Energy saving ejector

Digital pressure switch for vacuum with energy saving function cuts supply air when the pressure reached the desired vacuum.

Air consumption 90% reduction*

*Based on SMC’s measuring conditions

More efficient ejector

Suction flow 50% increase

Air consumption 30% reduction

(Compared to other SMC single stage ejectors)

Two-stage ejector

First ejector Second ejector

\[ Q_1 + Q_2 = \text{Suction flow} \]

Reduced-wiring

D-sub connector/Flat ribbon cable/Individual wiring

Compact / Lightweight

Volume 88 cm³ 28% reduction

Weight 81 g 59% reduction

High-noise reduction silencer added

Low noise: 46 dB** (A)

Suction flow rate:

Improved by up to approx. 20%**

*1 Nozzle size: ø0.7
*2 Nozzle size: ø1.5

(Based on SMC’s measuring conditions)

High-noise reduction silencer

Current product

ZK2
**Energy saving ejector**

Digital pressure switch with energy saving function reduces air consumption by 90%.

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

---

**Power consumption cost per year reduced by 70,594 JPY/year**

The energy saving function shortens the exhaust time, which reduces the annual power consumption cost.

<table>
<thead>
<tr>
<th></th>
<th>Power consumption cost per year</th>
<th>Energizing time per year</th>
<th>Exhaust time</th>
<th>Compressor's consumption per unit time</th>
</tr>
</thead>
<tbody>
<tr>
<td>ZK2 With energy saving function</td>
<td>5,344 JPY/year</td>
<td>1875 h/year</td>
<td>0.6 s</td>
<td>0.19 kWh</td>
</tr>
<tr>
<td>Current product</td>
<td>75,938 JPY/year</td>
<td>18750 h/year</td>
<td>6 s</td>
<td>0.27 kWh</td>
</tr>
</tbody>
</table>

Cost conditions:
- Electric power charge: 15 JPY/kWh, Operating hours: 10 hours/day, Operating days: 250 days/year, When 10 units are used
- Power consumption of the compressor is the theoretical value from the air consumption of each product at 0.35 MPa.

---

**Improved low noise and suction flow by adoption of a high-noise reduction silencer**

![Diagram]

**Low noise**

46 dB(A)

*Nozzle size: ø0.7

**Suction flow rate**

Improved by up to approx. 20%

---

**Vacuum Unit ZK2 Series**

Supply valve signal

- Current product
- Ejector with energy saving function

Vacuum port pressure

- Vacuum pressure
- Energy saving ON/OFF operation
- Achievable vacuum pressure

Exhaust pressure

- Ejector with energy saving function
- Air is supplied and exhausted intermittently when the vacuum decreases.

Vacuum pressure

- Exhaust pressure
- Cut-off the unpleasant frequency while exhibiting the maximum possible vacuum performance.

---

**Noise level [dB (A)]**

200 2000 20000

ZK2A07 (Silencer exhaust)

ZK2G07 (High-noise reduction silencer exhaust)

Reduces high frequency range from 2000 to 20000 Hz.

---

**Exhaust type**

High-noise reduction silencer exhaust

Silencer exhaust

---

**Maximum suction flow rate [L/min (ANR)]**

Nozzle size

<table>
<thead>
<tr>
<th>Nozzle size</th>
<th>Exhaust type</th>
<th>Maximum suction flow rate [L/min (ANR)]</th>
</tr>
</thead>
<tbody>
<tr>
<td>ø1.5</td>
<td>High-noise reduction silencer exhaust</td>
<td>40</td>
</tr>
<tr>
<td></td>
<td>Silencer exhaust</td>
<td>67</td>
</tr>
</tbody>
</table>

Approx. 20%
**Vacuum Unit ZK2 Series**

### Dual 2 port valve (Release valve/Supply valve)
- **Supply valve: Self-holding**
  - Even if there is a power cut, the vacuum is maintained as long as there is supply air.
  - The vacuum is maintained during power failure as long as air is supplied.
  - This can prevent the workpiece from being dropped.
  - The unit turns on by instantaneous energizing (minimum 20 ms.). Continuous energizing is not necessary.
  - This can reduce the power consumption.

- **Linked supply and release valves operation**
  - The self-holding type supply valve will be turned off by turning on the release valve. It is not necessary to send a signal to stop the vacuum, which simplifies the wiring and programming. (Current double solenoid and latching type require a signal to stop the vacuum.)

- **Power saving pilot valve**
  - Supply and release valve are low power consumption type. (0.35 W)

---

### Pressure sensor/switch
- **Variations**
  - With digital pressure switch for vacuum with energy saving function
  - Digital pressure switch for vacuum
  - Pressure sensor

---

### Easier maintenance
- **Set value copy function:**
  - Reduction in setting work/Prevention of mistakes in setting
  - Set value can be copied up to 10 units.
  - Copy function is not available for switches with the energy saving function.

