CAT.ES11-80 A

SMC

5-Port Solenoid Valve

Series VQC

Connector Type Manifold

Series VQC1000/2000/4000

Outstanding response times and long life

(Metal seal: Single type with light and surge suppressor)

VQC1100: 10ms ±2ms; 200 million cycles
VQC2100: 20ms ±2ms; 200 million cycles
VQC4100: 17ms ±3ms; 100 million cycles

Conforming to IP67 for protection from dust and moisture

(Based on IEC529)
(For kits S and T)

Connector

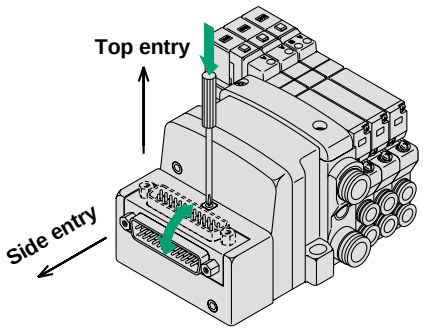
Compact and high flow

Type (Series)	Manifold pitch (mm)	Flow characteristics Note)						Applicable cylinder 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	to ø50
VQC2000	16	2.6	0.15	0.60	3.2	0.30	0.80	to ø80
VQC4000	25	6.9	0.17	1.7	7.3	0.38	2.0	to ø140

Note) Values for 2-position single from the cylinder port to the exhaust. (From 2 to 3 and from 4 to 5)

Connector entry direction can be changed with a single push

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.

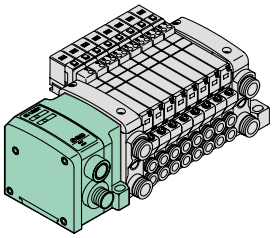


Accommodates gateway type serial wiring

- Gateway unit types are DeviceNet, PROFIBUS-DP and Remote I/O.
- Because just one gateway unit controls up to 4 branch lines, it offers much more freedom in choosing valve mounting locations than do conventional serial units.
- Manifolds and input blocks can be mounted in close proximity of actuators, thus effectively shortening air piping and electrical wiring lengths.
- Since wiring is “prepackaged” into one multi-connector type cable, wiring work is not only made easier, but much more accurate.
- 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 use of a multi-connector for input blocks makes manifold station expansion or reduction a breeze.

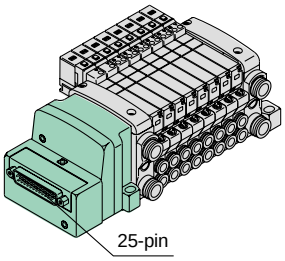
A wide variety of prepackaged wiring configurations

S **Kit (Serial transmission)**

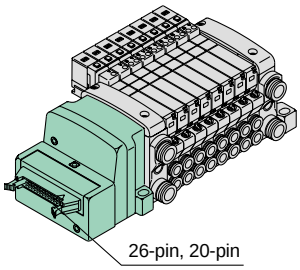


Protective enclosure conforms to IP 67

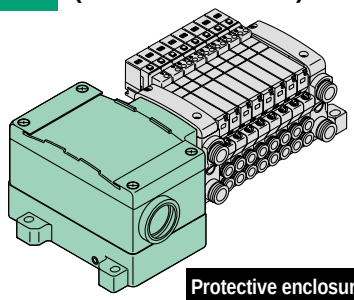
F **Kit (D-sub connector)**



P **Kit (Flat ribbon cable)**



T **Kit (Terminal block box)**

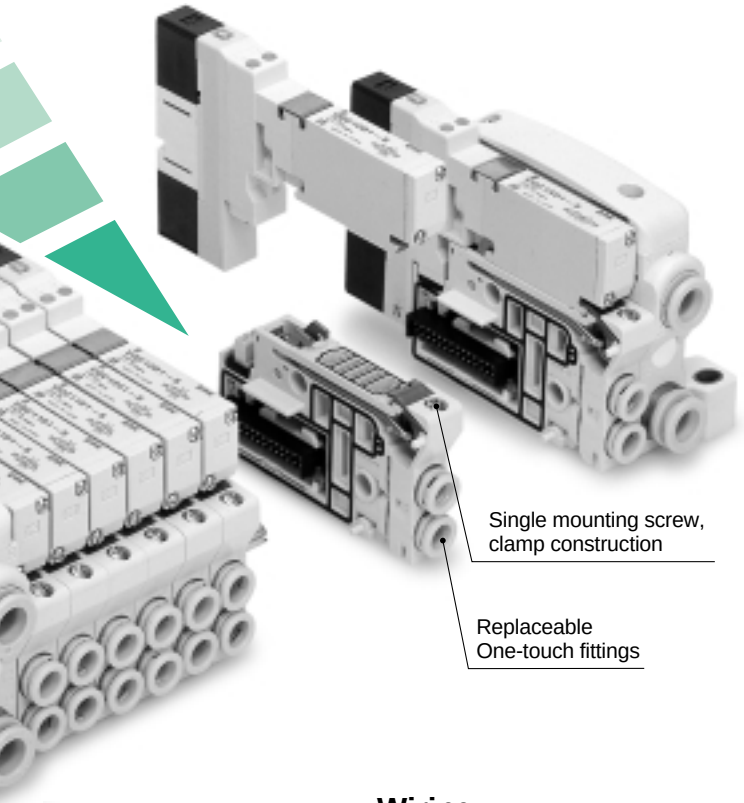


Protective enclosure conforms to IP 67

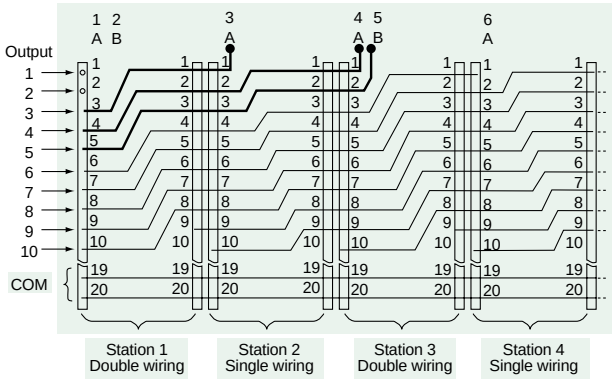
- Our four standard wiring packages bring a world of ease to wiring and maintenance work, while the protective enclosures of two of them conform to IP67 standards.
- The S Kit is compatible with a combined I/O unit. (If used with gataway unit, SI must be output only.)

Connector type manifold

- The use of multi-pin connectors to replace wiring inside manifold blocks provides flexibility when adding stations or changing manifold configuration.
- Connector clusters give a new dimension to the notion of interchangeability. For example, changing from F Kit (D-sub connector) to S Kit (serial transmission) is achieved by simply changing the kit piece.



Connector wiring diagram (mixed wiring)



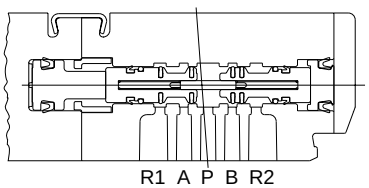
(Refer to the connector wiring diagram)
Printed circuit board patterns between connectors are shifted at every station. This allows for viable connections to take place without necessarily specifying whether the manifold station is double, single, or mixed wiring.

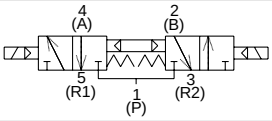
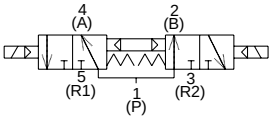
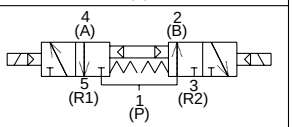
Dual 3-port valves, 4 positions

VQC1000/2000 (Rubber seal type only)

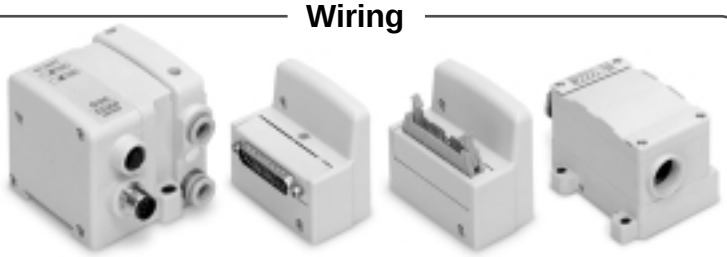
- Two 3-port valves built into one body.
- The 3-port valves on the A and B sides can operate independently.
- When used as 3-port valves, only half the number of stations is required.
- Can also be used as a 4-position, 5-port type valve.

Exhaust center : **VQC1A01** **VQC2A01**
Pressure center: **VQC1B01** **VQC2B01**



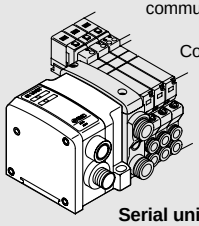
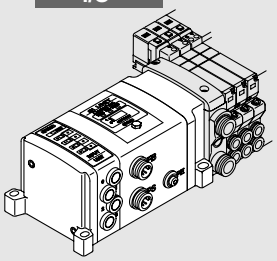
Model	A side	B side	JIS symbol
VQC1A01 VQC2A01	**N.C. valve**	**N.C. valve**	
VQC1B01 VQC2B01	**N.O. valve**	**N.O. valve**	
VQC1C01 VQC2C01	**N.C. valve**	**N.O. valve**	

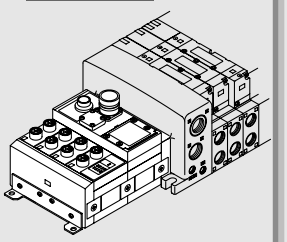
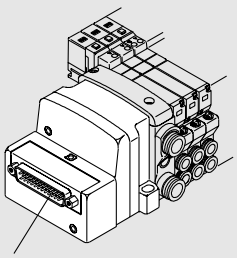
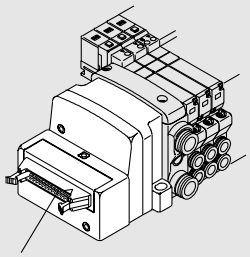
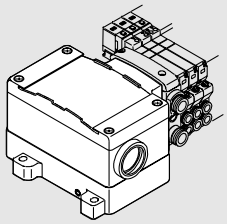
Wiring



Serial transmission EX500 | D-sub connector | Flat ribbon cable | Terminal block box

Base-Mounted type: Variations

			Sonic Conductance C[dm³/(s·bar)] (Values of CYL to EXH (From 4 to 5 and from 2 to 3))		Applicable bore size	S Kit	
						Serial transmission	
						Gateway application Compatible network • Remote I/O • DeviceNet • PROFIBUS-DP Decentralized Serial Wiring Gateway application requires a gateway unit and communication cable separately. Contact SMC for more details.  Serial unit: EX500 Conforms to IP67	Compatible network • DeviceNet • PROFIBUS-DP I/O  Serial unit: EX250 Conforms to IP67
			Single/Double	3-position (Closed center)			
Series VQC1000	Metal seal	VQC1□00	0.72	0.72	to ø50	○	○
	Rubber seal	VQC1□01	1.0	0.65			
Series VQC2000	Metal seal	VQC2□00	2.6	2.0	to ø80	○	○
	Rubber seal	VQC2□01	3.2	2.2			
Series VQC4000	Metal seal	VQC4□00	6.9	6.3	to ø140	—	—
	Rubber seal	VQC4□01	7.3	6.4			

	F Kit	P Kit	T Kit	Port size	
	D-sub connector	Flat ribbon cable	Terminal block box		
Compatible network • DeviceNet • PROFIBUS-DP I/O  Serial unit: EX240 Conforms to IP67	D-sub connector Compatible with D-sub connector that complies with MIL standard.  25-pin	Flat ribbon cable Compatible with flat ribbon cable connector that complies with MIL standard.  26-pin 20-pin	Terminal block box (Terminal blocks) Terminals are concentrated in compact clusters within the terminal block box.  Conforms to IP67	SUP / EHX port 1, 3 (P, R)	Cylinder port 2, 4 (A, B)
—	○	○	○	C8 (for ø8) N9 (ø5/16")	C3 (for ø3.2) C4 (for ø4) C6 (for ø6) M5 (M5 thread) N1 (ø1/8") N3 (ø5/32") N7 (ø1/4")
—	○	○	○	C10 (for ø10) N11 (ø3/8")	C4 (for ø4) C6 (for ø6) C8 (for ø8) N3 (ø5/32") N7 (ø1/4") N9 (ø5/16")
○	—	—	○	<SUP port> Rc 1/2 (NPT, NPTF, G)	C8 (for ø8) C10 (for ø10) C12 (for ø12) N7 (ø1/4") N9 (ø5/16") N11 (ø3/8")
				<EXH port> Rc 3/4 (NPT, NPTF, G)	Rc 1/4 Rc 3/8 Rc 1/4 (bottom ported) (NPT, NPTF, G)

Series VQC1000/2000
Base-Mounted Type
Plug-in Unit

How to Order Manifolds

VV5QC 1 1 — 08 C6 FD1 — B ····· F / P / T Kit

VV5QC 1 1 — 08 C6 SDQ □ □ □ □ — B ····· S Kit

Series

1	VQC1000
2	VQC2000

Manifold type

1	Plug-in unit

Stations

Cylinder port size

Kit designation/Electrical entry/Cable length

SI unit COM

Number of input blocks (Indicate for I/O unit only)

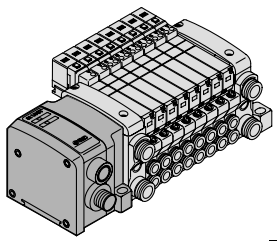
Input block type (Indicate for I/O unit only)

Input block COM (Indicate for I/O unit only)

Options

Refer to manifold specification sheet on pages 23 to 26 for detailed information on models.

S Kit (Decentralized wiring type serial transmission kit)



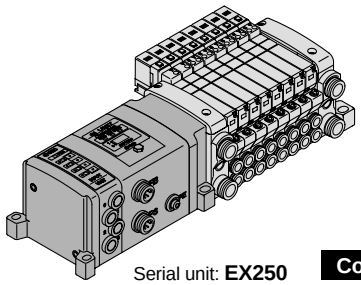
Serial unit: **EX500**

Conforms to IP67

Note) A separate gateway unit and communication cable are required.

SD0	Serial kit without SI unit	1 to 8 stations (16 stations)
SDA1	Serial kit for Remote I/O	
SDA2	Serial kit for DeviceNet/PROFIBUS-DP	

S Kit (I/O serial transmission kit)

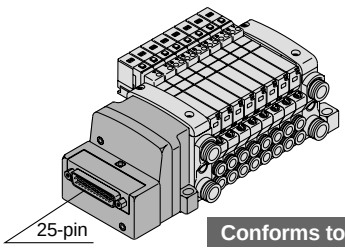


Serial unit: **EX250**

Conforms to IP67

SD0	Serial kit without SI unit	1 to 12 stations (24 stations)
SDQ	Serial kit for DeviceNet	
SDN	Serial kit for PROFIBUS-DP	

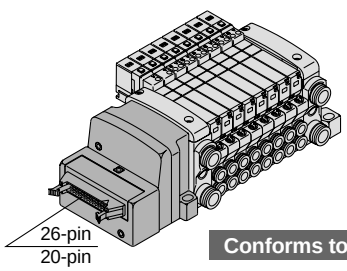
F Kit (D-sub connector kit)



Conforms to IP40

FD0	D-sub connector kit (25P) without cable	1 to 12 stations (24 stations)
FD1	D-sub connector kit (25P) with 1.5m cable	
FD2	D-sub connector kit (25P) with 3.0m cable	
FD3	D-sub connector kit (25P) with 5.0m cable	

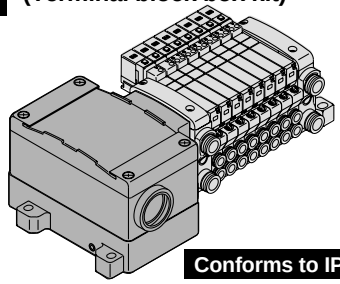
P Kit (Flat ribbon cable kit)



Conforms to IP40

PD0	Flat ribbon cable kit (26P) without cable	1 to 12 stations (24 stations)
PD1	Flat ribbon cable kit (26P) with 1.5m cable	
PD2	Flat ribbon cable kit (26P) with 3.0m cable	
PD3	Flat ribbon cable kit (26P) with 5.0m cable	
PDC	Flat ribbon cable kit (20P) without cable	1 to 9 stations (18 stations)

T Kit (Terminal block box kit)



Conforms to IP67

TD0	Terminal block box kit	1 to 10 stations (20 stations)

How to Order Valves

VQC 1 1 0 0 ☐ — 5 ☐ ☐

Series

1	VQC1000
2	VQC2000

Type of actuation

1	2-position single	A Note)	4-position dual 3-port valve (A)
2	2-position double (metal)	B Note)	4-position dual 3-port valve (B)
	2-position double (rubber)	C Note)	4-position dual 3-port valve (C)
3	3-position closed center		
4	3-position exhaust center		
5	3-position pressure center		

Note) For rubber seal type only.

Seal type

0	Metal seal
1	Rubber seal

Coil voltage

5	24VDC
6	12VDC

Function

Nil	Standard type (1W)
K Note 1)	High voltage type (1.0MPa)
N	Negative COM
R	External pilot
Y	Low-wattage type (0.5W)

Note 1) For metal seal type only.
Note 2) When specifying more than one option, enter symbols in alphabetical order.

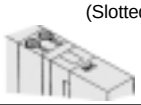
Light/Surge voltage suppressor

Nil	With
E	Without Note)

Note) Not applicable to S Kit.

