

Solenoid Valves Flow Characteristics

(How to indicate flow characteristics)

1. Indication of flow characteristics

Indication of the flow characteristics in specifications for equipment such as solenoid valve, etc. is depending on "Table (1)".

Table (1) Indication of Flow Characteristics

Corresponding equipment	Indication by international standard	Other indications	Standards conforming to
Equipment for pneumatics	C, b		ISO 6358: 1989 JIS B 8390: 2000
		S	JIS B 8390: 2000 Equipment: JIS B 8373, 8374, 8379, 8381
		C_v	ANSI/(NFPA)T3.21.3: 1990

2. Equipment for pneumatics

2.1 Indication according to the international standards

(1) Standards conforming to

ISO 6358: 1989 : Pneumatic fluid power—Components using compressible fluids—Determination of flow-rate characteristics

JIS B 8390: 2000 : Pneumatic fluid power—Components using compressible fluids—How to test flow-rate characteristics

(2) Definition of flow characteristics

Flow rate characteristics are indicated by the comparison between sonic conductance C and critical pressure ratio b .

Sonic conductance C : Values which divide the passing mass flow rate of an equipment in a choked flow condition by the product of the upstream absolute pressure and the density in the standard condition.

Critical pressure ratio b : It is the pressure ratio which will turn to the choke flow (downstream pressure/upstream pressure) when it is smaller than this values. (critical pressure ratio)

Choked flow : It is the flow which upstream pressure is higher than the downstream pressure and it is being reached the sonic speed in a certain part of an equipment.
Gaseous mass flow rate is in proportion to the upstream pressure, and not dependent on the downstream pressure. (choked flow)

Subsonic flow : Flow in more than the critical pressure ratio.

Standard condition : Air in the state of temperature 20°C, absolute pressure 0.1 MPa (= 100 kPa = 1 bar), relative humidity 65%.

It is stipulated by adding the abbreviation (ANR) after the unit depicting air volume.
(standard reference atmosphere)

Standard conforming to: ISO 8778: 1990 Pneumatic fluid power—Standard reference atmosphere, JIS B 8393: 2000: Pneumatic fluid power—Standard reference atmosphere

(3) Formula of flow rate

It can be indicated by the practical unit as following.

When

$$\frac{P_2 + 0.1}{P_1 + 0.1} \leq b, \text{ choked flow}$$

$$Q = 600 \times C (P_1 + 0.1) \sqrt{\frac{293}{273 + t}} \dots\dots\dots(1)$$

When

$$\frac{P_2 + 0.1}{P_1 + 0.1} > b, \text{ subsonic flow}$$

Solenoid Valves Flow Characteristics

$$Q = 600 \times C (P_1 + 0.1) \sqrt{1 - \left[\frac{P_2 + 0.1}{P_1 + 0.1} - b \right]^2} \sqrt{\frac{293}{273 + t}} \dots\dots\dots (2)$$

Q : Air flow rate [dm³/min (ANR)], dm³ (Cubic decimeter) of SI unit are also allowed to described by ℓ (liter). 1 dm³ = 1 ℓ.

C : Sonic conductance [dm³/(s·bar)]

b : Critical pressure ratio [-]

P_1 : Upstream pressure [MPa]

P_2 : Downstream pressure [MPa]

t : Temperature [°C]

Note) Formula of subsonic flow is the elliptic analogous curve.

Flow characteristics curve is indicated in Graph (1). For details, make the use of SMC's "Energy Saving Program".

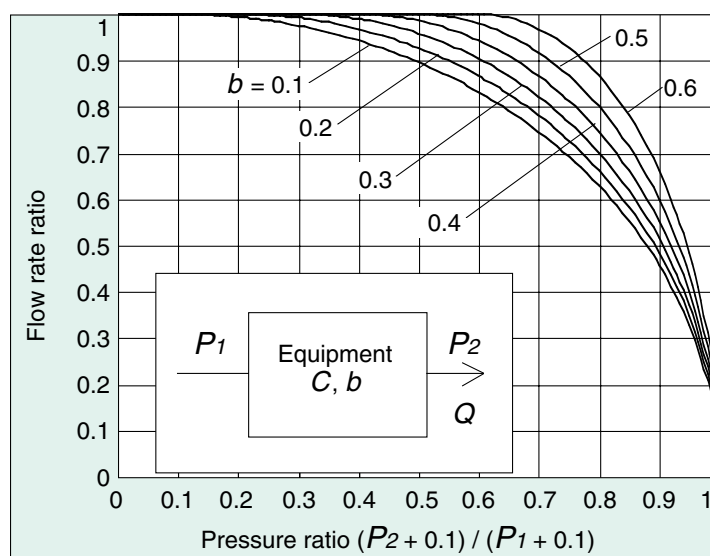
Example)

Obtain the air flow rate for $P_1 = 0.4$ [MPa], $P_2 = 0.3$ [MPa], $t = 20$ [°C] when a solenoid valve is performed in $C = 2$ [dm³/(s·bar)] and $b = 0.3$.

According to formula 1, the maximum flow rate = $600 \times 2 \times (0.4 + 0.1) \times \sqrt{\frac{293}{273 + 20}} = 600$ [dm³/min (ANR)]

$$\text{Pressure ratio} = \frac{0.3 + 0.1}{0.4 + 0.1} = 0.8$$

Based on Graph (1) it is going to be 0.7 if it is read by the pressure ratio as 0.8 and the flow ratio to be $b = 0.3$.
Hence, flow rate = Max. flow x flow ratio = $600 \times 0.7 = 420$ [dm³/min (ANR)].



Graph (1) Flow characteristics line

Solenoid Valves Flow Characteristics

(How to indicate flow characteristics)

2.1 Indication by international standards

(4) How to test

By piping the equipment on test with the test circuit as shown in figure (1), while maintaining the upstream pressure to a certain value which does not go down below 0.3 MPa, measure the maximum flow rate to be saturated in the first place. Then next, measure this flow at the point of 80%, 60%, 40%, 20% flow and the upstream pressure and downstream pressure. And from this maximum flow rate, figure out the sonic conductance C . Also, substitute the other each data for the subsonic flow formula to figure out b and then obtain the critical pressure ratio b from that average.

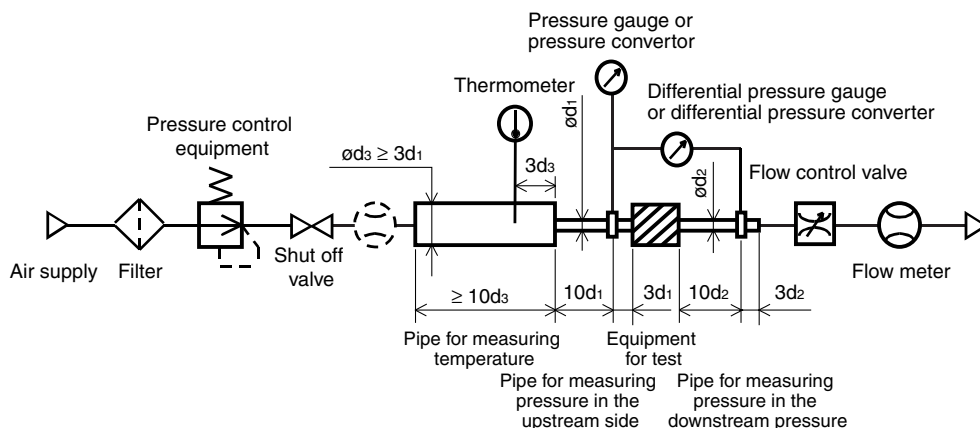


Fig. (1) Test circuit based on ISO6358, JIS B 8390.

2.2 Effective area S

(1) Standards conforming to

JIS B 8390: 2000: Pneumatic fluid power—Components using compressible fluids—Determination of flow-rate characteristics

Equipment standards: JIS B 8373: 2 port solenoid valve for pneumatics

JIS B 8374: 3 port solenoid valve for pneumatics

JIS B 8379: Silencer for pneumatics

JIS B 8381: Fittings of flexible joint for pneumatics

(2) Definition of flow characteristics

Effective area S: It is the cross-sectional area with having an ideal throttle without friction which was deduced by the calculation of the pressure changes inside air tank or without reduced flow when discharging the compressed air in a choked flow from an equipment attached to air tank. It is the same concept representing the "easy to run through" as sonic conductance C .

(3) Formula of flow rate

When

$$\frac{P_2 + 0.1}{P_1 + 0.1} \leq 0.5, \text{ choked flow}$$

$$Q = 120 \times S(P_1 + 0.1) \sqrt{\frac{293}{273 + t}} \quad (3)$$

When

$$\frac{P_2 + 0.1}{P_1 + 0.1} > 0.5, \text{ subsonic flow}$$

$$Q = 240 \times S \sqrt{(P_2 + 0.1)(P_1 - P_2)} \sqrt{\frac{293}{273 + t}} \quad (4)$$

Conversion with sonic conductance C :

$$S = 5.0 \times C \quad (5)$$

Q : Air flow rate[dm³/min(ANR)], dm³ (cubic decimeter) of SI unit is good to be described by ℓ (liter), too. 1 dm³ = 1 ℓ

S : Effective area [mm²]

P_1 : Upstream pressure [MPa]

P_2 : Downstream pressure [MPa]

t : Temperature [°C]

Note) Formula of subsonic flow (4) is only applicable when the critical pressure ratio b is the unknown equipment. In the formula by sonic conductance C (2), it is the same formula when $b = 0.5$.

(4) Test method

By piping an equipment for test with the test circuit shown in the figure (2), discharge air to the atmosphere until the pressure inside the air tank goes down to 0.25 MPa (0.2 MPa) from the air tank filled with compressed air of a certain pressure (0.5 MPa) which does not go down below 0.6 MPa. Measure the discharging time for this time and the residual pressure inside the air tank which had been left until it turned to be the normal values, and then figure out the effective area S by the following formula. The volume of air tank should be selected within the specified range by corresponding to the effective area of an equipment for test.

In the case of JIS B 8373, 8374, 8379, 8381, the pressure values are in the parenthesis and the coefficient of formula is 12.9.

$$S = 12.1 \frac{V}{t} \log_{10} \left(\frac{P_s + 0.1}{P + 0.1} \right) \sqrt{\frac{293}{T}} \dots\dots (6)$$

S : Effective area [mm²]

V : Air tank capacity [dm³]

t : Discharging time [s]

P_s : Pressure inside air tank before discharging [MPa]

P : Residual pressure inside air tank after discharging [MPa]

T : Temperature inside air tank before discharging [K]

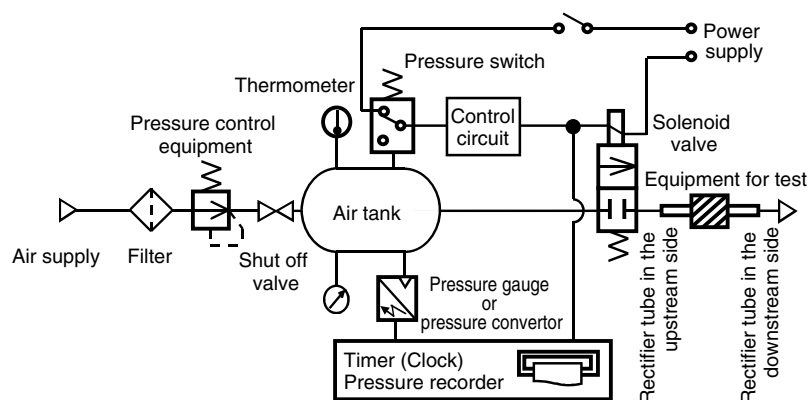


Fig. (2) Test circuit based on JIS B 8390

2.3 Flow coefficient C_v factor

The United States Standard ANSI/(NFPA)T3.21.3:1990: Pneumatic fluid power—Flow rating test procedure and reporting method—For fixed orifice components

defines the C_v factor of flow coefficient by the following formula based on the test conducted by the test circuit analogous to ISO 6358.

$$C_v = \frac{Q}{114.5 \sqrt{\frac{\Delta P (P_2 + P_a)}{T_1}}} \dots\dots\dots (7)$$

ΔP : Pressure drop between the static pressure tapping ports [bar]

P_1 : Pressure of the upstream tapping port [bar gauge]

P_2 : Pressure of the downstream tapping port [bar gauge]: $P_2 = P_1 - \Delta P$

Q : Flow rate [dm³/s standard condition]

P_a : Atmospheric pressure [bar absolute]

T_1 : Test conditions of the upstream absolute temperature [K]

Test condition is $P_1 + P_a = 6.5 \pm 0.2$ bar absolute, $T_1 = 297 \pm 5$ K, $0.07 \text{ bar} \leq \Delta P \leq 0.14$ bar.

This is the same concept as effective area A which ISO6358 stipulates as being applicable only when the pressure drop is smaller than the upstream pressure and the compression of air does not become a problem.

International System of Units (SI)

This catalog is written with SI units.

For detailed specifications, convert them by referring to the table below.

Principal SI units

No.	Description	Symbol	Conventional unit → SI unit	SI unit → conventional unit
1	Pressure	MPa	1 kgf/cm ² ≅ 0.098 MPa	1 MPa ≅ 10.2 kgf/cm ²
2	Force/Load	N	1 kgf ≅ 9.8 N	1 N ≅ 0.102 kgf
3	Moment of force	N·m	1 kgf·m ≅ 9.8 N·m	1 N·m ≅ 0.102 kgf·m
4	Vacuum pressure	-kPa	-1 mmHg ≅ -0.133 kPa	-1 kPa ≅ -7.5 mmHg
5	Moment of inertia	kg·m ²	1 kgf·cm·s ² ≅ 0.098 kg·m ²	1 kg·m ² ≅ 10.2 kgf·cm·s ²
6	Kinetic energy	J	1 kgf·cm ≅ 0.098 J	1 J ≅ 10.2 kgf·cm

① Pressure MPa → kgf/cm² (1 MPa ≅ 10.2 kg)

MPa	0.001	0.002	0.003	0.004	0.005	0.006	0.007	0.008	0.009	0.01	0.011	0.012	0.013	0.014	0.015	0.016	0.017	0.018	0.019
kgf/cm ²	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09	0.1	0.11	0.12	0.13	0.14	0.15	0.16	0.17	0.18	0.19
MPa	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09	0.1	0.11	0.12	0.13	0.14	0.15	0.16	0.17	0.18	0.19	0.2
kgf/cm ²	0.2	0.31	0.41	0.51	0.61	0.71	0.82	0.92	1.0	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8	1.9	2.0
MPa	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8	1.9	2.0	2.5
kgf/cm ²	3.1	4.1	5.1	6.1	7.1	8.2	9.2	10.2	11.2	12.2	13.3	14.3	15.3	16.3	17.3	18.4	19.4	20.4	25.5
MPa	3.0	3.5	4.0	4.5	5.0	5.5	6.0	6.5	7.0	7.5	8.0	8.5	9.0	9.9	10	20	30	40	50
kgf/cm ²	30.6	35.7	40.8	45.9	51.0	56.1	61.2	66.3	71.4	76.5	81.6	86.7	91.8	101.0	102	204	306	408	510

② Force/Load N → kgf (1 N ≅ 0.102 kgf)

N	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8	1.9
kgf	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09	0.1	0.11	0.12	0.13	0.14	0.15	0.16	0.17	0.18	0.19
N	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
kgf	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8	1.9	2.0
N	30	40	50	60	70	80	90	100	110	120	130	140	150	160	170	180	190	200	250
kgf	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	25
N	300	350	400	450	500	550	600	650	700	750	800	850	900	950	1000	2000	3000	4000	5000
kgf	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100	200	300	400	500



Safety Instructions

These safety instructions are intended to prevent hazardous situations and/or equipment damage. These instructions indicate the level of potential hazard with the labels of “**Caution**,” “**Warning**” or “**Danger**.” They are all important notes for safety and must be followed in addition to International Standards (ISO/IEC), Japan Industrial Standards (JIS)*¹⁾ and other safety regulations*²⁾.

* 1) ISO 4414: Pneumatic fluid power – General rules relating to systems.

ISO 4413: Hydraulic fluid power – General rules relating to systems.

IEC 60204-1: Safety of machinery – Electrical equipment of machines. (Part 1: General requirements)

ISO 10218-1992: Manipulating industrial robots -Safety.

JIS B 8370: General rules for pneumatic equipment.

JIS B 8361: General rules for hydraulic equipment.

JIS B 9960-1: Safety of machinery – Electrical equipment of machines. (Part 1: General requirements)

JIS B 8433-1993: Manipulating industrial robots - Safety.

etc.

* 2) Labor Safety and Sanitation Law, etc.

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

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

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

⚠ Warning

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

Since the product specified here is used under various operating conditions, its compatibility with specific equipment must be decided by the person who designs the equipment or decides its specifications based on necessary analysis and test results. The expected performance and safety assurance of the equipment will be the responsibility of the person who has determined its compatibility with the product. This person should also continuously review all specifications of the product referring to its latest catalog information, with a view to giving due consideration to any possibility of equipment failure when configuring the equipment.

2. Only personnel with appropriate training should operate machinery and equipment.

The product specified here may become unsafe if handled incorrectly. The assembly, operation and maintenance of machines or equipment including our products must be performed by an operator who is appropriately trained and experienced.

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

1. The inspection and maintenance of machinery/equipment should only be performed after measures to prevent falling or runaway of the driven objects have been confirmed.

2. When the product is to be removed, confirm that the safety measures as mentioned above are implemented and the power from any appropriate source is cut, and read and understand the specific product precautions of all relevant products carefully.

3. Before machinery/equipment is restarted, take measures to prevent unexpected operation and malfunction.

4. Contact SMC beforehand and take special consideration of safety measures if the product is to be used in any of the following conditions.

1. Conditions and environments outside of the given specifications, or use outdoors or in a place exposed to direct sunlight.

2. Installation on equipment in conjunction with atomic energy, railways, air navigation, space, shipping, vehicles, military, medical treatment, combustion and recreation, or equipment in contact with food and beverages, emergency stop circuits, clutch and brake circuits in press applications, safety equipment or other applications unsuitable for the standard specifications described in the product catalog.

3. An application which could have negative effects on people, property, or animals requiring special safety analysis.

4. Use in an interlock circuit, which requires the provision of double interlock for possible failure by using a mechanical protective function, and periodical checks to confirm proper operation.



Safety Instructions

Caution

The product is provided for use in manufacturing industries.

The product herein described is basically provided for peaceful use in manufacturing industries.

If considering using the product in other industries, consult SMC beforehand and exchange specifications or a contract if necessary. If anything is unclear, contact your nearest sales branch.

Limited Warranty and Disclaimer/Compliance Requirements

The product used is subject to the following “Limited Warranty and Disclaimer” and “Compliance Requirements”. Read and accept them before using the product.

Limited Warranty and Disclaimer

1. The warranty period of the product is 1 year in service or 1.5 years after the product is delivered.*3)

Also, the product may have specified durability, running distance or replacement parts. Please consult your nearest sales branch.

2. For any failure or damage reported within the warranty period which is clearly our responsibility, a replacement product or necessary parts will be provided.

This limited warranty applies only to our product independently, and not to any other damage incurred due to the failure of the product.

3. Prior to using SMC products, please read and understand the warranty terms and disclaimers noted in the specified catalog for the particular products.

* 3) Vacuum pads are excluded from this 1 year warranty.

A vacuum pad is a consumable part, so it is warranted for a year after it is delivered.

Also, even within the warranty period, the wear of a product due to the use of the vacuum pad or failure due to the deterioration of rubber material are not covered by the limited warranty.

Compliance Requirements

When the product is exported, strictly follow the laws required by the Ministry of Economy, Trade and Industry (Foreign Exchange and Foreign Trade Control Law).

5 Port Solenoid Valve

Connector Type Manifold
Metal Seal / Rubber Seal

IP67 enclosure compatible



RoHS
compliant

Power saving

Standard: **0.4 w**

(Reduced by **60%** compared to existing model)

High-pressure (1 MPa, Metal seal): **0.95 w**



Series **VQC1000/2000**



CAT.ES11-101A

Connector Type Manifold

Series VQC1000/2000

Power saving

Standard: **0.4 W** (Reduced by **60%** compared to existing model)

High-pressure (1 MPa, Metal seal): **0.95 W**

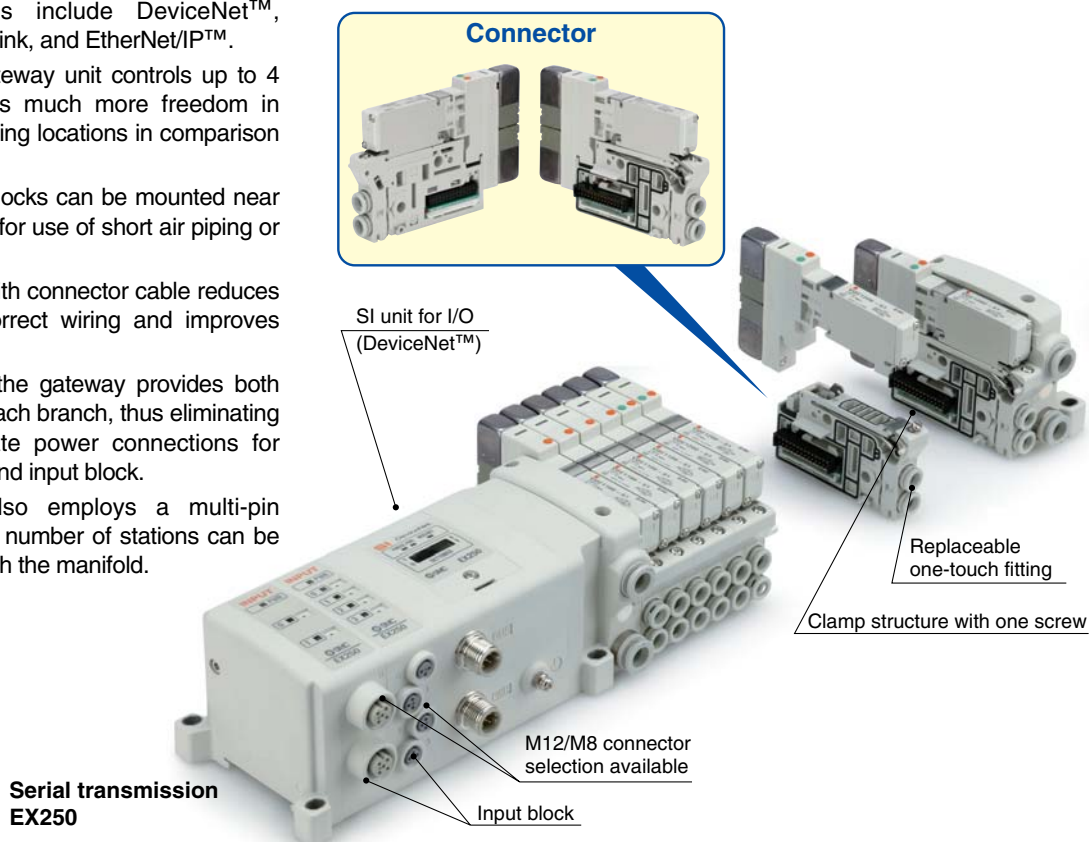
IP67 enclosure compatible Dust-tight, Immersion-proof

(Based on IEC60529)

(S/T/L/M kit)

Accommodates gateway-type serial wiring.

- Gateway unit types include DeviceNet™, PROFIBUS DP, CC-Link, and EtherNet/IP™.
- Because just one gateway unit controls up to 4 branch lines, it offers much more freedom in choosing valve mounting locations in comparison with other serial units.
- Manifolds and input blocks can be mounted near the actuator, allowing for use of short air piping or electric wiring.
- The package wiring with connector cable reduces the potential for incorrect wiring and improves wiring efficiency.
- A single cable from the gateway provides both signal and power to each branch, thus eliminating the need for separate power connections for each manifold valve and input block.
- The input block also employs a multi-pin connector so that the number of stations can be changed easily, as with the manifold.



Applicable to EX600 (Input/Output) serial transmission system (Fieldbus system)

- Available for DeviceNet™, PROFIBUS DP and CC-Link fieldbus protocols
- **Max. 9 units** ^{Note)} can be connected in any order.
The unit to connect input device such as an auto switch, pressure switch and flow switch, and the unit to connect output device such as a solenoid valve, relay and indicator light can be connected in any order.
^{Note)} Except SI unit
- **Analogue Input Unit can be connected with analogue input device.**
As well as a Digital (switch) Input/Output Unit, a unit applicable to analogue signal is provided, and can be connected with various device for control.
- **Self-diagnosis function**
It is possible to ascertain the maintenance period and identify the parts that require maintenance, by an input (sensor) open circuit detecting function and an input/output signal of ON/OFF counter function. Also, the monitoring of input/output signal and the setting of parameters can be performed with a Handheld Terminal.



Compact and high flow

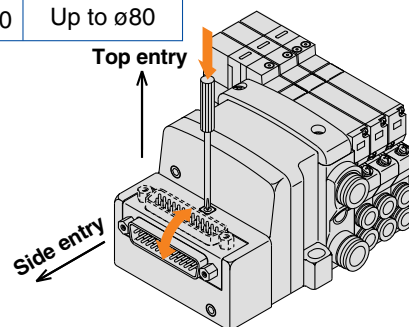
Series	Manifold pitch (mm)	Flow-rate characteristics ^{Note)}						Applicable cylinder bore size (mm)
		Metal seal			Rubber seal			
		C [dm³/(s·bar)]	b	Cv	C [dm³/(s·bar)]	b	Cv	
VQC1000	10.5	0.72	0.25	0.18	1.0	0.30	0.25	Up to ø50
VQC2000	16	2.6	0.15	0.60	3.2	0.30	0.80	Up to ø80

Note) Flow-rate characteristics: 2-position single, 4/2 → 5/3 (A/B → R1/R2)

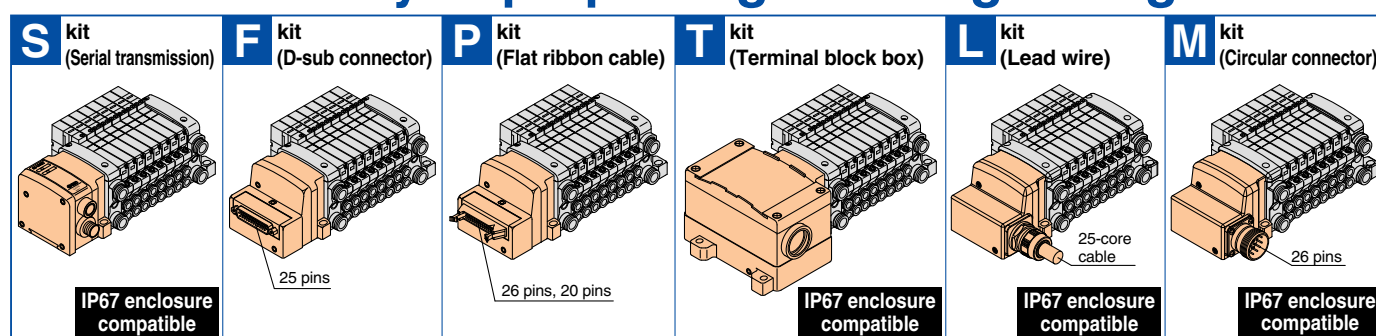
Connector entry direction can be changed with a single push. (F/P kit)

The connector entry direction can be changed from the top to the side by simply pressing the manual release button.

It is not necessary to use the manual release button when switching from the side to the top.



A wide variety of prepackaged wiring configurations



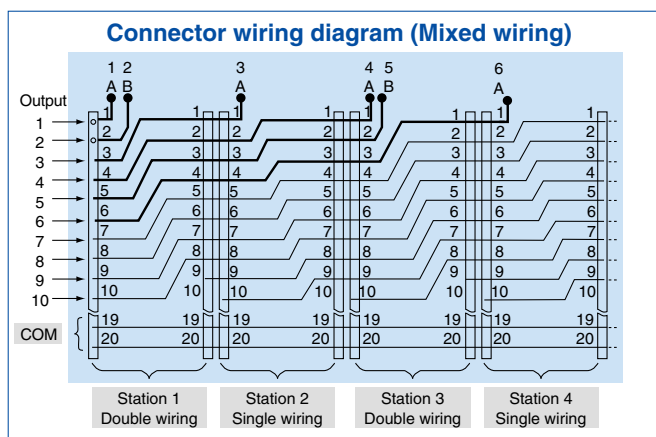
- Our six standard wiring packages bring a world of ease to wiring and maintenance work, while the protective enclosures of four of them conform to IP67 standards.
- The S kit is compatible with a combined I/O unit. (Not applicable to Gateway unit)

Connector type manifold

- The use of multi-pin connectors to replace wiring inside manifold blocks provides flexibility when adding stations or changing manifold configuration.
- All kits use multi-pin connectors, so switching from the F kit (D-sub connector) to the S kit (serial transmission) can be done simply by changing the kit section.

(Refer to the connector wiring diagram.)

Printed circuit board patterns between connectors are shifted at every station. This allows for viable connections to take place without necessarily specifying whether the manifold station is double, single, or mixed wiring.



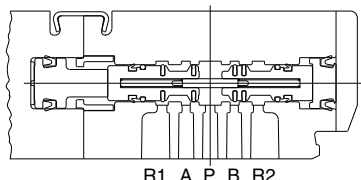
Dual 3-port valves, 4 positions

VQC1000/2000 (Rubber seal only)

- Two 3-port valves built into one body
- The 3-port valves on the A and B sides can operate independently.
- When used as 3-port valves, only half the number of stations is required.
- Can also be used as a 4-position, 5-port type valve.

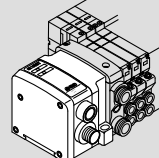
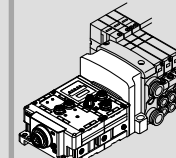
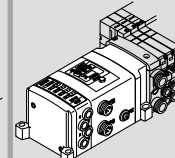
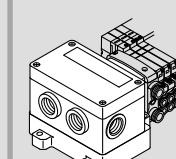
Exhaust center : **VQC1A01**
: **VQC2A01**

Pressure center : **VQC1B01**
: **VQC2B01**

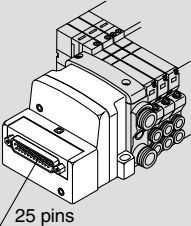
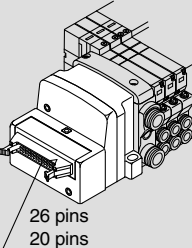
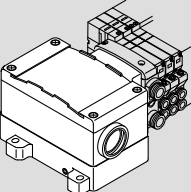
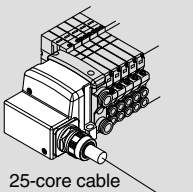
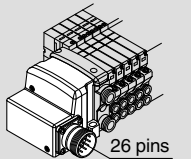


Model	A side	B side	JIS symbol
VQC1A01 VQC2A01	N.C. valve	N.C. valve	
VQC1B01 VQC2B01	N.O. valve	N.O. valve	
VQC1C01 VQC2C01	N.C. valve	N.O. valve	

Series VQC/Base Mounted: Variations

			Sonic conductance C [dm ³ /(s·bar)] (CYL → EXH) 4/2 → 5/3		Applicable cylinder bore size	S kit			
						Serial transmission			
Single/Double 3-position (Closed center)						Gateway application Compatible network • DeviceNet™ • PROFIBUS DP • CC-Link • EtherNet/IP™ Decentralized Serial Wiring Gateway application requires a gateway unit and communication cable separately. Please contact SMC for details.  Serial unit: EX500 IP67 compliant	Compatible network • DeviceNet™ • PROFIBUS DP • CC-Link I/O  Serial unit (Fieldbus system): EX600 IP67 compliant	Compatible network • DeviceNet™ • PROFIBUS DP • CC-Link • AS-Interface • CANopen • ControlNet™ • EtherNet/IP™ I/O  Serial unit: EX250 IP67 compliant	Compatible network • CC-Link Output  Serial unit: EX126 IP67 compliant
Series VQC1000 P. 5	Metal seal	VQC1□00	0.72	0.72	Up to ø50				
	Rubber seal	VQC1□01	1.0	0.65					
Series VQC2000 P. 9	Metal seal	VQC2□00	2.6	2.0	Up to ø80				
	Rubber seal	VQC2□01	3.2	2.2					

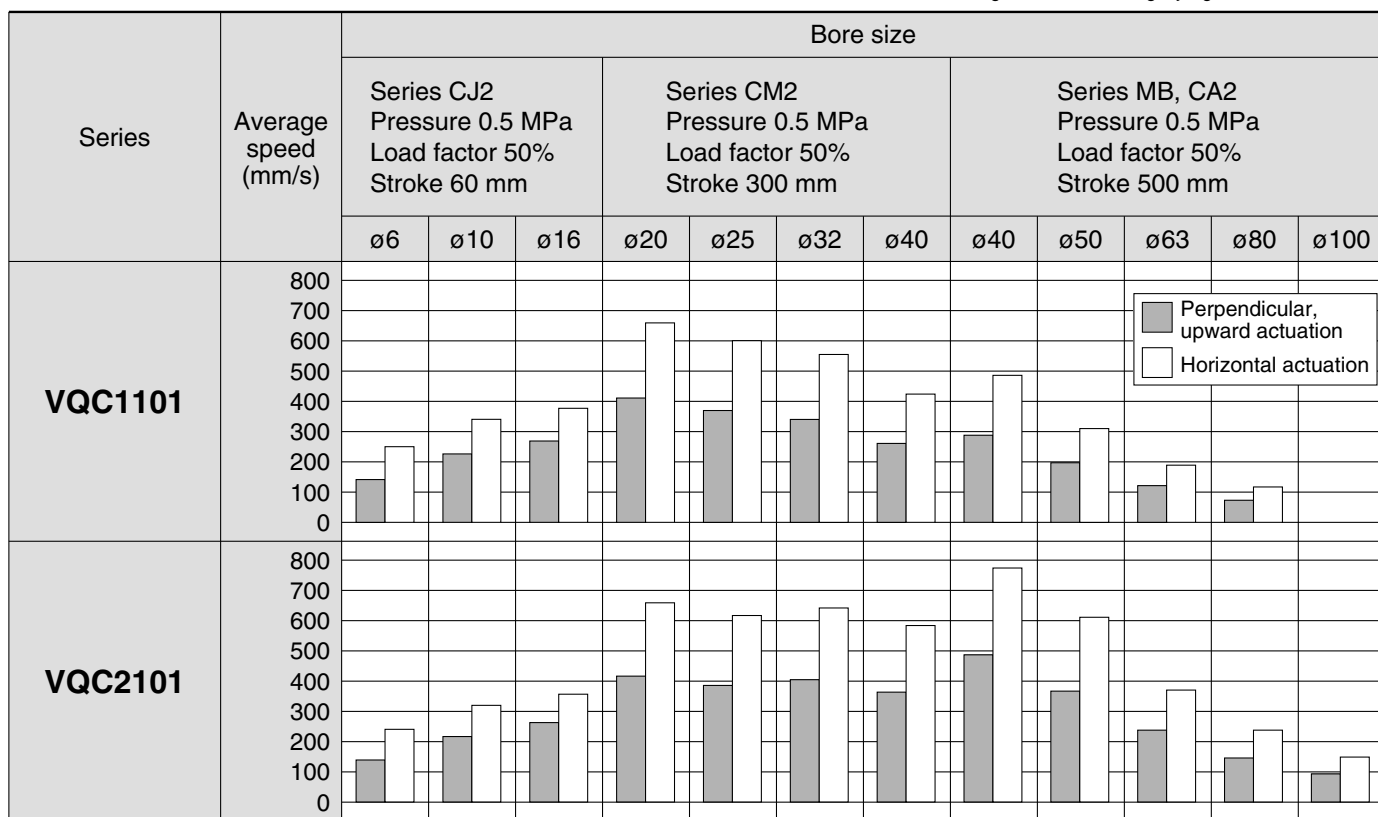
5 Port Solenoid Valve *Series VQC1000/2000*

	F kit	P kit	T kit	L kit	M kit	Port size	
	D-sub connector	Flat ribbon cable	Terminal block box	Electrical entry	Circular connector		
	D-sub connector (Conforming to MIL D-sub connector)  25 pins	Flat ribbon cable (Conforming to MIL flat ribbon cable connector)  26 pins 20 pins	Terminal block box (Terminal block) (Terminal block is compactly arranged on one side.)  IP67 compliant	Lead wire (IP67 enclosure with use of multiple wire cable with sheath and waterproof connector)  25-core cable IP67 compliant	Circular connector (IP67 enclosure with use of waterproof circular connector)  26 pins IP67 compliant	SUP EXH port 1, 3 (P, R)	Cylinder port 2, 4 (A, B)
						C8 (ø8) N9 (ø5/16")	C3 (ø3.2) C4 (ø4) C6 (ø6) M5 (M5 thread) N1 (ø1/8") N3 (ø5/32") N7 (ø1/4")
						C10 (ø10) N11 (ø3/8") In case of branch type C12 (ø12) N13 (ø1/2")	C4 (ø4) C6 (ø6) C8 (ø8) N3 (ø5/32") N7 (ø1/4") N9 (ø5/16")

Series VQC1000/2000

Cylinder Speed Chart

This chart is provided as guidelines only.
For performance under various conditions, use SMC's Model Selection Program before making a judgment.



-  * It is when the cylinder is extending that is meter-out controlled by speed controller which is directly connected with cylinder, and its needle valve with being fully open.
 * The average velocity of the cylinder is what the stroke is divided by the total stroke time.
 * Load factor: ((Load mass x 9.8)/Theoretical force) x 100%

Conditions

Series	Conditions	Series CJ2	Series CM2	Series MB, CA2
VQC1101	Tube x Length	T0604 (O.D. ø6/I.D. ø4) x 1 m		
	Speed controller	AS3001F-06		
	Silencer	AN200-KM8		
VQC2101	Tube x Length	T0806 (O.D. ø8/I.D. ø6) x 1 m		
	Speed controller	AS3001F-08		
	Silencer	AN200-KM10		

How to Order Valves

VQC 1 **1** 0 0 **5** **1**

Series VQC1000

(A) (B) (C) (D) (E) (F)

A Type of actuation

1	2-position single (A) (B) 4 2 5 1 3 (R1) (P) (R2)	Note) A	4-position dual 3-port valve (A) (B) 4 2 5 1 3 (R1) (P) (R2) N.C. (P) N.C.
	2-position double (Metal) (A) (B) 4 2 5 1 3 (R1) (P) (R2)		4-position dual 3-port valve (B) (A) 4 2 5 1 3 (R1) (P) (R2) N.O. (P) N.O.
2	2-position double (Rubber) (A) (B) 4 2 5 1 3 (R1) (P) (R2)	Note) C	4-position dual 3-port valve (C) (A) (B) 4 2 5 1 3 (R1) (P) (R2) N.C. (P) N.O.
3	3-position closed center (A) (B) 4 2 5 1 3 (R1) (P) (R2)	Note) Rubber seal only	
4	3-position exhaust center (A) (B) 4 2 5 1 3 (R1) (P) (R2)		
5	3-position pressure center (A) (B) 4 2 5 1 3 (R1) (P) (R2)		

B Seal

0	Metal seal
1	Rubber seal

C Function

Nil	Standard (0.4 W)
B	High-speed response type (0.95 W)
K Note 2)	High-pressure type (1.0 MPa, 0.95 W)
N Note 3)	Negative common
R Note 4)	External pilot

Note 1) When two or more symbols are specified, indicate them alphabetically. However, combination of "B" and "K" is not possible.

Note 2) Metal seal only

Note 3) When "-COM." is specified for the SI unit, select and mount the valve of negative common.

Note 4) Dual 3-port is not applicable.

D Coil voltage

5 Note)	24 VDC
6	12 VDC

Note) Only 24 VDC is available with the S kit.

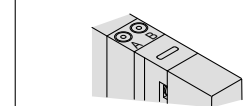
E Light/surge voltage suppressor

Nil	Yes
E Note)	None

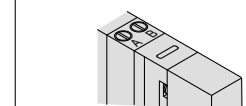
Note) Not applicable to the S kit.

F Manual override

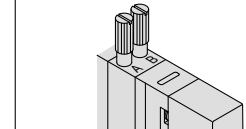
Nil: Non-locking push type (Tool required)



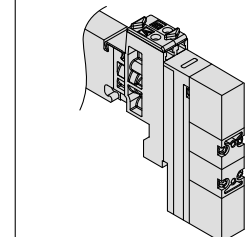
B: Locking type (Tool required)



C: Locking type (Manual)



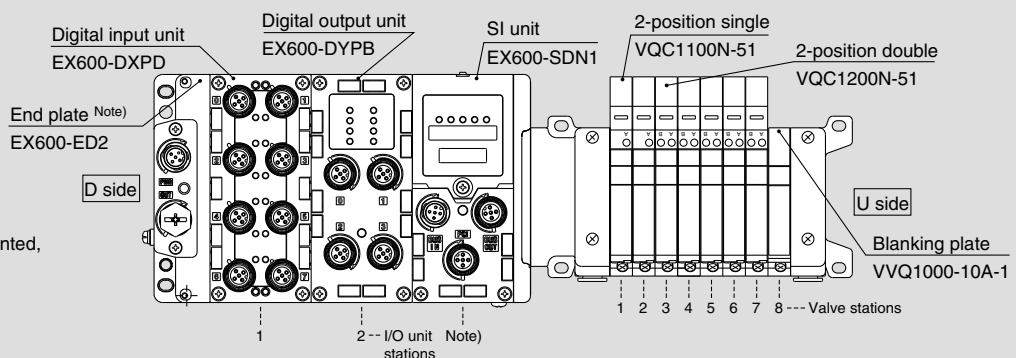
D: Slide locking type (Manual)



How to Order Manifold Assembly

Example

Manifold
Power supply with
M12 connector



For the I/O unit part number mounted, refer to catalog CAT.E02-24.

- Digital input unit
- Digital output unit
- Analog input unit

Serial transmission kit

VV5QC11-08C6SD6Q2N2 1 set Manifold base part number

* VQC1100N-51 2 sets Valve part number (Stations 1 to 2)

* VQC1200N-51 5 sets Valve part number (Stations 3 to 7)

* VVQ1000-10A-1 1 set Blanking plate number (Station 8)

* EX600-DXPD 1 set I/O unit part number (Station 1)

* EX600-DYPB 1 set I/O unit part number (Station 2)

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

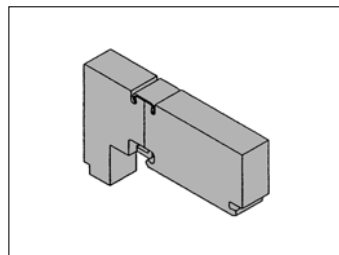
Enter in order starting from the first station on the D-side.
When entry of part numbers becomes complicated, indicate with the manifold specification sheet.

Enter in order starting from the first station on the U-side.
When entry of part numbers becomes complicated, indicate with the manifold specification sheet.

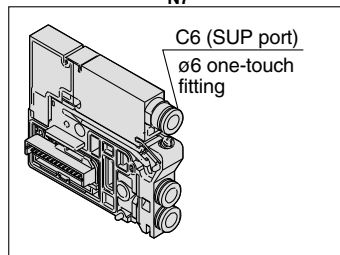
Note) Do not enter the SI unit part number and the end plate part number together.

Refer to pages 40 through to 43 for details.

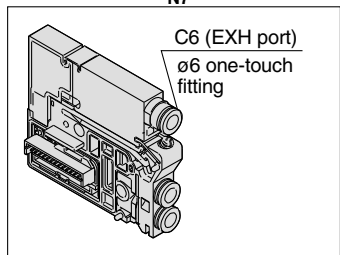
Blanking plate assembly VVQ1000-10A-1



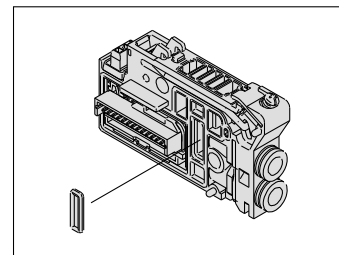
Individual SUP spacer
VVQ1000-P-1-C₆
N₇



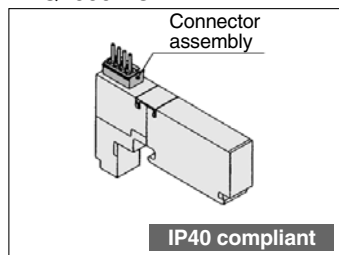
Individual EXH spacer
VVQ1000-R-1-^{C6}_{N7}



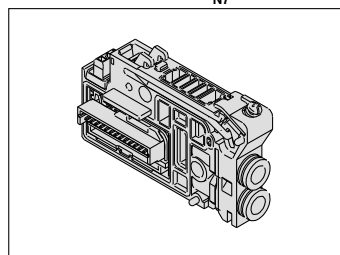
SUP block plate
VVQ1000-16A



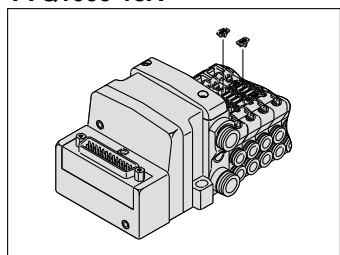
Blanking plate with connector
VVQ1000-1C□-□



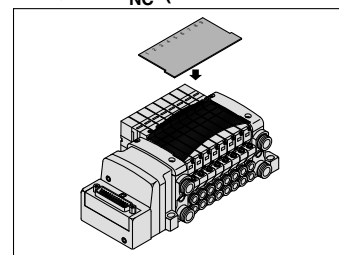
EXH block plate assembly
VVQC1000-19A-S-D ^{C3, C4} ^{C6, M5} ^{N1, N3} ^{N17}



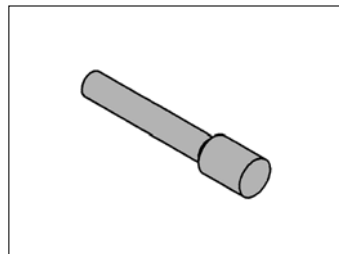
**Back pressure check valve
assembly [-B]
VVQ1000-18A**



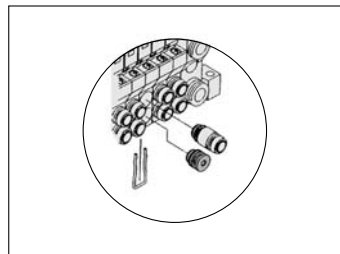
Name plate [-N]
VVQ1000-^N_{NC}-(1 to Max. stations)



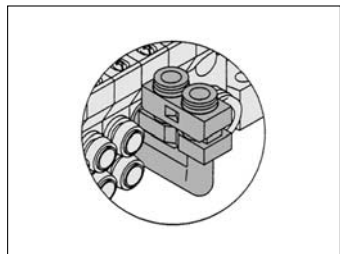
Blanking plug
KQ2P-□



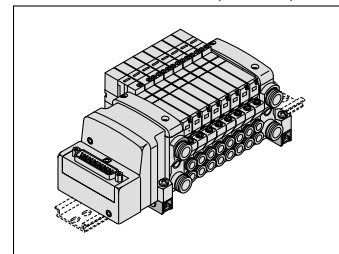
Port plug
VVQ0000-58A



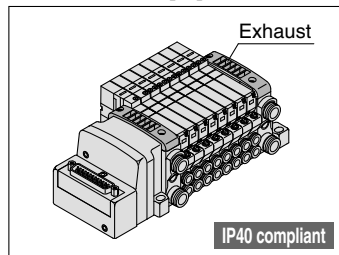
Elbow fitting assembly
VVQ1000-F-L ☐



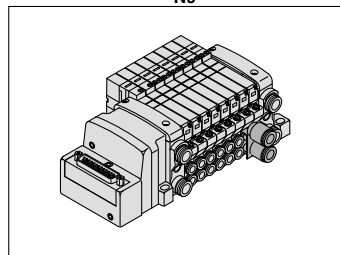
DIN rail mounting bracket [-D]
VVQ1000-57A
 {For F/L/M/P/S (EX500) kit}
VVQC1000-57A-S
 {For S (EX250) kit}
VVQC1000-57A-T (For T kit)



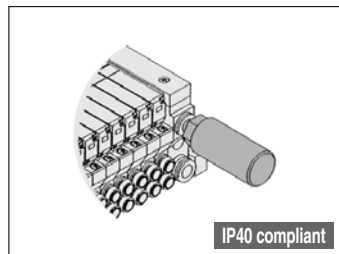
**Direct EXH outlet with
built-in silencer [-S]**



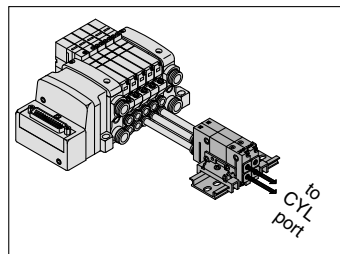
Dual flow fitting assembly
VVQ1000-52A-C8
No.



