

# Compact Vacuum Unit

**New**  
 CE UK CA  
 RoHS

Ejector System Vacuum Pump System

Energy saving is possible due to the vacuum pressure switch with energy saving function.

**Air consumption** **90% reduction**<sup>\*1</sup>

<sup>\*1</sup> Based on SMC's measurement conditions

Even when the suction signal is ON, the ON/OFF operation of the supply valve is performed automatically within the set value.

**Power consumption** **60% reduction**  
 1 W (Existing model) → 0.4 W

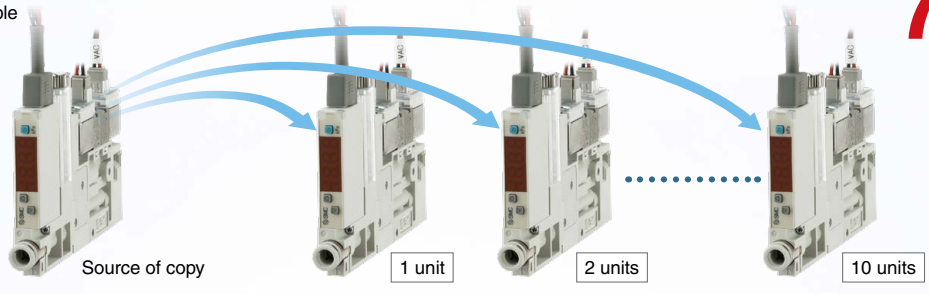
**Vacuum release pressure** **From 0 MPa**<sup>\*2</sup>  
 From 0.3 MPa (Existing model) → From 0 MPa

<sup>\*2</sup> With release pressure supply (PD) port

**Copy function** Reduced setting labor,  
 Minimized risk of setting mistakes

<sup>\*</sup> The copy function is not available for the vacuum pressure switch with energy saving function.

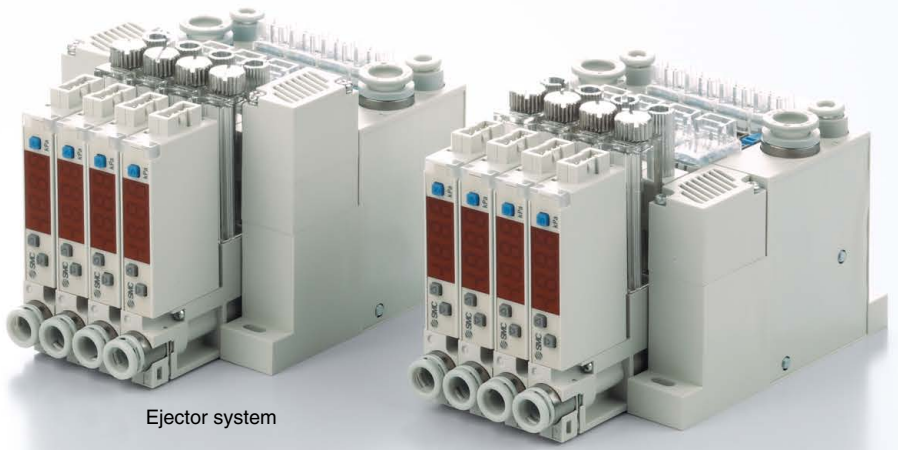
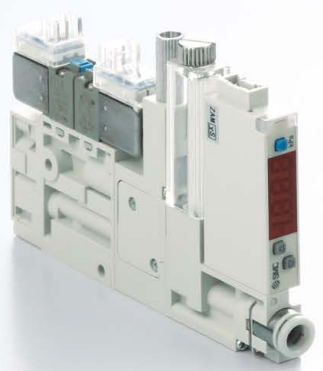
The set value can be copied to up to 10 units simultaneously.



Space saving  
 Width  
**10.2 mm**



**Lightweight**  
**70 g**

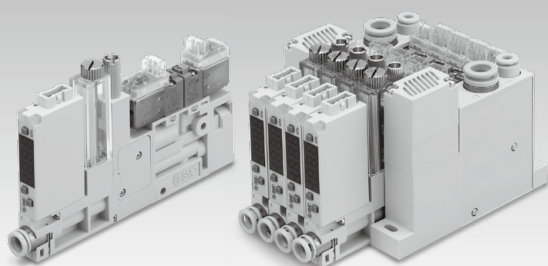


**ZQ□A Series**

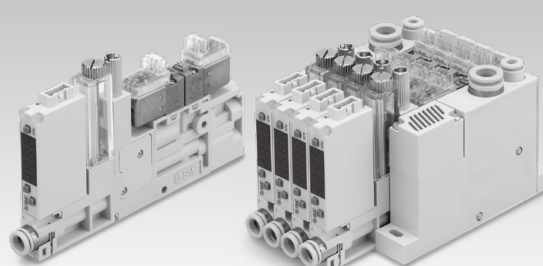
**SMC**  
 CAT.ES100-139A <sup>Ⓐ</sup>

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Ejector system



Vacuum pump system

### ● Ejector System

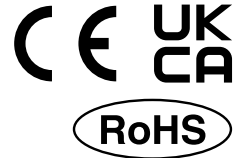
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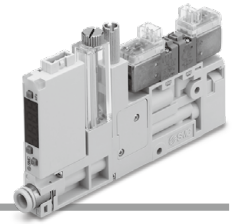
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# Ejector System Compact Vacuum Unit With Energy Saving Function



## ZQ□A Series

Single Unit Part Number



### How to Order

ZQ **05** **1U** A - **K15** **LO** □ - **VA** **M** **W** - **3** **3** - □

①
②
③
④
⑤
⑥
⑦
⑧
⑨
⑩
⑪
⑫

#### ① Nominal nozzle size

<b>05</b>	0.5
<b>07</b>	0.7
<b>10</b>	1.0

#### ② Body type

<b>1U</b>	For Single unit
<b>3M</b>	For Manifold

#### ③ Solenoid valve combination

<b>K1</b>	Supply valve (N.C.), Release valve (N.C.)
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#### ④ Solenoid valve rated voltage

<b>5</b>	24 VDC
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#### ⑤ Electrical entry

<b>LO</b>	L plug connector (Without connector) With light/surge voltage suppressor
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#### ⑥ Manual override

<b>Nil</b>	Non-locking push type
<b>B</b>	Locking slotted type

#### ⑦ Vacuum pressure switch (With suction filter\*1)

Symbol	Pressure range [kPa]	Output
<b>VA</b>	-100 to 100	NPN 1 output + Energy saving function
<b>VB</b>		PNP 1 output + Energy saving function

\*1 The filter used in this product is of a simple type, and will become clogged quickly in environments with high quantities of dust or particulates. Please consider using in combination with an air suction filter of the ZFC series, etc.

#### ⑧ Unit

<b>Nil</b> *2	With unit switching function
<b>M</b>	SI unit only (kPa)

\*2 Under the New Measurement Act, switches with the unit switching function are not permitted for use in Japan (implemented October 1999).

#### ⑨ Lead wire

<b>Nil</b>	Without lead wire with connector
<b>W</b>	Lead wire for switch with energy saving function (Length: 2 m) (Included)

#### ⑩ Fitting (V port)

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

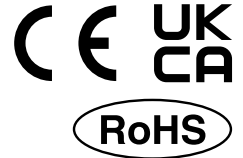
#### ⑪ Fitting (P port)

Symbol	Applicable tubing O.D.	Specification
<b>Nil</b>	Without port	Manifold
<b>0</b>	Without fitting (M5 x 0.8)	Single unit
<b>2</b>	ø4 (Straight)	
<b>3</b>	ø6 (Straight)	
<b>5</b>	ø4 (Elbow)	

#### ⑫ Option

	Bracket for single unit	
	Single unit	Manifold
<b>Nil</b>	With	Without
<b>N</b>	Without	Not available

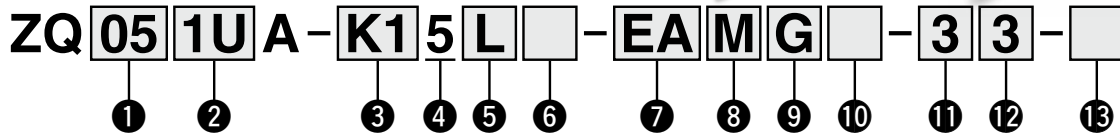
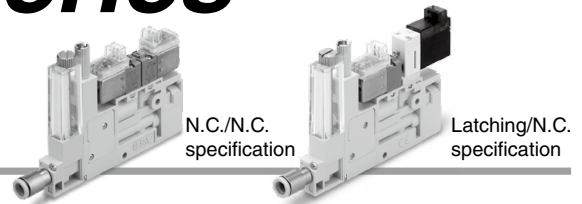
# Ejector System Compact Vacuum Unit Without Energy Saving Function



## ZQ□A Series

Single Unit Part Number

### How to Order



#### 1 Nominal nozzle size

05	0.5
07	0.7
10	1.0

#### 2 Body type

1U	For Single unit
3M	For Manifold

#### 3 Solenoid valve combination

K1	Supply valve (N.C.), Release valve (N.C.)
K2	Supply valve (N.O.), Release valve (N.C.)
J1	Supply valve (N.C.)
J2	Supply valve (N.O.)
Q1*1	Supply valve (Latching), Release valve (N.C.)
Q2*1	Supply valve (Latching)

\*1 Latching (+ common)

#### 4 Solenoid valve rated voltage

5	24 VDC
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#### 5 Electrical entry

L	L plug connector (Lead wire length: 0.3 m) With light/surge voltage suppressor
LO	L plug connector (Without connector) With light/surge voltage suppressor

#### 6 Manual override

Nil	Non-locking push type
	Latching: Push-locking slotted type
B*2	Locking slotted type

\*2 When "Q1" is selected in 3, the locking slotted type is only available in the release valve.  
This option cannot be chosen when "Q2" is selected in 3.

#### 7 Vacuum pressure switch (With suction filter\*3)

Symbol	Pressure range [kPa]	Output
EA	0 to -100	NPN 2 outputs
EB		PNP 2 outputs
EC		NPN 1 output + Analog voltage
EE		PNP 1 output + Analog voltage
FA		NPN 2 outputs
FB	-100 to 100	PNP 2 outputs
FC		NPN 1 output + Analog voltage
FE		PNP 1 output + Analog voltage
F*4	Suction filter only	

\*3 The filter used in this product is of a simple type, and will become clogged quickly in environments with high quantities of dust or particulates. Please consider using in combination with an air suction filter of the ZFC series, etc.

\*4 It is not necessary to select the items for 8 and 9.

#### 8 Unit

Nil*5	With unit switching function
M	SI unit only (kPa)
P*5	With unit switching function (Initial value: psi)

\*5 Under the New Measurement Act, switches with the unit switching function are not permitted for use in Japan (implemented October 1999).

#### 9 Lead wire

Nil	Without lead wire with connector
G	Lead wire with connector (Length: 2 m) (Included)

#### 10 Check valve\*6

Nil	None
K*7	With check valve

\*6 The check valve has a function to prevent the exhaust air from the exhaust unit 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.

\*7 Cannot be selected when 2 is "1U", or 3 is "J1", "J2", or "Q2"

#### 11 Fitting (V port)

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)

#### 12 Fitting (P port)

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

#### 13 Option

##### For Single Unit (2: 1U)

Symbol	Bracket assembly	Converter assembly for solenoid valve*8
Nil	○	—
N	—	—
C	—	○
D	○	○

##### For Manifold (2: 3M)

Symbol	Release pressure supply (PD) port*9	Converter assembly for solenoid valve*8
Nil	—	—
S	○	—
C	—	○
E	○	○

\*8 A converter assembly for attaching the VQ100 lead wire assembly with a connector to the ZQ-A is included. Refer to the "Converter assembly for solenoid valve" on page 27.

"Q2" cannot be selected in 3. Select "LO" in 5.

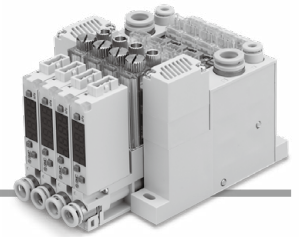
\*9 Select "C" for 4 for the manifold part number on page 4. "J1", "J2", or "Q2" cannot be selected in 3.

### Warning

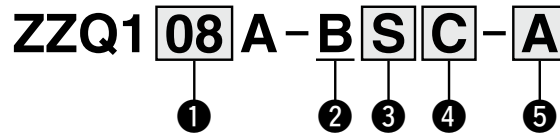
- Cannot be used for vacuum retention
- Use a release valve. Without a release valve, a workpiece may not be released.

# ZQ□A Series

Manifold Part Number



## How to Order



### 1 Stations\*1

01	1 station
02	2 stations
⋮	⋮
08	8 stations

\*1 Number of stations varies according to nominal nozzle size during simultaneous operation. (Table 1)

**Table 1. Max. Number of Stations that Can Operate Simultaneously\*2**

Nominal nozzle size	Max. number of stations that can operate simultaneously
0.5	8 stations
0.7	6 stations
1.0	4 stations

\*2 For any of the nominal nozzle sizes, the max. number of stations that can be mounted is 8. However, please ensure that the max. number of stations that are operated simultaneously comply with the values above.

### 2 Air pressure supply (P) port location

B	Both sides
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### 4 Release pressure supply (PD) port

B	None (Release pressure: Commonly supplied from the P port)
C*3	Provided (Release pressure: Supplied from the PD port)

\*3 If the individual unit does not have the energy saving function, select "S" or "E" in 10 for the single unit part number on page 3.

### 3 Exhaust

S	Silencer exhaust (Both sides)
P	Port exhaust (Both sides)

### 5 Shipping configuration

Nil	Assembled as a vacuum unit
A*4	Manifold unit only

\*4 A set of end blocks and the clamp rod assembly is included in this manifold unit. (Used for the maintenance of the end block)

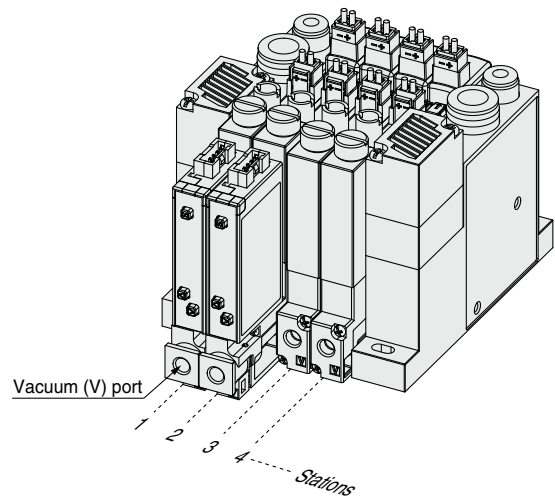
## Manifold Order Example

ZZQ104A-BSB ..... 1 pc.

\* ZQ053MA-K15L-EAG-0 ..... 2 pcs. → Stations 1 and 2

\* ZQ103MA-K15L-F-0 ..... 2 pcs. → Stations 3 and 4

\* When the manifold is viewed from the vacuum (V) port, the first station starts from the left. ZQ053MA-K15L-EAG-0 (2 pcs.) and ZQ103MA-K15L-F-0 (2 pcs.) are arranged from the first station.

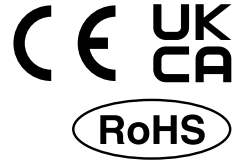


### ⚠ Caution when ordering manifold

- ! The asterisk (\*) denotes the symbol for the assembly.
- ! Prefix it to the single unit part number.
- ! If "\*" is not entered, the manifold and single unit will be shipped without being assembled.
- ! When the manifold and the units are not assembled, please assemble them by referring to "How to increase/decrease manifold stations" on page 16.
- ! There is nothing else to arrange additionally.



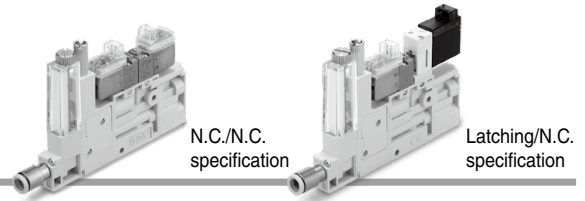
# Vacuum Pump System Compact Vacuum Unit



# ZQ□A Series

Single Unit Part Number

## How to Order



ZQ000 **U** A - **K1** **5** **L** □ - **EA** **M** **G** - **3** **3** - □

①
②
③
④
⑤
⑥
⑦
⑧
⑨
⑩
⑪

### ① Body type

<b>U</b>	For Single unit
<b>M</b>	For Manifold

### ② Solenoid valve combination

<b>K1</b>	Supply valve (N.C.), Release valve (N.C.)
<b>K2</b>	Supply valve (N.O.), Release valve (N.C.)
<b>J1</b> *1	Supply valve (N.C.)
<b>J2</b> *1	Supply valve (N.O.)
<b>Q1</b> *2	Supply valve (Latching), Release valve (N.C.)
<b>Q2</b> *1 *2	Supply valve (Latching)

\*1 The air in the adsorption section of this product is not released to the atmosphere at the vacuum suspension state. Devise the circuit for the vacuum release additionally.