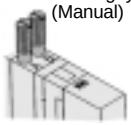
Manual override

Nil: Non-locking push type (Slotted)



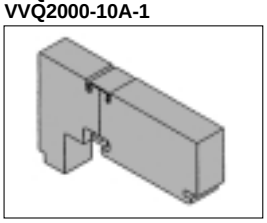
B: Locking type (Slotted)

C: Locking type (Manual)

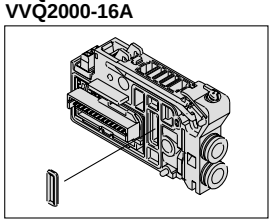


Manifold Options

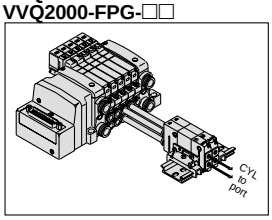
Blanking plate assembly
VVQ1000-10A-1
VVQ2000-10A-1



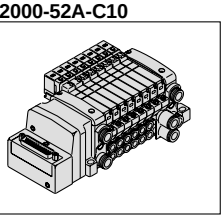
SUP block plate
VVQ1000-16A
VVQ2000-16A



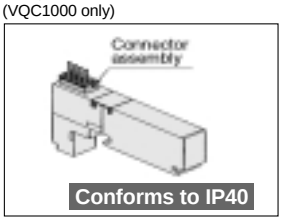
Perfect block
VVQ1000-FPG-☐☐
VVQ2000-FPG-☐☐



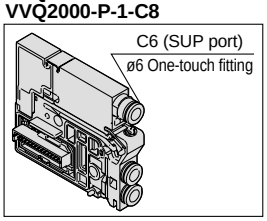
Dual flow fitting assembly
VVQ1000-52A-C8
VVQ2000-52A-C10



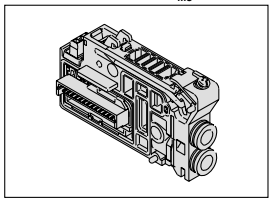
Blanking plate with connector
VVQ1000-1C☐-☐
(VQC1000 only)



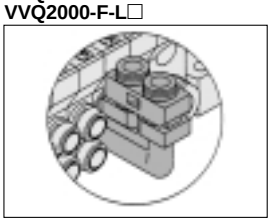
Individual SUP spacer
VVQ1000-P-1-C6
VVQ2000-P-1-C8



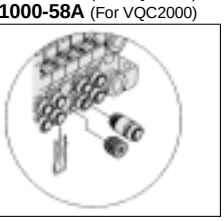
EXH block plate assembly
VVQC1000-19A- $\begin{matrix}D\\S\end{matrix}\begin{matrix}C3\\C4\\C6\\M5\end{matrix}$



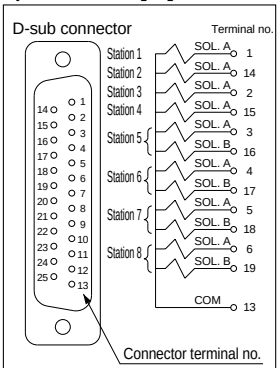
Elbow fitting assembly
VVQ1000-F-L☐
VVQ2000-F-L☐



Port plug
VVQ0000-58A (For VQC1000)
VVQ1000-58A (For VQC2000)

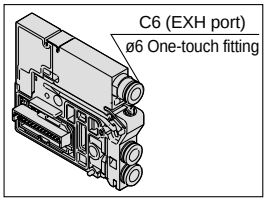


Electrical wiring specifications [-K]

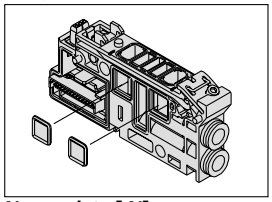


Standard manifolds are for double wiring, but mixed wiring (single and double wiring) can be specified as options.

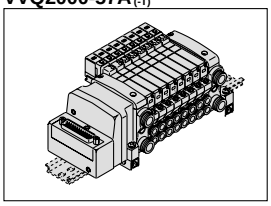
Individual EXH spacer
VVQ1000-R-1-C6
VVQ2000-R-1-C8



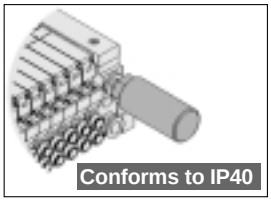
EXH block plate
VVQ2000-19A



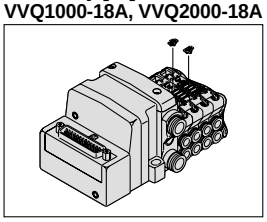
DIN rail mounting bracket [-D]
VVQ1000-57A (-S) (-T)
VVQ2000-57A (-S) (-T)



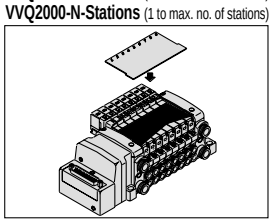
Silencer (EXH port)
AN200-KM8 (For VQC1000)
AN200-KM10 (For VQC2000)



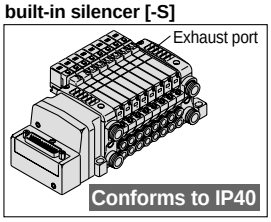
Back pressure check valve Assembly [-B]
VVQ1000-18A, VVQ2000-18A



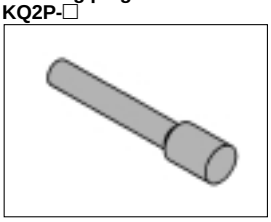
Name plate [-N]
VVQ1000-N-Stations (1 to max. no. of stations)
VVQ2000-N-Stations (1 to max. no. of stations)



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



Blanking plug
KQ2P-☐



Plug-in Unit

How to Order Manifolds

VV5QC 4 1 — 08 02 TD0 ····· T Kit

VV5QC 4 1 — 16 03 SDQW ····· S Kit

Series

4	VQC4000

Manifold type

1	Plug-in unit

Stations

Cylinder port size

Kit designation/Electrical entry

Options

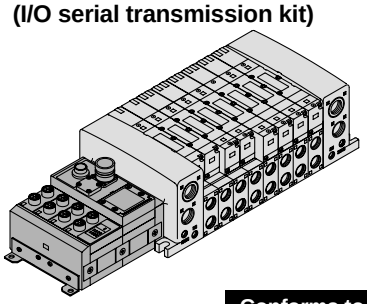
Input block COM
(Indicate for I/O unit only)

Number of input blocks
(Indicate for I/O unit only)

SI unit COM

Refer to manifold specification sheet on pages 27 and 28 for detailed information on models.

S **Kit**
(I/O serial transmission kit)

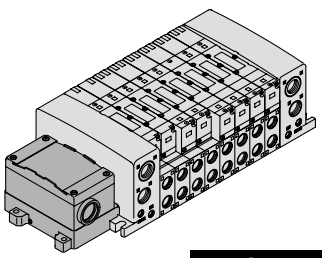


Serial unit: **EX240**

Conforms to IP67

SD0	Serial kit without SI unit	1 to 16 stations
SDQW	Serial kit for DeviceNet	
SDNW	Serial kit for PROFIBUS-DP	

T **Kit**
(Terminal block box kit)



Conforms to IP67

TD0	Terminal block box kit	1 to 10 stations (16 stations)

How to Order Valves

VQC 4 1 0 0 ☐ – 5 ☐ ☐

Series

4	VQC4000

Type of actuation

1	2-position single
2	2-position double (metal)
	2-position double (rubber)
3	3-position closed center
4	3-position exhaust center
5	3-position pressure center
6	3-position perfect

Seal type

0	Metal seal
1	Rubber seal

Function

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

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

Coil voltage

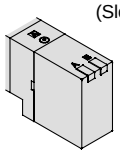
5	24VDC

Light/Surge voltage suppressor

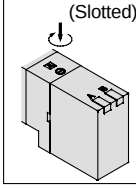
Nil	With
E	Without light, with surge voltage supressor

Manual override

Nil: Non-locking push type (Slotted)

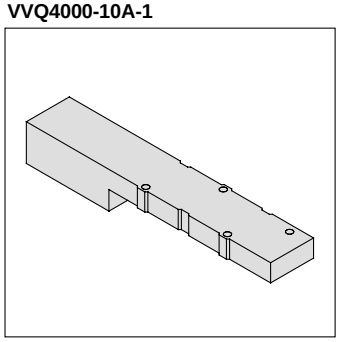


B: Locking type (Slotted)

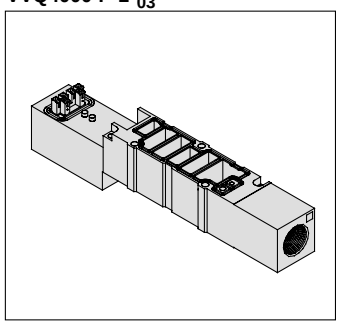


Manifold Options

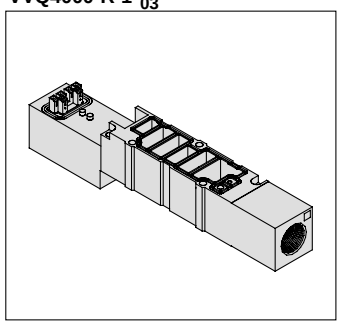
Blanking plate assembly
VVQ4000-10A-1



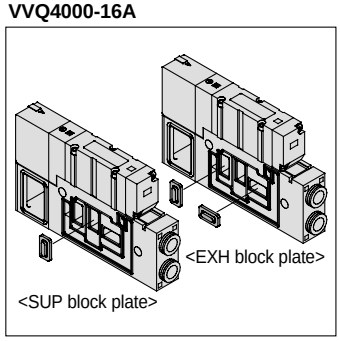
Individual SUP spacer
VVQ4000-P-1-$^{02}_{03}$



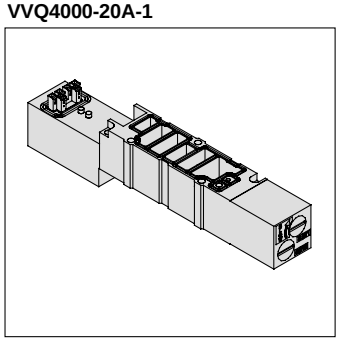
Individual EXH spacer
VVQ4000-R-1-$^{02}_{03}$



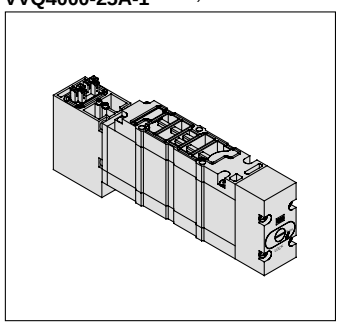
SUP/EXH block plate
VVQ4000-16A



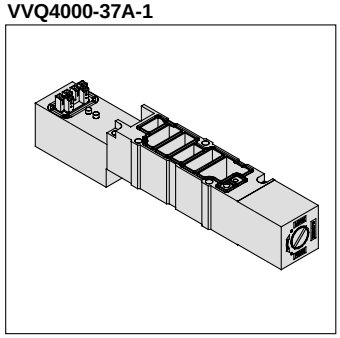
Throttle valve spacer
VVQ4000-20A-1



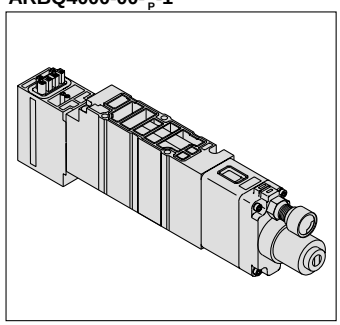
Residual pressure release valve perfect spacer
VVQ4000-25A-1 Note 1)



SUP stop valve spacer
VVQ4000-37A-1



Interface regulator
ARBQ4000-00-$^{A}_{B}$-1



Note1) Perfect spacers with residual pressure release valve cannot be combined with external pilot specifications.

Series VQC Base-Mounted Type
Plug-in Unit

Models

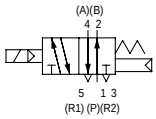
Series	No. of solenoids		Model		Flow characteristics 1→4, 2 (P→A, B) C[dm³/(s·bar)]	b	Cv	Flow characteristics 4, 2→5, 3 (A, B→R1, R2) C[dm³/(s·bar)]	b	Cv	Response time Note 2) ms Standard: 1W	Low wattage	Weight g
VQC1000	2-position	Single	Metal seal	VQC1100	0.70	0.15	0.16	0.72	0.25	0.18	12 or less	15 or less	64
			Rubber seal	VQC1101	0.85	0.20	0.21	1.0	0.30	0.25	15 or less	20 or less	
		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	
		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	VQC1A/B/C01	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	
		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	
		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	VQC2A/B/C01	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	
		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	
			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	280
			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	
		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

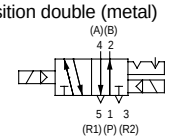
Note 2) Values represented in this column are based on JISB8375-1981 (operating with clean air and a supply pressure of 0.5MPa. Equipped with light and surge voltage suppressor. Values vary depending on the pressure as well as the air quality.) Values for double types are when the switch is ON.

Symbols

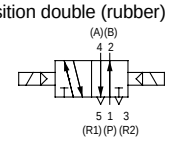
2-position single



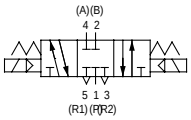
2-position double (metal)



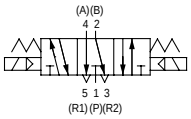
2-position double (rubber)



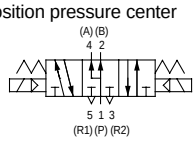
3-position closed center



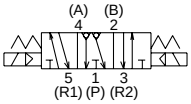
3-position exhaust center



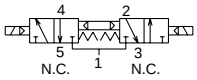
3-position pressure center



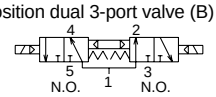
3-position perfect



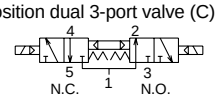
4-position dual 3-port valve (A)



4-position dual 3-port valve (B)



4-position dual 3-port valve (C)



Standard Specifications

Valve specifications	Valve Configuration			Metal seal	Rubber seal
	Fluid			Air/Inert gas	
	VQC1000/2000	Max. operating pressure		0.7MPa (High pressure type: 1.0MPa) Note 4)	
		Min. operating pressure	Single	0.1MPa	0.15MPa
			Double	0.1MPa	
			3-position	0.1MPa	0.2MPa
			4-position	—	0.15MPa
	VQC4000	Max. operating pressure Note 3)		1.0MPa (0.7MPa)	
		Min. operating pressure	Single	0.15MPa	0.2MPa
			Double	0.15MPa	
			3-position	0.15MPa	0.2MPa
	Proof pressure			1.5MPa	
	Ambient and fluid temperature			–10° to 50°C Note 1)	
	Lubrication			Not required	
	Manual override			Push type/Locking type (tool required) optional	
	Impact resistance/Vibration resistance			150/30 m/s² Note 2)	
	Enclosure			Dust proof (conforms to IP67)	
Electrical specifications	Rated coil voltage			24VDC	
	Allowable voltage fluctuation			±10% of rated voltage	
	Coil insulation type			Equivalent to B type	
	Power consumption (Current)		24VDC	1W DC (42mA), 0.5W DC (21mA)	

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 8.3 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 (0.5W) specification.

Note 4) Metal seal type only.

Manifold Specifications

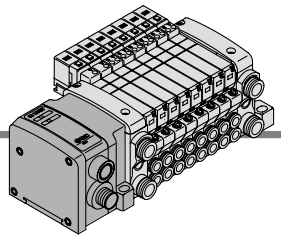
Series	Base model	Connection type	Piping specifications			Applicable stations Note 2)	Applicable solenoid valves	5-station weight (g)
			Port direction	Port size Note 1)				
				1, 3 (P, R)	2, 4 (A, B)			
VQC1000	VV5QC11-□□□	■ F Kit: D-sub connector ■ P Kit: Flat ribbon cable ■ T Kit: Terminal block box ■ S Kit: Serial transmission	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 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-□□□	■ F Kit: D-sub connector ■ P Kit: Flat ribbon cable ■ T Kit: Terminal block box ■ S Kit: Serial transmission	Side	C10 (for ø10) Options: Direct outlet with built-in silencer	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-□□□	■ T Kit: Terminal block box ■ S Kit: Serial transmission	Side	P: Rc 1/2 R: Rc 3/4	C8 (for ø8) C10 (for ø10) C12 (for ø12) Rc 1/4 Rc 3/8	(T Kit 1 to 10 stations) (S Kit 1 to 16 stations)	VQC4□00-5 VQC4□01-5	4150 • S Kit (without unit) • Solenoid weight 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

Kit (Serial Transmission Kit) Decentralized Serial wiring Conforms to IP67



Gateway type serial transmission system

- **Since wiring is "prepackaged" into one multi-connector type cable, wiring work is not only made easier, but much more accurate.**

S Kit can be used by connecting to gateway unit.

Gateway (GW) Unit

How to Order

EX500 – G DN 1

Communication protocol

DN	DeviceNet
PR	PROFIBUS-DP
AB	Remote I/O (RIO)

Applicable GW unit

Nil	DeviceNet PROFIBUS-DP
-X1	Remote I/O (RIO)

Specifications

Model	EX500-GAB1-X1	EX500-GDN1	EX500-GPR1
Applicable PLC Communication protocol	Rockwell·Automation PLC	DeviceNet Release 2.0	PROFIBUS-DP
Communication speed	57.6Kbit/sec, 115.2Kbit/sec 230.4Kbit/sec	125Kbit/sec, 250Kbit/sec 500Kbit/sec	9.6, 19.2, 93.75, 187.5, 500Kbit/sec 1.5, 3, 6, 12Mbit/sec
Rated voltage	24VDC		
Power supply voltage range	Input and control unit power supply: 24VDC ±10% Solenoid valve power supply: 24VDC +10%/–5% (with power drop warning at approx. 20V)		
Current consumption	200mA or less		
Number of inputs/outputs	Maximum 64 inputs/64 outputs		
Number of input/output branches	4 branches (16 inputs/16 outputs per branch)		
Branch cable	8-core heavy-duty cable		
Branch cable length	5m or less (total extension 10m or less)		
Communication connector	M12 connector (8-pin, socket)		
Power connector	M12 connector (5-pin, plug)		
Ambient operating temperature and humidity	+5° to +45°C at 35% to 85% RH (no condensation)		
Enclosure	IP65		
Applicable standard	UL, CSA, CE		

∗ Communication cables and communication connectors are sold separately.

Input Block

Note) When ordering an input block manifold, enter the Input manifold part no. + Input block part no. together. The input block, end block and DIN rail are included in the input manifold.

How to Order Input Manifold

EEX500 – IB1 – E 8

Input unit specifications

Connector type

E	M8 connector
T	M12 connector
M	M8 and M12 mixed

Stations

1	1 station
⋮	⋮
8	8 stations

Applicable GW unit

Nil	DeviceNet PROFIBUS-DP
-X1	Remote I/O (RIO)

How to Order Input Block

EX500 – IE 1

Block type

1	M8 connector, PNP specifications
2	M8 connector, NPN specifications
3	M12 connector, PNP specifications
4	M12 connector, NPN specifications
5	8-point integrated type, M8 connector, PNP specifications
6	8-point integrated type, M8 connector, NPN specifications

Applicable GW unit

Nil	DeviceNet PROFIBUS-DP
-X1	Remote I/O (RIO)

∗ With waterproof cap

Input block specifications

Connection block	Current source type input block (PNP input block) or Current sink type input block (NPN input block)
Communication connector	M12 connector (8-pin, plug)
Number of connection blocks	Maximum 8 blocks
Block supply voltage	24VDC
Block supply current	0.65A maximum
Current consumption	100mA or less (at rated voltage)
Short circuit protection	Operates at 1A Typ. (power supply cut) GW unit reset by turning power OFF and back ON.

