3-Port Solenoid Valve

VQ100 Series

[Option]

Unprecedented high speed, with stable response times

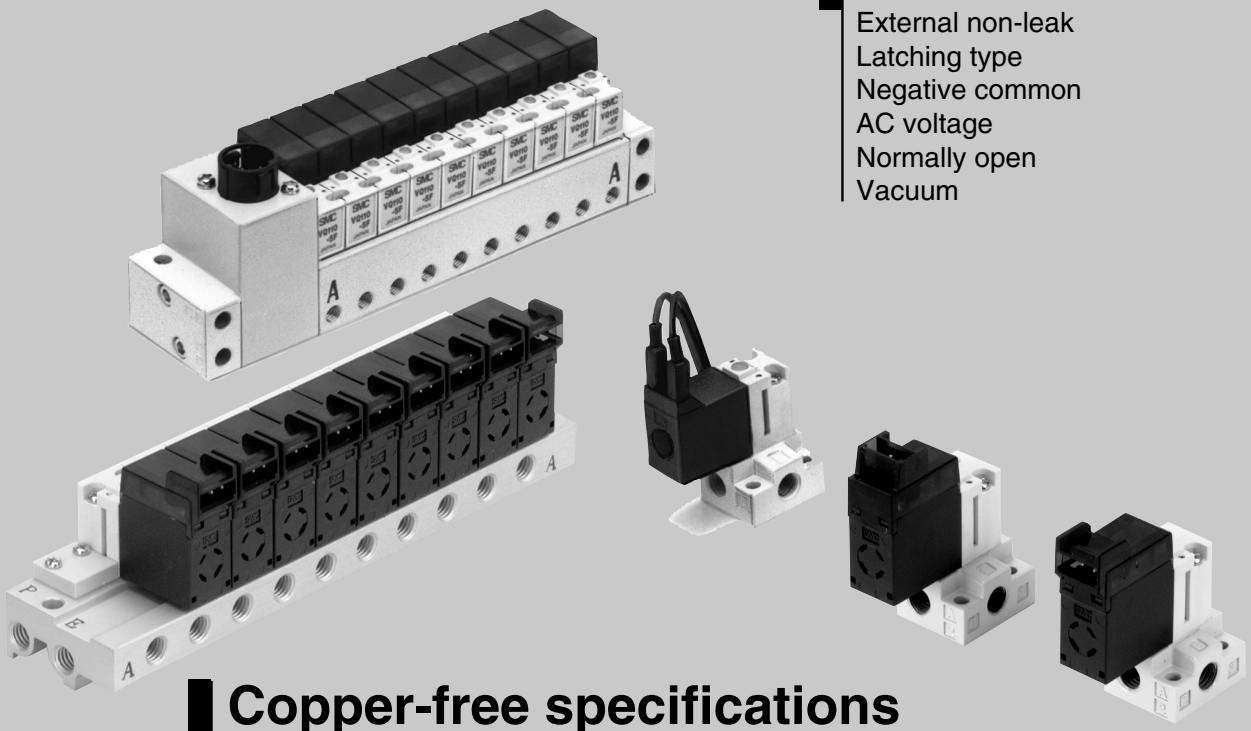
ON: 3.5 ms, OFF: 2 ms, Dispersion accuracy ±1 ms
(With light/surge voltage suppressor; supply pressure 0.5 MPa)

Compact with large flow capacity.

Body width 9.8 mm C: 0.055 $dm^3/(s \cdot bar)$ (Standard, high-pressure type)
C: 0.14 $dm^3/(s \cdot bar)$ (Large flow capacity type)
: Semi-standard

Semi-standard

External non-leak
Latching type
Negative common
AC voltage
Normally open
Vacuum

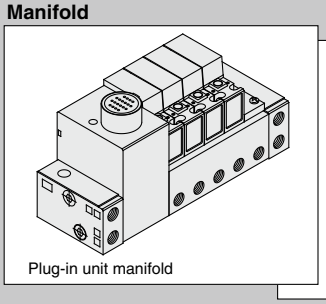


Copper-free specifications

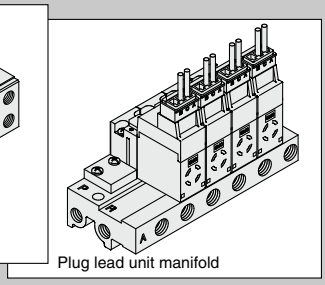
The fluid contacting section is copper-free and the standard type can be used as it is.

A wide variation of wiring

Manifold

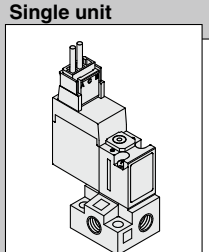


Plug-in unit manifold

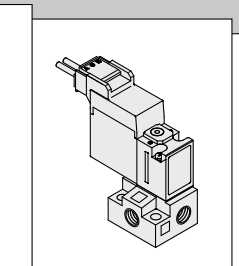


Plug lead unit manifold

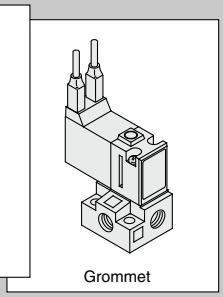
Single unit



L plug connector



M plug connector



Grommet

3-Port Solenoid Valve
VQ100 Series

[Option]
* The 100 VAC, 110 VAC, 24 VDC, and 12 VDC are the only CE/UKCA-compliant products.

NRTL /C
(Refer to page 17 for details.)

How to Order Valves

VQ1 1 0 □ – 5 F □ – □ – □ – □

VQ series
Compact 3-port valve

Actuation

1	Normally closed
2[*1]	Normally open

*1 Normally open is only selectable for the standard type (1 W).

Functions[*3]

Nil	Standard type (1 W)
H	High-pressure type (1.5 W)
Y	Low wattage type (0.5 W)
L[*2]	Latching type[*4] Positive common
N[*2]	Latching type[*4] Negative common
U[*2]	Large flow capacity type

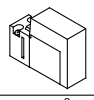
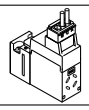
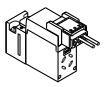
*2 Semi-standard (It has both + and – polarity.)
*3 Only one function can be selected. If the valve is to be energized continuously for extended periods of time, select "Y" (low-wattage type). For details, refer to "Extended periods of continuous energization" in the "Selection" section of the Best Pneumatics No. 1 catalog.
*4 For details on the latching type, refer to the latching type in the "Specific Product Precautions" on page 15.

Coil rated voltage

		CE/UKCA-compliant
1	100 VAC (50/60 Hz)	●
2	200 VAC (50/60 Hz)	—
3	110 VAC (50/60 Hz)	●
4	220 VAC (50/60 Hz)	—
5	24 VDC	●
6	12 VDC	●

For other rated voltages, please consult with SMC.

Electrical entry

F	Plug-in With light/surge voltage suppressor (only for plug-in manifold)	
L	L plug connector, With lead wire With light/surge voltage suppressor	
LO	L plug connector, Without connector With light/surge voltage suppressor	
M	M plug connector, With lead wire With light/surge voltage suppressor	
MO	M plug connector, Without connector With light/surge voltage suppressor	
G	Grommet	

* Grommet: No latching, AC and large flow capacity.

CE/UKCA-compliant

Nil	—
Q	CE/UKCA-compliant

* The 100 VAC, 110 VAC, 24 VDC, and 12 VDC are the only CE/UKCA-compliant products.

Made to Order

Symbol	Specifications
Nil	Standard
X21	Power saving type (1.5 W)
X42	Fluid-contact part: Oil-free
X113	Fluororubber

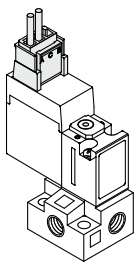
Port size

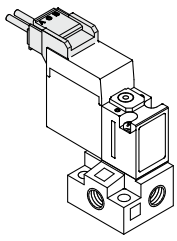
Nil	Without sub-plate
M3	With sub-plate
M5	With sub-plate

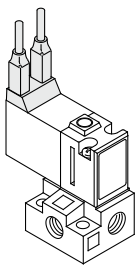
Manual override

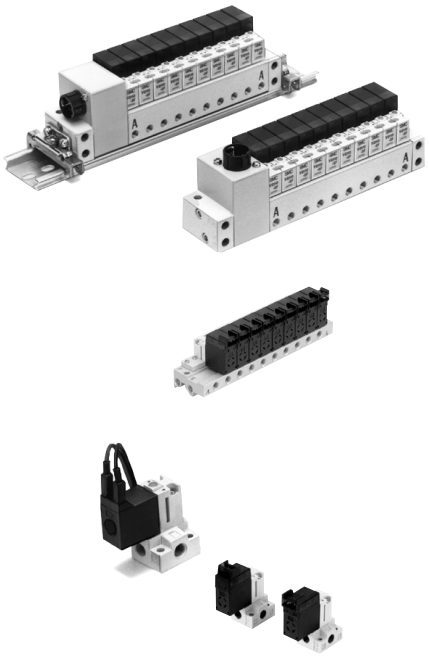
Nil	Non-locking push type (Tool required)
	Latching type: Push-locking type (Tool required)
B[*5]	Locking type (Tool required)

*5 Semi-standard
* Latching manual override: Push-locking type only.


