

3-Port Solenoid Valve

VQ100 Series



Unprecedented high speed, with stable response times

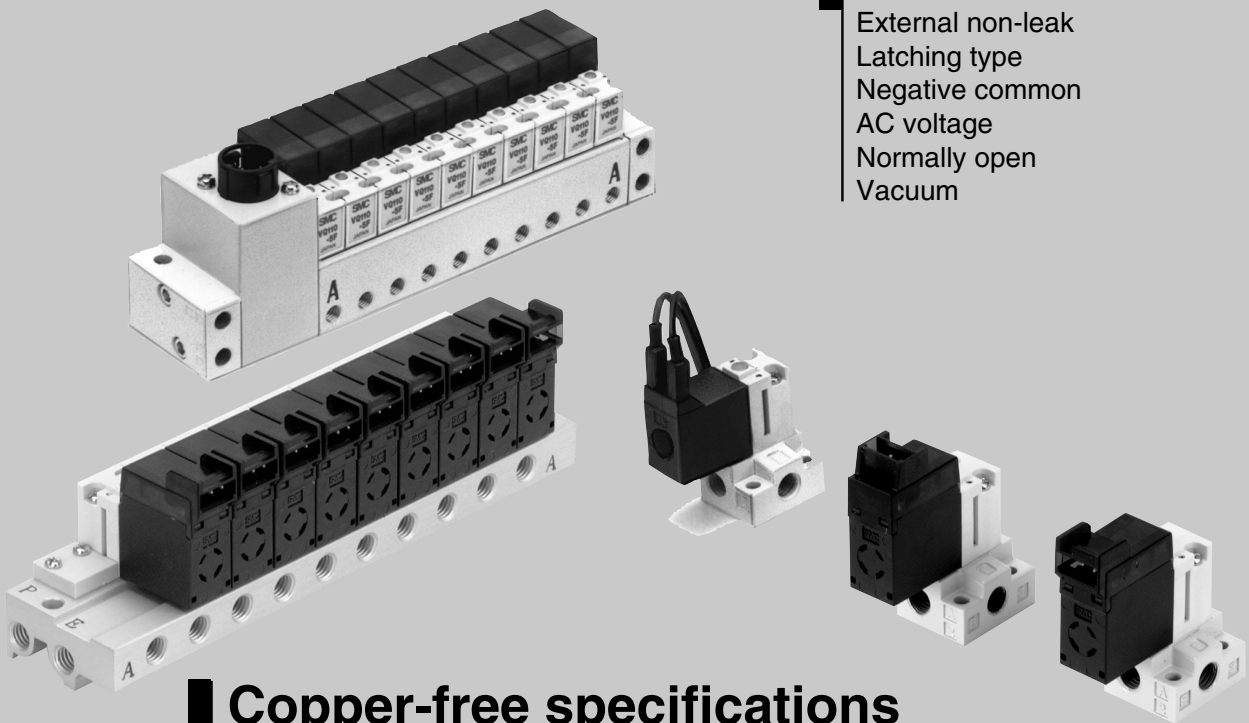
ON: 3.5 ms, OFF: 2 ms, Dispersion accuracy ± 1 ms
(With light/surge voltage suppressor; supply pressure 0.5 MPa)

Compact with large flow capacity.

Body width 9.8 mm C: 0.055 dm³/(s·bar) (Standard, high-pressure type)
C: 0.14 dm³/(s·bar) (Large flow capacity type)
: Semi-standard

Semi-standard

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

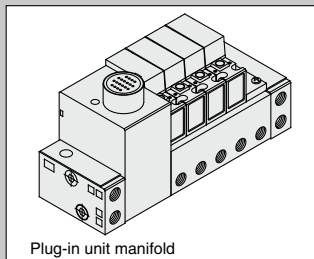


Copper-free specifications

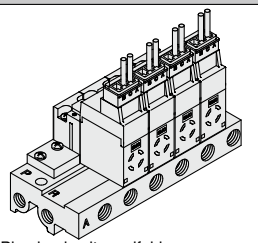
The fluid contacting section is copper-free and the standard type can be used as it is.