Input block specifications

Applicable sensor	Current source type (PNP output) or Current sink type (NPN output)
Sensor connector	M8 connector (3-pin) or M12 connector (4-pin)
Number of inputs	2 inputs/8 inputs (M8 only)
Rated voltage	24VDC
Indication	Green LED
Insulation	None
Sensor supply current	Maximum 30mA/Sensor

Cables

How to Order Cable with M12 Connector

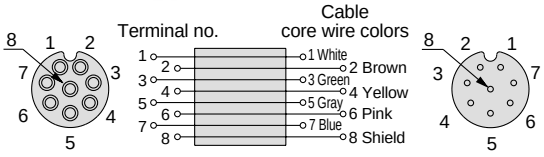
EX500 – AC 030 – SSPS

Cable length

003	0.3m
005	0.5m
010	1m
030	3m
050	5m

Connector specifications

SSPS	Socket side: Straight Plug side: Straight
SAPA	Socket side: Angle Plug side: Angle



Socket connector pin arrangement | Connections | Plug connector pin arrangement

How to Order Power Cable with Connector

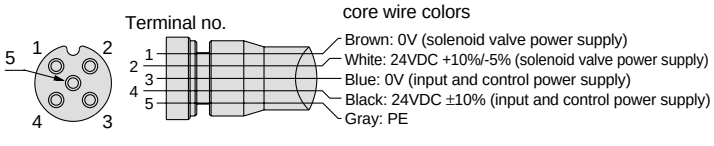
EX500 – AP 050 – S

Cable length

010	1m
050	5m

Connector specifications

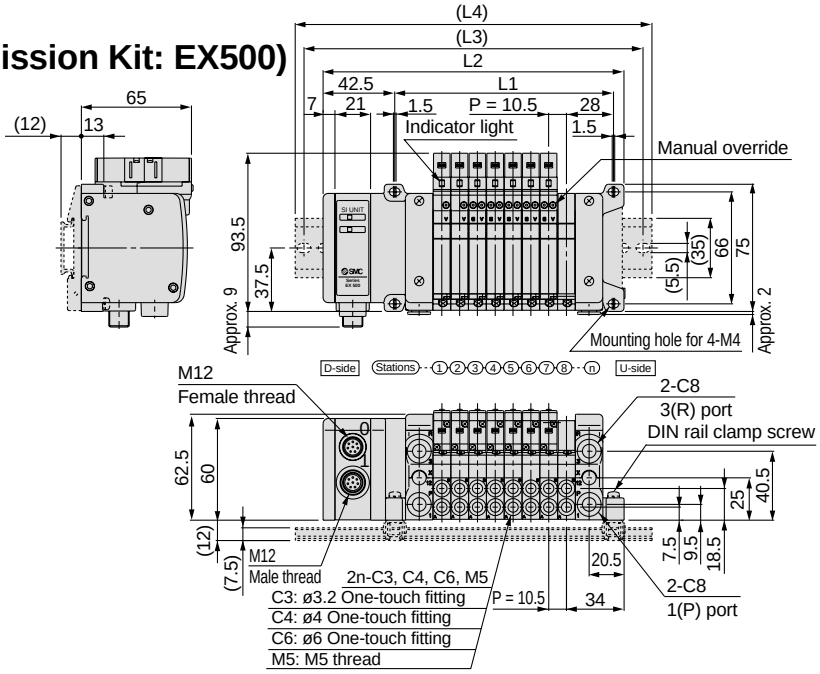
S	Straight
A	Angle



Socket connector pin arrangement | Connections

SMC

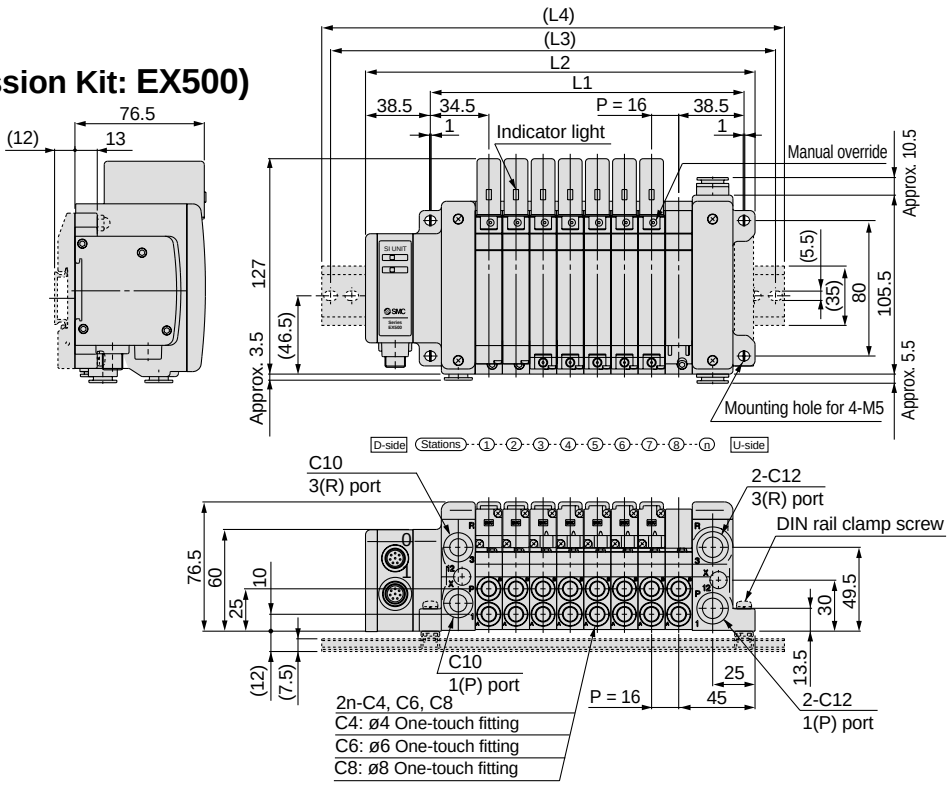
VV5QC11
S Kit (Serial Transmission Kit: EX500)



Formulas: 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

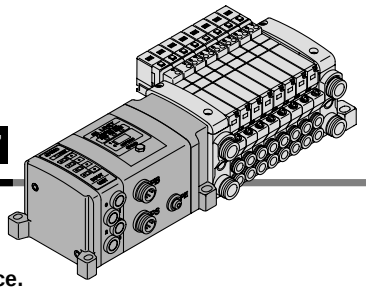
VV5QC21
S Kit
(Serial Transmission Kit: EX500)



Formulas: 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 VQC1000/2000
Kit (Serial Transmission Kit) for I/O Conforms to IP67



Compatible network DeviceNet/PROFIBUS-DP

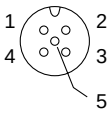
• The serial transmission system greatly reduces connection work, minimizes wiring, and saves space.

DeviceNet/PROFIBUS compatible SI unit
As a DeviceNet/PROFIBUS slave unit, this kit is capable of solenoid valve ON and OFF control up to 32 points.
Furthermore, by connecting an input block, a maximum 32 sensor signal inputs are possible.

Input block
This expansion block connects to the SI unit and allows for sensor input to the auto switches.
Each input block can receive input from up to two or four sensors, and the common can be matched to the sensor by an NPN/PNP selector switch.
Input connectors are available in both M8 and M12 types.

Connector Details

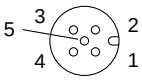
● Input connector: M12, 5 pins (receptacle)
Cable side connector example: OMRON Corporation XS2G
2-input block (EX250-IE1)
4-input block (EX250-IE2)



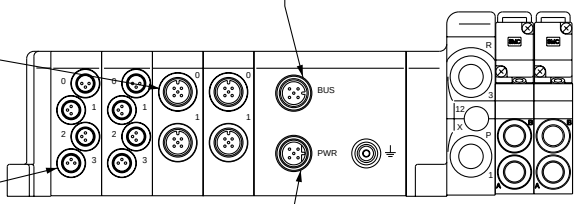
No.	Description	Function
1	SW+	(+) Sensor power supply
2*	N.C. (SIGNAL)	Open
3	SW–	(–) Sensor power supply
4	SIGNAL	Sensor input signal
5	E	Sensor ground

∗ In the case of 4-input block unit (EX250-IE2), this is the sensor input signal.

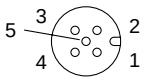
● Communication connector DeviceNet: M12, 5 pins (for plug and DeviceNet only)
Example of corresponding cable assemblies with connector:
OMRON Corporation DCA1-5CN05F1, Karl Lumberg GmbH & Co. KG RKT5-56



No.	Description	Function
1	Drain	Drain/Shield
2	V+	(+) Circuit power supply
3	V–	(–) Circuit power supply
4	CAN_H	Signal H
5	CAN_L	Signal L



● Communication connector (PROFIBUS-DP): M12, 5 pins (plug)

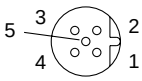


No.	Description	Function
1	VP	Terminal +5V
2	R x D/T x D(N)	Signal –N
3	DGND	GND terminal
4	R x D/T x D(P)	Signal –P
5	SHIELD	Shield ground

● Input connector: M8, 3 pins (receptacle)
Cable side connector example: Franz Binder GesmbH
718,768 series
4-input block (EX250-IE3)

No.	Description	Function
1	24V	(+) Sensor power supply
3	0V	(–) Sensor power supply
4	IN	Sensor input signal

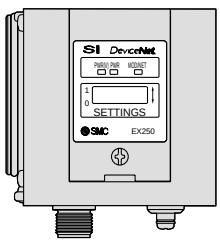
● Power connector: M12, 5 pins
(Boss configuration differs from plug and communication connector.)
Example of corresponding cable assemblies with connector:
Hans Turck FmbH & Co. KG SAKW4.5T-2.



No.	Description	Function
1	SV24V	For solenoid valve +24V
2	SV0V	For solenoid valve 0V
3	SW24V	For sensor unit +24V
4	SW0V	For sensor unit 0V
5	E	Ground

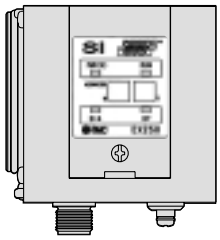
Indicator Unit (LED) Description and Function

■ SI unit (DeviceNet)



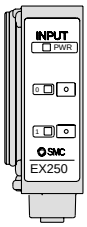
Description	Function
PWR(V)	ON when solenoid valve power supply is turned ON.
PWR	ON when DeviceNet circuit power supply input is turned ON.
MOD/NET	OFF: Power supply off, off line, or when checking duplication of MAC_ID.
	GREEN BLINKING: Waiting for connection (on line).
	GREEN ON: Connection established (on line).
	RED BLINKING: Connection time out (minor communication abnormality).
	RED ON: MAC_ID duplication error, or BUSOFF error (major communication abnormality).

■ SI unit (PROFIBUS-DP)

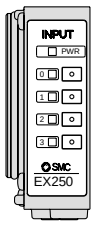


Description	Function
PWR(V)	ON when solenoid valve power supply is turned ON. OFF when the power supply voltage is less than 19V.
RUN	ON when operating (SI unit power supply is ON).
DIA	ON when the self diagnosis device detects abnormality.
BF	ON for BUS abnormality.

■ Input block



2-input type
(EX250-IE1)

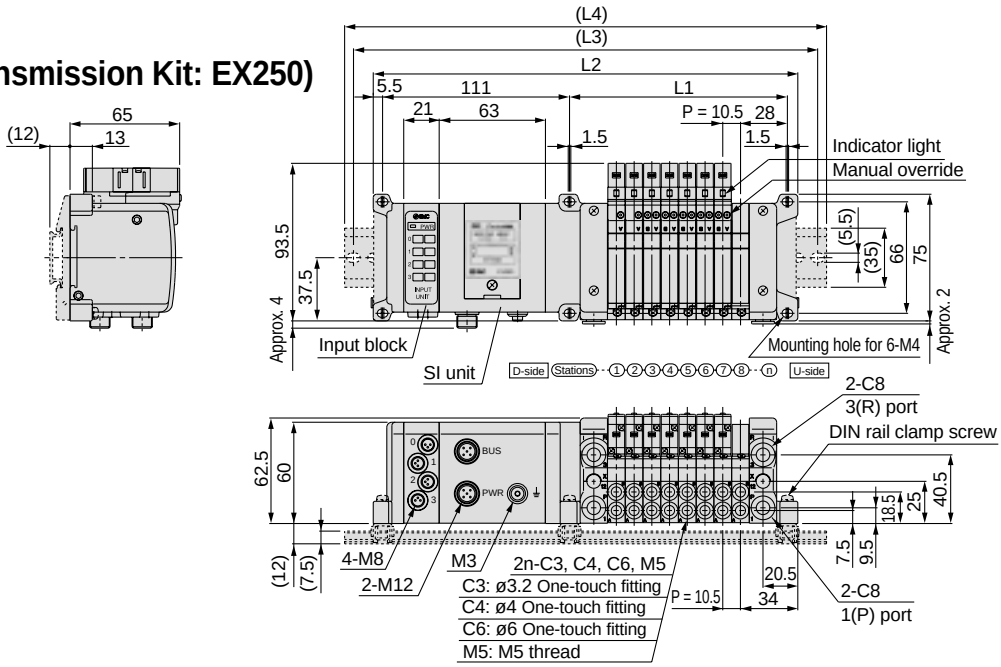


4-input type
(EX250-IE2/3)

Description	Function
PWR	ON when sensor power is turned ON.
0 to 1(3)	ON when each sensor input goes ON.

∗ Contact your SMC representative for specifications and handling precautions.

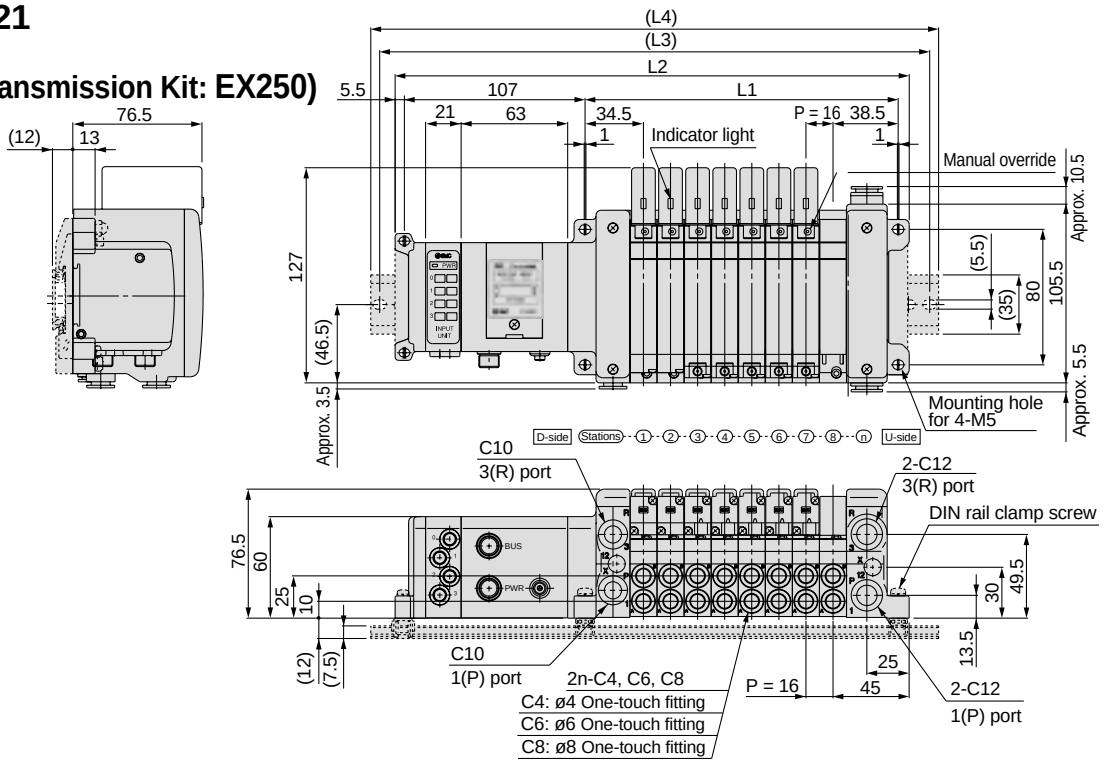
VV5QC11
S Kit
(Serial Transmission Kit: EX250)



Formulas: L1 = 10.5n + 45, L2 = 10.5n + 167.5 (for 1 input block. For each additional input block, add 21mm.) 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

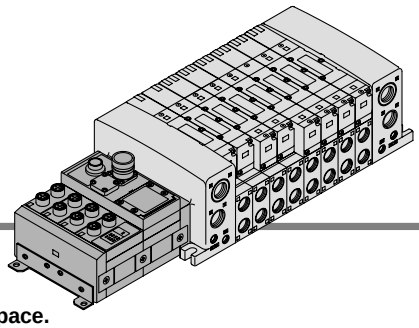
VV5QC21
S Kit
(Serial Transmission Kit: EX250)



Formulas: L1 = 16n + 57, L2 = 16n + 176 (for 1 input block. For each additional input block, add 21mm.) 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

S VQC4000
Kit (Serial Transmission Kit) for I/O Conforms to IP67



Compatible network DeviceNet/PROFIBUS-DP

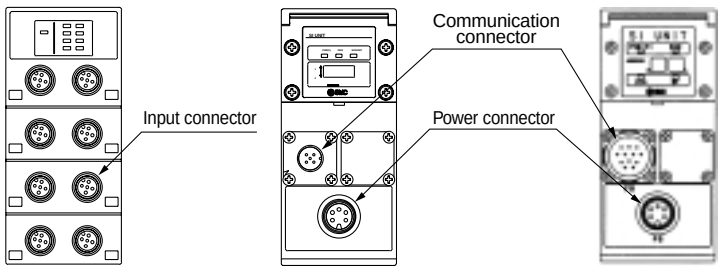
• The serial transmission system greatly reduces connection work, minimizes wiring, and saves space.

DeviceNet/PROFIBUS compatible SI unit
As a DeviceNet/PROFIBUS slave unit, this kit is capable of solenoid valve ON and OFF control up to 32 points.
Furthermore, by connecting a maximum of 4 input blocks, up to 32 sensor signal inputs are possible.

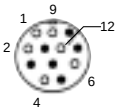
Input block
This expansion block connects to the SI unit and allows for sensor input to the auto switches.
Each input block can receive input from up to 8 sensors, and the common can be matched to the sensor by an NPN/PNP selector switch.

Connector Details

Input block **SI unit (DeviceNet)** **SI unit (PROFIBUS-DP)**



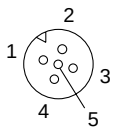
• Communication connector (PROFIBUS-DP): CONINVERS® RC-2RS1N12, 12 pins
Cable side connector example: Siemens AG 6ES5 760-2CB11



No.	Description	Function
1	M5V	GND Terminal
2	A	Signal –N
4	B	Signal –P
6	+5V	Terminal +5V
9	SHIELD	Shield ground
12	RTS	Optical fiber (reserve)

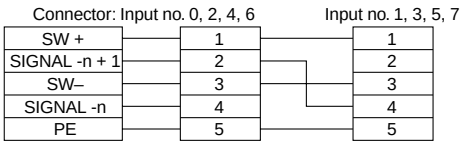
• Pin no. 3, 5, 7, 8, 10 and 11 marked with "●" are open.
∗ The connector configuration and the pin arrangement are compatible with Siemens AG ET200C.

• Input connector: M12, 5 pins (OMRON Corporation XS2F compatible) x 8 pcs.
Cable side connector example: OMRON Corporation XS2G

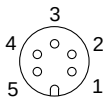


No.	Description	Function
1	SW +	(+) Sensor power supply
2	N.C.	Open∗
3	SW –	(–) Sensor power supply
4	SIGNAL	Sensor input signal
5	PE	Protective sensor ground

∗ The second pin of the connector with input no. 0, 2, 4, 6 (the connector at the right side of the input block) is connected internally to the fourth pin (sensor input no.) of the connector with input no. 1, 3, 5, 7. This makes it possible to directly input two inputs that are combined together by the common connector.

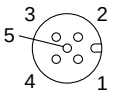


• Power connector: Franz Binder GesmbH Series723, 5 pins (72309-0115-80-05)
Cable side connector example: Franz Binder GesmbH 72309-0114-70-15, etc.
∗ DIN type 5 pins



No.	Description	Function
1	SV24V	For solenoid valve +24V
2	SV0V	For solenoid valve 0V
3	PE	Protective ground
4	SW24V	For solenoid valve +24V
5	SW0V	For solenoid valve 0V

• Communication connector (DeviceNet): M12, 5 pins (for DeviceNet only)
Example of corresponding cable assemblies with connector:
OMRON Corporation DCA1-5CN05F1, Karl Lumberg GmbH & Co. KG RKT5-56.



