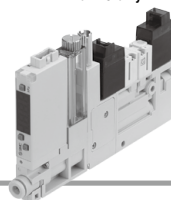


Space Saving Vacuum Ejector

ZQ Series



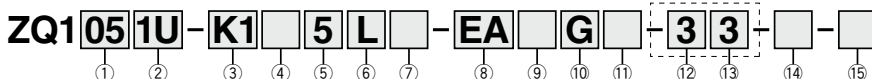
The ZQ series space saving vacuum ejector/vacuum pump system is to be discontinued as of April 2023. Consider selecting a ZQ□□ series compact vacuum unit as a substitute. [Click here for details.](#)



How to Order

Ejector Unit

Made to Order For "Made to Order", refer to pages 613 and 614.



① Nozzle nominal size

05	ø0.5
07	ø0.7
10	ø1.0

② Exhaust type

1U	With silencer for single unit
3M	With silencer for manifold

③ Solenoid valve combination (Refer to Table (1).)

Symbol	Supply valve	Vacuum release valve
K1	Normally closed	Normally closed
K2 <small>Note 1)</small>	Normally open	Normally closed
J1	Normally closed	None
J2 <small>Note 1)</small>	Normally open	None
Q1	Latching positive common	Normally closed
Q2	Latching positive common	None
N1	Latching negative common	Normally closed
N2	Latching negative common	None

Note 1) When using K2 or J2 (supply valve normally open), ensure that the energizing time does not become longer than the non-energizing time. If the energizing time becomes longer or if the valve is energized for 10 minutes or longer, select the DC low wattage type in "Made to Order". (Refer to page 614.)

④ Pilot valve (Refer to Table (1).)

Nil	Standard (DC: 1 W) <small>Note 2)</small>
Y	DC low wattage type (0.5 W) <small>Note 2)</small>

Note 2) Avoid energizing the solenoid valve for long periods of time. (Refer to Design and Selection on Specific Product Precautions.)

⑤ Solenoid valve rated voltage (Refer to Table (1).)

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




Note 3) CE/UKCA-compliant products are not available for "1", "2", "3" and "4".

Table (1) Combination of Solenoid Valve, Pilot Valve and Power Supply Voltage

Combination no.	Solenoid valve combination symbol	Pilot valve symbol	Applicable power supply voltage (V)					
			100 AC	200 AC	110 AC	220 AC	24 DC	12 DC
①	K1	Nil	—	—	—	—	●	●
②	K1	Y	—	—	—	—	●	●
③	K2	Nil	—	—	—	—	●	●
④	J1	Nil	●	●	●	●	●	●
⑤	J1	Y	—	—	—	—	●	●
⑥	J2	Nil	—	—	—	—	●	●
⑦	Q1	Nil	—	—	—	—	●	●
⑧	Q2	Nil	●	●	●	●	●	●
⑨	N1	Nil	—	—	—	—	●	●
⑩	N2	Nil	—	—	—	—	●	●

* Combinations ① to ⑩ in the above table are the only possible options.

⑥ Electrical entry

L	L-type plug connector, with 0.3 m lead wire, with light/surge voltage suppressor	
LO	L-type plug connector, without connector, with light/surge voltage suppressor	
G	Grommet, with 0.3 m lead wire (Latching/AC type: Not applicable)	

⑦ Manual override Note 4)

Nil	Non-locking push type Latching type: Push-locking type
B	Locking type (Q1/Q2/N1/N2: Not applicable)

Note 4) Latching type supply valve: Available in "Nil" only.
In this case, the supply valve and release valve come with a push-locking type.

⑧ Vacuum pressure switch suction filter Note 5)

EA	0 to -101 kPa/NPN open collector 2 outputs, with suction filter
EB	0 to -101 kPa/PNP open collector 2 outputs, with suction filter
EC	0 to -101 kPa/NPN open collector 1 output + analog voltage, with suction filter
EE	0 to -101 kPa/PNP open collector 1 output + analog voltage, with suction filter
FA	100 to -100 kPa/NPN open collector 2 outputs, with suction filter
FB	100 to -100 kPa/PNP open collector 2 outputs, with suction filter
FC	100 to -100 kPa/NPN open collector 1 output + analog voltage, with suction filter
FE	100 to -100 kPa/PNP open collector 1 output + analog voltage, with suction filter
F	Suction filter only

Note 5) The filter included in this product is of a simple type, and will become clogged quickly in environments with high quantities of dust or particulates. Please make additional use of an air suction filter of the ZFA, ZFB or ZFC series.