\*2 Latching (+ common)

### ③ Solenoid valve rated voltage

<b>5</b>	24 VDC
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### ④ Electrical entry

<b>L</b>	L plug connector (Lead wire length: 0.3 m) With light/surge voltage suppressor
<b>LO</b>	L plug connector (Without connector) With light/surge voltage suppressor

### ⑤ Manual override

<b>Nil</b>	Non-locking push type
	Latching: Push-locking slotted type
<b>B</b> *3	Locking slotted type

\*3 When "Q1" is selected in ②, the locking slotted type is only available in the release valve.  
This option cannot be chosen when "Q2" is selected in ②.

### ⑥ Vacuum pressure switch (With suction filter)\*4

Symbol	Pressure range [kPa]	Output
<b>EA</b>	0 to -100	NPN 2 outputs
<b>EB</b>		PNP 2 outputs
<b>EC</b>		NPN 1 output + Analog voltage
<b>EE</b>		PNP 1 output + Analog voltage
<b>FA</b>		NPN 2 outputs
<b>FB</b>	-100 to 100	PNP 2 outputs
<b>FC</b>		NPN 1 output + Analog voltage
<b>FE</b>		PNP 1 output + Analog voltage
<b>F</b> *5	Suction filter only	

\*4 The filter used in this product is of a simple type, and will become clogged quickly in environments with high quantities of dust or particulates. Please consider using in combination with an air suction filter of the ZFC series, etc.

\*5 It is not necessary to select the items for ⑦ and ⑧.

### ⑦ Unit

<b>Nil</b> *6	With unit switching function
<b>M</b>	SI unit only (kPa)
<b>P</b> *6	With unit switching function (Initial value: psi)

\*6 Under the New Measurement Act, switches with the unit switching function are not permitted for use in Japan (implemented October 1999).

### ⑧ Lead wire

<b>Nil</b>	Without lead wire with connector
<b>G</b>	Lead wire with connector (Length: 2 m) (Included)

### ⑨ Fitting (V port)

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

### ⑩ Fitting (PS/PV port)

Symbol	Applicable tubing O.D.	Specification
<b>Nil</b>	Without port	Manifold
<b>0</b>	Without fitting (M5 x 0.8)	Single unit
<b>2</b>	ø4 (Straight)	
<b>3</b>	ø6 (Straight)	
<b>5</b>	ø4 (Elbow)	

### ⑪ Option

#### For Single Unit (①: U)

Symbol	Bracket assembly	Converter assembly for solenoid valve*7
<b>Nil</b>	○	—
<b>N</b>	—	—
<b>C</b>	—	○
<b>D</b>	○	○

#### For Manifold (①: M)

Symbol	Release pressure supply (PD) port*8	Converter assembly for solenoid valve*7
<b>Nil</b>	—	—
<b>S</b>	○	—
<b>C</b>	—	○
<b>E</b>	○	○

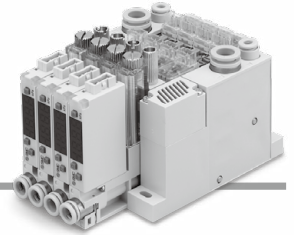
\*7 A converter assembly for attaching the VQ100 lead wire assembly with a connector to the ZQ-A is included. Refer to the "Converter Assembly for Solenoid Valve" on page 27.

\*8 "Q2" cannot be selected in ②. Select "LO" in ④.

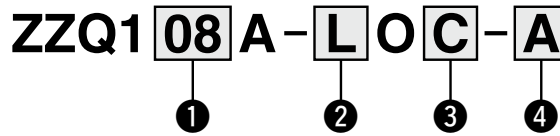
\*8 Select "C" for ③ for the manifold part number on page 6. "J1", "J2", or "Q2" cannot be selected in ②.

# ZQ□A Series

Manifold Part Number



## How to Order



### 1 Stations

01	1 station
02	2 stations
⋮	⋮
08	8 stations

### 2 Vacuum pressure supply (PV) port location\*1

L	Left side
R	Right side

\*1 The position of the vacuum pressure supply (PV) port when the vacuum (V) port is facing front. The pilot pressure supply (PS) port is on the opposite side. Refer to the "Table 1" for details.

### 3 Release pressure supply (PD) port

B	None (Release pressure: Commonly supplied from the PS port)
C*2	Provided (Release pressure: Supplied from the PD port)

\*2 Select "S" or "E" for 1 for the single unit part number on page 5.

### 4 Shipping configuration

Nil	Assembled as a vacuum unit
A*3	Manifold unit only

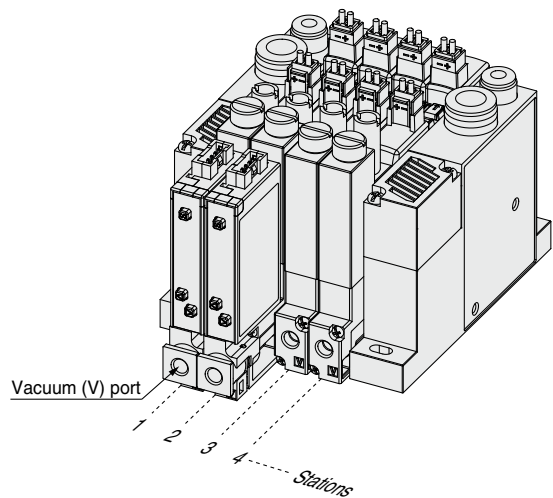
\*3 A set of end blocks and the clamp rod assembly is included in this manifold unit. (Used for the maintenance of the end block)

Table 1. Location of Each Port

2 PV port location	3 PD port	Left side with the V port facing the front			Right side with the V port facing the front		
		PS port	PV port	PD port	PS port	PV port	PD port
L	B	—	●	—	●	—	—
	C	—	●	●	●	—	●
R	B	●	—	—	—	●	—
	C	●	—	●	—	●	●

## Manifold Order Example

ZZQ104A-ROB..... 1 pc.  
 \* ZQ000MA-K15L-EAG-0 ..... 2 pcs. → Stations 1 and 2  
 \* ZQ000MA-K15L-F-0 ..... 2 pcs. → Stations 3 and 4  
 \* When the manifold is viewed from the vacuum (V) port, the first station starts from the left.  
 ZQ000MA-K15L-EAG-0 (2 pcs.) and ZQ000MA-K15L-F-0 (2 pcs.) are arranged from the first station.



### ⚠ Caution when ordering manifold

- ! The asterisk (\*) denotes the symbol for the assembly.
- ! Prefix it to the single unit part number.
- ! If "\*" is not entered, the manifold and single unit will be shipped without being assembled.
- ! When the manifold and the units are not assembled, please assemble them by referring to "How to increase/decrease manifold stations" on page 16.
- ! There is nothing else to arrange additionally.

# ZQ□A Series

## Specifications

### General Specifications

Item	ZQ series
Operating temperature range [°C]	5 to 50 (No condensation)
Fluid	Air
Vibration resistance [m/s <sup>2</sup> ]*1	20
Impact resistance [m/s <sup>2</sup> ]*2	100
Standards	CE/UKCA marking (EMC directive, RoHS directive)

\*1 10 to 150 Hz for 2 hours in each direction of X, Y, and Z (De-energized, Initial value)

\*2 3 times in each direction of X, Y, and Z (De-energized, Initial value)

### Vacuum Ejector System Specifications

Item	ZQ05□A	ZQ07□A	ZQ10□A
Nozzle size [mm]	0.5	0.7	1.0
Standard supply pressure [MPa]	0.35	0.43	
Max. vacuum pressure [kPa]*1	-80		
Max. suction flow rate [L/min (ANR)]*1	5	10	22
Air consumption [L/min (ANR)]*1	15	25	47
Supply pressure range [MPa]	Air pressure supply (P) port	0.3 to 0.5	
	Release pressure supply (PD) port*2	0 to 0.45*3	
Withstand pressure [MPa]	0.75		
Number of manifold stations that can operate simultaneously	8	6	4
Noise level [dB(A)]*4	For Single unit	65	68
	For Manifold (Max. number of stations that can operate simultaneously)	64	66
Main valve response time [ms]	25 or less		

\*1 Piping size: ø6, at the standard supply pressure. Values are based on SMC's measurement standards. They depend on atmospheric pressure (weather, altitude, etc.) and the measurement method.

\*2 Release pressure must be lower than P port pressure by at least 0.05 MPa.

\*3 0.1 MPa or more when the pressure switch with energy saving function is used

\*4 Actual values under SMC's measurement conditions (Not guaranteed values)

### Vacuum Pump System Specifications

Item	ZQ000□A	
Flow rate characteristics of V (ø6 Straight) ⇒ PV (ø6 Straight) (Vacuum side)*1	C [dm <sup>3</sup> /(s·bar)]	0.31
	b	0.23
	Cv	0.09
Flow rate characteristics of PS (ø6 Straight) ⇒ V (ø6 Straight) (Release side)*1, *2	C [dm <sup>3</sup> /(s·bar)]	0.24
	b	0.26
	Cv	0.08
Main valve response time [ms]	25 or less	
Supply pressure range	Vacuum pressure supply (PV) port [kPa]	0 to -101.3
	Pilot pressure supply (PS) port [MPa]	0.3 to 0.5
	Release pressure supply (PD) port [MPa]*3	0 to 0.45

\*1 Piping size: ø6

\*2 When the vacuum release flow adjusting needle is fully open

\*3 Release pressure must be lower than PS port pressure by at least 0.05 MPa.

## Weight

### Single Unit Part Number

Model/Additional specifications	Weight [g]
ZQ□□UA-K15L-F-00-N (Basic type for Single unit)	70
ZQ□□MA-K15L-F-0 (Basic type for Manifold)	70
Without release valve	-10
Supply valve (N.O.)	+2
Supply valve (Latching)	+5
With vacuum pressure switch (Excluding lead wire)	+20
Lead wire with connector for vacuum pressure switch	+45
Lead wire with connector for pressure switch with energy saving function	+50
With bracket assembly (ZQ1-BK-A)	+25

### Manifold Part Number

Model/Additional specifications	Weight [g]
ZZQ101A-BSB	115
ZZQ101A-BSC	130
ZZQ101-BPB	150
ZZQ101-BPC	155
ZZQ101A-□OB	105
ZZQ101A-□OC	120
1 station	+2

**Calculation of weight for the manifold type**  
 (Single unit weight x Number of stations) + (Manifold part number weight) + (1 station x Number of stations)



## Supply Valve / Release Valve Specifications

Type	Normally closed	Normally open	Latching type
Model	<b>ZQ1-V114-5LU-A</b>	<b>ZQ1-V124-5MU-A</b>	<b>ZQ1-VQ110L-5L-A</b>
Manual override	Non-locking push type/Locking slotted type		Locking slotted type
Rated coil voltage	24 VDC		
Allowable voltage range	-10 to 10%		
Power consumption	0.4 W		1 W
Electrical entry	L plug connector (With light/surge voltage suppressor)	M plug connector (With light/surge voltage suppressor)	L plug connector (With light/surge voltage suppressor)
Lead wire	Conductor cross section: 0.2 to 0.33 mm <sup>2</sup> , Max. O.D. of covering: 1.7 mm		

\* For details on the V100 and VQ100 series, please refer to the **Web Catalog**.

## Vacuum Pressure Switch Specifications

Model	ZSE10		
	Vacuum pressure switch	Compound pressure switch	Vacuum pressure switch with energy saving function
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		
Smallest settable increment	0.1 kPa		
Applicable fluid	Air, Non-corrosive gas, Non-flammable gas		
Power supply voltage	12 to 24 VDC ±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)		NPN or PNP open collector OUT1: General purpose OUT2: Valve control
Max. load current	80 mA		
Max. applied voltage	28 V (at NPN output)		26.4 V (at NPN output)
Residual voltage	2 V or less (with load current of 80 mA)		
Response time	2.5 ms or less (with anti-chattering function: 20, 100, 500, 1000, 2000 ms)		
Short-circuit protection	Yes		
Repeatability	±0.2% F.S. ±1 digit		
Hysteresis	Hysteresis mode	Variable (0 or above)*1	
	Window comparator mode	Variable (0 or above)*1	—
Analog output	Voltage output	Output voltage (Rated pressure range)	1 to 5 V ±2.5% F.S.
		Linearity	±1% F.S.
		Output impedance	Approx. 1 kΩ
Display	3 1/2 digit, 7-segment LED, 1-color display (Red)		
Display accuracy	±2% F.S. ±1 digit (at an ambient temperature of 25 ±3°C)		
Indicator light	Lights up when switch output is turned ON. OUT1: Green, OUT2: Red		
Environmental resistance	Enclosure	IP40	
	Operating temperature range	Operating: -5 to 50°C Stored: -10 to 60°C (No freezing or condensation)	
	Operating humidity range	Operating/Stored: 35 to 85%RH (No condensation)	
	Withstand voltage	1000 VAC for 1 minute between terminals and housing	
Insulation resistance	50 MΩ or more (500 VDC measured via megohmmeter) between terminals and housing		
Temperature characteristics	±2% F.S. (at 25°C in an ambient temperature of -5 and 50°C)		
Lead wire	Oilproof heavy-duty vinyl cable 5 cores, ø3.5, 2 m, Conductor cross section: 0.15 mm <sup>2</sup> (AWG26) Insulator O.D.: 1.0 mm		
Standards	CE/UKCA marking (EMC directive, RoHS directive)		

\*1 If the applied pressure fluctuates around the set value, the hysteresis must be set to a value more than the fluctuating width. Otherwise, chattering will occur.

\* The vacuum pressure switch mounted on this product is equivalent to our SMC product, the ZSE10 series compact digital pressure switch.

● Pressure switch correspondence table

Vacuum ejector ZQ□A series ZQ□□A-□□□□□-□□□□□-□□□□□

Vacuum pressure switch for the ZQ□A ZQ-ZS□□□□□-□□□□□-□□□□□

Compact digital pressure switch ZSE10 series ZSE10□□□□□-□□□□□-□□□□□

Rated pressure range/Output specification (Refer to the table below.) ● Vacuum pressure switch lead wire specification ● Vacuum pressure switch unit specification

For details on vacuum pressure switch functions, please refer to the ZSE10 series in the Web Catalog.

### Rated Pressure Range/Output Specifications Correspondence Table

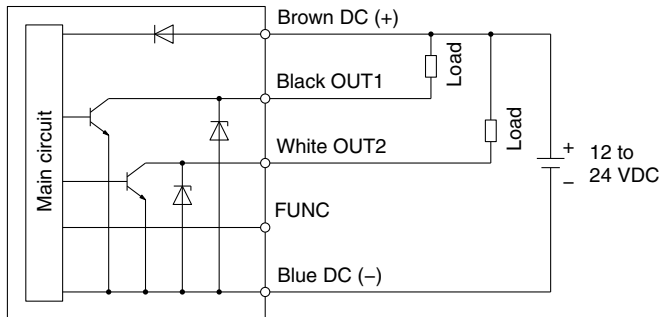
Vacuum pressure switch for the ZQ	ZSE10 series	Pressure range [kPa]	Output specifications
ZQ-ZSEA□□□□□-□□□□□-□□□□□	ZSE10□□□□□-□□□□□-□□□□□	0 to -100	NPN 2 outputs
ZQ-ZSEB□□□□□-□□□□□-□□□□□	ZSE10□□□□□-□□□□□-□□□□□		PNP 2 outputs
ZQ-ZSEC□□□□□-□□□□□-□□□□□	ZSE10□□□□□-□□□□□-□□□□□		NPN 1 output + Analog voltage
ZQ-ZSEE□□□□□-□□□□□-□□□□□	ZSE10□□□□□-□□□□□-□□□□□		PNP 1 output + Analog voltage
ZQ-ZSFA□□□□□-□□□□□-□□□□□	ZSE10F□□□□□-□□□□□-□□□□□	-100 to 100	NPN 2 outputs
ZQ-ZSFB□□□□□-□□□□□-□□□□□	ZSE10F□□□□□-□□□□□-□□□□□		PNP 2 outputs
ZQ-ZSFC□□□□□-□□□□□-□□□□□	ZSE10F□□□□□-□□□□□-□□□□□		NPN 1 output + Analog voltage
ZQ-ZSFE□□□□□-□□□□□-□□□□□	ZSE10F□□□□□-□□□□□-□□□□□		PNP 1 output + Analog voltage
ZQ-ZSVA□□□□□-□□□□□-□□□□□	Not available		NPN 1 output + Energy saving control
ZQ-ZSVB□□□□□-□□□□□-□□□□□	Not available		PNP 1 output + Energy saving control

Refer to page 14 for how to order the vacuum pressure switch.