A wide variation of wiring

Manifold

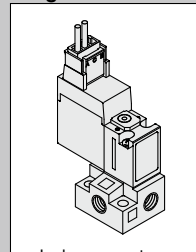


Plug-in unit manifold

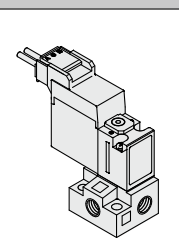


Plug lead unit manifold

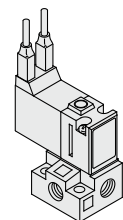
Single unit



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-compliant products.
 (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.)

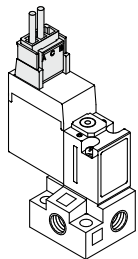
*3 Only one function can be selected. If the valve is to be energized continuously for extended periods of time, select "Y" (low-wattage type). For details, refer to "Extended periods of continuous energization" in the "Selection" section of the Best Pneumatics No. 1 catalog.

*4 For details on the latching type, refer to the latching type in the "Specific Product Precautions" on page 15.

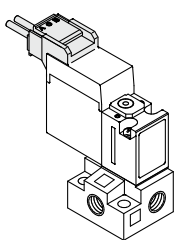
Coil rated voltage

		CE-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	●

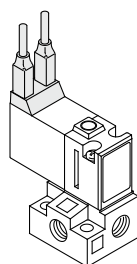
For other rated voltages, please consult with SMC.



L plug connector



M plug connector



Grommet

CE-compliant

Nil	—
Q	CE-compliant

* The 100 VAC, 110 VAC, 24 VDC, and 12 VDC are the only CE-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

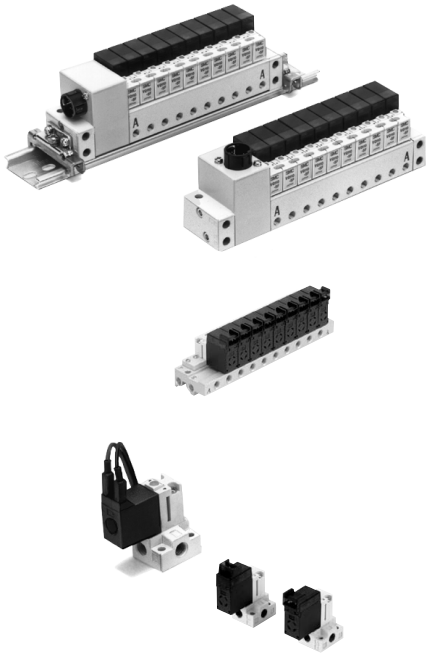
* Latching manual override: Push-locking type only.

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	



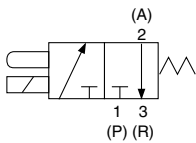
* Grommet: No latching, AC and large flow capacity.



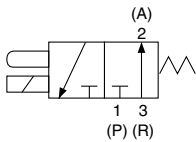
Standard Specifications

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 [dm ³ /(s·bar)]	0.055	0.042
			b	0.22	0.27
			Cv	0.014	0.011
		2 → 3	C [dm ³ /(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/s ²			
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)		

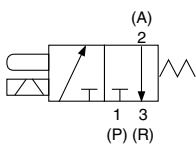
Symbol



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



- *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.

VQ100 Series

Semi-standard Specifications

Item	Type	Latching type	AC type	Large flow capacity type	Normally open type	Power saving type	
Valve specifications	Model	VQ110L-□	VQ110-½□	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 [dm ³ /(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 [dm ³ /(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.)

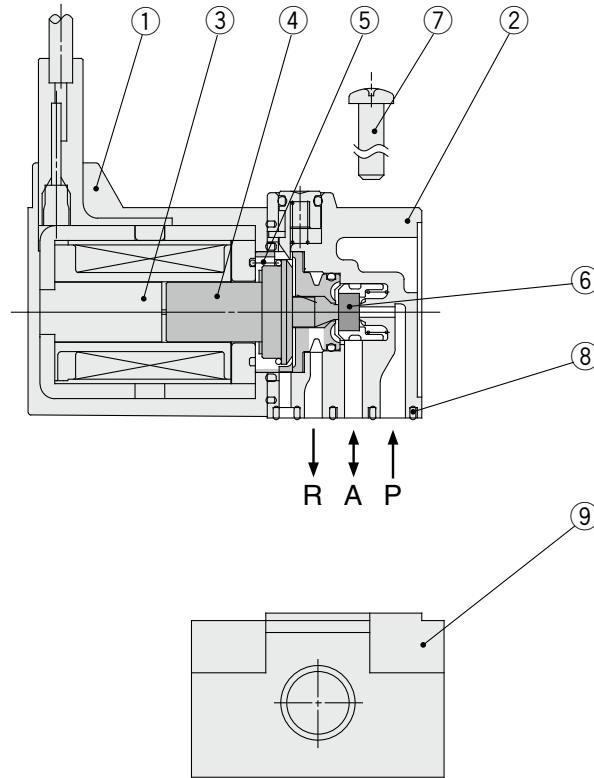
*5 If the 1(P) port is to be used for vacuum, and the 3(R) port is to be used for vacuum release, please select the VQ120 (normally open type). In this case, the 10- is not required.