L plug connector


M plug connector


Grommet

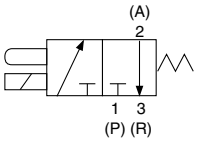


Standard Specifications

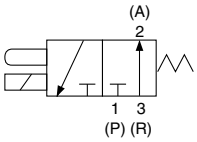
Item				Type: Standard (1 W)	High-pressure (1.5 W)	Low wattage (0.5 W)
Valve specifications	Valve structure			3-port direct operated poppet		
	Fluid			Air		
	Max. operating pressure			0.7 MPa	0.8 MPa	0.7 MPa
	Min. operating pressure (Vacuum)			0 MPa (–0.1 MPa[*5])		
	Flow rate characteristics	1 → 2	C [dm³/(s·bar)]	0.055		0.042
			b	0.22		0.27
			Cv	0.014		0.011
		2 → 3	C [dm³/(s·bar)]	0.083		0.045
			b	0.28		0.28
			Cv	0.021		0.012
	Response time[*1]			ON: 3.5 ms, OFF: 2 ms		ON: 3.5 ms, OFF: 2.5 ms
	Ambient and fluid temperatures			–10 to 50°C[*2]		
	Lubrication			Not required		
	Manual override			Non-locking push type/Locking type (Tool required)[*3]		
	Mounting operation			Free		
	Impact/Vibration resistance[*4]			150/30 m/s²		
	Enclosure			Dust-tight		
	Weight			12.6 g (L/M plug connector, Without sub-plate)		
Electrical specifications	Coil rated voltage		DC	24 V, 12 V		
	Allowable voltage fluctuation			±10% of rated voltage		
	Coil insulation type			Equivalent to class B		
	Power consumption (Current)		DC	1 W (42 mA)	1.5 W (63 mA)	0.5 W (21 mA)
	Electrical entry			Grommet Plug-in, L plug connector, M plug connector (With light/surge voltage suppressor)		

*1 Based on JIS B 8374-1993. With light/surge voltage suppressor (clean air), Dispersion accuracy ±1 ms
*2 Use dry air to prevent condensation when operating at low temperatures.
*3 Locking type: Semi-standard
*4 Impact resistance: No malfunction when tested with a drop tester in the axial direction and at a right angle to the armature, one time each in energized and deenergized states. Vibration resistance: No malfunction when tested with one sweep of 45 to 2000 Hz in the axial direction and at a right angle to the armature, in both energized and deenergized states. (Value in the initial stage)
*5 For vacuum, please use the 10- clean series. The 3(R) port can be used for vacuum, and the 1(P) port can be used for vacuum release pressure. (For the differential pressure between the 3(R) port and the 1(P) port, use within the max. operating pressure of each type.)
* For the power-saving type electrical entry, plug-in, L, or M plug connectors are applicable.

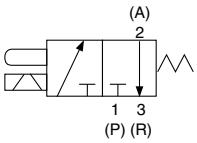
Symbol



Normally closed



Normally open



Latching type

Clean Series

Clean series is available for both standard and option specifications.

How to Order Valves

10 - VQ110 □-□

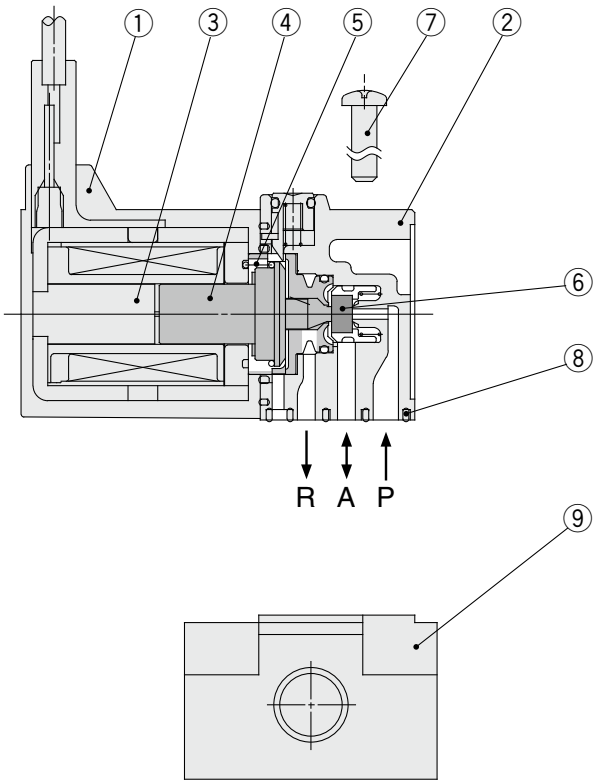
Clean series

Semi-standard Specifications

Item			Type	Latching type	AC type	Large flow capacity type	Normally open type	Power saving type
Valve specifications	**Model**			**VQ110L-□**	**VQ110-$\frac{1}{2}$□**	**VQ110U-□**	**VQ120-□**	**VQ110-□-X21**
	Max. operating pressure			0.7 MPa		0.6 MPa	0.5 MPa	0.7 MPa
	Min. operating pressure			0 MPa (–100 kPa[*4, *5])				
	Flow rate characteristics	**1 → 2[*6] (3 → 2)**	**C [dm³/(s·bar)]**	0.042		0.14	0.04	0.055
			b	0.27		0.26	0.11	0.22
			Cv	0.011		0.036	0.009	0.014
		2 → 3[*6] (2 → 1)	**C [dm³/(s·bar)]**	0.045		0.14	0.044	0.083
			b	0.28		0.25	0.3	0.28
			Cv	0.012		0.036	0.011	0.021
	Response time[*2]			5 ms or less	15 ms or less	5 ms or less	5 ms or less	5 ms or less
Electrical specifications	**Power consumption (Current)**		**24 VDC**	1 W (42 mA)[*7]	—	0.35 W (15 mA)[*3]	1 W (42 mA)	0.25 W (11 mA)[*8]
			12 VDC	1 W (83 mA)[*7]	—	0.35 W (30 mA)[*3]	1 W (83 mA)	0.25 W (21 mA)[*8]
			100 VAC	0.6 VA (6 mA)	0.5 VA (5 mA)	—		
			110 VAC	0.65 VA (5.9 mA)	0.55 VA (5 mA)	—		
			200 VAC	1.2 VA (6 mA)	1.0 VA (5 mA)	—		
			220 VAC	1.3 VA (5.9 mA)	1.1 VA (5 mA)	—		
	Electrical entry[*1]			Plug-in, L plug connector, M plug connector (With light/surge voltage suppressor)				

∗1 Grommets can only be produced for the normally open type (without light/surge voltage suppressor).
Only the 1 W DC specification is available for the normally open type.
∗2 Based on JIS B 8374-1993. With light/surge voltage suppressor (clean air).
∗3 Inrush: 3.1 W (10 ms after energized); Holding: 0.35 W (It has both + and – polarity.)
∗4 For vacuum, please use the 10- clean series. The 3(R) port can be used for vacuum, and the 1(P) port can be used for vacuum release pressure. (For the differential pressure between the 3(R) port and the 1(P) port, use within the max. operating pressure of each type.)
∗5 If the 1(P) port is to be used for vacuum, and the 3(R) port is to be used for vacuum release, please select the VQ120 (normally open type). In this case, the 10- is not required.
∗6 The values in brackets are for the normally open type's air passage.
∗7 It has both + and – polarity.
∗8 For the power-saving type electrical entry, plug-in, L, or M plug connectors are applicable.

Construction



(The normally closed valve is shown.)

Component Parts

No.	Description	Material
1	**Solenoid coil**	—
2	**Body**	Resin
3	**Core**	Stainless steel
4	**Armature assembly**	Stainless steel/Resin
5	**Return spring**	Stainless steel
6	**Poppet**	NBR
7	**Round head combination screw**	Carbon steel
8	**Interface gasket**	FKM

Replacement Parts

No.	Description	Material	Part no.
9	**Sub-plate**	ZDC	AXT662-1-$\frac{1}{2}$ (1: M5, 2: M3)

Optional Parts

· Gasket and screw: VQ100-GS-5

∗ 1 set includes 1 gasket and 2 screws.
An order contains 10 of these sets.

How to Order Valves

∗ The 100 VAC, 110 VAC, 24 VDC, and 12 VDC are the only CE/UKCA-compliant products.

[Option]

VQ1 1 0 □ – 5 L □ – M5 – □ – □

VQ series
Compact 3-port valve

Actuation

1	Normally closed
2∗1	Normally open

∗1 Normally open is only selectable for the standard type (1 W).