Silencer (For EXH port)
AN200-KM8
AN203-KM8

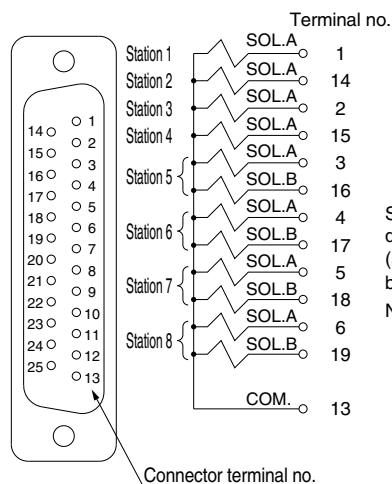


Double check block
VVQ1000-FPG-□□-□



Special electrical wiring specifications [-K]

Wiring example)
D-sub connector



Standard manifolds are for double wiring, but mixed wiring (single and double wiring) can be specified as an option.

Note) Refer to the pages of each kit for details.

F kit P. 25

P kit P. 27

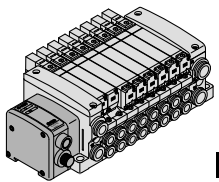
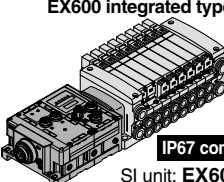
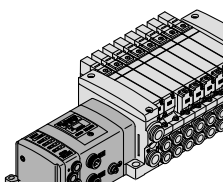
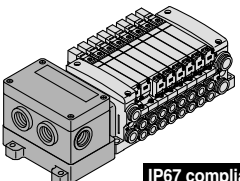
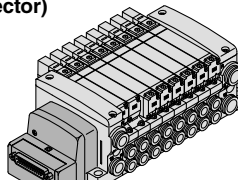
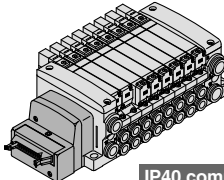
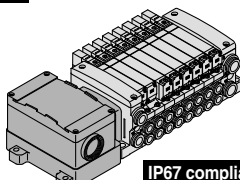
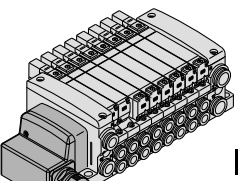
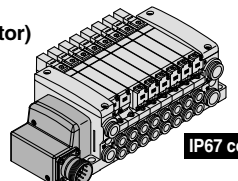
T kit P 29

I kit P. 31

M kit P. 33

3 Kit type/Electrical entry/Cable length

* Numbers in parentheses represent the maximum number of solenoids in case of mixed single and double wiring. The maximum number of stations is determined by the total number of solenoids. When ordering mixed wiring, please add the option symbol “-K”.

S kit (Serial transmission: EX500 gateway type)  IP67 compliant SI unit: EX500		S kit (Serial transmission (Fieldbus system): EX600 integrated type (I/O))  IP67 compliant SI unit: EX600		S kit (Serial transmission: EX250 integrated type (I/O))  IP40 compliant IP67 compliant SI unit: EX250		SD0 Without SI unit SDQ DeviceNet™ SDN PROFIBUS-DP SDV CC-LINK SDTA AS-Interface, 8 in/8 out, 31 slave modes, 2 power supply systems SDBT AS-Interface, 4 in/4 out, 31 slave modes, 2 power supply systems SDTC AS-Interface, 8 in/8 out, 31 slave modes, 1 power supply systems SDTD AS-Interface, 4 in/4 out, 31 slave modes, 1 power supply systems SDY CANopen SDZCN ControlNet™ (IP40 compliant) SDZEN EtherNet/IP™
SD0 Without SI unit SDA2 DeviceNet™, PROFIBUS DP, CC-LINK, EtherNet/IP™	1 to 8 stations (16)	SD60 Without SI unit SD6Q DeviceNet™ SD6N PROFIBUS DP SD6V CC-LINK	1 to 12 stations (24)			
S kit (Serial transmission: EX126 integrated type (Output))  IP67 compliant SI unit: EX126		F kit (D-sub connector)  IP40 compliant		P kit (Flat ribbon cable)  IP40 compliant Note) For a 20P flat ribbon cable, the cable assembly must be ordered separately.		PD0 Flat ribbon cable (26P) without cable PD1 Flat ribbon cable (26P) with 1.5 m cable PD2 Flat ribbon cable (26P) with 3.0 m cable PD3 Flat ribbon cable (26P) with 5.0 m cable PDC Flat ribbon cable (20P) without cable
SDVB CC-LINK	1 to 8 stations (16)	FD0 D-sub connector (25P) without cable FD1 D-sub connector (25P) with 1.5 m cable FD2 D-sub connector (25P) with 3.0 m cable FD3 D-sub connector (25P) with 5.0 m cable	1 to 12 stations (24)			1 to 12 stations (24) 1 to 9 stations (18)
T kit (Terminal block box)  IP67 compliant		L kit (Lead wire)  IP67 compliant 25-core cable		M kit (Circular connector)  IP67 compliant		MD0 Circular connector (26P) without cable MD1 Circular connector (26P) with 1.5 m cable MD2 Circular connector (26P) with 3.0 m cable MD3 Circular connector (26P) with 5.0 m cable
TD0 Terminal block box	1 to 10 stations (20)	LD0 Lead wire (25 cores) 0.6 m lead wire LD1 Lead wire (25 cores) 1.5 m lead wire LD2 Lead wire (25 cores) 3.0 m lead wire	1 to 12 stations (24)			1 to 12 stations (24)

* The maximum number of stations displayed in parentheses is applied to the special wiring specifications. (Option “-K”)

Note 1) When selecting SI units with SDTC or SDTD specifications, there are limits to the supply current from the SI unit to the input block or valve. Refer to Best Pneumatics No. ① for details.

Note 2) When selecting SI units with SDZCN specifications only, IP40 is compatible. (All other SI units are IP67 compliant.)

EX500 SI Unit Part No.

Symbol	Protocol	SI unit part no.		Page
		NPN output (+ COM.)	NPN output (- COM.)	
SDA2	DeviceNet™	EX500-Q001	EX500-Q101	Best Pneumatics No. ①
	PROFIBUS-DP			
	CC-LINK			
	EtherNet/IP™			

EX600 SI Unit Part No.

Symbol	Protocol	SI unit part no.		Page
		PNP output	NPN output	
SD6Q	DeviceNet™	EX600-SDN1	EX600-SDN2	Fieldbus system catalog (I/O)
SD6N	CC-LINK	EX600-SMJ1	EX600-SMJ2	
SD6V	PROFIBUS DP	EX600-SPR1	EX600-SPR2	

Refer to catalog CAT.E02-24, Fieldbus System (I/O), for details on the EX600 integrated-type (I/O).

Refer to Best Pneumatics No. ① for details on the EX500 gateway-type serial transmission system, EX250 integrated-type (I/O) serial transmission system and EX126 integrated-type (Output) serial transmission system.

EX250 SI Unit Part No.

Symbol	Protocol	SI unit part no.	Page
SDQ	DeviceNet™	EX250-SDN1	Best Pneumatics No. ①
SDN	PROFIBUS-DP	EX250-SPR1	
SDV	CC-LINK	EX250-SMJ2	
SDTA	AS-Interface, 8 in/8 out, 31 slave modes, 2 power supply systems	EX250-SAS3	
SDBT	AS-Interface, 4 in/4 out, 31 slave modes, 2 power supply systems	EX250-SAS5	
SDTC	AS-Interface, 8 in/8 out, 31 slave modes, 1 power supply systems	EX250-SAS7	
SDTD	AS-Interface, 4 in/4 out, 31 slave modes, 1 power supply systems	EX250-SAS9	
SDY	CANopen	EX250-SCA1A	
SDZCN	ControlNet™	EX250-SCN1	
SDZEN	EtherNet/IP™	EX250-SEN1	

EX126 SI Unit Part No.

Symbol	Protocol	SI unit part no.	Page
SDVB	CC-LINK	EX126D-SMJ1	Best Pneumatics No. ①

How to Order Valves

VQC2 1 0 0 - 5 **1**

Series VQC2000 • (A) (B) (C) (D) (E) (F)

A Type of actuation

1	2-position single (A) (B) 4 2 5 1 3 (R1) (P) (R2)	Note) A	4-position dual 3-port valve (A) (B) 4 2 5 1 3 (R1) (P) (R2) N.C. (P) N.C.
	2-position double (Metal) (A) (B) 4 2 5 1 3 (R1) (P) (R2)		4-position dual 3-port valve (B) (A) 4 2 5 1 3 (R1) (P) (R2) N.O. (P) N.O.
	2-position double (Rubber) (A) (B) 4 2 5 1 3 (R1) (P) (R2)		4-position dual 3-port valve (C) (A) (B) 4 2 5 1 3 (R1) (P) (R2) N.C. (P) N.O.
3	3-position closed center (A) (B) 4 2 5 1 3 (R1) (P) (R2)	Note) Rubber seal only	
4	3-position exhaust center (A) (B) 4 2 5 1 3 (R1) (P) (R2)		
5	3-position pressure center (A) (B) 4 2 5 1 3 (R1) (P) (R2)		

B Seal

0	Metal seal
1	Rubber seal

C Function

Nil	Standard (0.4 W)
B	High-speed response type (0.95 W)
K Note 2)	High-pressure type (1.0 MPa, 0.95 W)
N Note 3)	Negative common
R Note 4)	External pilot

Note 1) When two or more symbols are specified, indicate them alphabetically. However, combination of "B" and "K" is not possible.

Note 2) Metal seal only

Note 3) When "-COM." is specified for the SI unit, select and mount the valve of negative common.

Note 4) Dual 3-port type is not applicable.

D Coil voltage

5 Note)	24 VDC
6	12 VDC

Note) Only 24 VDC is available with the S kit.

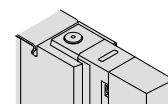
E Light/surge voltage suppressor

Nil	Yes
E Note)	None

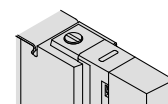
Note) Not applicable to the S kit.

F Manual override

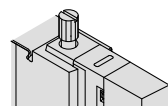
Nil: Non-locking push type (Tool required)



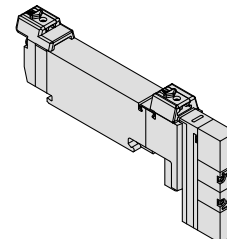
B: Locking type (Tool required)



C: Locking type (Manual)

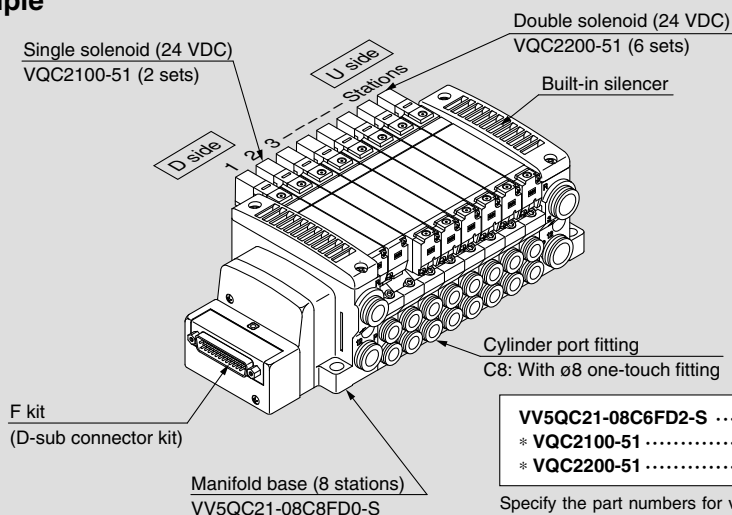


D: Slide locking type (Manual)



How to Order Manifold Assembly

Example



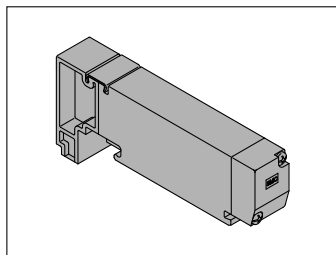
VV5QC21-08C6FD2-S 1 set (F kit, built-in silencer 8-station manifold base part no.)
 * **VQC2100-51** 2 sets (Single solenoid part no.)
 * **VQC2200-51** 6 sets (Double solenoid part no.)

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.

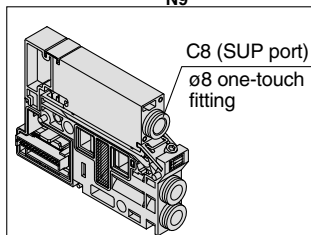
Manifold Options

Refer to pages 44 through to 46 for details.

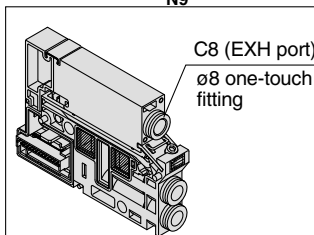
Blanking plate assembly
VVQ2000-10A-1



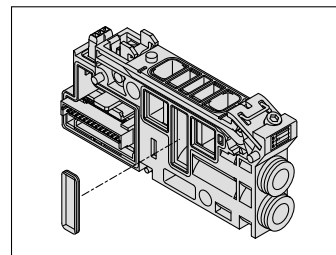
Individual SUP spacer
VVQ2000-P-1-C8
N9



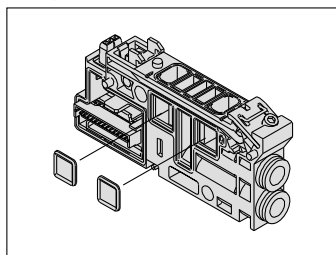
Individual EXH spacer
VVQ2000-R-1-C8
N9



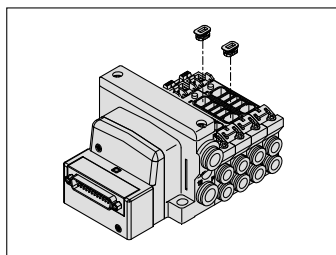
SUP block plate
VVQ2000-16A



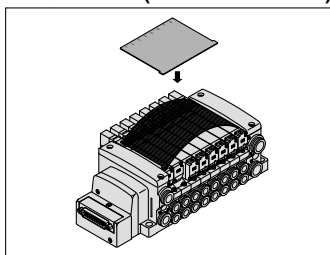
EXH block plate
VVQ2000-19A



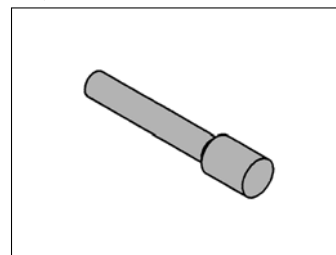
Back pressure check valve assembly [-B]
VVQ2000-18A



Name plate [-N]
VVQ2000-N-(1 to Max. stations)



Blanking plug
KQ2P-□



DIN rail mounting bracket [-D]

VVQ2000-57A

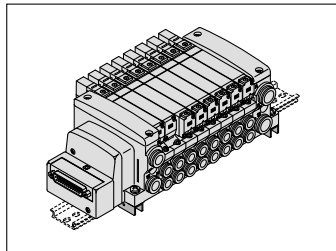
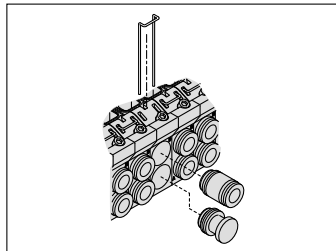
{For F/L/M/P/S (EX500) kit}

VVQC2000-57A-S

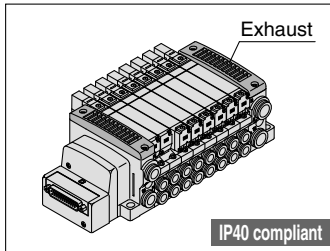
{For S (EX250) kit}

VVQC2000-57A-T (For T kit)

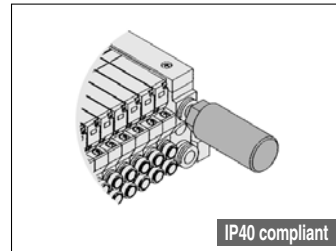
Port plug
VVQ1000-58A



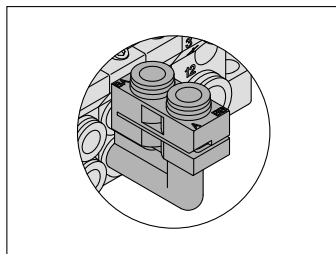
Direct EXH outlet with built-in silencer [-S]



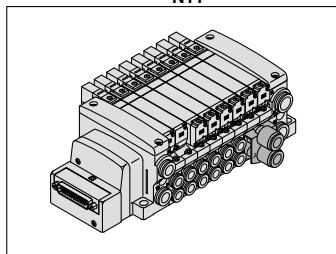
Silencer (For EXH port)
AN200-KM10



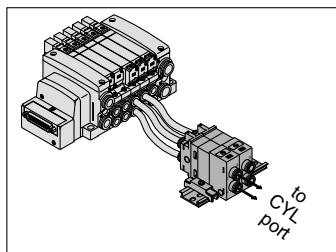
Elbow fitting assembly
VVQ2000-F-L-□



Dual flow fitting assembly
VVQ2000-52A-C10
N11



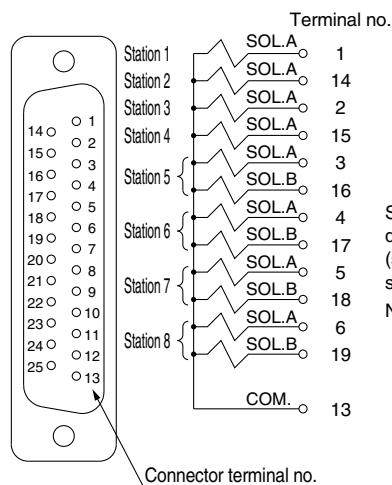
Double check block
VVQ2000-FPG-□□-□



Special electrical wiring specifications [-K]

Wiring example)

D-sub connector



Standard manifolds are for double wiring, but mixed wiring (single and double wiring) can be specified as an option.

Note) Refer to the pages of each kit for details.

F kit P. 25

P kit P. 27

T kit P. 29

L kit P. 31

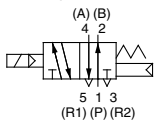
M kit P. 33

Plug-in Unit

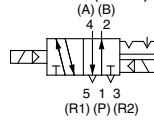
Model

Symbol

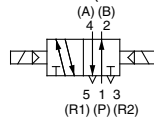
2-position single



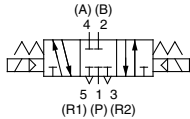
2-position double (Metal)



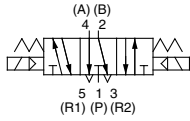
2-position double (Rubber)



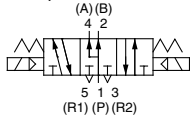
3-position closed center



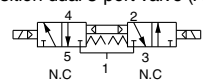
3-position exhaust center



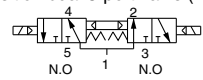
3-position pressure center



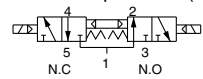
4-position dual 3-port valve (A)



4-position dual 3-port valve (B)



4-position dual 3-port valve (C)



Series	Type of actuation		Model		Flow-rate characteristics						Response time ^{Note 2)} (ms)		Mass (g)
					1 → 4, 2 (P → A, B)			4, 2 → 5, 3 (A, B → R1, R2)			Standard: 0.4 W	High-speed response: 0.95 W	
					C [dm³/(s·bar)]	b	Cv	C [dm³/(s·bar)]	b	Cv			
VQC1000	2-position	Single	Metal seal	VQC1100	0.70	0.15	0.16	0.72	0.25	0.18	15 or less	12 or less	67
			Rubber seal	VQC1101	0.85	0.20	0.21	1.0	0.30	0.25	20 or less	15 or less	
		Double	Metal seal	VQC1200	0.70	0.15	0.16	0.72	0.25	0.18	13 or less	10 or less	77
			Rubber seal	VQC1201	0.85	0.20	0.21	1.0	0.30	0.25	20 or less	15 or less	
	3-position	Closed center	Metal seal	VQC1300	0.68	0.15	0.16	0.72	0.25	0.18	26 or less	20 or less	
			Rubber seal	VQC1301	0.70	0.20	0.16	0.65	0.42	0.18	33 or less	25 or less	
		Exhaust center	Metal seal	VQC1400	0.68	0.15	0.16	0.72	0.25	0.18	26 or less	20 or less	
			Rubber seal	VQC1401	0.70	0.20	0.16	1.0	0.30	0.25	33 or less	25 or less	
		Pressure center	Metal seal	VQC1500	0.70	0.15	0.16	0.72	0.25	0.18	26 or less	20 or less	
			Rubber seal	VQC1501	0.85	0.20	0.21	0.65	0.42	0.18	33 or less	25 or less	
	4-position	Dual 3-port valve	Rubber seal	VQC1 ^A _B 01 C	0.70	0.20	0.16	0.70	0.20	0.16	33 or less	25 or less	
VQC2000	2-position	Single	Metal seal	VQC2100	2.0	0.15	0.46	2.6	0.15	0.60	29 or less	22 or less	95
			Rubber seal	VQC2101	2.2	0.28	0.55	3.2	0.30	0.80	31 or less	24 or less	
		Double	Metal seal	VQC2200	2.0	0.15	0.46	2.6	0.15	0.60	20 or less	15 or less	105
			Rubber seal	VQC2201	2.2	0.28	0.55	3.2	0.30	0.80	26 or less	20 or less	
	3-position	Closed center	Metal seal	VQC2300	2.0	0.15	0.46	2.0	0.18	0.46	38 or less	29 or less	
			Rubber seal	VQC2301	2.0	0.28	0.49	2.2	0.31	0.60	44 or less	34 or less	
		Exhaust center	Metal seal	VQC2400	2.0	0.15	0.46	2.6	0.15	0.60	38 or less	29 or less	
			Rubber seal	VQC2401	2.0	0.28	0.49	3.2	0.30	0.80	44 or less	34 or less	
		Pressure center	Metal seal	VQC2500	2.4	0.17	0.57	2.0	0.18	0.46	38 or less	29 or less	
			Rubber seal	VQC2501	3.2	0.28	0.80	2.2	0.31	0.60	44 or less	34 or less	
	4-position	Dual 3-port valve	Rubber seal	VQC2 ^A _B 01 C	1.8	0.28	0.46	1.8	0.28	0.46	44 or less	34 or less	



Note 1) Values represented in this column are in the following conditions:

VQC1000: Cylinder port size C6 without a back pressure check valve

VQC2000: Cylinder port size C8 without a back pressure check valve

Note 2) Values represented in this column are based on JIS B 8375-1981 (operating with clean air and a supply pressure of 0.5 MPa. Equipped with light/surge voltage suppressor. Values vary depending on the pressure as well as the air quality.) Values for double type are when the switch is turned ON.



Standard Specifications

Valve specifications	Valve type		Metal seal	Rubber seal
	Fluid		Air, Inert gas	
	Maximum operating pressure		0.7 MPa (High-pressure type: 1.0 MPa)	0.7 MPa
	Minimum operating pressure	Single	0.1 MPa	0.15 MPa
		Double	0.1 MPa	
		3-position	0.1 MPa	0.2 MPa
		4-position	—	0.15 MPa
	Ambient and fluid temperature		−10 to 50°C Note 1)	
	Lubrication		Not required	
	Manual override		Push type, Locking type (Tool required) semi-standard	
Electrical specifications	Impact/Vibration resistance		150/30 m/s ² Note 2)	
	Enclosure		Dustproof (IP67 compatible) Note 3)	
	Rated coil voltage		24 VDC	
	Allowable voltage fluctuation		±10% of rated voltage	
	Coil insulation type		Equivalent to Class B	
	Power consumption (Current)	24 VDC	0.4 W DC (17 mA), 0.95 W DC (40 mA) Note 4)	
		12 VDC	0.4 W DC (34 mA), 0.95 W DC (80 mA) Note 4)	



Note 1) Use dry air to prevent condensation when operating at low temperatures.

Note 2) Impact resistance No malfunction resulted from the impact test using a drop impact tester. Test was performed one time each in the axial and right angle directions of the main valve and armature for both energized and de-energized states.

Vibration resistance ... No malfunction occurred in a one-sweep test between 45 and 2000 Hz. Test was performed in the axial and right angle directions of the main valve and armature for both energized and de-energized states.

Note 3) Refer to page 1 and 2 for applicable variations.

Note 4) Value for high-speed response, high-pressure type (0.95 W)

Manifold Specifications

Series	Base model	Connection type	Piping specifications			Applicable stations Note 2)	Applicable solenoid valves	5-station mass (g)
			Port direction	Port size Note 1)				
				1, 3 (P, R)	2, 4 (A, B)			
VQC1000	VV5QC11-□□□	F kit: D-sub connector P kit: Flat ribbon cable T kit: Terminal block box S kit: Serial transmission L kit: Lead wire M kit: Circular connector	Side	C8 (ø8) Option: Direct EXH outlet with built-in silencer	C3 (ø3.2) C4 (ø4) C6 (ø6) M5 (M5 thread)	F/L/M/P kit 1 to 12 stations T kit 1 to 10 stations	VQC1□00-5 VQC1□01-5	643 (Single) 754 (Double, 3-position)
VQC2000	VV5QC21-□□□		Side	C10 (ø10) Option: Direct EXH outlet with built-in silencer Branch type C12 (ø12)	C4 (ø4) C6 (ø6) C8 (ø8)	S kit 1 to 8 stations: EX500 1 to 12 stations: EX250	VQC2□00-5 VQC2□01-5	1076 (Single) 1119 (Double, 3-position)



Note 1) Inch-size one-touch fittings are also available.

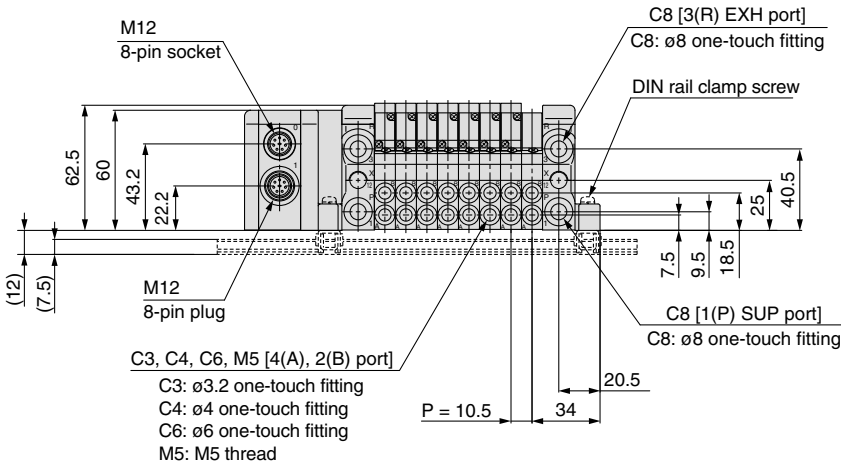
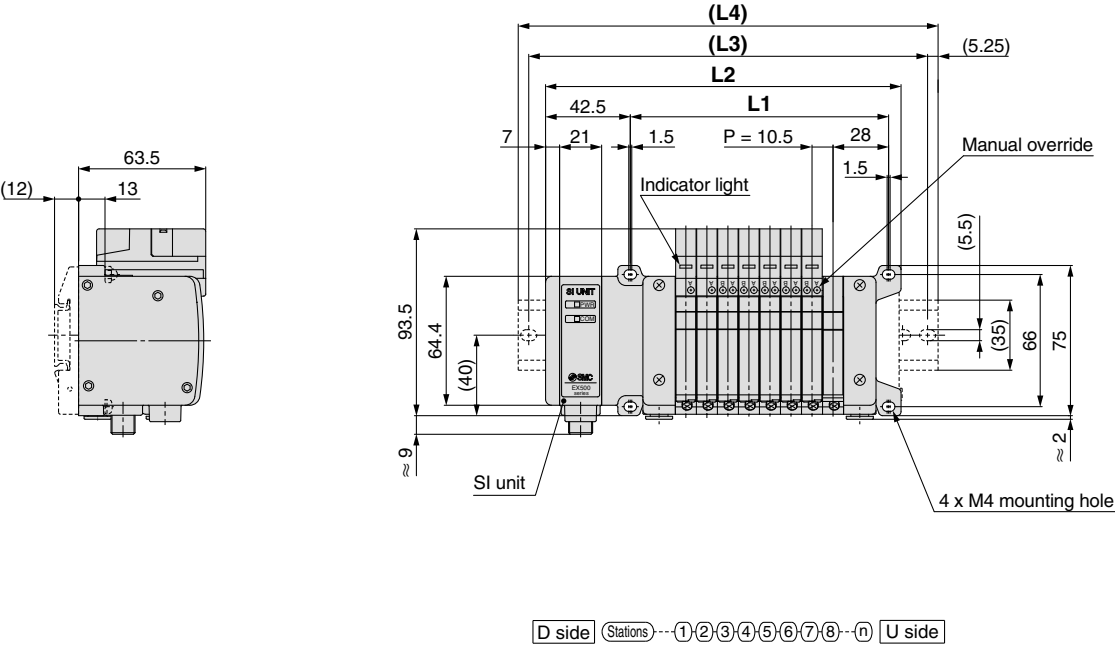
Note 2) Special wiring specifications are available as semi-standard to increase the maximum number of stations.

Series VQC

S

Series VQC1000/2000
kit (Serial transmission) For EX500 Gateway-type serial transmission system IP67 compliant

VV5QC11
S kit (Serial transmission kit: EX500)



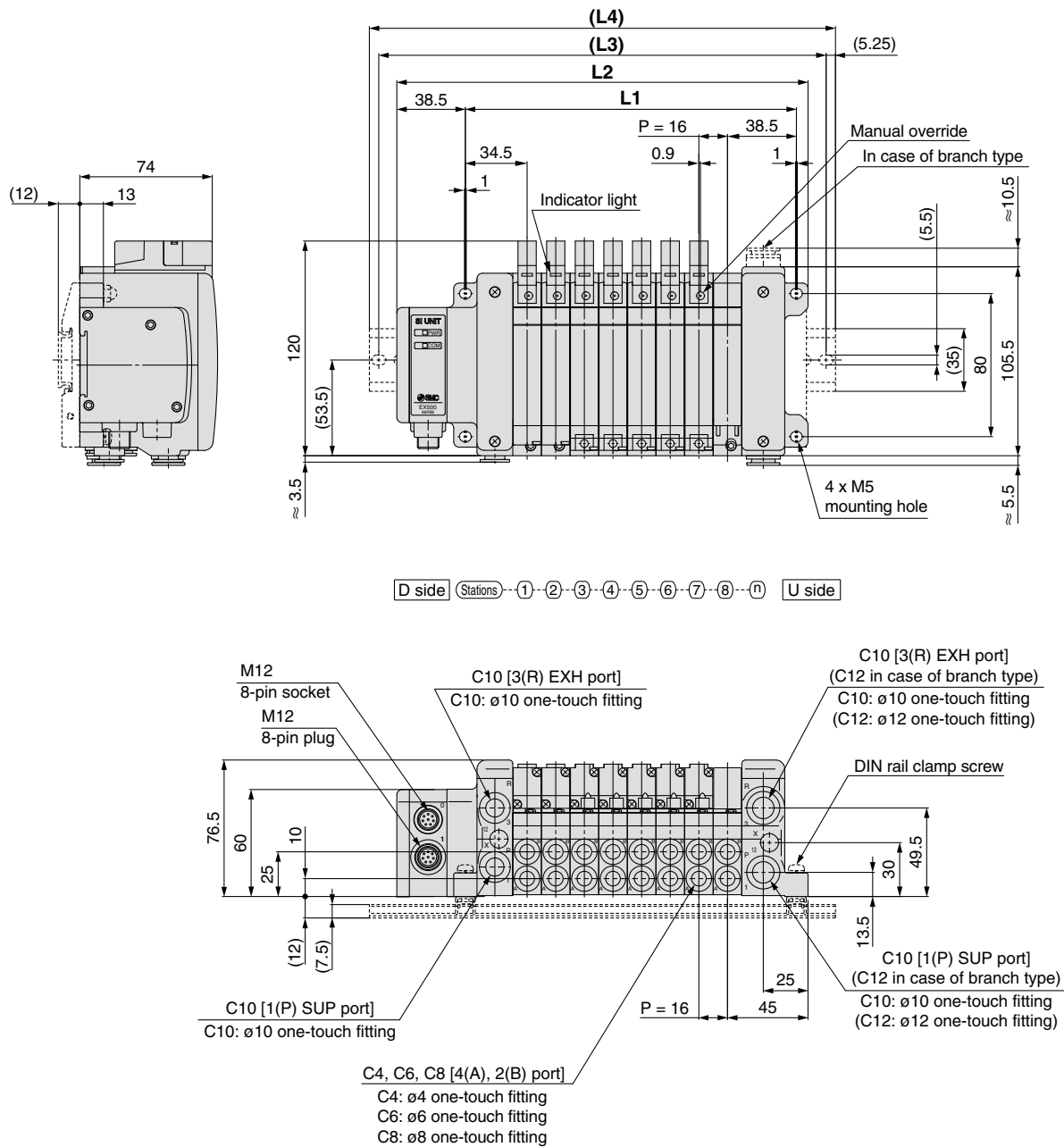
The dashed lines indicate DIN rail mounting [-D] (with DIN rail mounting bracket).

Formula: $L1 = 10.5n + 45$, $L2 = 10.5n + 93.5$ n: Stations (Maximum 16 stations)

L \ n	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
L1	55.5	66	76.5	87	97.5	108	118.5	129	139.5	150	160.5	171	181.5	192	202.5	213
L2	104	114.5	125	135.5	146	156.5	167	177.5	188	198.5	209	219.5	230	240.5	251	261.5
L3	125	137.5	150	162.5	175	187.5	187.5	200	212.5	225	237.5	250	250	262.5	275	287.5
L4	135.5	148	160.5	173	185.5	198	198	210.5	223	235.5	248	260.5	260.5	273	285.5	298

S**Series VQC1000/2000**

kit (Serial transmission) For EX500 Gateway-type serial transmission system

IP67 compliant**VV5QC21****S kit (Serial transmission kit: EX500)**

The dashed lines indicate DIN rail mounting [-D] (with DIN rail mounting bracket).

Formula: $L1 = 16n + 57$, $L2 = 16n + 102$ n: Stations (Maximum 16 stations)

L \ n	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
L1	73	89	105	121	137	153	169	185	201	217	233	249	265	281	297	313
L2	118	134	150	166	182	198	214	230	246	262	278	294	310	326	342	358
L3	137.5	150	175	187.5	200	212.5	237.5	250	262.5	287.5	300	312.5	337.5	350	362.5	375
L4	148	160.5	185.5	198	210.5	223	248	260.5	273	298	310.5	323	348	360.5	373	385.5

S kit**F kit****P kit****T kit****L kit****M kit****Construction****Exploded View of Manifold****Manifold Optional Parts****Safety Instructions****Specific Product Precautions**

Series VQC

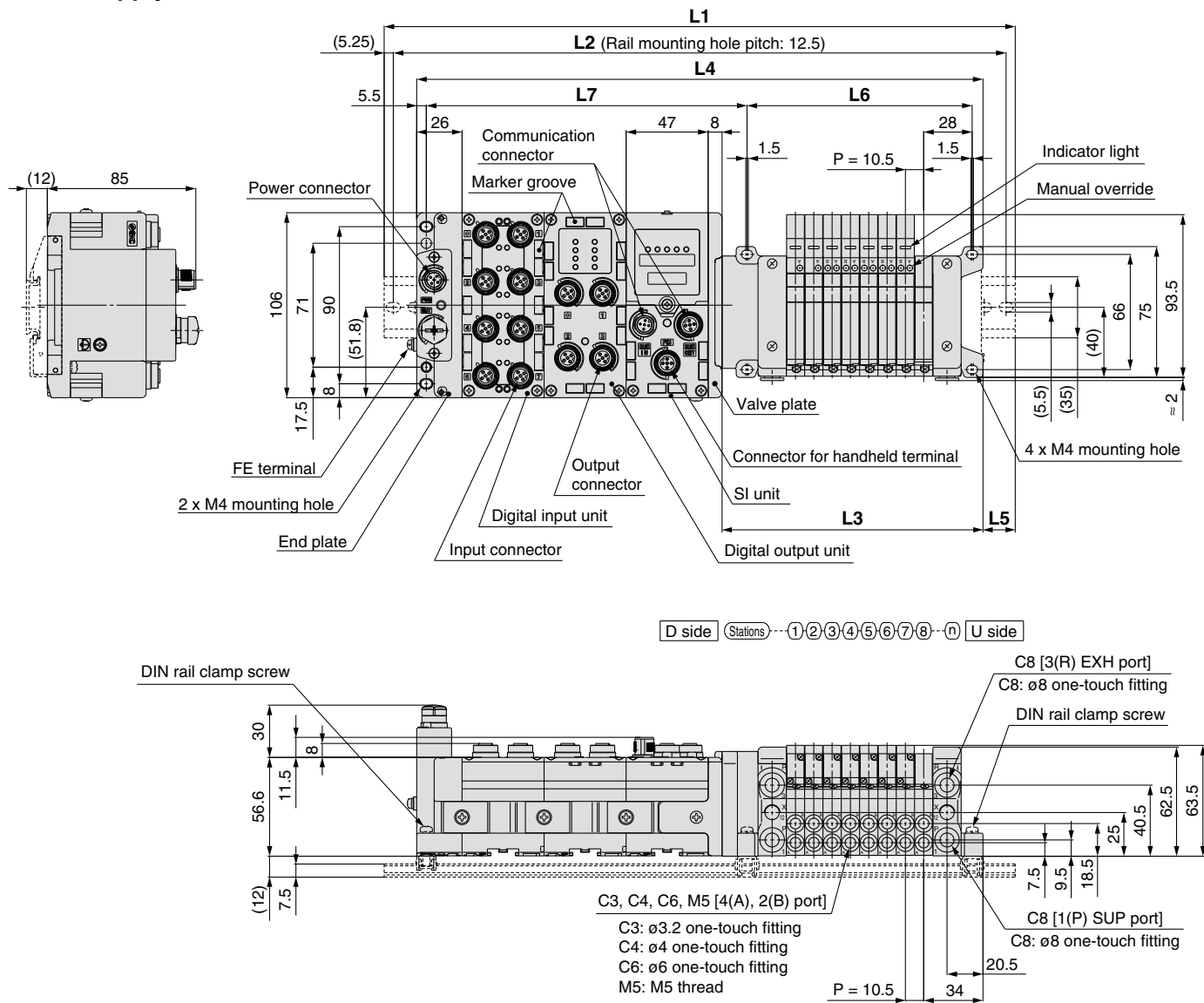
S Series VQC1000

kit (Serial transmission) For EX600 Integrated-type (I/O) serial transmission system IP67 compliant

VV5QC11

S kit (Serial transmission kit: EX600)

Power supply with M12 connector



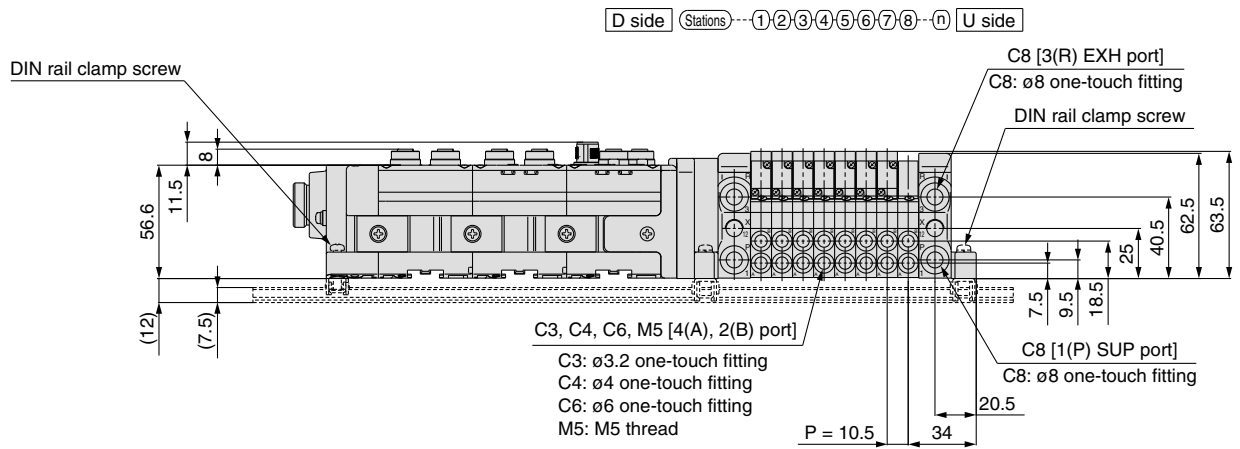
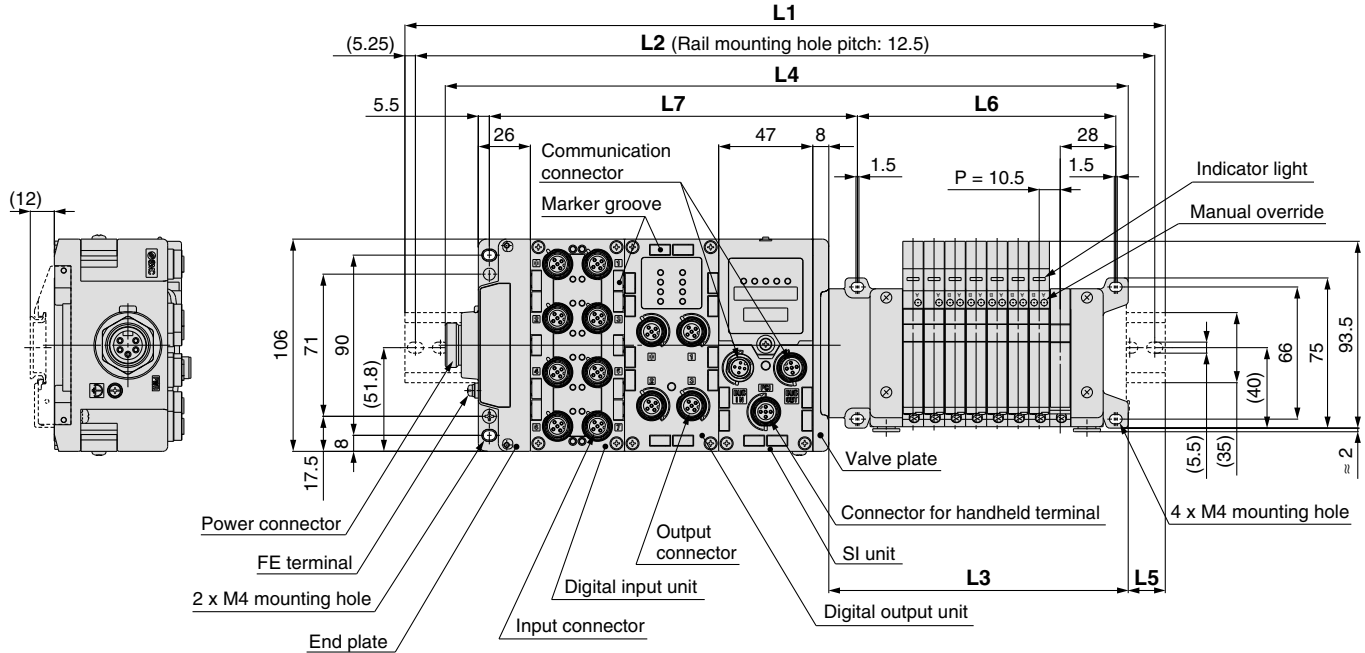
$$\begin{aligned} L2 &= L1 - 10.5 \\ L3 &= 10.5 \times n1 + 65.5 \\ L4 &= L3 + 81 + 47 \times n2 \\ L5 &= (L1 - L4)/2 \\ L6 &= 10.5 \times n1 + 45 \\ L7 &= 47 \times n2 + 89.8 \end{aligned}$$