*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

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.

Made to Order

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

CE-compliant

Nil	—
Q	CE-compliant

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

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.

Coil rated voltage

	CE-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

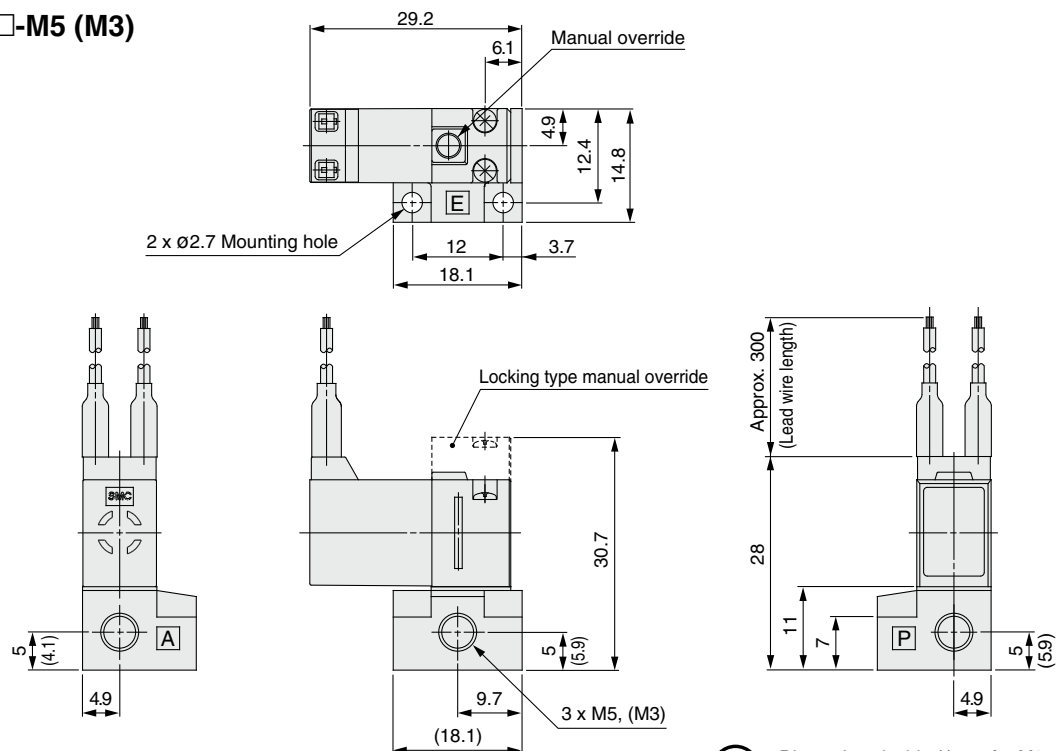
L	L plug connector, With lead wire With light/surge voltage suppressor
LO	L plug connector, Without connector With light/surge voltage suppressor
M	M plug connector, With lead wire With light/ surge voltage suppressor
MO	M plug connector, Without connector With light/surge voltage suppressor
G	Grommet

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

Dimensions

Grommet

VQ1□0□-□G□-M5 (M3)