Functions∗3

Nil	Standard type (1 W)
H	High-pressure type (1.5 W)
Y	Low wattage type (0.5 W)
L∗2	Latching type∗4 Positive common
N∗2	Latching type∗4 Negative common
U∗2	Large flow capacity type

∗2 Semi-standard (It has both + and – polarity.)
∗3 Only one function can be selected. If the valve is to be energized continuously for extended periods of time, select "Y" (low-wattage type). For details, refer to "Extended periods of continuous energization" in the "Selection" section of the Best Pneumatics No. 1 catalog.
∗4 For details on the latching type, refer to the latching type in the "Specific Product Precautions" on page 15.

Coil rated voltage

		CE/UKCA-compliant
1	100 VAC (50/60 Hz)	●
2	200 VAC (50/60 Hz)	—
3	110 VAC (50/60 Hz)	●
4	220 VAC (50/60 Hz)	—
5	24 VDC	●
6	12 VDC	●

For other rated voltages, please consult with SMC.

Manual override

Nil	Non-locking push type (Tool required)
	Latching type: Push-locking type (Tool required)
B∗5	Locking type (Tool required)

∗5 Semi-standard
∗ Latching manual override: Push-locking type only.

Port size

Nil	Without sub-plate
M3	With sub-plate
M5	With sub-plate

Electrical entry

L	L plug connector, With lead wire With light/surge voltage suppressor
LO	L plug connector, Without connector With light/surge voltage suppressor
M	M plug connector, With lead wire With light/ surge voltage suppressor
MO	M plug connector, Without connector With light/surge voltage suppressor
G	Grommet

∗ Grommet: No latching, AC and large flow capacity.

Made to Order

Symbol	Specifications
Nil	Standard
X21	Power saving type (1.5 W)
X42	Fluid-contact part: Oil-free
X113	Fluororubber

CE/UKCA-compliant

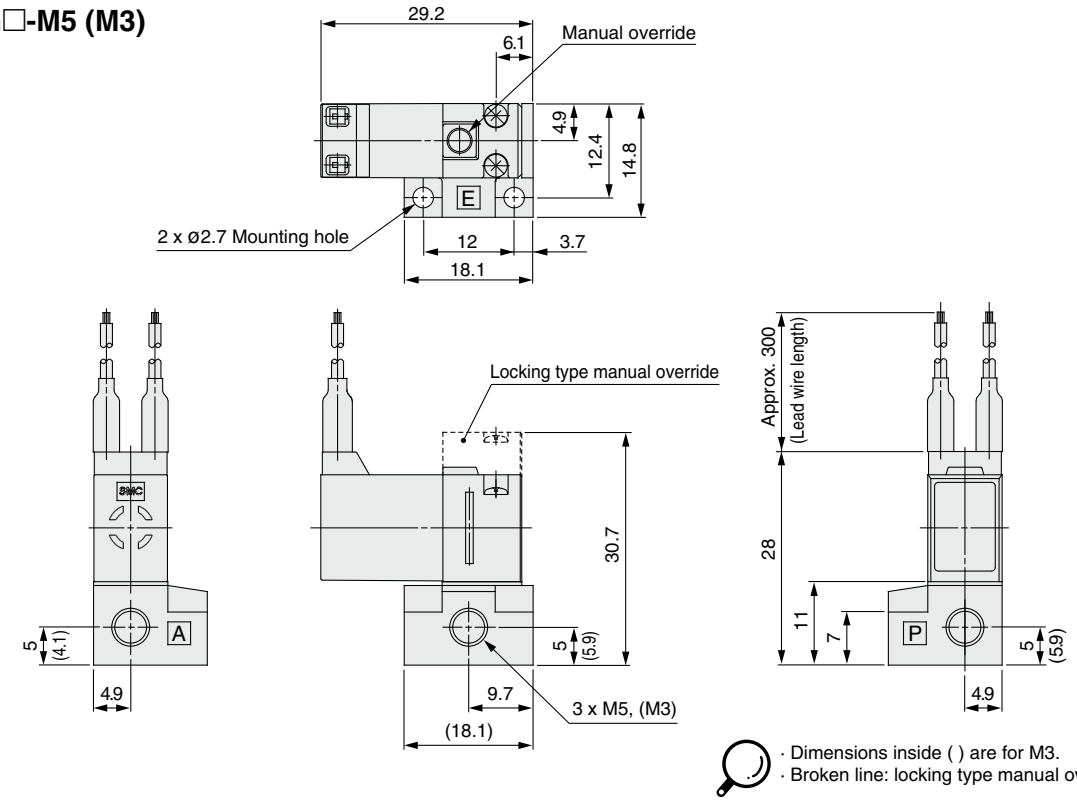
Nil	—
Q	CE/UKCA-compliant

∗ The 100 VAC, 110 VAC, 24 VDC, and 12 VDC are the only CE/UKCA-compliant products.

Dimensions

Grommet

VQ1□0□-□G□-M5 (M3)