⚠ Warning

The filter case of this suction filter is made of nylon. Contact with alcohol or similar chemicals may cause it to be damaged. Also, do not use the filter when these chemicals are present in the atmosphere.

⑪ Check valve Note 8) Note 9)

Nil	None
K	With check valve

Note 8) The check valve has a function to prevent the exhaust air from the silencer overflowing to the vacuum port side when a manifold is used, but it cannot prevent overflow of the exhaust air completely. During usage, please inspect thoroughly with actual machine.

Also, in order to completely prevent the overflow of exhaust air, leave plenty of space between the check valve unit and adjacent ejector to avoid interference from the ejector's exhaust unit.

Note 9) Only applicable to the exhaust type 3M and cannot be selected for solenoid valve combinations of J1, J2, Q2 and N2.

⚠ Warning

- Cannot be used for vacuum retention.
- Use a release valve. (Without a release valve, a workpiece may not be released.)

⑫ Fitting (V port) Note 10)

Symbol	Applicable tubing O.D.
0	Without fitting (M5 x 0.8)
1	ø3.2 (Straight)
2	ø4 (Straight)
3	ø6 (Straight)
4	ø3.2 (Elbow)
5	ø4 (Elbow)

⑬ Fitting (P port) Note 10)

Symbol	Applicable tubing O.D.	Object spec.
Nil	Without port	Manifold
0	Without fitting (M5 x 0.8)	Single unit
2	ø4 (Straight)	
3	ø6 (Straight)	
5	ø4 (Elbow)	

⑨ Vacuum pressure switch unit specifications

Nil	With unit switching function <small>Note 6)</small>
M	Fixed SI unit <small>Note 7)</small>
P	With unit switching function <small>Note 6)</small> (Initial value psi)

Note 6) Under the New Measurement Law, sales of switches with the unit switching function are not allowed for use in Japan.

Note 7) Fixed unit: kPa

⑩ Vacuum pressure switch lead wire specifications

Nil	Without connector
G	Lead wire with connector (Lead wire length 2 m) With connector cover

⑭ Bracket A

Nil	With bracket A
N	Without bracket A <small>Note 11)</small>

⑮ CE/UKCA-compliant

Nil	—
Q	CE/UKCA-compliant

Note) CE/UKCA-compliant: For DC only.

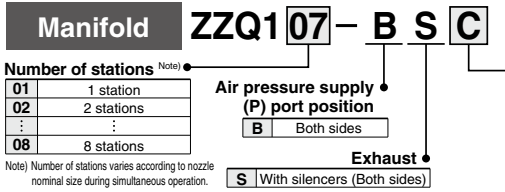
Note 10) For filter only (Without vacuum pressure switch)

Single unit: When neither V port fitting nor P port fitting are needed, enter nothing or -00 in the dotted line "How to Order".

Manifold specifications: When the V port fitting is not needed, enter nothing or -0 in the dotted line "How to Order".

Note 11) Only applicable to the exhaust type 1U.

How to Order



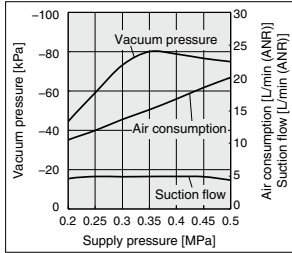
Maximum Number of Stations in Simultaneous Operation

Nozzle nominal size	Maximum number of stations in simultaneous operation
ø0.5	8 stations
ø0.7	6 stations
ø1.0	4 stations

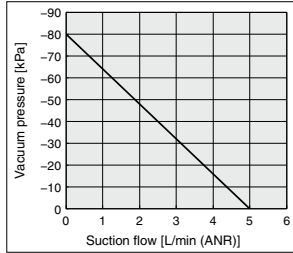
Note) If the number of stations in simultaneous operation is within the numbers stated above, a manifold can be used for up to 8 stations.