L1: DIN Rail Full Length

I/O unit stations (n2) \ Valve stations (n1)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
0	198	198	210.5	223	235.5	248	260.5	260.5	273	285.5	298	310.5	323	335.5	335.5	348	360.5	373	385.5	398	398	410.5	423	435.5
1	235.5	248	260.5	273	285.5	298	298	310.5	323	335.5	348	360.5	360.5	373	385.5	398	410.5	423	423	435.5	448	460.5	473	485.5
2	285.5	298	310.5	323	323	335.5	348	360.5	373	385.5	398	398	410.5	423	435.5	448	460.5	460.5	473	485.5	498	510.5	523	523
3	335.5	348	360.5	360.5	373	385.5	398	410.5	423	423	435.5	448	460.5	473	485.5	485.5	498	510.5	523	535.5	548	560.5	560.5	573
4	385.5	385.5	398	410.5	423	435.5	448	460.5	460.5	473	485.5	498	510.5	523	523	535.5	548	560.5	573	585.5	585.5	598	610.5	623
5	423	435.5	448	460.5	473	485.5	485.5	498	510.5	523	535.5	548	548	560.5	573	585.5	598	610.5	623	623	635.5	648	660.5	673
6	473	485.5	498	510.5	523	523	535.5	548	560.5	573	585.5	585.5	598	610.5	623	635.5	648	648	660.5	673	685.5	698	710.5	710.5
7	523	535.5	548	548	560.5	573	585.5	598	610.5	610.5	623	635.5	648	660.5	673	685.5	685.5	698	710.5	723	735.5	748	748	760.5
8	573	585.5	585.5	598	610.5	623	635.5	648	648	660.5	673	685.5	698	710.5	710.5	723	735.5	748	760.5	773	773	785.5	798	810.5
9	610.5	623	635.5	648	660.5	673	673	685.5	698	710.5	723	735.5	748	748	760.5	773	785.5	798	810.5	810.5	823	835.5	848	860.5

S**Series VQC1000**kit (Serial transmission) For EX600 Integrated-type (I/O) serial transmission system **IP67 compliant****VV5QC11****S kit (Serial transmission kit: EX600)**

Power supply with 7/8 inch connector



$$\begin{aligned}
 L2 &= L1 - 10.5 \\
 L3 &= 10.5 \times n1 + 65.5 \\
 L4 &= L3 + 81 + 47 \times n2 \\
 L5 &= (L1 - L4)/2 \\
 L6 &= 10.5 \times n1 + 45 \\
 L7 &= 47 \times n2 + 89.8
 \end{aligned}$$

L1: DIN Rail Full Length

I/O unit stations (n2)	Valve stations (n1)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
0		210.5	223	235.5	235.5	248	260.5	273	285.5	298	298	310.5	323	335.5	348	360.5	373	373	385.5	398	410.5	423	435.5	435.5	448
1		260.5	273	273	285.5	298	310.5	323	335.5	335.5	348	360.5	373	385.5	398	398	410.5	423	435.5	448	460.5	460.5	473	485.5	498
2		298	310.5	323	335.5	348	360.5	360.5	373	385.5	398	410.5	423	435.5	435.5	448	460.5	473	485.5	498	498	510.5	523	535.5	548
3		348	360.5	373	385.5	398	398	410.5	423	435.5	448	460.5	460.5	473	485.5	498	510.5	523	523	535.5	548	560.5	573	585.5	598
4		398	410.5	423	423	435.5	448	460.5	473	485.5	498	498	510.5	523	535.5	548	560.5	560.5	573	585.5	598	610.5	623	623	635.5
5		448	460.5	460.5	473	485.5	498	510.5	523	523	535.5	548	560.5	573	585.5	585.5	598	610.5	623	635.5	648	660.5	660.5	673	685.5
6		485.5	498	510.5	523	535.5	548	560.5	560.5	573	585.5	598	610.5	623	623	635.5	648	660.5	673	685.5	685.5	698	710.5	723	735.5
7		535.5	548	560.5	573	585.5	585.5	598	610.5	623	635.5	648	648	660.5	673	685.5	698	710.5	723	723	735.5	748	760.5	773	785.5
8		585.5	598	610.5	623	623	635.5	648	660.5	673	685.5	685.5	698	710.5	723	735.5	748	748	760.5	773	785.5	798	810.5	810.5	823
9		635.5	648	648	660.5	673	685.5	698	710.5	710.5	723	735.5	748	760.5	773	785.5	785.5	798	810.5	823	835.5	848	848	860.5	873

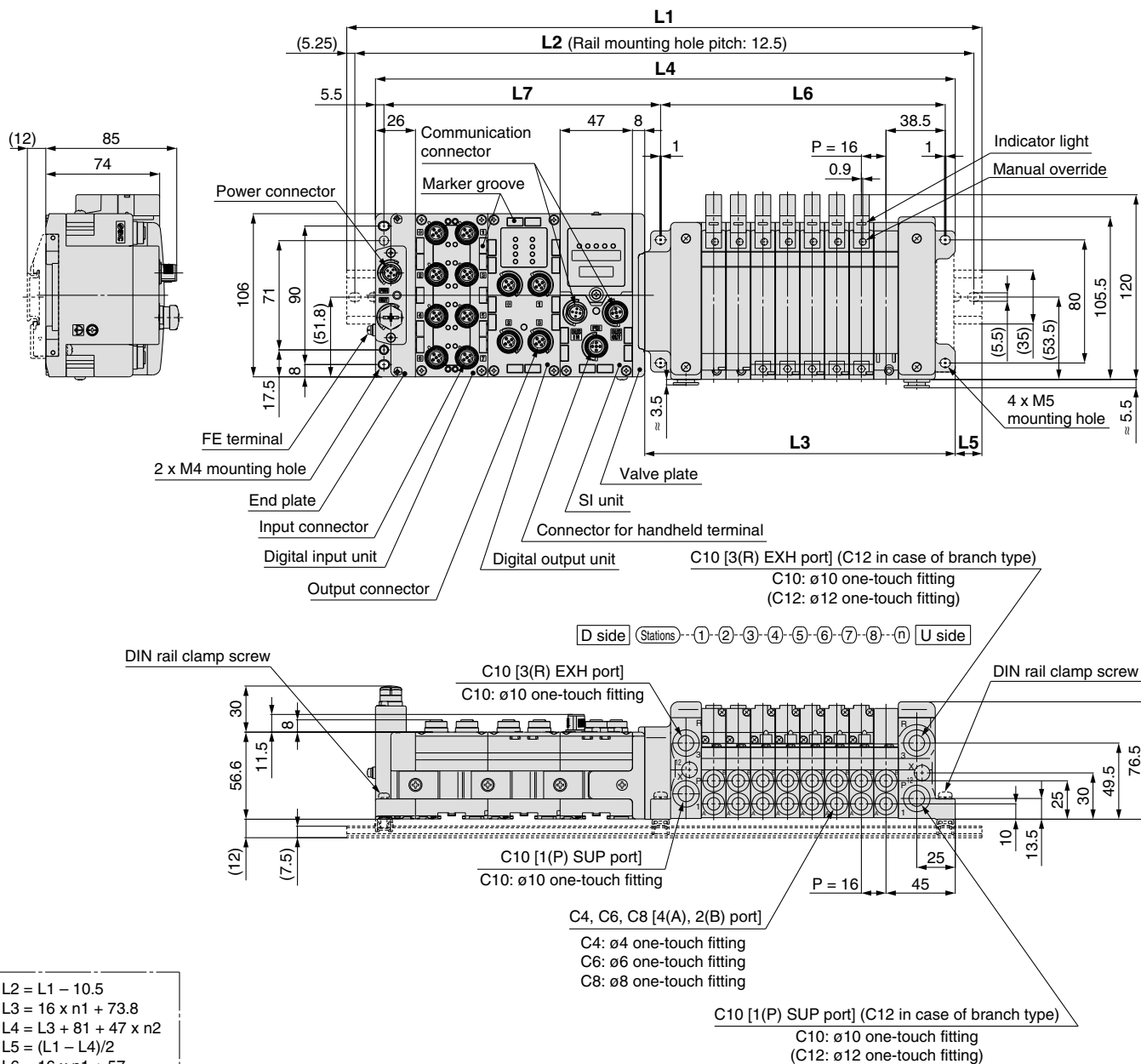
S Series VQC2000

kit (Serial transmission) For EX600 Integrated-type (I/O) serial transmission system IP67 compliant

VV5QC21

S kit (Serial transmission kit: EX600)

Power supply with M12 connector

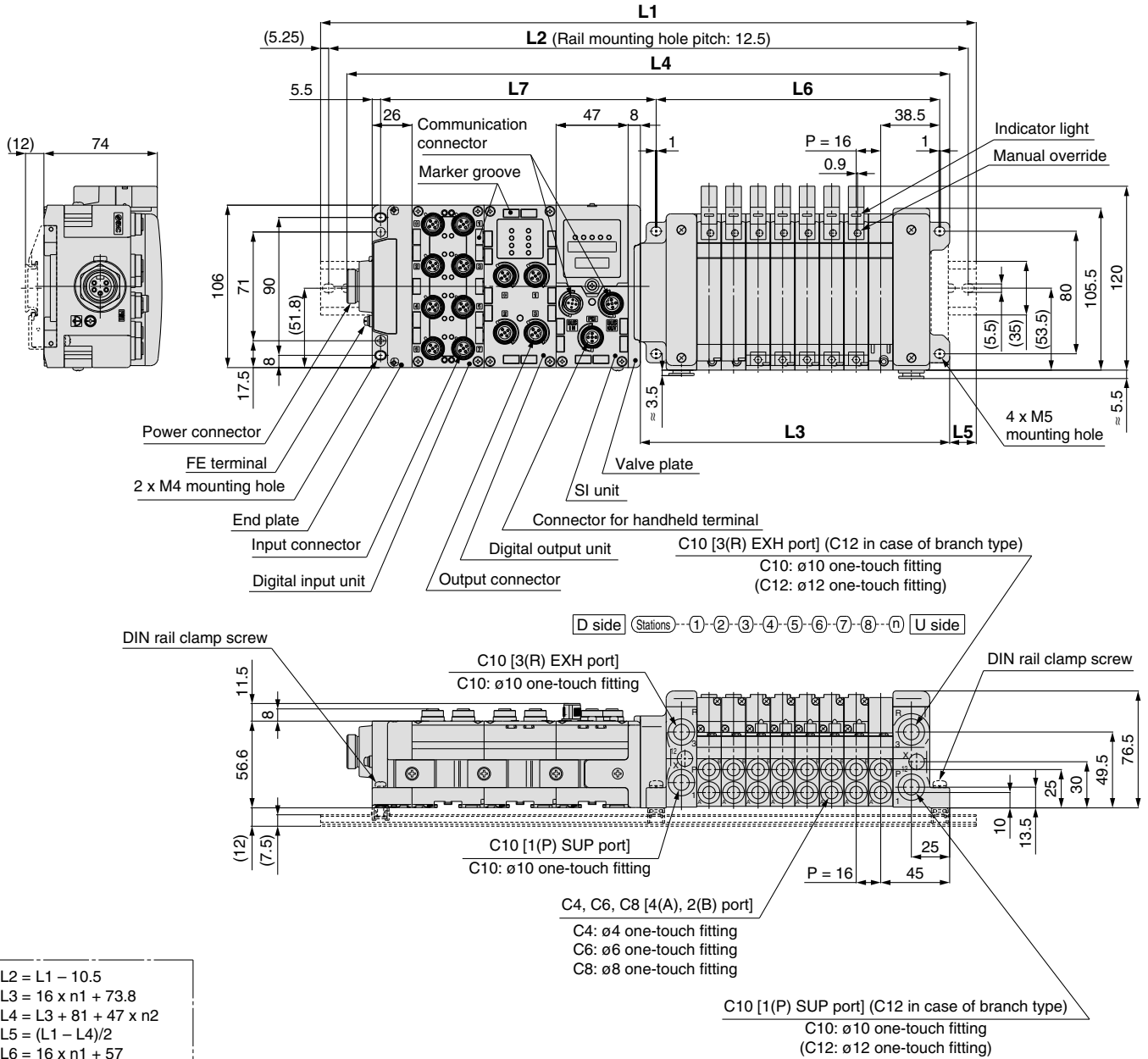


L1: DIN Rail Full Length

I/O unit stations (n2) \ Valve stations (n1)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
0	210.5	223	235.5	260.5	273	285.5	298	323	335.5	348	373	385.5	398	410.5	435.5	448	460.5	473	498	510.5	523	548	560.5	573
1	248	273	285.5	298	323	335.5	348	360.5	385.5	398	410.5	435.5	448	460.5	473	498	510.5	523	548	560.5	573	585.5	610.5	623
2	298	323	335.5	348	360.5	385.5	398	410.5	423	448	460.5	473	498	510.5	523	535.5	560.5	573	585.5	610.5	623	635.5	648	673
3	348	360.5	385.5	398	410.5	423	448	460.5	473	498	510.5	523	535.5	560.5	573	585.5	598	623	635.5	648	673	685.5	698	710.5
4	398	410.5	423	448	460.5	473	485.5	510.5	523	535.5	560.5	573	585.5	598	623	635.5	648	660.5	685.5	698	710.5	735.5	748	760.5
5	448	460.5	473	485.5	510.5	523	535.5	548	573	585.5	598	623	635.5	648	660.5	685.5	698	710.5	735.5	748	760.5	773	798	810.5
6	485.5	510.5	523	535.5	548	573	585.5	598	623	635.5	648	660.5	685.5	698	710.5	723	748	760.5	773	798	810.5	823	835.5	860.5
7	535.5	548	573	585.5	598	610.5	635.5	648	660.5	685.5	698	710.5	723	748	760.5	773	798	810.5	823	835.5	860.5	873	885.5	898
8	585.5	598	610.5	635.5	648	660.5	673	698	710.5	723	748	760.5	773	785.5	810.5	823	835.5	860.5	873	885.5	898	923	935.5	948
9	635.5	648	660.5	673	698	710.5	723	748	760.5	773	785.5	810.5	823	835.5	848	873	885.5	898	923	935.5	948	960.5	985.5	998.5

S Series VQC2000kit (Serial transmission) For EX600 Integrated-type (I/O) serial transmission system **IP67 compliant****VV5QC21****S kit (Serial transmission kit: EX600)**

Power supply with 7/8 inch connector

**L1: DIN Rail Full Length**

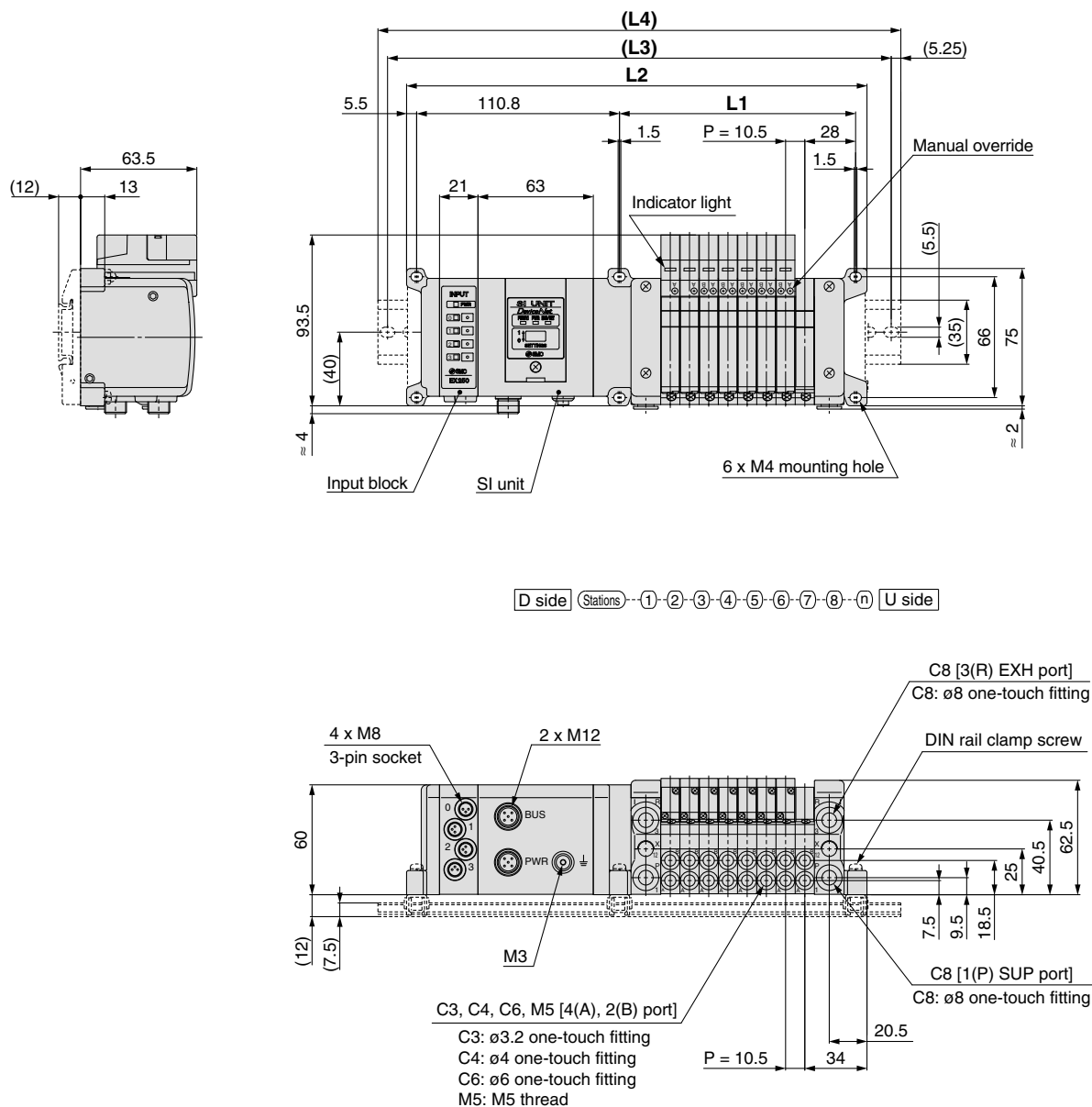
I/O unit stations (n2) \ Valve stations (n1)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
0	223	235.5	260.5	273	285.5	298	323	335.5	348	373	385.5	398	410.5	435.5	448	460.5	485.5	498	510.5	523	548	560.5	573	585.5
1	273	285.5	298	323	335.5	348	360.5	385.5	398	410.5	435.5	448	460.5	473	498	510.5	523	548	560.5	573	585.5	610.5	623	635.5
2	323	335.5	348	360.5	385.5	398	410.5	435.5	448	460.5	473	498	510.5	523	535.5	560.5	573	585.5	610.5	623	635.5	648	673	685.5
3	360.5	385.5	398	410.5	423	448	460.5	473	498	510.5	523	535.5	560.5	573	585.5	610.5	623	635.5	648	673	685.5	698	710.5	735.5
4	410.5	423	448	460.5	473	485.5	510.5	523	535.5	560.5	573	585.5	598	623	635.5	648	660.5	685.5	698	710.5	735.5	748	760.5	785.5
5	460.5	473	485.5	510.5	523	535.5	560.5	573	585.5	598	623	635.5	648	660.5	685.5	698	710.5	735.5	748	760.5	773	798	810.5	823
6	510.5	523	535.5	548	573	585.5	598	623	635.5	648	660.5	685.5	698	710.5	735.5	748	760.5	773	798	810.5	823	835.5	860.5	873
7	548	573	585.5	598	610.5	635.5	648	660.5	685.5	698	710.5	723	748	760.5	773	798	810.5	823	835.5	860.5	873	885.5	910.5	923
8	598	610.5	635.5	648	660.5	685.5	698	710.5	723	748	760.5	773	785.5	810.5	823	835.5	860.5	873	885.5	898	923	935.5	948	973
9	648	660.5	673	698	710.5	723	748	760.5	773	785.5	810.5	823	835.5	860.5	873	885.5	898	923	935.5	948	960.5	985.5	998.5	—

S **Series VQC1000/2000**
kit (Serial transmission) For EX250 Integrated

kit (Serial transmission) For EX250 Integrated-type (I/O) serial transmission system **IP67 compliant**

VV5QC11

S kit (Serial transmission kit: EX250)



The dashed lines indicate DIN rail mounting [-D] (with DIN rail mounting bracket).

Formula: $L1 = 10.5n + 45$, $L2 = 10.5n + 167.5$ (For one input block. Add 21 mm for each additional input block.) n: Stations (Maximum 24 stations)

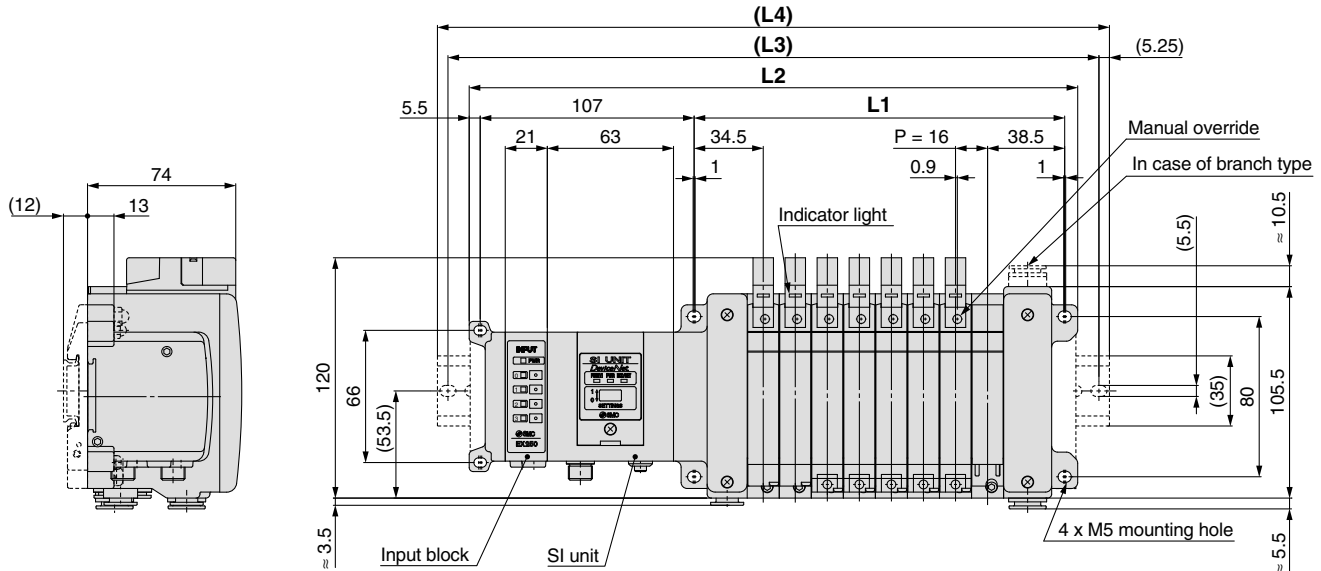
L	n	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
L1		55.5	66	76.5	87	97.5	108	118.5	129	139.5	150	160.5	171	181.5	192	202.5	213	223.5	234	244.5	255	265.5	276	286.5	297
L2		178	188.5	199	209.5	220	230.5	241	251.5	262	272.5	283	293.5	304	314.5	325	335.5	346	356.5	367	377.5	388	398.5	409	419.5
L3		200	212.5	225	237.5	250	250	262.5	275	287.5	300	312.5	325	325	337.5	350	362.5	375	387.5	387.5	400	412.5	425	437.5	450
L4		210.5	223	235.5	248	260.5	260.5	273	285.5	298	310.2	323	335.5	335.5	348	360.5	373	385.5	398	398	410.5	423	435.5	448	448

S Series VQC1000/2000

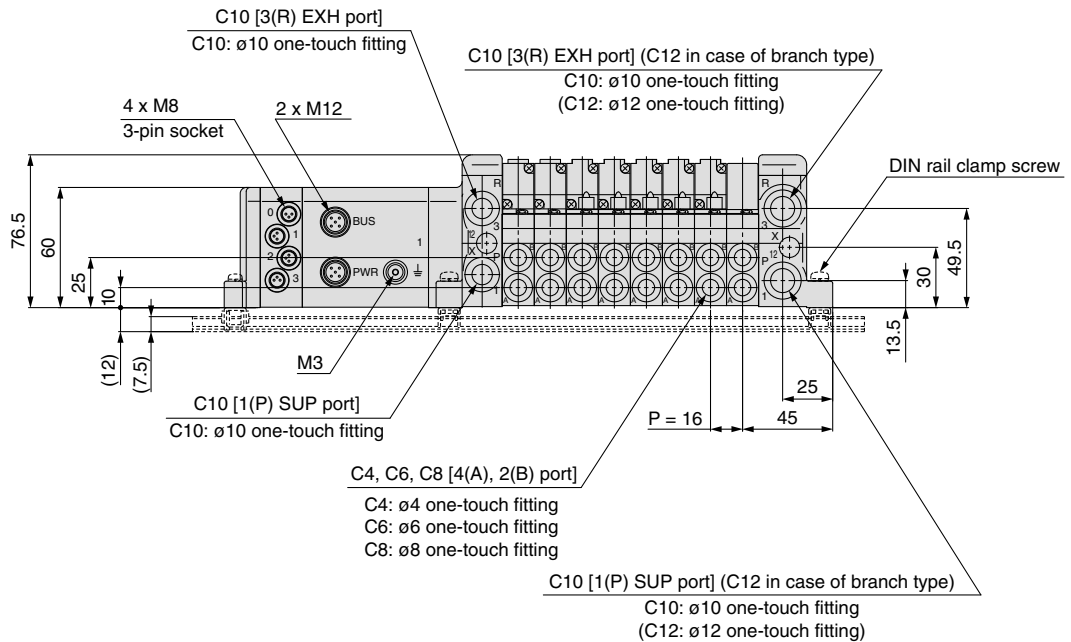
kit (Serial transmission) For EX250 Integrated-type (I/O) serial transmission system **IP67 compliant**

VV5QC21

S kit (Serial transmission kit: EX250)



D side Stations 1 2 3 4 5 6 7 8 n U side



The dashed lines indicate DIN rail mounting [-D] (with DIN rail mounting bracket).

Formula: $L1 = 16n + 57$, $L2 = 16n + 176$ (For one input block. Add 21 mm for each additional input block.) n: Stations (Maximum 24 stations)

L \ n	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
L1	73	89	105	121	137	153	169	185	201	217	233	249	265	281	297	313	329	345	361	377	393	409	425	441
L2	192	208	224	240	256	272	288	304	320	336	352	368	384	400	416	432	448	464	480	496	512	528	544	560
L3	212.5	237.5	250	262.5	275	287.5	312.5	325	337.5	362.5	375	387.5	400	425	437.5	450	462.5	487.5	500	512.5	537.5	550	562.5	587.5
L4	223	248	260.5	273	285.5	298	323	335.5	348	373	385.5	398	410.5	435.5	448	460.5	473	498	510.5	523	548	560.5	573	598

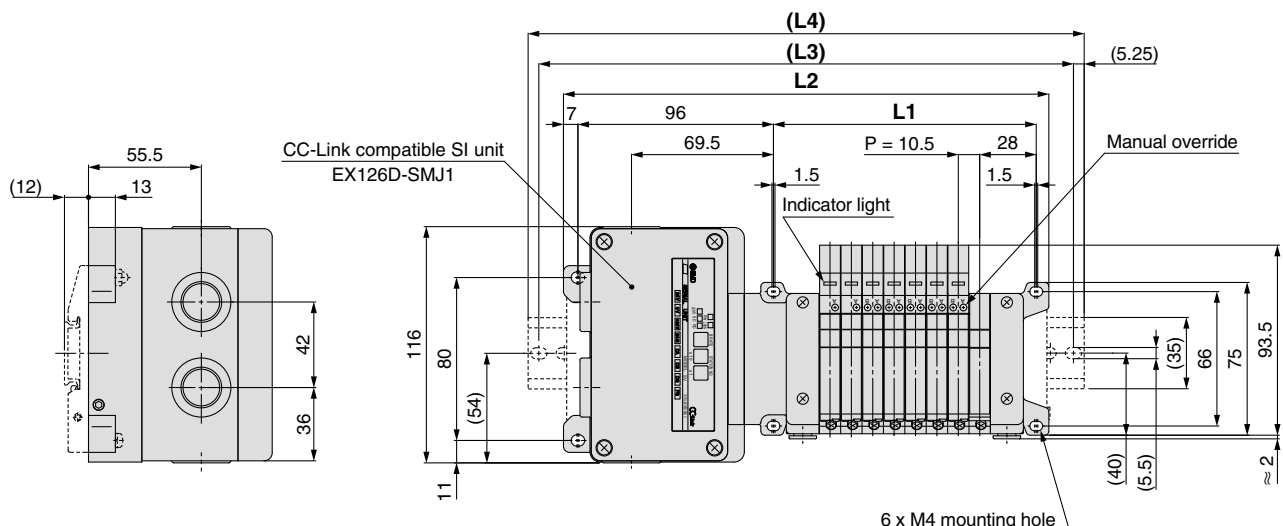
Series VQC

S Series VQC1000/2000

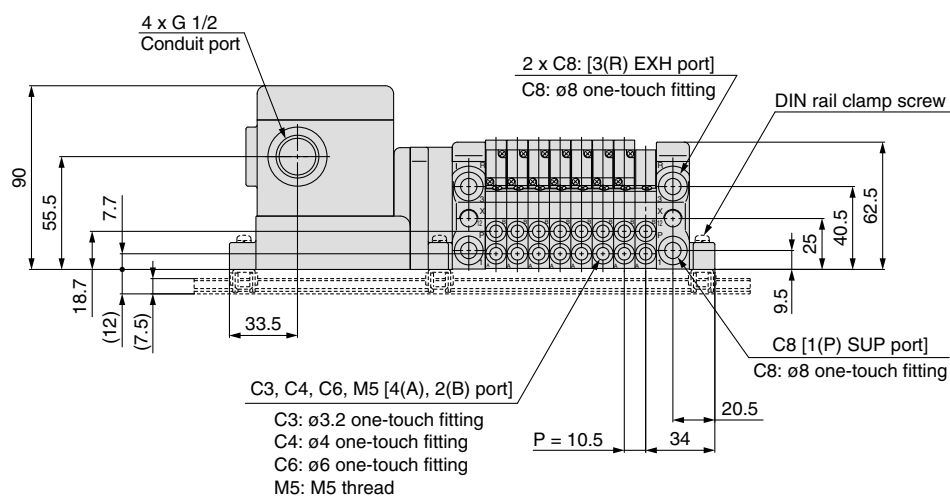
kit (Serial transmission) For EX126 Integrated-type (Output) serial transmission system **IP67 compliant**

VV5QC11

S kit (Serial transmission kit: EX126)



D side Stations 1 2 3 4 5 6 7 8 n U side



The dashed lines indicate DIN rail mounting [-D] (with DIN rail mounting bracket).

Formula: $L1 = 10.5n + 45$, $L2 = 10.5n + 154.5$ n: Stations (Maximum 16 stations)

n	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
L1	55.5	66	76.5	87	97.5	108	118.5	129	139.5	150	160.5	171	181.5	192	202.5	213
L2	165	175.5	186	196.5	207	217.5	228	238.5	249	259.5	270	280.5	291	301.5	312	322.5
L3	187.5	200	212.5	212.5	225	237.5	250	262.5	275	275	287.5	300	312.5	325	337.5	337.5
L4	198	210.5	223	223	235.5	248	260.5	273	285.5	285.5	298	310.5	323	335.5	348	348

* With signal cut block, L4 is L2 plus about 30 mm.

S

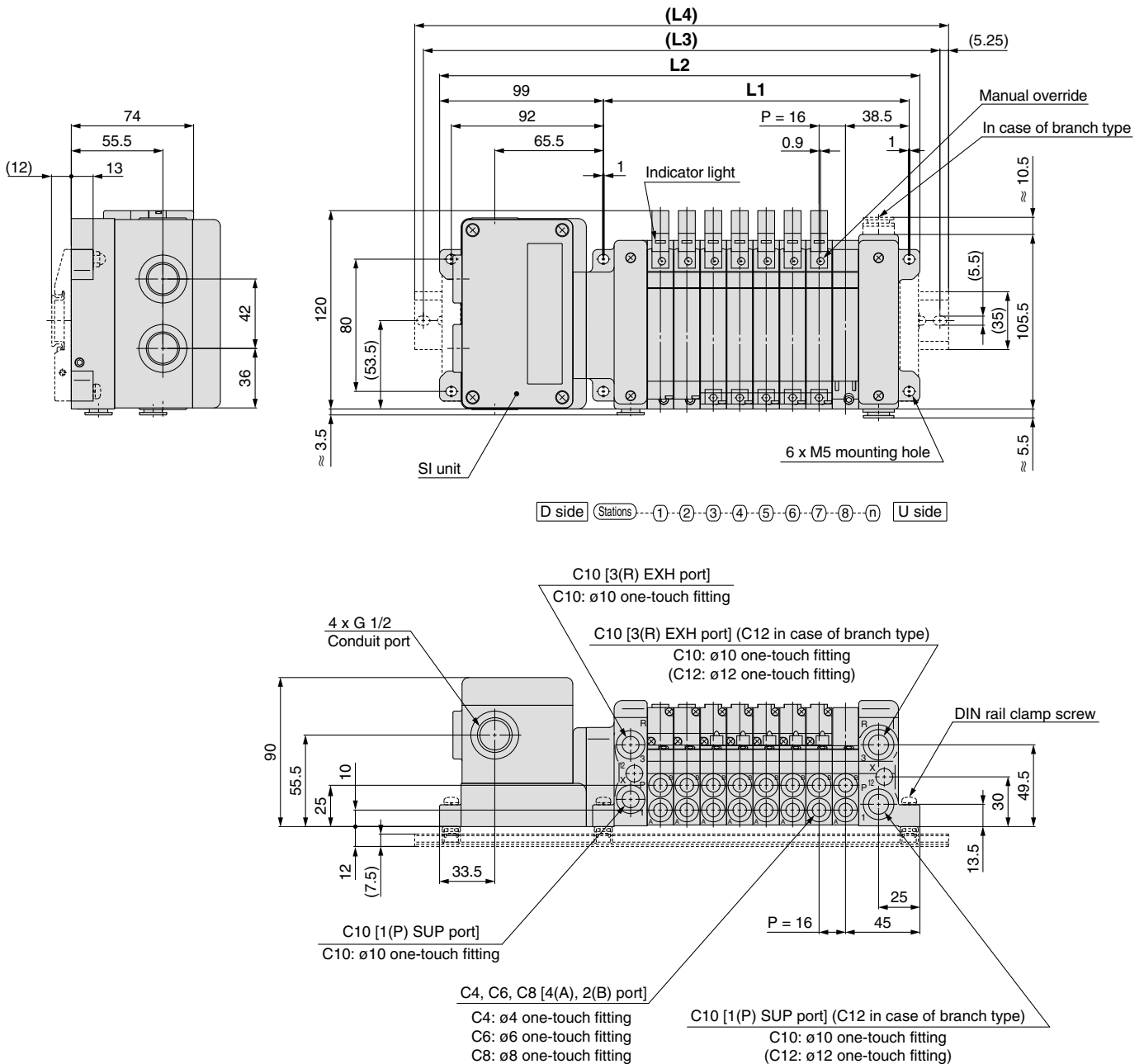
Series VQC1000/2000

kit (Serial transmission) For EX126 Integrated-type (Output) serial transmission system

IP67 compliant

VV5QC21

S kit (Serial transmission kit: EX126)



The dashed lines indicate DIN rail mounting [-D] (with DIN rail mounting bracket).

Formula: $L1 = 16n + 57$, $L2 = 16n + 163$ n: Stations (Maximum 16 stations)

Formula: $LE = \text{Len} \cdot F_{\text{or}} \cdot LE = \text{Len} \cdot F_{\text{or}} \cdot 1$; Stations: (maximum 16 stations)																
L \ n	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
L1	73	89	105	121	137	153	169	185	201	217	233	249	265	281	297	313
L2	179	195	211	227	243	259	275	291	307	323	339	355	371	387	403	419
L3	200	212.5	237.5	237.5	262.5	262.5	287.5	312.5	325	371	362.5	375	408.5	412.5	425	437.5
L4	210.5	223	248	248	273	273	298	323	335.5	360.5	373	385.5	398	423	435.5	448

* With signal cut block, L4 is L2 plus about 30 mm.

S kit

F kit

P kit

T kit

L kit

M kit

Construction

Exploded view of Manifold

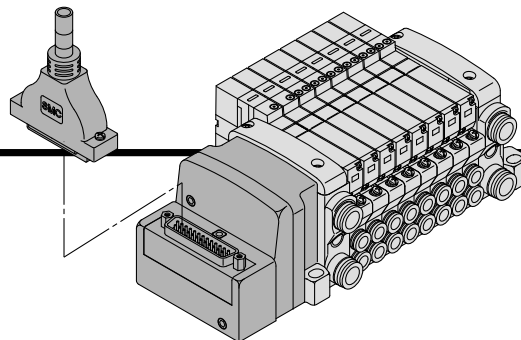
Manifold Optional Parts

Safety Instructions

Specific Product Precautions

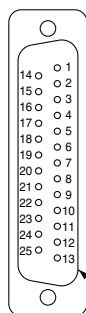
F Series VQC1000/2000 kit (D-sub connector) IP40 compliant

- Using our D-sub connector for electrical connections greatly reduces labor, while it also minimizes wiring and saves space.
- We use a D-sub connector (25P) that conforms to MIL standards and is therefore widely compatible with many standard commercial models.
- Top or side entry for the connector can be changed freely, allowing for changes even after mounting, to meet any changing needs for space.



Electrical Wiring Specifications

D-sub connector



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 12 stations or less, regardless of valve and option types. Mixed single and double wiring are available as an option. Refer to the below special wiring specifications (option).

Lead wire colors for D-sub connector assembly (AXT100-DS25-015/030/050)

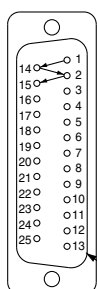
		Terminal no.	Polarity	Lead wire color	Dot marking	
Station 1	SOL.A	1	(-)	(+)	Black	None
	SOL.B	14	(-)	(+)	Yellow	Black
Station 2	SOL.A	2	(-)	(+)	Brown	None
	SOL.B	15	(-)	(+)	Pink	Black
Station 3	SOL.A	3	(-)	(+)	Red	None
	SOL.B	16	(-)	(+)	Blue	White
Station 4	SOL.A	4	(-)	(+)	Orange	None
	SOL.B	17	(-)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

Positive COM spec. Negative COM spec.

Note) When using the negative COM specification, use valves for negative COM.

Special Wiring Specifications (Option)

(25P)



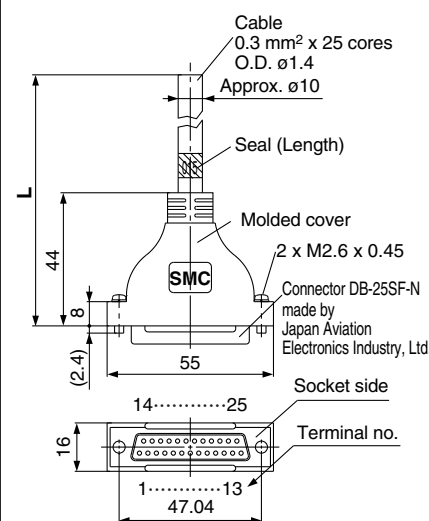
Mixed single and double wiring are available as an option. The maximum number of manifold stations is determined by the number of solenoids. Count one point for a single solenoid type and two points for a double solenoid type. The total number of solenoids (points) must not exceed 24.

COM

Cable Assembly

015
AXT100-DS25-030
050

(D-sub connector cable assembly can be ordered with manifolds.)
(Refer to "How to Order Manifold.")



Lead wire colors for D-sub connector cable assembly terminal numbers

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

D-sub connector cable assembly

Cable length (L)	Assembly part no.	Note
1.5 m	AXT100-DS25-015	Cable 0.3 mm ² x 25 cores
3 m	AXT100-DS25-030	
5 m	AXT100-DS25-050	

* When using a standard commercial connector, use a type 25P female connector conforming to MIL-C-24308.

* Cannot be used for transfer wiring.

* Lengths other than the above is also available. Please contact SMC for details.

Electrical characteristics

Item	Property
Conductor resistance Ω/km, 20°C	65 or less
Voltage limit V, 1 minute, AC	1000
Insulation resistance MΩ/km, 20°C	5 or more

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

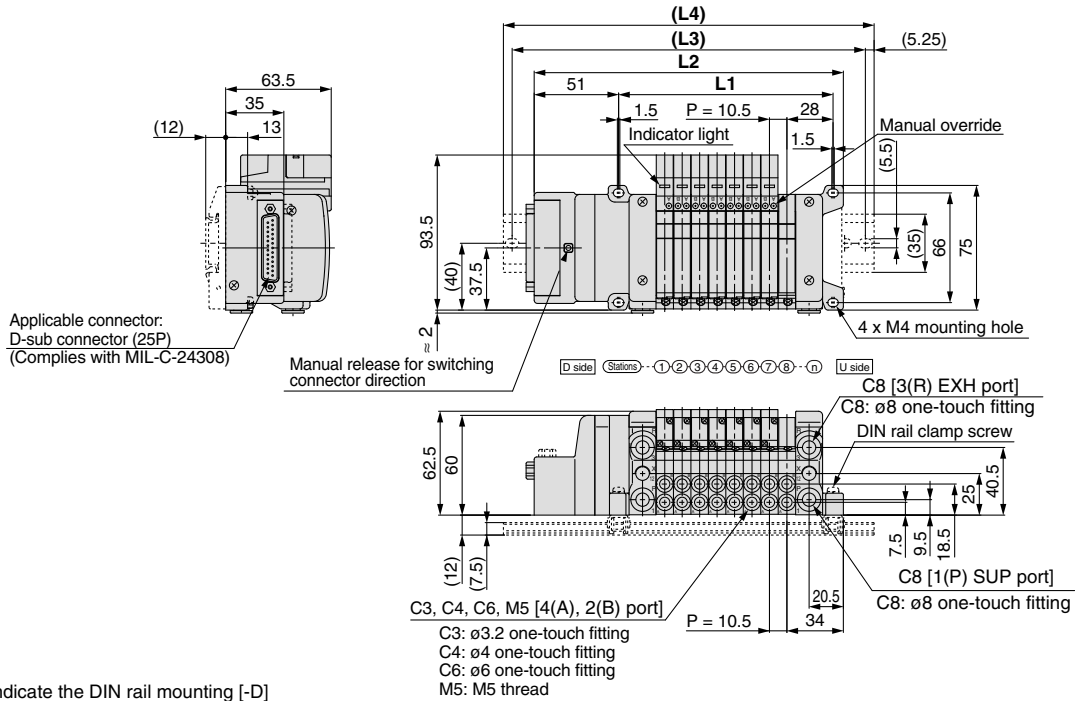
Connector Manufacturers' Example

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

F Series VQC1000/2000

kit (D-sub connector) IP40 compliant

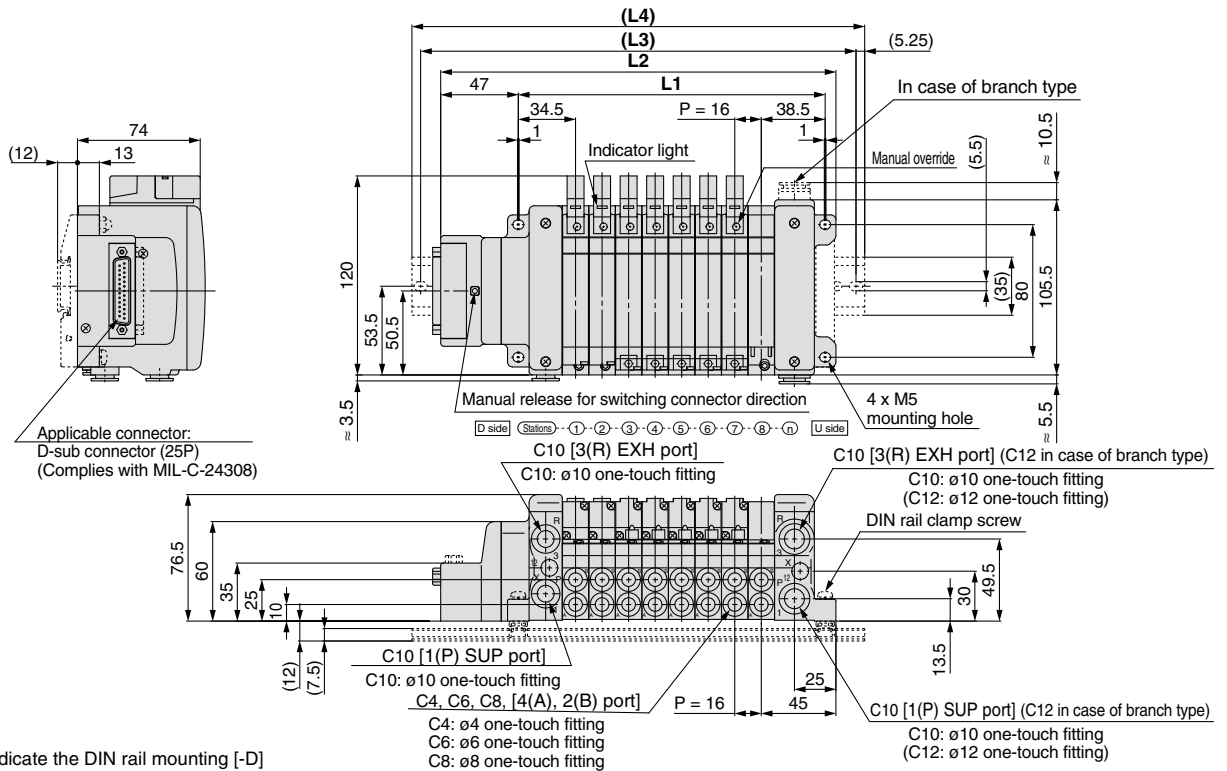
VV5QC11



The dashed lines indicate the DIN rail mounting [-D]
(with DIN rail mounting bracket).