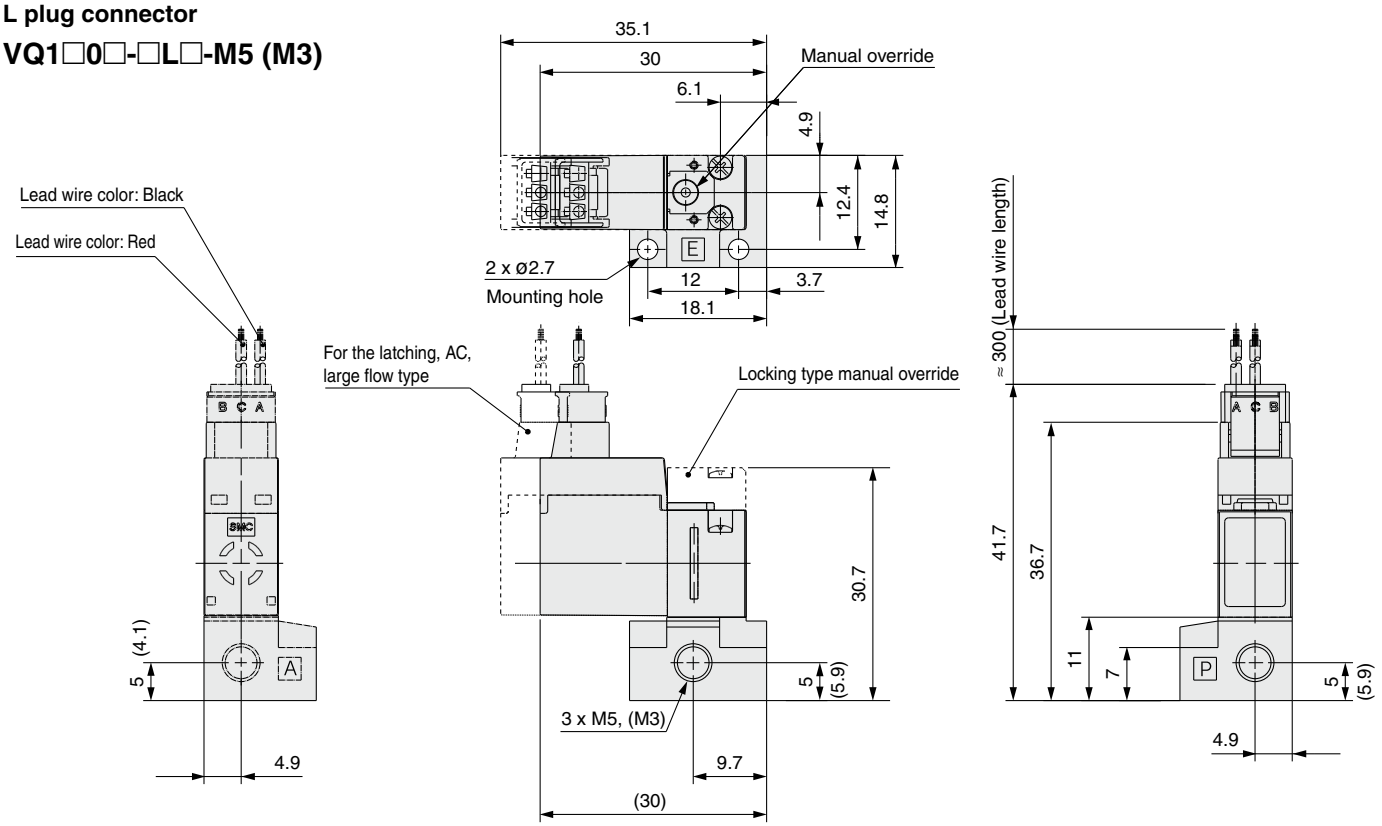


· Dimensions inside ( ) are for M3.
· Broken line: locking type manual override

Dimensions

L plug connector

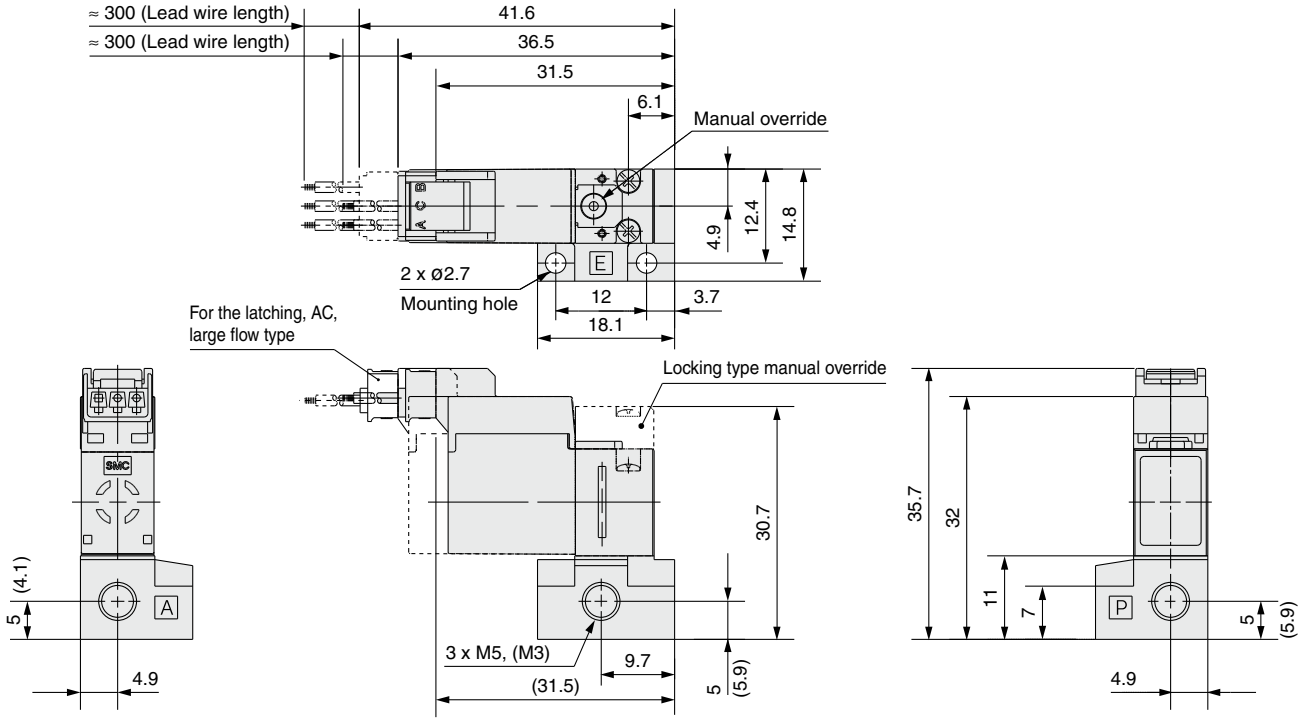
VQ1□0□-□L□-M5 (M3)



· Dimensions inside ( ) are for M3.
· The dashed lines show the latching, AC, large flow type.
· Dashed line: Locking type manual override and push locking type manual override (latching)

M plug connector

VQ1□0-□M□-M5 (M3)



· Dimensions inside ( ) are for M3.
· **The dashed lines show the latching, AC, large flow type.**
· Dashed line: Locking type manual override and push locking type manual override (latching)

How to Order Manifold

[Option]

Plug-in unit manifold **VV3Q 1 1 – 08 C U 1 – D –**

Applicable solenoid valve (Plug-in type)
VQ1□0□-□F
- Consult SMC for mounting latching type.
- Possible to mount U type (large flow capacity). In this case, it will be + common. For – common, add X343 to the end of the part number.

＊ Normally closed and normally open type cannot be mounted on the same manifold.

Series

1	VQ100

Stations

02	2 stations
⋮	⋮
18	18 stations

Electrical entry

C	Circular connector type

Manifold base

1	Plug-in unit

Electrical entry direction

U	Top entry
S	Side entry

Cable length

0	Without cable
1	With cable (1.5 m)
2	With cable (3 m)
3	With cable (5 m)

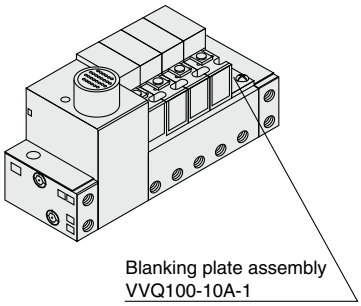
Option

Nil	None
D	DIN rail mounting (With standard DIN rail length)
DO＊1	DIN rail mounting (Without DIN rail)

＊1 Order DIN rail separately.
For DIN rail part no., refer to page 12.

CE/UKCA-compliant

Nil	—
Q	CE/UKCA-compliant



Blanking plate assembly
VVQ100-10A-1

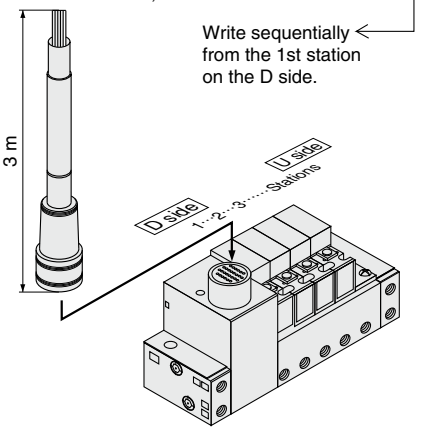
How to Order Manifold Assembly

Specify the part numbers for valves and options together beneath the manifold base part number.

<Example>
Plug-in unit manifold with cable (3 m)
VV3Q11-05CU2(-Q) ····· **1 set** —— **Manifold base part no.**
＊ **VQ110-5F(-Q)** ····· **4 sets** —— **Valve part no. (Stations 1 to 4)**
＊ **VVQ100-10A-1(-Q)** ·· **1 set** —— **Blanking plate part no. (Station 5)**

Prefix the asterisk to the part nos. of the solenoid valve, etc.

Write sequentially from the 1st station on the D side.



How to Order Valves

[Option]

＊ For CE/UKCA-compliant models, DC type only.

VQ1 1 0 □ – 5 F □ – □ – □

VQ series
Compact 3-port valve

Actuation

1	Normally closed
2＊1	Normally open

＊1 Normally open is only selectable for the standard type (1 W).

Functions＊3

Nil	Standard type (1 W)
H	High-pressure type (1.5 W)
Y	Low wattage type (0.5 W)
U＊2	Large flow capacity type

＊2 Semi-standard (It has both + and – polarity.)
＊3 Only one function can be selected. If the valve is to be energized continuously for extended periods of time, select "Y" (low-wattage type). For details, refer to "Extended periods of continuous energization" in the "Selection" section of the Best Pneumatics No. 1 catalog.

Coil rated voltage

		CE/UKCA-compliant
1	100 VAC (50/60 Hz)	●
2	200 VAC (50/60 Hz)	—
3	110 VAC (50/60 Hz)	●
4	220 VAC (50/60 Hz)	—
5	24 VDC	●
6	12 VDC	●

For other rated voltages, please consult with SMC.

Electrical entry

F	Plug-in With light/surge voltage suppressor (only for plug-in manifold)

Manual override

Nil	Non-locking push type (Tool required)
B＊4	Locking type (Tool required)

＊4 Semi-standard

Made to Order

Symbol	Specifications
Nil	Standard
X21	Power saving type (1.5 W)
X42	Fluid-contact part: Oil-free
X113	Fluororubber