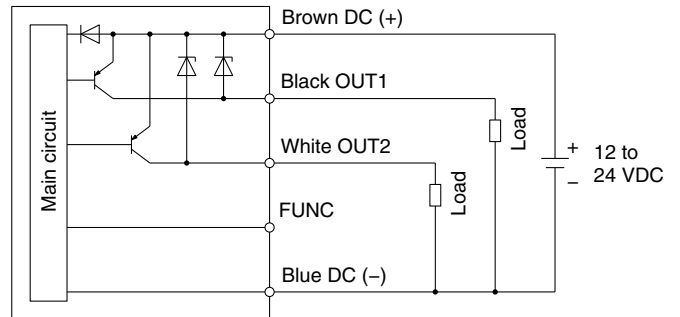
## Internal Circuits and Wiring Examples

### ■ Vacuum pressure switch

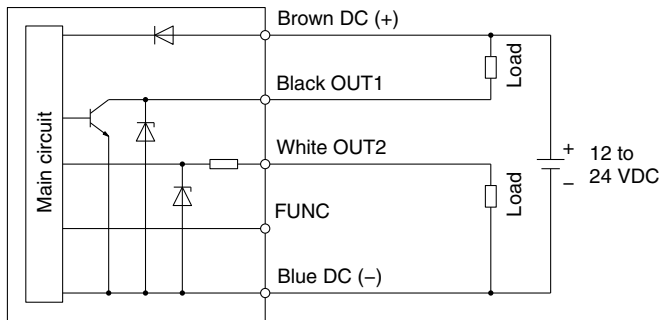
**EA, FA**  
NPN open collector (2 outputs)



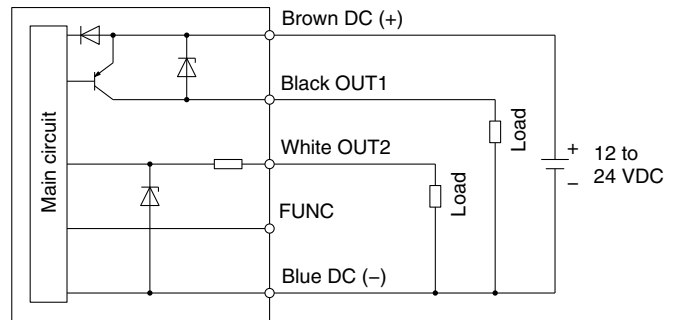
**EB, FB**  
PNP open collector (2 outputs)



**EC, FC**  
NPN open collector (1 output) + Analog voltage output



**EE, FE**  
PNP open collector (1 output) + Analog voltage output



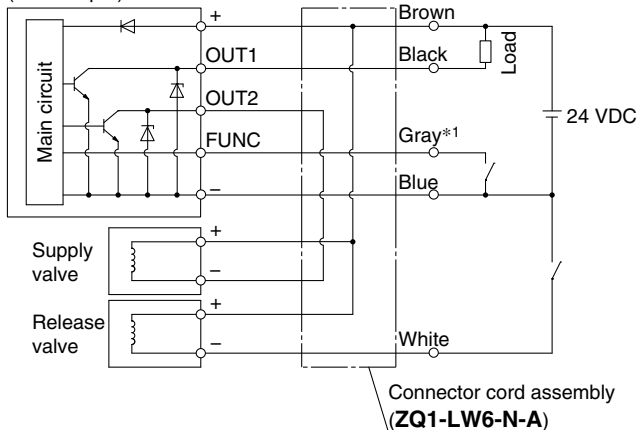
Max. 28 V, 80 mA  
Residual voltage: 2 V or less

\* The FUNC terminal is connected when using the copy function.  
(For details, please refer to the Operation Manual for the ZSE10/ISE10 on the SMC website.)

### ■ Vacuum pressure switch with energy saving function

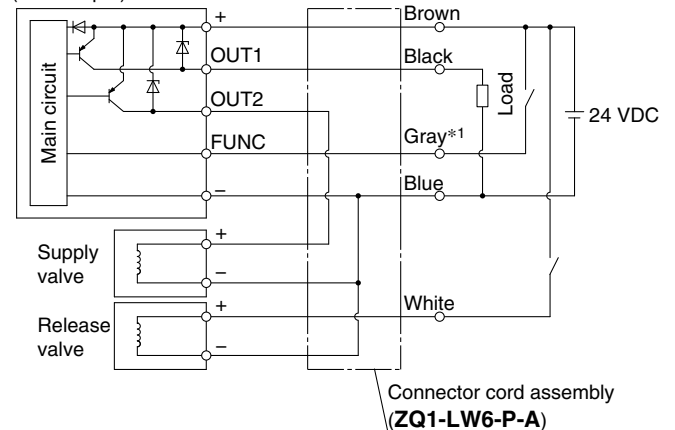
**NPN (1 output)**

Pressure switch  
(NPN output)



**PNP (1 output)**

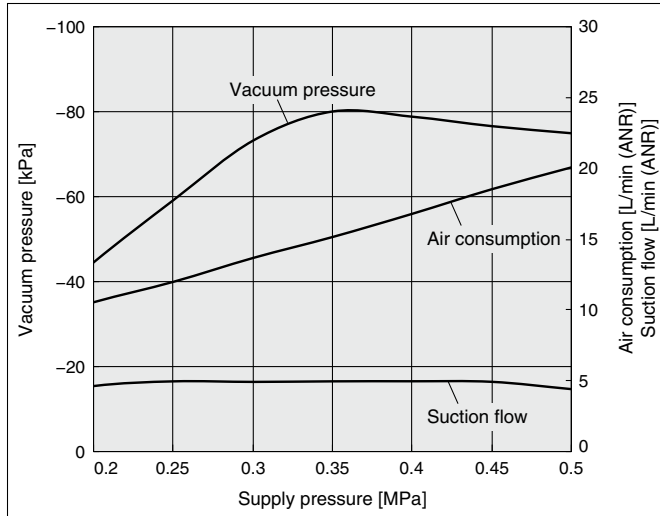
Pressure switch  
(PNP output)



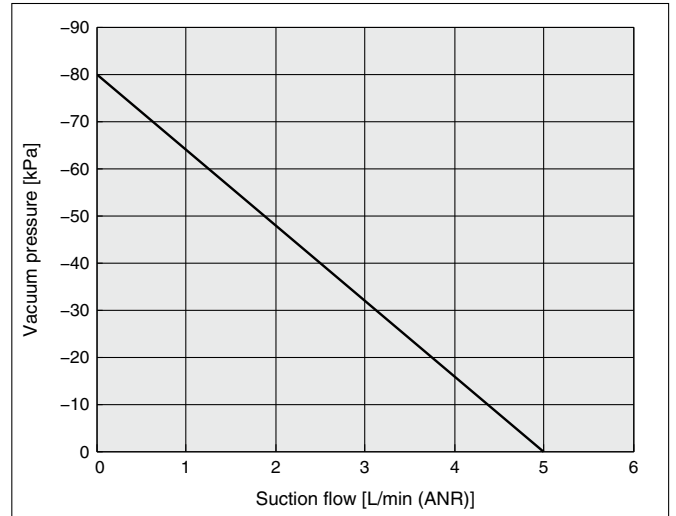
\*1 The gray wire (FUNC) is connected when operating the supply valve by energy saving control (for workpiece adsorption). (For details, please refer to the Operation Manual for the ZQ-ZSV□-□-A series on the SMC website.)

**Exhaust Characteristics / Flow Rate Characteristics**

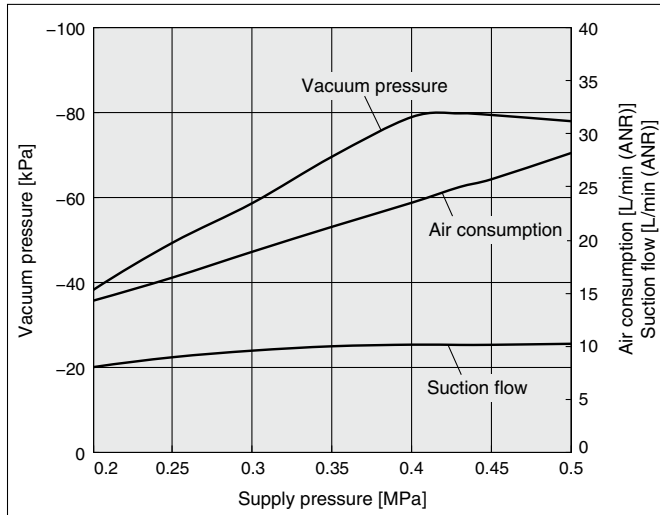
**ZQ05□A: Exhaust Characteristics**



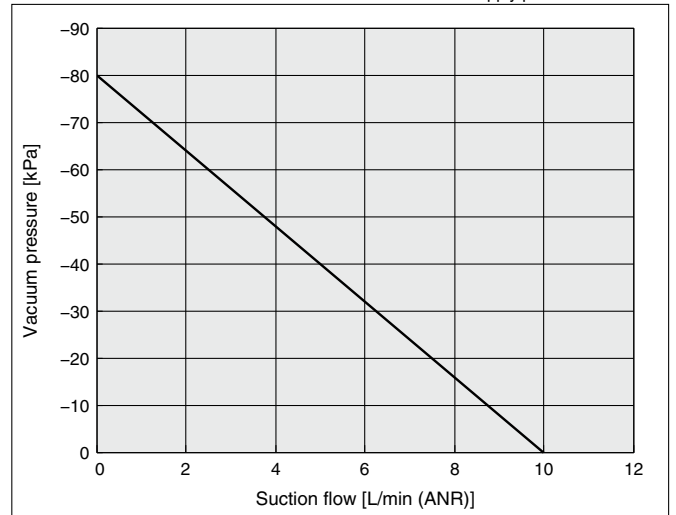
**ZQ05□A: Flow Rate Characteristics** Supply pressure: 0.35 MPa



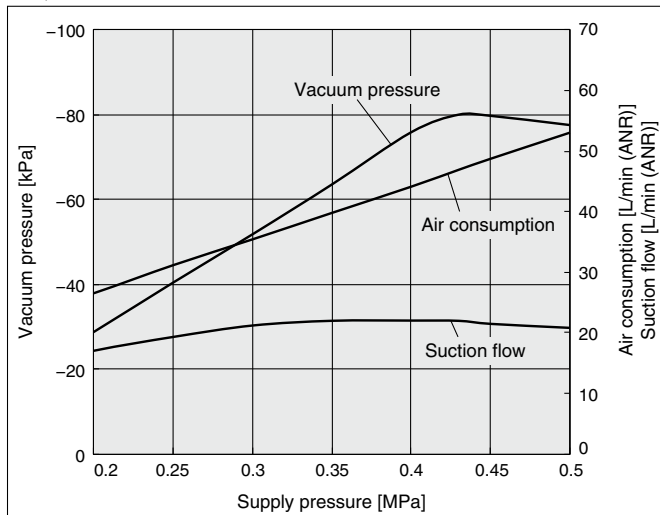
**ZQ07□A: Exhaust Characteristics**



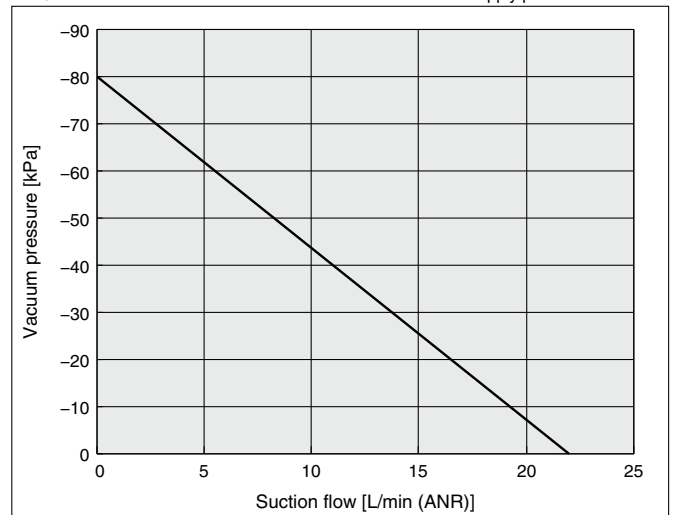
**ZQ07□A: Flow Rate Characteristics** Supply pressure: 0.43 MPa



**ZQ10□A: Exhaust Characteristics**



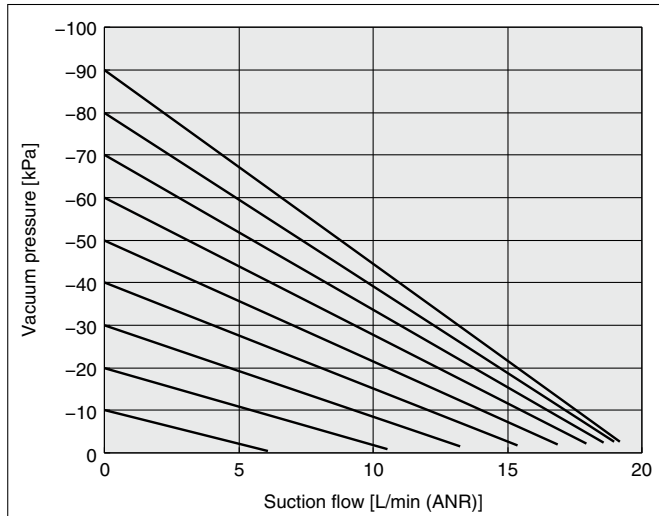
**ZQ10□A: Flow Rate Characteristics** Supply pressure: 0.43 MPa



# ZQ□A Series

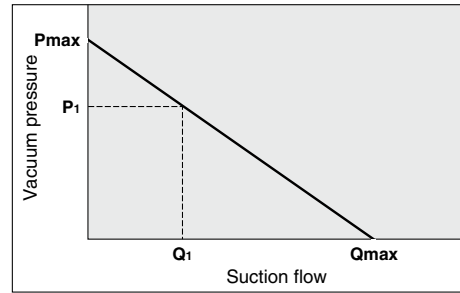
## Vacuum Pump System: Flow Rate Characteristics

### ZQ000A



The actual suction flow at the point of suction varies depending on the piping conditions to the vacuum port. (The above graph shows the value when V port is ø6.)

## How to Read the Flow Rate Characteristics Graph



The flow rate characteristics indicate the relationship between the vacuum pressure and the suction flow of the ejector. They also show that when the suction flow changes, the vacuum pressure also changes. In general, this indicates the relationship at the ejector's standard operating pressure. In the graph, **Pmax** indicates the max. vacuum pressure, and **Qmax** indicates the max. suction flow. These are the values that are published as specifications in catalogs, etc. Changes in vacuum pressure are explained in the order below.

1. If the ejector's suction port is closed and sealed tight, the suction flow becomes "0," and the vacuum pressure increases to the max. (**Pmax**).
2. If the suction port is opened gradually and air is allowed to flow (the air leaks), the suction flow increases, and the vacuum pressure decreases. (The condition of **P1** and **Q1**)
3. If the suction port is opened completely, the suction flow increases to the max. (**Qmax**), while the vacuum pressure then drops almost to "0" (atmospheric pressure).

As described above, the vacuum pressure changes when the suction flow changes. In other words, when there is no leakage from the vacuum port, the vacuum pressure can reach its maximum, but as the amount of leakage increases, the vacuum pressure decreases. When the amount of leakage and the max. suction flow become equal, the vacuum pressure becomes almost zero.

When adsorbing workpieces which are permeable, subject to leakage, etc., caution is required as the vacuum pressure will not be very high.

## Max. Release Flow

The table below shows vacuum release flow rate when the opening of the vacuum release flow adjustment needle is fully open (Shown by V port size).