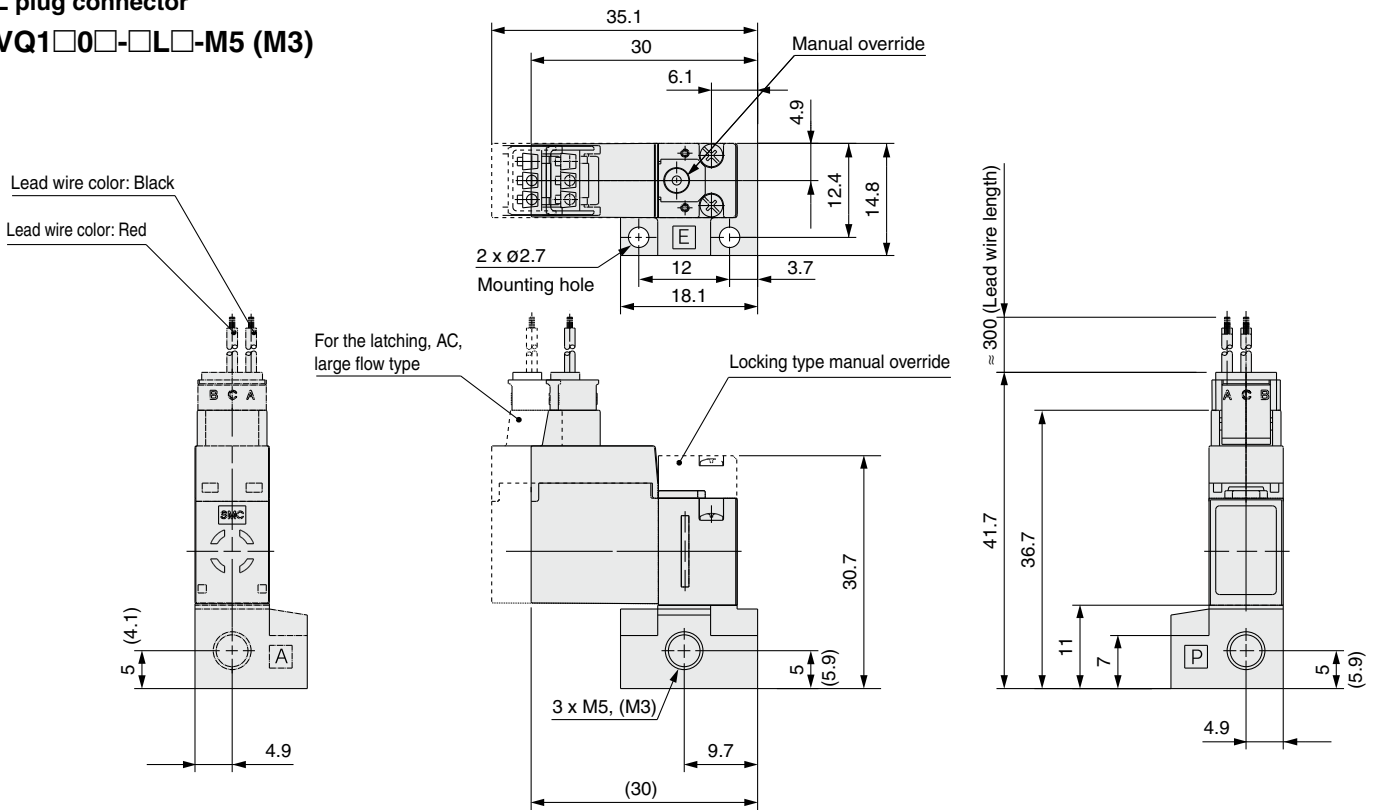


· Dimensions inside () are for M3.
· Broken line: locking type manual override

Dimensions

L plug connector

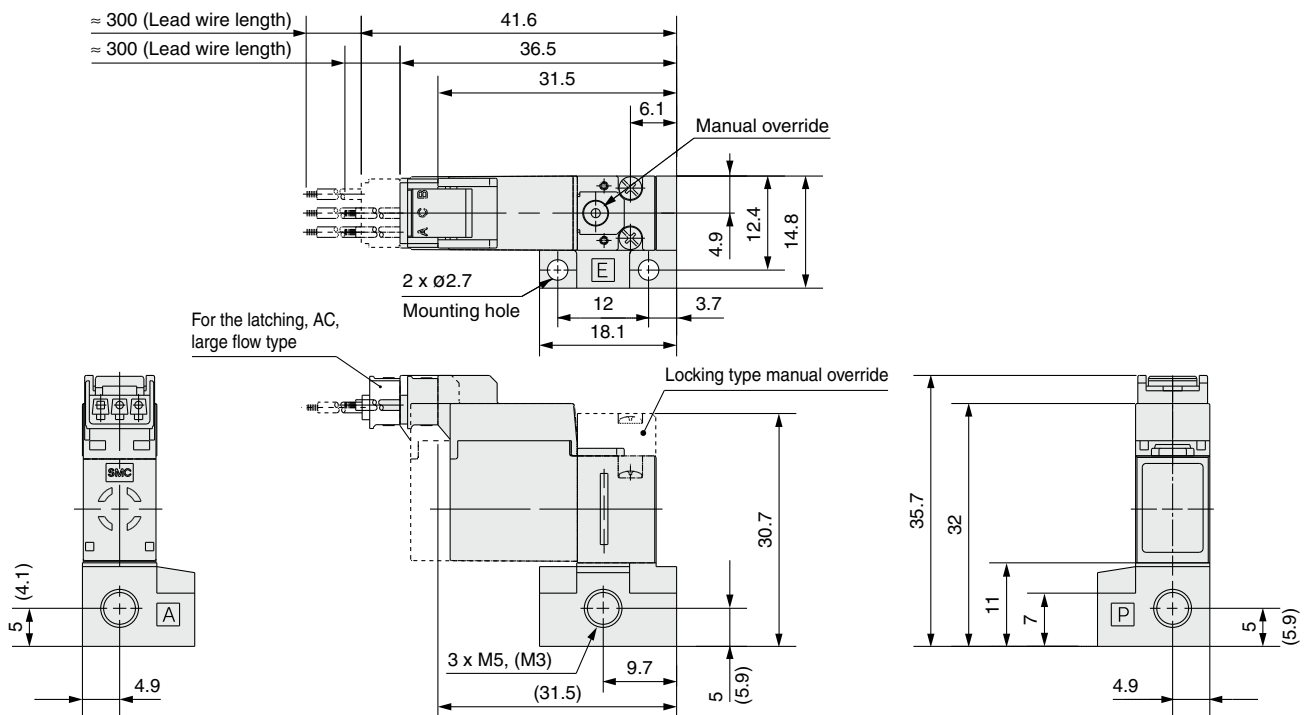
VQ1□0□-□L□-M5 (M3)



- 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)

VQ100 Series



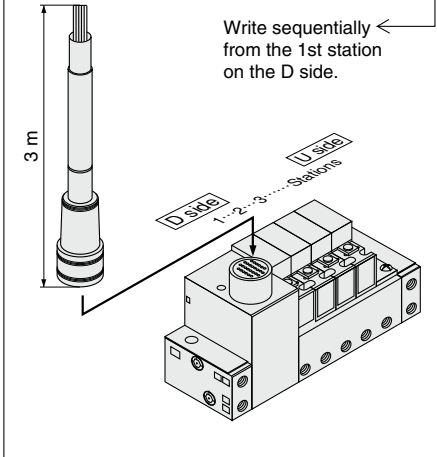
How to Order Manifold

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.

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

Electrical entry direction
 U Top entry
 S Side entry

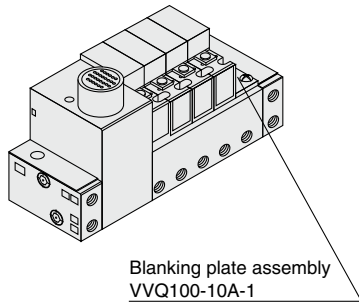
Manifold base
 1 Plug-in unit

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-compliant
 Nil —
 Q CE-compliant



Blanking plate assembly VVQ100-10A-1

How to Order Valves

* For CE-compliant models, DC type only. [Option]

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.

Manual override

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

*4 Semi-standard

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

Coil rated voltage CE-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.