- **Options**
  - Single unit bracket mounting
  - Single unit DIN rail mounting
  - Manifold DIN rail mounting

---

### Mounting
- **Bracket**
- **Stopper**

---

*Copy function is not available for switches with the energy saving function.*
# Vacuum Unit ZK2 Series

## Vacuum Unit Variations

### Single Unit Variations

<table>
<thead>
<tr>
<th>Nozzle size</th>
<th>φ0.7, φ1.0, φ1.2, φ1.5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Air pressure supply (PV) port</td>
<td>φ6, φ1/4&quot; One-touch fittings</td>
</tr>
<tr>
<td>Vacuum break flow adjusting needle</td>
<td>Round lock nut type (Option)</td>
</tr>
<tr>
<td>Screwdriver operation type</td>
<td>Screwdriver operation type (Option)</td>
</tr>
<tr>
<td>Vacuum (V) port</td>
<td>φ6, φ8 One-touch fittings φ1/4&quot;, φ5/16&quot; One-touch fittings</td>
</tr>
<tr>
<td>Vacuum switch</td>
<td>Pressure sensor</td>
</tr>
<tr>
<td>Combination of supply valve and release valve</td>
<td>Supply valve: N.C Release valve: N.C</td>
</tr>
<tr>
<td></td>
<td>Self-holding release valve: None</td>
</tr>
<tr>
<td>Supply valve/Release valve: Rated voltage</td>
<td>12, 24 VDC</td>
</tr>
<tr>
<td>Pilot pressure supply (PS) port</td>
<td>φ4, φ5/16&quot; One-touch fittings</td>
</tr>
<tr>
<td>Vacuum pressure supply (PV) port</td>
<td>φ6, φ1/4&quot; One-touch fittings</td>
</tr>
<tr>
<td>Vacuum (V) port</td>
<td>φ6, φ8 One-touch fittings φ1/4&quot;, φ5/16&quot; One-touch fittings</td>
</tr>
<tr>
<td>Supply valve</td>
<td>φ6, φ1/4&quot; One-touch fittings</td>
</tr>
<tr>
<td>Release valve</td>
<td>φ6, φ1/4&quot; One-touch fittings</td>
</tr>
<tr>
<td>Pressure sensor</td>
<td>Pressure switch for vacuum</td>
</tr>
<tr>
<td>Pressure switch for vacuum</td>
<td>Pressure switch for vacuum with energy saving function</td>
</tr>
<tr>
<td>Without vacuum switch</td>
<td>Without vacuum switch</td>
</tr>
<tr>
<td>Pressure switch for vacuum</td>
<td>Pressure switch for vacuum</td>
</tr>
<tr>
<td>Pressure switch for vacuum with energy saving function</td>
<td>Pressure switch for vacuum with energy saving function</td>
</tr>
<tr>
<td>Without vacuum switch</td>
<td>Without vacuum switch</td>
</tr>
<tr>
<td>Pressure sensor</td>
<td>Pressure sensor</td>
</tr>
<tr>
<td>Pressure switch for vacuum</td>
<td>Pressure switch for vacuum</td>
</tr>
<tr>
<td>Pressure switch for vacuum with energy saving function</td>
<td>Pressure switch for vacuum with energy saving function</td>
</tr>
<tr>
<td>Without vacuum switch</td>
<td>Without vacuum switch</td>
</tr>
<tr>
<td>Pressure sensor</td>
<td>Pressure sensor</td>
</tr>
<tr>
<td>Pressure switch for vacuum</td>
<td>Pressure switch for vacuum</td>
</tr>
<tr>
<td>Pressure switch for vacuum with energy saving function</td>
<td>Pressure switch for vacuum with energy saving function</td>
</tr>
<tr>
<td>Without vacuum switch</td>
<td>Without vacuum switch</td>
</tr>
<tr>
<td>Pressure sensor</td>
<td>Pressure sensor</td>
</tr>
<tr>
<td>Pressure switch for vacuum</td>
<td>Pressure switch for vacuum</td>
</tr>
<tr>
<td>Pressure switch for vacuum with energy saving function</td>
<td>Pressure switch for vacuum with energy saving function</td>
</tr>
<tr>
<td>Without vacuum switch</td>
<td>Without vacuum switch</td>
</tr>
<tr>
<td>Pressure sensor</td>
<td>Pressure sensor</td>
</tr>
<tr>
<td>Pressure switch for vacuum</td>
<td>Pressure switch for vacuum</td>
</tr>
<tr>
<td>Pressure switch for vacuum with energy saving function</td>
<td>Pressure switch for vacuum with energy saving function</td>
</tr>
<tr>
<td>Without vacuum switch</td>
<td>Without vacuum switch</td>
</tr>
<tr>
<td>Pressure sensor</td>
<td>Pressure sensor</td>
</tr>
<tr>
<td>Pressure switch for vacuum</td>
<td>Pressure switch for vacuum</td>
</tr>
<tr>
<td>Pressure switch for vacuum with energy saving function</td>
<td>Pressure switch for vacuum with energy saving function</td>
</tr>
<tr>
<td>Without vacuum switch</td>
<td>Without vacuum switch</td>
</tr>
<tr>
<td>Pressure sensor</td>
<td>Pressure sensor</td>
</tr>
<tr>
<td>Pressure switch for vacuum</td>
<td>Pressure switch for vacuum</td>
</tr>
<tr>
<td>Pressure switch for vacuum with energy saving function</td>
<td>Pressure switch for vacuum with energy saving function</td>
</tr>
<tr>
<td>Without vacuum switch</td>
<td>Without vacuum switch</td>
</tr>
<tr>
<td>Pressure sensor</td>
<td>Pressure sensor</td>
</tr>
<tr>
<td>Pressure switch for vacuum</td>
<td>Pressure switch for vacuum</td>
</tr>
<tr>
<td>Pressure switch for vacuum with energy saving function</td>
<td>Pressure switch for vacuum with energy saving function</td>
</tr>
<tr>
<td>Without vacuum switch</td>
<td>Without vacuum switch</td>
</tr>
<tr>
<td>Pressure sensor</td>
<td>Pressure sensor</td>
</tr>
<tr>
<td>Pressure switch for vacuum</td>
<td>Pressure switch for vacuum</td>
</tr>
<tr>
<td>Pressure switch for vacuum with energy saving function</td>
<td>Pressure switch for vacuum with energy saving function</td>
</tr>
<tr>
<td>Without vacuum switch</td>
<td>Without vacuum switch</td>
</tr>
</tbody>
</table>