L \ n	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
L1	55.5	66	76.5	87	97.5	108	118.5	129	139.5	150	160.5	171	181.5	192	202.5	213	223.5	234	244.5	255	265.5	276	286.5	297
L2	112.5	123	133.5	144	154.5	165	175.5	186	196.5	207	217.5	228	238.5	249	259.5	270	280.5	291	301.5	312	322.5	333	343.5	354
L3	137.5	150	162.5	175	175	187.5	200	212.5	225	237.5	237.5	250	262.5	275	287.5	300	300	312.5	325	337.5	350	362.5	375	375
L4	148	160.5	173	185.5	185.5	198	210.5	223	235.5	248	248	260.5	273	285.5	298	310.5	310.5	323	335.5	348	360.5	373	385.5	385.5

VV5QC21

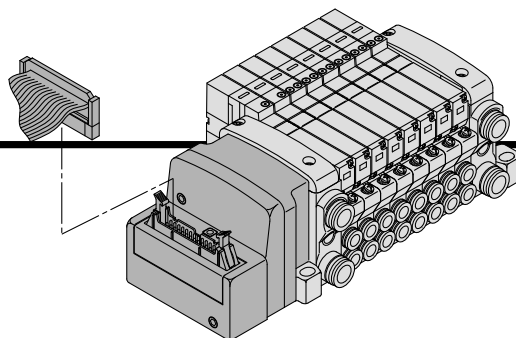


The dashed lines indicate the DIN rail mounting [-D]
(with DIN rail mounting bracket).

L \ n	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
L1	73	89	105	121	137	153	169	185	201	217	233	249	265	281	297	313	329	345	361	377	393	409	425	441
L2	126.5	142.5	158.5	174.5	190.5	206.5	222.5	238.5	254.5	270.5	286.5	302.5	318.5	334.5	350.5	366.5	382.5	398.5	414.5	430.5	446.5	462.5	478.5	494.5
L3	150	162.5	187.5	200	212.5	237.5	250	262.5	275	300	312.5	325	350	362.5	375	387.5	412.5	425	437.5	450	475	487.5	500	525
L4	160.5	173	198	210.5	223	248	260.5	273	285.5	310.5	323	335.5	360.5	373	385.5	398	423	435.5	448	460.5	485.5	498	510.5	535.5

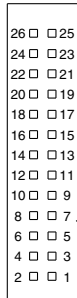
P Series VQC1000/2000 kit (Flat ribbon cable) IP40 compliant

- Using our flat ribbon cable for electrical connections greatly reduces labor, while it also minimizes wiring and saves space.
- We use flat ribbon cables whose connectors (26P and 20P) conform to MIL standards, and are therefore widely compatible with many standard commercial models.
- Top or side entry for the connector can be changed freely, allowing for changes even after mounting, to meet any changing needs for space.



Electrical Wiring Specifications

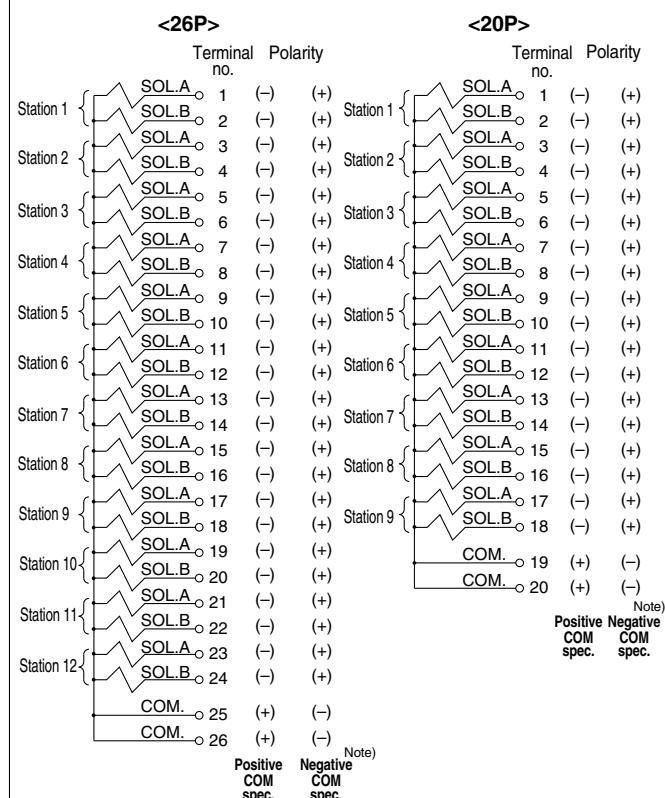
Flat ribbon cable connector



Connector terminal number

Triangle mark indicator position

Double wiring (connected to SOL. A and SOL. B) is adopted for the internal wiring of each station, regardless of valve and option types. Mixed single and double wiring are available as an option. Refer to the below special wiring specifications (option).

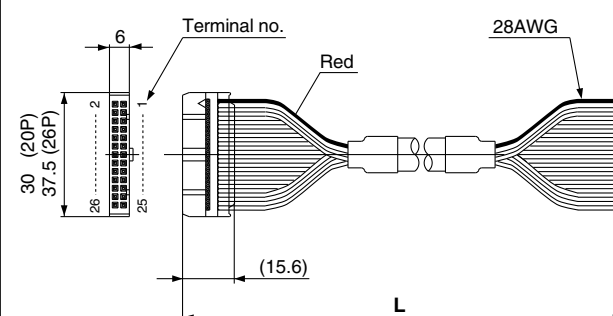


Note) When using the negative COM specification, use valves for negative COM.

Cable Assembly

AXT100-FC²⁰₂₆¹₂³

(Type 26P flat ribbon cable connector assembly can be ordered with manifolds. Refer to "How to Order Manifold.")



Flat ribbon cable connector assembly

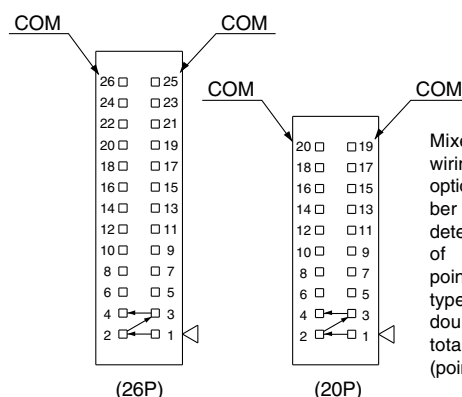
Cable length (L)	Assembly part no.	
	26P	20P
1.5 m	AXT100-FC26-1	AXT100-FC20-1
3 m	AXT100-FC26-2	AXT100-FC20-2
5 m	AXT100-FC26-3	AXT100-FC20-3

- * When using a standard commercial connector, use a type 26P connector conforming to MIL-C-83503 or a type 20P with strain relief.
- * Cannot be used for transfer wiring.
- * Lengths other than the above is also available. Please contact SMC for details.

Connector Manufacturers' Example

- Hirose Electric Co., Ltd.
- Sumitomo 3M Limited
- Fujitsu, Ltd.
- Japan Aviation Electronics Industry, Ltd.
- J.S.T. Mfg. Co., Ltd.
- Oki Electric Cable Co., Ltd.

Special Wiring Specifications (Option)



Mixed single and double wiring are available as an option. The maximum number of manifold stations is determined by the number of solenoids. Count one point for a single solenoid type and two points for a double solenoid type. The total number of solenoids (points) must not exceed 24.

Formula: $L1 = 10.5n + 45$, $L2 = 10.5n + 102$ n: Stations (Maximum 24 stations)

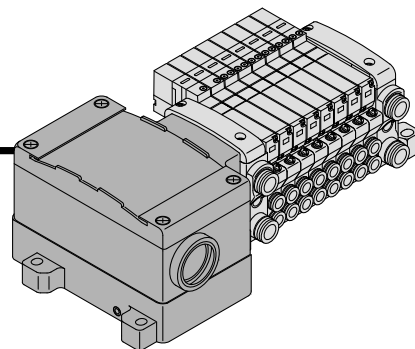
L	n	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
L1		55.5	66	76.5	87	97.5	108	118.5	129	139.5	150	160.5	171	181.5	192	202.5	213	223.5	234	244.5	255	265.5	276	286.5	297
L2		112.5	123	133.5	144	154.5	165	175.5	186	196.5	207	217.5	228	238.5	249	259.5	270	280.5	291	301.5	312	322.5	333	343.5	354
L3		137.5	150	162.5	175	175	187.5	200	212.5	225	237.5	237.5	250	262.5	275	287.5	300	300	312.5	325	337.5	350	362.5	375	375
L4		148	160.5	173	185.5	185.5	198	210.5	223	235.5	248	248	260.5	273	285.5	298	310.5	310.5	323	335.5	348	360.5	373	385.5	385.5

[illegible]

Formula: $L1 = 16n + 57$, $L2 = 16n + 110.5$ n: Stations (Maximum 24 stations)

$\frac{L}{n}$	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
L1	73	89	105	121	137	153	169	185	201	217	233	249	265	281	297	313	329	345	361	377	393	409	425	441
L2	126.5	142.5	158.5	174.5	190.5	206.5	222.5	238.5	254.5	270.5	286.5	302.5	318.5	334.5	350.5	366.5	382.5	398.5	414.5	430.5	446.5	462.5	478.5	494.5
L3	150	162.5	187.5	200	212.5	237.5	250	262.5	275	300	312.5	325	350	362.5	375	387.5	412.5	425	437.5	450	475	487.5	500	525
L4	160.5	173	198	210.5	223	248	260.5	273	285.5	310.5	323	335.5	360.5	373	385.5	398	423	435.5	448	460.5	485.5	498	510.5	535.5

T Series VQC1000/2000 kit (Terminal block box) IP67 compliant

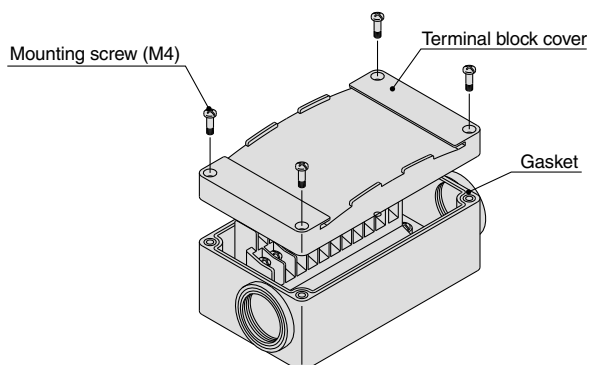


- This kit has a small terminal block inside a junction box. The electrical entry port of a G 3/4 permits connection of conduit fittings.

Terminal Block Connection

Step 1. Removing the terminal block cover

Loosen the 4 mounting screws (M4) and remove the terminal block cover.



Step 3. Mounting the terminal block cover

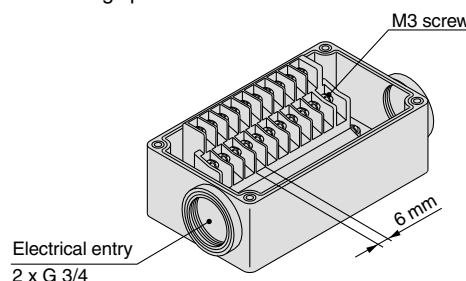
Securely tighten the screws to the torque shown in the table below, after confirming that the gasket is installed correctly.

Proper tightening torque (N·m)
0.7 to 1.2

Step 2. The diagram below shows the terminal block wiring.

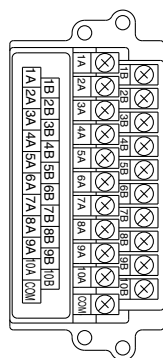
All stations are provided with double wiring regardless of the valves which are mounted.

Connect each wire to the power supply side, according to the markings provided inside the terminal block.



- Applicable crimped terminal: 1.25-3S, 1.25Y-3, 1.25Y-3N, 1.25Y-3.5
- Name plate: VVQ5000-N-T
- Drip-proof plug assembly (for G 3/4): AXT100-B06A

Electrical Wiring Specifications (IP67 compatible)



Double wiring (connected to SOL. A and SOL. B) is adopted for the internal wiring of each station, regardless of valve and option types. Mixed single and double wiring are available as an option.



Note) When using the negative COM specification, use valves for negative COM.

Standard wiring		Terminal no.	Polarity	
Station 1	SOL. A	1A	(-)	(+)
	SOL. B	1B	(-)	(+)
Station 2	SOL. A	2A	(-)	(+)
	SOL. B	2B	(-)	(+)
Station 3	SOL. A	3A	(-)	(+)
	SOL. B	3B	(-)	(+)
Station 4	SOL. A	4A	(-)	(+)
	SOL. B	4B	(-)	(+)
Station 5	SOL. A	5A	(-)	(+)
	SOL. B	5B	(-)	(+)
Station 6	SOL. A	6A	(-)	(+)
	SOL. B	6B	(-)	(+)
Station 7	SOL. A	7A	(-)	(+)
	SOL. B	7B	(-)	(+)
Station 8	SOL. A	8A	(-)	(+)
	SOL. B	8B	(-)	(+)
Station 9	SOL. A	9A	(-)	(+)
	SOL. B	9B	(-)	(+)
Station 10	SOL. A	10A	(-)	(+)
	SOL. B	10B	(-)	(+)
		COM	(+)	(-)

Positive COM spec. Negative COM spec. Note)

Special Wiring Specifications (Option)

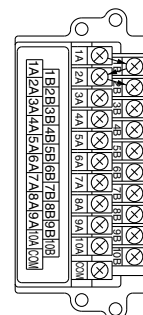
Mixed single and double wiring are available as an option. The maximum number of manifold stations is determined by the number of solenoids. Count one point for a single solenoid type and two points for a double solenoid type. The total number of solenoids (points) must not exceed 20.

1. How to Order

Indicate option symbol "K" in the manifold part number and be sure to specify station positions for single or double wiring on the manifold specification sheet.

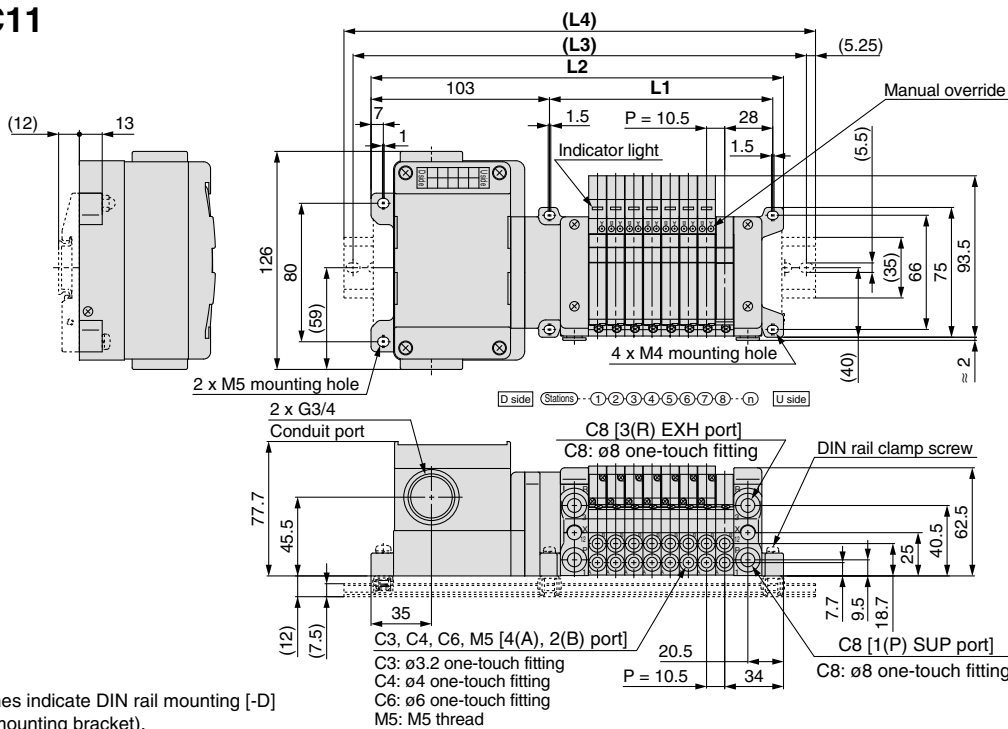
2. Wiring specifications

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.



kit (Terminal block box) IP67 compliant

VV5QC11

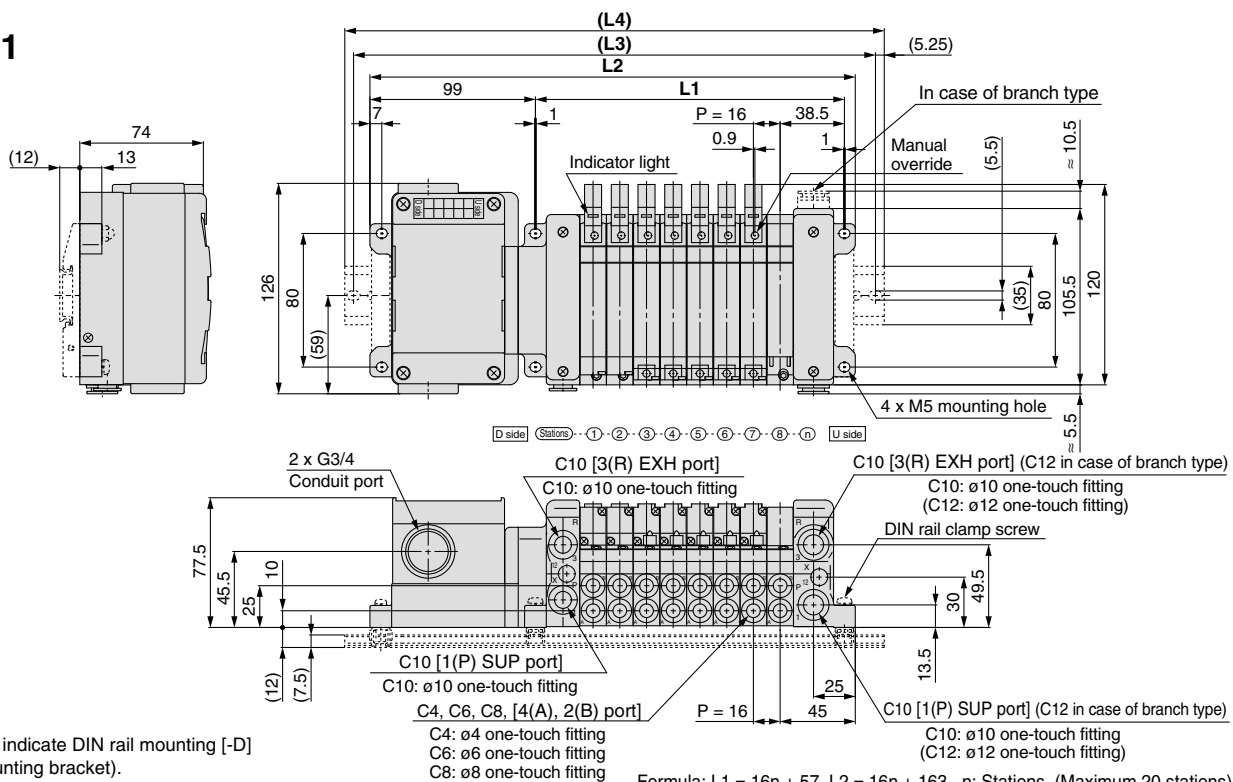


The dashed lines indicate DIN rail mounting [-D]
(with DIN rail mounting bracket).

Formula: $L1 = 10.5n + 45$, $L2 = 10.5n + 154.5$ n : Stations (Maximum 20 stations)

L	n	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
L1		55.5	66	76.5	87	97.5	108	118.5	129	139.5	150	160.5	171	181.5	192	202.5	213	223.5	234	244.5	255
L2		165	175.5	186	196.5	207	217.5	228	238.5	249	259.5	270	280.5	291	301.5	312	322.5	333	343.5	354	364.5
L3		187.5	200	212.5	212.5	225	237.5	250	262.5	275	275	287.5	300	312.5	325	337.5	337.5	350	362.5	375	387.5
L4		198	210.5	223	223	235.5	248	260.5	273	285.5	285.5	298	310.5	323	335.5	348	348	360.5	373	385.5	398

VV5QC21

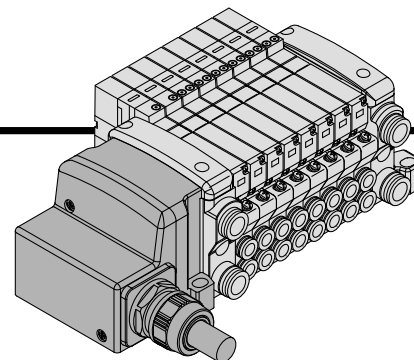


The dashed lines indicate DIN rail mounting [-D]
(with DIN rail mounting bracket).

Formula: $L1 = 16n + 57$, $L2 = 16n + 163$ n: Stations (Maximum 20 stations)

L \ n	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
L1	73	89	105	121	137	153	169	185	201	217	233	249	265	281	297	313	329	345	361	377
L2	179	195	211	227	243	259	275	291	307	323	339	355	371	387	403	419	435	451	467	483
L3	200	212.5	237.5	237.5	262.5	262.5	287.5	312.5	325	371	362.5	375	408.5	412.5	425	437.5	462.5	496	487.5	500
L4	210.5	223	248	248	273	273	298	323	335.5	360.5	373	385.5	398	423	435.5	448	473	485.5	498	510.5

Series VQC1000/2000 kit (Lead wire) IP67 compliant



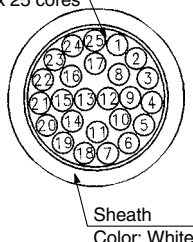
- Direct electrical entry type
- IP67 enclosure is available with use of cables with sheath and waterproof connectors.

Electrical Wiring Specifications

Lead wire specifications

Lead wire

0.3 mm² x 25 cores



Sheath
Color: White

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 12 stations or less, regardless of valve and option types.

Mixed single and double wiring are available as an option. Refer to the below special wiring specifications (option).

		Terminal no.	Polarity	Lead wire color	Dot marking	
Station 1		SOL.A 1	(-)	(+)	Black	None
		SOL.B 14	(-)	(+)	Yellow	Black
Station 2		SOL.A 2	(-)	(+)	Brown	None
		SOL.B 15	(-)	(+)	Pink	Black
Station 3		SOL.A 3	(-)	(+)	Red	None
		SOL.B 16	(-)	(+)	Blue	White
Station 4		SOL.A 4	(-)	(+)	Orange	None
		SOL.B 17	(-)	(+)	Purple	None
Station 5		SOL.A 5	(-)	(+)	Yellow	None
		SOL.B 18	(-)	(+)	Gray	None
Station 6		SOL.A 6	(-)	(+)	Pink	None
		SOL.B 19	(-)	(+)	Orange	Black
Station 7		SOL.A 7	(-)	(+)	Blue	None
		SOL.B 20	(-)	(+)	Red	White
Station 8		SOL.A 8	(-)	(+)	Purple	White
		SOL.B 21	(-)	(+)	Brown	White
Station 9		SOL.A 9	(-)	(+)	Gray	Black
		SOL.B 22	(-)	(+)	Pink	Red
Station 10		SOL.A 10	(-)	(+)	White	Black
		SOL.B 23	(-)	(+)	Gray	Red
Station 11		SOL.A 11	(-)	(+)	White	Red
		SOL.B 24	(-)	(+)	Black	White
Station 12		SOL.A 12	(-)	(+)	Yellow	Red
		SOL.B 25	(-)	(+)	White	None
		COM. 13	(+)	(-) Note)	Orange	Red
			Positive COM spec.	Negative COM spec.		

Note) When using the negative COM specification, use valves for negative COM.

Lead wire length

VV5QC11-08 C6 LD 0

Lead wire length

0	0.6 m
1	1.5 m
2	3.0 m

Electrical characteristics

Item	Property
Conductor resistance Ω/km, 20°C	65 or less
Voltage limit V, 1 minute, AC	1000
Insulation resistance MΩ/km, 20°C	5 or more

Note) Cannot be used for transfer wiring.
The minimum bending radius of the cable is 20 mm.

Special Wiring Specifications (Option)

Mixed single and double wiring are available as an option. The maximum number of manifold stations is determined by the number of solenoids. Count one point for a single solenoid type and two points for a double solenoid type. The total number of solenoids (points) must not exceed 24.

[illegible]

C3, C4, C6, M5 [4(A), 2(B)]

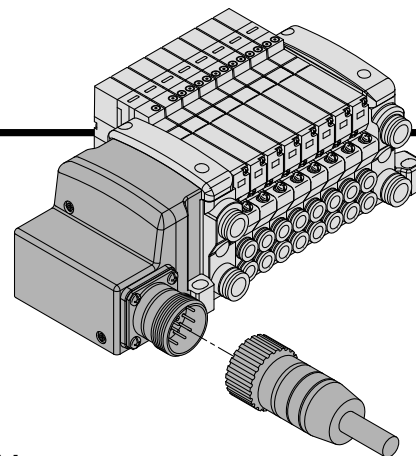
L	n	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
L1		55.5	66	76.5	87	97.5	108	118.5	129	139.5	150	160.5	171	181.5	192	202.5	213	223.5	234	244.5	255	265.5	276	286.5	297
L2		112.5	123	133.5	144	154.5	165	175.5	186	196.5	207	217.5	228	238.5	249	259.5	270	280.5	291	301.5	312	322.5	333	343.5	354
L3		137.5	150	162.5	175	187.5	200	212.5	225	237.5	250	262.5	275	287.5	300	312.5	325	337.5	350	362.5	375	387.5	400	412.5	425
L4		148	160.5	173	185.5	198	210.5	223	235.5	248	260.5	273	285.5	298	310.5	323	335.5	348	360.5	373	385.5	398	410.5	423	435.5

C4: ø4 one-touch fitting
C6: ø6 one-touch fitting
C8: ø8 one-touch fitting

L	n	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
L1		73	89	105	121	137	153	169	185	201	217	233	249	265	281	297	313	329	345	361	377	393	409	425	441
L2		126.5	142.5	158.5	174.5	190.5	206.5	222.5	238.5	254.5	270.5	286.5	302.5	318.5	334.5	350.5	366.5	382.5	398.5	414.5	430.5	446.5	462.5	478.5	494.5
L3		150	162.5	187.5	200	212.5	237.5	250	262.5	275	300	312.5	325	350	362.5	375	387.5	412.5	425	437.5	450	475	487.5	500	525
L4		160.5	173	198	210.5	223	248	260.5	273	285.5	310.5	323	335.5	360.5	373	385.5	398	423	435.5	448	460.5	485.5	498	510.5	535.5

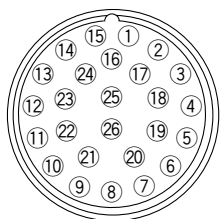
M Series VQC1000/2000 kit (Circular connector) IP67 compliant

- Use of circular connectors helps streamline wiring procedure to save labor.
- IP67 enclosure is available with use of waterproof circular connectors.



Electrical Wiring Specifications

Circular connector



Double wiring (connected to SOL.A and SOL.B) is used for the internal wiring of each station, regardless of valve and option types. Mixed single and double wiring are available as an option. Refer to the below special wiring specifications (option).

	Terminal no.	Polarity	
Station 1	SOL.A 1	(-)	(+)
	SOL.B 2	(-)	(+)
Station 2	SOL.A 3	(-)	(+)
	SOL.B 4	(-)	(+)
Station 3	SOL.A 5	(-)	(+)
	SOL.B 6	(-)	(+)
Station 4	SOL.A 7	(-)	(+)
	SOL.B 8	(-)	(+)
Station 5	SOL.A 9	(-)	(+)
	SOL.B 10	(-)	(+)
Station 6	SOL.A 11	(-)	(+)
	SOL.B 12	(-)	(+)
Station 7	SOL.A 13	(-)	(+)
	SOL.B 14	(-)	(+)
Station 8	SOL.A 15	(-)	(+)
	SOL.B 16	(-)	(+)
Station 9	SOL.A 17	(-)	(+)
	SOL.B 18	(-)	(+)
Station 10	SOL.A 19	(-)	(+)
	SOL.B 20	(-)	(+)
Station 11	SOL.A 21	(-)	(+)
	SOL.B 22	(-)	(+)
Station 12	SOL.A 23	(-)	(+)
	SOL.B 24	(-)	(+)
	COM. 25	(+)	(-)
	COM. 26	(+)	(-)

Note)
Positive COM spec. Negative COM spec.



Note) When using the negative COM specification, use valves for negative COM.

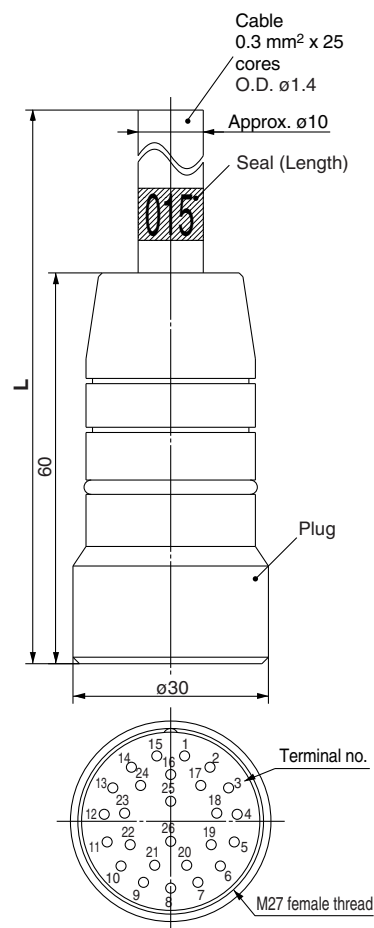
Special Wiring Specifications (Option)

Mixed single and double wiring are available as an option. The maximum number of manifold stations is determined by the number of solenoids. Count one point for a single solenoid type and two points for a double solenoid type. The total number of solenoids (points) must not exceed 24.

Cable Assembly

015
AXT100-MC26-030
050

(Type 26P circular connector cable assembly can be ordered with manifolds. Refer to "How to Order Manifold.")



Lead wire colors for circular connector cable assembly terminal numbers

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
26	White	None

Electrical characteristics

Item	Property
Conductor resistance Ω/km , 20°C	65 or less
Voltage limit V, 1 minute, AC	1000
Insulation resistance $\text{M}\Omega/\text{km}$, 20°C	5 or more



Note) The minimum bending radius of the circular connector cable is 20 mm.

Circular connector cable assembly

Cable length (L)	Assembly part no.
	26P
1.5 m	AXT100-MC26-015
3 m	AXT100-MC26-030
5 m	AXT100-MC26-050

- * Cannot be used for transfer wiring.
- * Lengths other than the above is also available. Please contact SMC for details.

L \ n	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
L1	55.5	66	76.5	87	97.5	108	118.5	129	139.5	150	160.5	171	181.5	192	202.5	213	223.5	234	244.5	255	265.5	276	286.5	297
L2	112.5	123	133.5	144	154.5	165	175.5	186	196.5	207	217.5	228	238.5	249	259.5	270	280.5	291	301.5	312	322.5	333	343.5	354
L3	137.5	150	162.5	175	175	187.5	200	212.5	225	237.5	237.5	250	262.5	275	287.5	300	300	312.5	325	337.5	350	362.5	375	375
L4	148	160.5	173	185.5	185.5	198	210.5	223	235.5	248	248	260.5	273	285.5	298	310.5	310.5	323	335.5	348	360.5	373	385.5	385.5

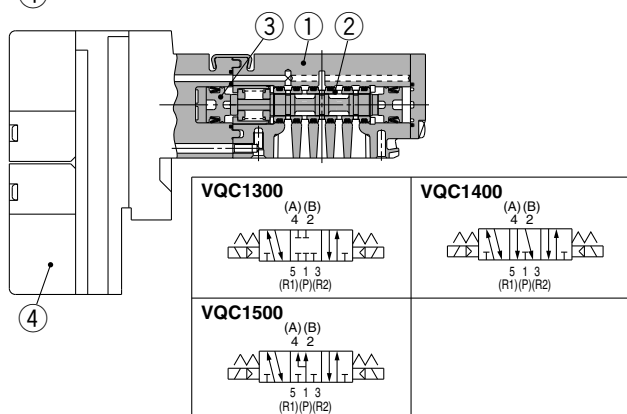
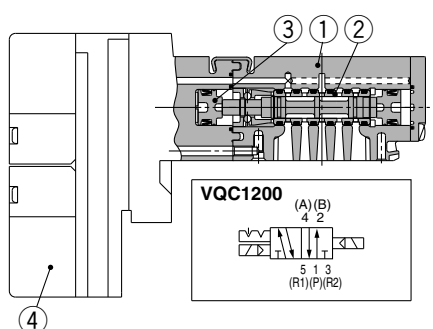
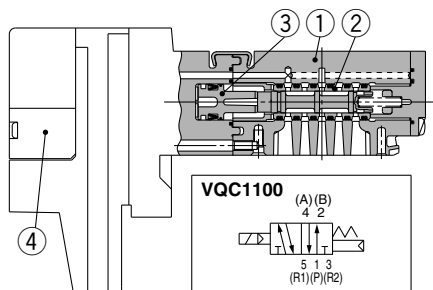
L		Formula 1: 1st - 12th												Formula 2: 13th - 24th											
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
L1	n	73	89	105	121	137	153	169	185	201	217	233	249	265	281	297	313	329	345	361	377	393	409	425	441
L2		126.5	142.5	158.5	174.5	190.5	206.5	222.5	238.5	254.5	270.5	286.5	302.5	318.5	334.5	350.5	366.5	382.5	398.5	414.5	430.5	446.5	462.5	478.5	494.5
L3		150	162.5	187.5	200	212.5	237.5	250	262.5	275	300	312.5	325	350	362.5	375	387.5	412.5	425	437.5	450	475	487.5	500	525
L4		160.5	173	198	210.5	223	248	260.5	273	285.5	310.5	323	335.5	360.5	373	385.5	398	423	435.5	448	460.5	485.5	498	510.5	535.5

Series VQC1000/2000

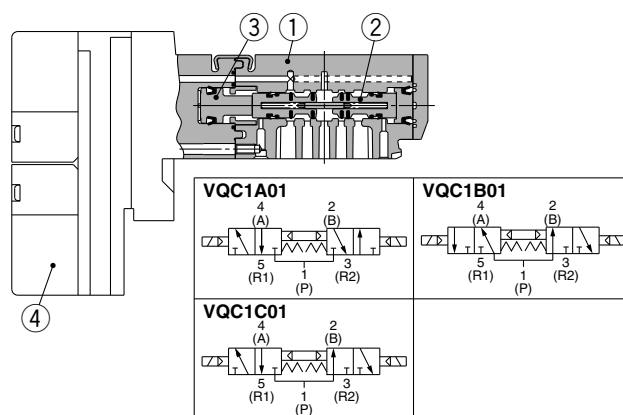
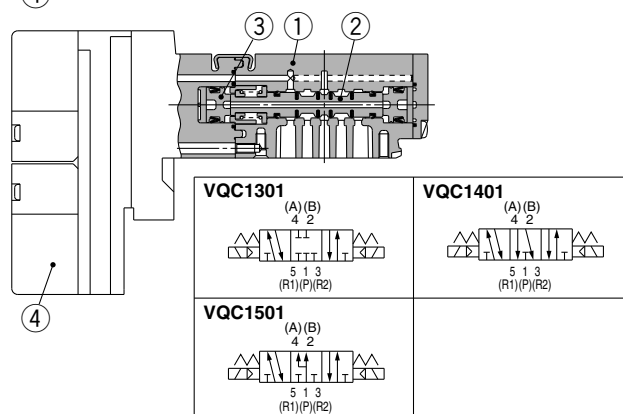
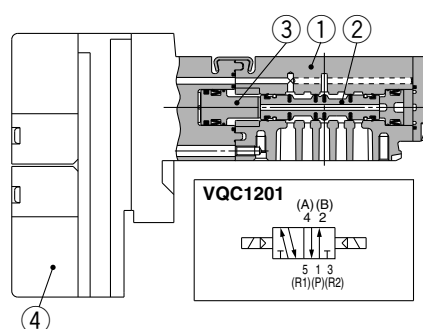
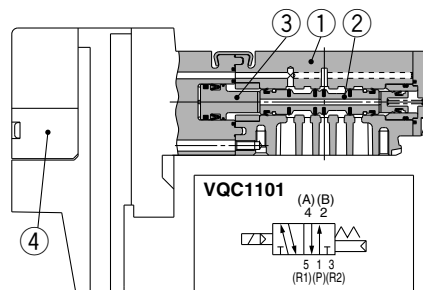
Construction

VQC1000 Plug-in Unit: Main Parts/Replacement Parts

Metal seal



Rubber seal



Component Parts

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

Note) Refer to page 39 for "How to Order Pilot Valve Assembly."

Component Parts

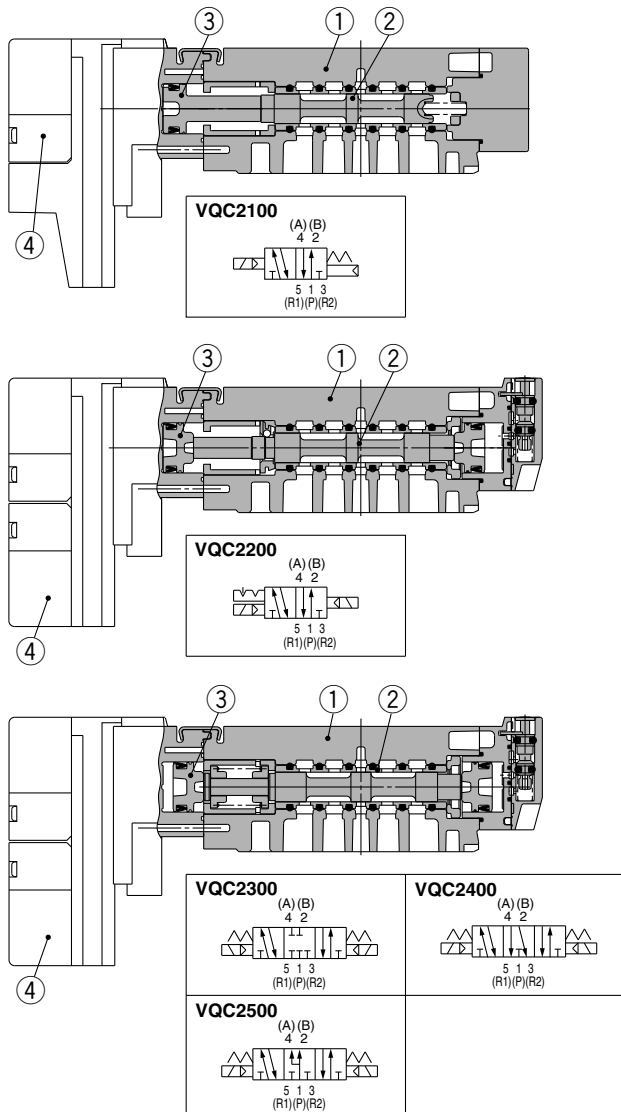
No.	Description	Material	Note
1	Body	Zinc die-casted	
2	Spool valve	Aluminum, HNBR	
3	Piston	Resin	
4	Pilot valve assembly	—	

Note) Refer to page 39 for "How to Order Pilot Valve Assembly."



VQC2000 Plug-in Unit: Main Parts/Replacement Parts

Metal seal

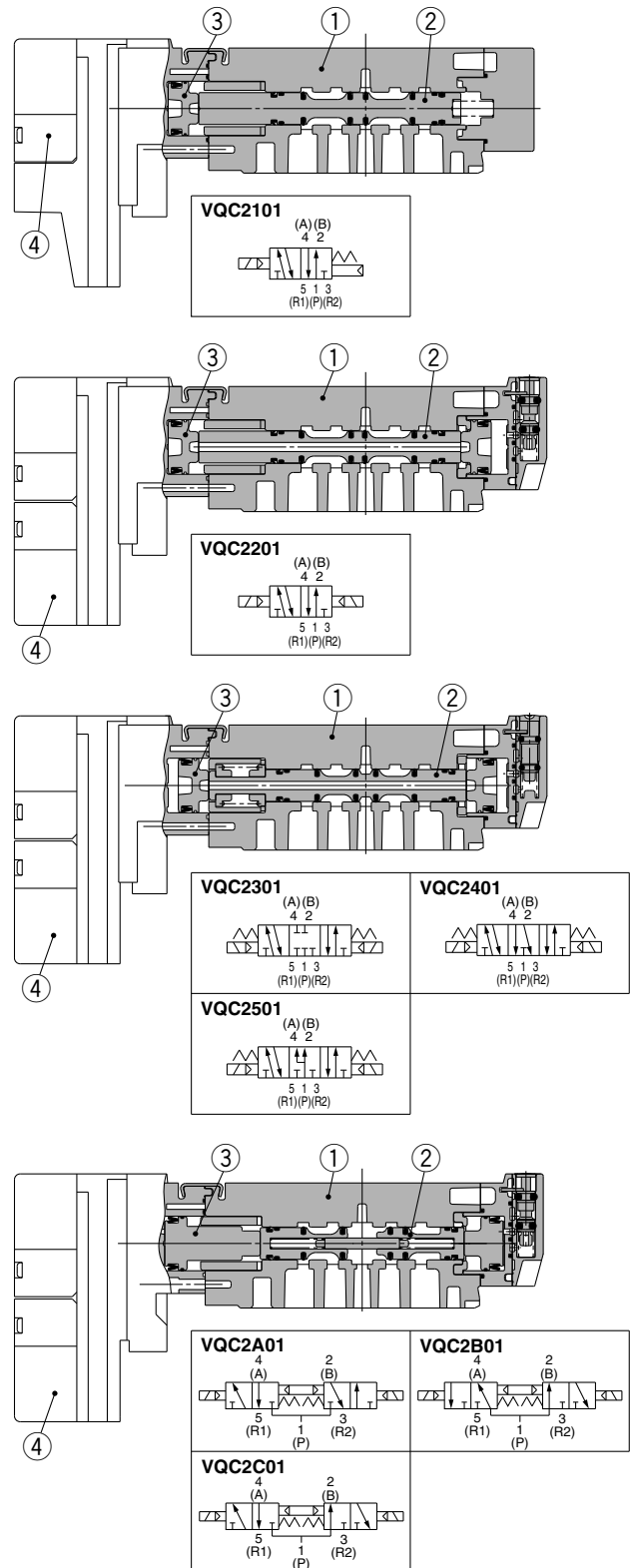


Component Parts

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

Note) Refer to page 39 for "How to Order Pilot Valve Assembly."

Rubber seal



Component Parts

No.	Description	Material	Note
1	Body	Zinc die-casted	
2	Spool valve	Aluminum, HNBR	
3	Piston	Resin	
4	Pilot valve assembly	—	

Note) Refer to page 39 for "How to Order Pilot Valve Assembly."

S kit

F kit

P kit

T kit

L kit

M kit

Construction

Exploded View
of Manifold

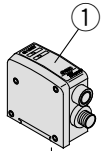
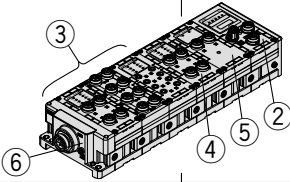
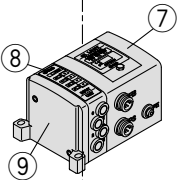
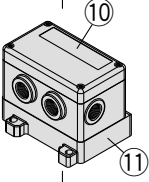
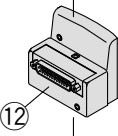
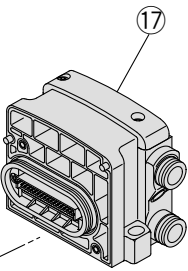
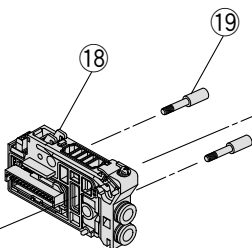
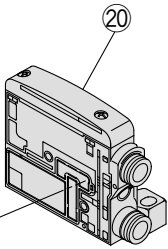
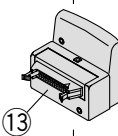
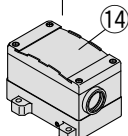
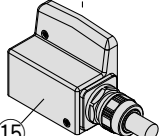
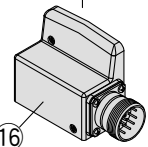
Manifold
Optional Parts

Safety
Instructions

Specific Product
Precautions

Series VQC1000/2000

Exploded View of Manifold

		Housing assembly and SI unit	D-side end plate assembly	Manifold block assembly	U-side end plate assembly
S kit (Serial transmission)	EX500				
	EX600				
	EX250				
	EX126				
F kit (D-sub connector)					
P kit (Flat ribbon cable)					
T kit (Terminal block box)					
L kit (Lead wire)					
M kit (Circular connector)					

Manifold Assembly Part No.