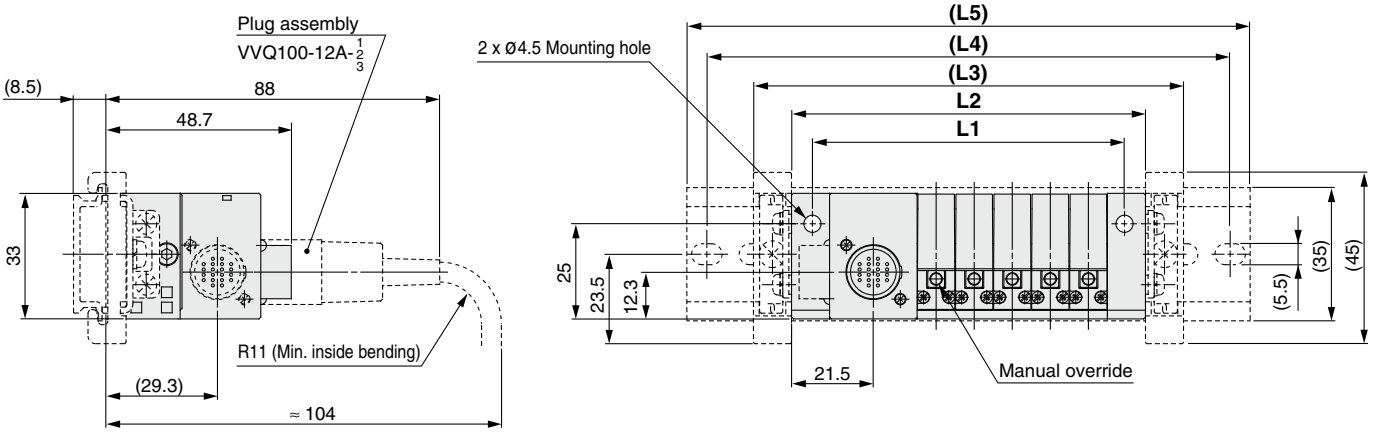
CE/UKCA-compliant

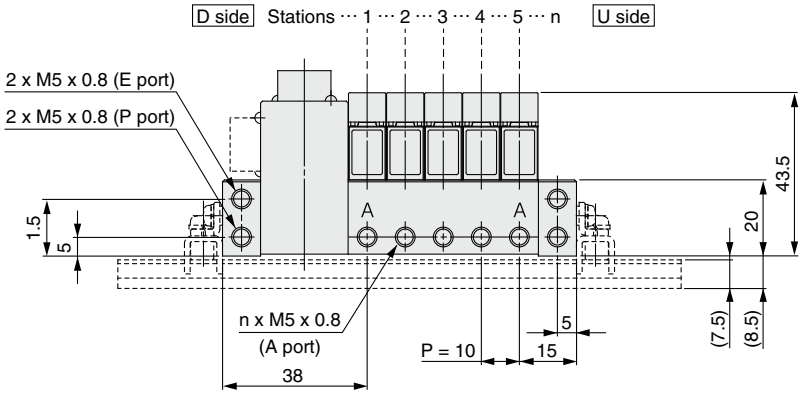
Nil	—
Q	CE/UKCA-compliant

＊ For CE/UKCA-compliant models, DC type only.

Plug-in Unit (VV3Q11) Manifold with Circular Connector

The broken line indicates DIN rail mounted type (-D) and side entry connector (S).





Dimensions

Formula: L1 = 10 n + 32 L2 = 10 n + 43 n: Station (Maximum 18 stations)

L \ n	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
L1	52	62	72	82	92	102	112	122	132	142	152	162	172	182	192	202	212
L2	63	73	83	93	103	113	123	133	143	153	163	173	183	193	203	213	223
(L3)	83	93	103	113	123	133	143	153	163	173	183	193	203	213	223	233	243
(L4)	112.5	112.5	125	137.5	150	162.5	162.5	175	187.5	200	212.5	212.5	225	237.5	250	262.5	262.5
(L5)	123	123	135.5	148	160.5	173	173	185.5	198	210.5	223	223	235.5	248	260.5	273	273

How to Order Manifold

[Option]

Plug lead unit manifold **VV3Q1 2 – 08 01N –**

Applicable solenoid valve (Plug lead type)
VQ1□0□-□L
VQ1□0□-□M
VQ1□0□-□G

∗ Normally closed and normally open type cannot be mounted on the same manifold.

Series

1	VQ100

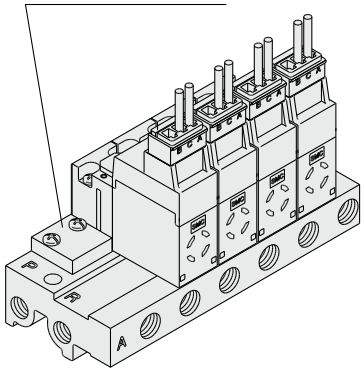
Manifold base

2	Plug lead unit
2U	Plug lead unit U type (large flow capacity) mounting base

Stations

02	2 stations
⋮	⋮
20	20 stations

Blanking plate assembly
VVQ1000-10A-2



Port size∗1 and thread

Nil	M5, Rc1/8
01N	NPT1/8
01T	NPTF1/8
01F	PF1/8

∗1 Only thread port size 1/8 type (2U type, P/E port) has choice of thread.

CE/UKCA-compliant

Nil	—
Q	CE/UKCA-compliant

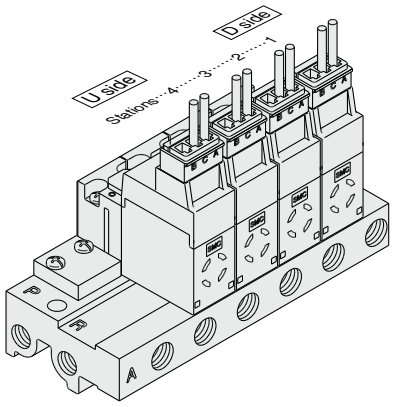
How to Order Manifold Assembly

Specify the part numbers for valves and options together beneath the manifold base part number.

<Example>
Plug lead unit manifold
VV3Q12-05 (-Q) ····· **1 set**———**Manifold base part no.**
∗ **VQ110-5L (-Q)** ····· **4 sets**———**Valve part no. (Stations 1 to 4)**
∗ **VVQ100-10A-2** ····· **1 set**—**Blanking plate part no. (Station 5)**

Prefix the asterisk to the part nos. of the solenoid valve, etc.

Write sequentially from the 1st station on the D side.



How to Order Valves

∗ For CE/UKCA-compliant models, DC type only.

[Option]

VQ1 1 0 □ – 5 L □ – □ – □

VQ series
Compact 3-port valve

Actuation

1	Normally closed
2∗1	Normally open

∗1 Normally open is only selectable for the standard type (1 W).

Functions∗3

Nil	Standard type (1 W)
H	High-pressure type (1.5 W)
Y	Low wattage type (0.5 W)
L∗2	Latching type∗4 Positive common
N∗2	Latching type∗4 Negative common
U∗2	Large flow capacity type

∗2 Semi-standard (It has both + and – polarity.)
∗3 Only one function can be selected. If the valve is to be energized continuously for extended periods of time, select "Y" (low-wattage type). For details, refer to "Extended periods of continuous energization" in the "Selection" section of the Best Pneumatics No. 1 catalog.
∗4 For details on the latching type, refer to the latching type in the "Specific Product Precautions" on page 15.

Coil rated voltage

		CE/UKCA-compliant
1	100 VAC (50/60 Hz)	●
2	200 VAC (50/60 Hz)	—
3	110 VAC (50/60 Hz)	●
4	220 VAC (50/60 Hz)	—
5	24 VDC	●
6	12 VDC	●

For other rated voltages, please consult with SMC.

Manual override

Nil	Non-locking push type (Tool required)
	Latching type: Push-locking type (Tool required)
B∗5	Locking type (Tool required)

∗5 Semi-standard
∗ Latching manual override: Push-locking type only.

Made to Order

Symbol	Specifications
Nil	Standard
X21	Power saving type (1.5 W)
X42	Fluid-contact part: Oil-free
X113	Fluororubber

CE/UKCA-compliant

Nil	—
Q	CE/UKCA-compliant

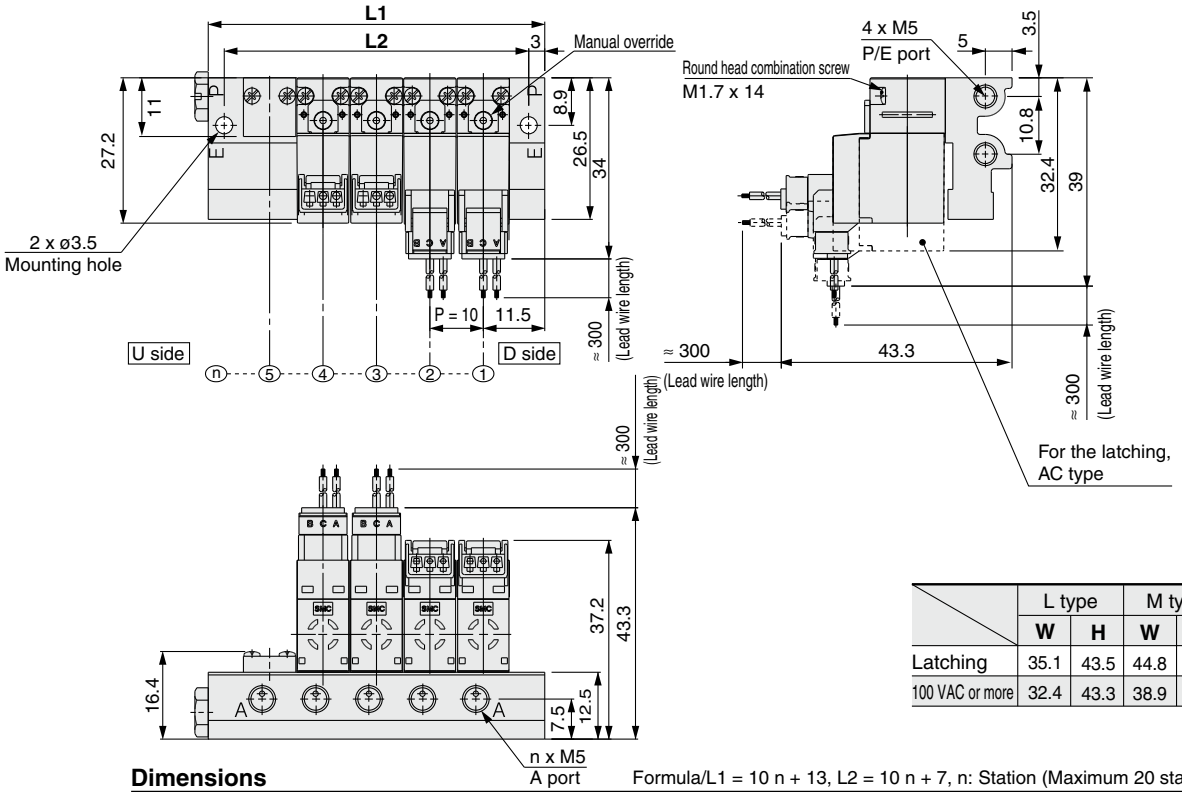
∗ For CE/UKCA-compliant models, DC type only.