### Manifold Variations

<table>
<thead>
<tr>
<th>Manifold stations</th>
<th>1 to 10 stations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wiring type</td>
<td>• D-sub connector</td>
</tr>
<tr>
<td></td>
<td>• Flat ribbon cable</td>
</tr>
<tr>
<td></td>
<td>• Individual wiring</td>
</tr>
<tr>
<td>Exhaust type</td>
<td>• Complex exhaust (Note)</td>
</tr>
<tr>
<td></td>
<td>• Port exhaust</td>
</tr>
<tr>
<td></td>
<td>• High-noise reduction silencer exhaust</td>
</tr>
<tr>
<td>Air pressure supply (PV) port</td>
<td>φ8, φ5/16&quot;</td>
</tr>
<tr>
<td>Vacuum pressure supply (PV) port</td>
<td>φ8, φ5/16&quot;</td>
</tr>
<tr>
<td>Common pilot pressure supply (PS) port</td>
<td>φ6, φ8 One-touch fittings</td>
</tr>
<tr>
<td>Individual port exhaust</td>
<td>Individual port exhaust</td>
</tr>
<tr>
<td>Flat ribbon cable connector</td>
<td>Flat ribbon cable connector</td>
</tr>
<tr>
<td>Common vacuum pressure supply (PV) port</td>
<td>Common vacuum pressure supply (PV) port</td>
</tr>
</tbody>
</table>

### Note)

The complex exhaust is a combined exhaust method of the common exhaust from the end plate and the direct exhaust from each station.

---

*Option*
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Vacuum Unit
ZK2 Series
Ejector System

How to Order Single Unit

With Valve
ZK2 [A 12 K 5 A L] - 08

Without Valve
ZK2 [A 12 N 0 N N] - 08

1 System/Body Type

<table>
<thead>
<tr>
<th>Symbol</th>
<th>System</th>
<th>Body type</th>
<th>Exhaust type</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B</td>
<td></td>
<td>Single unit</td>
<td>Port exhaust</td>
</tr>
<tr>
<td>G</td>
<td>Ejector system</td>
<td></td>
<td>High-noise reduction silencer exhaust</td>
</tr>
<tr>
<td>C</td>
<td></td>
<td>For manifold</td>
<td>Individual port exhaust</td>
</tr>
<tr>
<td>F</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>H</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note 1) Port size of exhaust port: mm: ø8 inch: ø5/16"
Note 2) The complex exhaust is a combined exhaust method of the common exhaust from the end plate and the direct exhaust from each station.