Housing Assembly and SI Unit/Input Block

No.	Description	Part no.	Note
①	SI unit	EX500-Q001	DeviceNet™, PROFIBUS DP, CC-Link, EtherNet/IP™ (+COM.)
		EX500-Q101	DeviceNet™, PROFIBUS DP, CC-Link, EtherNet/IP™ (–COM.)
②	SI unit	EX600-SDN1	DeviceNet™ PNP (–COM.)
		EX600-SDN2	DeviceNet™ NPN (+COM.)
		EX600-SMJ1	CC-Link PNP (–COM.)
		EX600-SMJ2	CC-Link NPN (+COM.)
		EX600-SPR1	PROFIBUS DP PNP (–COM.)
		EX600-SPR2	PROFIBUS DP NPN (+COM.)
③	Digital input unit	EX600-DXNB	NPN input, M12 connector, 5 pins (4 pcs.), 8 inputs
		EX600-DXPB	PNP input, M12 connector, 5 pins (4 pcs.), 8 inputs
		EX600-DXNC	NPN input, M8 connector, 3 pins (8 pcs.), 8 inputs
		EX600-DXNC1	NPN input, M8 connector, 3-pins (8 pcs.), 8 inputs, with broken wire detection function
		EX600-DXPC	PNP input, M8 connector, 3 pins (8 pcs.), 8 inputs
		EX600-DXPC1	PNP input, M8 connector, 3-pins (8 pcs.), 8 inputs, with broken wire detection function
		EX600-DXND	NPN input, M12 connector, 5 pins (8 pcs.), 16 inputs
		EX600-DXPD	PNP input, M12 connector, 5 pins (8 pcs.), 16 inputs
④	Digital output unit	EX600-DYNB	NPN input, M12 connector, 5 pins (4 pcs.), 8 inputs
		EX600-DYPB	PNP input, M12 connector, 5 pins (4 pcs.), 8 inputs
⑤	Analog input unit	EX600-AXA	M12 connector, 5 pins (2 pcs.), 2-channel input
⑥	End plate	EX600-ED2	M12 connector, 5 pins, Max. supply current 2 A
		EX600-ED2-2	M12 connector, 5 pins, Max. supply current 2 A, with DIN rail mounting bracket
		EX600-ED3	7/8 inch connector, 5 pins, Max. supply current 8 A
		EX600-ED3-2	7/8 inch connector, 5 pins, Max. supply current 8 A, with DIN rail mounting bracket
⑦	SI unit	EX250-SPR1	PROFIBUS DP (–COM.)
		EX250-SMJ2	CC-Link (+COM.)
		EX250-SAS3	AS-Interface, 8 in/8 out, 31 slave modes, 2 power supply systems (–COM.)
		EX250-SAS5	AS-Interface, 4 in/4 out, 31 slave modes, 2 power supply systems (–COM.)
		EX250-SAS7	AS-Interface, 8 in/8 out, 31 slave modes, 1 power supply systems (–COM.)
		EX250-SAS9	AS-Interface, 4 in/4 out, 31 slave modes, 1 power supply systems (–COM.)
		EX250-SCA1A	CANopen (–COM.)
		EX250-SCN1	ControlNet™ (–COM.)
		EX250-SDN1	DeviceNet™ (–COM.)
⑧	Input block	EX250-SEN1	EtherNet/IP™ (–COM.)
		EX250-IE1	M12, 2 inputs
		EX250-IE2	M12, 4 inputs
⑨	End plate assembly	EX250-IE3	M8, 4 inputs
		EX250-EA1	Standard
		EX250-EA2	For DIN rail mounting
⑩	SI unit	EX126D-SMJ1	CC-Link (+COM.)
⑪	Terminal block plate	VVQC1000-74A-2	For EX126 SI unit mounting
⑫	D-sub connector housing assembly	VVQC1000-F25-1	F kit, 25 pins
⑬	Flat ribbon cable housing assembly	VVQC1000-P26-1	P kit, 26 pins
		VVQC1000-P20-1	P kit, 20 pins
⑭	Terminal block box housing assembly	VVQC1000-T0-1	T kit
⑮	Lead wire housing assembly	VVQC1000-L25-0-1	L kit with 0.6 m lead wire
		VVQC1000-L25-1-1	L kit with 1.5 m lead wire
		VVQC1000-L25-2-1	L kit with 3.0 m lead wire
⑯	Circular connector housing assembly	VVQC1000-M26-1	M kit, 26 pins

S kit

F kit

P kit

T kit

L kit

M kit

Construction

Exploded View of Manifold

Manifold Optional Parts

Safety Instructions

Specific Product Precautions

Series VQC1000/2000

Manifold Assembly Part No.

<D-Side End Plate Assembly>

⑰ D-side end plate assembly part no.

VVQC **1** 000-3A-1-□-□

Series

1	VQC1000
2	VQC2000

Port size

Symbol	VQC1000	VQC2000
C8	●	
C10		●
N9	●	
N11		●

Option

Nil	Common EXH
R	External pilot
S	Direct EXH outlet with built-in silencer

<U-Side End Plate Assembly>

⑳ U-side end plate assembly part no.

VVQC **1** 000-2A-**1**-C8-□

Series

1	VQC1000
2	VQC2000

Supply/Exhaust port entry direction

1	Cylinder port side
2 (Note)	Branch type



Note) VQC2000 only

Port size

Symbol	VQC1000	VQC2000
C8	●	
C10		●
C12		●
N9	●	
N11		●
N13		●

Option

Nil	Common EXH
R	External pilot
S	Direct EXH outlet with built-in silencer

<Manifold Block Assembly>

⑱ Manifold block assembly part no.

VVQC **1** 000-1A-D-C6-□

Series

1	VQC1000
2	VQC2000



Note) Tie-rods (2 pcs.) for additional stations included.

Wiring specifications

D	Double wiring
S	Single wiring

Port size

Symbol	Port size	VQC1000	VQC2000
C3	For ø3.2 one-touch fitting	●	
C4	For ø4 one-touch fitting	●	●
C6	For ø6	●	●
C8	For ø8		●
N1	For ø1/8"	●	
N3	For ø5/32"	●	●
N7	For ø1/4"	●	●
N9	For ø5/16"		●
M5	For M5 thread	●	

Option

Nil	None
B	With back pressure check valve

<Replacement Parts>

Pilot valve assembly

V112-**5**A

Coil voltage

5	24 VDC
6	12 VDC

Function

Nil	Standard (0.4 W)
B	High-speed response type (0.95 W)
K	High-pressure type (1.0 MPa, 0.95 W)

Note) Common to single solenoid and double solenoid

⑲ Tie-rod assembly part no. (2 pcs.)

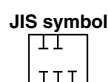
VQC1000	VVQC1000-TR-□
VQC2000	VVQC2000-TR-□

Note 1) Please order when reducing the number of manifold stations. When increasing the number of stations, additional orders are not required since they are included in the manifold block assembly.

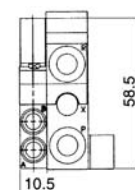
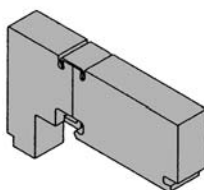
Note 2) □: Stations 02 to 24

VQC1000: Manifold Optional Parts

Blanking plate assembly VVQ1000-10A-1



It is used by attaching on the manifold block for being prepared for removing a valve for maintenance reasons or planning to mount a spare valve, etc.



Individual SUP spacer VVQ1000-P-1-C₆-N₇

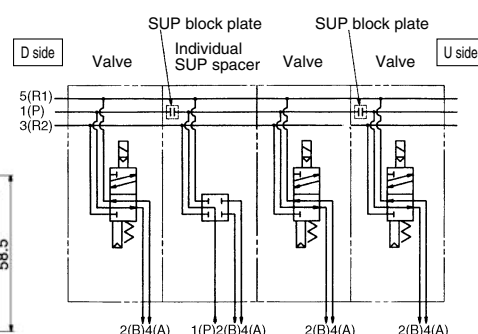
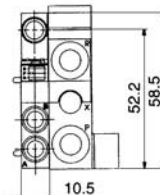
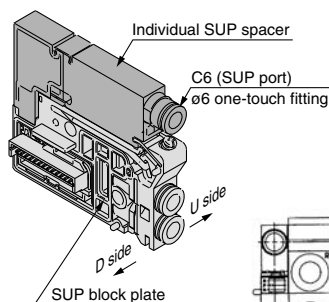
When the same manifold is to be used for different pressures, individual SUP spacers are used as SUP ports for different pressures. (One station space is occupied.) Block both sides of the station, for which the supply pressure from the individual SUP spacer is used, with SUP block plates. (Refer to the application example.)

* Specify the spacer mounting position and SUP block plate position by means of the manifold specification sheet.

The block plate is used in one or two places for one set. (Two SUP block plates for blocking SUP passage are attached to the individual SUP spacer.)

* As a standard, electric wiring is connected to the position of the manifold station where the individual SUP spacer is mounted.

* If wiring is not required for stations equipped with spacers, enter "X" in the special wiring specifications column in the manifold specification sheet.



Individual EXH spacer VVQ1000-R-1-C₆-N₇

When valve exhaust affects other stations due to the circuit configuration, this spacer is used for individual valve exhaust. (One station space is occupied.) Block both sides of the individual valve EXH station. (Refer to the application example.)

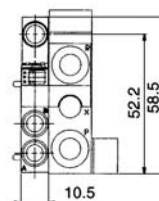
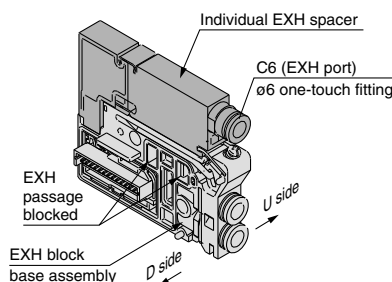
* Specify the spacer mounting position, as well as the EXH passage blocking position by means of the manifold specification sheet. The block plate is used in one or two places for one set.

* An EXH block base assembly is used in the blocking position when ordering an EXH spacer incorporated with a manifold. However, do not order an EXH block base assembly because it is attached to the spacer.

When separately ordering an individual EXH spacer, separately order an EXH block base assembly because it is not attached to the spacer.

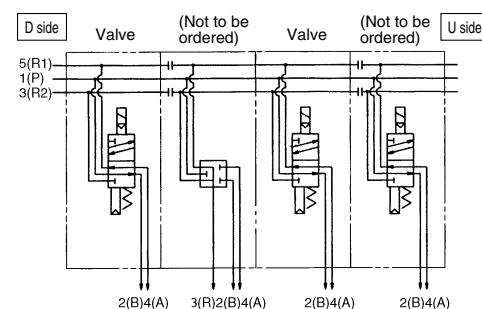
* As a standard, electric wiring is connected to the position of the manifold station where the individual EXH spacer is mounted.

* If wiring is not required for stations equipped with spacers, enter "X" in the special wiring specifications column in the manifold specification sheet.



Description/Model		Stations						
Valve	Single		●	●	●			
	...							
Option	Individual EXH spacer VVQ1000-R-1-C ₆		●					
	EXH blocking position: Specify 2 places.		●	●				

Individual EXH spacer + EXH block base assembly Valve + EXH block base assembly



SUP block plate VVQ1000-16A

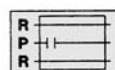
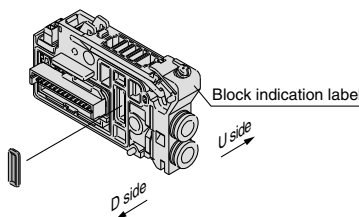
When different pressures are supplied to a manifold, a SUP block plate is used to block the stations under different pressures.

* Specify the mounting position by means of the manifold specification sheet.

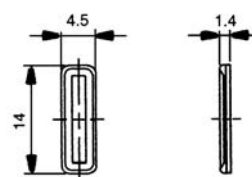
<Block indication label>

Indication labels to confirm the blocking position are attached (Each for SUP passage and SUP/EXH passage blocking positions).

* When ordering a block plate incorporated with a manifold, a block indication label is attached to the manifold.



SUP passage blocked



SUP/EXH passage blocked

Series VQC1000

VQC1000: Manifold Optional Parts

Blanking plate with connector

VVQ1000-1C-□

JIS symbol



Connector on the power supply side is not attached.

Connector assembly

Connector assembly part no.

AXT661-43 A-6

Lead wire length (mm)

Connector lead wire length (mm)	
Nil	300
6	600
10	1000
15	1500
20	2000
25	2500
30	3000

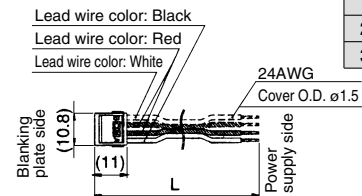
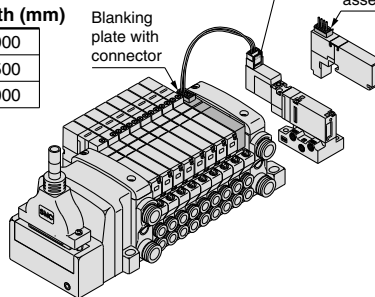
Connector

Connector	
Nil	Without connector
1	With connector/2-wire
2	With connector/4-wire

Blanking plate with a connector for individually outputting electricity to drive a single valve or equipment that are not on the manifold base.

* When "N" is suffixed to the end of the name plate, the plate will be different from a standard shape.

Note) Electric current should be 1A or less (including the mounted valves).



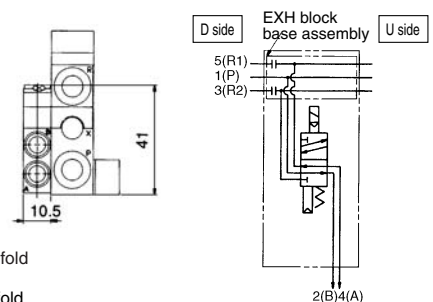
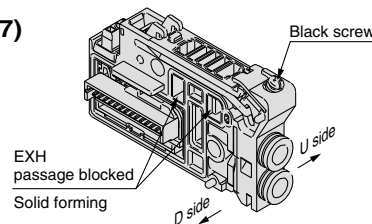
EXH block base assembly

VVQC1000-19A-□-(C3/C4/C6/M5/N1/N3/N7)

Wiring specifications

Wiring specifications	
S	Single wiring
D	Double wiring

The manifold block assembly is used between stations for which exhaust is desired to be divided when valve exhaust affects other stations due to the circuit configuration. The EXH passage on the D-side is blocked in the EXH block base assembly. It is also used in combination with an individual EXH spacer for individual exhaust.



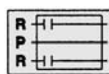
* Specify the mounting position by means of the manifold specification sheet.

* When ordering this option incorporated with a manifold, specify the EXH block base assembly part number with "*" in front of it beneath the manifold part number.

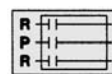
<Block indication label>

Indication labels to confirm the blocking position are attached (Each for EXH passage and SUP/EXH passage blocking positions).

* When ordering this option incorporated with a manifold, a block indication label is attached to the manifold.



EXH passage blocked



SUP/EXH passage blocked

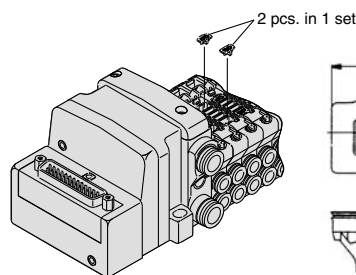
Back pressure check valve assembly [-B]

VVQ1000-18A

It prevents cylinder from malfunctioning by other valve's exhaust entry. Insert it into R (EXH) port on the manifold side of a valve which is affected. It is effective when a single-acting cylinder is used or an exhaust center type solenoid valve is used.

* When ordering it being mounted on all manifold stations, suffix "-B" to the end of the manifold part number.

Note) When a back pressure check valve is desired, and is to be installed only in certain manifold stations, clearly indicate the part number and specify the mounting station by means of the manifold specification sheet.



(Precautions)

1. The back pressure check valve assembly is the parts with a check valve structure. However, since the valve has slight air leakage, take precautions for the exhaust air not to be restricted at the exhaust port.
2. When a back pressure check valve is mounted, the effective area of the valve will decrease by about 20%.

Name plate [-N]

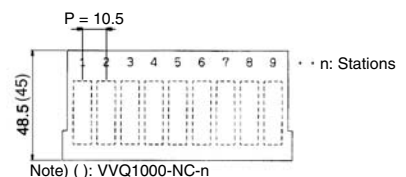
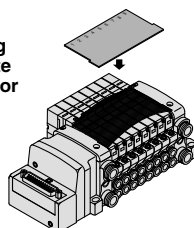
VVQ1000-NC-Station (1 to Max. stations)

N: Standard
NC: For mounting blanking plate with connector

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 the blanking plate with connector is mounted, it automatically will be "VVQ1000-NC-n"

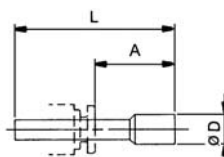
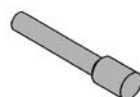
* When ordering this option incorporated with a manifold, suffix "-N" to the end of the manifold part number.



Blanking plug (For one-touch fittings)

KQ2P-□

It is inserted into an unused cylinder port and SUP/EXH ports. Purchasing order is available in units of 10 pieces.



Dimensions

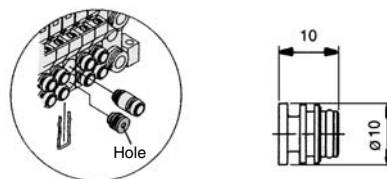
Applicable fitting size ød	Model	A	L	D	Applicable fitting size ød	Model	A	L	D
3.2	KQ2P-23	16	31.5	3.2	1/8"	KQ2P-01	16	31.5	5
4	KQ2P-04	16	32	6	5/32"	KQ2P-03	16	32	6
6	KQ2P-06	18	35	8	1/4"	KQ2P-07	18	35	8.5
8	KQ2P-08	20.5	39	10	5/16"	KQ2P-09	20.5	39	10

Port plug VVQ0000-58A

The plug is used to block the cylinder port.

* When ordering this option incorporated with a manifold, indicate "CM" for the port size of the manifold part number, as well as, the mounting position and number of stations and cylinder port mounting positions, 4(A) and 2(B) by means of the manifold specification sheet.

* Gently screw an M3 screw in the port plug hole and pull it for removal.



Elbow fitting assembly

VVQ1000-F-L(C3/C4/C6/M5/N1/N3/N7)

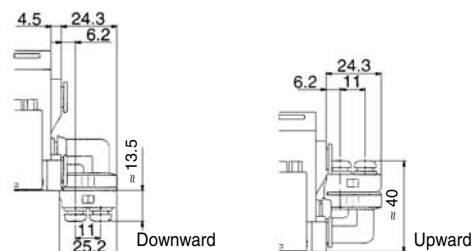
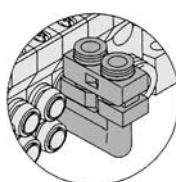
It is used for piping that extends upward or downward from the manifold.

* When ordering this option incorporated with a manifold, indicate "L□" or "B□" for the manifold port size (when installed in all stations.)

When installing it in part of the manifold stations, specify the elbow fitting assembly part number and the mounting position and number of stations by means of the manifold specification sheet.

* When mounting elbow fitting assembly on the edge of manifold station and a silencer on EXH port, select a silencer, AN203-KM8.

A silencer (AN200-KM8) is interfered with fittings.



DIN rail mounting bracket [-D]

VVQ1000-57A

{For F/L/M/P/S (EX500) kit}

VVQ1000-57A-S

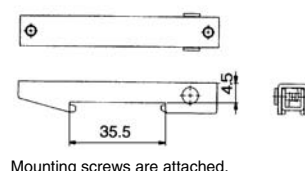
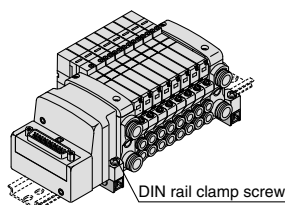
{For S (EX250) kit}

VVQ1000-57A-T (For T kit)

It is used for mounting a manifold on a DIN rail.

* When ordering this option incorporated with a manifold, suffix "-D" to the end of the manifold part number.

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



Direct EXH outlet with built-in silencer [-S]

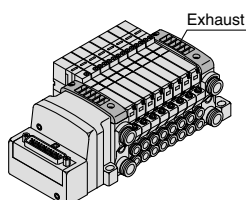
This is a type with an exhaust outlet atop the manifold end plate. The built-in silencer exhibits an excellent noise suppression effect. (Noise reduction: 30 dB)

* When ordering this option incorporated with a manifold, suffix "-S" to the end of the manifold part number.



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

● Refer to back page 5 for maintenance.



Dual flow fitting assembly

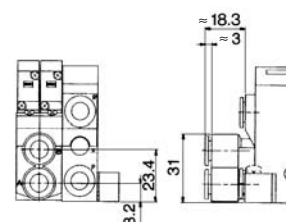
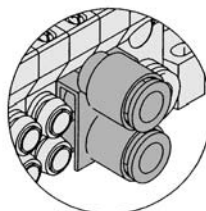
VVQ1000-52A-C8

This is a fitting to multiply the flow rate by combining the outputs of 2-valve stations. It is used for driving a large bore cylinder. This is a one-touch fitting for a port size of ø8 or ø5/16".

* The port size of the manifold part number is "CM".

Clearly indicate the dual flow fitting assembly part number and specify the mounting positions by means of the manifold specification sheet.

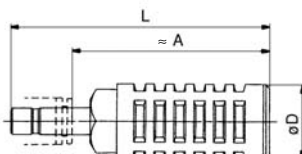
* In dual flow fitting assembly, a special clip which is combined in one-piece of 2 stations is attached as a holding clip.



Silencer (For EXH port)

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

* When mounting elbow fitting assembly (VVQ1000-F-L□) on the edge of manifold station, select a silencer, AN203-KM8. A silencer (AN200-KM8) is interfered with fittings.



Dimensions

Series	Applicable fitting size ød	Model	A	L	D	Effective area (mm ²)	Noise reduction (dB)
VQ1000	8	AN200-KM8	59	78	22	20	30
		AN203-KM8	32	51	16	14	25*

Series VQC1000

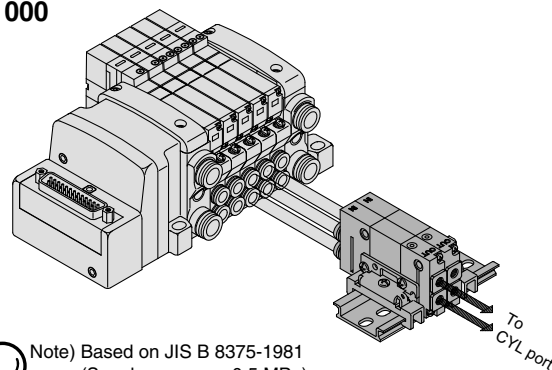
VQC1000: Manifold Optional Parts

Double check block (Separated) for VQC1000 VQ1000-FPG-□□-□

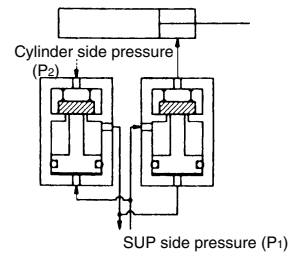
It is used on the outlet side piping to keep the cylinder in the intermediate position for long periods of time. Combining the double check block with a built-in pilot type double check valve and a 3-position exhaust center solenoid valve will enable the cylinder to stop in the middle or maintain its position for a long time. The combination with a 2-position single/double solenoid valve will permit this block to be used for preventing the dropping at the cylinder stroke end when the SUP residual pressure is released.

Specifications

Max. operating pressure	0.8 MPa
Min. operating pressure	0.15 MPa
Ambient and fluid temp.	-5 to 50°C
Flow characteristics: C	0.60 dm³/(s·bar)
Max. operating frequency	180 c.p.m



<Circuit diagram>



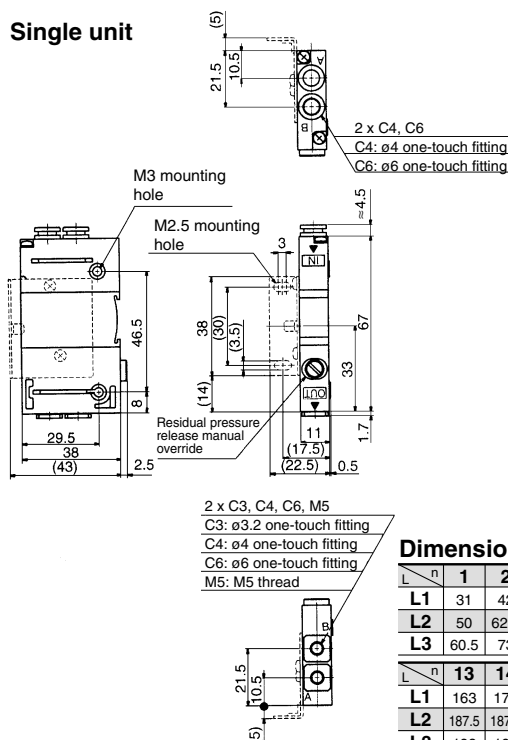
VVQ1000-FPG-02 1 set
* VQ1000-FPG-C6M5-D 2 pcs.



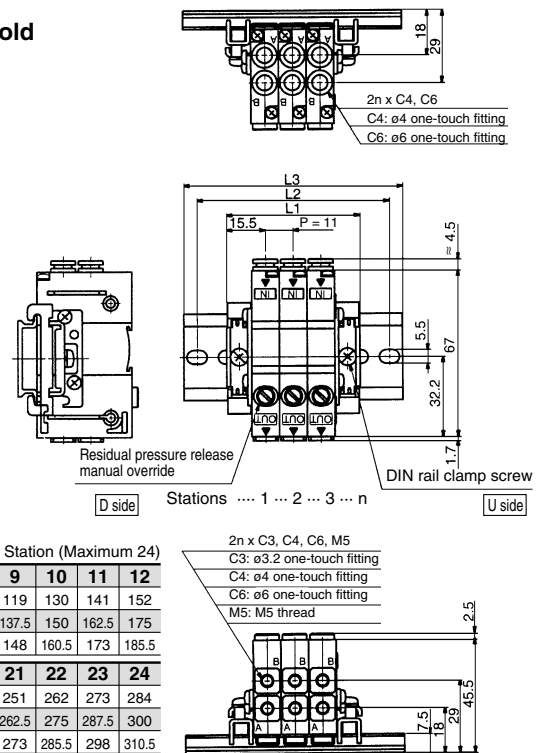
Note) Based on JIS B 8375-1981
(Supply pressure: 0.5 MPa)

Dimensions

Single unit



Manifold



Dimensions

Formula $L1 = 11n + 20$ n: Station (Maximum 24)

L	n	1	2	3	4	5	6	7	8	9	10	11	12
L1		31	42	53	64	75	86	97	108	119	130	141	152
L2		50	62.5	75	87.5	100	112.5	125	137.5	150	162.5	175	
L3		60.5	73	85.5	98	110.5	123	135.5	148	160.5	173	185.5	
L	n	13	14	15	16	17	18	19	20	21	22	23	24
L1		163	174	185	196	207	218	229	240	251	262	273	284
L2		187.5	197.5	207.5	217.5	227.5	237.5	247.5	257.5	267.5	277.5	287.5	297.5
L3		198	208	218	228	238	248	258	268	278	288	298	308

How to Order

Double check block

VQ1000-FPG-**C4** **M5** - **F**

IN side port size

M5	M5 thread
C3	ø3.2 one-touch fitting
C4	ø4 one-touch fitting
C6	ø6 one-touch fitting
N3	ø5/32" one-touch fitting
N7	ø1/4" one-touch fitting

OUT side port size

M5	M5 thread
C3	ø3.2 one-touch fitting
C4	ø4 one-touch fitting
C6	ø6 one-touch fitting
N3	ø5/32" one-touch fitting
N7	ø1/4" one-touch fitting

Option

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

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

Manifold (DIN rail mounting)

VVQ1000-FPG-**06**

Stations

01	1 station
16	16 stations

When ordering a double check block, order the DIN rail mounting [-D].

<Ordering example>

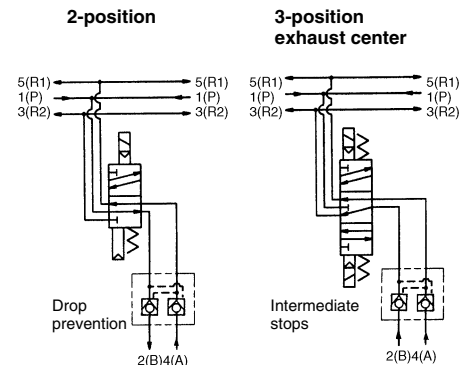
VVQ1000-FPG-06---6-station manifold

*VQ1000-FPG-C4M5-D, 3 sets
*VQ1000-FPG-C6M5-D, 3 sets

Bracket Assembly

Part no.	Tightening torque
VQ1000-FPG-FB	0.22 to 0.25 N·m

<Example>



Caution

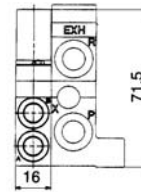
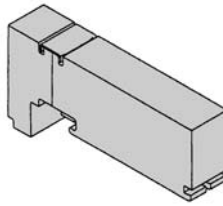
- Air leakage from the pipe between the valve and cylinder or from the fittings will prevent the cylinder from stopping for long periods of time. Check the leakage using neutral household detergent, such as dish washing soap.
- Also, check the cylinder's tube gasket, piston packing and rod packing for 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 long periods of time.
- Combining double check block with 3-position closed center or pressure center solenoid valve will not work.
- M5 fitting assembly is attached, not incorporated into the double check block. After screwing in the M5 fittings, mount the assembly on the double check block. (Tightening torque: 0.8 to 1.2 N·m)
- If the exhaust of the double check block is restricted 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.

VQC2000: Manifold Optional Parts

Blanking plate assembly JIS symbol VVQ2000-10A-1



It is used by attaching on the manifold block for being prepared for removing a valve for maintenance reasons or planning to mount a spare valve, etc.



Individual SUP spacer VVQ2000-P-1-C₈ N₉

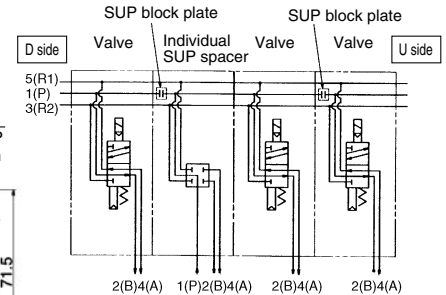
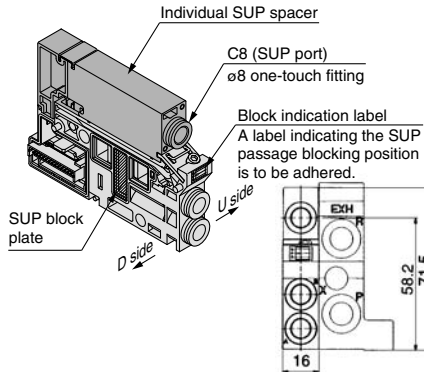
When the same manifold is to be used for different pressures, individual SUP spacers are used as SUP ports for different pressures. (One station space is occupied.)

Block both sides of the station, for which the supply pressure from the individual SUP spacer is used, with SUP block plates. (Refer to the application example.)

* Specify the spacer mounting position and SUP passage blocking position by means of the manifold specification sheet. The block plate is used in one or two places for one set. (Two SUP block plates for blocking SUP passage are attached to the individual SUP spacer.)

* As a standard, electric wiring is connected to the position of the manifold station where the individual SUP spacer is mounted.

* If wiring is not required for stations equipped with spacers, enter "X" in the special wiring specifications column in the manifold specification sheet.



Individual EXH spacer VVQ2000-R-1-C₈ N₉

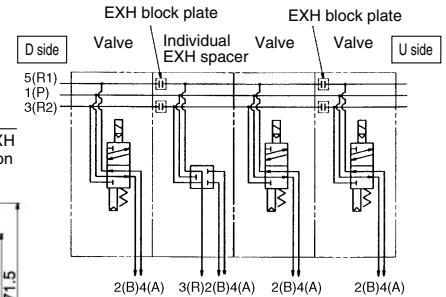
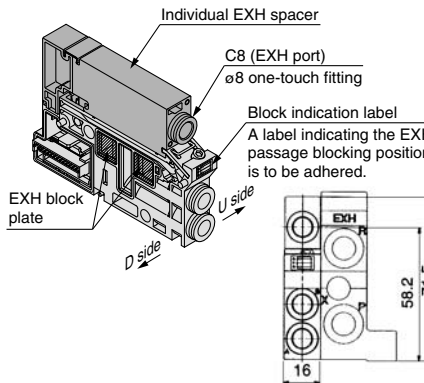
When valve exhaust affects other stations due to the circuit configuration, this spacer is used for individual valve exhaust. (One station space is occupied.)

Block both sides of the individual valve EXH station. (Refer to the application example.)

* Specify the spacer mounting position, as well as the EXH passage blocking position by means of the manifold specification sheet. The block plate is used in one or two places for one set. (Four EXH block plates (2 sets) for blocking EXH passage are attached to the individual EXH spacer.)

* As a standard, electric wiring is connected to the position of the manifold station where the individual EXH spacer is mounted.

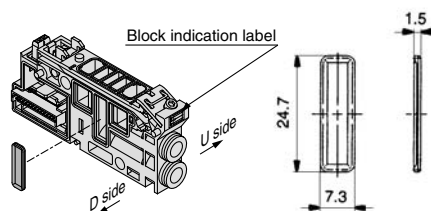
* If wiring is not required for stations equipped with spacers, enter "X" in the special wiring specifications column in the manifold specification sheet.



SUP block plate VVQ2000-16A

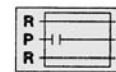
When different pressures are supplied to a manifold, a SUP block plate is used to block the stations under different pressures.

* Specify the mounting position by means of the manifold specification sheet.



<Block indication label>

Indication labels to confirm the blocking position are attached. (Each for SUP passage and SUP/EXH passage blocking positions)



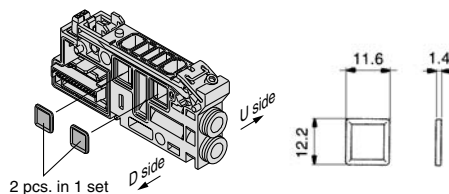
SUP passage blocked SUP/EXH passage blocked

* When ordering a block plate incorporated with a manifold, a block indication label is attached to the manifold.

EXH block plate VVQ2000-19A

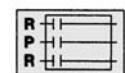
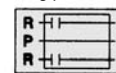
The EXH block plate is used between stations for which exhaust is desired to be divided when valve exhaust affects other stations configuration. It is also used in combination with an individual EXH spacer for individual exhaust.

* Specify the mounting position by means of the manifold specification sheet.



<Block indication label>

Indication labels to confirm the blocking position are attached. (Each for EXH passage and SUP/EXH passage blocking positions)



EXH passage blocked SUP/EXH passage blocked

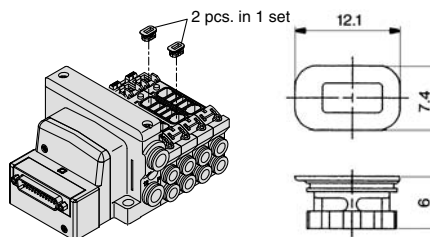
* When ordering a block plate incorporated with a manifold, a block indication label is attached to the manifold.

Back pressure check valve assembly [-B] VVQ2000-18A

It prevents cylinder malfunction caused by other valve exhaust entry. Insert it into R (EXH) port on the manifold side of a valve which is affected. It is effective when a single-acting cylinder is used or an exhaust center type solenoid valve is used.

* When ordering this option incorporated with a manifold, suffix "-B" to the end of the manifold part number.

Note) When a back pressure check valve is desired, and is to be installed only in certain manifold stations, clearly indicate the part number and specify the mounting position by means of the manifold specification sheet.



<Precautions>

1. The back pressure check valve assembly is assembly parts with a check valve structure. However, since the valve has slight air leakage, take precautions for the exhaust air not to be restricted at the exhaust port.
2. When a back pressure check valve is mounted, the effective area of the valve will decrease by about 20%.

Series VQC2000

VQC2000: Manifold Optional Parts

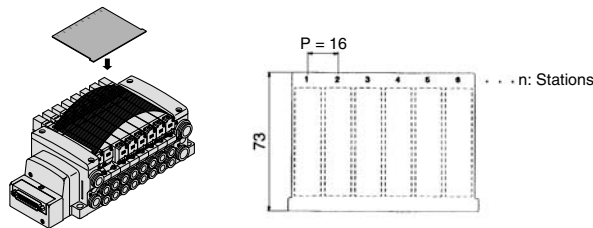
Name plate [-N]

VVQ2000-N-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 this option incorporated with a manifold, suffix "-N" to the end of the manifold part number.

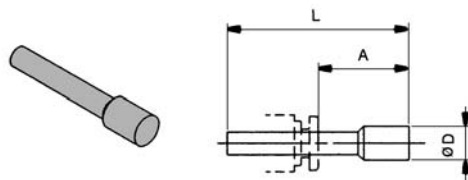


Blanking plug (For one-touch fittings)

KQ2P-□

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

Purchasing order is available in units of 10 pieces.



Dimensions

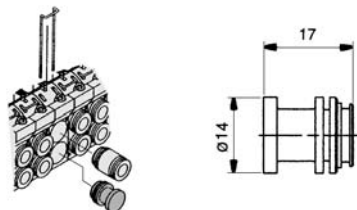
Applicable fitting size ϕd	Model	A	L	D
4	KQ2P-04	16	32	6
6	KQ2P-06	18	35	8
8	KQ2P-08	20.5	39	10
10	KQ2P-10	22	43	12
5/32"	KQ2P-03	16	32	6
1/4"	KQ2P-07	18	35	8.5
5/16"	KQ2P-09	20.5	39	10
3/8"	KQ2P-11	22	43	11.5

Port plug

VVQ1000-58A

The plug is used to block the cylinder port.

* When ordering this option incorporated with a manifold, indicate "CM" for the port size of the manifold part number, as well as, the mounting station and cylinder port mounting positions, A and B, by means of the manifold specification sheet.



DIN rail mounting bracket [-D]

VVQ2000-57A

{For F/L/M/P/S (EX500) kit}

VVQ2000-57A-S

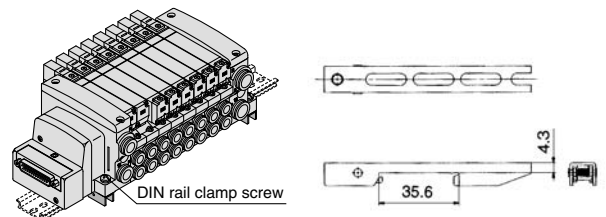
{For S (EX250) kit}

VVQ2000-57A-T (For T kit)

It is used for mounting a manifold on a DIN rail.

* When ordering this option incorporated with a manifold, suffix "-D" to the end of the manifold part number.

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



Direct EXH outlet with built-in silencer [-S]

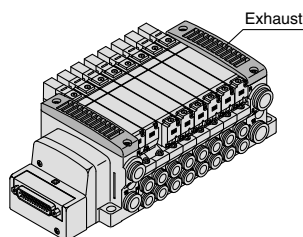
This is a type with an exhaust outlet atop the manifold end plate. The built-in silencer exhibits an excellent noise suppression effect. (Noise reduction: 30 dB)

* When ordering this option incorporated with a manifold, suffix "-S" to the end of the manifold part number.



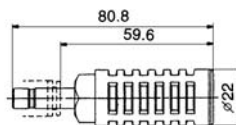
Note) A large quantity of drainage generated in the air source results in exhaust of air together with drainage.

● Refer to back page 5 for maintenance.



Silencer (For EXH port)

This silencer is to be inserted into the EXH port (one-touch fittings).



Dimensions

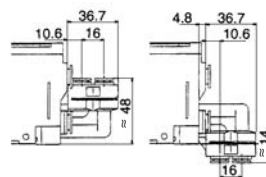
Series	Applicable fitting size ϕd	Model	A	L	D	Effective area (mm ²) (Cv factor)	Noise reduction (dB)
VQ2000	10	AN200-KM10	59.6	80.8	22	26 (1.4)	30

Elbow fitting assembly

VVQ2000-F-L (C4/C6/C8/N3/N7/N9)

It is used for piping that extends upward or downward from the manifold.

When installing it only in some manifold stations, specify the elbow fitting assembly part number and the mounting position by means of the manifold specification sheet.



Dual flow fitting assembly

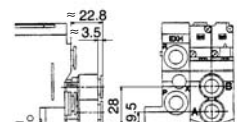
VVQ2000-52A-C10 N11

This is a fitting to multiply the flow rate by combining the outputs of 2-valve stations. It is used for driving a large bore cylinder. This is a one-touch fitting for a port size of $\phi 10$ or $\phi 3/8$ ".



* The port size of the manifold part number is "CM".

Clearly indicate the dual flow fitting assembly part number and specify the mounting position by means of the manifold specifications.



Double check block (Separated) for VQC2000

VQ2000-FPG-□□-□

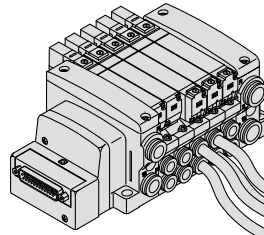
It is mounted on the outlet side piping to keep the cylinder in the intermediate position for long periods of time. Combining with a 3-position exhaust center solenoid valve will enable the cylinder to stop in the middle or maintain its position for a long time. Combining with a 2-position single/double solenoid valve will prevent a cylinder from dropping at the stroke end when the residual pressure of SUP is released.

Specifications

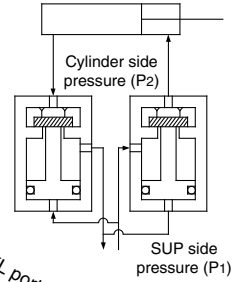
Max. operating pressure	0.8 MPa
Min. operating pressure	0.15 MPa
Ambient and fluid temp.	-5 to 50°C
Flow characteristics: C	3.0 dm ³ /(s·bar)
Max. operating frequency	180 c.p.m



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

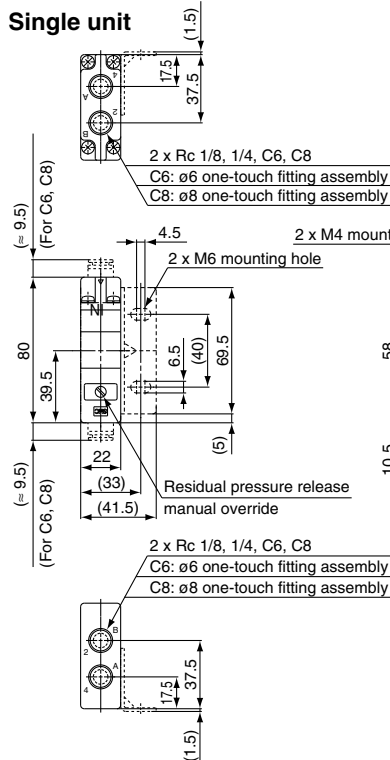


<Circuit diagram>

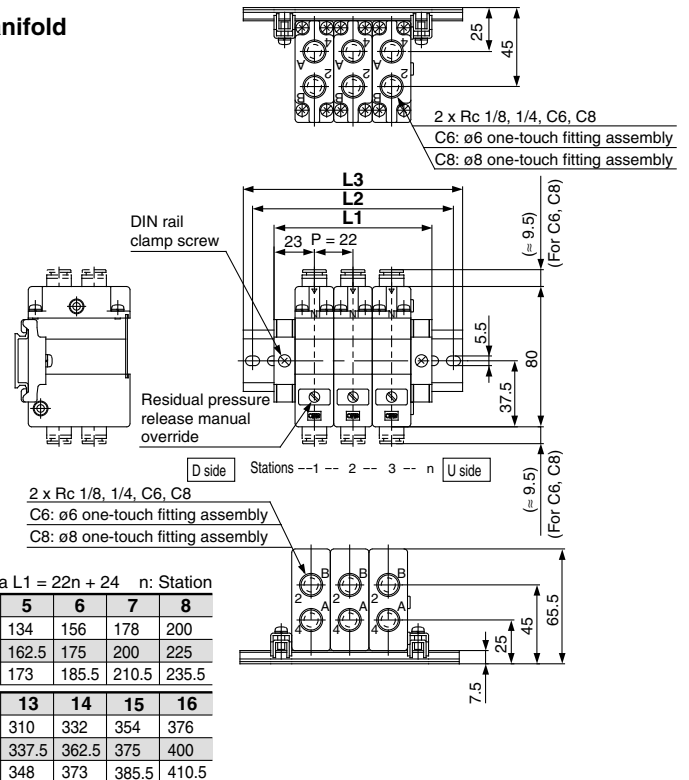


Dimensions

Single unit



Manifold



Dimensions

Formula L1 = 22n + 24 n: Station

n	1	2	3	4	5	6	7	8
L1	46	68	90	112	134	156	178	200
L2	75	87.5	112.5	137.5	162.5	175	200	225
L3	85.5	98	123	148	173	185.5	210.5	235.5

n	9	10	11	12	13	14	15	16
L1	222	244	266	288	310	332	354	376
L2	250	262.5	287.5	312.5	337.5	362.5	375	400
L3	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	ø6 one-touch fitting
C8	ø8 one-touch fitting
N7	ø1/4" one-touch fitting
N9	ø5/16" one-touch fitting

OUT side port size

01	Rc 1/8
02	Rc 1/4
C6	ø6 one-touch fitting
C8	ø8 one-touch fitting
N7	ø1/4" one-touch fitting
N9	ø5/16" one-touch fitting

Option

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

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

Manifold (DIN rail mounting)

VVQ2000-FPG-06

Stations

01	1 station
...	...
16	16 stations

When ordering a double check block, order the DIN rail mounting [-D].

<Ordering example>

VVQ2000-FPG-06--6-station manifold

*VQ2000-FPG-
C6C6-D, 3set
*VQ2000-FPG-
C8C8-D, 3set

Double
check block

Bracket Assembly

Part no.	Tightening torque
VQ2000-FPG-FB	0.8 to 1.0 N·m

Caution

- Air leakage from the pipe between the valve and cylinder or from the fittings will prevent the cylinder from stopping for long periods of 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 is recommended when stopping the cylinder in the middle for long periods of time.
- Combining double check block with 3-position closed center or pressure center solenoid valve will not work.
- When fittings, etc. are being screwed to the double check block, tighten them with the torque below.

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

- If the exhaust of the double check block is restricted 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.



Safety Instructions

These safety instructions are intended to prevent hazardous situations and/or equipment damage. These instructions indicate the level of potential hazard with the labels of “**Caution**,” “**Warning**” or “**Danger**.” They are all important notes for safety and must be followed in addition to International Standards (ISO/IEC), Japan Industrial Standards (JIS)*1) and other safety regulations*2).

*1) ISO 4414: Pneumatic fluid power – General rules relating to systems.

ISO 4413: Hydraulic fluid power – General rules relating to systems.

IEC 60204-1: Safety of machinery – Electrical equipment of machines. (Part 1: General requirements)

ISO 10218-1992: Manipulating industrial robots - Safety.

JIS B 8370: General rules for pneumatic equipment.

JIS B 8361: General rules for hydraulic equipment.

JIS B 9960-1: Safety of machinery – Electrical equipment of machines. (Part 1: General requirements)

JIS B 8433-1993: Manipulating industrial robots – Safety.

etc.

*2) Labor Safety and Sanitation Law, etc.



Caution: **Caution** indicates a hazard with a low level of risk which, if not avoided, could result in minor or moderate injury.



Warning: **Warning** indicates a hazard with a medium level of risk which, if not avoided, could result in death or serious injury.



Danger: **Danger** indicates a hazard with a high level of risk which, if not avoided, will result in death or serious injury.

Warning

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

Since the product specified here is used under various operating conditions, its compatibility with specific equipment must be decided by the person who designs the equipment or decides its specifications based on necessary analysis and test results. The expected performance and safety assurance of the equipment will be the responsibility of the person who has determined its compatibility with the product. This person should also continuously review all specifications of the product referring to its latest catalog information, with a view to giving due consideration to any possibility of equipment failure when configuring the equipment.