CE-compliant


Nil	—
Q	CE-compliant

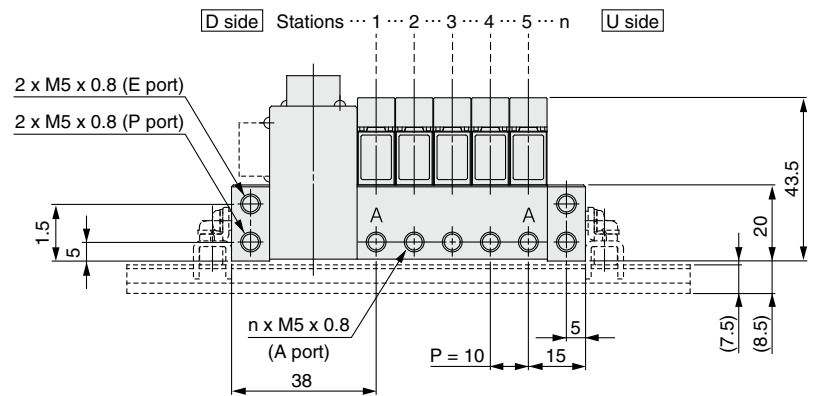
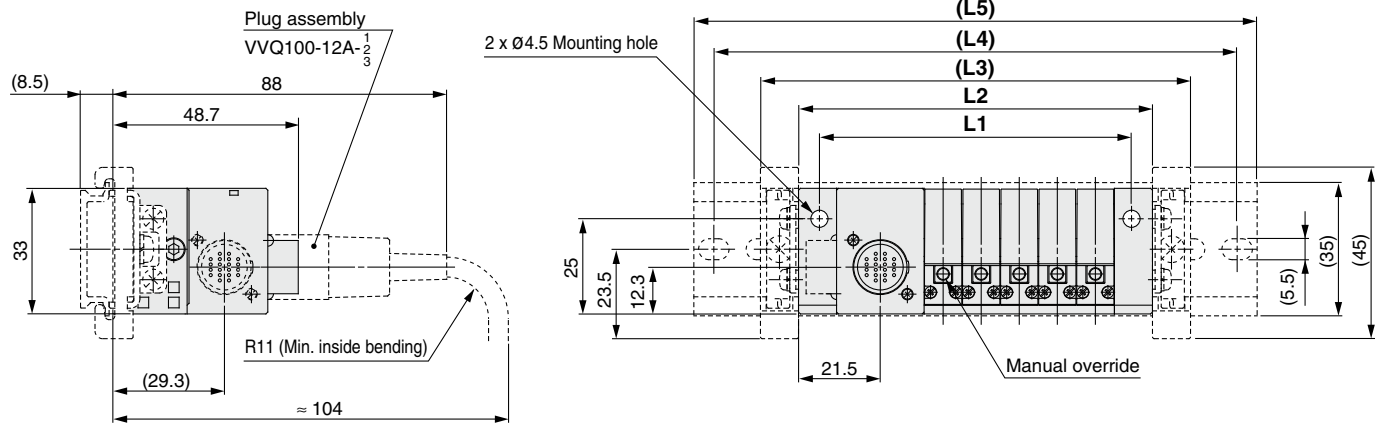
* For CE-compliant models, DC type only.

Made to Order

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

Plug-in Unit (VV3Q11) Manifold with Circular Connector

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



Dimensions

Formula: $L1 = 10n + 32$ $L2 = 10n + 43$ 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

VQ100 Series



How to Order Manifold

Plug lead unit manifold

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.

Blanking plate assembly
VVQ1000-10A-2

VV3Q 1 2 - 08 01N -

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

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-compliant

Nil	—
Q	CE-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

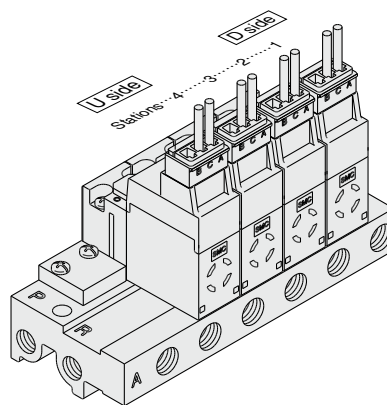
VV3Q12-05 (-Q) 1 set — Manifold base part no.

* **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-compliant models, DC type only.



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.

CE-compliant

Nil	—
Q	CE-compliant

* For CE-compliant models, DC type only.

Made to Order

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

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.