2 Nominal Nozzle Size

<table>
<thead>
<tr>
<th>Symbol</th>
<th>System</th>
<th>Nominal size</th>
</tr>
</thead>
<tbody>
<tr>
<td>07</td>
<td>Ejector system</td>
<td>ø0.7</td>
</tr>
<tr>
<td>10</td>
<td></td>
<td>ø1.0</td>
</tr>
<tr>
<td>12</td>
<td></td>
<td>ø1.2</td>
</tr>
<tr>
<td>15</td>
<td></td>
<td>ø1.5</td>
</tr>
</tbody>
</table>

Note 3) Standard supply pressure for nozzle size 07 to 12 is 0.35 MPa, 15 is 0.4 MPa

3 Combination of Supply Valve and Release Valve

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Supply valve</th>
<th>Release valve</th>
</tr>
</thead>
<tbody>
<tr>
<td>K</td>
<td>N.C.</td>
<td>N.C.</td>
</tr>
<tr>
<td>J</td>
<td>N.C.</td>
<td>None</td>
</tr>
<tr>
<td>R</td>
<td>Self-holding release valve linked</td>
<td>N.C.</td>
</tr>
<tr>
<td>N</td>
<td>None</td>
<td>None</td>
</tr>
</tbody>
</table>

Note 4) Only non-locking type is available for the manual override for "K, J, R, N.
Note 5) Self-holding type maintains vacuum by instantaneous energization (20 ms or more). Stopping the vacuum turns on the release valve. (signal to stop vacuum not needed)
Note 6) When the digital pressure switch for vacuum with energy saving function is selected, select "K" for Pressure Sensor/Digital Pressure Switch for Vacuum Specifications.

4 Rated Voltage

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Voltage</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>24 VDC</td>
</tr>
<tr>
<td>6</td>
<td>12 VDC</td>
</tr>
<tr>
<td>0</td>
<td>When (_) is &quot;N&quot;</td>
</tr>
</tbody>
</table>

Note 7) Rated voltage for the supply and release valve

5 Pressure Sensor/Digital Pressure Switch for Vacuum Specifications

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Type</th>
<th>Pressure range [kPa]</th>
<th>Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>P</td>
<td>Pressure sensor</td>
<td>0 to –101</td>
<td>Analog output 1 to 5 V</td>
</tr>
<tr>
<td>T</td>
<td>–100 to 100</td>
<td>Analog output 1 to 5 V</td>
<td></td>
</tr>
<tr>
<td>A</td>
<td>Digital pressure switch for vacuum</td>
<td>0 to –101</td>
<td>NPN 2 output; unit selection function</td>
</tr>
<tr>
<td>B</td>
<td></td>
<td>–100 to 100</td>
<td>NPN 2 output; unit selection function</td>
</tr>
<tr>
<td>C</td>
<td></td>
<td></td>
<td>SI unit only</td>
</tr>
<tr>
<td>D</td>
<td></td>
<td></td>
<td>SI unit only</td>
</tr>
<tr>
<td>E</td>
<td></td>
<td></td>
<td>NPN 2 output; unit selection function</td>
</tr>
<tr>
<td>F</td>
<td></td>
<td></td>
<td>PNP 2 output; unit selection function</td>
</tr>
<tr>
<td>G</td>
<td></td>
<td></td>
<td>SI unit only</td>
</tr>
<tr>
<td>H</td>
<td></td>
<td></td>
<td>SI unit only</td>
</tr>
</tbody>
</table>

Note 8) Unit selection function is not available in Japan due to new measurement law.
Note 9) Fixed unit: kPa.
Note 10) When "K, Q, R, S" is selected, select "K" for Combination of Supply Valve and Release Valve. Select "W" or "L3" for ①.
### Supply Valve/Release Valve/Digital Pressure Switch for Vacuum Connector Specifications

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Connector type</th>
<th>Lead wire with connector for pressure switch/energy saving function</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>Common wiring (Plug-in)</td>
<td>X (Note 15)</td>
</tr>
<tr>
<td>C1</td>
<td>(For manifold)</td>
<td>X (Note 16)</td>
</tr>
<tr>
<td>L</td>
<td>Note 12)</td>
<td>X (Note 15)</td>
</tr>
<tr>
<td>L1</td>
<td>Note 13)</td>
<td>X (Note 15)</td>
</tr>
<tr>
<td>L2</td>
<td>Note 12)</td>
<td>X (Note 16)</td>
</tr>
<tr>
<td>L3</td>
<td>Note 13)</td>
<td>X (Note 16)</td>
</tr>
<tr>
<td>W</td>
<td>With lead wire for switch with energy saving function</td>
<td></td>
</tr>
<tr>
<td>Y</td>
<td>Non-valve (without supply/release valve)</td>
<td>X (Note 15)</td>
</tr>
<tr>
<td>Y1</td>
<td>When &quot;N&quot; is selected for 1</td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>Nil when &quot;N&quot; is selected for both 1 (Combination of Supply Valve and Release Valve) and 3 (Pressure Sensor/Digital Pressure Switch for Vacuum Specifications) (without supply/release valve, without switch, pressure sensor)</td>
<td></td>
</tr>
</tbody>
</table>