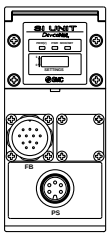
No.	Description	Function
1	Drain	Drain/Shield
2	V +	(+) Circuit power supply
3	V –	(–) Circuit power supply
4	CAN_H	Signal H
5	CAN_L	Signal L

Compatible with DeviceNet specification Micro Style connector.

⚠Caution
When IP65 or equivalent enclosures are required, install a waterproof cover on the input connector that is not being used. Order waterproof covers separately.
Example: OMRON Corporation XS2Z-12

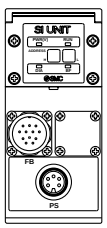
Indicator Unit (LED) Descriptions and Functions

■ SI unit (DeviceNet)



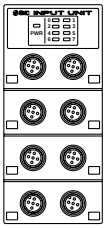
Description	Function
PWR(V)	ON when solenoid valve power supply is turned ON.
PWR	ON when DeviceNet circuit power supply input is turned ON.
MOD/NET	OFF: Power supply off, off line, or when checking duplication of MAC_ID.
	GREEN BLINKING: Waiting for connection (on line).
	GREEN ON: Connection established (on line).
	RED BLINKING: Connection time out (minor communication abnormality).
	RED ON: MAC_ID duplication error, or BUSOFF error (major communication abnormality).

■ SI unit (PROFIBUS-DP)



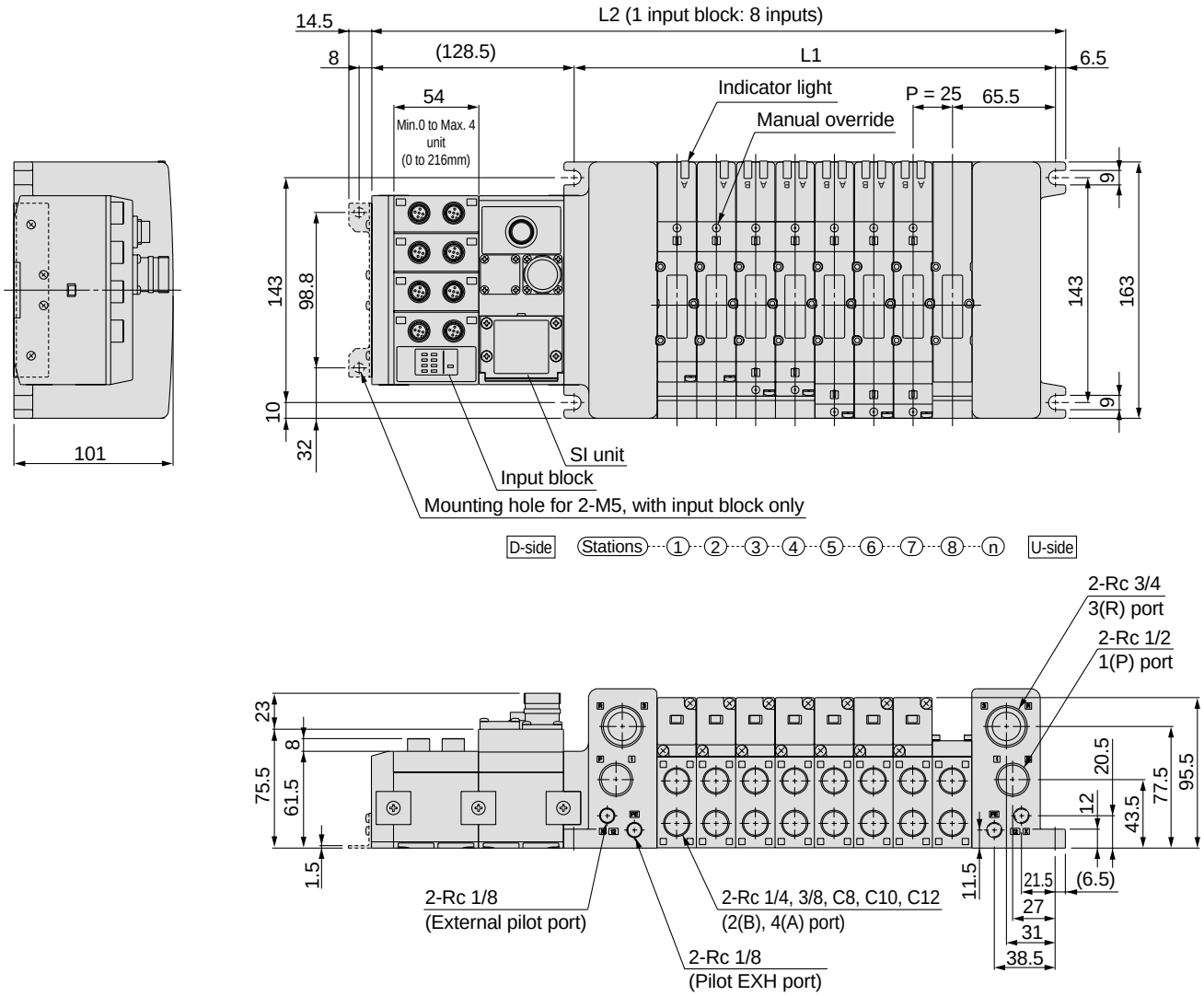
Description	Function
PWR(V)	ON when solenoid valve power supply is turned ON. OFF when the power supply voltage is less than 19V.
RUN	ON when operating (SI unit power supply is ON).
DIA	ON when self diagnosis device detects abnormality.
BF	ON for BUS abnormality.

■ Input block



Description	Function
PWR	ON when sensor power is turned ON. OFF when short circuit protection is working.
0 to 7	ON when each sensor input goes ON.

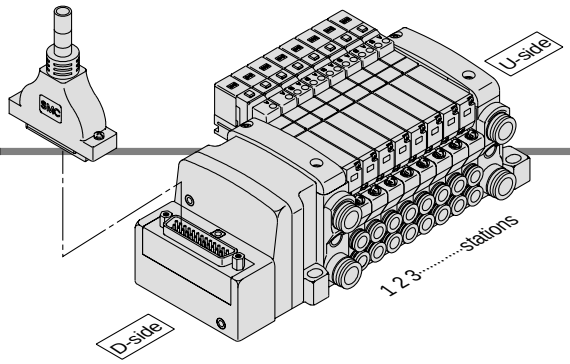
VV5QC41
S Kit (Serial Transmission Kit: EX240)



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

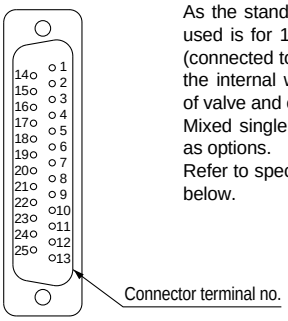
F VQC1000/2000
Kit (D-sub Connector Kit) Conforms to IP40



- 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.

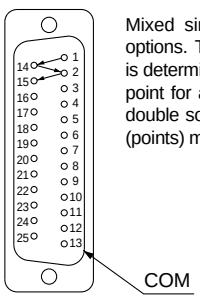
Lead wire colors for D-sub connector assemblies (AXT100-DS25-$^{015}_{030}_{050}$)

		Terminal no.	Polarity (–)	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	(+) Positive COM spec.	(–) Negative COM spec. Note)	Orange	Red

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

Special wiring specifications (options)

(For 25P)

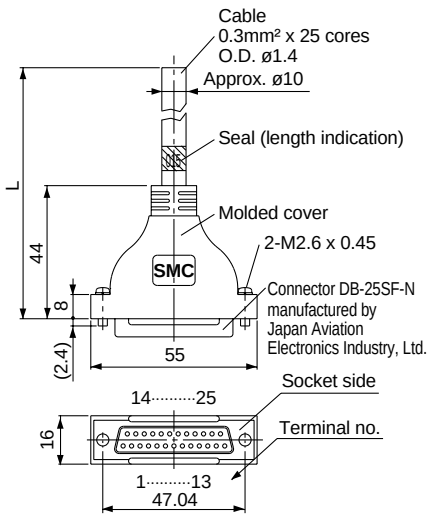


Mixed single and double wiring are available as options. The maximum number of manifold stations is determined by the number of solenoids. Count one point for a single solenoid type and two points for a double solenoid type. The total number of solenoids (points) must not exceed 24.

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 (optional)

Cable length (L)	Part no.	Note
1.5m	AXT100-DS25-015	Cable 0.3mm² x 25 cores
3m	AXT100-DS25-030	
5m	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.

Electrical characteristics

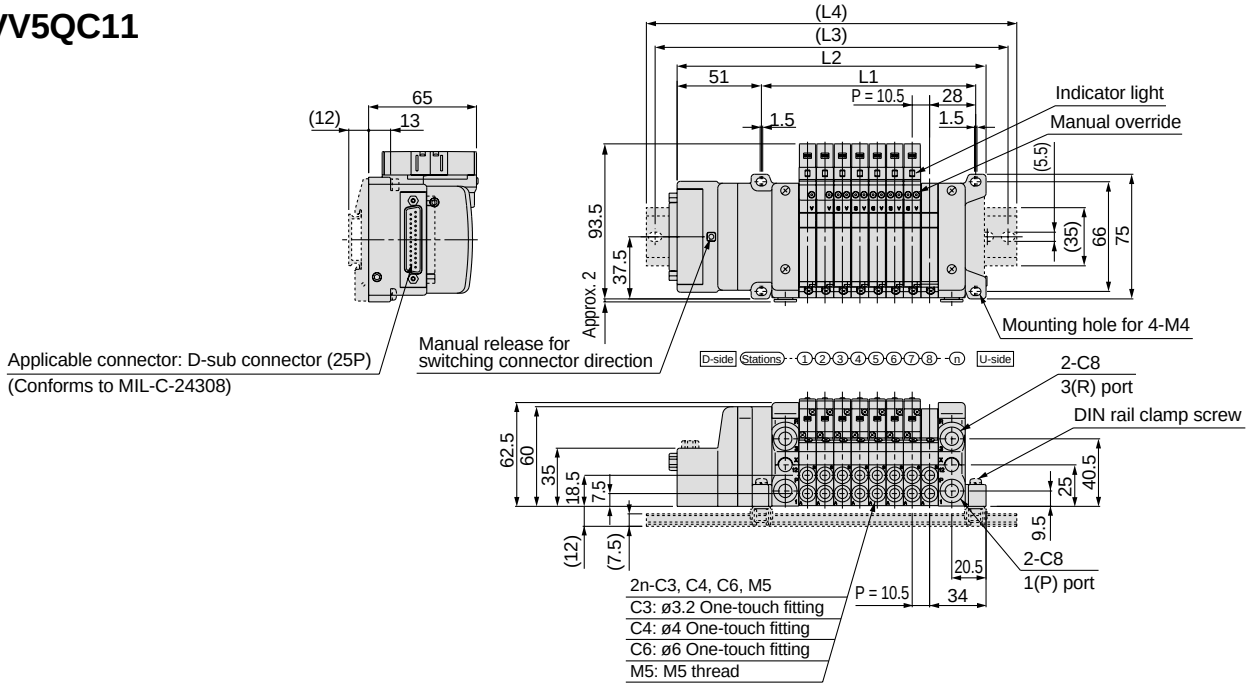
Item	Characteristic
Conductor resistance Ω/km, 20°C	65 or less
Withstand pressure V, 1 minute, AC	1000
Insulation resistance MΩ/km, 20°C	5 or more

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

Some connector manufacturers:

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

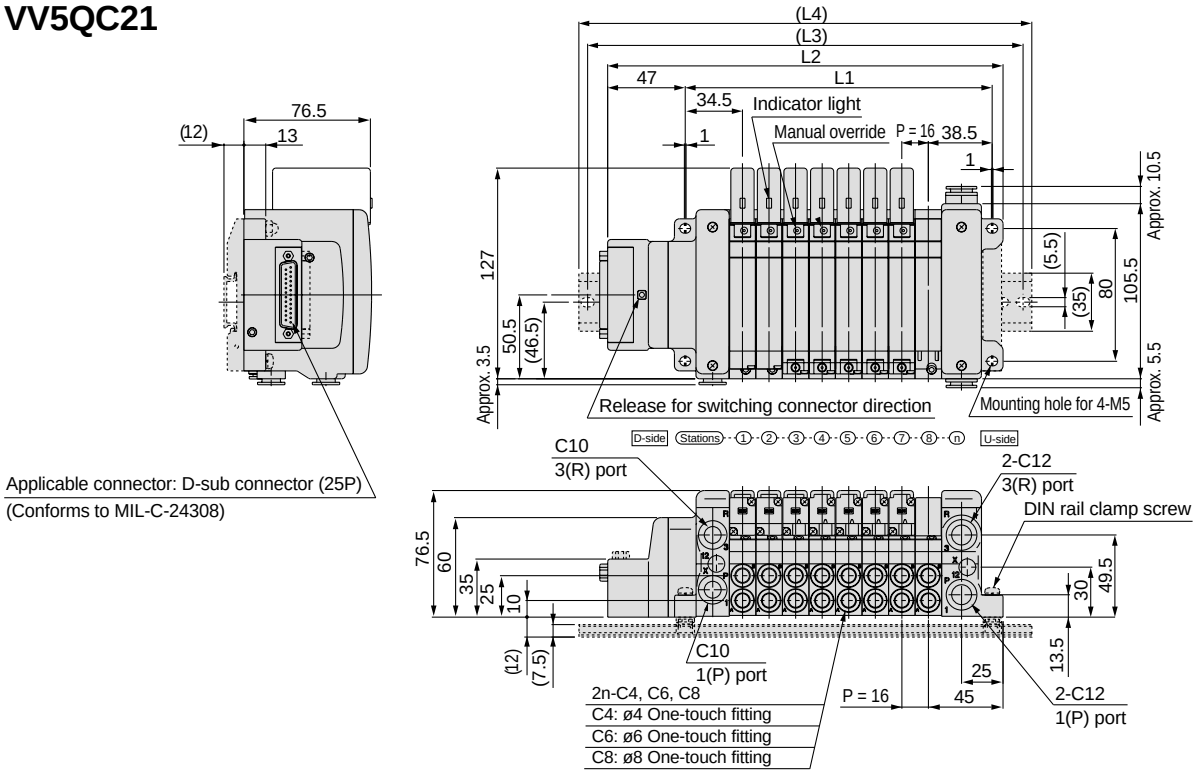
VV5QC11



Formulas: 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

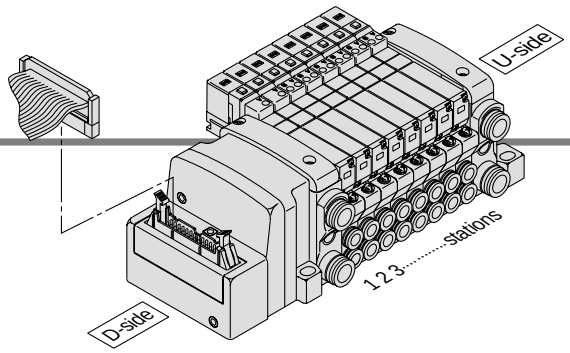
VV5QC21



Formulas: L1 = 16n + 57, L2 = 16n + 110.5 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	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

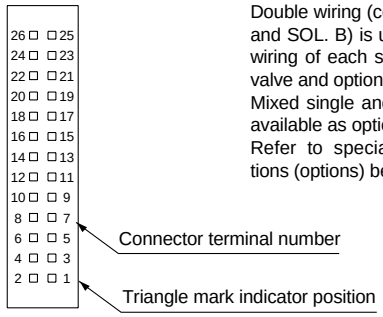
P VQC1000/2000
Kit (Flat Ribbon Cable Kit) Conforms to IP40



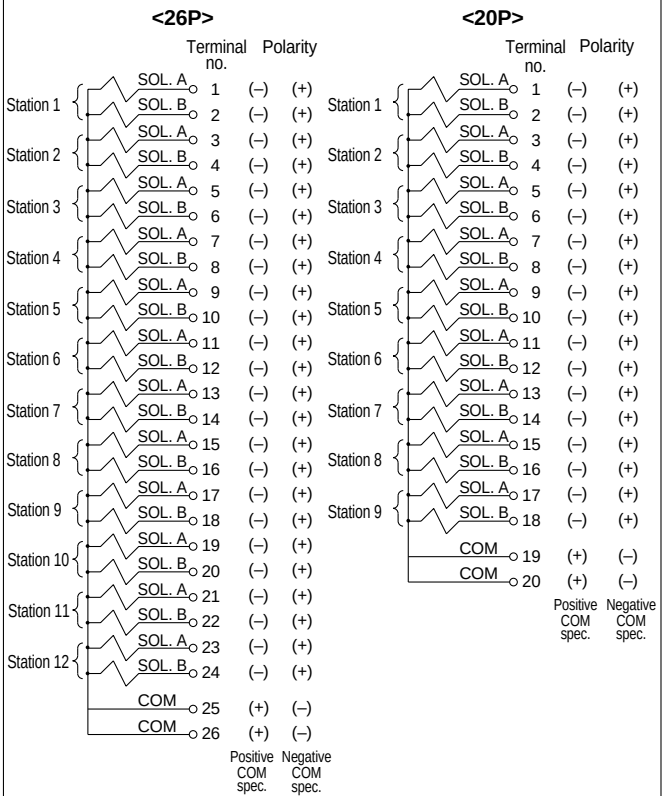
- Using our flat ribbon cable for electrical connections greatly reduces labor, while it also minimizes wiring and saves space.
- We use flat ribbon cables whose connectors (26P and 20P) conform to MIL standards, and are therefore widely compatible with many standard commercial models.
- Top or side 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



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.

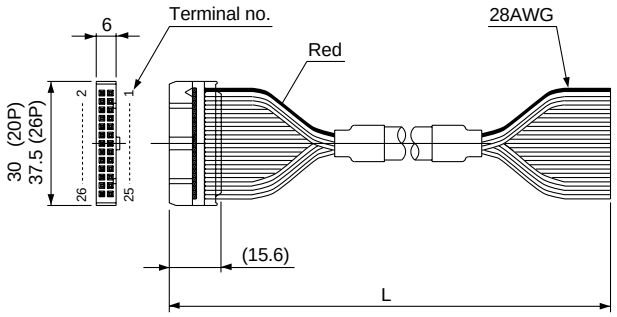


Note) When using the negative COM specification, use valves for negative COM.

Cable assembly

AXT100-FC $\begin{matrix}20\\26\end{matrix}$ **-** $\begin{matrix}1\\2\\3\end{matrix}$

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



Flat ribbon cable connector assemblies (optional)

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

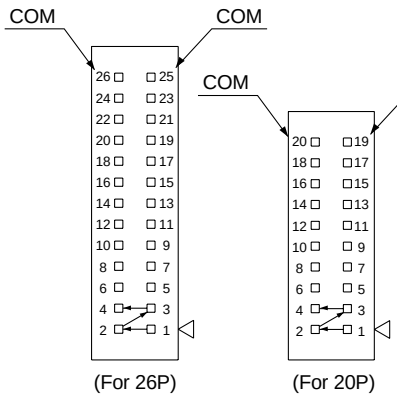
∗ When using a standard commercial connector, use a type 26P connector conforming to MIL-C-83503 or a type 20P with strain relief.