Flow/Exhaust Characteristics

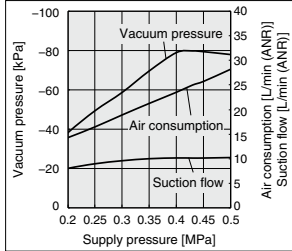
ZZQ105 / Exhaust Characteristics



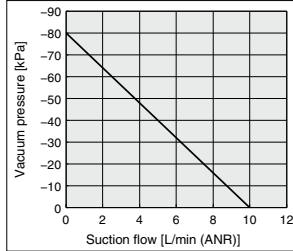
ZZQ105 / Flow Rate Characteristics



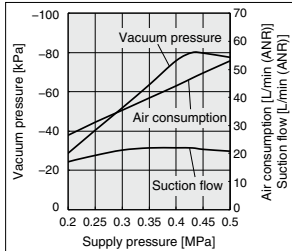
ZZQ107 / Exhaust Characteristics



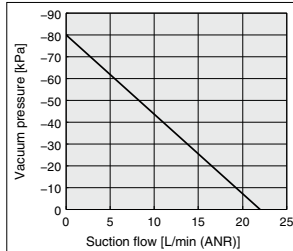
ZZQ107 / Flow Rate Characteristics



ZZQ110 / Exhaust Characteristics



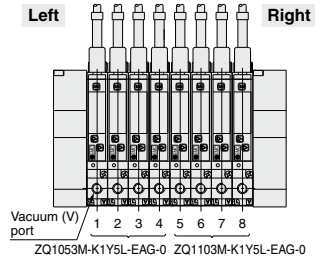
ZZQ110 / Flow Rate Characteristics



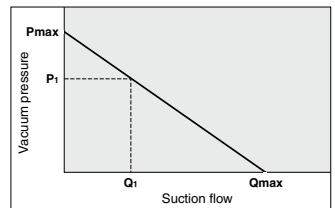
Manifold Ordering Example

ZZQ108-BSB → 1 pc.
 *ZZQ1053M-K1Y5L-EAG-0 (-Q) → 4 pcs. (Stations 1 to 4)
 *ZZQ103M-K1Y5L-EAG-0 (-Q) → 4 pcs. (Stations 5 to 8)

Note) By viewing the front side of vacuum port (V), stations are counted starting from station 1 on the left side.



How to Read Flow Rate Characteristics



Flow rate characteristics are expressed in ejector vacuum pressure and suction flow. If suction flow rate changes, a change in vacuum pressure will also be expressed. Normally this relationship is expressed in ejector standard use.

In the graph, **Pmax** is max. vacuum pressure and **Qmax** is max. suction flow. The valves are specified according to catalog use. Changes in vacuum pressure are expressed in the below order.

- When ejector suction port is covered and made airtight, suction flow becomes 0 and vacuum pressure is at maximum value (**Pmax**).
- When suction port is opened gradually, air can flow through, (air leakage), suction flow increases, but vacuum pressure decreases. (condition **P1** and **Q1**)
- When suction port is opened further, suction flow moves to maximum value (**Qmax**), but vacuum pressure is near 0. (atmospheric pressure).

When vacuum port (vacuum piping) has no leakage, vacuum pressure becomes maximum, and vacuum pressure decreases as leakage increases. When leakage value is the same as max. suction flow, vacuum pressure is near 0.

When ventrative or leaky work must be adsorbed, please note that vacuum pressure will not be high.

⚠️ Precautions

Be sure to read this before handling the products. Refer to page 33 for safety instructions and pages 34 to 36 for vacuum equipment precautions.

⚠️ Caution

Refer to the vacuum equipment model selection on pages 11 to 32 for the selecting and sizing of ZQ series.

Specifications

Ejector

Model		ZQ105	ZQ107	ZQ110
Nozzle nominal diameter (mm)		0.5	0.7	1.0
Maximum suction flow (L/min (ANR))		5	10	22
Air consumption (L/min (ANR))		15	25	47
Maximum vacuum pressure		-80 kPa		
Supply pressure range	Air pressure supply port (P)	0.3 to 0.5 MPa (Normally open: 0.3 to 0.45 MPa)		
	Supply pressure port for vacuum release (PD)	0.3 to 0.5 MPa (Normally open: 0.3 to 0.45 MPa), and also PD pressure ≤ P pressure		
Supply pressure ^{Note)}		0.35 MPa	0.43 MPa	
Operating temperature range		5 to 50°C		
Fluid		Air		

Note) Maximum suction flow can be obtained by standard supply pressure.