2. Only personnel with appropriate training should operate machinery and equipment.

The product specified here may become unsafe if handled incorrectly. The assembly, operation and maintenance of machines or equipment including our products must be performed by an operator who is appropriately trained and experienced.

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

1. The inspection and maintenance of machinery/equipment should only be performed after measures to prevent falling or runaway of the driven objects have been confirmed.

2. When the product is to be removed, confirm that the safety measures as mentioned above are implemented and the power from any appropriate source is cut, and read and understand the specific product precautions of all relevant products carefully.

3. Before machinery/equipment is restarted, take measures to prevent unexpected operation and malfunction.

4. Contact SMC beforehand and take special consideration of safety measures if the product is to be used in any of the following conditions.

1. Conditions and environments outside of the given specifications, or use outdoors or in a place exposed to direct sunlight.

2. Installation on equipment in conjunction with atomic energy, railways, air navigation, space, shipping, vehicles, military, medical treatment, combustion and recreation, or equipment in contact with food and beverages, emergency stop circuits, clutch and brake circuits in press applications, safety equipment or other applications unsuitable for the standard specifications described in the product catalog.

3. An application which could have negative effects on people, property, or animals requiring special safety analysis.

4. Use in an interlock circuit, which requires the provision of double interlock for possible failure by using a mechanical protective function, and periodical checks to confirm proper operation.



Safety Instructions

⚠ Caution

1. The product is provided for use in manufacturing industries.

The product herein described is basically provided for peaceful use in manufacturing industries.

If considering using the product in other industries, consult SMC beforehand and exchange specifications or a contract if necessary.

If anything is unclear, contact your nearest sales branch.

Limited warranty and Disclaimer/Compliance Requirements

The product used is subject to the following “Limited warranty and Disclaimer” and “Compliance Requirements”.

Read and accept them before using the product.

Limited warranty and Disclaimer

1. The warranty period of the product is 1 year in service or 1.5 years after the product is delivered.*3)

Also, the product may have specified durability, running distance or replacement parts. Please consult your nearest sales branch.

2. For any failure or damage reported within the warranty period which is clearly our responsibility, a replacement product or necessary parts will be provided.

This limited warranty applies only to our product independently, and not to any other damage incurred due to the failure of the product.

3. Prior to using SMC products, please read and understand the warranty terms and disclaimers noted in the specified catalog for the particular products.

*3) Vacuum pads are excluded from this 1 year warranty.

A vacuum pad is a consumable part, so it is warranted for a year after it is delivered.

Also, even within the warranty period, the wear of a product due to the use of the vacuum pad or failure due to the deterioration of rubber material are not covered by the limited warranty.

Compliance Requirements

When the product is exported, strictly follow the laws required by the Ministry of Economy, Trade and Industry (Foreign Exchange and Foreign Trade Control Law).

S kit

F kit

P kit

T kit

L kit

M kit

Construction

Exploded View of Manifold

Manifold Optional Parts

Safety Instructions

Specific Product Precautions



Series VQC1000/2000

Specific Product Precautions 1

Be sure to read before handling.

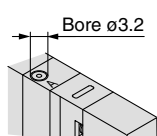
Refer to back pages 1 and 2 for Safety Instructions and Handling Precautions for SMC Products (M-E03-3) for 3/4/5 Port Solenoid Valves Precautions.

Manual Override

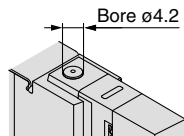
⚠ Warning

Connected actuator is started by manual operation. Use the manual override after confirming that there is no danger. Push type is standard. (Tool required) Locking type is semi-standard. (Tool required)

Non-locking push type (Tool required)



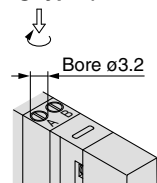
VQC1000



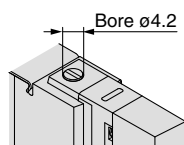
VQC2000

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

Locking type (Tool required) <Semi-standard>



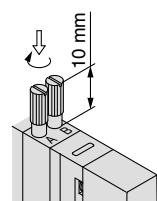
VQC1000



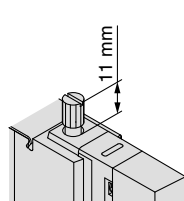
VQC2000

Push down on the manual override with a small flat head screwdriver until it stops. Turn it clockwise by 90° to lock it. Turn it counterclockwise to release it.

Locking type (Manual) <Semi-standard>



VQC1000



VQC2000

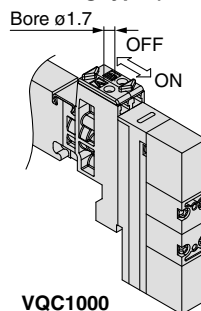
Push down on the manual override with a small screwdriver or with your fingers until it stops. Turn it clockwise by 90° to lock it. Turn it counterclockwise to release it.

⚠ Caution

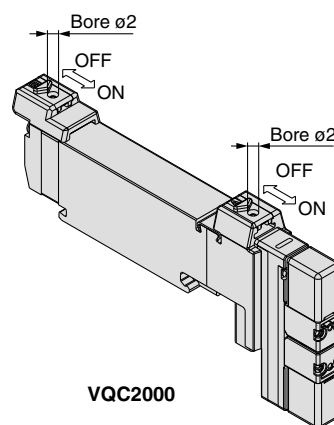
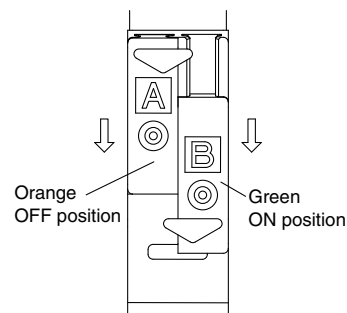
Do not apply excessive torque when turning the locking type manual override. (0.1 N·m or less)

⚠ Warning

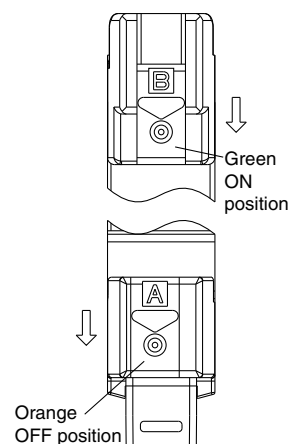
Slide locking type (Manual) <Semi-standard>



VQC1000



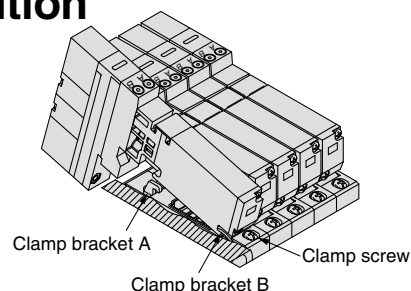
VQC2000



The manual override is locked by sliding it all the way to the pilot valve side (ON side) with a small flat head screwdriver or with your fingers. Slide it to the fitting side (OFF side) to release it. In addition, it can also be used as a push type by using a screwdriver, etc., of ø1.7 or less. (ø2 or less for VQC2000)

How to Mount/Remove Solenoid Valves

⚠ Caution



Removing

1. Loosen the clamp screw until it turns freely. (The screw is captive.)
2. Lift the coil side of the valve body while pressing down slightly on the screw head and remove it from the clamp bracket B. When the screw head cannot be pressed easily, gently press the area near the manual override of the valve.

Mounting

1. Press down on the clamp screw. Clamp bracket A opens. Diagonally insert the hook on the valve end plate side into clamp B.
2. Press the valve body downward. (When the screw is released, it will be locked by clamp bracket A.)
3. Tighten the clamp screw. (Proper tightening torque: VQC1000, 0.25 to 0.35 N·m; VQC2000, 0.5 to 0.7 N·m)

⚠ Caution

Dust on the sealing surface of the gasket or solenoid valve can cause air leakage.



Series VQC1000/2000

Specific Product Precautions 2

Be sure to read before handling.

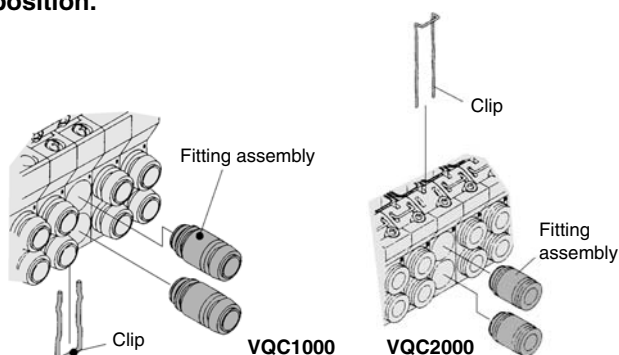
Refer to back pages 1 and 2 for Safety Instructions and Handling Precautions for SMC Products (M-E03-3) for 3/4/5 Port Solenoid Valves Precautions.

Cylinder Port Fittings Replacement

⚠ Caution

One-touch fittings on the cylinder port are a cassette for easy replacement. The fittings are blocked by a clip. After removing the corresponding valve and take out the clip with a flat head screwdriver, etc., then replace the fittings.

For mounting, insert the fitting until it strikes against the inside wall and then insert the clip to the specified position.



Applicable tubing O.D.	Fitting assembly part no.	
	VQC1000	VQC2000
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
M5	VVQ1000-50A-M5	—
Applicable tubing ø1/8"	VVQ1000-50A-N1	—
Applicable tubing ø5/32"	VVQ1000-50A-N3	VVQ1000-51A-N3
Applicable tubing ø1/4"	VVQ1000-50A-N7	VVQ1000-51A-N7
Applicable tubing ø5/16"	—	VVQ1000-51A-N9

* Refer to "Manifold Optional Parts" on pages 42 and 45 for other types of fittings.

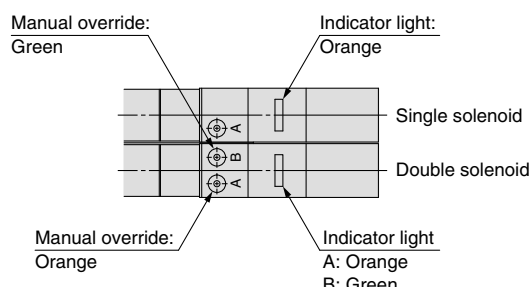
⚠ Caution

- 1) Use caution that O-rings must be free from scratches and dust. Otherwise, air leakage may result.
- 2) After screwing in the fittings, mount the M5 fitting assembly on the manifold base. (Tightening torque: 0.8 to 1.2 N·m)
- 3) Purchasing order is available in units of 10 pieces.

Light/Surge Voltage Suppressor

⚠ Caution

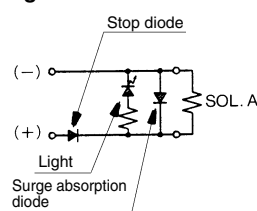
The lighting positions are concentrated on one side for both single solenoid type and double solenoid type. In the double solenoid type, A side and B side energization are indicated by two colors which match the colors of the manual overrides.



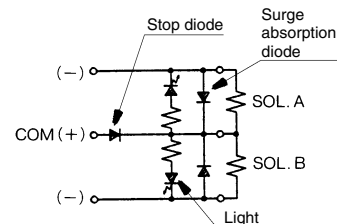
(Drawing shows a VQC1000 case.)

DC circuit diagram

Single solenoid



Double solenoid



Note) A-side energization:

A light (Orange) illuminates.

B-side energization:

B light (Green) illuminates.

With wrong wiring prevention (stop diode) mechanism

With a surge absorption (surge absorption diode) mechanism



Series VQC1000/2000

Specific Product Precautions 3

Be sure to read before handling.

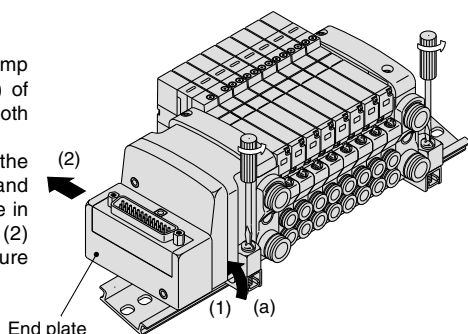
Refer to back pages 1 and 2 for Safety Instructions and Handling Precautions for SMC Products (M-E03-3) for 3/4/5 Port Solenoid Valves Precautions.

How to Mount/Remove DIN Rail

⚠ Caution

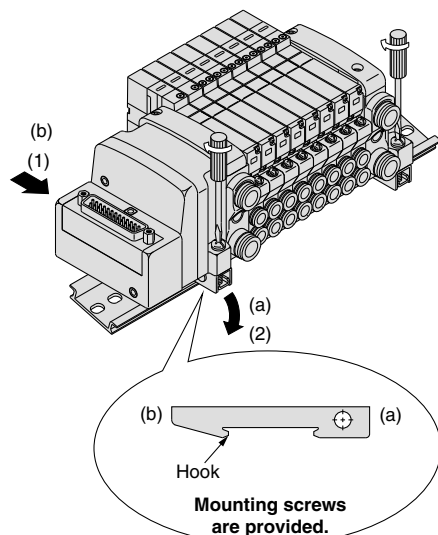
Removing

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.



IP67 Enclosure

⚠ Caution

Wiring connection for models conforming to IP67 should also have enclosures equivalent to or of stricter than IP67.

Built-in Silencer Element

⚠ Caution

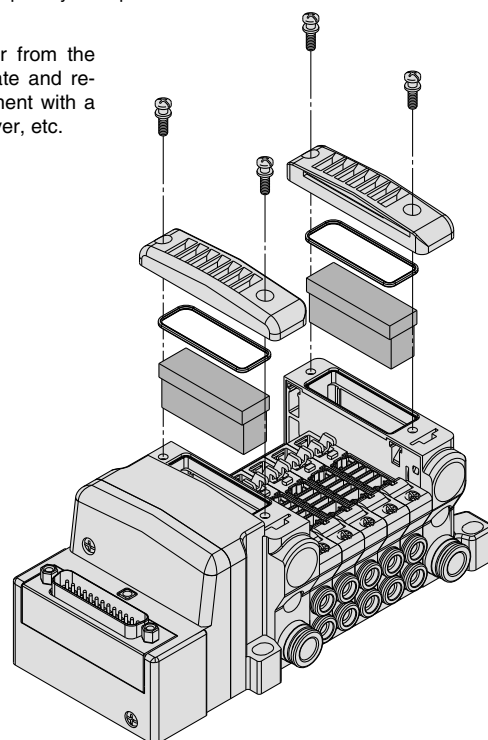
A filter element is incorporated in the end plate on both sides of the manifold base. A dirty and choked element may reduce cylinder speed or cause malfunction. Clean or replace the dirty element.

Element Part No.

Type	Element part no.	
	VQC1000	VQC2000
Direct EXH outlet with built-in silencer	VVQ1000-82A-1	VVQ2000-82A-1

The minimum order quantity is 10 pcs.

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



How to Calculate Flow Rate

Refer to Best Pneumatics No. ① for obtaining the flow rate.



Series VQC1000/2000

Specific Product Precautions 4

Be sure to read before handling.

Refer to back pages 1 and 2 for Safety Instructions and Handling Precautions for SMC Products (M-E03-3) for 3/4/5 Port Solenoid Valves Precautions.

EX500/EX250/EX126 Precautions

⚠ Warning

1. These products are intended for use in general factory automation equipment.
Avoid using these products in machinery/equipment which affects human safety, and in cases where malfunction or failure can result in extensive damage.
2. Do not use in explosive environments, in the presence of inflammable gases, or in corrosive environments. This can cause injury or fire.
3. Work such as transporting, installing, piping, wiring, operation, control and maintenance should be performed by knowledgeable and qualified personnel only. As handling involves the risk of a danger of electrocution, injury or fire.
4. Install an external emergency stop circuit that can promptly stop operation and shut off the power supply.
5. Do not modify these products. Modifications done to these products carry the risk of injury and damage.

⚠ Caution

1. Read the instruction manual carefully, strictly observe the precautions and operate within the range of the specifications.
2. Do not drop these products or submit them to strong impacts. This can cause damage, failure or malfunction.
3. In locations with poor electrical conditions, take steps to ensure a steady flow of the rated power supply. Use of a voltage outside of the specifications can cause malfunction, damage to the unit, electrocution or fire.
4. Do not touch connector terminals or internal circuit elements when current is being supplied. There is a danger of malfunction, damage to the unit or electrocution if connector terminals or internal circuit elements are touched when current is being supplied.
Be sure that the power supply is OFF when adding or removing manifold valves or input blocks or when connecting or disconnecting connectors.
5. Operate at an ambient temperature that is within the specifications. Even when the ambient temperature range is within the specifications, do not use in locations where there are rapid temperature changes.
6. Keep wire scraps and other extraneous materials from getting inside these products. This can cause fire, failure or malfunction.
7. Give consideration to the operating environment depending on the type of enclosure being used.
To achieve IP65 and IP67 protection class, provide appropriate wiring between all units using electrical wiring cables, communication connectors and cables with M12 connectors. Also, provide waterproof caps when there are unused ports, and perform proper mounting of input units, input blocks, SI units and manifold valves. Provide a cover or other protection for applications in which there is constant exposure to water.
8. Use the proper tightening torques.
There is a possibility of damaging threads if tightening exceeds the tightening torque range.
9. Provide adequate protection when operating in locations such as follows:
 - Where noise is generated by static electricity
 - Where there is a strong electric field
 - Where there is a danger of exposure to radiation
 - When in close proximity to power supply lines

⚠ Caution

10. When these products are installed in equipment, provide adequate protection against noise by using noise filters.
11. Since these products are components whose end usage is obtained after installation in other equipment, the customer should confirm conformity to EMC directives for the finished product.
12. Do not remove the name plate.
13. Perform periodic inspections and confirm normal operation, otherwise it may be impossible to guarantee safety due to unexpected malfunction or erroneous operation.

Safety Instructions on Power Supply

⚠ Caution

1. Operation is possible with a single power supply or a separate power supply. However, be sure to provide two wiring systems (one for solenoid valves, and one for input and control units).
2. Use the UL-certified products below for combined direct current power supply.
 - (1) Circuit in which voltage and current are controlled in accordance with UL508
Circuit which makes the winding wire in the secondary side of the insulation transformer (which meets the following conditions) to be as the power supply
 - Maximum voltage (with no load):
30 Vrms (42.4 V at peak) or less
 - Maximum current:
 1. 8 A or less (including short-circuited)
 2. and in case of being controlled by circuit protection devices (fuse, etc) which meets the below rated voltages.

Voltage with no load (V peak)	Maximum rated current
0 to 20 (V)	5.0
Exceeding 20 (V) up to 30 (V)	100
Voltage figure at peak	

- (2) Class 2 power supply unit in accordance with UL1310 or circuit (Class 2 circuit) in accordance with UL1585, that is powered by Class 2 transformer with the maximum of 30 Vrms (42.4 V at peak)

Safety Instructions on Cable

⚠ Caution

1. Avoid miswiring, as this can cause malfunction, damage and fire in the unit.
2. To prevent noise and surge in signal lines, keep all wiring separate from power lines and high-voltage lines. Otherwise, this can cause malfunction.
3. Check wiring insulation, as defective insulation can cause damage to the unit when excessive voltage or current is applied.
4. Do not bend or pull cables repeatedly, and do not place heavy objects on them or allow them to be pinched. This can cause broken lines.



Series VQC1000/2000

Specific Product Precautions 5

Be sure to read before handling.

Refer to back pages 1 and 2 for Safety Instructions and Handling Precautions for SMC Products (M-E03-3) for 3/4/5 Port Solenoid Valves Precautions.

EX600 Precautions

Design/Selection

⚠ Warning

1. **Use this product within the specification range.**
Using beyond the specified specifications range can cause fire, malfunction, or damage to the system.
Confirm the specifications when operating.
2. **When using for an interlock circuit:**
 - Provide a multiple interlock system which is operated by another system (such as mechanical protection function).
 - Perform an inspection to check that it is working properly.

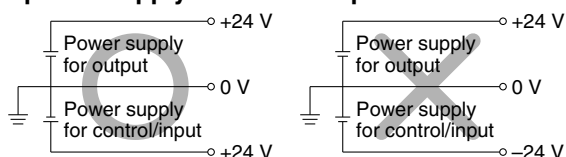
This may cause possible injury due to malfunction.

⚠ Caution

1. **Use the UL-certified products below for combined direct current power supply.**
 - (1) Circuit in which voltage and current are controlled in accordance with UL508
Circuit which makes the winding wire in the secondary side of the insulation transformer (which meets the following conditions) to be as the power supply
 - Maximum voltage (with no load):
30 Vrms (42.4 V at peak) or less
 - Maximum current:
 1. 8 A or less (including short-circuited)
 2. and in case of being controlled by circuit protection devices (fuse, etc) which meets the below rated voltages.

Voltage with no load (V peak)	Maximum rated current
0 to 20 (V)	5.0
Exceeding 20 (V) up to 30 (V)	100
Voltage figure at peak	

- (2) Class 2 power supply unit in accordance with UL1310 or circuit (Class 2 circuit) in accordance with UL1585, that is powered by Class 2 transformer with the maximum of 30 Vrms (42.4 V at peak)
2. **Use this product within the specified voltage range.**
Using beyond the specified voltage range is likely to cause the units and connecting devices to be damaged or to malfunction.
 3. **The power supply for the unit should be 0 V as the standard for both power supply for output as well as power supply for control/input.**



4. **Do not install a unit in a place where it can be used as a foothold.**
Applying any excessive load such as stepping on the unit by mistake or placing a foot on it, will cause it to break.
5. **Keep the surrounding space free for maintenance.**
When designing a system, take into consideration the amount of free space needed for performing maintenance.
6. **Do not remove the name plate.**
Improper maintenance or incorrect use of instruction manual can cause failure and malfunction. Also, there is a risk of losing conformity with safety standards.
7. **Beware of inrush current when the power supply is turned on.**
Some connected loads can apply an initial charge current which will trigger the over current protection function, causing the unit to malfunction.

Back page 7

Mounting

⚠ Caution

1. **When handling and assembling units:**
 - Do not touch the sharp metal parts of the connector or plug.
 - Do not apply excessive force to the unit.
The connecting portions of the unit are firmly joined with seals.
 - When joining units, take care not to get fingers caught between units.
Injury can result.
2. **Do not drop, bump, or apply excessive impact.**
Otherwise, the unit can become damaged, malfunction, or fail to function.
3. **Observe the tightening torque range.**
Tightening outside of the allowable torque range will likely damage the product.
IP67 protection class cannot be guaranteed if the screws are not tightened to the specified torque.
4. **When lifting a large size manifold solenoid valve unit, take care to avoid causing stress to the valve connection joint.**
The connection parts of the unit may be damaged.
Because the unit may be heavy, carrying and installation should be performed by more than one operator to avoid strain or injury.
5. **When placing a manifold, mount it on a flat surface.**
Torsion in the whole manifold can lead to trouble such as air leakage or defective insulation.

Wiring

⚠ Caution

1. **Confirm grounding to maintain the safety of the reduced wiring system and for anti-noise performance.**
Provide a specific grounding as close to the unit as possible to minimize the distance to grounding.
2. **Avoid repeatedly bending or stretching the cable and applying a heavy object or force to it.**
Wiring applying repeated bending and tensile stress to the cable can break the circuit.
3. **Avoid miswiring.**
If miswired, there is a danger of malfunction or damage to the reduced wiring system.
4. **Do not wire while energizing the product.**
There is a danger of malfunction or damage to the reduced wiring system or input/output equipment.



Series VQC1000/2000

Specific Product Precautions 6

Be sure to read before handling.

Refer to back pages 1 and 2 for Safety Instructions and Handling Precautions for SMC Products (M-E03-3) for 3/4/5 Port Solenoid Valves Precautions.

EX600 Precautions

Wiring

Caution

5. Avoid wiring the power line and high-pressure line in parallel.

Noise or surge produced by signal line resulting from the power line or high pressure line could cause malfunction. Wiring of the reduced wiring system or input/output device and the power line or high-pressure line should be separated from each other.

6. Confirm the wiring insulation.

Defective insulation (contact with other circuits, improper insulation between terminals, etc.) may cause damage to the reduced wiring system or input/output device due to excessive voltage or current.

7. When a reduced wiring system is installed in machinery/equipment, provide adequate protection against noise by using noise filters, etc.

Noise in signal lines may cause malfunction.

8. When connecting wires of input/output device or handheld terminal, prevent water, solvent or oil from entering inside from the connector section.

This can cause damage, equipment failure, or malfunction.

9. Avoid wiring patterns in which excessive stress is applied to the connector.

This may cause malfunction or damage to the unit due to contact failure.

Operating Environment

Warning

1. Do not use in an atmosphere containing an inflammable gas or explosive gas.

Use in such an atmosphere is likely to cause a fire or explosion. This system is not explosion-proof.

Caution

1. Select the proper type of enclosure according to the environment of operation.

IP65/67 protection class is achieved when the following conditions are met.

- 1) The units are connected properly with wiring cable for power supply, communication connector, and cable with M12 connector.

- 2) Suitable mounting of each unit and manifold valve.

- 3) Be sure to mount a seal cap on any unused connectors.

If using in an environment that is exposed to water splashes, please take measures such as using a cover.

Also, the Handheld Terminal confirms to IP20, so prevent foreign matter from entering inside, and water, solvent or oil from coming in direct contact with it.

Operating Environment

Caution

2. Provide adequate protection when operating in locations such as the following.

Failure to do so may cause damage or malfunction.

The effect of countermeasures should be checked in individual equipment and machine.

- 1) Where noise is generated by static electricity, etc.
- 2) Where there is a strong electric field
- 3) Where there is a danger of exposure to radiation
- 4) When in close proximity to power supply lines

3. Do not use in an environment where oil and chemicals are used.

Operating in environments with coolants, cleaning solvents, various oils or chemicals may cause adverse effects (damage, malfunction) to the unit even in a short period of time.

4. Do not use in an environment where the product could be exposed to corrosive gas or liquid.

This may damage the unit and cause it to malfunction.

5. Do not use in locations with sources of surge generation.

Installation of the unit in an area around the equipment (electromagnetic lifters, high frequency induction furnaces, welding machine, motors etc.), which generates the large surge voltage could cause to deteriorate an internal circuitry element of the unit or result in damage. Implement countermeasures against the surge from the generating source, and avoid touching the lines with each other.

6. Use the product type that has an integrated surge absorption element when directly driving a load which generates surge voltage by relay, solenoid valves or lamp.

When a surge generating load is directly driven, the unit may be damaged.

7. The product is CE marked, but not immune to lightning strikes. Take measures against lightning strikes in your system.

8. Keep dust, wire scraps and other extraneous material from getting inside the product.

This may cause malfunction or damage.

9. Mount the unit in such locations, where no vibration or shock is affected.

This may cause malfunction or damage.

10. Do not use in places where there are cyclic temperature changes.

In case that the cyclic temperature is beyond normal temperature changes, the internal unit is likely to be adversely effected.

11. Do not use in direct sunlight.

Do not use in direct sunlight. It may cause malfunction or damage.

12. Use this product within the specified ambient temperature range.

This may cause malfunction.

13. Do not use in places where there is radiated heat around it.

Such a place is likely to cause malfunction.

S kit

F kit

P kit

T kit

L kit

M kit

Construction

Exploded View of Manifold

Manifold Optional Parts

Safety Instructions

Specific Product Precautions



Series VQC1000/2000

Specific Product Precautions 7

Be sure to read before handling.

Refer to back pages 1 and 2 for Safety Instructions and Handling Precautions for SMC Products (M-E03-3) for 3/4/5 Port Solenoid Valves Precautions.

EX600 Precautions

Adjustment/Operation

Warning

1. **Do not perform operation or setting with wet hands.**
There is a risk of electrical shock.

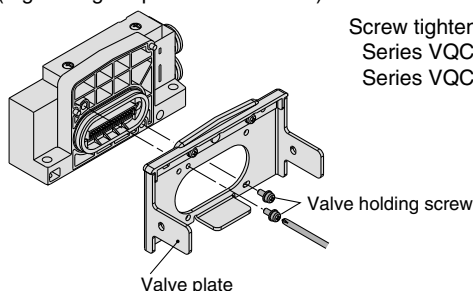
<Handheld Terminal>

2. **Do not apply pressure to the LCD display.**
There is a possibility of the crack of LCD display and injuring.
3. **The forced input/output function is used to change the signal status forcibly. When operating this function, be sure to check the safety of the surroundings and installation.**
Otherwise, injury or equipment damage could result.
4. **Incorrect setting of parameters can cause malfunction. Be sure to check the settings before use.**
This may cause injury or equipment damage.

Caution

1. **Use a watchmaker's screwdriver with thin blade for the setting of each switch of the SI unit.**
When setting the switch, do not touch other unrelated parts.
This may cause parts damage or malfunction due to a short circuit.
 2. **Provide adequate setting for the operating conditions.**
Failure to do so could result in malfunction.
Refer to the instruction manual for setting of the switches.
 3. **For the details of programming and address setting, refer to the manual from the PLC manufacturer.**
The content of programming related to protocol is designed by the manufacturer of the PLC used.
- ##### <Handheld Terminal>
4. **Do not press the setting buttons with a sharp pointed object.**
This may cause damage or malfunction.
 5. **Do not apply excessive load and impact to the setting buttons.**
This may cause damage, equipment failure or malfunction.

When the order does not include the SI unit, the valve plate to connect the manifold and SI unit is not mounted. Use attached valve fixing screws and mount the valve plate.
(Tightening torque: 0.6 to 0.7 N·m)



Screw tightened parts
Series VQC1000: 2 places
Series VQC2000: 3 places

Maintenance

Warning

1. **Do not disassemble, modify (including circuit board replacement) or repair this product.**
Such actions are likely to cause injuries or breakage.
2. **When an inspection is performed,**
 - Turn off the power supply.
 - Stop the air supply, exhaust the residual pressure in piping and verify that the air is released before performing maintenance work.Unexpected malfunction of system components and injury can result.

Caution

1. **When handling and replacing the unit:**
 - Do not touch the sharp metal parts of the connector or plug.
 - Do not apply excessive force to the unit.
The connecting portions of the unit are firmly joined with seals.
 - When joining units, take care not to get fingers caught between units.
Injury can result.
2. **Perform periodic inspection.**
Unexpected malfunction in the system composition devices is likely to occur due to malfunction of machinery or equipment.
3. **After maintenance, make sure to perform an appropriate functionality inspection.**
In cases of abnormality such as faulty operation, stop operation. Unexpected malfunction in the system composition devices is likely to occur.
4. **Do not use benzene and thinner for cleaning units.**
Damage to the surface or erasure of the display can result. Wipe off any stains with a soft cloth. If the stain is persistent, wipe off with a cloth soaked in a dilute solution of neutral detergent and wrung out tightly, and then finish with a dry cloth.

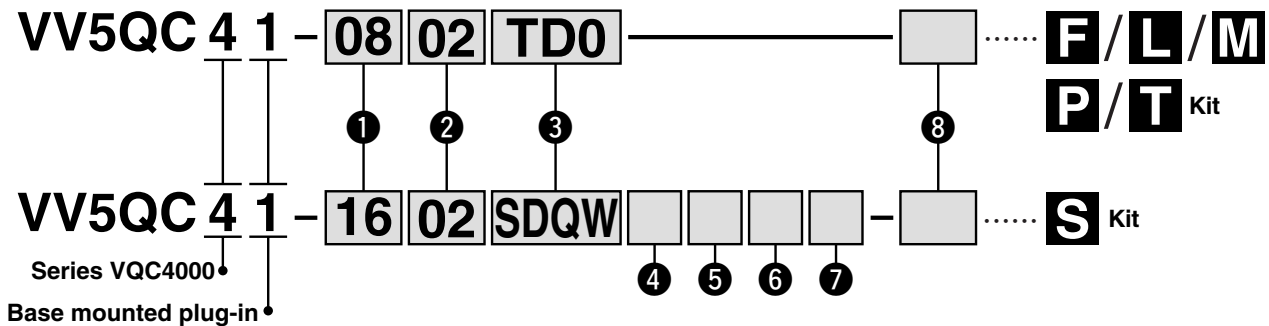
■ Trademark

DeviceNet™ is a trademark of ODVA.

Product names described in this catalog may be used as trademarks by each manufacturer.

Base Mounted Plug-in Unit Series VQC4000

How to Order Manifold



1 Stations

01	1 station
⋮	⋮

The minimum or maximum number of stations differs depending on the electrical entry. (Refer to ③)
 Note) In the case of compatibility with the S kit/AS-Interface, the maximum number of solenoids is as shown below, so please be careful of the number of stations.
 8 in/8 out: Maximum 8 solenoids
 4 in/4 out: Maximum 4 solenoids

2 Cylinder port size

C8	With ø8 One-touch fitting
C10	With ø10 One-touch fitting
C12	With ø12 One-touch fitting
02	Rc 1/4 Note)
03	Rc 3/8 Note)
B	Bottom ported Rc 1/4 Note)
CM	Mixed

Note) Besides Rc, also compatible with G, NPT/NPTF.
 Part number displayed is as shown below.

V5QC41-0803 TD0

Cylinder port	
Thread type	
Nil	Rc
F	G
T	NPT/NPTF

4 SI unit COM

SI unit COM	EX240 integrated type (for I/O) serial transmission system	
	DeviceNet	PROFIBUS DP
Nil	+ COM	○
N	- COM	—

SI unit COM	EX250 integrated type (for I/O) serial transmission system						
	DeviceNet	PROFIBUS DP	CC-Link	AS-Interface	CANopen	ControlNet	EtherNet/IP
Nil	+ COM	—	—	○	—	—	—
N	- COM	○	○	—	○	○	p

SI unit COM	EX500 gateway type serial transmission system			
	DeviceNet	PROFIBUS DP	CC-Link	EtherNet/IP
Nil	+ COM	○	○	○
N	- COM	○	○	○

Note) Leave the box blank for the SI unit COM without SI unit (SDO□).

5 Number of input blocks (Enter only for S kit compliant with EX240 and EX250)

Symbol	No. of blocks	EX240	EX250
Nil	Without SI unit	○	○
0	Without input block	○	○
1	With 1 input block	○	○
⋮	⋮	○	○
4	With 4 input blocks	○	○
⋮	⋮	—	○
8	With 8 input blocks	—	○

7 Input block COM (Enter only for S kit compliant with EX240 and EX250)

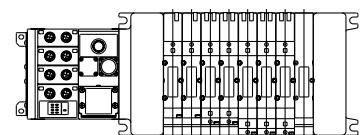
Nil	PNP sensor input (+ COM) or without input block
N	NPN sensor input (- COM)

8 Option

Nil	None
K	Special wiring specifications (except for double wiring)
N	With name plate (available for T kit only)

6 Input block type (Fill out for I/O unit only)

Nil	Without input block
0	M12, 8 inputs (EX240)
1	M12, 2 inputs (EX250)
2	M12, 4 inputs (EX250)
3	M8, 4 inputs (EX250)

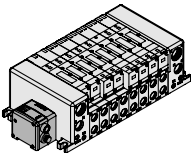
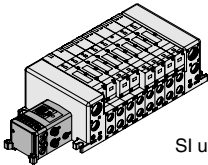
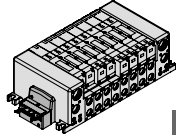
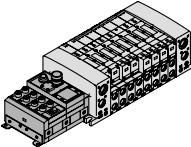
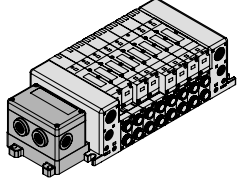
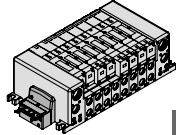
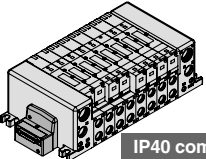
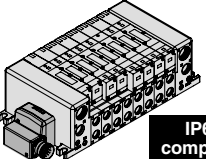
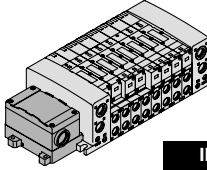


D side Stations...1...2...3...4...5...6...7...8...n U side

* Stations are counted from station 1 on the D side.

3 Kit Designation/Electrical Entry/Cable Length

* Numbers in parentheses represent the maximum number of solenoids in the case of mixed single and double wiring. The total number of solenoids determines the maximum number of stations. When ordering mixed wiring, please add the option symbol "K".

S Kit (Serial transmission kit: EX500 gateway type)		S Kit (Serial transmission kit: EX250 integrated type (for I/O))		P Kit (Flat ribbon cable kit)	
					
SI unit: EX500		SI unit: EX250		IP40 compliant IP67 compliant	
SD0A Serial kit without SI unit SDA2 Device Net, PROFIBUS DP, CC-Link, Ether Net/IP		SD0 Serial kit without SI unit SDQ Serial kit for DeviceNet SDN Serial kit for PROFIBUS-DP SDV Serial kit for CC-LINK SDTA AS-i, 8 in/out, 31 slave modes, 2 power supply systems SDTB AS-i, 4 in/out, 31 slave modes, 2 power supply systems		SDTC (Note 1) AS-i, 8 in/out, 31 slave modes, 1 power supply systems SDTD (Note 1) AS-i, 4 in/out, 31 slave modes, 1 power supply systems SDY For CANopen SDZCN For ControlNet (IP40 compliant) (Note 2) SDZEN For EtherNet/IP	
1 to 8 stations (16 stations)		1 to 12 stations (16 stations) 1 to 4 stations (8 stations) 1 to 2 stations (4 stations)		1 to 4 stations (8 stations) 1 to 2 stations (4 stations) 1 to 12 stations (16 stations)	
S Kit (Serial transmission kit: EX240 integrated type (for I/O))		S Kit (Serial transmission kit: EX126 integrated type (for output))		P Kit (Flat ribbon cable kit)	
					
SI unit: EX240		SI unit: EX126		IP40 compliant	
SD0W Serial kit without SI unit SDQW Serial kit for DeviceNet SDNW Serial kit for PROFIBUS-DP		SDVB Serial kit for CC-LINK		PD0 Flat ribbon cable kit (26P) without cable PD1 Flat ribbon cable kit (26P) with 1.5 m cable PD2 Flat ribbon cable kit (26P) with 3.0 m cable PD3 Flat ribbon cable kit (26P) with 5.0 m cable PDC Flat ribbon cable kit (20P) without cable (1)	
1 to 12 stations (16 stations)		1 to 8 stations (16 stations)		1 to 12 stations (16 stations) 1 to 9 stations (16 stations)	
F Kit (D-sub connector kit)		M Kit (Circular connector kit)		T Kit (Terminal block box kit)	
					
IP40 compliant		IP67 compliant		IP67 compliant	
FD0 D-sub connector kit (25P) without cable FD1 D-sub connector kit (25P) with 1.5 m cable FD2 D-sub connector kit (25P) with 3.0 m cable FD3 D-sub connector kit (25P) with 5.0 m cable		MD0 Circular connector kit (26P) without cable MD1 Circular connector kit (26P) with 1.5 m cable MD2 Circular connector kit (26P) with 3.0 m cable MD3 Circular connector kit (26P) with 5.0 m cable		TD0 Terminal block box kit	
1 to 12 stations (16 stations)		1 to 12 stations (16 stations)		1 to 10 stations (16 stations)	
				LD0 Lead wire kit (25 core) 0.6 m lead wire LD1 Lead wire kit (25 core) 1.5 m lead wire LD2 Lead wire kit (25 core) 3.0 m lead wire	
				1 to 12 stations (16 stations)	

* The maximum number of stations displayed in parentheses is applied to the special wiring specification (Option "K").

Note 1) When selecting SI units with SDTC or SDTD specifications, there are limits to the supply current from the SI unit to the input block or valve. Refer to page 1667 for details.

Note 2) When selecting SI units with SDZCN specifications only, IP40 is compatible. (All other SI units are IP67 compliant.)

EX500 SI Unit Part No. Table

Symbol	Protocol type	Serial unit No.		Page
		NPN output (+ COM)	PNP output (- COM)	
SDA2	Serial kit for DeviceNet	EX500-Q001	EX500-Q101	P. 1688
	Serial kit for PROFIBUS-DP			
	Serial kit for CC-LINK			
	EtherNet/IP			

EX240 SI Unit Part No. Table

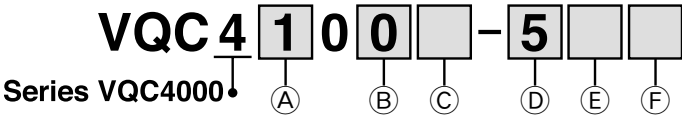
Symbol	Protocol type	Serial unit No.	Page
SDQW	For DeviceNet	EX240-SDN2	P. 1661
SDNW	For PROFIBUS DP	EX240-SPR1	

EX250 SI Unit Part No. Table

Symbol	Protocol type	Serial unit no.	Page
SDQ	Serial kit for DeviceNet	EX250-SDN1	P. 1664
SDN	Serial kit for PROFIBUS-DP	EX250-SPR1	
SDV	Serial kit for CC-LINK	EX250-SMJ2	
SDTA	AS-i, 8 in/out, 31 slave modes, 2 power supply systems	EX250-SAS3	
SDTB	AS-i, 4 in/out, 31 slave modes, 2 power supply systems	EX250-SAS5	
SDTC	AS-i, 8 in/out, 31 slave modes, 1 power supply systems	EX250-SAS7	
SDTD	AS-i, 4 in/out, 31 slave modes, 1 power supply systems	EX250-SAS9	
SDY	CANopen	EX250-SCA1A	
SDZCN	ControlNet	EX250-SCN1	
SDZEN	EtherNet/IP	EX250-SEN1	

Refer to pages 1680 to 1694 for the details of EX500 gateway type serial transmission systems, pages 1664 to 1679 for the details of EX250 integrated-type (for I/O) serial transmission systems and pages 1661 to 1663 for the details of EX240 integrated-type (for I/O) serial transmission systems.

How to Order Valves



A Type of actuation

1	2 position single (A) (B) 4 2 5 1 3 (R1) (P) (R2)	4	3 position exhaust center (A) (B) 4 2 5 1 3 (R1) (P) (R2)
2	2 position double (metal) (A) (B) 4 2 5 1 3 (R1) (P) (R2)	5	3 position pressure center (A) (B) 4 2 5 1 3 (R1) (P) (R2)
	2 position double (rubber) (A) (B) 4 2 5 1 3 (R1) (P) (R2)	6	3 position perfect (A) (B) 4 2 5 1 3 (R1) (P) (R2)
3	3 position closed center (A) (B) 4 2 5 1 3 (R1) (P) (R2)		

B Seal type

0	Metal seal
1	Rubber seal

C Function

Nil	Standard type (1 W)
R	External pilot
Y	Low wattage type (0.5 W)

Note 1) When specifying more than one option, enter symbols in alphabetical order.

Note 2) Please select when you expect to energize the unit for extended periods of time. Refer to page 3 for details.

D Coil voltage

5	24 VDC Note)
6	12 VDC

Note) S kit is only available for 24 VDC.

E Light/Surge voltage suppressor

Nil	With
E	Without light, with surge voltage supressor

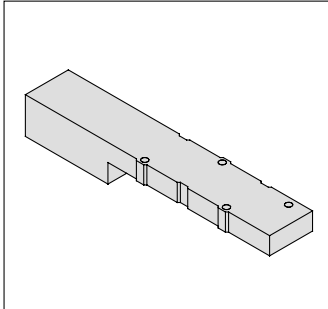
F Manual override

Nil: Non-locking push type (Tool required)

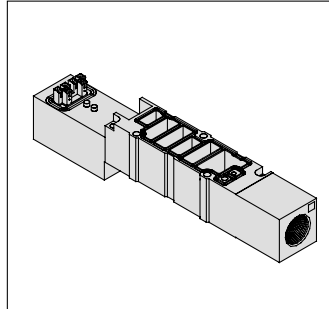
B: Locking type (Tool required)

Manifold Option Refer to pages 790 to 791 for option details.

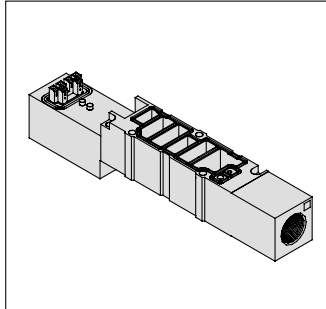
Blanking plate assembly
VVQ4000-10A-1



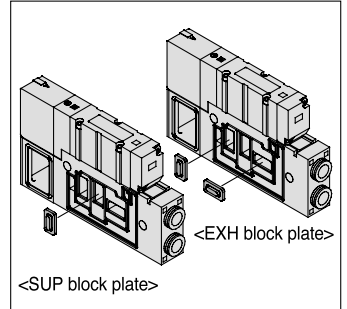
Individual SUP spacer
VVQ4000-P-1-⁰²/₀₃



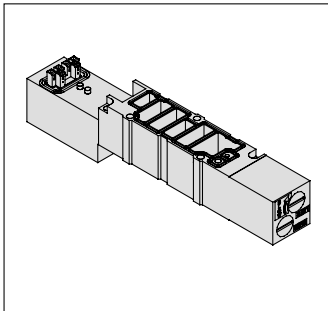
Individual EXH spacer
VVQ4000-R-1-⁰²/₀₃



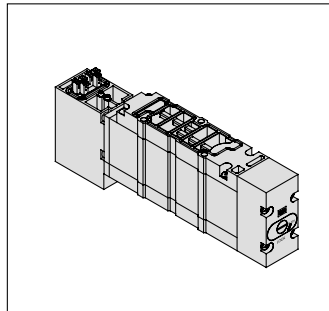
SUP/EXH block plate
VVQ4000-16A



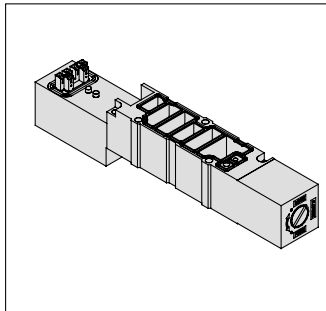
Throttle valve spacer
VVQ4000-20A-1



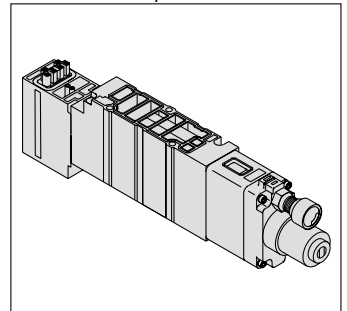
Residual pressure release valve perfect spacer
VVQ4000-25A-1 Note 1)



SUP stop valve spacer
VVQ4000-37A-1



Interface regulator
ARBQ4000-00-^A/_P-1



Note 1) Perfect spacers with residual pressure release valve cannot be combined with external pilot specifications.