∗ Cannot be used for transfer wiring.

Some connector manufacturers:

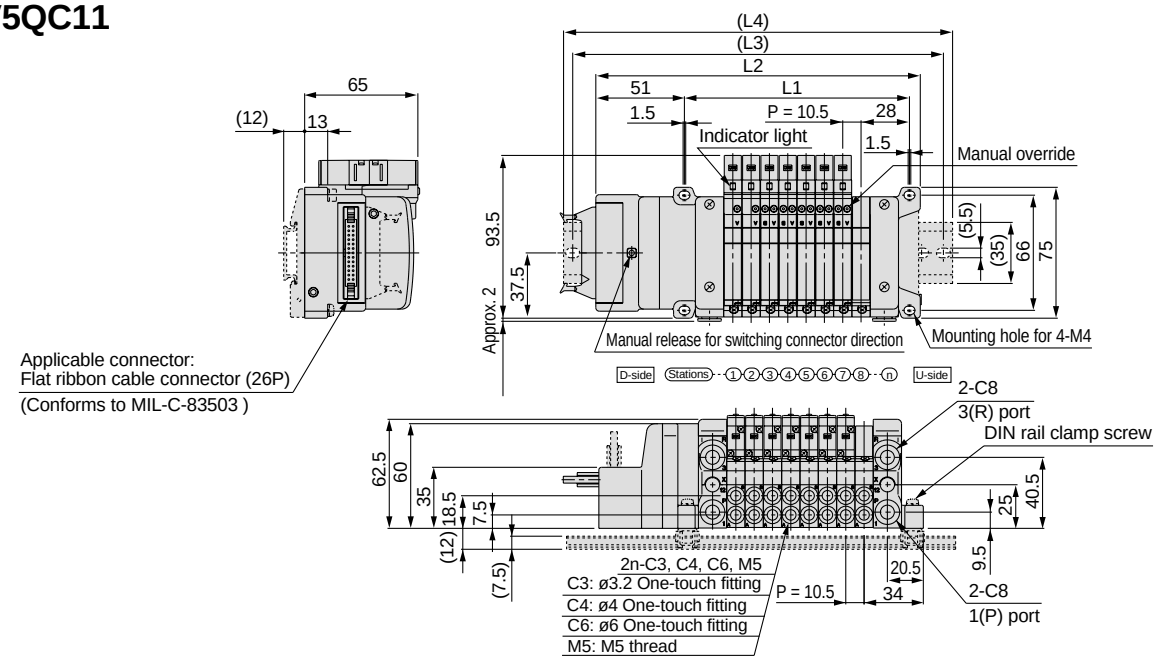
- HIROSE ELECTRIC CO., LTD.
- Sumitomo/3-M Limited
- Fujitsu, Ltd.
- Japan Aviation Electronics Industry, Ltd.
- J.S.T. Mfg. Co., Ltd.
- Oki Electric Cable Co., Ltd.

Special wiring specifications (options)



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.

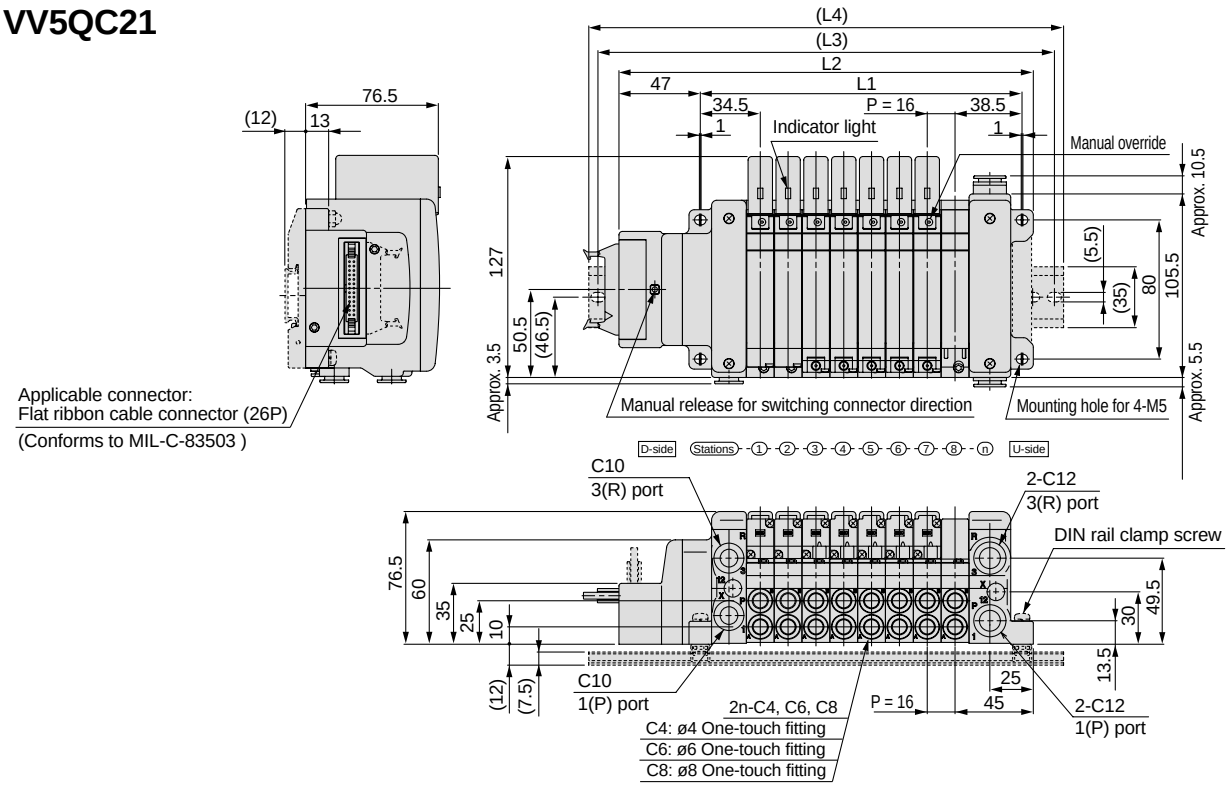
VV5QC11



Formulas: 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

VV5QC21

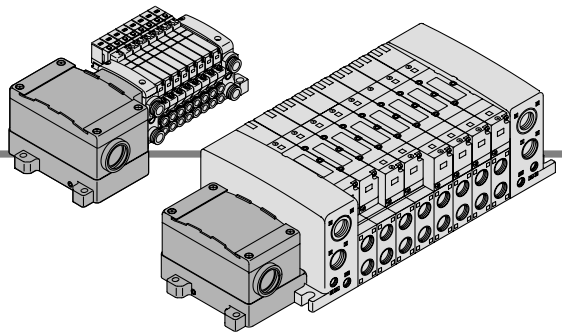


Formulas: L1 = 16n + 57, L2 = 16n + 110.5 n: Stations (maximum 24 stations)

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	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 VQC1000/2000/4000

Kit (Terminal Block Box Kit) Conforms to IP67

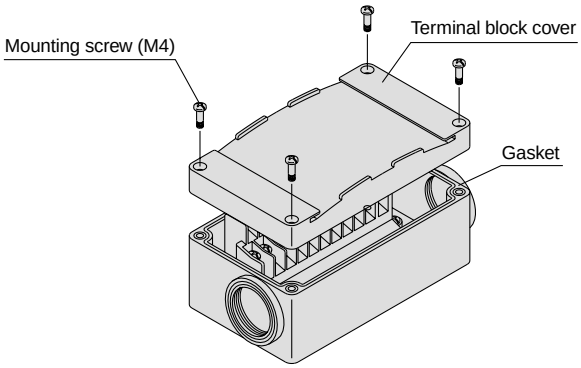


- **This kit has a small terminal block inside a junction box. The provision of a G3/4 electrical entry allows connection of conduit fittings.**

Terminal Block Connection

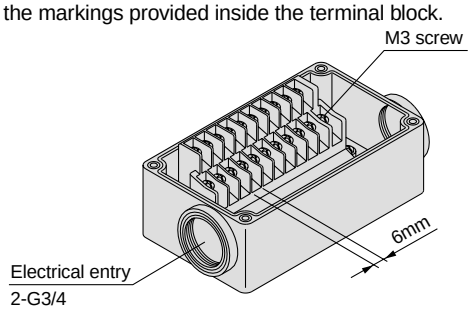
Step 1. How to remove terminal block cover

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



Step 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.



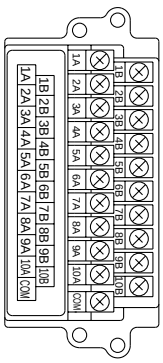
Step 3. How to replace the terminal block cover

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

• Applicable crimp terminal (fork tongue type): 1.25-3S, 1.25Y-3
1.25Y-3N, 1.25Y-3.5

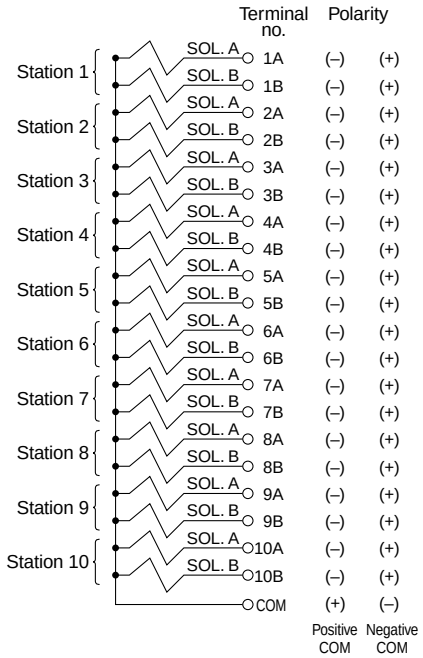
Electrical wiring specifications (conforms to IP67)



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) There is no polarity. This device can also be used as a negative common.

Standard wiring



Special wiring specifications (options)

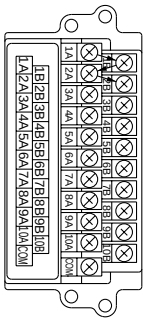
Mixed single and double wiring are available as options. The maximum number of manifold stations is determined by the number of solenoids. Count one point for a single solenoid type and two points for a double solenoid type. The total number of solenoids (points) must not exceed 20.

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.

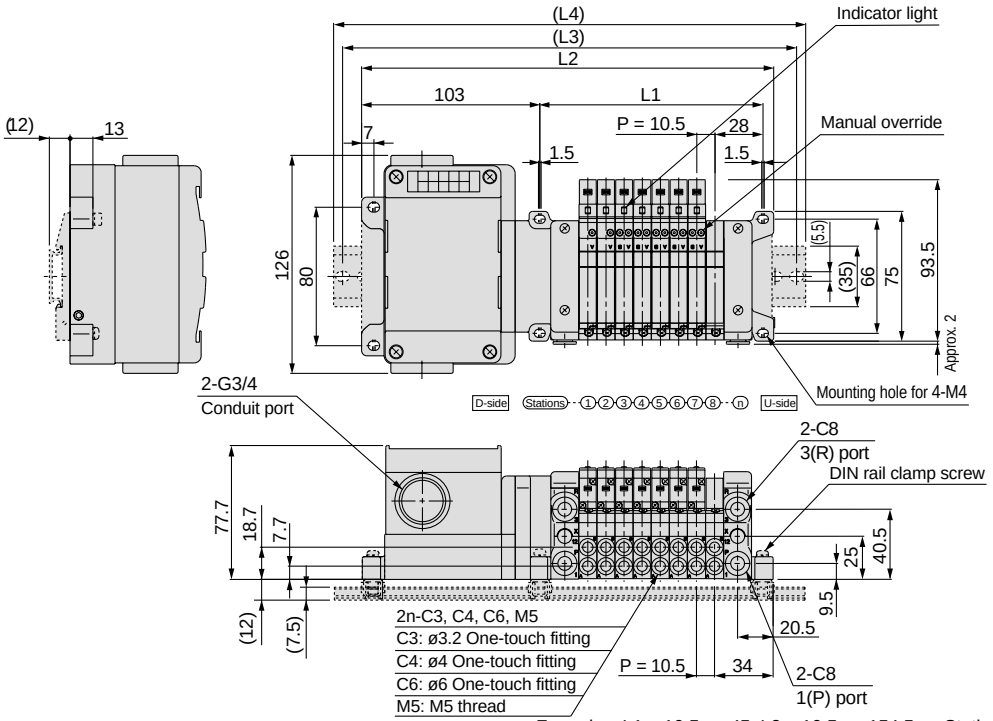
2. Wiring specifications

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.



SMC

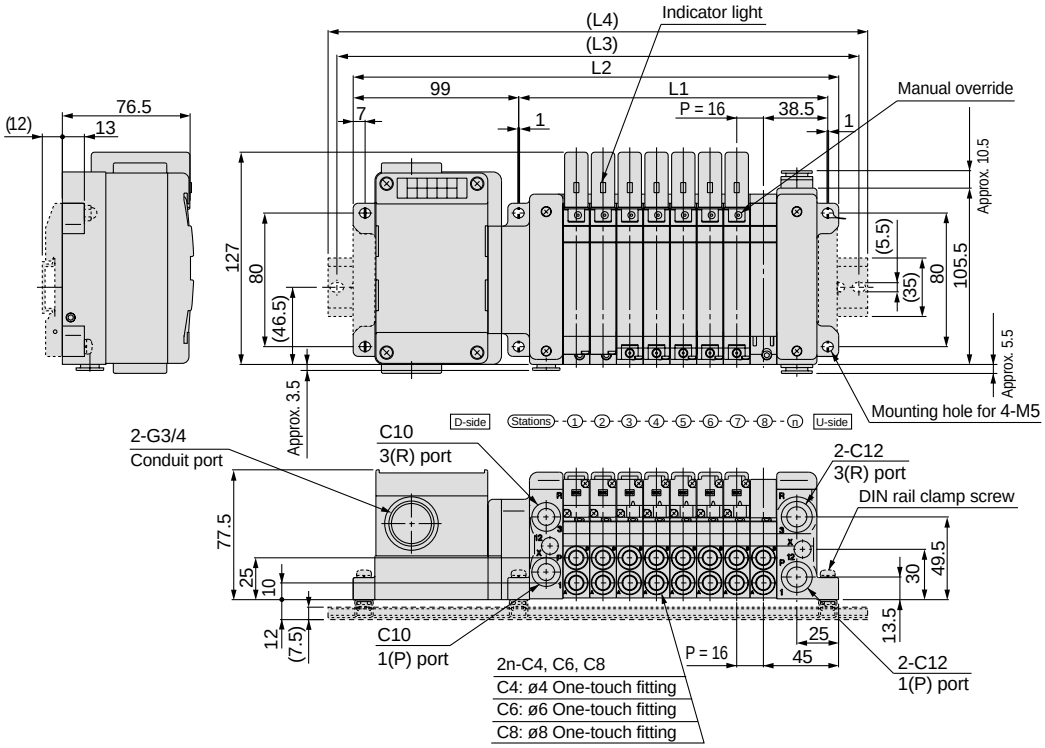
VV5QC11



Formulas: 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



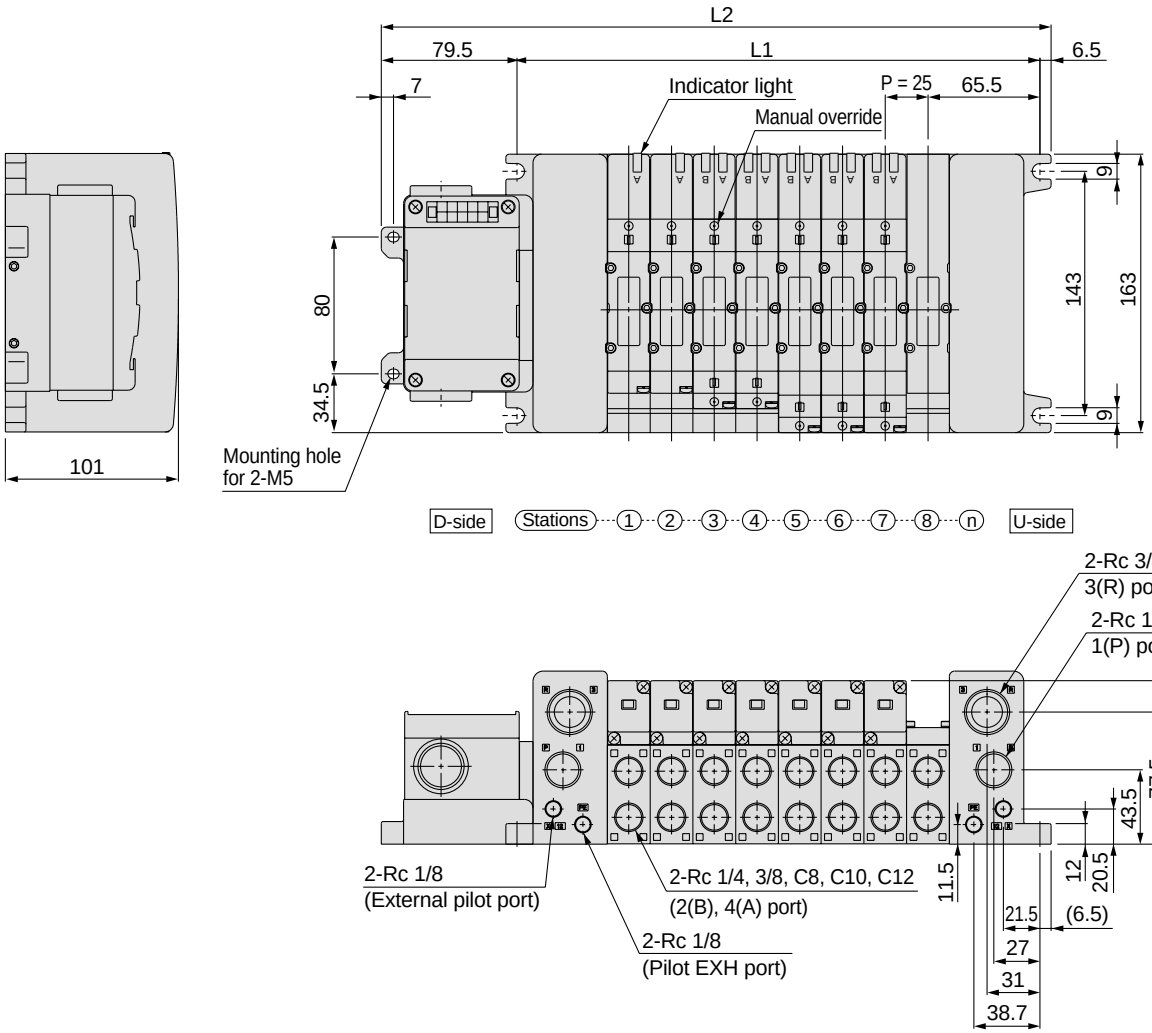
Formulas: L1 = 16n + 57, L2 = 16n + 163 n: Stations (maximum 20 stations)