### Single Unit and Options

**Symbol**
- For supply/release valve (Note 11)
- Lead wire with connector for pressure switch/energy saving function (Note 14)

**Type**
- System/Body type (Note 27)
- Normal nozzle size
- Combination of supply and release valve
- Rated voltage
- Pressure sensor/digital pressure switch for vacuum specifications
- Supply valve/release valve/digital pressure switch for vacuum connector specifications
- Vacuum (V) port

**Optional specifications**
- B/D/I/K/W
- B/D/I/J/K
- B/D/I/J/K/W
- B/W
- B/W
- JK/L/P/W
- JK/L/J/P
- L/W
- N

- **Note 27** When "J" is selected for 1 Combination of Supply Valve and Release Valve, "J" or "K" cannot be selected for 3 Optional Specifications. For options not in the table, please contact SMC. Refer to page 97 when mounting a single unit onto the DIN rail.

### Vacuum (V) Port

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Type</th>
<th>Port size</th>
</tr>
</thead>
<tbody>
<tr>
<td>06</td>
<td>Metric size</td>
<td>Ø6 One-touch fitting</td>
</tr>
<tr>
<td>08</td>
<td>Ø8 One-touch fitting</td>
<td></td>
</tr>
<tr>
<td>07</td>
<td>Inch size</td>
<td>Ø1/4&quot; One-touch fitting</td>
</tr>
<tr>
<td>09</td>
<td>Ø5/16&quot; One-touch fitting</td>
<td></td>
</tr>
</tbody>
</table>

**Note 17** Supply port (PV) size of single unit: Ø6 (mm), Ø1/4" (inch)

**Symbol**
- Nil Without option
- B With internal release pressure supply specification
- D With external release pressure supply specification (Note 10)
- J Pressure break flow adjusting needle
- K Pressure break flow adjusting needle Screw operation type
- W With exhaust interference prevention valve

**Type**
- Body type "F" or "H," when "L" is selected for 1 Combination of Supply Valve and Release Valve and "P" for the single unit model number.

**Note 18, 26** When more than one option is selected, list the option symbols in an alphabetical order. Example: -BJ Refer to page 91 for Function/Application.

**Note 19** Only M3 is available for PD port size. Use One-touch fitting (M3AU-4) or barb fitting for piping. (O.D.: within ø6.2)

**Note 20** Select when PV pressure of 0.3 MPa or lower is required.

**Note 21** Select body for manifold. Select "L" for manifold type. When the common supply and individual supply are mixed, please contact SMC.

**Note 22** When "J" is selected for manifold type, select "P" option for the single unit model number.

**Note 23** To prevent backflow of the manifold common exhaust, not for holding vacuum. This option does not completely stop the backflow of the exhaust air. Select port exhaust type depending on purpose.

**Note 24** When "J" is selected for 1 Combination of Supply Valve and Release Valve and "W" (with exhaust interference prevention valve) is selected for 3 Optional Specifications, install a release valve or vacuum breaker.

**Note 25** When "K, Q, R, S" is selected for 1 Pressure Sensor/Digital Pressure Switch for Vacuum Specifications, models with exhaust interference prevention valve is provided. So, it is not necessary to select "W." 26 For System/Body type "F" or "H," when "L" is selected for 1 Option, the vacuum break flow-adjusting needle option "K" or "JK" can be additionally selected for increased workability.
Vacuum Unit
ZK2 Series
Vacuum Pump System

How to Order Single Unit

Vacuum Pump System  ZK2 P 00 K 5 A L – 08

1 System/Body Type
Symbol | System | Body type | Exhaust type
--- | --- | --- | ---
P | Vacuum pump system | Single unit | —

Note 1) PS port size of pump system: mm: ø4 inch: ø5/32"

2 Combination of Supply Valve and Release Valve
Symbol | Supply valve | Release valve
--- | --- | ---
K | N.C. | N.C.
J | N.C. | None
R | Self-holding release valve linked | N.C.