Electrical entry

L	L plug connector, With lead wire With light/surge voltage suppressor
LO	L plug connector, Without connector With light/surge voltage suppressor
M	M plug connector, With lead wire With light/ surge voltage suppressor
MO	M plug connector, Without connector With light/surge voltage suppressor
G	Grommet

∗ Grommet: No latching, AC and large flow capacity.

Plug Lead Unit Manifold (VV3Q12)

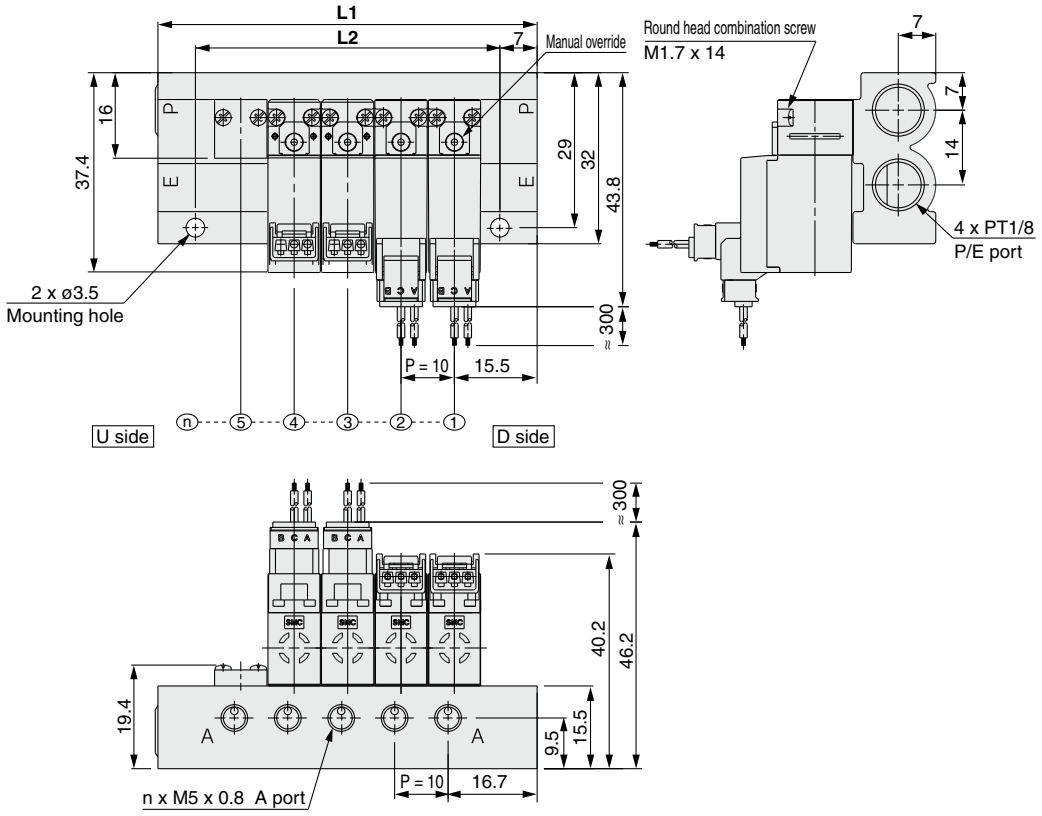


	L type		M type	
	W	**H**	**W**	**H**
Latching	35.1	43.5	44.8	32.2
100 VAC or more	32.4	43.3	38.9	37.2

Dimensions Formula/L1 = 10 n + 13, L2 = 10 n + 7, n: Station (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	23	33	43	53	63	73	83	93	103	113	123	133	143	153	163	173	183	193	203	213
L2	17	27	37	47	57	67	77	87	97	107	117	127	137	147	157	167	177	187	197	207

Plug Lead Unit U Type (Large Flow Capacity) Mounted Manifold (VV3Q12U)



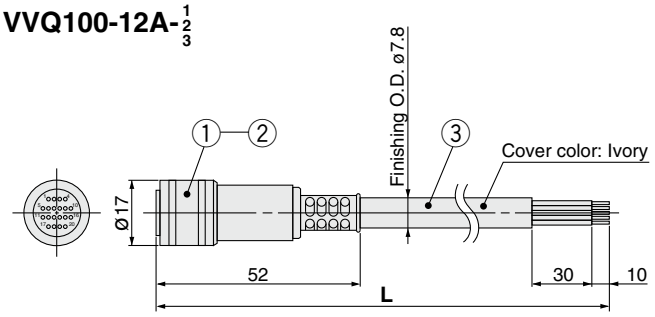
Dimensions Formula/L1 = 10 n + 21, L2 = 10 n + 7, n: Station (Maximum 20 stations)

L \ n	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**
L1	31	41	51	61	71	81	91	101	111	121	131	141	151	161	171	181	191	201	211	221
L2	17	27	37	47	57	67	77	87	97	107	117	127	137	147	157	167	177	187	197	207

Manifold Option

Plug Assembly

VVQ100-12A- 1 2 3



1	**Plug**	RP13A-12PS-20SC <Made by HIROSE ELECTRIC CO., LTD.>
2	**Female contact**	RP19-SC-222 <Made by HIROSE ELECTRIC CO., LTD.>
3	**Vinyl multi-core cable**	VVRF 0.2 mm^2 20 cores

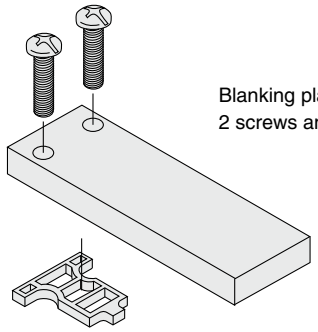
Cable length

Part no.	**L** Dimension
VVQ100-12A-1	1.5 m
VVQ100-12A-2	3 m
VVQ100-12A-3	5 m

Blanking Plate Assembly

VVQ100-10A-1

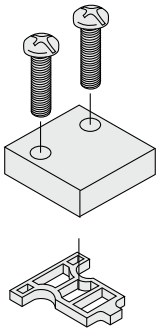
Plug-in Unit (**VV3Q11**) for Manifold with Circular Connector



Blanking plate assembly includes
2 screws and gasket

VVQ100-10A-2

Plug Lead Unit (**VV3Q12**) for Manifold



Blanking plate assembly includes
2 screws and gasket

VV3Q11 For Manifold with Circular Connector

<D-Side End Plate Assembly>

D-side end plate assembly no.

VVQ100-3A-□

Option

1	Standard type
2	DIN rail mounting

<U-Side End Plate Assembly>

U-side end plate assembly no.

VVQ100-2A-□

Option

1	Standard type
2	DIN rail mounting

<DIN Rail Mounting Brackets Assembly>

DIN rail mounting brackets assembly no.

AXT802-1A-□

Mounting direction

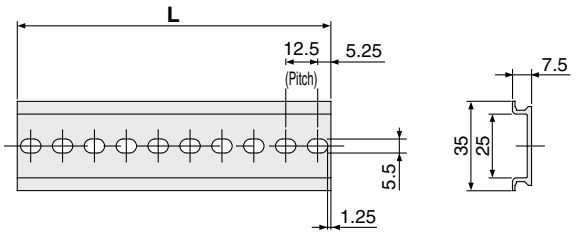
D	D side mounting
U	U side mounting

∗ The number of manifold stations cannot be changed.

When Ordering DIN Rail Only

DIN rail no: AXT100-DR-□

∗ As for □, enter the number from the DIN rail dimensions table.
For L dimension, refer to the dimensions on page 9.



L Dimension L = 12.5 n + 10.5

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

VQ100 Series
Specific Product Precautions 1

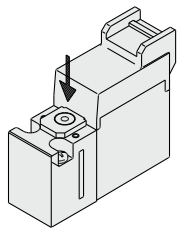
Be sure to read this before handling the products.
Refer to the "Handling Precautions for SMC Products" (M-E03-3) for safety instructions and solenoid valve precautions.