V port size	Without release pressure supply (PD) port*1					With release pressure supply (PD) port*2				
	P/PS port pressure [MPa]	ZQ05□A	ZQ07□A	ZQ10□A	ZQ000□A	PD port pressure [MPa]	ZQ05□A	ZQ07□A	ZQ10□A	ZQ000□A
ø3.2	0.1	—	—	—	—	0.05	11	10	8	16
	0.2	—	—	—	—	0.15	22	10	17	32
	0.3	38 (29)	34 (26)	27 (22)	53	0.25	31	29	24	46
	Standard supply pressure*3	44 (35)	46 (41)	36 (33)	66	0.35	44	39	31	60
	0.5	59 (54)	52 (49)	41 (39)	79	0.45	54	48	38	74
ø4	0.1	—	—	—	—	0.05	11	11	9	16
	0.2	—	—	—	—	0.15	24	22	18	33
	0.3	40 (30)	37 (29)	31 (23)	54	0.25	34	32	27	48
	Standard supply pressure*3	46 (37)	49 (44)	41 (36)	68	0.35	46	42	35	62
	0.5	63 (57)	57 (51)	46 (43)	82	0.45	57	52	44	76
ø6	0.1	—	—	—	—	0.05	12	11	9	16
	0.2	—	—	—	—	0.15	25	24	20	33
	0.3	43 (34)	39 (30)	35 (28)	54	0.25	37	34	30	47
	Standard supply pressure*3	49 (41)	53 (50)	47 (43)	68	0.35	49	45	39	63
	0.5	67 (64)	61 (59)	54 (51)	81	0.45	61	56	48	77

\*1 The values in ( ) are for models with a pressure switch with energy saving function.

\*2 There is no difference in vacuum release flow rate depending on the presence of the pressure switch with energy saving function.

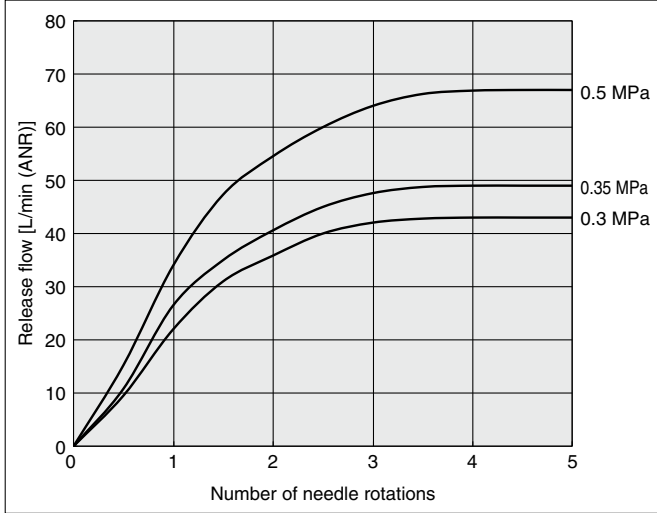
\*3 ZQ05□A: 0.35 MPa, ZQ07□A and ZQ10□A: 0.43 MPa, ZQ000□A: 0.4 MPa

The graph shows the flow rate characteristics at different supply pressures when the break flow adjusting needle is open from the fully closed state.

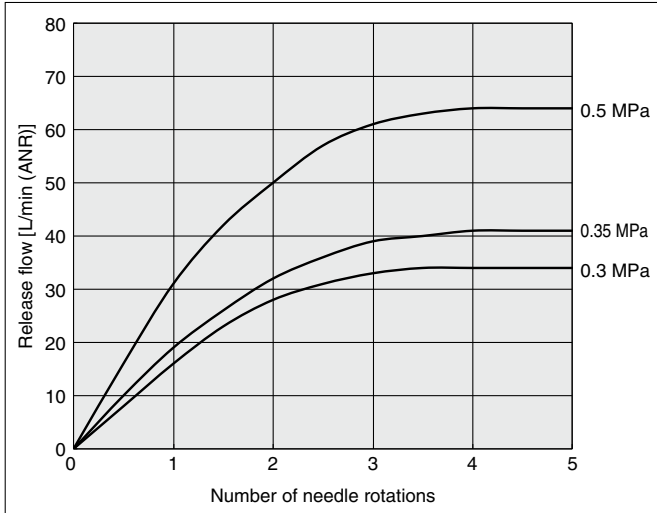
## Vacuum Release Flow Rate Characteristics (V Port Size: $\varnothing 6$ )

### Ejector System

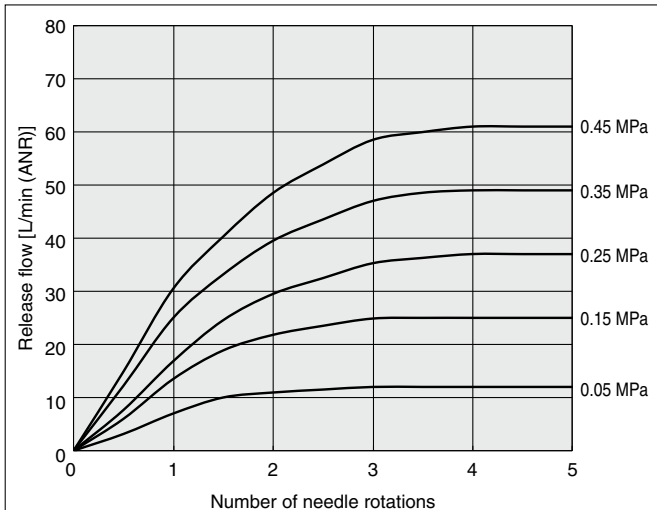
**ZQ□A Without release pressure supply (PD) port (Without energy saving switch)**



**ZQ□A Without release pressure supply (PD) port (With energy saving switch)**



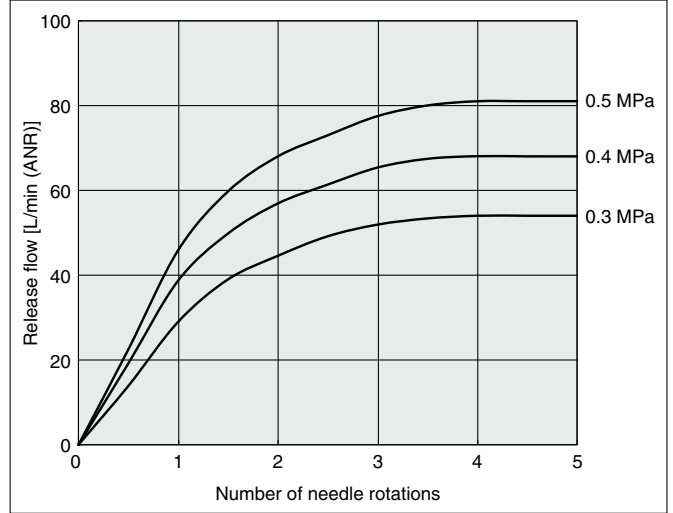
**ZQ□A With release pressure supply (PD) port\*1**



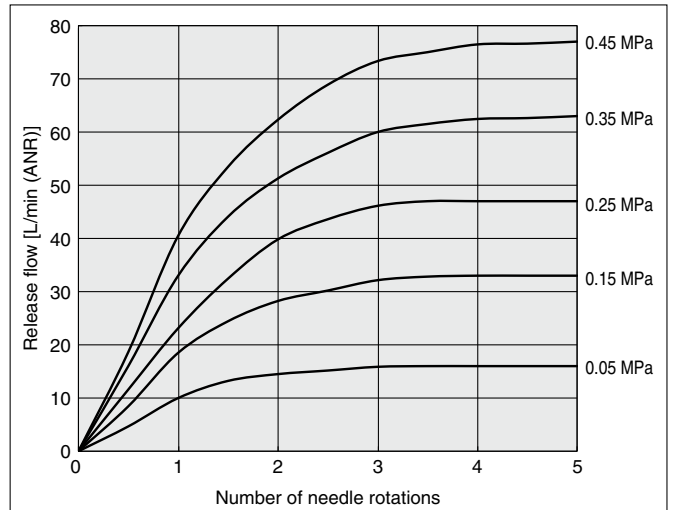
\*1 There is no difference in vacuum release flow rate depending on the presence of the pressure switch with energy saving function.

### Pump System

**ZQ000□A Without release pressure supply (PD) port**



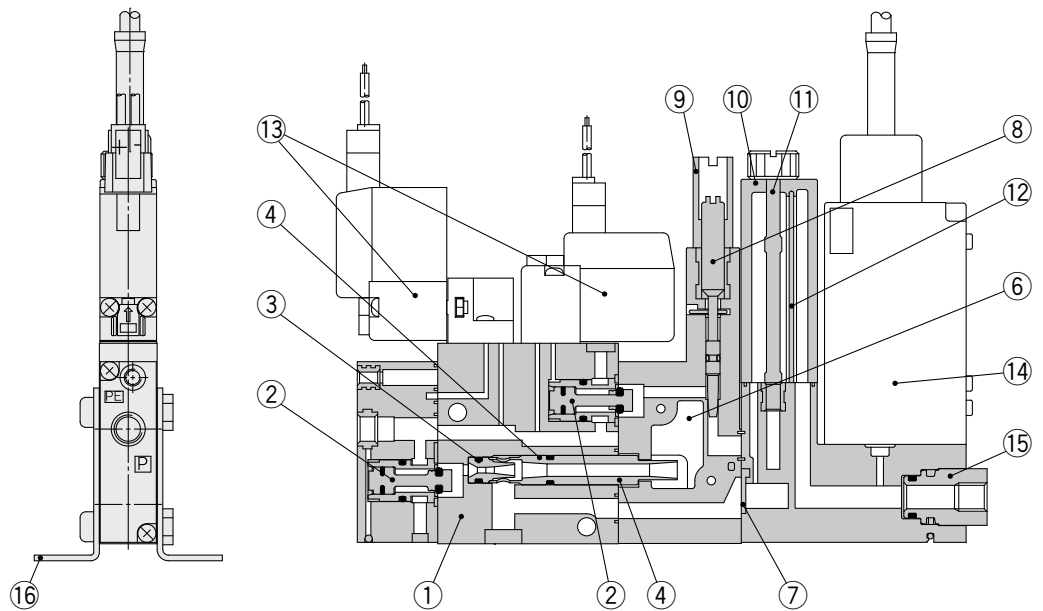
**ZQ000□A With release pressure supply (PD) port**



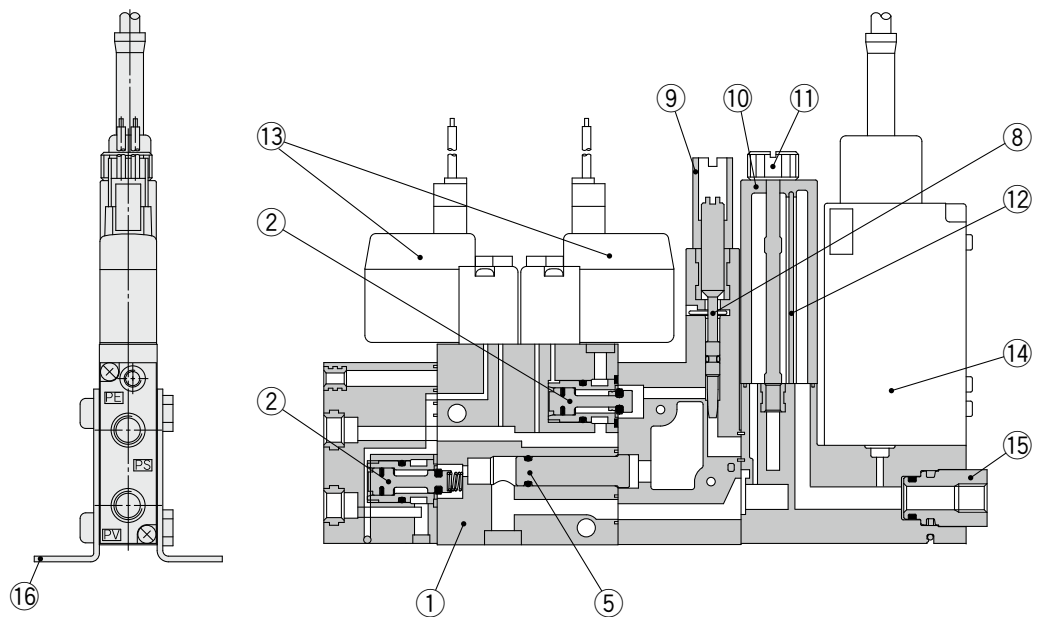
# ZQ□A Series

## Construction

### Vacuum ejector (N.O. specification)



### Vacuum pump system (N.C. specification)



### Component Parts

No.	Description	Material	Note
1	Body	PBT	Brass and aluminum alloy are also used.
2	Supply valve / Release valve assembly	POM/Aluminum alloy/Stainless steel	
3	Nozzle	PBT	
4	Diffuser	PBT	
5	Bushing	Aluminum alloy	
6	Sound absorbing material	Non-woven fabric (PET)	Refer to [3] on page 15 for how to order. (When replacing the sound absorbing material, order a silencer plate assembly.) Refer to [6] on page 15 for how to order.
7	Check valve	HNBR	
8	Vacuum release flow adjusting needle	Stainless steel	
9	Lock nut	Aluminum alloy (Anodized)	
10	Filter case	PC (Refer to the precautions on page 26.)	Refer to [4] on page 15 for how to order.
11	Tension bolt	Stainless steel	
12	Filter element	PVA sponge	Refer to [5] on page 15 for how to order.
13	Pilot supply valve / Pilot valve (for release)	—	Refer to [1] on page 14 for how to order.
14	Vacuum pressure switch	—	Refer to [2] on page 14 for how to order.
15	Vacuum (V) port fitting	—	Refer to [7] on page 15 for how to order.
16	Bracket assembly	Steel (Nickel plating)	Refer to [9] on page 15 for how to order.
—	Seal material (O-ring, etc.)	NBR/HNBR	
—	Screws for assembly	Steel (Zinc chromating/Nickel plating)	



## How to Order Replacement Parts for Single Unit

### 1 Solenoid Valve

(Recommended torque for replacement: 0.054 to 0.08 N-m)

N.C. Pilot Supply Valves, Pilot Valves (for Release) **ZQ1 - V114 - 5** **L** **U** □ - **A**

①      ②

#### 1 Electrical entry

L	LO
With lead wire (300 mm)	Without connector

#### 2 Manual override

Nil	B
Non-locking push type	Locking slotted type

N.O. Pilot Supply Valves **ZQ1 - V124 - 5** **M** **U** □ - **A**

①      ②

#### 1 Electrical entry

M	MO
With lead wire (300 mm)	Without connector

#### 2 Manual override

Nil	B
Non-locking push type	Locking slotted type

Latching Pilot Supply Valves **ZQ1 - VQ110L - 5** **L** - **A**

①

#### 1 Electrical entry

L	LO
With lead wire (300 mm)	Without connector

### Lead Wire with Connector Assembly for Solenoid Valve

For N.C./N.O. Pilot Valves, Pilot Valves (for Release) **SY100 - 30 - 4 A -** **6** ① Lead wire length

For Latching Pilot Valves **AXT661 - 13A -** **6** ①

Nil	300 mm
6	600 mm
10	1000 mm
15	1500 mm
20	2000 mm
30	3000 mm
50	5000 mm

### Connector and Socket for Solenoid Valve

For N.C./N.O. Pilot Valves, Pilot Valves (for Release) **SY100 - 30 - A** \* With connector and sockets only  
(Number of sockets: 2)

For Latching Pilot Valves **AXT661 - 12A**  
(Number of sockets: 3)

### 2 Vacuum Pressure Switch (With Suction Filter)

(Recommended torque for replacement: 0.11 to 0.13 N-m)

**ZQ - ZS** **EA** **M** **G** □ - **2** - **A**

①   ②   ③   ④   ⑤

#### 1 Vacuum pressure switch

Symbol	Pressure range [kPa]	Output
EA	0 to -100	NPN 2 outputs
EB		PNP 2 outputs
EC		NPN 1 output + Analog voltage
EE		PNP 1 output + Analog voltage
FA	-100 to 100	NPN 2 outputs
FB		PNP 2 outputs
FC		NPN 1 output + Analog voltage
FE		PNP 1 output + Analog voltage
VA*1		NPN 1 output + Energy saving control
VB*1		PNP 1 output + Energy saving control

\*1 It is not possible to replace the vacuum pressure switch from the specification without energy saving function to the specification with energy saving function.

#### 2 Unit

Nil*2	With unit switching function
M	SI unit only (kPa)
P*2, *3	With unit switching function (Initial value: psi)

\*2 Under the New Measurement Act, switches with the unit switching function are not permitted for use in Japan (implemented October 1999).

\*3 Cannot be selected when ① is "VA" or "VB"

#### 3 Lead wire

Nil	Without lead wire with connector
G	Lead wire with connector (Length: 2 m) (Included)
W	Lead wire for switch with energy saving function (Length: 2 m) (Included)

#### 4 Check valve\*4

Nil	None
K*5	With check valve

\*4 The check valve has a function to prevent the exhaust air from the exhaust unit 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.

\*5 When "VA" or "VB" is specified for ①, the check valve is already built in.

### ⚠ Warning

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

#### 5 Fitting (V port)

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)

### Lead Wire with Connector Assembly for Vacuum Pressure Switch

(When an individual lead wire is necessary, order with the part numbers below.)