Weight

Single unit	With suction filter ^{Note 1)}	95 g
	With vacuum pressure switch and suction filter ^{Note 2)}	109 g
End plate assembly for manifold		122 g

Note 1) Including a 0.3 m connector for supply valve and vacuum release valve.

Note 2) Including a 0.3 m connector for supply valve and vacuum release valve and a 2 m connector for vacuum pressure switch.

◎ Calculation of weight for the manifold type
 (Single unit weight) x (Number of stations) + (Weight of end plate assembly for manifold)

Example) Vacuum pressure switch + 8 stations with suction filter
 109 g x 8 + 122 g = 994 g

Supply Valve / Vacuum Release Valve

Type	Normally closed		Latching type	Normally open
	Standard (1 W)	Low wattage type (0.5 W)		
Model (Refer to "How to Order" for solenoid valves on page 605.)	VQ110-□	VQ110Y-□	VQ110 _h -□	ZQ1-VQ120-□
Manual override	Non-locking push type / Locking type (Tool type)		Push-locking type	Non-locking push type / Locking type (Tool type)
Rated coil voltage	12, 24 VDC, 100, 110, 200, 220 VAC	12, 24 VDC	12, 24 VDC, 100, 110, 200, 220 VAC	12, 24 VDC
Power consumption (current value)	DC	1 W	1 W	
	100 VAC	0.5 VA (5 mA)	—	0.6 VA (6 mA) —
	110 VAC	0.55 VA (5 mA)	—	0.65 VA (5.9 mA) —
	200 VAC	1.0 VA (5 mA)	—	1.2 VA (6 mA) —
	220 VAC	1.1 VA (5 mA)	—	1.3 VA (5.9 mA) —
Electrical entry	Grommet L-type plug connector (with light/surge voltage suppressor)		L-type plug connector (with light/surge voltage suppressor)	Grommet L-type plug connector (with light/surge voltage suppressor)

Specifications

Vacuum Pressure Switch

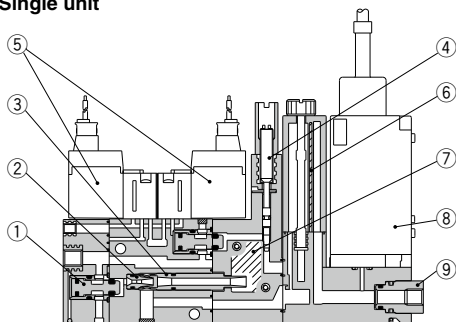
Model		ZQ1-ZSE (ZSE10)	ZQ1-ZSF (ZSE10F)
Rated pressure range		0 to -101 kPa	-100 to 100 kPa
Set pressure range/Display pressure range		10 to -105 kPa	-105 to 105 kPa
Withstand pressure		500 kPa	
Minimum setting unit		0.1 kPa	
Power supply voltage		12 to 24 VDC $\pm 10\%$, Ripple (p-p) 10% or less (with power supply polarity protection)	
Current consumption		40 mA or less	
Switch output		NPN or PNP open collector; 2 outputs (selectable)	
Maximum load current		80 mA	
Maximum applied voltage		28 V (with NPN output)	
Residual voltage		2 V or less (with load current of 80 mA)	
Response time		2.5 ms or less (Response time selections with anti-chattering function: 20, 100, 500, 1000 and 2000 ms)	
Short circuit protection		With short-circuit protection	
Repeatability		$\pm 0.2\%$ F.S. ± 1 digit	
Hysteresis		Variable (0 or above) ^{Note 1)}	
Hysteresis mode			
Window comparator mode			
Analog output	Voltage output	Output voltage (rated pressure range)	1 to 5 V $\pm 2.5\%$ F.S.
		Linearity	$\pm 1\%$ F.S. or less
	Output impedance	Approx. 1 k Ω	
Display system		3 1/2-digit, 7 segment LED 1-color display (Red)	
Display accuracy		$\pm 2\%$ F.S. ± 1 digit (at ambient temperature of 25 $\pm 3^\circ\text{C}$)	
Operation indicator light		Lights when ON, OUT1: Green, OUT2: Red	
Environmental resistance	Enclosure		IP40
	Ambient humidity range		Operating/Stored: 35 to 85% RH (with no condensation)
	Withstand voltage		1000 VAC for 1 min. between terminals and housing
Insulation resistance		50 M Ω or more (500 VDC measured via megohmmeter) between terminals and housing	
Temperature characteristics		$\pm 2\%$ F.S. (at 25 $^\circ\text{C}$ of ambient temperature range between -5 and 50 $^\circ\text{C}$)	
Lead wires		Oil-resistant cabtire cord Cross section: 0.15 mm ² (AWG26), 5 cores, 2 m, Conductor O.D.: 1.0 mm	