⚠ Warning

Manual Override

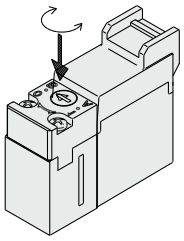
Connected actuator is started by manual operation. Use the manual override after confirming that there is no danger.

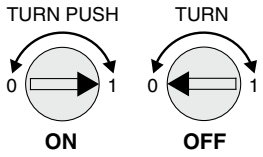
■ Non-locking push type (Tool required)



· It is turned ON by pushing the button in the direction indicated by the arrow until it hits the end and turned OFF by releasing the button.

■ Locking type (Tool required) <Semi-standard>

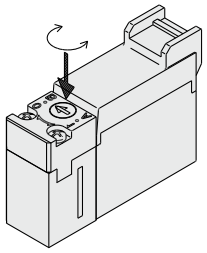


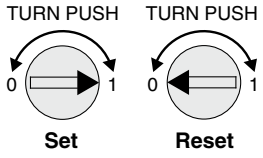


· It can be locked in the ON state by turning the manual override to the right, setting the ▶ mark to 1 and pushing it.
· It can be unlocked by turning the manual override to the left, setting the ◀ mark to 0 and pushing it, and the manual returns.

∗ Make sure the locking type manual override is unlocked before use.

■ Push-locking type (Tool required) <Latching type>





· It can be locked in the set state (flow: P → A) by turning the manual override to the right, setting the ▶ mark to 1 and pushing it.
· It can be turned back to the reset state (flow: A → R) by turning the manual override to the left, setting the ◀ mark to 0 and pushing it. (It is set in reset state when shipped.)

⚠ Caution When operating the locking type manual override with a screwdriver, turn it gently using a watchmakers screw driver.
[Torque: Less than 0.1 N·m]
For the locking type, be sure to completely turn the manual override before pressing it. (Pressing the manual override while turning it will damage the manual override button.)

Mounting

To mount the valve, check the condition of the body interface gasket and then tighten it uniformly to the appropriate tightening torque (0.15 to 0.18 N·m).

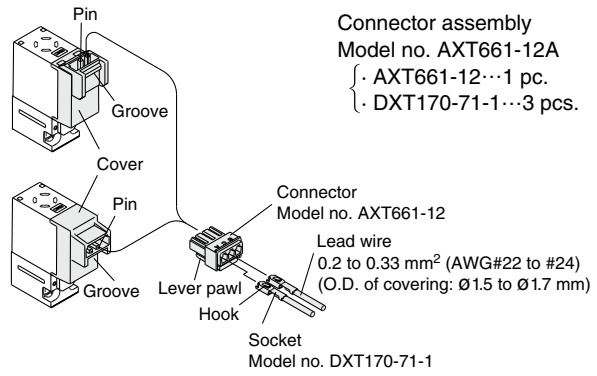
⚠ Caution

How to Use Plug Connector

Attaching and detaching connectors

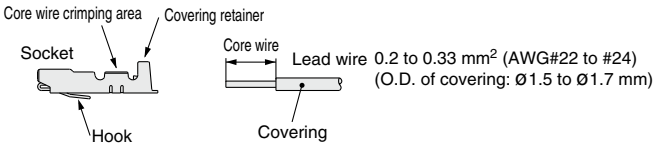
- To attach a connector, hold the lever and connector unit between your fingers and insert straight onto the pins of the solenoid valve so that the lever's pawl is pushed into the groove and locks.
- To detach a connector, remove the pawl from the groove by pushing the lever downward with your thumb, and pull the connector straight out.

∗ Gently pull the lead wire, otherwise it may cause contact failure or disconnection.



Crimping connection of lead wire and socket

Strip 3.2 to 3.7 mm at the end of lead wires, insert the end of the core wires evenly into the sockets, and then crimp it by a crimping tool. When this is done, take care that the coverings of the lead wires do not enter the core wire crimping area.
(Crimping tool: Model no. DXT170-75-1)



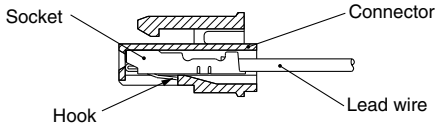
Attaching and detaching lead wires with sockets

- Attaching

  Insert the sockets into the square holes of the connector (A, C, B indication), and continue to push the sockets all the way in until they lock by hooking into the seats in the connector. (When they are pushed in, their hooks open and they are locked automatically.) Then confirm that they are locked by pulling lightly on the lead wires.

- Detaching

  To detach a socket from a connector, pull out the lead wire while pressing the socket's hook with a stick having a thin tip (approx. 1 mm). If the socket will be used again, first spread the hook outward.



VQ100 Series
Specific Product Precautions 2

Be sure to read this before handling the products.
Refer to the "Handling Precautions for SMC Products" (M-E03-3) for safety instructions and solenoid valve precautions.

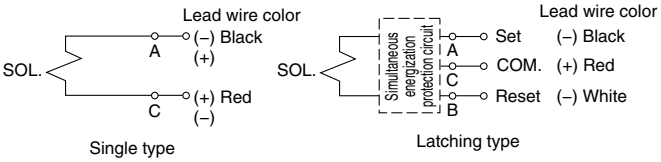
⚠ Caution

How to Use Plug Connector

Wiring Specifications

●Wiring should be connected as shown below. Connect with the power supply respectively.

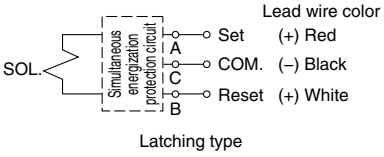
DC positive common



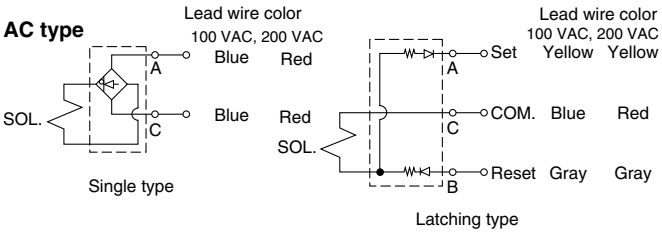
DC negative common

There is no polarity for the single type.

∗ However, there is polarity for the large flow type.



AC type



● How to Order valve plug connector assembly

DC positive common
- **Single type** **AXT661-14A-□**
- **Latching type** **AXT661-13A-□**

DC negative common
- **Latching type** **AXT661-13AN-□**

For 100 VAC
- **Single type** **AXT661-31A-□**
- **Latching type** **AXT661-32A-□**

For 200 VAC
- **Single type** **AXT661-34A-□**
- **Latching type** **AXT661-35A-□**

Connector/Socket only (3 pcs.) **AXT661-12A**

Lead wire length

Nil	300 mm
6	600 mm
10	1000 mm
20	2000 mm
30	3000 mm

● Plug connector lead wire length

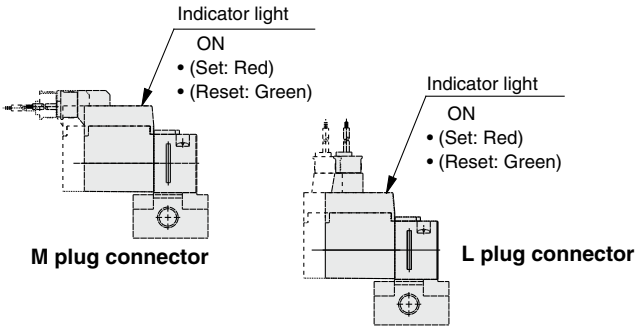
The lead wire length of the valves with lead wire is 300 mm. When ordering a lead wire length of 600 mm or longer, list the part numbers for the valve without connector and the connector assembly.

⚠ Caution

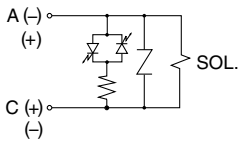
Light/Surge Voltage Suppressor

In the latching type, the set side and the reset side energization are indicated by two colors – red and green.

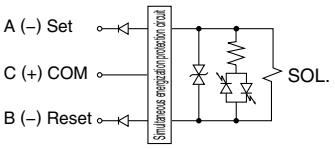
∗ ( ) and the dotted lines indicate the latching and large flow type.



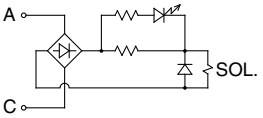
Single solenoid (DC)



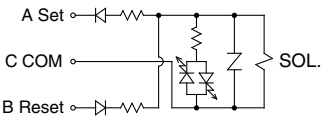
Latching solenoid (DC)



Single solenoid (AC)



Latching solenoid (AC)



∗ Single: No polarity
ON: Red light lights.

∗ Setting side energizing: Red light lights.
Resetting side energizing: Green light lights.
With wrong wiring prevention (stop diode) mechanism
With surge voltage suppresser (ZNR/Surge absorbing diode)

∗ A (set) side energizing: P → A
B (set) side energizing: A → R

∗ Negative common specification is applicable.