· Lead wire with connector for vacuum pressure switch

**ZS - 39 - 5G**

· Lead wire with connector for pressure switch with energy saving function

**ZQ1 - LW6 -** **N** - **A**

#### ① Output

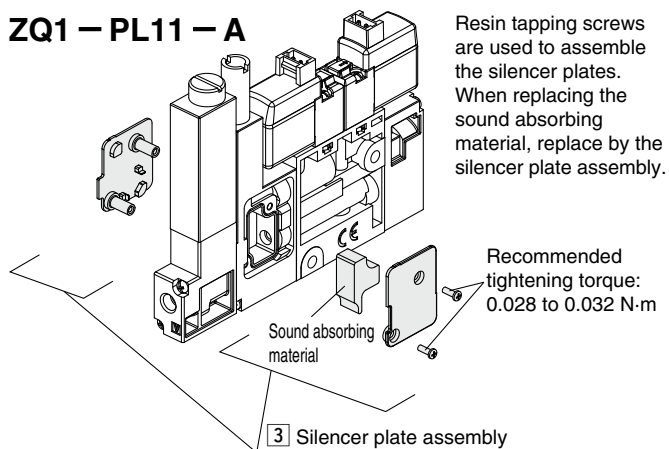
N	NPN open collector
P	PNP open collector

# ZQ□A Series

## How to Order Replacement Parts for Single Unit

### 3 Silencer Plate Assembly

ZQ1 – PL11 – A



### 4 Filter Case Assembly \* One filter element is included.

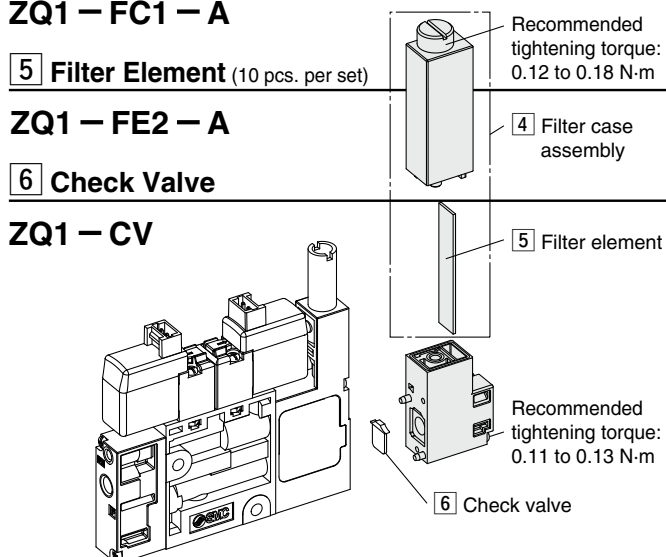
ZQ1 – FC1 – A

### 5 Filter Element (10 pcs. per set)

ZQ1 – FE2 – A

### 6 Check Valve

ZQ1 – CV



### 7 V Port Fitting

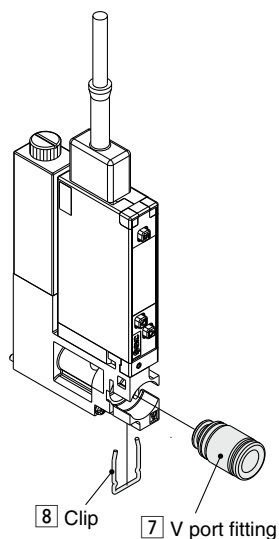
VVQ1000 – 50A-C4

### 1 Specifications

50A-M5	M5 female thread
50A-C3	Straight, ø3.2
50A-C4	Straight, ø4
50A-C6	Straight, ø6
F1-LC3	Elbow, ø3.2
F1-LC4	Elbow, ø4

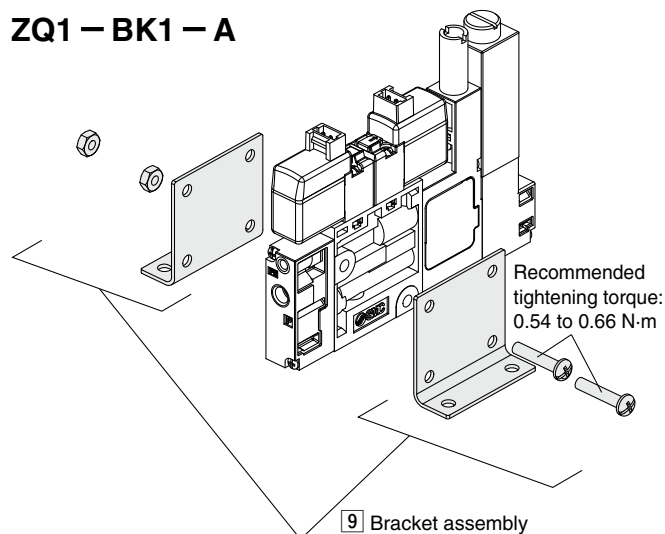
### 8 Clip (10 pcs. per set)

ZK1 – CP – A

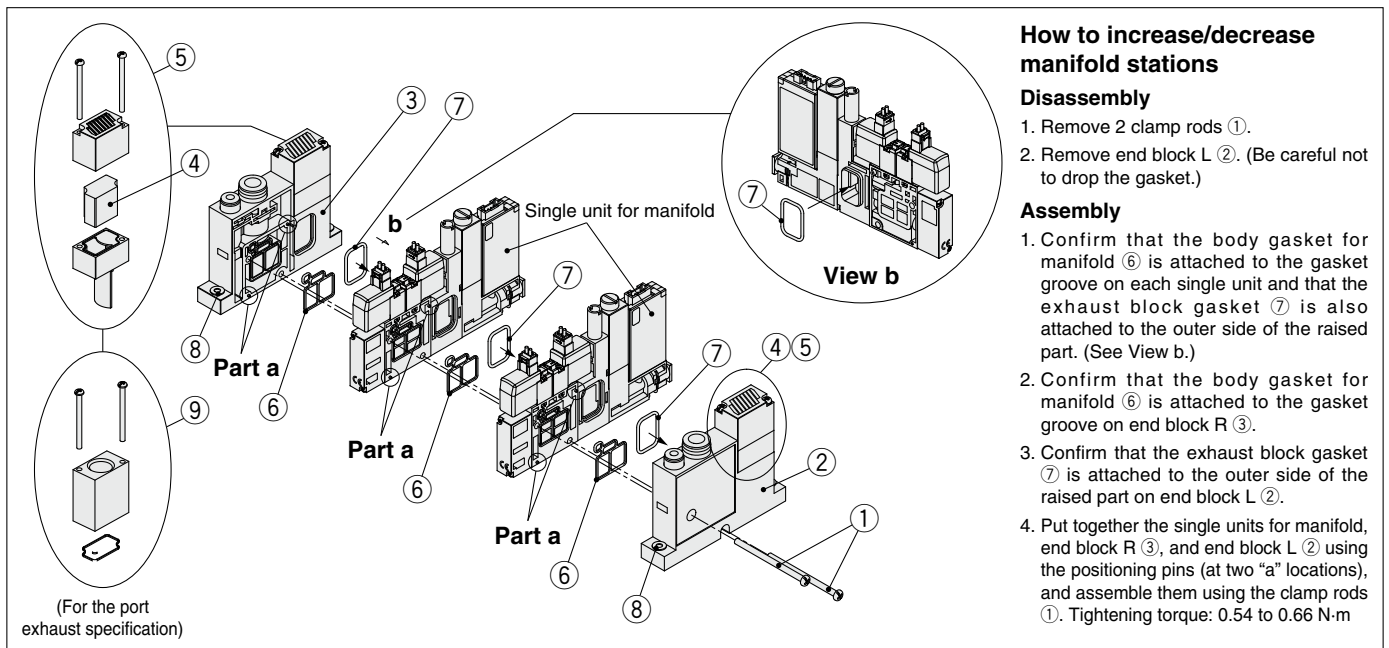


### 9 Bracket Assembly

ZQ1 – BK1 – A



# Compact Vacuum Unit/ZQ□A Series Manifold Exploded View



## Component Parts

No.	Description	Material	Note
1	Clamp rod assembly	Steel (Zinc chromating)	Refer to ① below for how to order.
2	End block L	PBT, POM, PET, Steel, Aluminum alloy, Brass, Stainless steel	Left side with the vacuum (V) port facing the front
3	End block R	PBT, POM, PET, Steel, Aluminum alloy, Brass, Stainless steel	Right side with the vacuum (V) port facing the front
4	Sound absorbing material (For Manifold)	Non-woven fabric (PET)	Refer to ② below for how to order.
5	Silencer block assembly	PBT	Refer to ③ below for how to order.
6	Body gasket for manifold	NBR	Refer to ④ below for how to order.
7	Exhaust block gasket	NBR	Refer to ⑤ below for how to order.
8	Washer assembly	Steel (Zinc chromating)	Refer to ⑥ below for how to order.
9	Port block assembly	Aluminum alloy, Steel (Zinc chromating), NBR	Refer to ⑦ below for how to order.

## How to Order Replacement Parts for Manifold

### ① Clamp Rod Assembly (2 pcs. per set)

ZQ1 - SR1 - 04 - A



#### ① Stations

01	For 1 station
02	For 2 stations
⋮	⋮
08	For 8 stations

### ② Sound Absorbing Material (For Manifold)

(2 pcs. per set)

ZQ1 - SE2 - A

Recommended tightening torque: 0.25 to 0.31 N·m

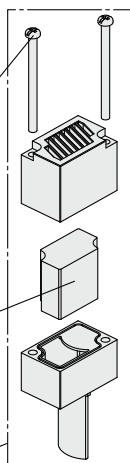
### ③ Silencer Block Assembly

(2 pcs. per set)

ZQ1 - SC1 - A

② Sound absorbing material (For Manifold)

③ Silencer block assembly



### ④ Body Gasket for Manifold (10 pcs. per set)

ZQ - 3 - 005 - 10AS

### ⑤ Exhaust Block Gasket (10 pcs. per set)

ZQ - 3 - 009 - 10AS

### ⑥ Washer Assembly (4 pcs. per set)

ZQ1 - WS 3 - A



#### ① Size

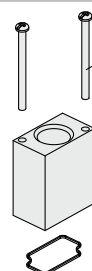
3	For M3 (Without release pressure supply port)
4	For M4 (With release pressure supply port)

### ⑦ Port Block Assembly

(2 pcs. per set)

ZQ1 - EP2 - A

Recommended tightening torque: 0.25 to 0.31 N·m



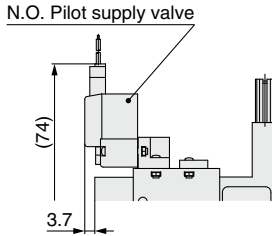
# ZQ□A Series

## Dimensions

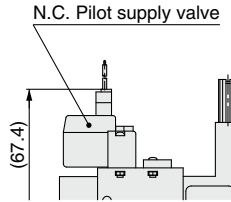
### Vacuum ejector: Single unit specification

ZQ□1UA-□5L□-□□□-00

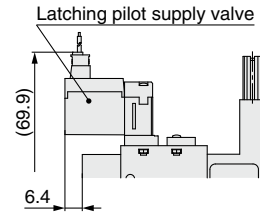
Supply valve (N.O.), Without release valve  
(Type J2)



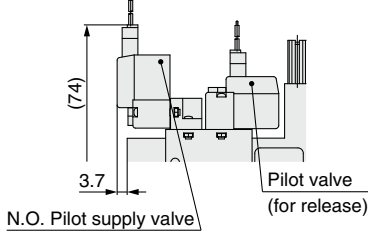
Supply valve (N.C.), Without release valve  
(Type J1)



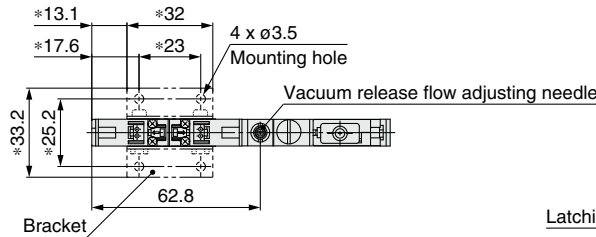
Supply valve (Latching), Without release valve  
(Type Q2)



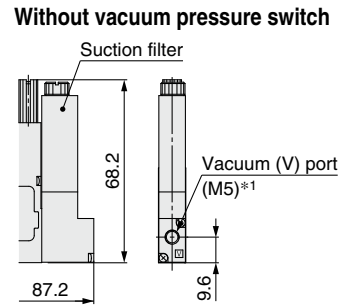
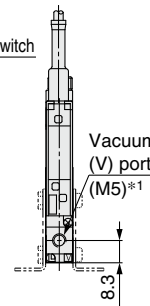
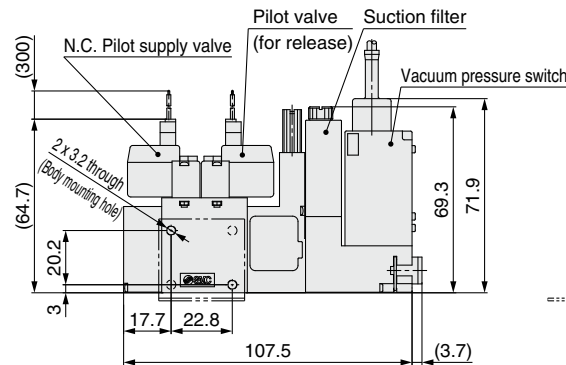
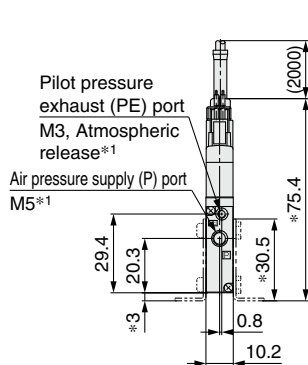
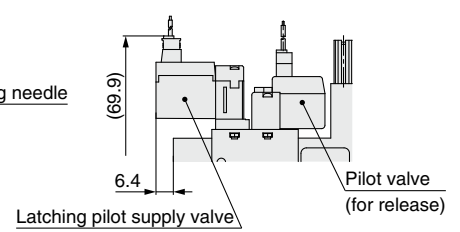
Supply valve (N.O.), With release valve  
(Type K2)



Supply valve (N.C.), With release valve  
(Type K1)



Supply valve (Latching), With release valve  
(Type Q1)



\*1 The pitches of P, PE, and V ports are determined assuming the use of One-touch fittings.

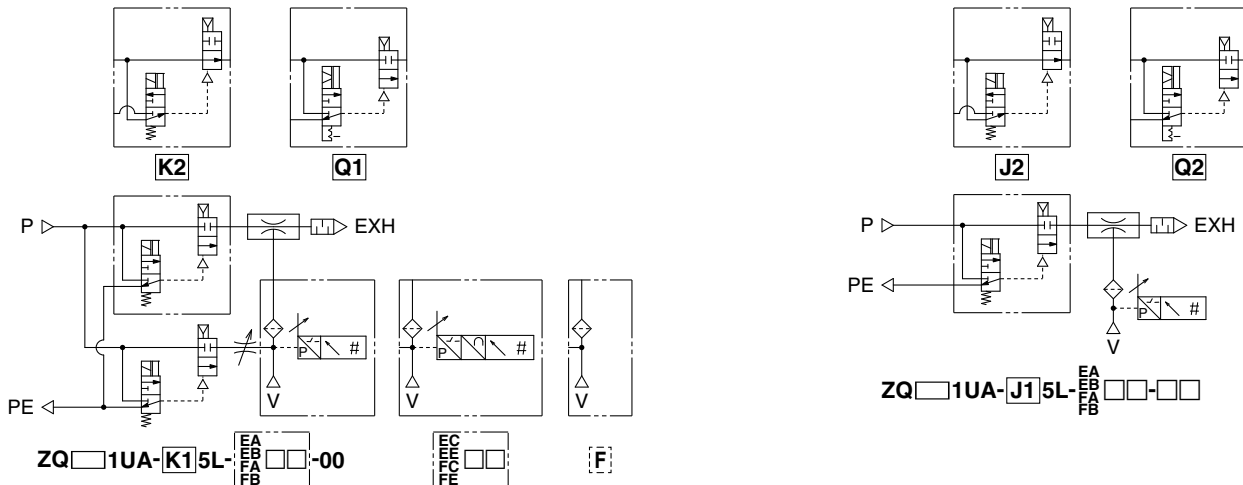
If used with other fittings, these may cause interference depending on their type and size. Please refer to the catalog to confirm the sizes of the fittings to be used.

\* Dimensions marked with "\*" are those after the bracket is mounted.

\* Recommended tightening torque for body mounting: 0.54 to 0.66 N·m

\* When the release valve is not used, design the circuit for vacuum release separately in order to release a workpiece.