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

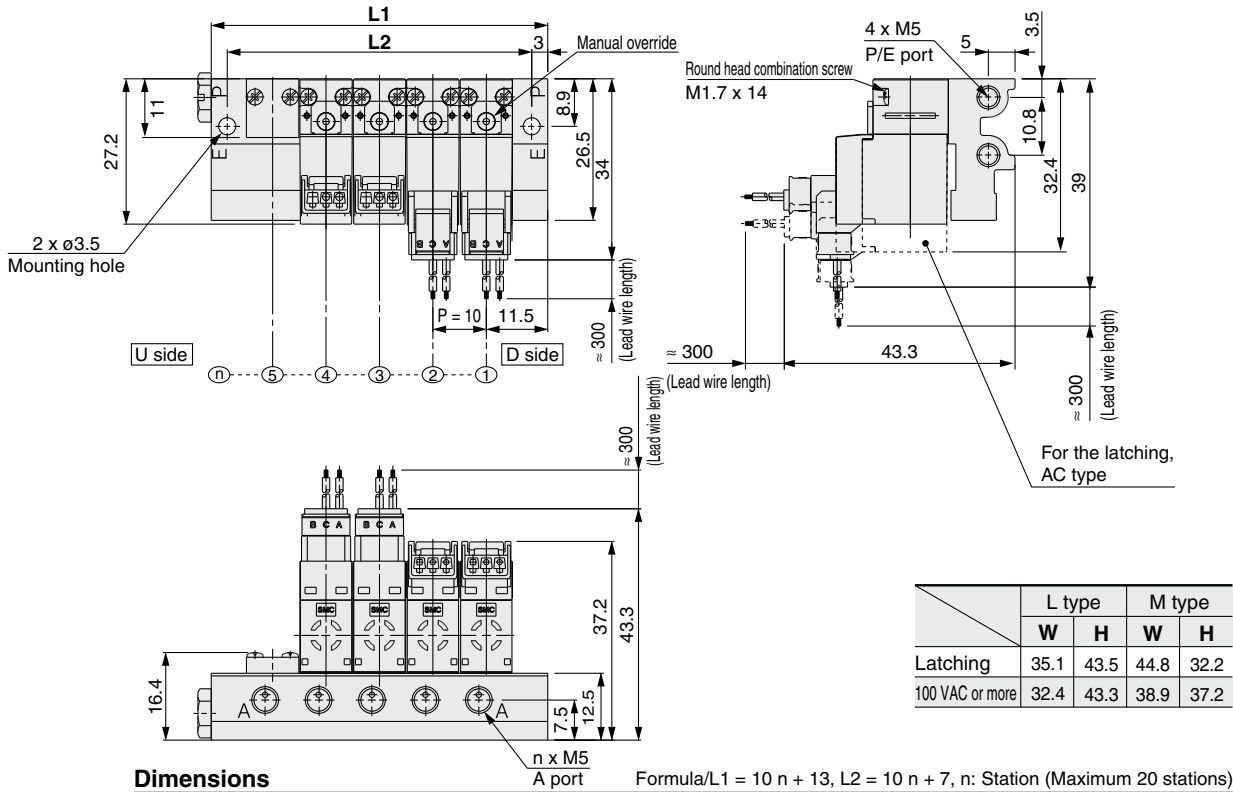
* Grommet: No latching, AC and large flow capacity.

Coil rated voltage

	CE-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.

Plug Lead Unit Manifold (VV3Q12)