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

VQC1000/2000/4000

Kit (Terminal Block Box Kit) Conforms to IP67

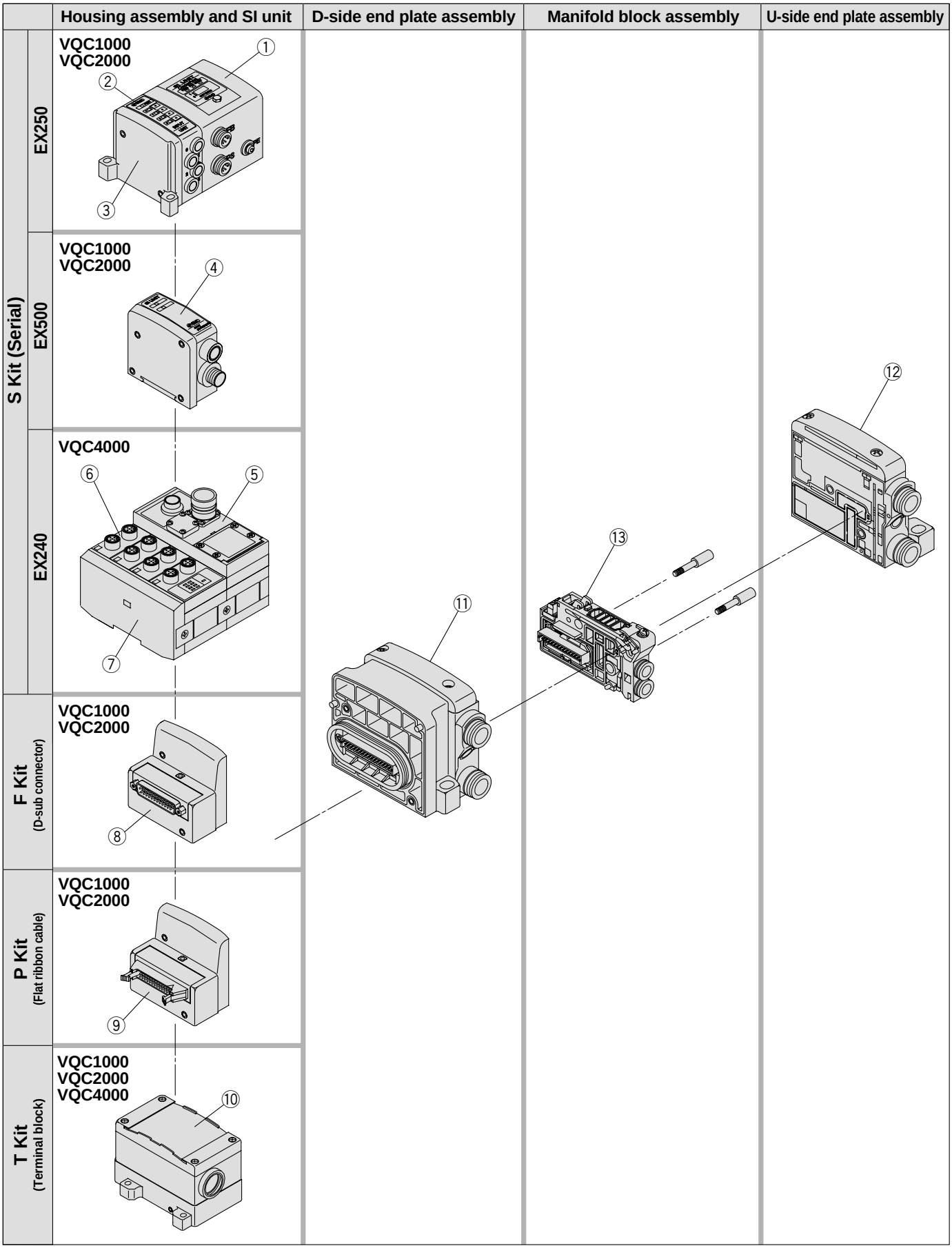
VV5QC41



Formulas: L1 = 25n + 106, L2 = 25n + 192 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	131	156	181	206	231	256	281	306	331	356	381	406	431	456	481	506	531	556	581	606
L2	217	242	267	292	317	342	367	392	417	442	467	492	517	542	567	592	617	642	667	692

Manifold Exploded View



SMC

Note) Drawing shows VQC1000 type.

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-SDN1**	DeviceNet (–COM)	●	●	—
		EX250-SPR1	PROFIBUS-DP (–COM)	●	●	—
2	**Input block**	**EX250-IE1**	M12, 2 inputs	●	●	—
		EX250-IE2	M12, 4 inputs	●	●	—
		EX250-IE3	M8, 4 inputs	●	●	—
3	**End plate assembly**	**EX250-EA□**	1: Standard 2: DIN rail mounting	●	●	—
4	**SI unit**	**EX500-Q001**	DeviceNet (+COM)	●	●	—
		EX500-Q001-X1	Remote I/O (+COM)			
		EX500-Q101	DeviceNet (–COM)	●	●	—
		EX500-Q101-X1	Remote I/O (–COM)			
5	**SI unit**	**EX240-SDN2**	DeviceNet (+COM)	—	—	●
		EX240-SPR1	PROFIBUS-DP (–COM)	—	—	●
6	**Input block**	**EX240-IE1**	M12, 8 inputs	—	—	●
7	**End cover assembly**	**EX240-EA2**	For manifold with input block	—	—	●
		EX240-EA4	For manifold without input block			
8	**D-sub connector housing assembly**	**VVQC1000-F25-1**	F Kit, 25-pin	●	●	—
9	**Flat ribbon cable housing assembly**	**VVQC1000-P26-1**	P Kit, 26-pin	●	●	—
		VVQC1000-P20-1	P Kit, 20-pin			
10	**Terminal block box housing assembly**	**VVQC1000-T0-1**	T Kit	●	●	●

D-side end plate assembly

⑪ **D-side end plate assembly part no.**

VQC1000/2000

VVQC 1 000-3A-1– C8 –□

Series

1	VQC1000
2	VQC2000

Port size

Symbol	VQC1000	VQC2000
C8	●	
C10		●
N9	●	
N11		●

Options

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

VQC4000

VVQC4000-3A– 1 □

Kit type

1	S Kit
2	T Kit

Thread type

F	Rc
T	G
	NPT/NPTF

U-side end plate assembly

⑫ **U-side end plate assembly part no.**

VQC1000/2000

VVQC 1 000-2A– 1 – C8 –□

Series

1	VQC1000
2	VQC2000

Port size

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

Note) For supply/exhaust port with front and back entry type only.

Supply/Exhaust port entry direction

1	Front
2 Note)	Front and back

Note) VQC2000 only

Options

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

VQC4000

VVQC4000-2A– 1 □

Thread type

Nil	Rc
F	G
T	NPT/NPTF

Manifold block assembly

⑬ **Manifold block assembly part no.**

VVQC 1 000-1A– D – C6 –□

Wiring specification

D	Double wiring
S	Single wiring

Series

1	VQC1000
2	VQC2000
4	VQC4000

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

Options

Nil	None
B Note)	With back pressure check valve

Note) Except for VQC4000.

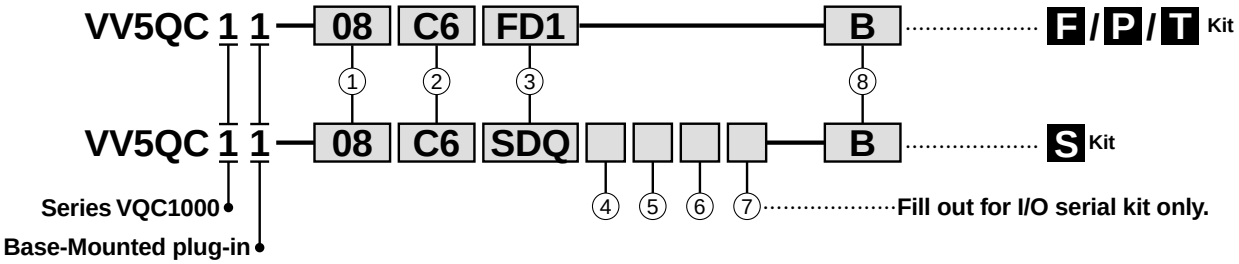
Port size

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

Manifold Specification Sheet

Series VQC1000: Base-Mounted Type/Plug-in Unit

❶ How to order manifolds



① Stations

01	1 station
⋮	⋮

The maximum number of stations differs depending on the electrical entry. Refer to ③.

② Cylinder port size

C3	With ø3.2 One-touch fitting
C4	With ø4 One-touch fitting
C6	With ø6 One-touch fitting
M5	M5 thread
CM	Mixed sizes and with port plug
L3	Top ported elbow Wtih ø3.2 One-touch fitting
L4	Top ported elbow With ø4 One-touch fitting
L6	Top ported elbow With ø6 One-touch fitting
L5	M5 thread
B3	Bottom ported elbow With ø3.2 One-touch fitting
B4	Bottom ported elbow With ø4 One-touch fitting
B6	Bottom ported elbow With ø6 One-touch fitting
B5	M5 thread
LM	Elbow port, mixed sizes

Note 1) Indicate the size in the specification sheet in the case of CM and LM.

Note 2) Symbols for inch sizes are as follows:

<For One-touch fittings>

N1: ø1/8"
N3: ø5/32"
N7: ø1/4"
NM: Mixed

The top ported elbow is LN□ and the bottom ported elbow is BN□.

③ Electrical entry/Cable length

	D-side entry	Kit, Cable length	Stations Note 2)
F Kit	FD0	D-sub connector kit (25P) without cable	1 to 12 (24)
	FD1	D-sub connector kit (25P) with 1.5m cable	
	FD2	D-sub connector kit (25P) with 3.0m cable	
	FD3	D-sub connector kit (25P) with 5.0m cable	
P Kit	PD0	Flat ribbon cable kit (26P) without cable	1 to 12 (24)
	PD1	Flat ribbon cable kit (26P) with 1.5m cable	
	PD2	Flat ribbon cable kit (26P) with 3.0m cable	
	PD3	Flat ribbon cable kit (26P) with 5.0m cable	
	PDC	Flat ribbon cable kit (20P) without cable Note 1)	1 to 9 (18)
T Kit	TD0	Terminal block box kit	1 to 10 (20)
S Kit	**Input/Output serial kit (EX250)**		1 to 12 (24)
	SD0	Serial kit without SI unit	
	SDQ	Serial kit DeviceNet compatible	
	SDN	Serial kit PROFIBUS-DP compatible	
	Decentralized wiring serial kit (EX500)		1 to 8 (16)
	SDA1	Serial kit for Remote I/O	
	SDA2	Serial kit DeviceNet/PROFIBUS-DP compatible	

Note 1) P Kit: Order the cable assembly separately for the type 20P.

Note 2) Numbers inside ( ) indicate the maximum number of solenoids for mixed single and double wiring. The maximum number of stations is determined by the total number of solenoids. In the case of mixed wiring, use the option symbol "-K".

④ SI unit COM

SI unit COM		EX250		EX500		
		DeviceNet	PROFIBUS-DP	DeviceNet	PROFIBUS-DP	Remote I/O
Nil	+COM	—	—	○	○	○
N	–COM	○	○	○	○	○

Note) Leave the box blank for the SI unit COM without input block (SD0).

⑦ Input block COM (Fill out for I/O unit only)

Nil	PNP (+) or without SI unit/input block (SD0)
N	NPN (–)

⑧ Options

Nil	None
B	All stations with back pressure check valve Note 1)
D	With DIN rail (rail length: standard)
D□	With DIN rail (rail length: special) Note 2)
K	Special wiring specifications Note 3) (except for double wiring)
N	With name plate
R	External pilot Note 4)
S	Direct exhaust with built-in silencer Note 5)

∗ When specifying two or more options, list symbols in alphabetical order. Example: -BRS

Note 1) When using the back pressure check valve for the necessary stations only, enter the back pressure check valve part no. and indicate the number of manifold stations in the specification sheet.

Note 2) For special DIN rail length, indicate "D□." (Enter the number of stations inside □).

Example: -D08

In this case, stations will be mounted on a DIN rail for 8 stations regardless of the actual number of manifold stations.

Indicate "-D0" for the option without DIN rail.

Note 3) Be sure to indicate the wiring specifications in the specification sheet.

Note 4) For external pilot option, "-R", indicate the external pilot specification "R" for the applicable valves as well.

Note 5) The built-in silencer type does not satisfy the IP67 standard.

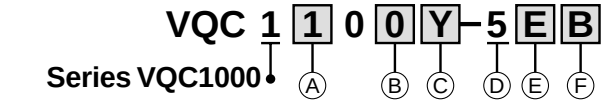
⑤ Input block (Fill out for I/O unit only)

Nil	Without SI unit/input block (SD0)
0	Without input block
1	With 1 input block
⋮	⋮
8	With 8 input blocks

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

Nil	Without input block
1	M12, 2 inputs
2	M12, 4 inputs
3	M8, 4 inputs (3 pins)

❷ How to order applicable valves



Ⓐ Type of actuation

1	2-position single
2	2-position double
3	3-position closed center
4	3-position exhaust center
5	3-position pressure center
A Note)	Dual 3-port valve (N.C. + N.C.)
B Note)	Dual 3-port valve (N.O. + N.O.)
C Note)	Dual 3-port valve (N.C. + N.O.)

Note) Available for the rubber seal type only.

Ⓑ Seal type

0	Metal seal
1	Rubber seal

Ⓒ Function

Nil	Standard type (1W)
K Note 1)	High voltage type (1.0MPa)
N	Negative COM
R	External pilot
Y	Low wattage type (0.5W)

Note 1) Available for the metal seal type only.

∗ Wnen specifying two or more options, list symbols in alphabetical order.

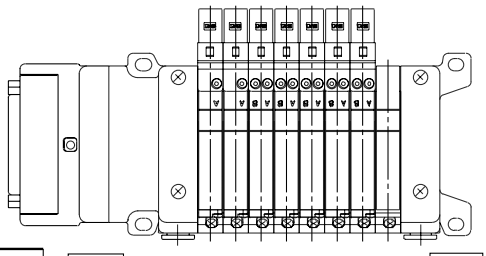
Ⓓ Coil voltage

5	24VDC

Ⓔ Light/Surge voltage suppressor

Nil	With
E	Without Note)

Note) Not applicable to S Kit.



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

∗ Stations are numbered in ascending order from the D-side.

Ⓕ Manual override

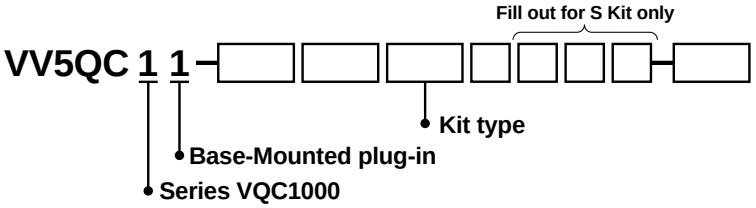
Nil	Non-locking push type (tool required)
B	Slotted locking type (tool required)
C	Locking type (manual)

Manifold Specification Sheet

For ordering: Please copy this page and use it as often as necessary.

Series VQC1000/Plug-in Unit

Manifold Model



Date: / /

Customer name			
Contact person			
Specification sheet no.			
Purchase order no.			
Equipment name			
Quantity	set(s)	Required date	

Specifications

← D-side ∗ Indicate required stations with a "○". U-side →

Description/Model			Stations	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Valves	Single																										
	Double																										
	Closed center																										
	Exhaust center																										
	Pressure center																										
	Dual 3-port valve (A)																										
	Dual 3-port valve (B)																										
	Dual 3-port valve (C)																										
Options	Blanking plate VVQ1000-10A-1																										
	Individual SUP spacer VVQ1000-P-1-C6																										
	SUP shutoff position: Specify 2 positions.																										
	Individual EXH spacer VVQ1000-R-1-C6																										
	EXH shutoff position: Specify 2 positions.																										
	SUP block plate VVQ1000-16A																										
	EXH shutoff position Note 1) (When using EXH block base (VVQC1000-19A-□□-C□)																										
	Port plug Note 2)			A B	A B	A B	A B	A B	A B	A B	A B	A B	A B	A B	A B	A B	A B	A B	A B	A B	A B	A B	A B	A B	A B	A B	A B
Cylinder port sizes Note 3) Fill out in case of mixed sizes (CM/LM/NM).	With ø3.2 (ø1/8") One-touch fitting	Side port	C3 (N1)																								
	With ø4 (ø5/32") One-touch fitting	Side port	C4 (N3)																								
	With ø6 (ø1/4") One-touch fitting	Side port	C6 (N7)																								
	M5 thread	Side port	M5																								
	Dual flow fitting VVQ1000-52A-C8																										
Special wiring specifications Note 4)	Single wiring																										
	Double wiring																										
Description/Model			Stations	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24

Notes

Note 1) Indicate the shutoff position. The D-side of the EXH block in the EXH passage is blocked.
Note 2) When using port plugs, circle ports to specify.
Note 3) When mounting an elbow fitting assembly (VVQ1000-F-L-$^{C3}_{C4}$), indicate "L $^{C3}_{C4}$" in the table above.
Note 4) In case of single wiring or mixed wiring, connections to the connector terminals start from the A-side solenoid of station 1 and continue in order without skipping any terminals.

For SMC use only

Applicable valves and options

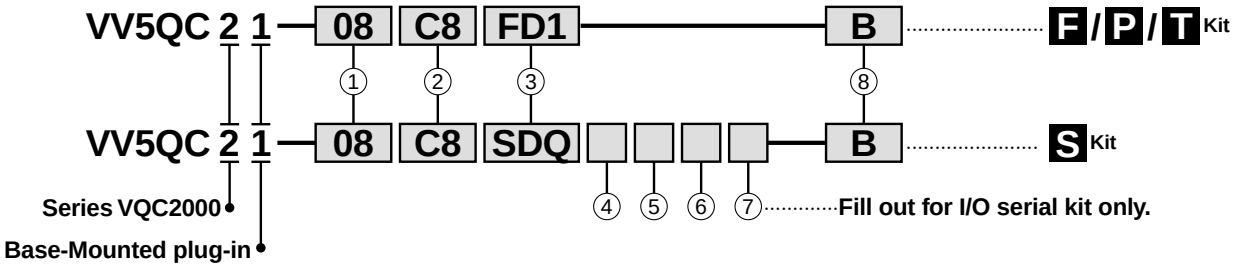
	Part no.	Qty.

	Part no.	Qty.

Order no.	
Clerk (code no.)	
Dept. code	

Series VQC2000: Base-Mounted Type/Plug-in Unit

❶ How to order manifolds



① Stations

01	1 station
⋮	⋮

The maximum number of stations differs depending on the electrical entry. Refer to ③.

② Cylinder port size

C4	With ø4 One-touch fitting
C6	With ø6 One-touch fitting
C8	With ø8 One-touch fitting
CM	Mixed or with port plug
L4	Top ported elbow With ø4 One-touch fitting
L6	Top ported elbow With ø6 One-touch fitting
L8	Top ported elbow With ø8 One-touch fitting
B4	Bottom ported elbow With ø4 One-touch fitting
B6	Bottom ported elbow With ø6 One-touch fitting
B8	Bottom ported elbow With ø8 One-touch fitting
LM	Elbow port, mixed sizes

Note 1) Indicate the size in the specification sheet in the case of CM and LM.

Note 2) Symbols for inch sizes are as follows:

<For One-touch fittings>

N3: ø5/32"

N7: ø1/4"

N9: ø5/16"

NM: Mixed

The top ported elbow is LN☐ and the bottom ported elbow is BN☐.