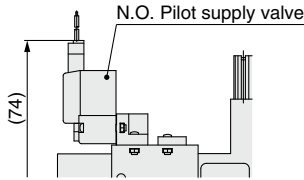
## Circuit diagram



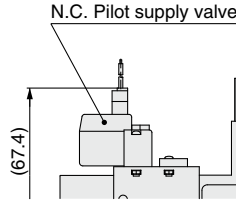
## Dimensions

### Vacuum pump system: Single unit specification ZQ000UA-□5L□-□□□-00

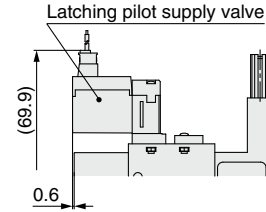
Supply valve (N.O.), Without release valve  
(Type J2)



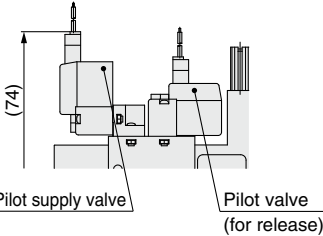
Supply valve (N.C.), Without release valve  
(Type J1)



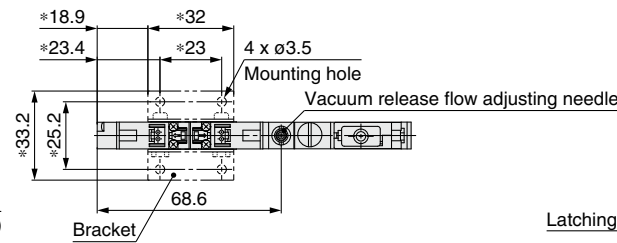
Supply valve (Latching), Without release valve  
(Type Q2)



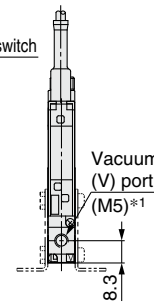
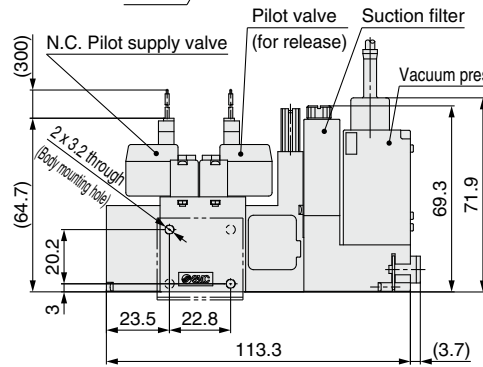
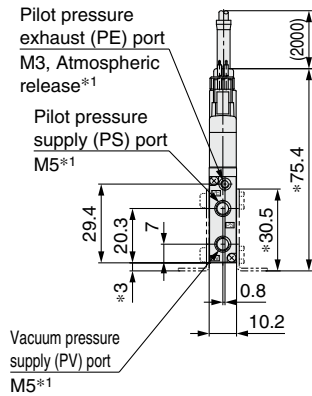
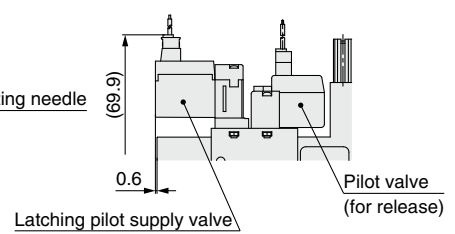
Supply valve (N.O.), With release valve  
(Type K2)



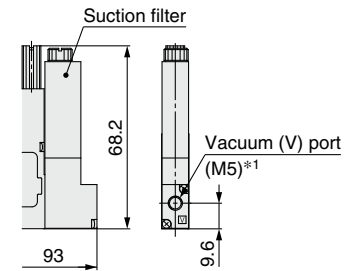
Supply valve (N.C.), With release valve  
(Type K1)



Supply valve (Latching), With release valve  
(Type Q1)



Without vacuum pressure switch



\*1 The pitches of PV, PS, PE, and V ports are determined assuming the use of One-touch fittings.

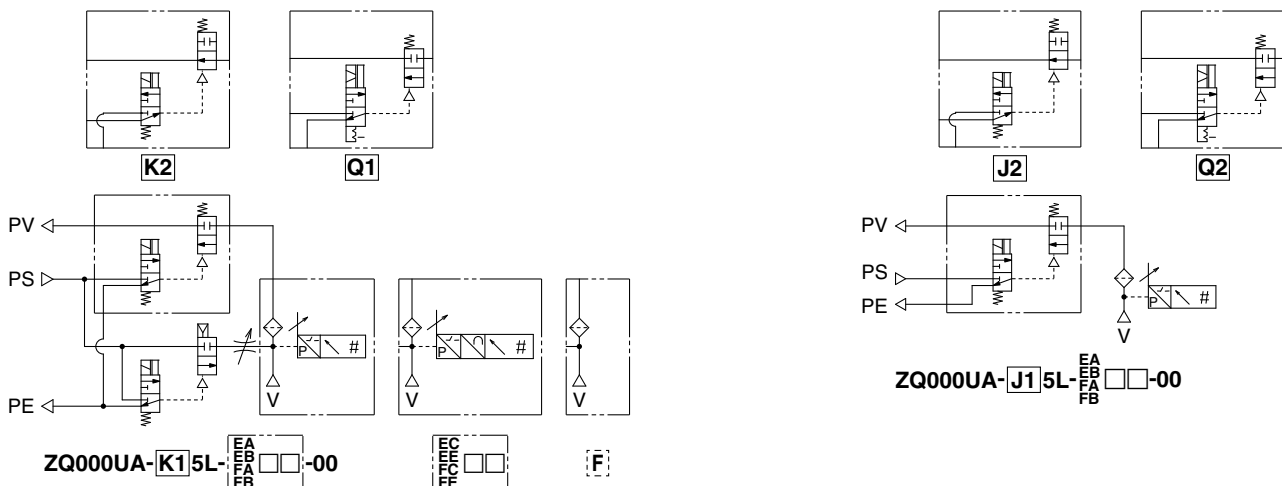
If used with other fittings, these may cause interference depending on their type and size. Please refer to the catalog to confirm the sizes of the fittings to be used.

\* Dimensions marked with "\*" are those after the bracket is mounted.

\* Recommended tightening torque for body mounting: 0.54 to 0.66 N·m

\* When the release valve is not used, design the circuit for vacuum release separately in order to release a workpiece.

## Circuit diagram



# ZQ□A Series

## Dimensions

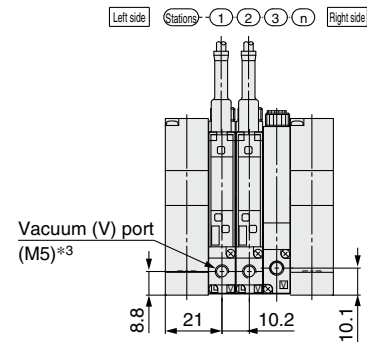
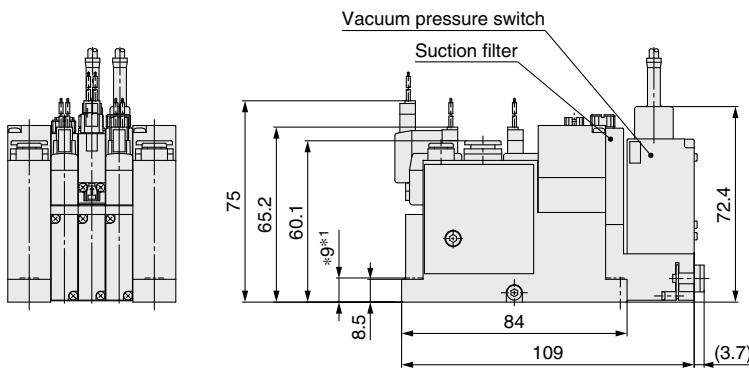
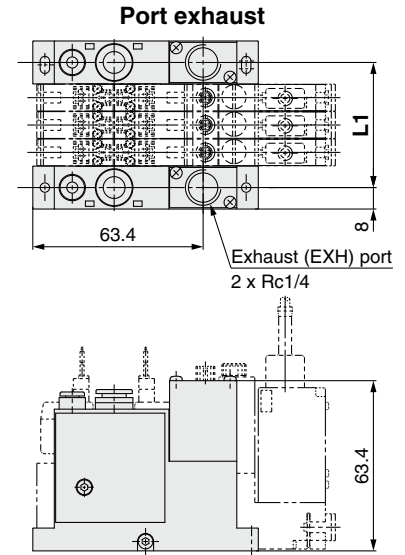
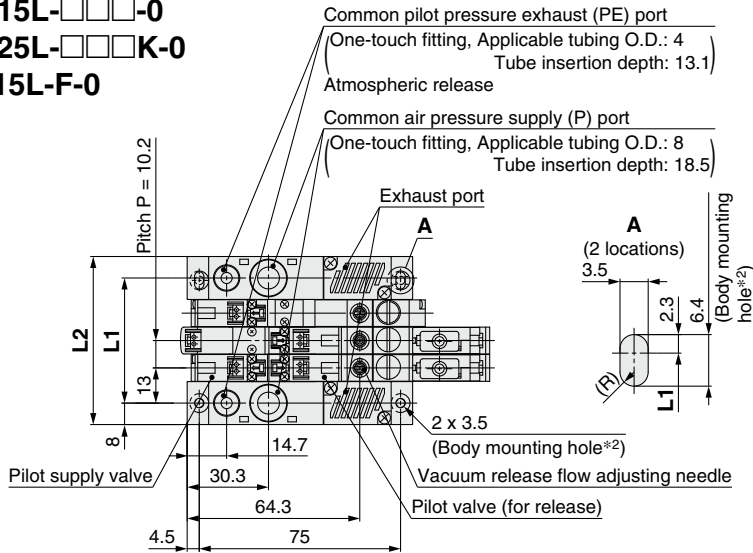
### Vacuum ejector: Manifold specification (Without PD port)

#### ZZQ1□A-B<sub>P</sub><sup>S</sup>B

\*ZQ□3MA-K15L-□□□-0

\*ZQ□3MA-K25L-□□□K-0

\*ZQ□3MA-J15L-F-0



## Dimensions

n: Stations	1	2	3	4	5	6	7	8
L1	26.2	36.4	46.6	56.8	67.0	77.2	87.4	97.6
L2	42.2	52.4	62.6	72.8	83.0	93.2	103.4	113.6

\*1 Dimensions marked with "\*" are those after the attached washer is mounted.

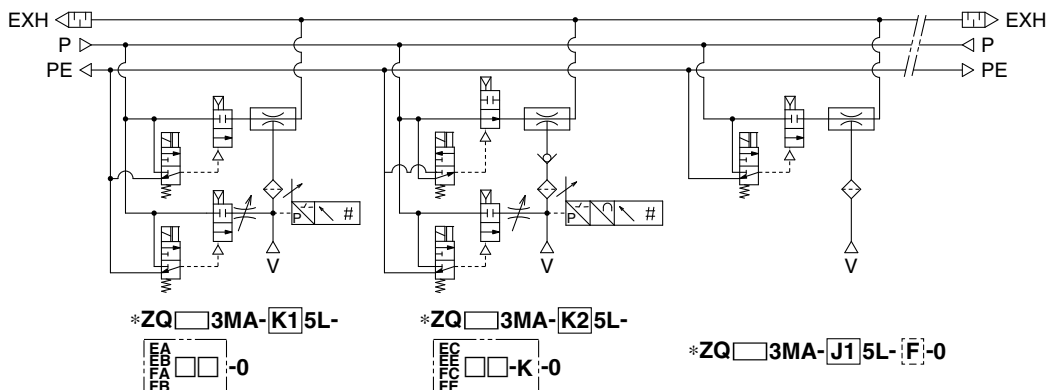
\*2 Recommended tightening torque for body mounting: 0.28 to 0.34 N·m

\*3 The pitches of V ports are determined assuming the use of One-touch fittings.

If used with other fittings, these may cause interference depending on their type and size. Please refer to the catalog to confirm the sizes of the fittings to be used.

\* Use the attached washer when installing the product.

## Circuit diagram





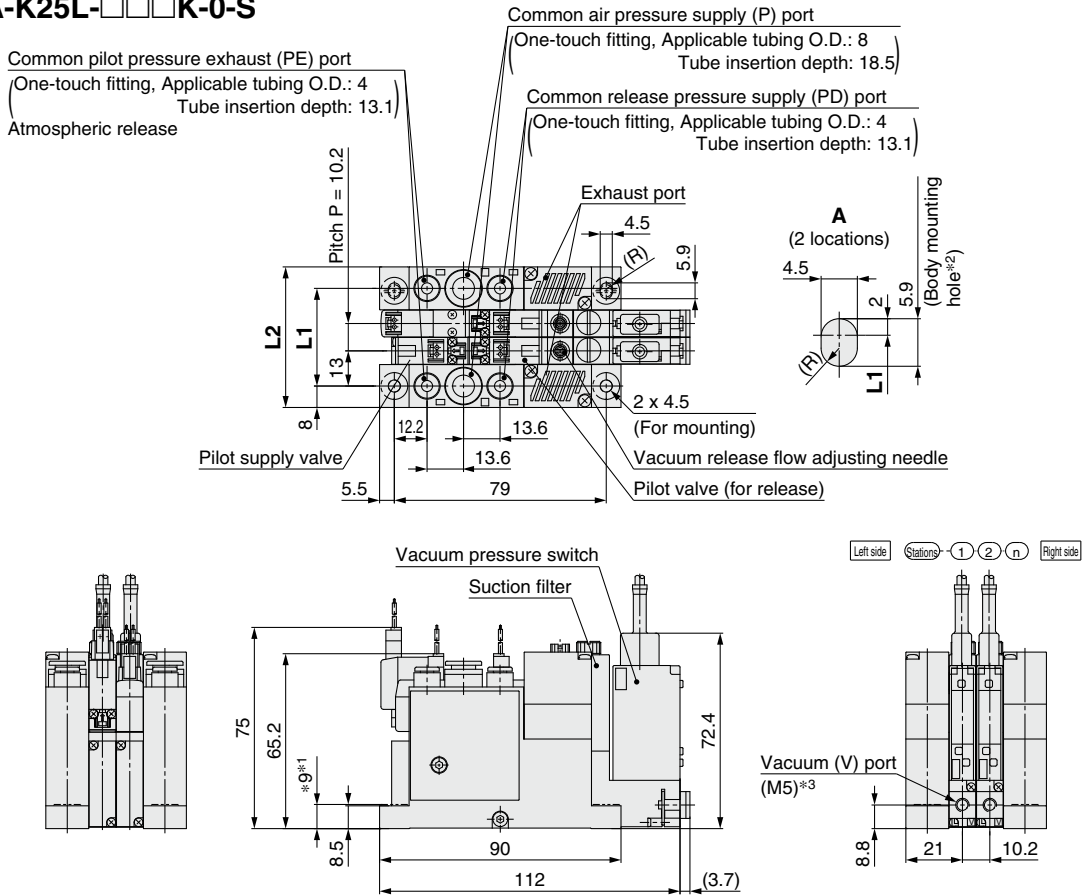
## Dimensions

### Vacuum ejector: Manifold specification (With PD port)

ZZQ1□A-B<sub>P</sub>C

\*ZQ□3MA-K15L-□□□-0-S

\*ZQ□3MA-K25L-□□□K-0-S



## Dimensions

n: Stations	1	2	3	4	5	6	7	8
<b>L1</b>	26.2	36.4	46.6	56.8	67.0	77.2	87.4	97.6
<b>L2</b>	42.2	52.4	62.6	72.8	83.0	93.2	103.4	113.6

\*1 Dimensions marked with "\*" are those after the attached washer is mounted.

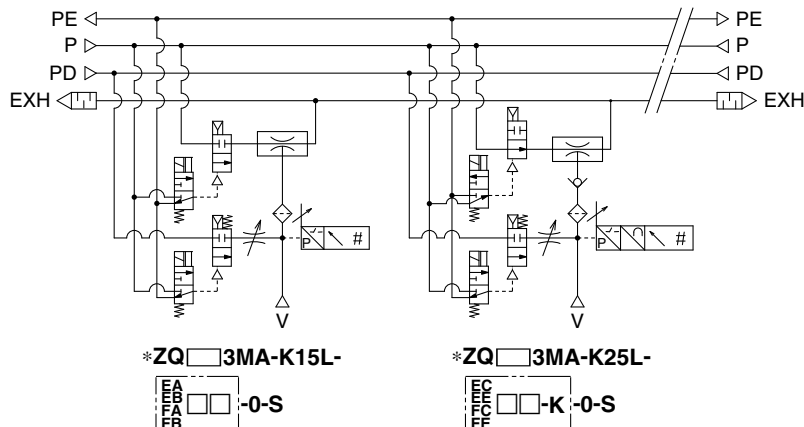
\*2 Recommended tightening torque for body mounting: 0.68 to 0.83 N·m

\*3 The pitches of V ports are determined assuming the use of One-touch fittings.