Note 2) Only non-locking type is available for the manual override for “K, J, R”.
Note 3) When “J” is selected for vacuum pump system, install a release valve or vacuum breaker.
Note 4) Self-holding type maintains vacuum by instantaneous energization (20 ms or more). Stopping the vacuum turns on the release valve. (signal to stop vacuum not needed)

3 Rated Voltage
Symbol | Voltage
--- | ---
5 | 24 VDC
6 | 12 VDC

Note 5) Rated voltage for the supply and release valve

4 Pressure Sensor/Digital Pressure Switch for Vacuum Specifications
Symbol | Type | Pressure range [kPa] | Specifications
--- | --- | --- | ---
P | Pressure sensor | 0 to –101 | Analog output 1 to 5 V
T | Pressure sensor | –100 to 100 | Analog output 1 to 5 V
A | Digital pressure switch for vacuum | 0 to –101 | NPN 2 outputs Unit selection function
B | Digital pressure switch for vacuum | 0 to –101 | PNP 2 outputs Unit selection function
C | Digital pressure switch for vacuum | 0 to –101 | SI unit only
D | Digital pressure switch for vacuum | 0 to –101 | SI unit only
E | Digital pressure switch for vacuum | 0 to –101 | SI unit only
F | Digital pressure switch for vacuum | 0 to –101 | SI unit only
H | Digital pressure switch for vacuum | –100 to 100 | NPN 2 outputs Unit selection function
J | Digital pressure switch for vacuum | –100 to 100 | PNP 2 outputs Unit selection function
N | Digital pressure switch for vacuum | –100 to 100 | SI unit only

Note 6) Unit selection function is not available in Japan due to new measurement law.
Note 7) Fixed unit: kPa

Refer to page 64 for How to Order Manifold.
### 5 Supply Valve/Release Valve/Digital Pressure Switch for Vacuum Connector Specifications

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Type</th>
<th>Port size</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>C</td>
<td>ø6 (mm)</td>
<td></td>
</tr>
<tr>
<td>C1</td>
<td>C1</td>
<td>ø8</td>
<td></td>
</tr>
<tr>
<td>L</td>
<td>L</td>
<td>ø5/16”</td>
<td></td>
</tr>
<tr>
<td>L1</td>
<td>L1</td>
<td>ø5/16”</td>
<td></td>
</tr>
<tr>
<td>L2</td>
<td>L2</td>
<td>ø1/4”</td>
<td></td>
</tr>
<tr>
<td>L3</td>
<td>L3</td>
<td>ø1/4”</td>
<td></td>
</tr>
</tbody>
</table>

**Note 8)** Solenoid valve with light/surge voltage suppressor

**Note 9)** Standard lead wire length for solenoid valve is 300 mm.

**Note 10)** For lead wire lengths other than standard, select “L1 or L3”, and order the connector assembly with desired length. (Refer to page 81.)

**Note 11)** Standard lead wire length for pressure sensor is 3 m. Standard lead wire length with connector for switch for vacuum and the lead wire length for switch with energy saving function is 2 m.

**Note 12)** Select “C, L, L1” when the pressure sensor (P, T) is selected for Pressure Sensor/Digital Pressure Switch for Vacuum Specifications. Since only grommet type is available for the pressure sensor, sensor without lead wire cannot be selected.

**Note 13)** Select when no pressure switch for vacuum, pressure sensor, or pressure switch for vacuum with connector without lead wire is used.

### 6 Vacuum (V) Port

**Note 14)** Supply port (PV) size of single unit: ø6 (mm), ø1/4” (inch)

### 7 Optional Specifications

**Note 15, 18)** When more than one option is selected, list the option symbols in an alphabetical order. Example) cBJ

**Note 16)** Only M3 is available for PD port size. Use One-touch fitting (M-3AU-4) or barb fitting for piping. (O.D.: within ø6.2)

**Note 17)** When “cD” is selected for manifold option, select “cP” option for the single unit model number.

**Note 18)** Refer to page 91 for Function/Application.

**Note 19)** Use Onectouch fitting (Mc3AUc4) or barb fitting for piping. (O.D.: within ø5.8)

### Single Unit and Options

**Note 10)** For options not in the table, please contact SMC.

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Body type</th>
<th>Part number</th>
<th>Combination of supply valve and release valve</th>
<th>Rated voltage</th>
<th>Pressure sensor/digital pressure switch for vacuum specifications</th>
<th>Supply valve/release valve/digital pressure switch for vacuum connector specifications</th>
<th>Vacuum (V) port</th>
<th>Optional specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>P</td>
<td>00</td>
<td>K/R</td>
<td>5/6</td>
<td>P/T</td>
<td>L/L1</td>
<td>L/L1/L2/L3</td>
<td>06</td>
<td>B/C/D/J/K</td>
</tr>
<tr>
<td></td>
<td></td>
<td>A/B/C/D/E/F/H/J</td>
<td></td>
<td></td>
<td>N</td>
<td>L2/L3</td>
<td>08</td>
<td>B/C</td>
</tr>
<tr>
<td>Q</td>
<td>00</td>
<td>K/R</td>
<td>5/6</td>
<td>P/T</td>
<td>L/L1</td>
<td>L/L1/L2/L3</td>
<td>07</td>
<td>C/J/K/P</td>
</tr>
<tr>
<td></td>
<td></td>
<td>A/B/C/D/E/F/H/J</td>
<td></td>
<td></td>
<td>N</td>
<td>C1/L1/L2/L3</td>
<td>09</td>
<td>C</td>
</tr>
</tbody>
</table>

**Note 19)** When “J” is selected for Combination of Supply Valve and Release Valve, “J” or “K” cannot be selected for Optional Specifications. For options not in the table, please contact SMC.