SJ
SY
SV
SYJ
SZ
VP4
S0700
VQ
VQ4
VQ5
VQC
VQZ
SQ
VFS
VFR
VQ7

Series VQC

Base Mounted

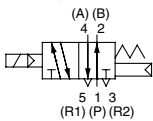
Plug-in Unit

Model

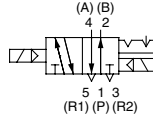


JIS Symbol

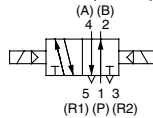
2 position single



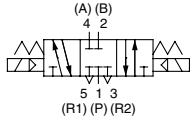
2 position double (metal)



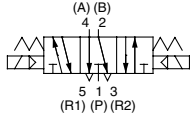
2 position double (rubber)



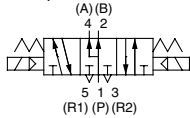
3 position closed center



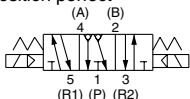
3 position exhaust center



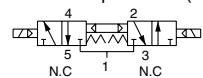
3 position pressure center



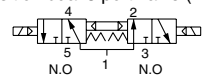
3 position perfect



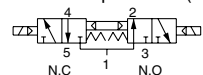
4 position dual 3 port valve (A)



4 position dual 3 port valve (B)



4 position dual 3 port valve (C)



Series	No. of solenoids	Model		Flow characteristics						Note 2) Response time (ms)		Mass (g)	
				1 → 4, 2 (P → A, B)			4, 2 → 5, 3 (A, B → R1, R2)			Standard: 1 W	Low wattage		
				C[dm³/(s·bar)]	b	Cv	C[dm³/(s·bar)]	b	Cv				
VQC1000	2 position	Single	Metal seal	VQC1100	0.70	0.15	0.16	0.72	0.25	0.18	12 or less	15 or less	64
			Rubber seal	VQC1101	0.85	0.20	0.21	1.0	0.30	0.25	15 or less	20 or less	
	2 position	Double	Metal seal	VQC1200	0.70	0.15	0.16	0.72	0.25	0.18	10 or less	13 or less	78
			Rubber seal	VQC1201	0.85	0.20	0.21	1.0	0.30	0.25	15 or less	20 or less	
	3 position	Closed center	Metal seal	VQC1300	0.68	0.15	0.16	0.72	0.25	0.18	20 or less	26 or less	
			Rubber seal	VQC1301	0.70	0.20	0.16	0.65	0.42	0.18	25 or less	33 or less	
		Exhaust center	Metal seal	VQC1400	0.68	0.15	0.16	0.72	0.25	0.18	20 or less	26 or less	
			Rubber seal	VQC1401	0.70	0.20	0.16	1.0	0.30	0.25	25 or less	33 or less	
	3 position	Pressure center	Metal seal	VQC1500	0.70	0.15	0.16	0.72	0.25	0.18	20 or less	26 or less	
			Rubber seal	VQC1501	0.85	0.20	0.21	0.65	0.42	0.18	25 or less	33 or less	
4 position	Dual 3 port valve	Rubber seal	VQC1601	0.70	0.20	0.16	0.70	0.20	0.16	25 or less	33 or less		
VQC2000	2 position	Single	Metal seal	VQC2100	2.0	0.15	0.46	2.6	0.15	0.60	22 or less	29 or less	90
			Rubber seal	VQC2101	2.2	0.28	0.55	3.2	0.30	0.80	24 or less	31 or less	
	2 position	Double	Metal seal	VQC2200	2.0	0.15	0.46	2.6	0.15	0.60	15 or less	20 or less	110
			Rubber seal	VQC2201	2.2	0.28	0.55	3.2	0.30	0.80	20 or less	26 or less	
	3 position	Closed center	Metal seal	VQC2300	2.0	0.15	0.46	2.0	0.18	0.46	29 or less	38 or less	
			Rubber seal	VQC2301	2.0	0.28	0.49	2.2	0.31	0.60	34 or less	44 or less	
		Exhaust center	Metal seal	VQC2400	2.0	0.15	0.46	2.6	0.15	0.60	29 or less	38 or less	
			Rubber seal	VQC2401	2.0	0.28	0.49	3.2	0.30	0.80	34 or less	44 or less	
	3 position	Pressure center	Metal seal	VQC2500	2.4	0.17	0.57	2.0	0.18	0.46	29 or less	38 or less	
			Rubber seal	VQC2501	3.2	0.28	0.80	2.2	0.31	0.60	34 or less	44 or less	
4 position	Dual 3 port valve	Rubber seal	VQC2601	1.8	0.28	0.46	1.8	0.28	0.46	34 or less	44 or less		
VQC4000	2 position	Single	Metal seal	VQC4100	6.2	0.19	1.5	6.9	0.17	1.7	20 or less	22 or less	230
			Rubber seal	VQC4101	7.2	0.43	2.1	7.3	0.38	2.0	25 or less	27 or less	
	2 position	Double	Metal seal	VQC4200	6.2	0.19	1.5	6.9	0.17	1.7	12 or less	12 or less	260
			Rubber seal	VQC4201	7.2	0.43	2.1	7.3	0.38	2.0	15 or less	15 or less	
	3 position	Closed center	Metal seal	VQC4300	5.9	0.23	1.5	6.3	0.18	1.6	45 or less	47 or less	280
			Rubber seal	VQC4301	7.0	0.34	1.9	6.4	0.42	1.9	50 or less	52 or less	
		Exhaust center	Metal seal	VQC4400	6.2	0.18	1.5	6.9	0.17	1.7	45 or less	47 or less	
			Rubber seal	VQC4401	7.0	0.38	1.9	7.3	0.38	2.0	50 or less	52 or less	
		Pressure center	Metal seal	VQC4500	6.2	0.18	1.9	6.4	0.18	1.6	45 or less	47 or less	
			Rubber seal	VQC4501	7.0	0.38	1.9	7.1	0.38	2.0	50 or less	52 or less	
	3 position	Perfect	Metal seal	VQC4600	2.7	—	—	3.7	—	—	55 or less	57 or less	500
			Rubber seal	VQC4601	2.8	—	—	3.9	—	—	62 or less	64 or less	



Note 1) Values represented in this column are in the following conditions:

VQC1000: Cylinder port size C6 without a back pressure check valve

VQC2000: Cylinder port size C8 without a back pressure check valve

VQC4000: Cylinder port size Rc 3/8

Note 2) Values represented in this column are based on JIS B 8375-1981 (operating with clean air and a supply pressure of 0.5 MPa. Equipped with light/surge voltage suppressor. Values vary depending on the pressure as well as the air quality.) Values for double types are when the switch is ON.

Standard Specifications

Valve specifications	Valve Configuration		Metal seal		Rubber seal		
	Fluid		Air/Inert gas				
	VQC1000/2000	Max. operating pressure		0.7 MPa (High pressure type: 1.0 MPa) ^{Note 4)}			
		Min. operating pressure	Single	0.1 MPa		0.15 MPa	
			Double	0.1 MPa			
			3 position	0.1 MPa		0.2 MPa	
			4 position	—		0.15 MPa	
	VQC4000	Max. operating pressure ^{Note 3)}		1.0 MPa (0.7 MPa)			
		Min. operating pressure	Single	0.15 MPa		0.2 MPa	
			Double	0.15 MPa			
			3 position	0.15 MPa		0.2 MPa	
	Proof pressure		1.5 MPa				
	Ambient and fluid temperature		−10 to 50°C ^{Note 1)}				
	Lubrication		Not required				
	Manual override		Push type/Locking type (tool required) option				
	Impact resistance/Vibration resistance		150/30 m/s ² ^{Note 2)}				
	Enclosure		Dust proof (IP67 compliant)				
Electrical specifications	Rated coil voltage		24 VDC				
	Allowable voltage fluctuation		±10% of rated voltage				
	Coil insulation type		Equivalent to B type				
	Power consumption (Current)	24 VDC	1 W DC (42 mA), 0.5 W DC (21 mA)				
		12 VDC	1 W DC (83 mA), 0.5 W DC (42 mA)				



Note 1) Use dry air to prevent condensation at low temperatures.

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

Vibration resistance: No malfunction occurred in a one-sweep test between 45 and 2000Hz. Test was performed in the axial and right angle directions of the main valve and armature for both energized and de-energized states.

Note 3) Values in () are for the low wattage (0.5 W) specification.

Note 4) Metal seal type only.

Manifold Specifications

Series	Base model	Connection type	Piping specifications			Applicable stations Note 2)	Applicable solenoid valves	5 station mass (g)
			Port direction	Port size Note 1)				
				1, 3 (P, R)	2, 4 (A, B)			
VQC1000	VV5QC11-□□□	■ F Kit: D-sub connector ■ P Kit: Flat cable ■ T Kit: Terminal block box ■ S Kit: Serial transmission ■ L Kit: Lead wire ■ M Kit: Circular connector	Side	C8 (For ø8) Options Direct outlet with built-in silencer	C3 (For ø3.2) C4 (For ø4) C6 (For ø6) M5 (M5 threads)	(F, L, M and P kits) 1 to 12 stations T kit 1 to 10 stations	VQC1□00-5 VQC1□01-5	628 (Single) 759 (Double, 3P)
VQC2000	VV5QC21-□□□		Side	C10 (For ø10) Options Direct outlet with built-in silencer Branch type C12 (for ø12)	C4 (For ø4) C6 (For ø6) C8 (For ø8)	S kit 1 to 8 stations: EX500 1 to 12 stations: EX250	VQC2□00-5 VQC2□01-5	1051 (Single) 1144 (Double, 3P)
VQC4000	VV5QC41-□□□		Side	P: Rc 1/2 R: Rc 3/4	C8 (For ø8) C10 (For ø10) C12 (For ø12) Rc 1/4 Rc 3/8	(F, L, M and P kits) 1 to 12 stations T kit 1 to 10 stations S kit 1 to 12 stations: EX240, EX250 1 to 8 stations: EX500	VQC4□00-5 VQC4□01-5	4150 • S kit (without unit) • Solenoid mass is not included.
		Bottom	Rc 1/4					



Note 1) One-touch fittings in inch sizes are also available.

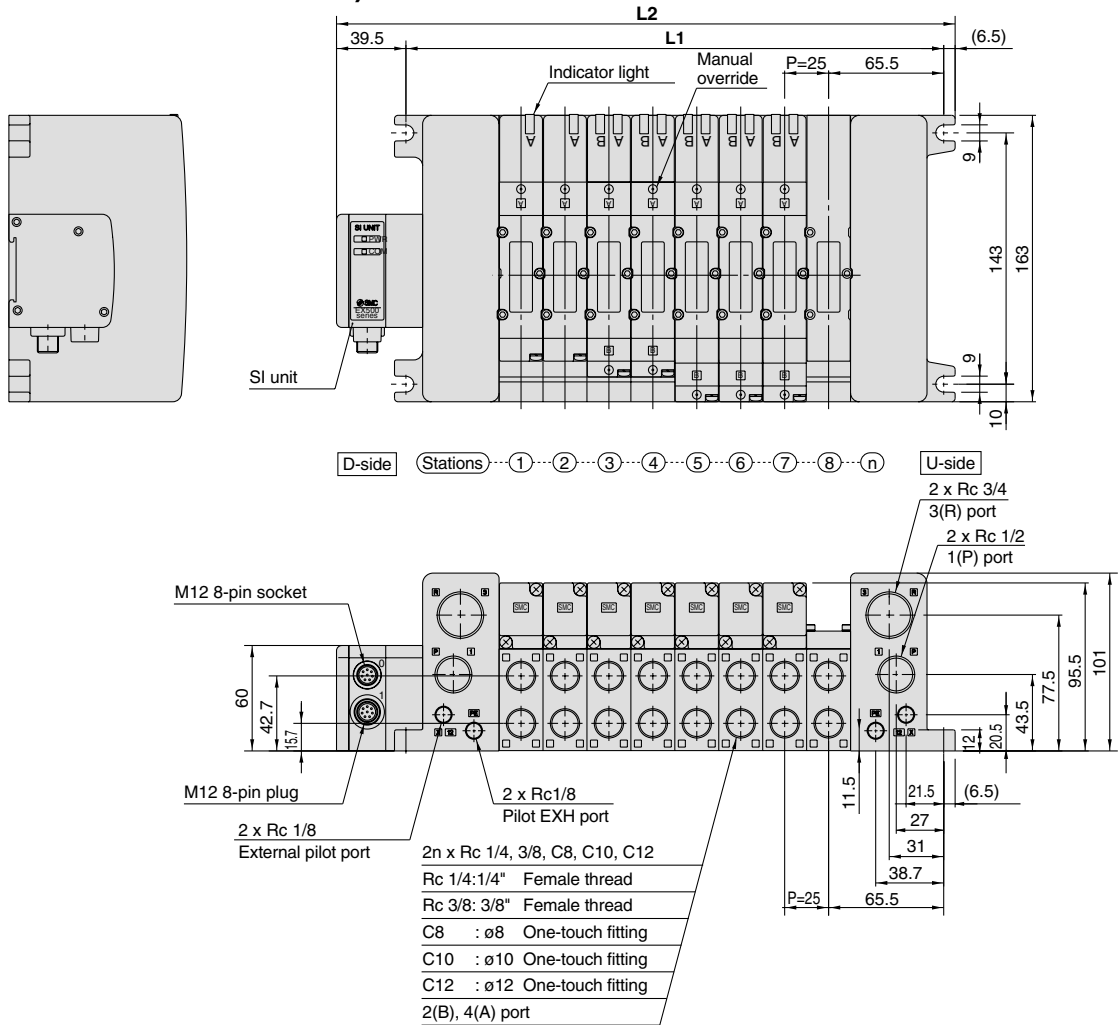
Note 2) An optional specification for special wiring is available to increase the maximum number of stations.

S VQC1000/2000/4000

Kit (Serial Transmission Kit) Compatible with EX500 Gateway Type Serial Transmission System **IP67 compliant**

VV5QC41

S Kit (Serial transmission kit: EX500)



Formulas: $L1 = 25n + 106$, $L2 = 25n + 152$ n: Stations (Maximum 16 stations)

n	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
L1	131	156	181	206	231	256	281	306	331	356	381	406	431	456	481	506
L2	177	202	227	252	277	302	327	352	377	402	427	452	477	502	527	552

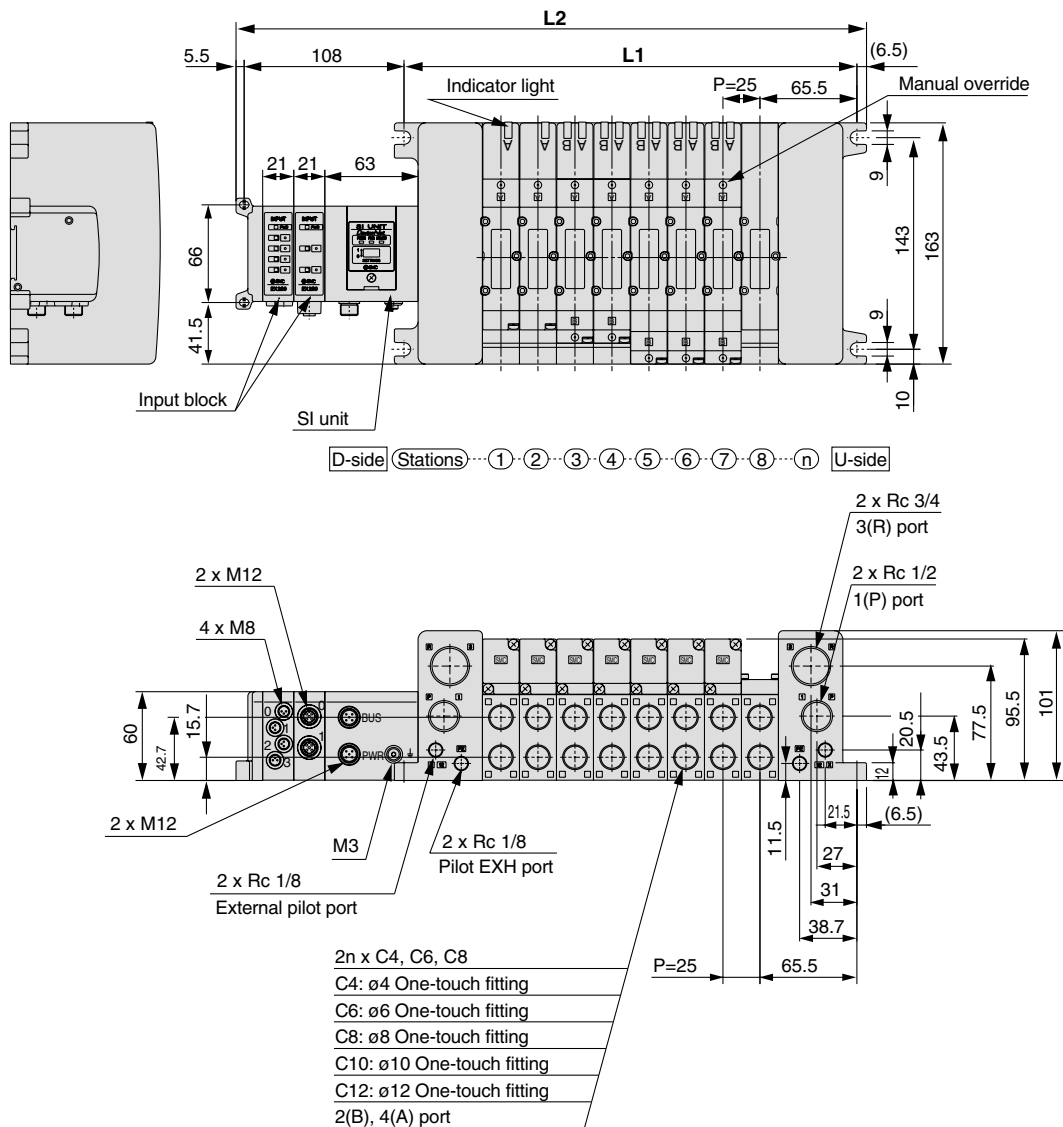
S VQC1000/2000/4000

Kit (Serial Transmission Kit) Compatible with EX250 Integrated Type (for I/O) Serial Transmission System **IP67 compliant**

VV5QC41

S Kit

(Serial transmission kit: EX250)



Formulas: $L1 = 25n + 106$, $L2 = 25n + 205$ (For one input block. Add 21 mm for each additional input block.) n: Stations (Maximum 16 stations)

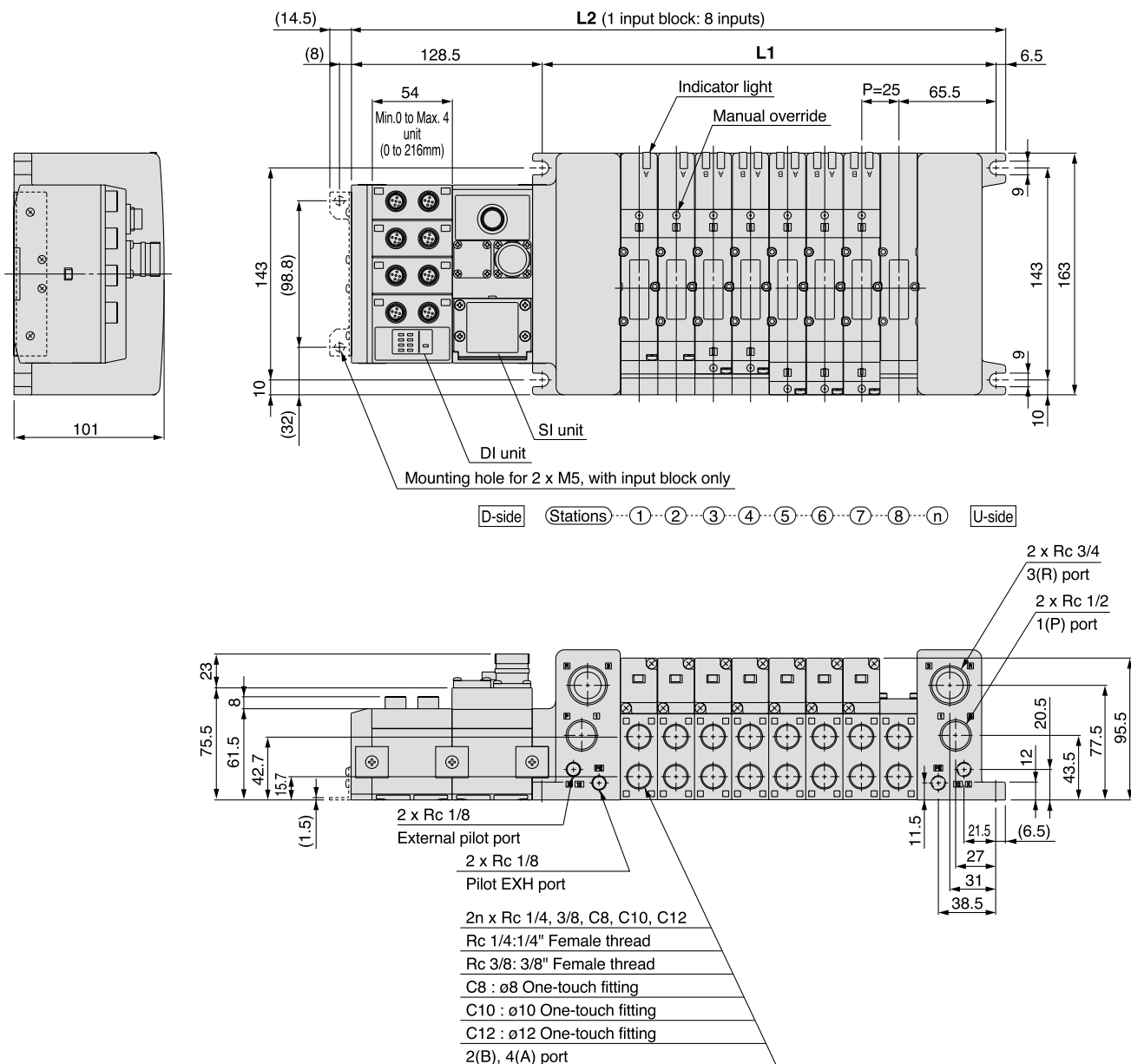
L	n	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
L1		131	156	181	206	231	256	281	306	331	356	381	406	431	456	481	506
L2		230	255	280	305	330	355	380	405	430	455	480	505	530	555	580	605

S VQC4000

Kit (Serial Transmission Kit) Compatible with EX240 Integrated Type (for I/O) Serial Transmission System

VV5QC41

S Kit (Serial transmission kit: EX240)



Formulas: L1 = 25n + 106, L2 = 25n + 241 (For 1 input block. For each additional input block, add 54 mm.) n: Stations (Maximum 16 stations)

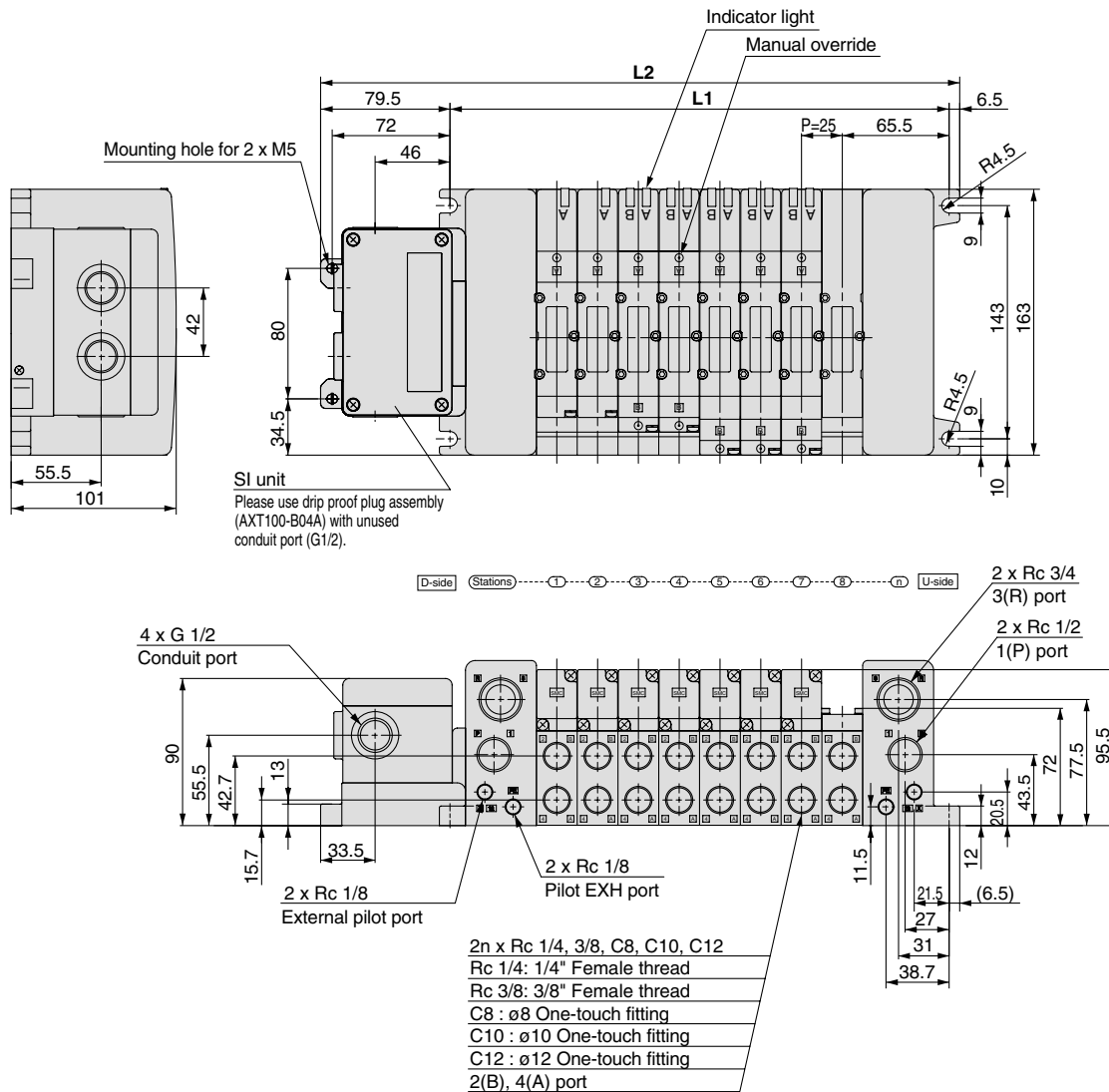
L \ n	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
L1	131	156	181	206	231	256	281	306	331	356	381	406	431	456	481	506
L2	266	291	316	341	366	391	416	441	466	491	516	541	566	591	616	641

S VQC1000/2000/4000

Kit (Serial Transmission Kit) Compatible with EX126 Integrated Type (for Output) Serial Transmission System **IP67 compliant**

VV5QC41

S Kit (Serial transmission kit: EX126)



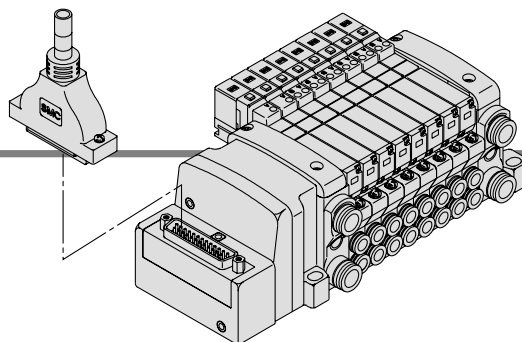
Formulas: L1 = 25n + 106, L2 = 25n + 192 n: Stations (Maximum 16 stations)																
L \ n	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
L1	131	156	181	206	231	256	281	306	331	356	381	406	431	456	481	506
L2	217	242	267	292	317	342	367	392	417	442	467	492	517	542	567	592

SJ
SY
SV
SYJ
SZ
VP4
S0700
VQ
VQ4
VQ5
VQC
VQZ
SQ
VFS
VFR
VQ7

F VQC1000/2000/4000

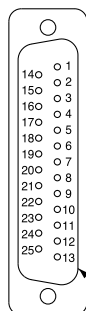
Kit (D-sub connector kit) IP40 compliant

- Using our D-sub connector for electrical connections greatly reduces labor, while it also minimizes wiring and saves space.
- We use a D-sub connector (25P) that conforms to MIL standards and is therefore widely compatible with many standard commercial models.
- Top or side entry for the connector can be changed freely, allowing for changes even after mounting, to meet any changing needs for space.



Electrical Wiring Specifications

D-sub connector



As the standard electrical wiring specification used is for 12 stations or less, double wiring (connected to SOL. A and SOL. B) is used for the internal wiring of each station regardless of valve and option types.

Mixed single and double wiring are available as options.

Refer to special wiring specifications (options) below.

Lead wire colors for D-sub connector assemblies (AXT100-DS25-015, 030, 050)

		Terminal no.	Polarity	Lead wire color	Dot marking	
Station 1	SOL.A	1	(-)	(+)	Black	None
	SOL.B	14	(-)	(+)	Yellow	Black
Station 2	SOL.A	2	(-)	(+)	Brown	None
	SOL.B	15	(-)	(+)	Pink	Black
Station 3	SOL.A	3	(-)	(+)	Red	None
	SOL.B	16	(-)	(+)	Blue	White
Station 4	SOL.A	4	(-)	(+)	Orange	None
	SOL.B	17	(-)	(+)	Purple	None
Station 5	SOL.A	5	(-)	(+)	Yellow	None
	SOL.B	18	(-)	(+)	Gray	None
Station 6	SOL.A	6	(-)	(+)	Pink	None
	SOL.B	19	(-)	(+)	Orange	Black
Station 7	SOL.A	7	(-)	(+)	Blue	None
	SOL.B	20	(-)	(+)	Red	White
Station 8	SOL.A	8	(-)	(+)	Purple	White
	SOL.B	21	(-)	(+)	Brown	White
Station 9	SOL.A	9	(-)	(+)	Gray	Black
	SOL.B	22	(-)	(+)	Pink	Red
Station 10	SOL.A	10	(-)	(+)	White	Black
	SOL.B	23	(-)	(+)	Gray	Red
Station 11	SOL.A	11	(-)	(+)	White	Red
	SOL.B	24	(-)	(+)	Black	White
Station 12	SOL.A	12	(-)	(+)	Yellow	Red
	SOL.B	25	(-)	(+)	White	None
	COM.	13	(+)	(-) (Note)	Orange	Red
			Positive COM spur	Negative COM spur		

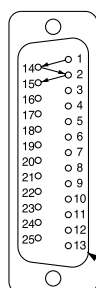
Positive COM spec. Negative COM spec. (Note)



Note) When using the negative COM specification for VQC1000/2000, use valves for negative COM.

Special Wiring Specifications (Options)

(For 25P)



Mixed single and double wiring are available as options. The maximum number of manifold stations is determined by the number of solenoids. Count one point for a single solenoid type and two points for a double solenoid type. The total number of solenoids (points) must not exceed 24.

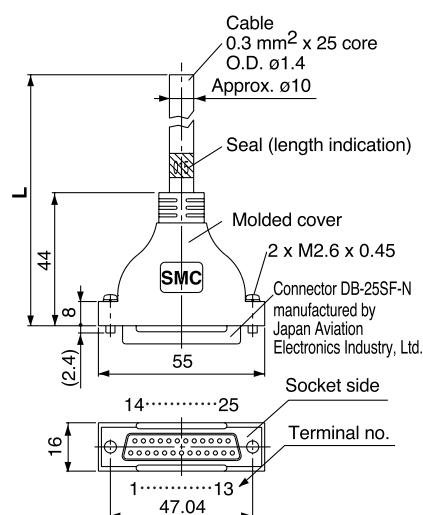
COM

Cable Assembly

AXT100-DS25-015, 030, 050

(D-sub connector cable assemblies can be ordered with manifolds.) Refer to manifold ordering.

Lead wire colors for D-sub connector cable assembly terminal numbers



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

D-sub connector cable assemblies

Cable length (L)	Part no.	Note
1.5 m	AXT100-DS25-015	Cable 0.3 mm ² x 25 cores
3 m	AXT100-DS25-030	
5 m	AXT100-DS25-050	

* When using a standard commercial connector, use a type 25P female connector conforming to MIL-C-24308.

* Cannot be used for transfer wiring.

* Lengths other than the above is also available. Please contact SMC for details.

Electrical characteristics

Item	Characteristic
Conductor resistance Ω/km, 20°C	65 or less
Voltage limit V, 1 minute, AC	1000
Insulation resistance MΩ/km, 20°C	5 or more



Note) The minimum bending radius for D-sub connector cables is 20 mm.

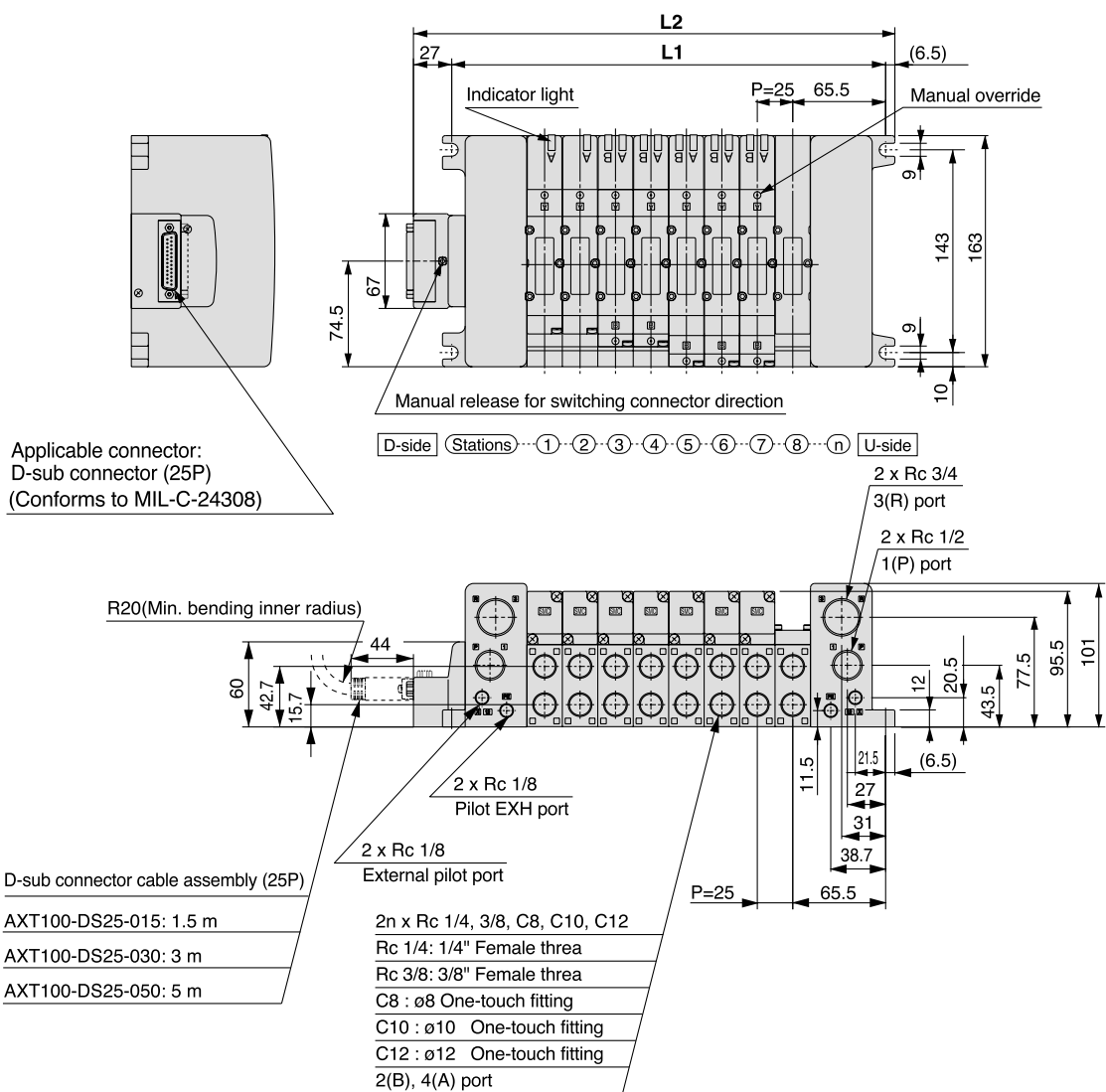
Some connector manufacturers:

- Fujitsu, Ltd.
- Japan Aviation Electronics Industry, Ltd.
- J.S.T. Mfg. Co., Ltd.
- HIROSE ELECTRIC CO., LTD.

F VQC1000/2000/4000

Kit (D-sub connector kit) IP40 compliant

VV5QC41



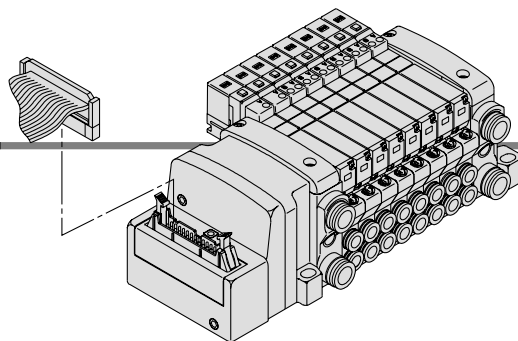
Formulas: $L1 = 25n + 106$, $L2 = 25n + 139.5$ n: Stations (Maximum 16 stations)

L	n	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
L1		131	156	181	206	231	256	281	306	331	356	381	406	431	456	481	506
L2		164.5	189.5	214.5	239.5	264.5	289.5	314.5	339.5	364.5	389.5	414.5	439.5	464.5	489.5	514.5	539.5

P VQC1000/2000/4000

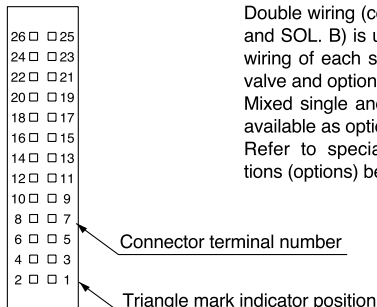
Kit (Flat ribbon cable kit) IP40 compliant

- Using our flat ribbon cable for electrical connections greatly reduces labour, while it also minimizes wiring and saves space.
- We use flat ribbon cables whose connectors (26P and 20P) conform to MIL standards, and are therefore widely compatible with many standard commercial models.
- Top or side entry for the connector can be changed freely, allowing for changes even after mounting, to meet any changing needs for space.

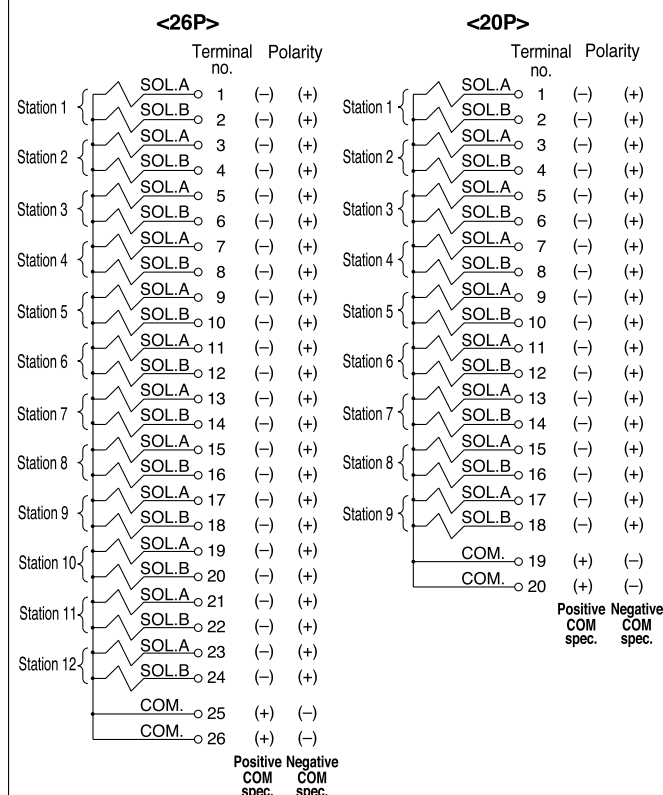


Electrical Wiring Specifications

Flat ribbon cable connector



Double wiring (connected to SOL. A and SOL. B) is used for the internal wiring of each station regardless of valve and option types. Mixed single and double wiring are available as options. Refer to special wiring specifications (options) below.

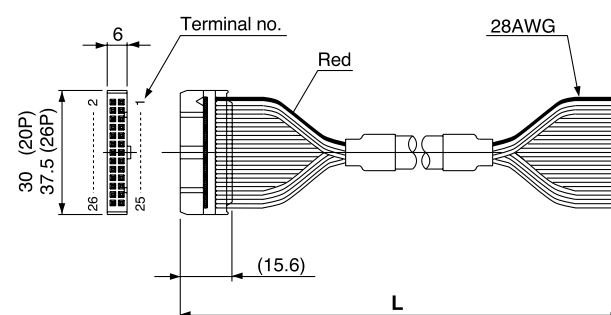


Note) When using the negative COM specification for VQC1000/2000, use valves for negative COM.

Cable Assembly

AXT100-FC²⁰₂₆₋₃

(Type 26P flat ribbon cable connector assemblies can be ordered with manifolds. Refer to manifold ordering.)



Flat ribbon cable connector assemblies

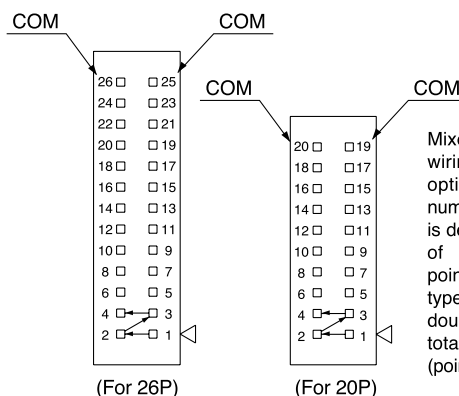
Cable length (L)	Part no.	
	26P	20P
1.5 m	AXT100-FC26-1	AXT100-FC20-1
3 m	AXT100-FC26-2	AXT100-FC20-2
5 m	AXT100-FC26-3	AXT100-FC20-3

- * When using a standard commercial connector, use a type 26P connector conforming to MIL-C-83503 or a type 20P with strain relief.
- * Cannot be used for transfer wiring.
- * Lengths other than the above is also available. Please contact SMC for details.

Connector Manufacturers Example:

- Hirose Electric CO., Ltd.
- Sumitomo/3-M Limited
- Fujitsu, Ltd.
- Japan Aviation Electronics Industry, Ltd.
- J.S.T. Mfg. Co., Ltd.
- Oki Electric Cable Co., Ltd.

Special Wiring Specifications (Option)

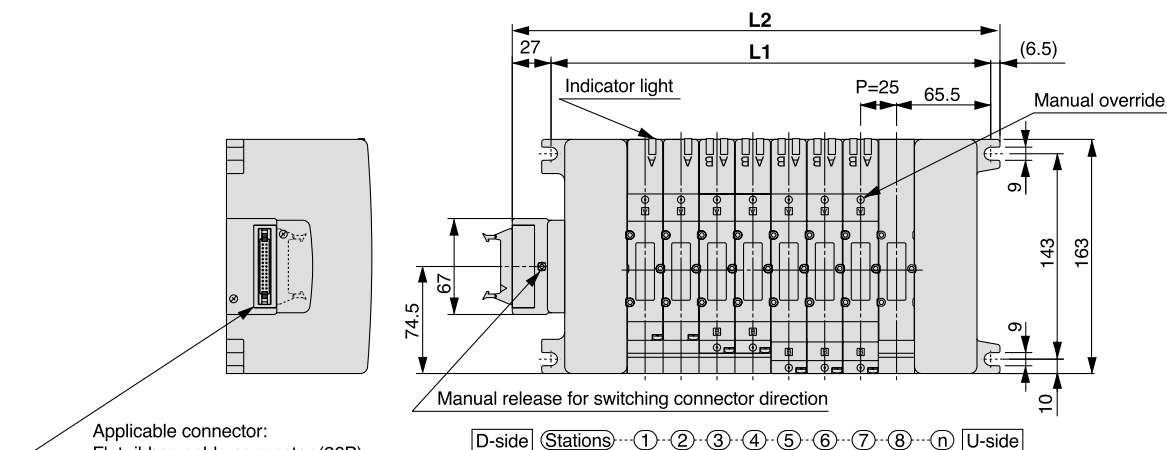


Mixed single and double wiring are available as options. The maximum number of manifold stations is determined by the number of solenoids. Count one point for a single solenoid type and two points for a double solenoid type. The total number of solenoids (points) must not exceed 24.