If used with other fittings, these may cause interference depending on their type and size. Please refer to the catalog to confirm the sizes of the fittings to be used.

\* Use the attached washer when installing the product.

## Circuit diagram



# ZQ□A Series

## Dimensions

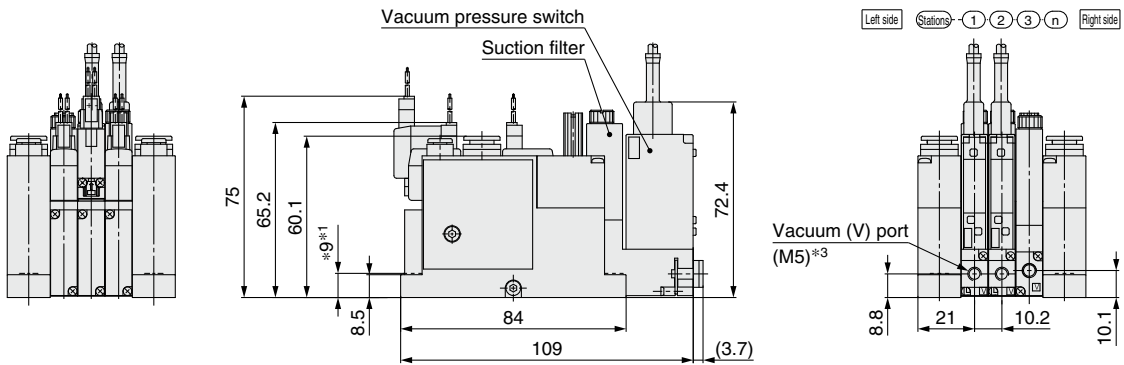
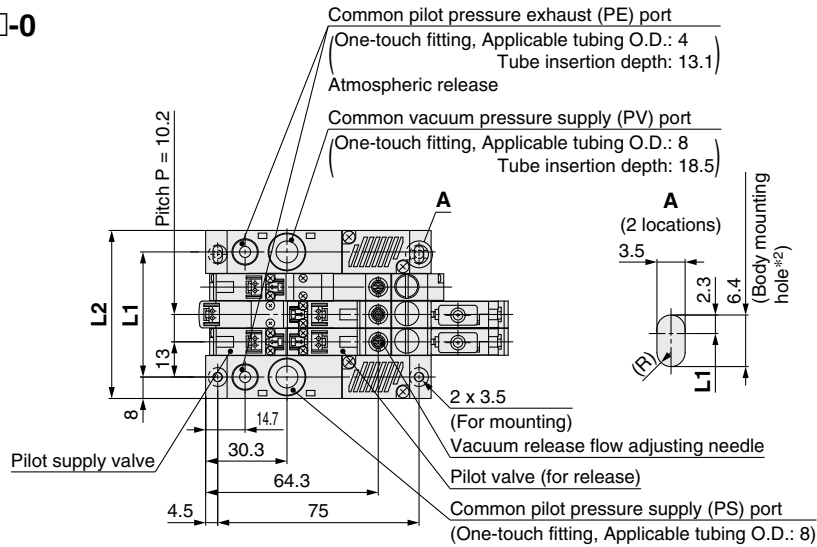
### Vacuum pump system: Manifold specification (Without PD port)

#### ZZQ1□A-□OB

\*ZQ000MA-K15L-□□□-0

\*ZQ000MA-K25L-□□□-0

\*ZQ000MA-J15L-F-0



## Dimensions

n: Stations	1	2	3	4	5	6	7	8
L1	26.2	36.4	46.6	56.8	67.0	77.2	87.4	97.6
L2	42.2	52.4	62.6	72.8	83.0	93.2	103.4	113.6

\*1 Dimensions marked with "\*" are those after the attached washer is mounted.

\*2 Recommended tightening torque for body mounting: 0.28 to 0.34 N·m

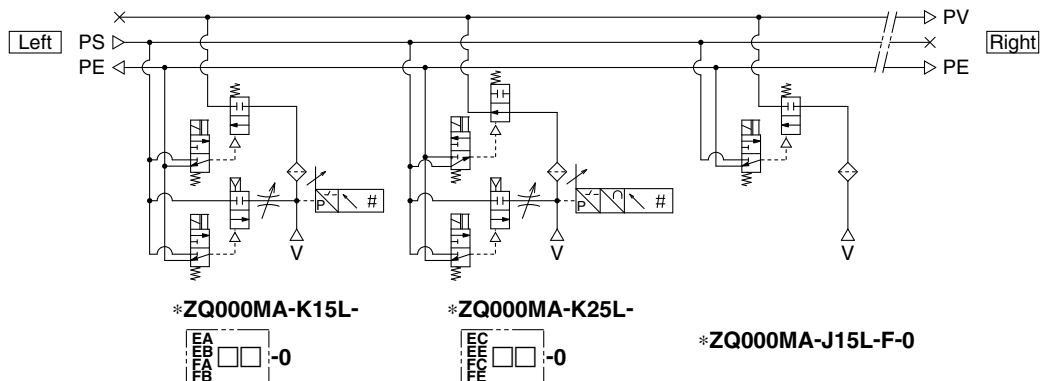
\*3 The pitches of V ports are determined assuming the use of One-touch fittings.

If used with other fittings, these may cause interference depending on their type and size. Please refer to the catalog to confirm the sizes of the fittings to be used.

\* Use the attached washer when installing the product.

\* When the release valve is not used, design the circuit for vacuum release separately in order to release a workpiece.

## Circuit diagram



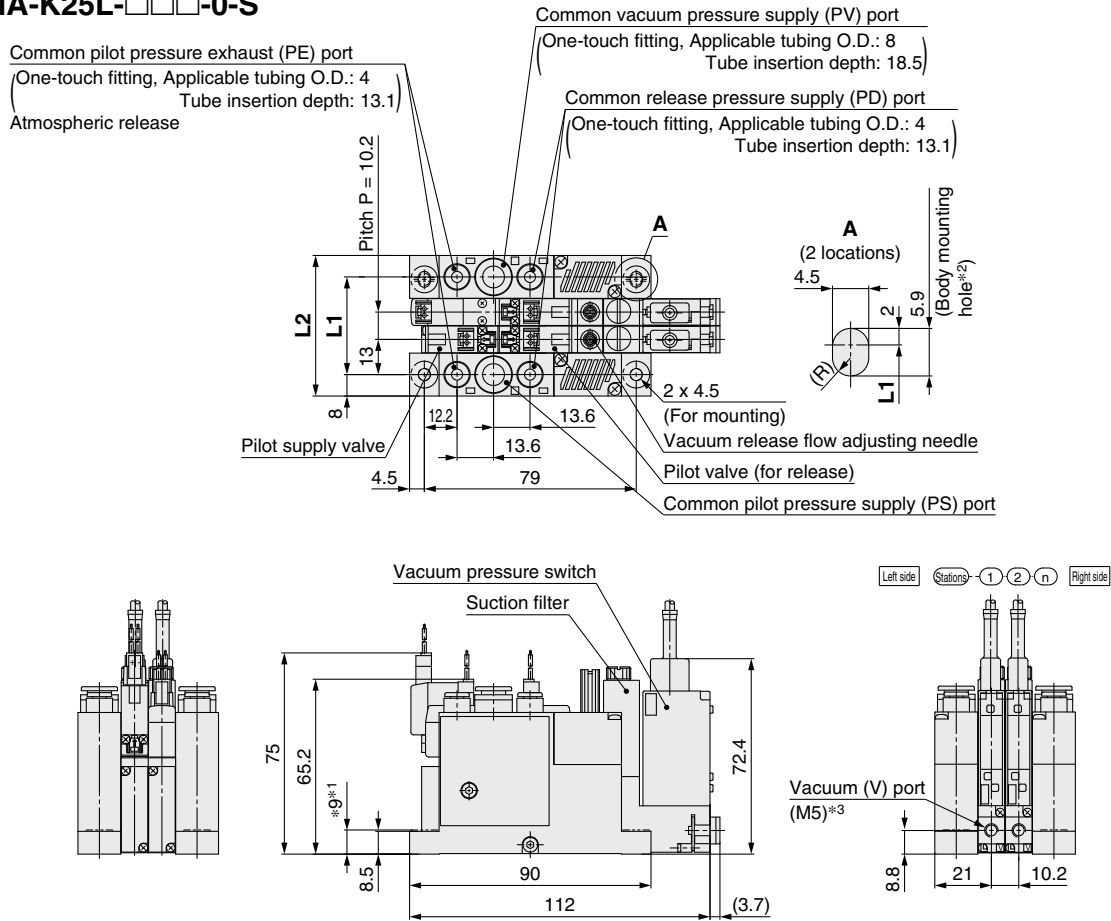
## Dimensions

### Vacuum pump system: Manifold specification (With PD port)

#### ZZQ1□A-□OC

\*ZQ000MA-K15L-□□□-0-S

\*ZQ000MA-K25L-□□□-0-S



## Dimensions

n: Stations	1	2	3	4	5	6	7	8
<b>L1</b>	26.2	36.4	46.6	56.8	67.0	77.2	87.4	97.6
<b>L2</b>	42.2	52.4	62.6	72.8	83.0	93.2	103.4	113.6

\*1 Dimensions marked with "\*" are those after the attached washer is mounted.

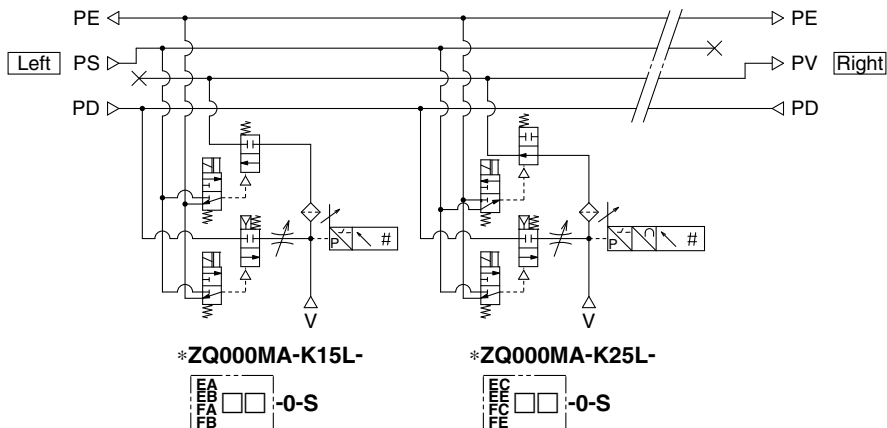
\*2 Recommended tightening torque for body mounting: 0.68 to 0.83 N·m

\*3 The pitches of V ports are determined assuming the use of One-touch fittings.

If used with other fittings, these may cause interference depending on their type and size. Please refer to the catalog to confirm the sizes of the fittings to be used.

\* Use the attached washer when installing the product.

## Circuit diagram



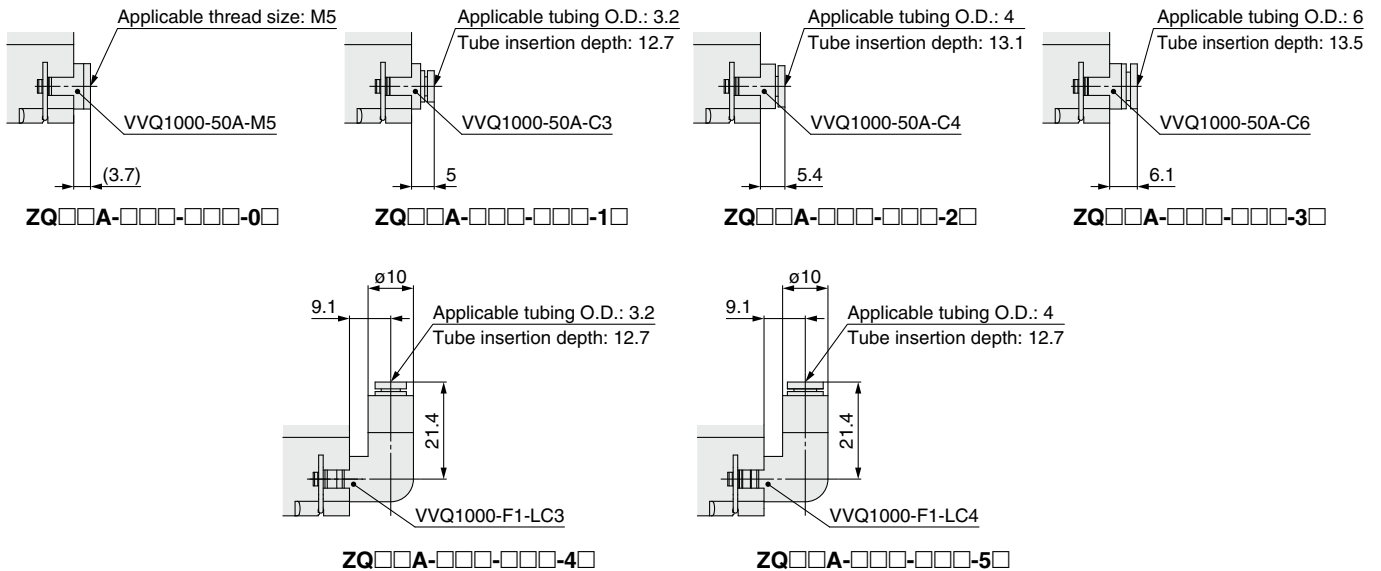
# ZQ□A Series

## Dimensions

### Fitting dimensions after installation

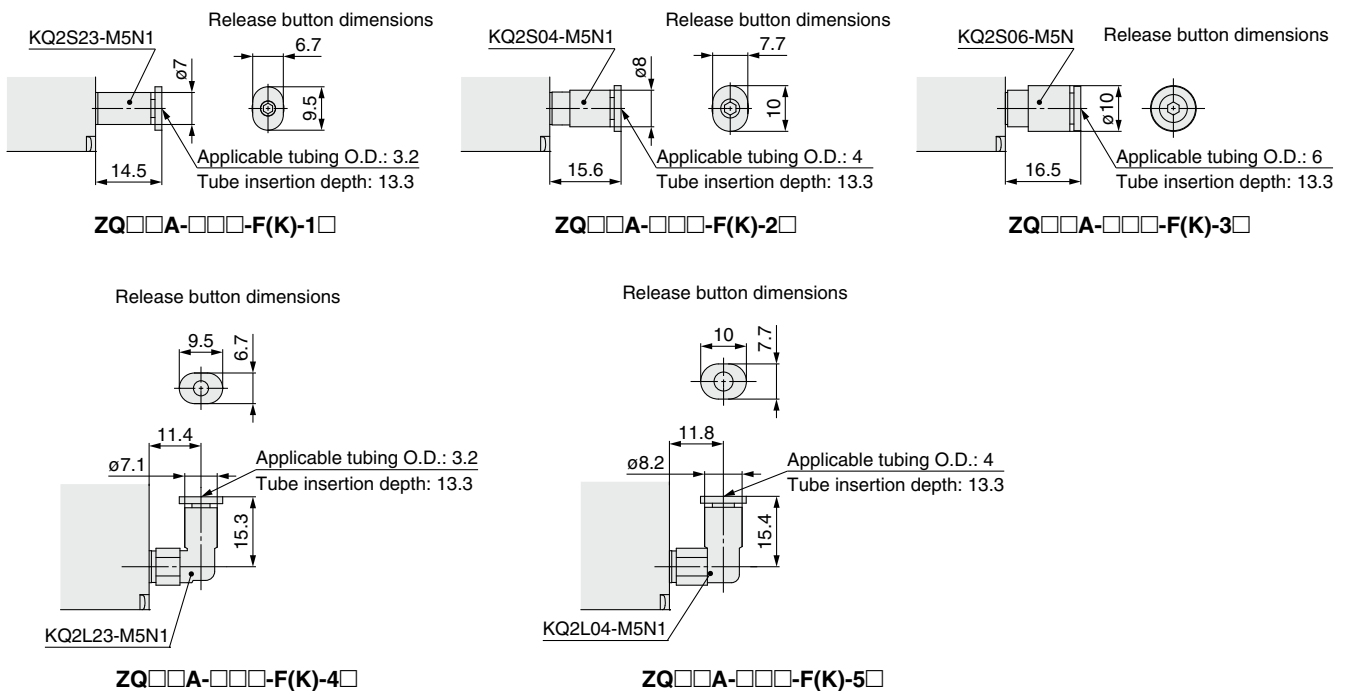
#### V port

<With vacuum pressure switch>



#### V port

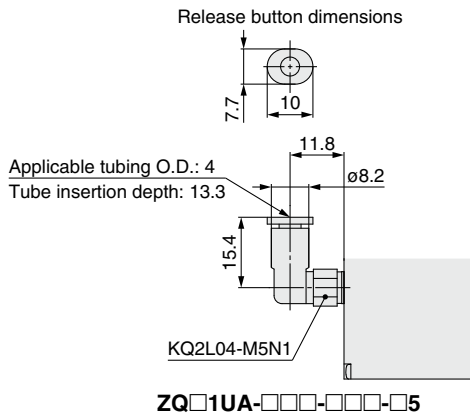
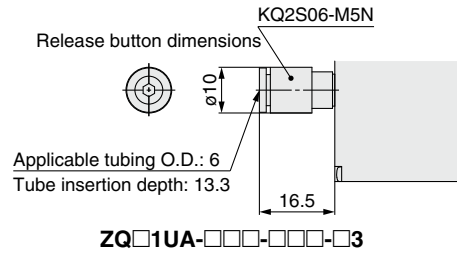
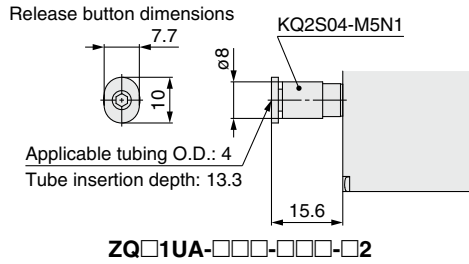
<Suction filter only>