*Refer to page 97 when mounting a single unit onto the DIN rail.*
### How to Order Manifold

**ZK2 Series**

#### Stations (Note 1)

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Stations</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>1 station</td>
</tr>
<tr>
<td>02</td>
<td>2 stations</td>
</tr>
<tr>
<td>…</td>
<td>…</td>
</tr>
<tr>
<td>10</td>
<td>10 stations</td>
</tr>
</tbody>
</table>

**Note 1)** In the case of an ejector, for an adequate performance, the number of stations when operated simultaneously depends on the nozzle diameter. (Refer to Maximum Number of Manifold Stations that Can Operate Simultaneously on page 67.)

#### System (Port combination) (Note 2)

<table>
<thead>
<tr>
<th>Symbol</th>
<th>System</th>
<th>Port Standard</th>
</tr>
</thead>
<tbody>
<tr>
<td>P</td>
<td>Vacuum pump system</td>
<td>Common PV: ø8, Common PS: ø6</td>
</tr>
<tr>
<td>A</td>
<td>Ejector system</td>
<td>Common PV: ø8</td>
</tr>
<tr>
<td>PN</td>
<td>Vacuum pump system</td>
<td>Common PV: ø5/16&quot;, Common PS: ø1/4&quot;</td>
</tr>
<tr>
<td>AN</td>
<td>Ejector system</td>
<td>Common PV: ø5/16&quot;</td>
</tr>
</tbody>
</table>

**Note 2)** Refer to pages 73 to 79 for the port layout of standard port combinations and options.

**Note 3)** Common PS port and common PD port are connected inside. Connect One-touch fitting to one of ports so that piping becomes easier. (Connected to PS port initially)

**Note 4)** Common PV = Common PS = Common PD. Pressure is equal.

#### Exhaust

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Exhaust type</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>Vacuum pump system Without silencer</td>
</tr>
<tr>
<td>1</td>
<td>Ejector system</td>
</tr>
<tr>
<td>2</td>
<td>Individual exhaust (Individual port exhaust, High-noise reduction silencer exhaust) (Note 6)</td>
</tr>
</tbody>
</table>

**Note 5)** Select "C" for System/Body Type for the single unit model number.

**Note 6)** Select "F" or "H" for System/Body Type for the single unit model number.

**Note 7)** The complex exhaust is a combined exhaust method of the common exhaust from the end plate and the direct exhaust from each station.

#### Wiring (Note 8)

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>L</td>
<td>Individual wiring specification</td>
</tr>
<tr>
<td>F</td>
<td>D-sub connector (25 pins)</td>
</tr>
<tr>
<td>P</td>
<td>Flat ribbon cable connector (26 pins)</td>
</tr>
<tr>
<td>N</td>
<td>No wiring (No valve)</td>
</tr>
</tbody>
</table>

**Note 8)** Common wiring is available only for solenoid valve wiring. Individual wiring is specified for vacuum switches and sensors.

**Note 9)** Select "L, L,", or "W" for Supply Valve/Release Valve/ Digital Pressure Switch for Connector Specifications for the single unit model number.

**Note 10)** Select "C, C1" for Supply Valve/Release Valve/Digital Pressure Switch for Connector Specifications for the single unit model number.

---

*Air is exhausted not only from the end plate, but also from the exhaust of each station.*

*Note 5)* Select “C” for **System/Body Type** for the single unit model number.

*Note 6)* Select “F” or “H” for **System/Body Type** for the single unit model number.

*Note 7)* The complex exhaust is a combined exhaust method of the common exhaust from the end plate and the direct exhaust from each station.

*Note 8)* Common wiring is available only for solenoid valve wiring. Individual wiring is specified for vacuum switches and sensors.

*Note 9)* Select “L, L, or W” for **Supply Valve/Release Valve/ Digital Pressure Switch for Connector Specifications** for the single unit model number.