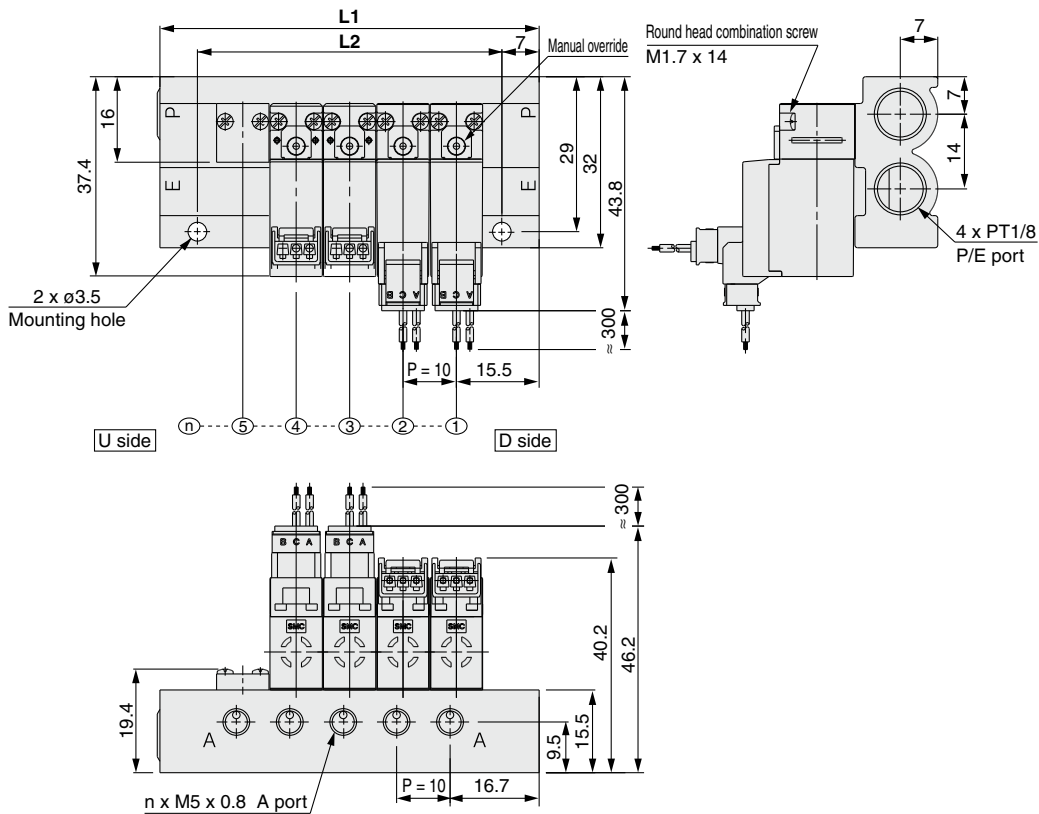


Dimensions

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)

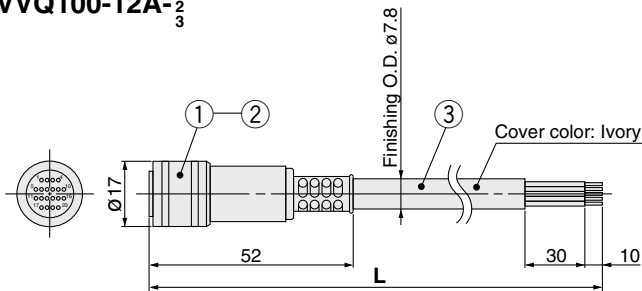
L \ n	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
L1	31	41	51	61	71	81	91	101	111	121	131	141	151	161	171	181	191	201	211	221
L2	17	27	37	47	57	67	77	87	97	107	117	127	137	147	157	167	177	187	197	207

VQ100 Series

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

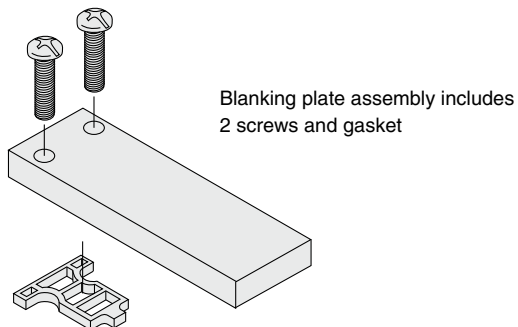
Cable length

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

Blanking Plate Assembly

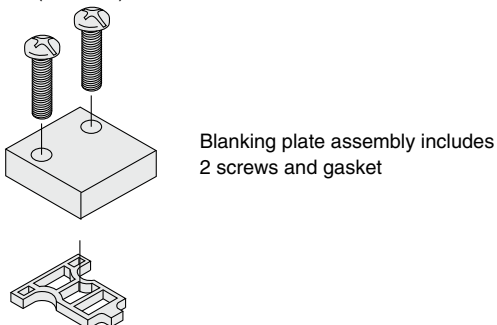
VVQ100-10A-1

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



VVQ100-10A-2

Plug Lead Unit (VV3Q12) for Manifold



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

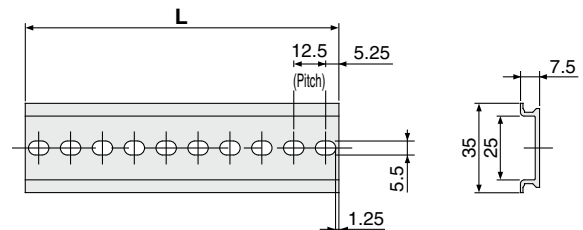


* The number of manifold stations cannot be changed.

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