Note 1) If the applied voltage fluctuates around the set-value, the hysteresis must be set to a value more than the fluctuating width, otherwise chattering will occur.

Note 2) For others, refer to ejector specifications on page 603.

Construction

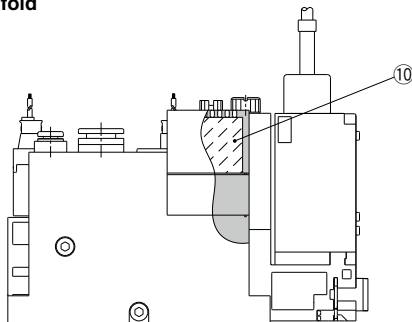
Single unit



Component Parts

No.	Description	Material
1	Poppet valve assembly	—
2	Nozzle	Resin
3	Diffuser	Resin
4	Vacuum release flow adjustment needle	Stainless steel

Manifold



Replacement Parts

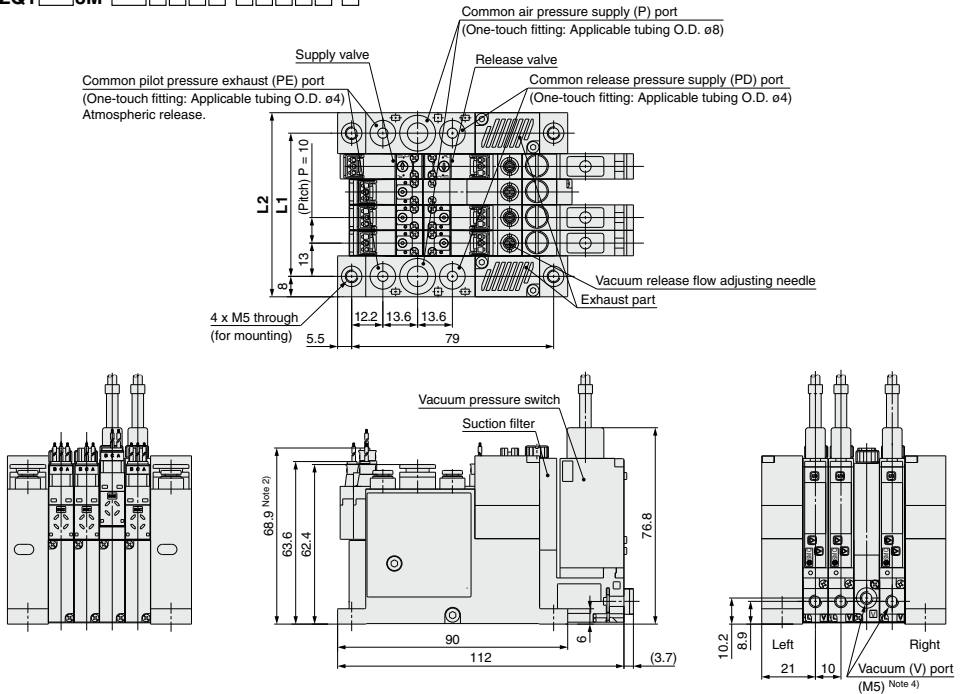
No.	Description	Material	Part no.
5	Solenoid valve	—	Refer to page 605.
6	Filter element	PVA sponge	XT534-5-001-AS
7	Sound absorbing material 1 (single unit)	PVA sponge	ZQ-SAE
8	Vacuum pressure switch	—	Refer to page 605.
9	Fitting	—	—
10	Sound absorbing material 2 (manifold)	PVA sponge	ZZQ-SAE