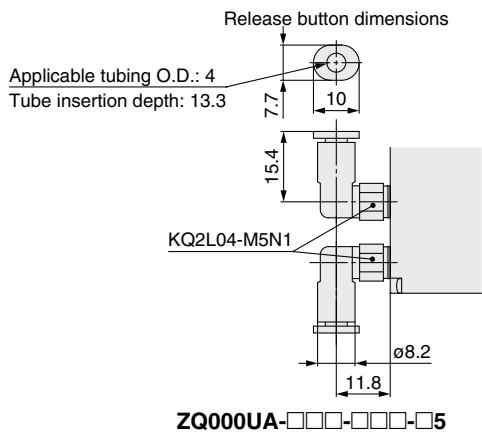
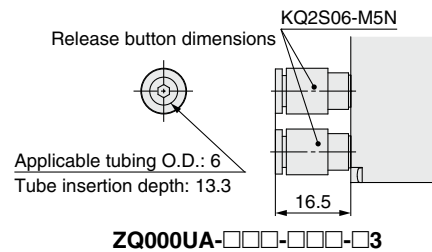
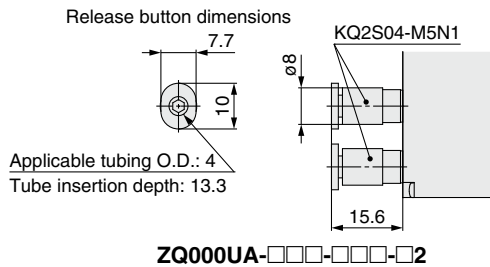
## Dimensions

### Fitting dimensions after installation

#### P port



#### PS/PV port





## ZQ□A Series

# Specific Product Precautions 1

Be sure to read this before handling the products. Refer to the back cover for safety instructions. For vacuum equipment precautions, refer to the “Handling Precautions for SMC Products” and the “Operation Manual” on the SMC website: <https://www.smcworld.com>

### ■ Handling of Products

#### Handling / Mounting

### ⚠ Caution

1. Do not drop, hit, or apply excessive impact to the product when handling it.

Even if the body looks undamaged, the internal components may be damaged, leading to a malfunction.

2. Load to the body

The product body is made of resin; therefore, do not apply load to the port after mounting. Prevent any kind of operation which generates moment as this may cause reduced performance or damage to the body.

#### Operating Supply Pressure

### ⚠ Caution

- Use the product within the specified supply pressure range.

Operation over the max. operating pressure can cause damage to the product.

The parts around the vacuum port of this product are designed to be used with vacuum pressure. With the vacuum pump system, since air is not released to the atmosphere from a silencer, the applied air for vacuum release increases the internal pressure of the vacuum port. Select the vacuum pad which shape allows smooth exhaust of release air to the atmosphere and avoid clogging.

#### Other Tubing Brands

### ⚠ Caution

1. When using tubing from a manufacturer other than SMC, be careful of the tolerance of the tubing O.D.

- 1) Nylon tubing: Within  $\pm 0.1$  mm
- 2) Soft nylon tubing: Within  $\pm 0.1$  mm
- 3) Polyurethane tubing: Within  $+0.15$  mm, within  $-0.2$  mm

Do not use tubing which does not satisfy the specified tubing O.D. accuracy. It may cause difficulty when connecting the tubing, air leakage after connection, or the disconnection of the tubing.

### ■ Vacuum Release Flow Adjusting Needle

#### Vacuum Release Air

### ⚠ Caution

1. The flow rate characteristics show the representative values of the product itself.

They may change depending on piping, circuit and pressure conditions, etc. The flow rate characteristics and the number of needle rotations will vary due to the range of the specifications of the product.

2. Even if the needle is fully closed, vacuum release air may be output when the vacuum release valve is turned on. Excessive tightening of the needle can cause damage.

### ■ Vacuum Release Flow Adjusting Needle

#### Operation of Vacuum Release Flow Adjusting Needle

### ⚠ Caution

1. The needle has a retaining mechanism, so it will not continue to rotate after it reaches the rotation stop position.

The needle may break if it is turned with a 0.4 N·m or greater torque.

2. Do not overtighten the lock nut.

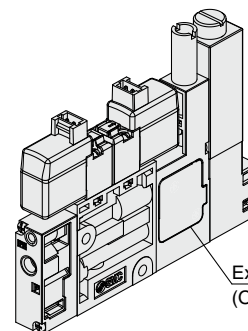
When tightening the lock nut, tighten it by approx. 15 to 30 degrees. Pay attention not to cause breakage by over tightening.

#### Ejector Exhaust / Exhaust Noise

### ⚠ Caution

#### ■ Ejector Exhaust

- The exhaust resistance should be as small as possible to obtain max. ejector performance. There should be no shield around the exhaust port for the silencer exhaust specification. When the product is installed, one of the exhaust ports should be open to atmosphere.



For the port exhaust specification, back pressure may increase depending on the size and length of the piping connected to the exhaust (EXH) port. Ensure that the back pressure does not exceed 0.005 MPa (5 kPa). Do not operate the ejector or apply pressure to the exhaust port with the exhaust port closed. This increases the pressure in the product and can damage the vacuum ejector.

- If the sound absorbing material is clogged, it will cause reduced ejector performance.

Sometimes, if the operating environment contains a lot of particles or mist, the replacement of the filter element only is not enough to recover vacuum performance - as the sound absorbing material may be clogged. Replace the sound absorbing material. (Regular replacement of the filter element and the sound absorbing material is recommended.)



## Specific Product Precautions 2

Be sure to read this before handling the products. Refer to the back cover for safety instructions. For vacuum equipment precautions, refer to the “Handling Precautions for SMC Products” and the “Operation Manual” on the SMC website: <https://www.smcworld.com>

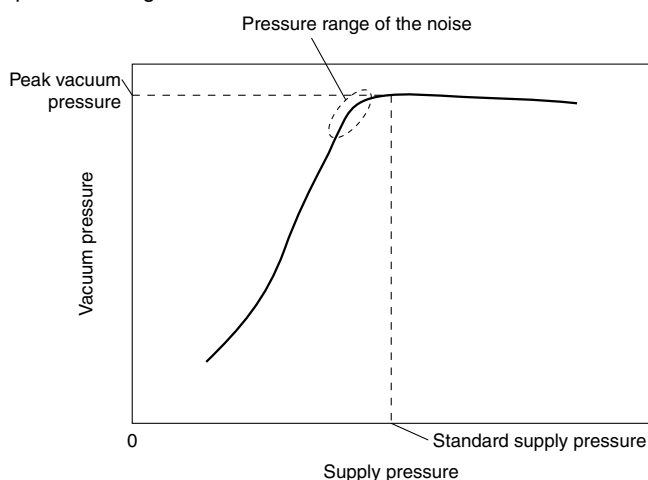


### Ejector Exhaust / Exhaust Noise

#### ⚠ Caution

##### ■ Exhaust Noise

- When the ejector generates vacuum, noise can be heard from the exhaust port when the standard supply pressure is close to the pressure that generates peak vacuum pressure, making the vacuum pressure unstable. If the vacuum pressure range is adequate for adsorption, there should be no problem. If the noise causes a problem or affects the setting of the pressure switch, change the supply pressure slightly to avoid the pressure range of the noise.



##### ■ Solenoid Valve / Pressure Switch

#### Wiring and Connection of Solenoid Valves and Vacuum Pressure Switches

#### ⚠ Caution

- Incorrect wiring can damage the solenoid valve and vacuum pressure switch, and cause a failure or malfunction. Connections should only be made when the power supply is turned OFF.
- Do not attempt to insert or pull out the connector while the power is ON. Doing so may cause malfunction.
- Malfunctions stemming from noise may occur if the wire is installed in the same route as that of the power cable or another high-voltage cable. Wire the switch independently.
- Be sure to ground the frame ground (FG) terminal when using a commercially available switching power supply. (Pressure switch)
- Do not apply a load such as tension directly to the lead wire of the solenoid valve and vacuum pressure switch. Load on the lead wire may cause a failure. Hold the body when handling the product.
- Avoid repeatedly bending or stretching the lead wire of the solenoid valve or vacuum pressure switch. Lead wires will break if bending stress or tensile force is applied to them repeatedly. If the lead wire moves around, secure it near the body of the product. The recommended bending radius is 40 mm or more. Please contact SMC for further details.

##### ■ Solenoid Valve / Pressure Switch

#### Environment

#### ⚠ Warning

- The solenoid valve and vacuum pressure switch are not designed to be explosion proof, dustproof, or drip proof. Never use in atmospheres which contain flammable or explosive gases.

#### ⚠ Caution

- The vacuum pressure switch and solenoid valve are CE/UKCA-compliant but not immune to lightning strikes. Take measures against lightning strikes in your system.
- Do not use the product in places where static electricity is a problem. Doing so may result in system failure or malfunction.

#### Design

#### ⚠ Caution

- Avoid energizing the solenoid valve for long periods of time. If a solenoid valve is continuously energized for an extended period of time, the heat generated by the coil assembly may reduce the performance and life of the valve or have adverse effects on peripheral equipment. Therefore, if the solenoid valve is to be continuously energized for an extended period of time or if the energized period per day will be longer than the de-energized period, use an N.O. (normally open) type product. When the valve is mounted onto a control panel, take measures to radiate heat in order to keep the product temperature within the specified range.
- For specific product precautions on solenoid valves, please refer to the solenoid valve (V100 series, VQ100 series) catalog.
- For specific product precautions on vacuum pressure switches, please refer to the pressure switch (ZSE10 series) catalog.

##### ■ Filter Case

#### Filter Case

#### ⚠ Caution

- The filter case of this product is made of polycarbonate. Avoid chemicals such as thinner, carbon tetrachloride, chloroform, acetic ester, aniline, cyclohexane, trichloroethylene, sulfuric acid, lactic acid, water base cutting fluid (alkaline).
- Do not expose the filter case to direct sunlight for long periods of time.



# ZQ□A Series

## Specific Product Precautions 3

Be sure to read this before handling the products. Refer to the back cover for safety instructions. For vacuum equipment precautions, refer to the “Handling Precautions for SMC Products” and the “Operation Manual” on the SMC website: <https://www.smcworld.com>

### Converter Assembly for Solenoid Valve

#### ⚠ Caution

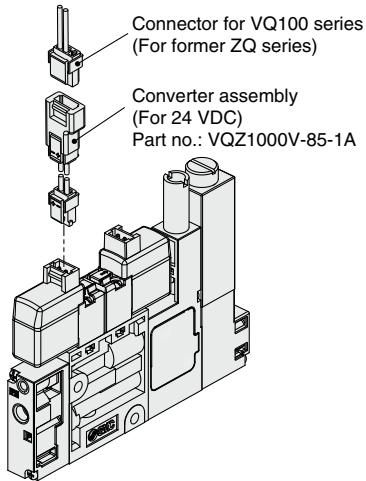
1. When replacing the former ZQ series (with the VQ100 series installed) with the ZQ-A due to maintenance or other reasons, the “converter assembly” that converts the solenoid valve connecting terminal from a 3-terminal type to a 2-terminal type is required.

This option can be selected when ordering the product or can be ordered separately (see the figure below).

The required amount of converter assemblies (included in the package) according to the combined solenoid valve types are shown in the table below.


#### Required Amount of Converter Assemblies According to Product Type


Model	Necessity of a converter assembly		Required amount of converter assemblies (included in the package)
	Pilot supply valve	Pilot valve (for release)	
ZQ□□A-K15LO-□□□□-□□-□	Yes	Yes	2
ZQ□□A-K25LO-□□□□-□□-□	Yes	Yes	2
ZQ□□A-J15LO-□□□□-□□-□	Yes	No	1
ZQ□□A-J25LO-□□□□-□□-□	Yes	No	1
ZQ□□A-Q15LO-□□□□-□□-□	No	Yes	1
ZQ□□A-Q25LO-□□□□-□□-□	No	No	Cannot be included




## Safety Instructions

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

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

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

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

\*1) ISO 4414: Pneumatic fluid power – General rules relating to systems.  
ISO 4413: Hydraulic fluid power – General rules relating to systems.  
IEC 60204-1: Safety of machinery – Electrical equipment of machines.  
(Part 1: General requirements)  
ISO 10218-1: Manipulating industrial robots – Safety.  
etc.

### Warning

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

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

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

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

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

1. The inspection and maintenance of machinery/equipment should only be performed after measures to prevent falling or runaway of the driven objects have been confirmed.
2. When the product is to be removed, confirm that the safety measures as mentioned above are implemented and the power from any appropriate source is cut, and read and understand the specific product precautions of all relevant products carefully.
3. Before machinery/equipment is restarted, take measures to prevent unexpected operation and malfunction.

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

1. Conditions and environments outside of the given specifications, or use outdoors or in a place exposed to direct sunlight.
2. Installation on equipment in conjunction with atomic energy, railways, air navigation, space, shipping, vehicles, military, medical treatment, combustion and recreation, or equipment in contact with food and beverages, emergency stop circuits, clutch and brake circuits in press applications, safety equipment or other applications unsuitable for the standard specifications described in the product catalog.
3. An application which could have negative effects on people, property, or animals requiring special safety analysis.
4. Use in an interlock circuit, which requires the provision of double interlock for possible failure by using a mechanical protective function, and periodical checks to confirm proper operation.

### Caution

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

The product herein described is basically provided for peaceful use in manufacturing industries.  
If considering using the product in other industries, consult SMC beforehand and exchange specifications or a contract if necessary.  
If anything is unclear, contact your nearest sales branch.

### Limited warranty and Disclaimer/ Compliance Requirements

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

Read and accept them before using the product.

#### Limited warranty and Disclaimer

1. The warranty period of the product is 1 year in service or 1.5 years after the product is delivered, whichever is first.\*2)  
Also, the product may have specified durability, running distance or replacement parts. Please consult your nearest sales branch.
2. For any failure or damage reported within the warranty period which is clearly our responsibility, a replacement product or necessary parts will be provided.  
This limited warranty applies only to our product independently, and not to any other damage incurred due to the failure of the product.
3. Prior to using SMC products, please read and understand the warranty terms and disclaimers noted in the specified catalog for the particular products.

##### \*2) Vacuum pads are excluded from this 1 year warranty.

A vacuum pad is a consumable part, so it is warranted for a year after it is delivered.  
Also, even within the warranty period, the wear of a product due to the use of the vacuum pad or failure due to the deterioration of rubber material are not covered by the limited warranty.

#### Compliance Requirements

1. The use of SMC products with production equipment for the manufacture of weapons of mass destruction (WMD) or any other weapon is strictly prohibited.
2. The exports of SMC products or technology from one country to another are governed by the relevant security laws and regulations of the countries involved in the transaction. Prior to the shipment of a SMC product to another country, assure that all local rules governing that export are known and followed.

### Caution

#### SMC products are not intended for use as instruments for legal metrology.

Measurement instruments that SMC manufactures or sells have not been qualified by type approval tests relevant to the metrology (measurement) laws of each country. Therefore, SMC products cannot be used for business or certification ordained by the metrology (measurement) laws of each country.

## Safety Instructions

Be sure to read the “Handling Precautions for SMC Products” (M-E03-3) and “Operation Manual” before use.

## SMC Corporation

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Specifications are subject to change without prior notice and any obligation on the part of the manufacturer.

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