VQ100 Series
Specific Product Precautions 3

Be sure to read this before handling the products.
Refer to the "Handling Precautions for SMC Products" (M-E03-3) for safety instructions and solenoid valve precautions.

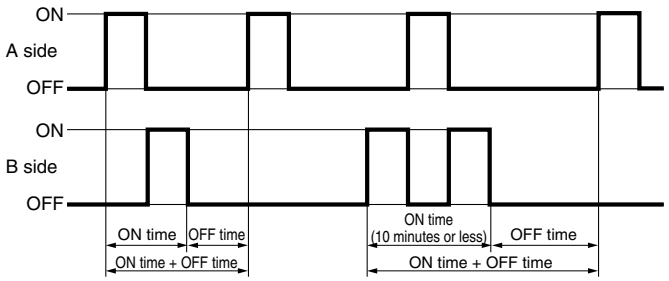
⚠ Caution

Latching Type

The latching solenoid is equipped with a self-holding mechanism which permits the movable iron core in the solenoid to hold the set position or reset position during momentary energization (20 ms or longer), so there is no need for continuous energization. Depending on conditions, continuous energization may cause a rise in the coil temperatures, resulting in a malfunction.

<Special precautions to be taken with the latching type>

1. Do not continuously energize the latching type.
   When it is necessary to energize it continuously, keep the energized period to 10 minutes or less, and then leave a de-energized period (on both the A side and B side) lasting longer than the energized period, before operating it again. The duty ratio should be 50% or less.



· Maximum ON time is 10 minutes.
· Duty ratio ≤ 50% (Duty ratio = $\frac{\text{ON time}}{\text{ON time + OFF time}}$)

Example: When energization lasts for five minutes, it should be followed by five or more minutes of de-energization. Because the latching type has only one solenoid, both the A side and B side should be off for five minutes or more.

However, a minimum energization time of 20 ms is recommended.
[Ambient temperature]
The product should be installed in an environment with an ambient temperature of –10°C to 50°C. Especially in environments with poor heat dissipation, such as in a panel, the heat of the coil can cause the ambient temperature to rise, so please exercise caution.

2. Use a circuit in which the set and reset signals will not be energized at the same time.
3. The minimum energization time for self-holding is 20 ms.
4. Even when there is no problem with normal operations and locations, please consult with SMC before using in locations with a vibration of 30 m/s^2 or more or a strong magnetic field.
5. Even though this valve is set to the reset position at the time of shipment (passage: A → R), it may switch to the set position during transportation or due to impact when mounting valves, etc. Therefore, check the initial position with the power supply or by performing a manual override prior to use.

Latching	Passage	Indicator light
A-C ON (set)	P → A	Red
B-C ON (reset)	A → R	Green

Single	Passage	Indicator light
A-C ON	P → A	Red
OFF	A → R	—

VQ100 Series
Specific Product Precautions 4

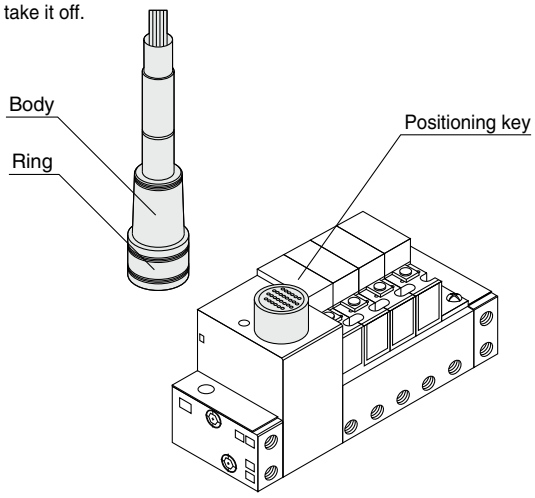
Be sure to read this before handling the products.
Refer to the "Handling Precautions for SMC Products" (M-E03-3) for safety instructions and solenoid valve precautions.

⚠ Caution

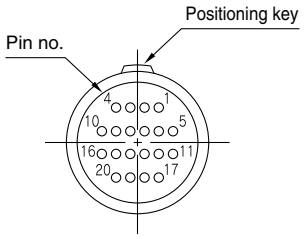
How to Use of Circular Connector (For plug-in manifold: For VV3Q11)

1. Attaching and detaching connectors

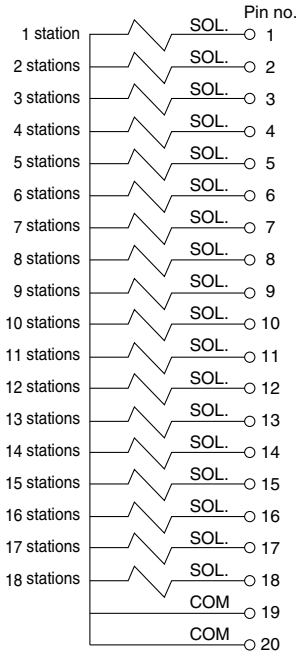
- To attach a connector, align the positioning key grooves of the body to the key, and it is locked.
- To detach the connector, pull the ring section straight back, and it is unlocked and then take it off.



2. Wiring Specifications



Circular connector pin arrangement



Electrical wiring specifications

Terminal no./Lead wire color

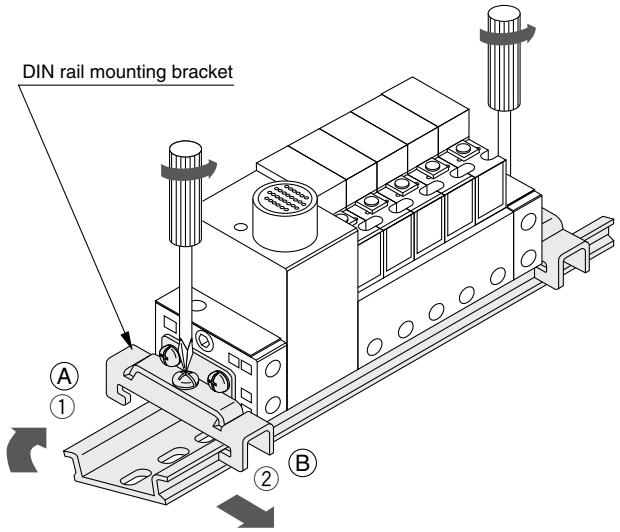
Terminal no.	Lead wire color	
	Wire color	Dot marking
1	Black	—
2	Brown	—
3	Red	—
4	Orange	—
5	Yellow	—
6	Pink	—
7	Blue	—
8	Violet	White
9	Gray	Black
10	White	Black
11	White	Red
12	Yellow	Red
13	Orange	Red
14	Yellow	Black
15	Pink	Black
16	Blue	White
17	Violet	—
18	Gray	—
19	Orange	Black
20	Red	White

⚠ Caution

How to Connect/Disconnect DIN Rail

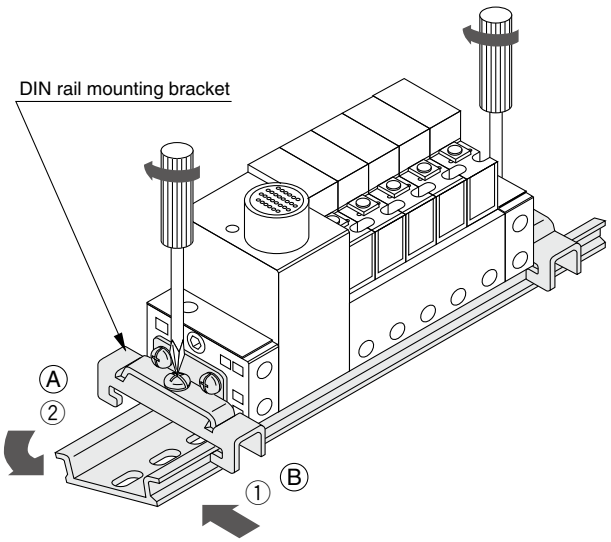
Removing

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



Mounting

1) Hook side Ⓑ of the manifold base on the DIN rail.
2) Press down side Ⓐ and mount the end plate on the DIN rail.
   Tighten the clamp screw on the side.
   Proper tightening torque of thread: 0.8 to 1.2 N·m



How to Calculate the Flow Rate

For obtaining the flow rate, refer to the Best Pneumatics No. 1

3-Port Solenoid Valve
VQ100 Series

NRTL /C

How to Order Valves

30 – VQ1 [1] 0 – [5] [F] – [ ]

Conforming to CSA standard

VQ series
Compact 3-port valve

Actuation

1	Normally closed
2	Normally open

Coil rated voltage

5	24 VDC
6	12 VDC

Port size

Nil	Without sub-plate
M3	With sub-plate
M5	With sub-plate

Electrical entry

F	Plug-in With light/surge voltage suppressor (only for plug-in manifold)	

Function: Standard (1 W)
Manual override: Non-locking push type (Tool required)
Latching type: Push-locking type (Tool required)

Refer to standard products for specifications and dimensions.