P VQC1000/2000/4000

Kit (Flat ribbon cable kit) IP40 compliant

VV5QC41



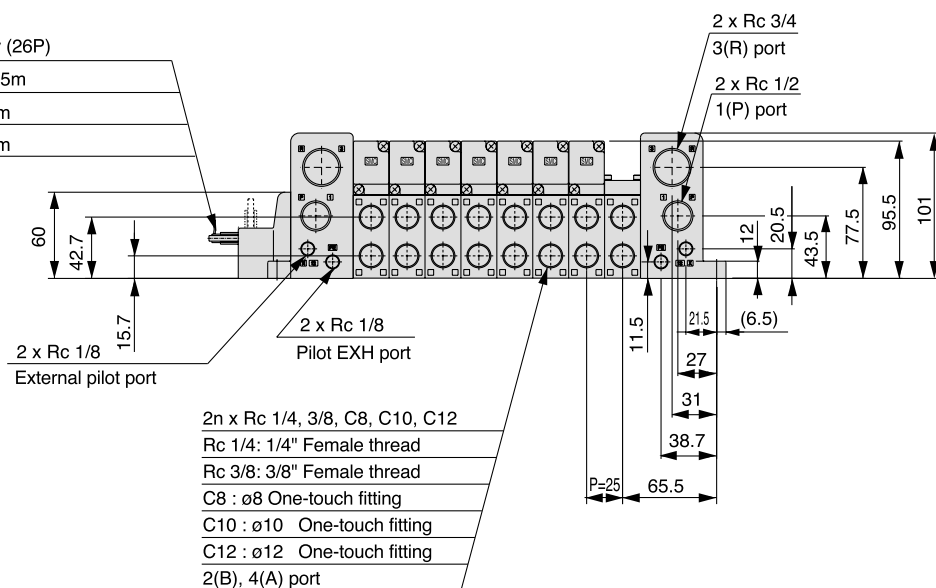
Applicable connector:
Flat ribbon cable connector (26P)
(Conforms to MIL-C-83503)

Flat ribbon cable
connector assembly (26P)

AXT100-FC26-1: 1.5m

AXT100-FC26-2: 3m

AXT100-FC26-3: 5m

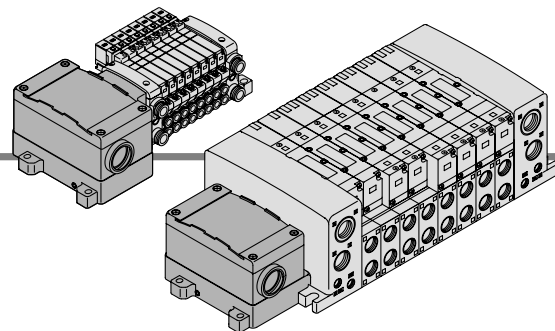


Formulas: $L1 = 25n + 106$, $L2 = 25n + 139.5$ n: Stations (Maximum 16 stations)

L \ n	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
L1	131	156	181	206	231	256	281	306	331	356	381	406	431	456	481	506
L2	164.5	189.5	214.5	239.5	264.5	289.5	314.5	339.5	364.5	389.5	414.5	439.5	464.5	489.5	514.5	539.5

T VQC1000/2000/4000

Kit (Terminal block box kit) IP67 compliant

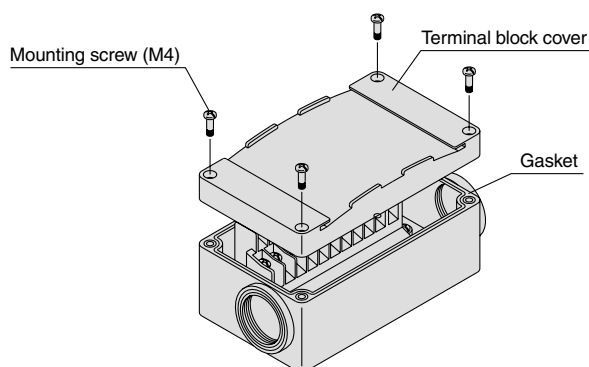


- This kit has a small terminal block inside a junction box. The provision of a G 3/4 electrical entry allows connection of conduit fittings.

Terminal Block Connection

Step 1. How to remove terminal block cover

Loosen the 4 mounting screws (M4) and remove the terminal block cover.



Step 3. How to replace the terminal block cover

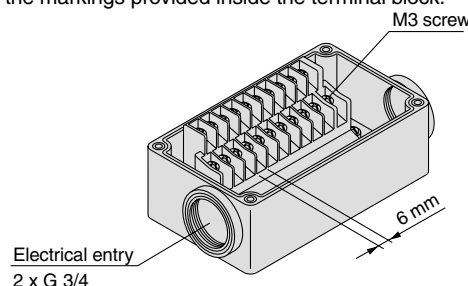
Securely tighten the screws to the torque shown in the table below, after confirming that the gasket is installed correctly.

Proper tightening torque (N·m)
0.7 to 1.2

Step 2. The diagram below shows the terminal block wiring.

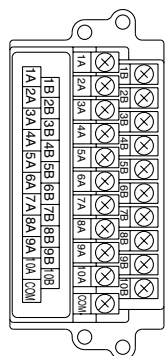
All stations are provided with double wiring regardless of the valves which are mounted.

Connect each wire to the power supply side, according to the markings provided inside the terminal block.



- Applicable crimped terminal: 1.25-3S, 1.25Y-3, 1.25Y-3N, 1.25Y-3.5
- Name plate: VVQ5000-N-T
- Drip proof plug assembly (for G 3/4): AXT100-B06A

Electrical Wiring Specifications (Conforms to IP67)



The internal wiring is double (connected to SOL. A and SOL. B) for all stations regardless of the type of valve or options. Mixed single and double wiring are available as options.



Note) When using the negative COM specification for VQC1000/2000, use valves for negative COM.

Standard wiring

	Terminal no.	Polarity
Station 1	SOL. A 1A	(-) (+)
	SOL. B 1B	(-) (+)
Station 2	SOL. A 2A	(-) (+)
	SOL. B 2B	(-) (+)
Station 3	SOL. A 3A	(-) (+)
	SOL. B 3B	(-) (+)
Station 4	SOL. A 4A	(-) (+)
	SOL. B 4B	(-) (+)
Station 5	SOL. A 5A	(-) (+)
	SOL. B 5B	(-) (+)
Station 6	SOL. A 6A	(-) (+)
	SOL. B 6B	(-) (+)
Station 7	SOL. A 7A	(-) (+)
	SOL. B 7B	(-) (+)
Station 8	SOL. A 8A	(-) (+)
	SOL. B 8B	(-) (+)
Station 9	SOL. A 9A	(-) (+)
	SOL. B 9B	(-) (+)
Station 10	SOL. A 10A	(-) (+)
	SOL. B 10B	(-) (+)
	COM	(+) (-)

Positive Negative
COM COM

Special Wiring Specifications (Option)

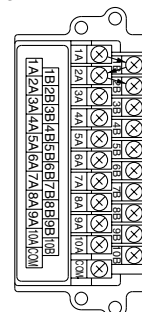
Mixed single and double wiring are available as options. The maximum number of manifold stations is determined by the number of solenoids. Count one point for a single solenoid type and two points for a double solenoid type. The total number of solenoids (points) must not exceed 20.

1. How to order

Indicate option symbol "-K" in the manifold part number and be sure to specify station positions for single or double wiring on the manifold specification sheet.

2. Wiring specifications

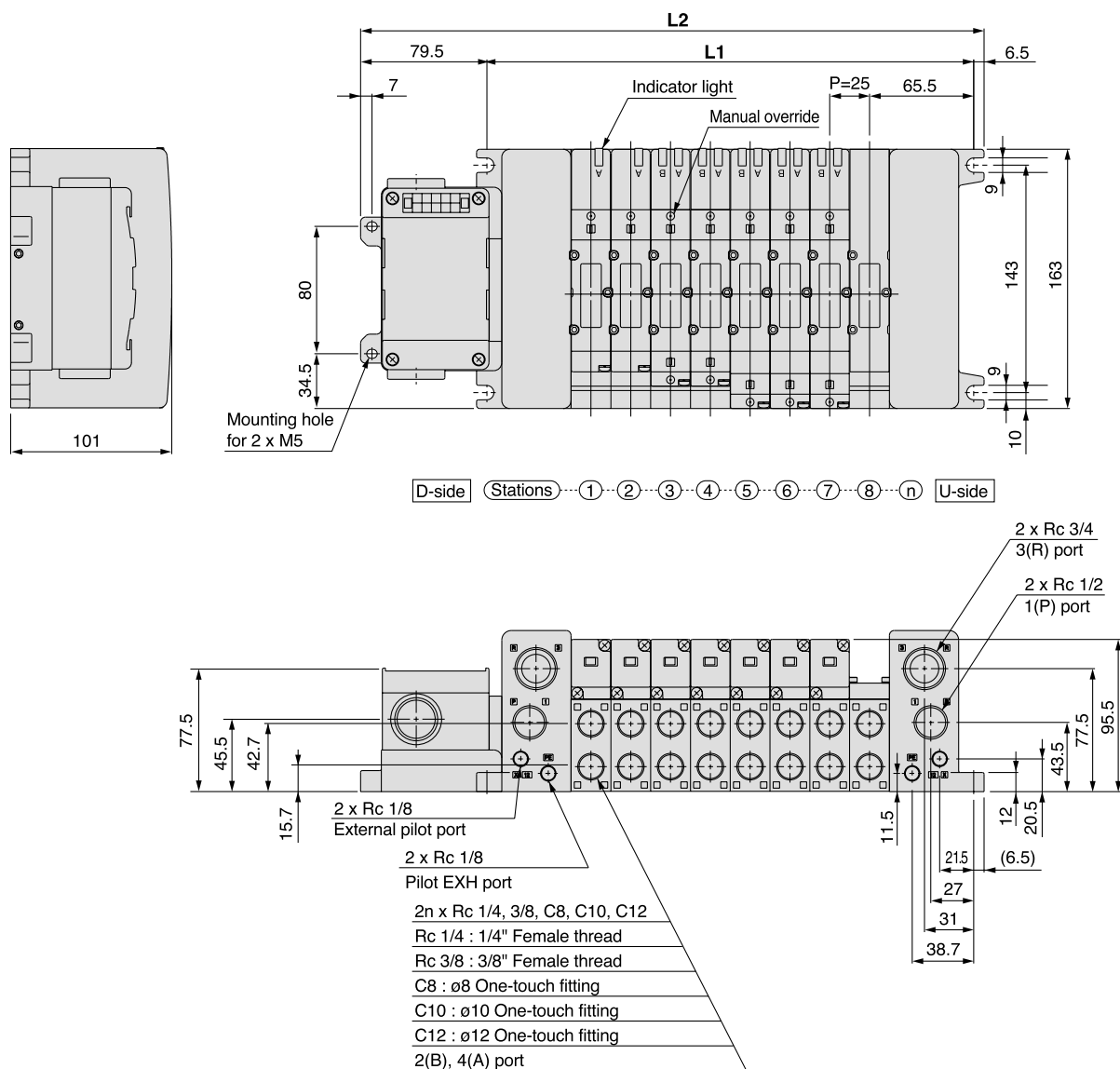
Connector terminal numbers are connected from solenoid station 1 on the A side in the order indicated by the arrows without skipping any terminal numbers.



T VQC1000/2000/4000

Kit (Terminal block box kit) IP67 compliant

VV5QC41

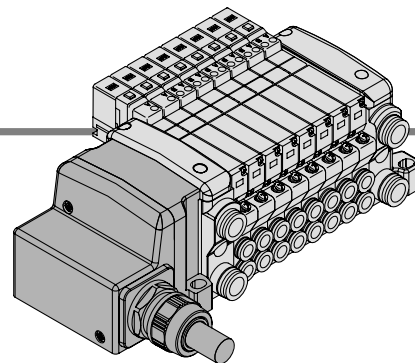


Formulas: $L1 = 25n + 106$, $L2 = 25n + 192$ n: Stations (Maximum 16 stations)

L	n	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
L1		131	156	181	206	231	256	281	306	331	356	381	406	431	456	481	506
L2		217	242	267	292	317	342	367	392	417	442	467	492	517	542	567	592

L VQC1000/2000/4000

Kit (Lead wire kit) IP67 compliant

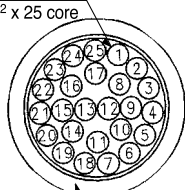


- Direct electrical entry type.
- IP67 enclosure is available with use of cables with sheath and waterproof connectors.

Electrical Wiring Specifications

Lead wire specifications

Lead wire
0.3 mm² x 25 core



Sheath
Colour: Urban white

As the standard electrical wiring specification used is for 12 stations or less, double wiring (connected to SOL. A and SOL. B) is used for the internal wiring of each station regardless of valve and option types.

Mixed single and double wiring are available as options.

Refer to special wiring specifications (options) below.

		Terminal no.	Polarity	Lead wire colour	Dot marking	
Station 1	SOL.A	1	(-)	(+)	Black	None
	SOL.B	14	(-)	(+)	Yellow	Black
Station 2	SOL.A	2	(-)	(+)	Brown	None
	SOL.B	15	(-)	(+)	Pink	Black
Station 3	SOL.A	3	(-)	(+)	Red	None
	SOL.B	16	(-)	(+)	Blue	White
Station 4	SOL.A	4	(-)	(+)	Orange	None
	SOL.B	17	(-)	(+)	Purple	None
Station 5	SOL.A	5	(-)	(+)	Yellow	None
	SOL.B	18	(-)	(+)	Grey	None
Station 6	SOL.A	6	(-)	(+)	Pink	None
	SOL.B	19	(-)	(+)	Orange	Black
Station 7	SOL.A	7	(-)	(+)	Blue	None
	SOL.B	20	(-)	(+)	Red	White
Station 8	SOL.A	8	(-)	(+)	Purple	White
	SOL.B	21	(-)	(+)	Brown	White
Station 9	SOL.A	9	(-)	(+)	Grey	Black
	SOL.B	22	(-)	(+)	Pink	Red
Station 10	SOL.A	10	(-)	(+)	White	Black
	SOL.B	23	(-)	(+)	Grey	Red
Station 11	SOL.A	11	(-)	(+)	White	Red
	SOL.B	24	(-)	(+)	Black	White
Station 12	SOL.A	12	(-)	(+)	Yellow	Red
	SOL.B	25	(-)	(+)	White	None
	COM.	13	(+)	(-)	Orange	Red
			Positive COM SPEC.	Negative COM SPEC. (Note)		



Note) When using the negative COM. specification for VQC1000/2000, use valves for negative COM.

Lead wire length

VV5QC11-08 C6 LD 0

Lead wire length

0	0.6 m
1	1.5 m
2	3.0 m

Electrical characteristics

Item	Characteristic
Conductor resistance Ω/km, 20°C	65 or less
Withstand pressure V, 1 minute, AC	1000
Insulation resistance MΩ/km, 20°C	5 or more



Note) Cannot be used for transfer wiring.
The minimum bending radius for cables is 20 mm.

Special Wiring Specifications (Option)

Mixed single and double wiring are available as options. The maximum number of manifold stations is determined by the number of solenoids. Count one point for a single solenoid type and two points for a double solenoid type. The total number of solenoids (points) must not exceed 24.

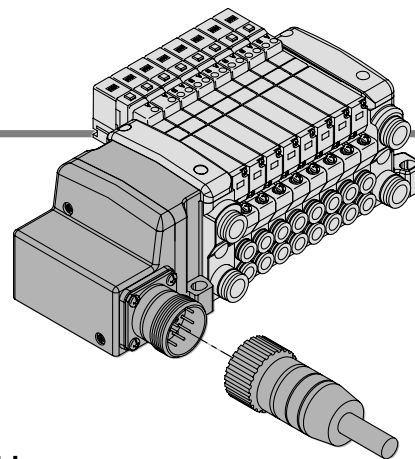
VV5QC41

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M VQC1000/2000/4000

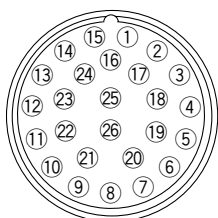
Kit (Circular connector kit) IP67 compliant

- Use of circular connectors helps streamline wiring procedure to save labor.
- IP67 enclosure is available with use of waterproof multiple connectors.



Electrical Wiring Specifications

Multiple connector



Double wiring (connected to SOL.A and SOL.B) is used for the internal wiring of each station regardless of valve and option types. Mixed single and double wiring are available as options. Refer to special wiring specifications (options) below.

	Terminal no.	Polarity	
Station 1	SOL.A 1	(-)	(+)
	SOL.B 2	(-)	(+)
Station 2	SOL.A 3	(-)	(+)
	SOL.B 4	(-)	(+)
Station 3	SOL.A 5	(-)	(+)
	SOL.B 6	(-)	(+)
Station 4	SOL.A 7	(-)	(+)
	SOL.B 8	(-)	(+)
Station 5	SOL.A 9	(-)	(+)
	SOL.B 10	(-)	(+)
Station 6	SOL.A 11	(-)	(+)
	SOL.B 12	(-)	(+)
Station 7	SOL.A 13	(-)	(+)
	SOL.B 14	(-)	(+)
Station 8	SOL.A 15	(-)	(+)
	SOL.B 16	(-)	(+)
Station 9	SOL.A 17	(-)	(+)
	SOL.B 18	(-)	(+)
Station 10	SOL.A 19	(-)	(+)
	SOL.B 20	(-)	(+)
Station 11	SOL.A 21	(-)	(+)
	SOL.B 22	(-)	(+)
Station 12	SOL.A 23	(-)	(+)
	SOL.B 24	(-)	(+)
	COM. 25	(+)	(-)
	COM. 26	(+)	(-)

Positive COM spec. Negative COM spec.



Note) When using the negative COM specification for VQC1000/2000, use valves for negative COM.

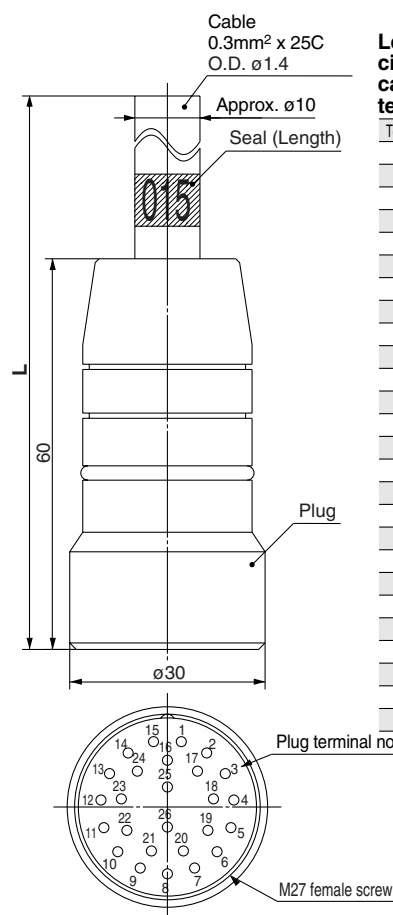
Special Wiring Specifications (Option)

Mixed single and double wiring are available as an option. The maximum number of manifold stations is determined by the number of solenoids. Count one point for a single solenoid type and two points for a double solenoid type. The total number of solenoids (points) must not exceed 24.

Cable Assembly

015
AXT100-MC26-030
050

(Type 26P circular connector cable assemblies can be ordered with manifolds. Refer to manifolds ordering.)



Lead wire colors for circular connector cable assembly terminal numbers

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
26	White	None

Electric characteristics

Item	Property
Conductor resistance Ω/km, 20°C	65 or less
Voltage limit V, 1 minute, AC	1000
Insulation resistance MΩ/km, 20°C	5 or more

Note) The minimum bending radius of the multiple connector cable is 20 mm.

Circular connector cable assemblies

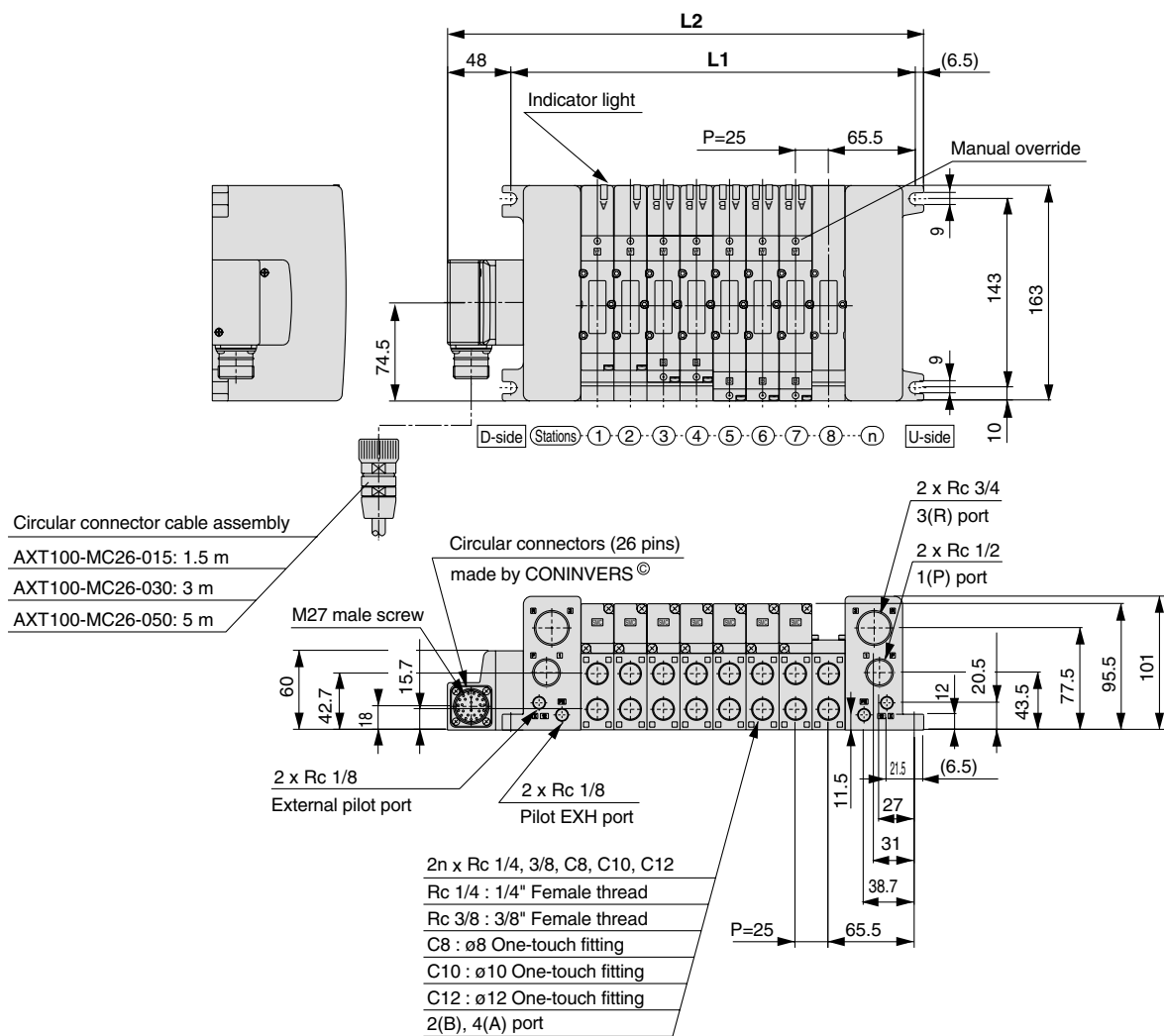
Cable length (L)	Assembly no.
	26P
1.5 m	AXT100-MC26-015
3 m	AXT100-MC26-030
5 m	AXT100-MC26-050

* Cannot be used for transfer wiring.
* Lengths other than the above is also available. Please contact SMC for details.

M VQC1000/2000/4000

Kit (Circular connector kit) IP67 compliant

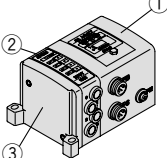
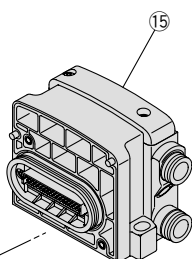
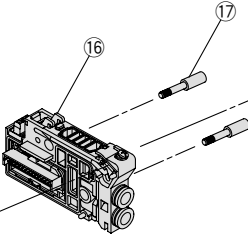
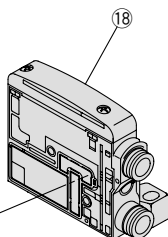
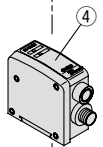
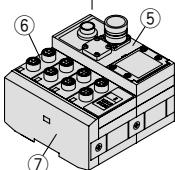
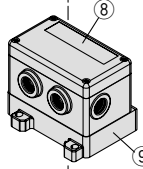
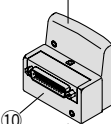
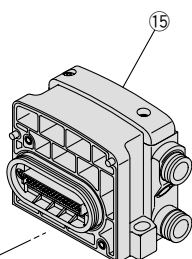
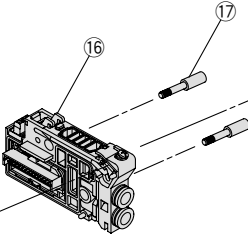
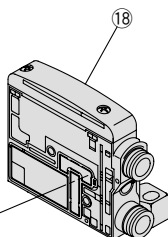
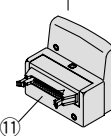
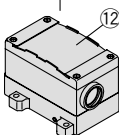
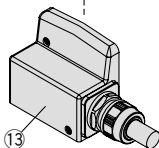
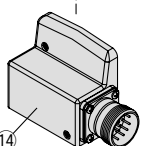
VV5QC41



Formulas: $L1 = 25n + 106$, $L2 = 25n + 150.5$ n: Stations (Maximum 16 stations)

L \ n	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
L1	131	156	181	206	231	256	281	306	331	356	381	406	431	456	481	506
L2	185.5	210.5	235.5	260.5	285.5	310.5	335.5	360.5	385.5	410.5	435.5	460.5	485.5	510.5	535.5	560.5

Exploded View of Manifold

	Housing assembly and SI unit	D-side end plate assembly	Manifold block assembly	U-side end plate assembly
S Kit (Serial)	EX250 VQC1000 VQC2000 VQC4000 			
	EX500 VQC1000 VQC2000 VQC4000 			
	EX240 VQC4000 			
	EX126 VQC1000 VQC2000 VQC4000 			
F Kit (D-sub connector)	VQC1000 VQC2000 VQC4000 			
P Kit (Flat ribbon cable)	VQC1000 VQC2000 VQC4000 			
T Kit (Terminal block)	VQC1000 VQC2000 VQC4000 			
L Kit (Lead wire)	VQC1000 VQC2000 VQC4000 			
M Kit (Multiple connector)	VQC1000 VQC2000 VQC4000 			

Manifold Assembly Part No.**Housing Assembly and SI Unit/Input Block**

No.	Description	Part no.	Note	Applicable model		
				VQC1000	VQC2000	VQC4000
1	SI unit	EX250-SPR1	PROFIBUS DP (– COM.)	●	●	●
		EX250-SMJ2	CC-Link (+ COM.)	●	●	●
		EX250-SAS3	As-i, 8 in/out, 31 slave modes, 2 power supply systems (– COM.)	●	●	●
		EX250-SAS5	As-i, 4 in/out, 31 slave modes, 2 power supply systems (– COM.)	●	●	●
		EX250-SAS7	As-i, 8 in/out, 31 slave modes, 1 power supply systems (– COM.)	●	●	●
		EX250-SAS9	As-i, 4 in/out, 31 slave modes, 1 power supply systems (– COM.)	●	●	●
		EX250-SCA1A	CANopen (– COM.)	●	●	●
		EX250-SCN1	ControlNet (– COM.)	●	●	●
		EX250-SDN1	DeviceNet (– COM.)	●	●	●
		EX250-SEN1	EtherNet/IP (– COM.)	●	●	●
2	Input block	EX250-IE1	M12, 2 inputs	●	●	●
		EX250-IE2	M12, 4 inputs	●	●	●
		EX250-IE3	M8, 4 inputs	●	●	●
3	End plate assembly	EX250-EA1	Standard	●	●	●
		EX250-EA2	DIN rail mounting	●	●	—
4	SI unit	EX500-Q001	DeviceNet (+ COM.)	●	●	●
		EX500-Q101	DeviceNet (– COM.)	●	●	●
5	SI unit	EX240-SDN2	DeviceNet (+ COM.)	—	—	●
		EX240-SPR1	PROFIBUS DP (– COM.)	—	—	●
6	DI unit	EX240-IE1	M12, 8 inputs	—	—	●
7	End bowl assembly	EX240-EA2	DI unit with manifold	—	—	●
		EX240-EA4	DI unit without manifold	—	—	●
8	SI unit	EX126D-SMJ1	CC-Link (+ COM.)	●	●	●
9	Terminal plate	VVQC1000-74A-2	For EX126 SI unit mounting	●	●	●
10	D-sub connector housing assembly	VVQC1000-F25-1	F kit, 25 pins	●	●	●
11	Flat ribbon cable housing assembly	VVQC1000-P26-1	P kit, 26 pins	●	●	●
		VVQC1000-P20-1	P kit, 20 pins	●	●	●
12	Terminal block box housing assembly	VVQC1000-T0-1	T kit	●	●	●
13	Lead wire housing assembly	VVQC1000-L25-0-1	L kit with 0.6 m lead wire	●	●	●
		VVQC1000-L25-1-1	L kit with 1.5 m lead wire	●	●	●
		VVQC1000-L25-2-1	L kit with 3.0 m lead wire	●	●	●
14	Multiple connector housing assembly	VVQC1000-M26-1	M kit 26 pins	●	●	●

SJ

SY

SV

SYJ

SZ

VP4

S0700

VQ

VQ4

VQ5

VQC

VQZ

SQ

VFS

VFR

VQ7

Manifold Assembly Part No.

D-side end plate assembly

⑮ D-side end plate assembly part no.

VQC1000/2000

VVQC 1 000-3A-1 - -

Series

1	VQC1000
2	VQC2000

Port size

Symbol	VQC1000	VQC2000
C8	●	
C10		●
N9	●	
N11		●

Option

Nil	Centralized exhaust
R	External pilot
S	Direct exhaust outlet with built-in silencer

VQC4000

VVQC4000-3A-1 -

Kit type

1	S (EX240) kit
2	F, P, T, S (EX250) kit
3	L, M, S (EX500) kit

Thread type

Nil	Rc
F	G
T	NPT/NPTF

U-side end plate assembly

⑮ U-side end plate assembly part no.

VQC1000/2000

VVQC 1 000-2A-1 - C8 -

Series

1	VQC1000
2	VQC2000

Option

Nil	Centralized exhaust
R	External pilot
S	Direct exhaust outlet with built-in silencer

Port size

Symbol	VQC1000	VQC2000
C8	●	
C10		●
C12		●
N9	●	
N11		●
N13		●

Thread type

Nil	Rc
F	G
T	NPT/NPTF

Supply/Exhaust port entry direction

1	Cylinder port side
2 (Note)	Branch type

Note) VQC2000 only

VQC4000

VVQC4000-2A-1 -

Manifold block assembly

⑮ Manifold block assembly part no.

VVQC 1 000-1A-D-C6 - -

Wiring specifications

D	Double wiring
S	Single wiring

Series

1	VQC1000
2	VQC2000
4	VQC4000

Note) Tie-rods (2 pcs.) for additional stations included.

Option

Nil	None
B (Note)	With back pressure check valve

Note) Except VQC4000.

Thread type (Note)

Nil	Rc
F	G
T	NPT/NPTF

Note) VQC 4000 thread port only

Port size

Symbol	Port size	VQC1000	VQC2000	VQC4000
C3	For ø3.2 One-touch fitting	●		
C4	For ø4 One-touch fitting	●	●	
C6	For ø6	●	●	
C8	For ø8		●	●
C10	For ø10			●
C12	For ø12			●
N1	For ø1/8"	●		
N3	For ø5/32"	●	●	
N7	For ø1/4"	●	●	●
N9	For ø5/16"		●	●
N11	For ø3/8"			●
M5	For M5 thread	●		
O2	Rc 1/4"			●
O3	Rc 3/8"			●
B	Rc 1/4" bottom ported			●

Replacement parts

Pilot valve assembly

VQC1000	VQ111 (H) W-□-1	Single type
VQC2000	VQ131 (H) W-□-1	Double type
VQC4000	VQZ111P(Y)-□ (Note 3)	

Note 1) (H): 1.5 W, (Y): 0.5 W

Note 2) □: Coil rated voltage Ex.) 24 VDC: 5

Note 3) This model no. does not include an indicator light subplate. If it is required, please order it separately.

⑮ Tie-rod assembly part no. (2 units)

VQC1000	VVQC1000-TR-□
VQC2000	VVQC2000-TR-□
VQC4000	VVQC4000-TR-□

Note 1) Please order when reducing the number of manifold stations. When increasing the number of stations, additional orders are not required since they are included in the manifold block assembly.

Note 2) □: Number of stations, 02 to 24 (VQC4000: 02 to 16)



Series VQC Specific Product Precautions 1

Be sure to read this before handling. Refer to Front matters 58 and 59 for Safety Instructions and pages 3 to 7 for 3/4/5 Port Solenoid Valve Precautions.

Manual Override

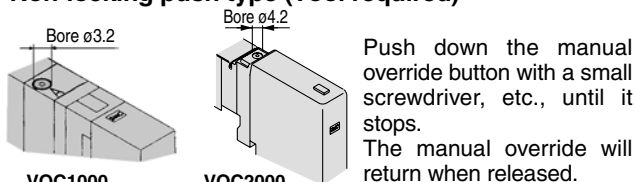
Warning

Since connected equipment will operate when the manual override is activated, confirm that conditions are safe prior to activation.

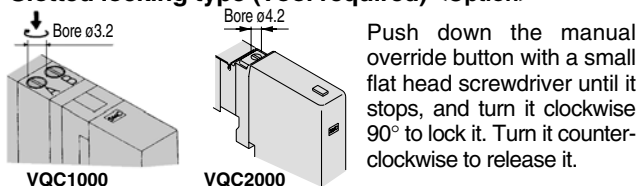
The non-locking push type (tool required) is standard, and the slotted locking type (tool required) is optional.

■ VQC1000/2000

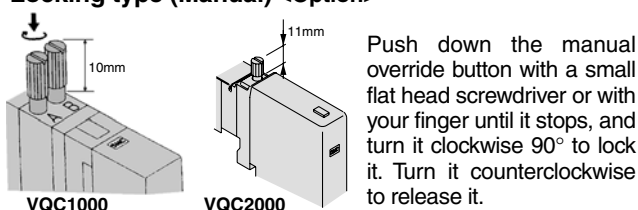
Non-locking push type (Tool required)



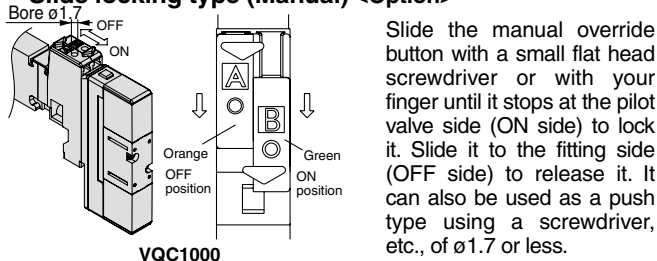
Slotted locking type (Tool required) <Option>



Locking type (Manual) <Option>

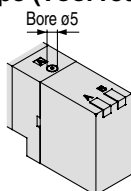


Slide locking type (Manual) <Option>

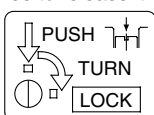
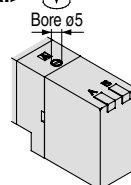


■ VQC4000

Push type (Tool required)

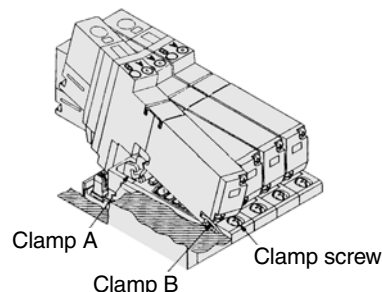


Locking type (Tool required) <Optional>



Solenoid Valve Removal and Mounting (VQC1000/2000)

Caution



Removal steps

1. Loosen the clamp screws until they turn freely. (The screws do not come out.)
2. Remove the solenoid valve from clamp B by lifting the coil side of the valve while pushing on the screw top. If pushing down on the screw is difficult, you can alternately press down on the valve gently in the area near the manual override.

Mounting steps

1. Push the clamp screws. Clamp A opens. Now insert the end plate hook of the valve into clamp B from an angle.
2. Push the valve down into place. (When you release the screws, the valve will be locked into clamp A.)
3. Tighten the clamp screws with a tightening torque of 0.25 to 0.35 N·m for VQC1000 and 0.5 to 0.7 N·m for VQC2000.

Caution

Do not let foreign matter stick on the seal side of the gasket and solenoid, as this will cause air leakage.

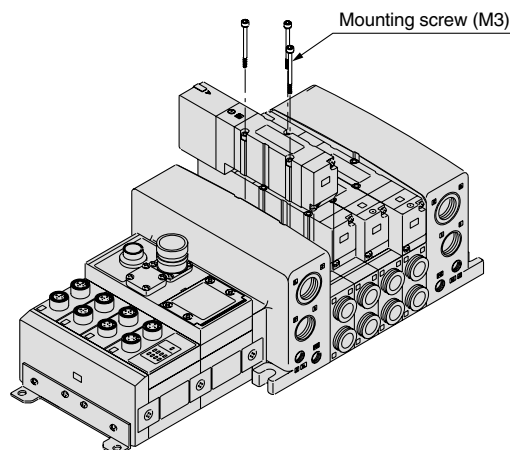
Valve Mounting (VQC4000)

Caution

After confirming that the gasket is installed correctly, securely tighten the mounting screws according to the tightening torque shown below.

Proper tightening torque (N·m)

0.8 to 1.2





Series VQC Specific Product Precautions 2

Be sure to read this before handling. Refer to Front matters 58 and 59 for Safety Instructions and pages 3 to 7 for 3/4/5 Port Solenoid Valve Precautions.

Replacing One-touch Fittings

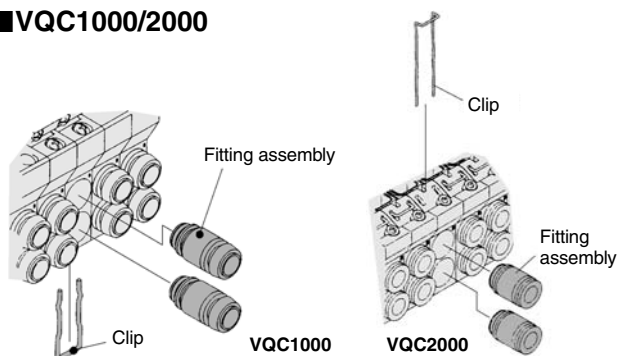
⚠ Caution

Cylinder port fittings are available in cassette type and can be replaced easily.

Fittings are secured with a retaining clip that is inserted from the top side of the valve. After removing the valve, remove the clip with a flat head screw driver to replace the fittings.

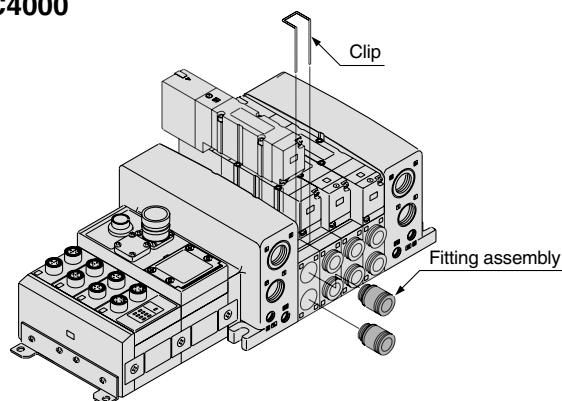
To mount a fitting, insert the fitting assembly until it stops and reinsert the retaining clip to its designated position.

■ VQC1000/2000



Applicable tube O.D.	Fitting assembly part no.	
	VQC1000	VQC2000
ø3.2	VVQ1000-50A-C3	—
ø4	VVQ1000-50A-C4	VVQ1000-51A-C4
ø6	VVQ1000-50A-C6	VVQ1000-51A-C6
ø8	—	VVQ1000-51A-C8
M5	VVQ1000-50A-M5	—
ø1/8"	VVQ1000-50A-N1	—
ø5/32"	VVQ1000-50A-N3	VVQ1000-51A-N3
ø1/4"	VVQ1000-50A-N7	VVQ1000-51A-N7
ø5/16"	—	VVQ1000-51A-N9

■ VQC4000



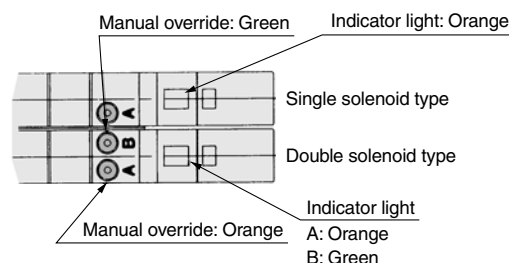
Applicable tube O.D.	Fitting assembly part no.	
	VQC4000	
ø8	VVQ4000-50B-C8	
ø10	VVQ4000-50B-C10	
ø12	VVQ4000-50B-C12	
ø1/4"	VVQ4000-50B-N7	
ø5/16"	VVQ4000-50B-N9	
ø3/8"	VVQ4000-50B-N11	

Light/Surge Voltage Suppressor (VQC1000/2000)

⚠ Caution

Indicator lights are all positioned on one side for both single solenoid and double solenoid type valves.

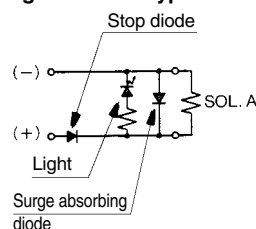
For double solenoid type, 2 colours that are same as the manual override are used to indicate the energization of A-side or B-side.



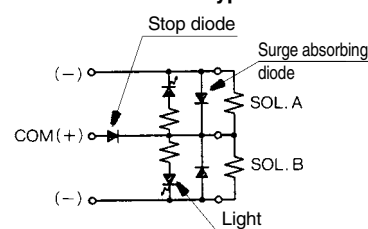
(For VQC1000)

DC circuit

Single solenoid type



Double solenoid type

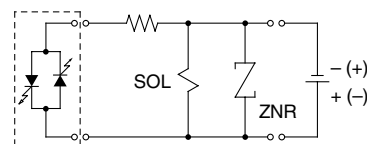


Note 1) A-side energized: Light (orange) ON With miswiring prevention mechanism (stop diode)
B-side energized: Light (green) ON With surge absorbing mechanism (surge absorbing diode) mechanism

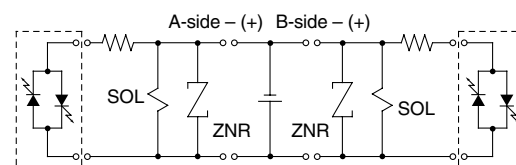
Note 2) Coil surge voltage generated when OFF is about -40V. Please contact SMC separately for further suppression of the coil surge voltage.

Internal Wiring Specifications (VQC4000)

⚠ Caution



Light circuit assembly (orange) **DC: Single**



A-side light circuit assembly (orange) **DC: Double** B-side light circuit assembly (green)

Note) Coil surge voltage generated when OFF is about -60V. Please contact SMC separately for further suppression of the coil surge voltage.

How to Calculate the Flow Rate

Refer to Front matters 44 to 47.



Series VQC

Specific Product Precautions 3

Be sure to read this before handling. Refer to Front matters 58 and 59 for Safety Instructions and pages 3 to 7 for 3/4/5 Port Solenoid Valve Precautions.

Serial Wiring EX500/EX250/EX240/EX126 Precautions

⚠ Warning

1. These products are intended for use in general factory automation equipment.
Avoid using these products in machinery/equipment which affects human safety, and in cases where malfunction or failure can result in extensive damage.
2. Do not use in explosive environments, in the presence of inflammable gases, or in corrosive environments. This can cause injury or fire.
3. Work such as transporting, installing, piping, wiring, operation, control and maintenance should be performed by knowledgeable and qualified personnel only. As handling involves the risk of a danger of electrocution, injury or fire.
4. Install an external emergency stop circuit that can promptly stop operation and shut off the power supply.
5. Do not modify these products. Modifications done to these products carry the risk of injury and damage.

⚠ Caution

1. Read the instruction manual carefully, strictly observe the precautions and operate within the range of the specifications.
2. Do not drop these products or submit them to strong impacts. This can cause damage, failure or malfunction.
3. In locations with poor electrical conditions, take steps to ensure a steady flow of the rated power supply. Use of a voltage outside of the specifications can cause malfunction, damage to the unit, electrocution or fire.
4. Do not touch connector terminals or internal circuit elements when current is being supplied. There is a danger of malfunction, damage to the unit or electrocution if connector terminals or internal circuit elements are touched when current is being supplied.
Be sure that the power supply is OFF when adding or removing manifold valves or input blocks or when connecting or disconnecting connectors.
5. Operate at an ambient temperature that is within the specifications. Even when the ambient temperature range is within the specifications, do not use in locations where there are rapid temperature changes.
6. Keep wire scraps and other extraneous materials from getting inside these products. This can cause fire, failure or malfunction.
7. Give consideration to the operating environment depending on the type of enclosure being used.
To achieve IP65 and IP67 protection, provide appropriate wiring between all units using electrical wiring cables, communication connectors and cables with M12 connectors. Also, provide waterproof caps when there are unused ports, and perform proper mounting of input units, input blocks, SI units and manifold valves. Provide a cover or other protection for applications in which there is constant exposure to water.
8. Use the proper tightening torques.
There is a possibility of damaging threads if tightening exceeds the tightening torque range.

⚠ Caution

9. Provide adequate protection when operating in locations such as the following:
 - Where noise is generated by static electricity
 - Where there is a strong electric field
 - Where there is a danger of exposure to radiation
 - When in close proximity to power supply lines
10. When these products are installed in equipment, provide adequate protection against noise by using noise filters.
11. Since these products are components whose end usage is obtained after installation in other equipment, the customer should confirm conformity to EMC directives for the finished product.
12. Do not remove the name plate.
13. Perform periodic inspections and confirm normal operation, otherwise it may be impossible to guarantee safety due to unexpected malfunction or erroneous operation.

Power Supply Safety Instructions

⚠ Caution

1. Operation is possible with a single power supply or a separate power supply. However, be sure to provide two wiring systems (one for solenoid valves, and one for input and control units).
2. Use the following UL approved products for DC power supply combinations.
 - (1) Controlled voltage current circuit conforming to UL508
Circuit uses the secondary coil of an isolated transformer as the power supply, satisfying the following conditions.
 - Max. voltage (with no load): 30 Vrms (42.4 V peak) or less
 - Max. current: ① 8 A or less (including shorts), and ② When controlled by a circuit protector (fuse) with the following ratings:

No-load voltage (V peak)	Max. current rating
0 to 20 [V]	5.0
Over 20 [V] and up to 30 [V]	100
Peak voltage value	

- (2) A circuit (class 2 circuit) with maximum 30 Vrms (42.4 V peak) or less, and a power supply consisting of a class 2 power supply unit conforming to UL1310, or a class 2 transformer conforming to UL1585.

Cable Safety Instructions

⚠ Caution

1. Avoid miswiring, as this can cause malfunction, damage and fire in the unit.
2. To prevent noise and surge in signal lines, keep all wiring separate from power lines and high voltage lines. Otherwise, this can cause a malfunction.
3. Check wiring insulation, as defective insulation can cause damage to the unit when excessive voltage or current is applied.
4. Do not bend or pull cables repeatedly, and do not place heavy objects on them or allow them to be pinched. This can cause broken lines.

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