③ Electrical entry/Cable length

	D-side entry	Kit, Cable length	Stations Note 2)
F Kit	FD0	D-sub connector kit (25P) without cable	1 to 12 (24)
	FD1	D-sub connector kit (25P) with 1.5m cable	
	FD2	D-sub connector kit (25P) with 3.0m cable	
	FD3	D-sub connector kit (25P) with 5.0m cable	
P Kit	PD0	Flat ribbon cable kit (26P) without cable	1 to 12 (24)
	PD1	Flat ribbon cable kit (26P) with 1.5m cable	
	PD2	Flat ribbon cable kit (26P) with 3.0m cable	
	PD3	Flat ribbon cable kit (26P) with 5.0m cable	
	PDC	Flat ribbon cable kit (20P) without cable Note 1)	1 to 9 (18)
T Kit	TD0	Terminal block box kit	1 to 10 (20)
S Kit	Input/Output serial kit (EX250)		1 to 12 (24)
	SD0	Serial kit without SI unit	
	SDQ	Serial kit DeviceNet compatible	
	SDN	Serial kit PROFIBUS-DP compatible	
	Decentralized wiring serial kit (EX500)		1 to 8 (16)
	SDA1	Serial kit for Remote I/O	
	SDA2	Serial kit DeviceNet/PROFIBUS-DP compatible	

Note 1) P Kit: Order the cable assembly separately for type 20P.

Note 2) Numbers inside ( ) indicate the maximum number of solenoids for mixed single and double wiring. The maximum number of stations is determined by the total number of solenoids. In the case of mixed wiring, use the option symbol "-K".

④ SI unit COM

SI unit COM		EX250		EX500		
		DeviceNet	PROFIBUS-DP	DeviceNet	PROFIBUS-DP	Remote I/O
Nil	+COM	—	—	○	○	○
N	–COM	○	○	○	○	○

Note) Leave the box blank for the SI unit COM without input block (SD0).

⑦ Input block COM (Fill out for I/O unit only)

Nil	PNP (+) or without SI unit/input block (SD0)
N	NPN (–)

⑧ Options

Nil	None
B	All stations with back pressure check valve Note 1)
D	With DIN rail (rail length: standard)
D☐	With DIN rail (rail length: special) Note 2)
K	Special wiring specifications Note 3) (except for double wiring)
N	With name plate
R	External pilot Note 4)
S	Direct exhaust with built-in silencer Note 5)

∗ When specifying two or more options, list symbols in alphabetical order. Example: -BRS

Note 1) When using the back pressure check valve for the necessary stations only, enter the back pressure check valve part no. and indicate the number of manifold stations in the specification sheet.

Note 2) For special DIN rail length, indicate "D☐." (Enter the number of stations inside ☐.)

Example: -D08

In this case, stations will be mounted on a DIN rail for 8 stations regardless of the actual number of manifold stations.

Indicate "-D0" for the option without DIN rail.

Note 3) Be sure to indicate the wiring specifications in the specification sheet.

Note 4) For external pilot option, "-R", indicate the external pilot specification "R" for the applicable valves as well.

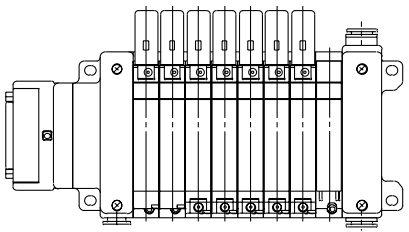
Note 5) The built-in silencer type does not satisfy the IP67 standard.

⑤ Input block (Fill out for I/O unit only)

Nil	Without SI unit/input block (SD0)
0	Without input block
1	With 1 input block
⋮	⋮
8	With 8 input blocks

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

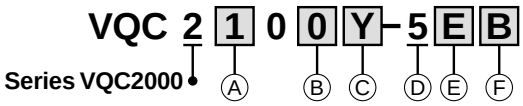
Nil	Without input block
1	M12, 2 inputs
2	M12, 4 inputs
3	M8, 4 inputs (3 pins)



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

∗ Stations are numbered in ascending order from the D-side.

❷ How to order applicable valves



Ⓐ Type of actuation

1	2-position single
2	2-position double
3	3-position closed center
4	3-position exhaust center
5	3-position pressure center
A Note)	Dual 3-port valve (N.C. + N.C.)
B Note)	Dual 3-port valve (N.O. + N.O.)
C Note)	Dual 3-port valve (N.C. + N.O.)

Note) Available for the rubber seal type only.

Ⓑ Seal type

0	Metal seal
1	Rubber seal

Ⓒ Function

Nil	Standard type (1W)
K Note 1)	High voltage type (1.0MPa)
N	Negative COM
R	External pilot
Y	Low wattage type (0.5W)

Note 1) Available for the metal seal type only.

∗ When specifying two or more options, list symbols in alphabetical order.

Ⓓ Coil voltage

5	24VDC

Ⓔ Light/Surge voltage suppressor

Nil	With
E	Without Note)

Note) Not applicable to S Kit.

Ⓕ Manual override

Nil	Non-locking push type (tool required)
B	Slotted locking type (tool required)
C	Locking type (manual)

For ordering: Please copy this page and use it as often as necessary.

Manifold Specification Sheet

Series VQC2000/Plug-in Unit

Manifold Model

Fill out for S Kit only

VV5QC 2 1 □ □ □ □ □ □ □ □

- Kit type
- Base-Mounted plug-in
- Series VQC2000

Date: / /

Customer name	
Contact person	
Specification sheet no.	
Purchase order no.	
Equipment name	
Quantity	set(s) Required date

Specifications

← D-side ∗ Indicate required stations with a "○". U-side →

Description/Model		Stations	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Valves	Single																									
	Double																									
	Closed center																									
	Exhaust center																									
	Pressure center																									
	Dual 3-port valve (A)																									
	Dual 3-port valve (B)																									
	Dual 3-port valve (C)																									
Options	Blanking plate VVQ2000-10A-1																									
	Individual SUP spacer VVQ2000-P-1-C8																									
	SUP shutoff position: Specify 2 positions.																									
	Individual EXH spacer VVQ2000-R-1-C8																									
	EXH shutoff position: Specify 2 positions.																									
	SUP block plate VVQ2000-16A																									
	EXH block plate VVQ2000-19A																									
	Port plug Note 1)		A B	A B	A B	A B	A B	A B	A B	A B	A B	A B	A B	A B	A B	A B	A B	A B	A B	A B	A B	A B	A B	A B	A B	A B
Cylinder port sizes Fill out in case of mixed sizes (CM/LM/NM).	With ø4 (ø5/32") One-touch fitting	Side port	C4 (N3)																							
	With ø6 (ø1/4") One-touch fitting	Side port	C6 (N7)																							
	With ø8 (ø5/16") One-touch fitting	Side port	C8 (N9)																							
Special wiring Note 2) specifications	Single wiring																									
	Double wiring																									
Description/Model		Stations	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24

Notes

Note 1) When using port plugs, circle ports to specify.

Note 2) In case of single wiring or mixed wiring, connections to the connector terminals start from the A-side solenoid of station 1 and continue in order without skipping any terminals.

For SMC use only

Applicable valves and options

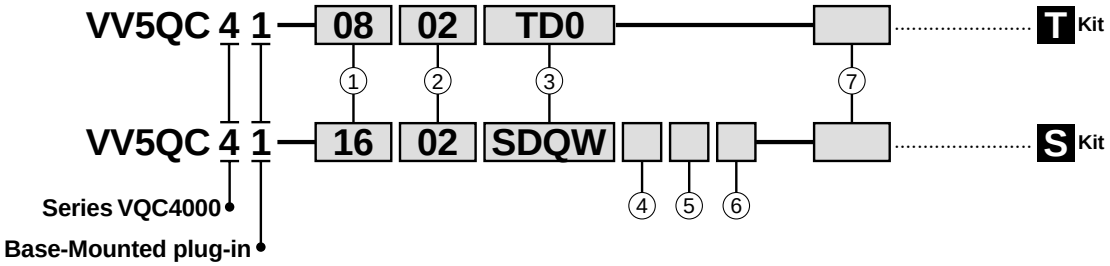
	Part no.	Qty.

	Part no.	Qty.

Order no.	
Clerk (code no.)	
Dept. code	

Series VQC4000: Base-Mounted Type/Plug-in Unit

❶ How to order manifolds



① Stations

01	1 station
⋮	⋮

The maximum number of stations differs depending on the electrical entry. Refer to ③.

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
03	Rc 3/8
B	Bottom ported Rc 1/4
CM	Mixed

Note 1) Indicate the size in the specification order sheet in the case of CM.

Note 2) Symbols for inch sizes are as follows:

<For One-touch fittings>

N7: ø1/4"
N9: ø5/16"
N11: ø3/8"
NM: Mixed

<For threads> P, R, A, B port

VV5QC41-0803 □ TD0

Cylinder port

Thread type

Nil	Rc
F	G
T	NPT/NPTF

Note) P and R ports use the same type of threads.

③ Electrical entry

	D-side entry	Kit	Stations Note 1)
T Kit	TD0	Terminal block box kit	1 to 10 (20)
S Kit	SD0W	Serial kit without SI unit	1 to 16 (24)
	SDQW	Serial kit DeviceNet compatible	
	SDNW	Serial kit PROFIBUS-DP compatible	

Note 1) Numbers inside ( ) indicate the maximum number of solenoids for mixed single and double wiring. The maximum number of stations is determined by the total number of solenoids. In the case of mixed wiring, use the option symbol "-K."

④ SI unit COM

SI unit COM.		DeviceNet (SDQW)	PROFIBUS-DP (SDNW)
Nil	+COM	○	—
N	–COM	—	○

Note) Leave the box blank for the SI unit COM without input block (SD0).

⑤ Input block

Nil	Without SI unit/input block (SD0)
0	Without input block
1	With 1 input block
2	With 2 input blocks
3	With 3 input blocks
4	With 4 input blocks

⑥ Input block COM

Nil	PNP (+) or without SI unit/input block (SD0)
N	NPN (–)

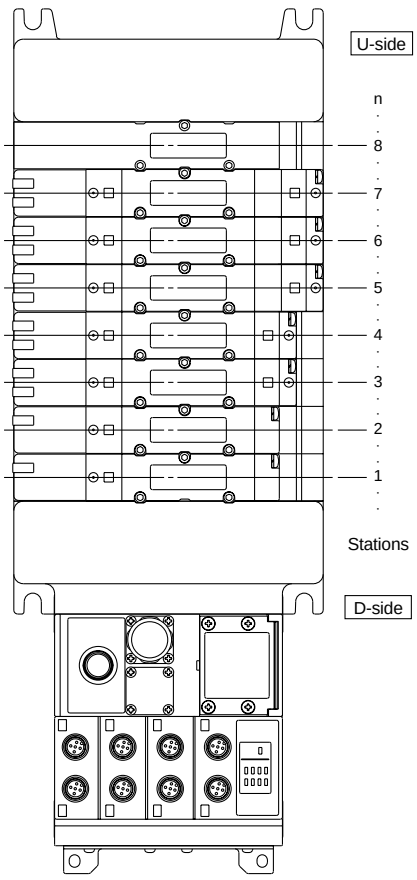
⑦ Options

Nil	None
K	Special wiring specifications Note 1) (except for double wiring)
N	With name plate Note 2) (available for T Kit only)

∗ When specifying two or more options, list symbols in alphabetical order. Example: -KN

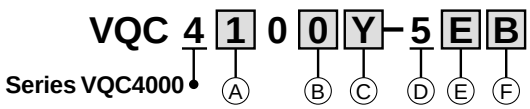
Note 1) Be sure to indicate the wiring specifications in the specification order sheet.

Note 2) The mounting position of the name plate is on the top face of the cover for the terminal block box.



∗ Stations are numbered in ascending order from the D-side.

❷ How to order applicable valves



Ⓐ Type of actuation

1	2-position single
2	2-position double
3	3-position closed center
4	3-position exhaust center
5	3-position pressure center
6	3-position perfect

Ⓑ Seal type

0	Metal seal
1	Rubber seal

Ⓒ Function

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

∗ When specifying two or more options, list symbols in alphabetical order.

Ⓓ Coil voltage

5	24VDC

Ⓔ Light/Surge voltage suppressor

Nil	With
E	Without

Ⓕ Manual override

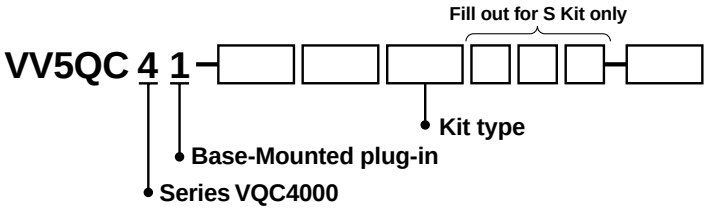
Nil	Non-locking push type (tool required)
B	Slotted locking type (tool required)

Manifold Specification Sheet

For ordering: Please copy this page and use it as often as necessary.

Series VQC4000/Plug-in Unit

Manifold Model



Date: / /

Customer name			
Contact person			
Specification sheet no.			
Purchase order no.			
Equipment name			
Quantity	set(s)	Required date	

Specifications

← D-side ＊ Indicate required stations with a "○". U-side →

Description/Model \ Stations			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Valves	Single																									
	Double																									
	Closed center																									
	Exhaust center																									
	Pressure center																									
	Perfect																									
Options	Blanking plate VVQ4000-10A-1																									
	Individual SUP spacer VVQ4000-P-1-02/03																									
	Individual EXH spacer VVQ4000-P-1-02/03																									
	Throttle valve spacer VVQ4000-20A-1																									
	Perfect spacer with residual pressure release valve VVQ4000-25A-1																									
	Interface regulator (A regulator) ARBQ4000-00-A-1																									
	Interface regulator (B regulator) ARBQ4000-00-B-1																									
	Interface regulator (P regulator) ARBQ4000-00-P-1																									
	SUP/EXH block plate VVQ4000-16A	P																								
		R1																								
		R2																								
Cylinder port sizes (Fill out in case of mixed sizes (CM/LM/NM).)	Rc 1/4	02																								
	Rc 3/8	03																								
	With ø8 (ø1/4") One-touch fitting	C8 (N7)																								
	With ø10 (ø5/16") One-touch fitting	C10 (N9)																								
	With ø12 (ø3/8") One-touch fitting	C10 (N11)																								
	Bottom ported Rc 1/4																									
Special wiring specifications Note 1)	Single wiring																									
	Double wiring																									
Description/Model \ Stations			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24

Note

Note 1) In case of single wiring or mixed wiring, connections to the connector terminals start from the A-side solenoid of station 1 and continue in order without skipping any terminals.

For SMC use only

Applicable valves and options

	Part no.	Qty.

	Part no.	Qty.

Order no.	
Clerk (code no.)	
Dept. code	

Series VQC
Safety Instructions

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

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

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

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

Note 1) ISO 4414: Pneumatic fluid power — Recommendations for the application of equipment to transmission and control systems.

Note 2) JIS B 8370: General rules for pneumatic equipment

⚠Warning

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

Since the products specified here are used in various operating conditions, their compatibility with the specific pneumatic system must be based on specifications or after analysis and/or tests to meet your specific requirements.

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

Compressed air can be dangerous if an operator is unfamiliar with it. Assembly, handling or repair of pneumatic systems should be performed by trained and experienced operators.

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

1. Inspection and maintenance of machinery/equipment should only be performed after confirmation of safe locked-out control positions.
2. When equipment is to be removed, confirm the safety process as mentioned above. Cut the supply pressure for this equipment and exhaust all residual compressed air in the system.
3. Before machinery/equipment is restarted, take measures to prevent shooting-out of cylinder piston rod, etc. (Bleed air into the system gradually to create back pressure.)

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

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

Series VQC
5-Port Solenoid Valve Precautions 1

Be sure to read before handling.

Design

⚠ Warning

1. Actuator drive

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

2. Intermediate stopping

When a 3-position closed center valve is used to stop a cylinder's piston at an intermediate position, accurate stopping of the piston in a predetermined position is not possible due to the compressibility of air.

Furthermore, since valves and cylinders are not guaranteed for zero air leakage, it may not be possible to hold a stopped position for an extended length of time. Contact SMC if it is necessary to hold a stopped position for an extended time.

3. Effect of back pressure when using a manifold

Use caution when valves are used on a manifold, as actuator malfunction due to back pressure may occur. Special caution is necessary when using a 3-position exhaust center valve, or when driving a single acting cylinder. In cases where there is a danger of this kind of malfunction, take countermeasures by using a back-pressure check valve, an individual EXH spacer assembly, or an EXH blocking plate.

4. Dealing with pilot exhaust

Operate the pilot exhaust port (PE) with silencers mounted on both the D and U sides, or with release to atmosphere. If merged with the main exhaust, the main valve may malfunction due to back pressure.

5. Holding of pressure (including vacuum)

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

6. Not for use as an emergency shutoff valve

None of the valves featured in this catalog is designed for safety applications such as an emergency shutoff valve. If application to this type of system is required, other reliable safety assurance measures should also be adopted.

7. Maintenance space

The installation should allow sufficient space for maintenance activities.

8. Release of residual pressure

Provide a residual pressure release function for maintenance purposes. Special consideration should be given to the release of residual pressure between the valve and cylinder in the case of a 3-position closed center type valve.

9. Vacuum applications

When a valve is used for vacuum switching, take appropriate measures against the suction of external dust or other contaminants through vacuum pads and exhaust ports. An external pilot type valve should be used in such cases. Contact SMC regarding the use of an internal pilot type or air operated valve.

10. Take suitable protective measures in locations or applications where valves are constantly exposed to water.

Selection

⚠ Warning

1. Confirm all specifications.

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

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

2. Extended periods of continuous energization

Contact SMC if valves will be continuously energized for extended periods of time.

⚠ Caution

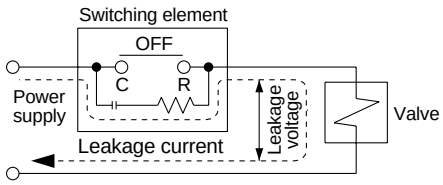
1. Momentary energization

If a double solenoid valve will be operated with momentary energization, it should be energized for at least 0.1 second.

However, depending on the secondary load conditions, it should be energized until the cylinder reaches the stroke end position. If the valve is to be used in an air blowing application, it should be energized continuously during the application.

2. Leakage voltage

When using a C-R element (surge voltage suppressor) for protection of the switching element, please keep in mind that leakage voltage will increase due to leakage current flowing through the C-R element.



Limit the amount of residual leakage voltage to the following values:

With DC coil

2% or less of rated voltage

3. Low temperature operation

Avoid ambient temperatures outside the range of –10°C to 50°C. At low temperatures, take any necessary steps to avoid solidification or freezing of drainage and moisture.

4. For air blowing applications

When using solenoid valves for air blowing, use external pilot type valves.

Also, air supply to the external pilot port should be compressed air that is within the pressure range prescribed in the specifications.

5. Mounting orientation

In the case of a single solenoid, the mounting orientation is unrestricted. In the case of double solenoid or 3-position valves, mount so that the spool valve is horizontal.

Also, when mounting for an application that will inevitably involve vibration or impact, mount so that the spool valve is at a right angle to the direction of vibration.

Do not use in applications where vibration or impact exceed the product's specifications.

Series VQC
5-Port Solenoid Valve Precautions 2

Be sure to read before handling.