Dimensions

Manifold type (with PD port)

ZZQ1□-BSC

*ZQ1□3M-□□□□□□-□□□□□□-□



Dimensions

n	1	2	3	4	5	6	7	8
L1	26	36	46	56	66	76	86	96
L2	42	52	62	72	82	92	102	112

Note 1) The above dimensions are for ZZQ104-BSC.

* ZQ1□3M-K1□□L-E□□G-O.

* ZQ1□3M-K2□□L-E□□G-O.

* ZQ1□3M-J1□□L-F□□G-O.

* ZQ1□3M-Q1□□L-E□□G-O.

* In case of ZQ1□3M-□□□□□□-F□□-0, the overall length is 91.7.

* In case of ZQ1□3M-□□□□□□-E□□G-O, the overall length is 112.

Note 2) * The above dimensions are for ZQ1□3M-□2□□□□□□□□□□.

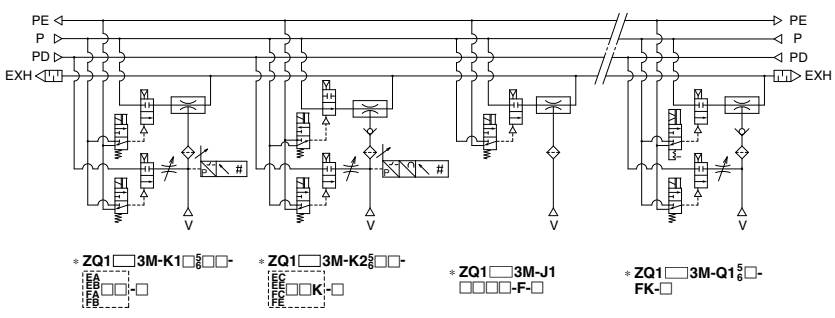
Note 3) When the body is mounted, tighten with a torque of 0.6 ± 0.06 N·m.

Using excessive torque may cause damage to the body.

Note 4) The pitches of V ports are determined assuming the use of One-touch fittings. If used with other fittings, these may cause interference, dependant on their type and size. Please refer to the catalog to confirm the sizes of the fittings to be used.

Note 5) When the release valve is not used, design the circuit for vacuum release separately in order to release a workpiece.