Mounting

⚠Warning

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

After mounting, repairs, or equipment modification, connect the compressed air and power supplies, and perform appropriate function and leakage inspections to confirm that the unit is mounted properly.

2. Instruction manual

Mount and operate the product only after reading the manual carefully and understanding its contents. Always keep the manual handy for easy reference.

3. Painting and coating

Warnings or specifications printed or pasted on the product should not be erased, removed or covered up.

Piping

⚠Caution

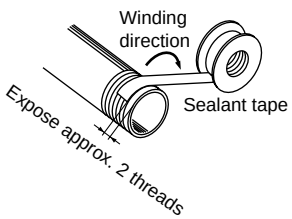
1. Preparation before piping

Before piping is connected, it should be thoroughly flushed out with air or washed out with water to remove chips, cutting oil and other debris.

2. Wrapping of sealant tape

When connecting pipes and fittings, etc., be sure that neither chips from the pipe threads nor sealing material get inside the valve.

When using sealant tape, leave 1.5 to 2 thread ridges exposed at the end of the pipe/fitting.



3. When using closed center type valves

When using closed center type valves, check carefully to make sure there are no air leaks from the piping between the valves and cylinders.

4. Ensure tightening to the prescribed tightening torques.

When screwing fittings into valves, tighten according to the torques given below.

Tightening torques for piping

Connection thread	Proper tightening torque (N·m)
Rc 1/8	7 to 9
Rc 1/4	12 to 14
Rc 3/8	22 to 24
Rc 1/2	28 to 30
Rc 3/4	28 to 30

5. Connection of piping to products

When connecting piping to a particular product, refer to the product's instruction manual to avoid mistakes regarding the supply port and other connections as applicable.

Wiring

⚠Caution

1. Polarity

Always confirm whether or not there is polarity when connecting a power supply to a DC specification solenoid valve equipped with a (light) voltage surge suppressor.

If there is a polarity, observe the following precautions:

• If there is no built-in diode for polarity protection:

Switching polarity by mistake poses the danger of burnout to the valve's built-in diode and the switching element on the control mechanism side, as well as to the power supply mechanism.

• If there is a diode for polarity protection:

Switching polarity by mistake will cause the valve's switching function to stop.

∗ Series VQ4000 has no polarity. (It is a polarity-free type valve.)

2. Applied voltage

Be careful to apply the proper voltage when connecting electric power to the solenoid valve. Application of improper voltage may cause malfunction or coil damage.

3. Confirm the connections.

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

Lubrication

⚠Caution

1. Lubrication

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

2) Should you wish to apply additional lubrication, however, please be sure to use ISO VG32 Class 1 turbine oil (without additives).

Please be aware, however, that once additional lubrication is applied, it must be continued to avoid malfunctions, as the new lubricant will completely cancel out the original lubrication.

Series VQC
5-Port Solenoid Valve Precautions 3

Be sure to read before handling.

Air Supply

⚠Warning

1. Use clean air.

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

⚠Caution

1. Install air filters.

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

2. Install an air dryer or after-cooler.

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

3. If excessive carbon powder is generated, eliminate it by installing mist separators at the upstream side of valves.

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

Refer to SMC's "Air Cleaning Equipment" catalog for further details on compressed air quality.

Operating Environment

⚠Warning

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

2. Do not use in an explosive atmosphere.

3. Do not use in locations subject to vibration or impact. Confirm the specifications for each series.

4. A protective cover should be used to shield valves from direct sunlight.

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

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

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

Maintenance

⚠Warning

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

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

2. Equipment removal and supply/exhaust of compressed air

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

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

3. Infrequent operation

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

4. Manual override operation

When the manual override is operated, connected equipment will be actuated. Confirm safety before operating.

⚠Caution

1. Filter drainage

Drain out condensate from air filters regularly. (Refer to specifications.)

2. Lubrication

In the case of rubber seals, once lubrication has been started, it must be continued.

Use VG32 Class 1 turbine oil (without additives). Other lubricating oils will cause malfunctions.

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

How to Find the Flow Rate (at air temperature of 20°C)

Subsonic flow when $P_1 + 0.1013 < 1.89 (P_2 + 0.1013)$

$$Q = 226S\sqrt{\triangle P(P_2 + 0.1013)}$$

Sonic flow when $P_1 + 0.1013 \geq 1.89 (P_2 + 0.1013)$

$$Q = 113S(P_1 + 0.1013)$$

Q: Air flow rate [l/min (ANR)]

S: Effective area [mm²]

△P: Pressure drop rate (P_1–P_2) [MPa]

P_1: Upstream pressure [MPa]

P_2: Downstream pressure [MPa]

＊ Correction for different air temperatures

Multiply the flow rate calculated with the above formulas by a coefficient from the table below.

Air temperature (°C)	–20	–10	0	10	30	40	50	60
Correction coefficient	1.08	1.06	1.04	1.02	0.98	0.97	0.95	0.94

Series VQC
Specific Product Precautions 1

Be sure to read before handling.
Refer to pages 29 through 32 for safety instructions and common precautions.

⚠ Warning

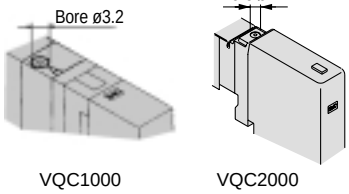
Manual Override

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.

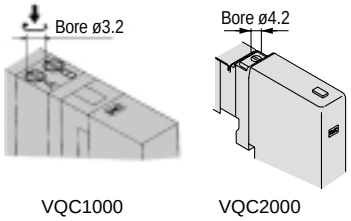
■ **VQC1000/2000**

Non-locking push type (tool required)



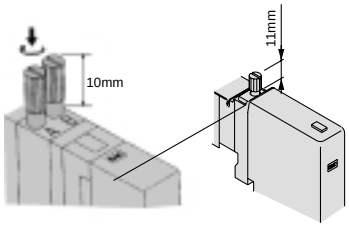
Push down the manual override button with a small screwdriver, etc., until it stops.
The manual override will return when released.

Slotted locking type (tool required) <Optional>



Push down the manual override button with a small flat head screwdriver until it stops, and turn it clockwise 90° to lock it. Turn it counter-clockwise to release it.

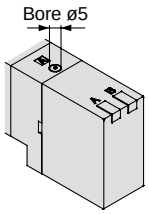
Locking type (manual) <Optional>



Push down the manual override button with a small flat head screwdriver or with your finger until it stops, and turn it clockwise 90° to lock it. Turn it counterclockwise to release it.

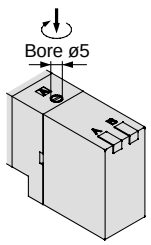
■ **VQC4000**

Non-locking push type (tool required)

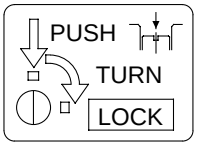


Push down the manual override button with a small screwdriver until it stops.
The manual override will return when released.

Locking type (manual) <Optional>

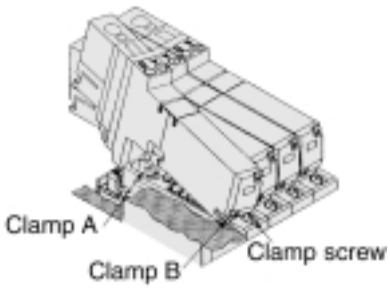


Push down the manual override button with a small flat head screwdriver until it stops, and turn it clockwise 90° to lock it. Turn it counter-clockwise to release it.



⚠ Caution

Solenoid Valve Removal and Mounting VQC1000/2000



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 0.35N·m for VQC1000 and 0.5 to 0.7N·m for VQC2000.

⚠Caution

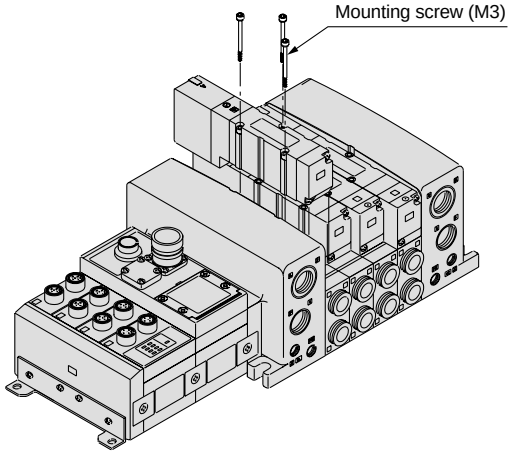
Do not let foreign matter stick on the seal side of the gasket and solenoid, as this will cause air leakage.

⚠ Caution

Valve Mounting VQC4000

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



Specific Product Precautions 2

Be sure to read before handling.
Refer to pages 29 through 32 for safety instructions and common precautions.

⚠ Caution

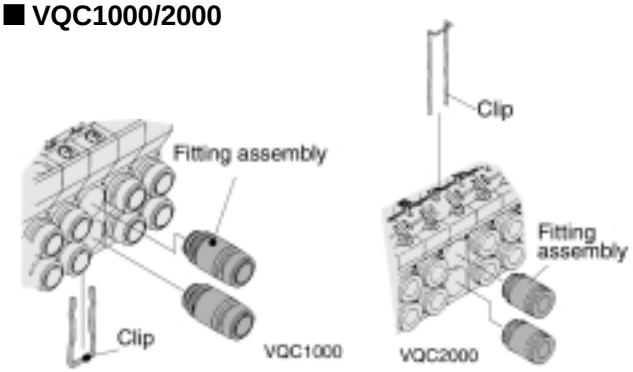
Replacing One-touch fittings

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.

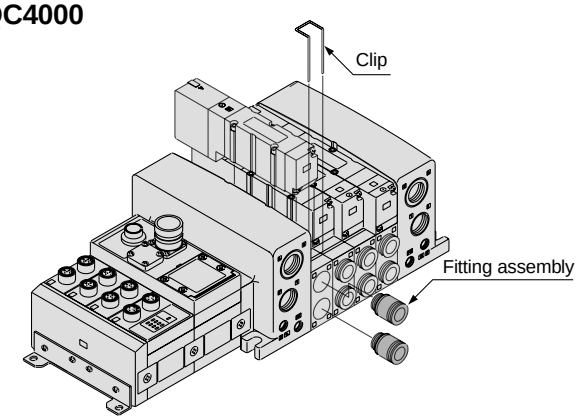
To mount a fitting, insert the fitting assembly until it stops and reinsert the retaining clip to its designated position.

■ **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**



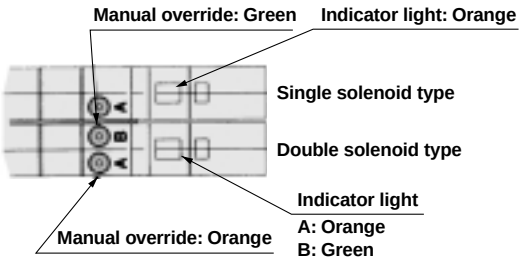
Applicable tube O.D.	Fitting assembly part no.
	VQC4000
ø8	VVQ4000-50B-C8
ø10	VVQ4000-50B-C10
ø12	VVQ4000-50B-C12
ø1/4"	VVQ4000-50B-N7
ø5/16"	VVQ4000-50B-N9
ø3/8"	VVQ4000-50B-N11

⚠ Caution

Light/Surge voltage suppressor VQC1000/2000

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

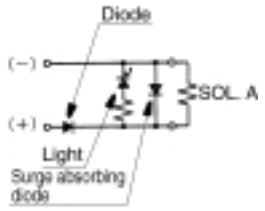
For double solenoid type, 2 colors that are same as the manual override are used to indicate the energization of A-side or B-side.



(For VQC1000)

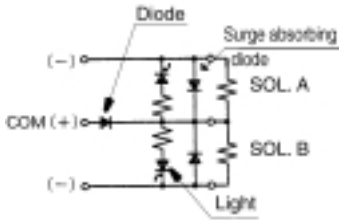
DC circuit

Single solenoid type



Note) A-side energized: Light (orange) ON
B-side energized: Light (green) ON

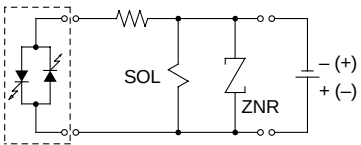
Double solenoid type



With miswiring prevention mechanism
With surge absorbing mechanism (surge absorbing diode) mechanism

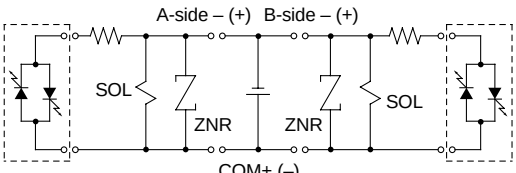
⚠ Caution

Internal Wiring Specifications VQC4000



Light circuit assembly (orange)

DC: Single



A-side light circuit assembly (orange)

DC: Double

B-side light circuit assembly (green)

Series VQC
Specific Product Precautions 3

Be sure to read before handling.
Refer to pages 29 through 32 for safety instructions and common precautions.

Serial wiring EX500/EX250/EX240 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 knowledgable 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.

⚠Caution

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.

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.

Series VQC
Specific Product Precautions 4

Be sure to read before handling.
Refer to pages 29 through 32 for safety instructions and common precautions.

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): 30Vrms (42.4V peak) or less
• Max. current: ① 8A 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]	$\frac{100}{\text{Peak voltage value}}$

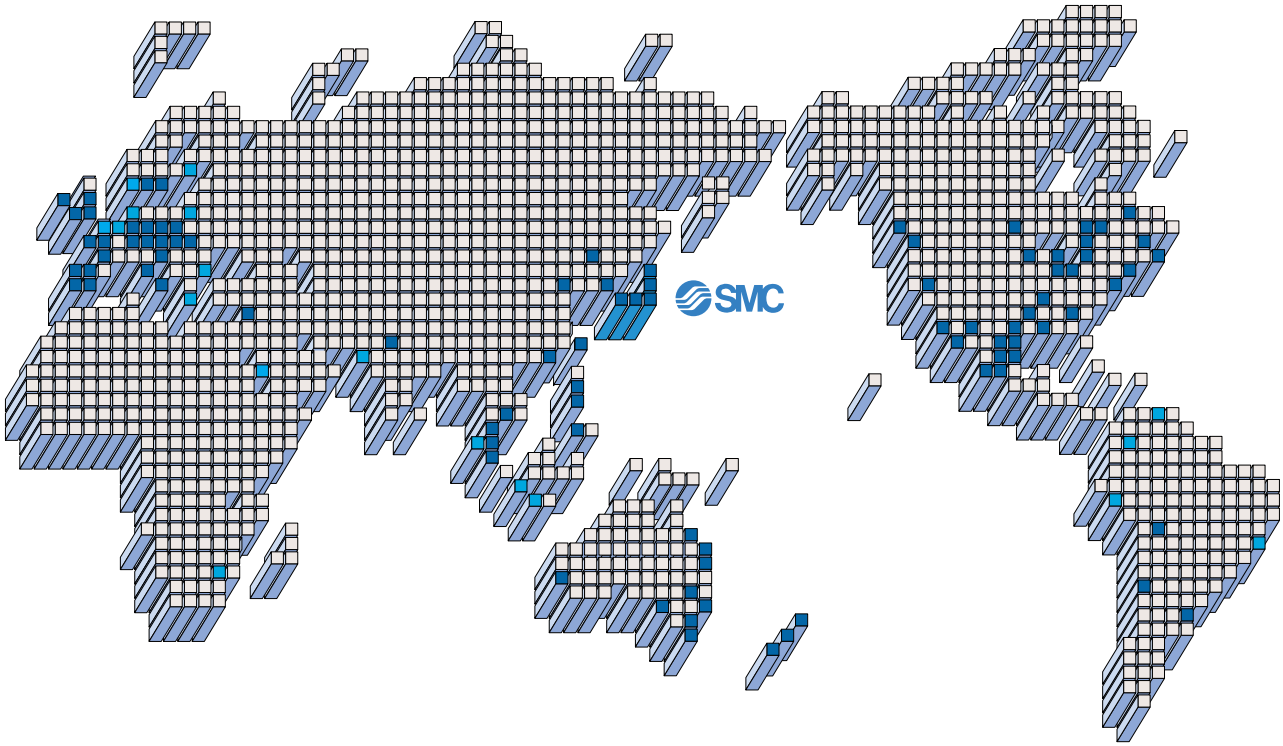
(2) A circuit (class 2 circuit) with maximum 30Vrms (42.4V peak) or less, and a power supply consisting of a class 2 power supply unit conforming to UL1310, or a class 2 transformer conforming to UL1585

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.**

SMC'S GLOBAL MANUFACTURING, DISTRIBUTION AND SERVICE NETWORK



EUROPE

AUSTRIA
SMC Pneumatik GmbH

CZECH
SMC Industrial Automation CZ s.r.o.

DENMARK
SMC Pneumatik A/S

FINLAND
SMC Pneumatiikka OY

FRANCE
SMC Pneumatique SA

GERMANY
SMC Pneumatik GmbH

HUNGARY
SMC Hungary Ipari Automatizálási Kft.

IRELAND
SMC Pneumatics (Ireland) Ltd.

ITALY
SMC Italia S.p.A.

NETHERLANDS
SMC Pnuematics BV.

NORWAY
SMC Pneumatics Norway A/S

POLAND
SMC Industrial Automation Polska Sp.z.o.o.

ROMANIA
SMC Romania s.r.l.

RUSSIA
SMC Pneumatik LLC.

SLOVAKIA
SMC Priemyselná automatizáciá, s.r.o.

EUROPE

SLOVENIA
SMC Industrijska Avtomatika d.o.o.

SPAIN/PORTUGAL
SMC España, S.A.

SWEDEN
SMC Pneumatics Sweden AB

SWITZERLAND
SMC Pneumatik AG.

UK
SMC Pneumatics (U.K.) Ltd.

ASIA

CHINA
SMC (China) Co., Ltd.

HONG KONG
SMC Pneumatics (Hong Kong) Ltd.

INDIA
SMC Pneumatics (India) Pvt. Ltd.

MALAYSIA
SMC Malaysia (S.E.A.) Sdn. Bhd.

PHILIPPINES
SMC Pneumatics (Philippines), Inc.

SINGAPORE
SMC Pneumatics (S.E.A.) Pte. Ltd.

SOUTH KOREA
SMC Pneumatics Korea Co., Ltd.

TAIWAN
SMC Pneumatics (Taiwan) Co., Ltd.

THAILAND
SMC Thailand Ltd.

NORTH AMERICA

CANADA
SMC Pneumatics (Canada) Ltd.

MEXICO
SMC Corporation (Mexico) S.A. de C.V.

USA
SMC Corporation of America

SOUTH AMERICA

ARGENTINA
SMC Argentina S.A.

BOLIVIA
SMC Pneumatics Bolivia S.R.L.

BRAZIL
SMC Pneumaticos Do Brazil Ltda.

CHILE
SMC Pneumatics (Chile) S.A.

VENEZUELA
SMC Neumatica Venezuela S.A.

OCEANIA

AUSTRALIA
SMC Pneumatics (Australia) Pty. Ltd.

NEW ZEALAND
SMC Pneumatics (N.Z.) Ltd.

SMC CORPORATION

1-16-4 Shimbashi, Minato-ku, Tokyo 105-0004, JAPAN
Tel: 03-3502-2740 Fax: 03-3508-2480
URL http://www.smcworld.com

1st printing June, 2001 D-SMC.L.A. P-80 (D)
This catalog is printed on recycled paper with concern for the global environment.