Circuit diagram

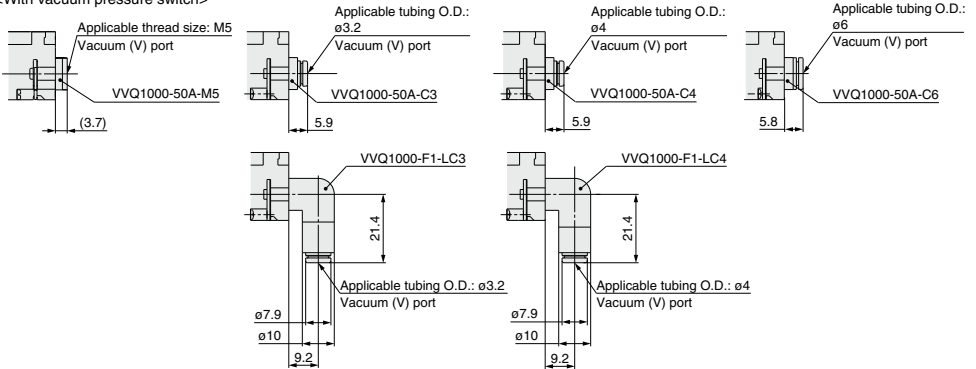


Dimensions

Fittings / Fitting type filter dimensions after installation

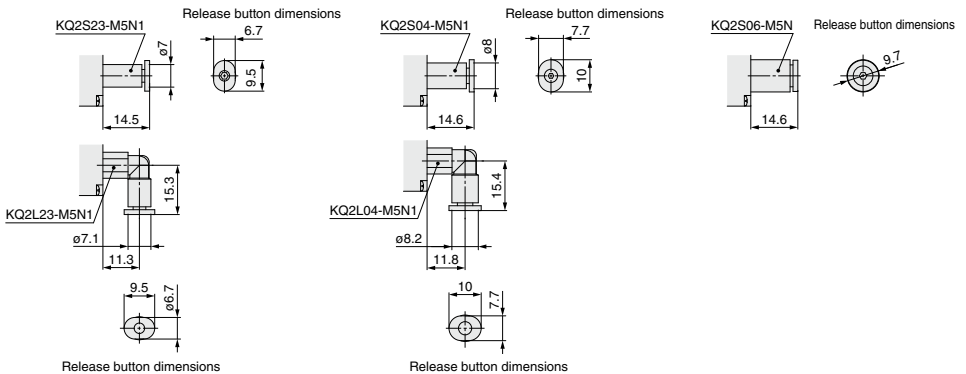
V port

<With vacuum pressure switch>

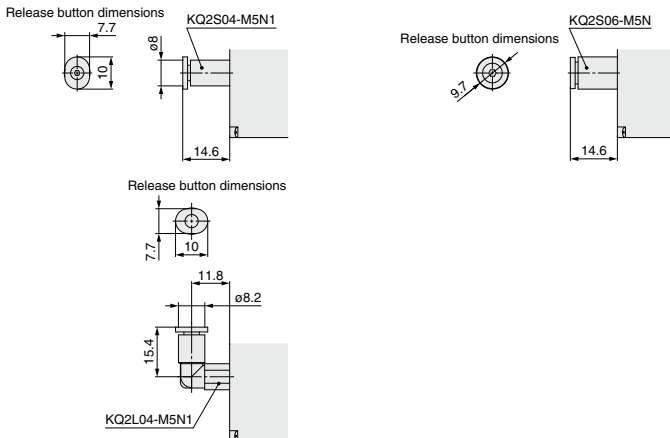


V port

<Suction filter only>



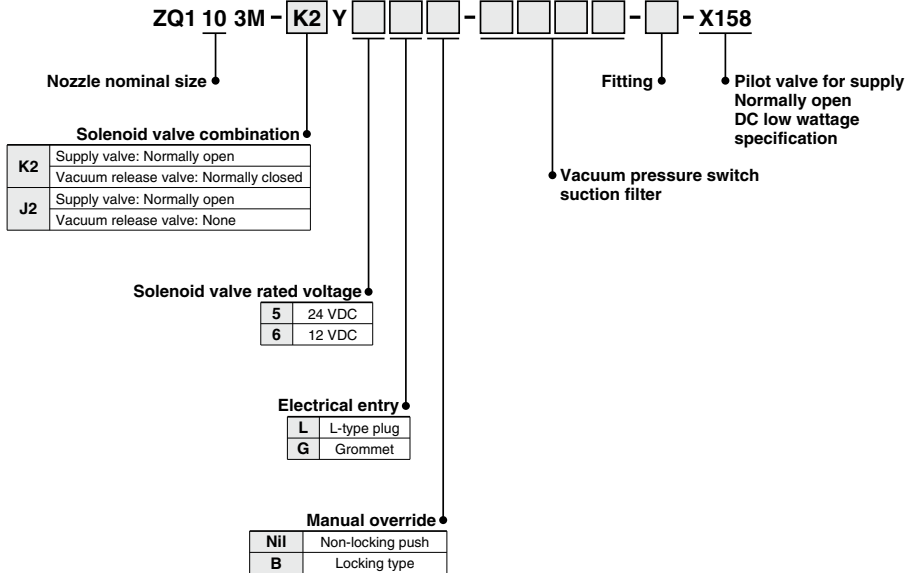
P port





2 Pilot Valve for Supply: Normally Open DC Low Wattage Specification

Power consumption (W): 0.3 [Inrush 1.5, Holding 0.3]



- Normally open supply valve with low wattage type pilot valve mounted
- When the normally open specification is selected as a countermeasure for power failure, the temperature increase of the solenoid valve can be suppressed in the operation cycle where the vacuum suspension state (supply valve energizing) is longer than the vacuum generation state.

Dimensions: Same as standard type.