*Note 10)* Select “C, C1” for **Supply Valve/Release Valve/Digital Pressure Switch for Connector Specifications** for the single unit model number.
**Manifold Assembly (Delivery condition)**

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nil</td>
<td>Individual units assembled delivered as a manifold</td>
</tr>
<tr>
<td>A</td>
<td>Delivered as individual parts (not assembled) (^{\text{Note 15}})</td>
</tr>
</tbody>
</table>

**Note 15)** Kit consists of end plates for both ends and tension bolts.

**Manifold parts when not assembled**

- Tension bolt
- End plate
- Manifold parts
- Ejector: Single unit

**Manifold Type and Options**

<table>
<thead>
<tr>
<th>ZZK2</th>
<th>P</th>
<th>PN</th>
<th>B</th>
<th>D</th>
<th>L</th>
<th>Nil</th>
<th>A</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>10</td>
<td>A</td>
<td>AN</td>
<td>1</td>
<td>2</td>
<td>L</td>
<td>F</td>
</tr>
</tbody>
</table>

**Example**

- ZZK2C10K5PL1-08 \(\times 1\) (Single unit part number)
- ZZK2C10K5BL3-08 \(\times 1\) (Single unit part number)
- ZZK2C10R5NC1-08 \(\times 3\) (Common wiring specification)
- ZZK2C10R5NL2-08 \(\times 1\) (Individual wiring specification)

\(\times\) The asterisk denotes the symbol for assembly.

\(\times\) Prefix to the single unit part number.

**How to Order Valve Manifold Assembly**

- When more than one option is selected, list the option symbols in alphabetical order. (Example) -BD
- When -D is selected for the manifold model number, select -P for Optional Specifications for the ejector system single unit model number and Optional Specifications for the vacuum pump system single unit model number. Refer to pages 73 to 79 for port layout.
- When -L (individual supply) is selected for Optional Specifications for the single unit model number, specify -L for manifold, too.

**Note 11)** When more than one option is selected, list the option symbols in alphabetical order.

**Note 12)** When -D is selected for the manifold model number, select -P for Optional Specifications for the ejector system single unit model number and Optional Specifications for the vacuum pump system single unit model number. Refer to pages 73 to 79 for port layout.

**Note 13)** When -D is selected for the manifold model number, select -P for Optional Specifications for the ejector system single unit model number and Optional Specifications for the vacuum pump system single unit model number. Refer to pages 73 to 79 for port layout.

**Note 14)** When -L (individual supply) is selected for Optional Specifications for the single unit model number, specify -L for manifold, too.

**Note 15)** Kit consists of end plates for both ends and tension bolts.
### Noise Level (Reference values)

<table>
<thead>
<tr>
<th>Item</th>
<th>ZK2-07</th>
<th>ZK2-10</th>
<th>ZK2-12</th>
<th>ZK2-15</th>
</tr>
</thead>
<tbody>
<tr>
<td>Noise level (Reference values)</td>
<td>46</td>
<td>55</td>
<td>63</td>
<td>69</td>
</tr>
</tbody>
</table>

Actual values based on SMC’s measurement conditions (Not guaranteed values)

### Weight

<table>
<thead>
<tr>
<th>Single Unit</th>
<th>Weight [g]</th>
</tr>
</thead>
<tbody>
<tr>
<td>ZK2P00K□□ (Vacuum pump system, Single unit, Without pressure sensor/switch for vacuum)</td>
<td>83</td>
</tr>
<tr>
<td>ZK2A□□□□□□ (Ejector system, Single unit, Without pressure sensor/switch for vacuum)</td>
<td>81</td>
</tr>
<tr>
<td>ZK2□□□□□□□□□□□□ (Ejector system, Single unit, Without valve)</td>
<td>54</td>
</tr>
<tr>
<td>ZK2 (One station for manifold, Without pressure sensor/switch for vacuum)</td>
<td>85</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Pressure Sensor/Pressure Switch for Vacuum</th>
<th>Weight [g]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pressure sensor/Pressure switch for vacuum model</td>
<td>5</td>
</tr>
<tr>
<td>ZK2-PS□□ (Except cable portion)</td>
<td>14</td>
</tr>
<tr>
<td>ZK2-ZS□□□□□□□□ (Except lead wire assembly with connector)</td>
<td>14</td>
</tr>
<tr>
<td>ZK2-ZSV□□□□□□□□ (Except special lead wire assembly with connector)</td>
<td>14</td>
</tr>
</tbody>
</table>

### Calculation of Weight for the Manifold Type

\[(\text{Single unit weight} \times \text{Number of stations}) + (\text{Pressure sensor/Pressure switch for vacuum weight} \times \text{Number of stations}) + \text{Manifold base weight}\]

Example) 5-station manifold with pressure sensors: \[85 \text{ g} \times 5 \text{ pcs.} + 5 \text{ g} \times 5 \text{ pcs.} + 141 \text{ g} = 591 \text{ g}\]
ZK2 Series

Ejector Exhaust Characteristics/Flow Rate Characteristics (Representative value)

ZK2□07

Exhaust Characteristics

Flow Rate Characteristics

ZK2□10

Exhaust Characteristics

Flow Rate Characteristics

∗The flow rate characteristics correspond to the standard supply pressure.
Ejector Exhaust Characteristics/Flow Rate Characteristics (Representative value)

ZK2□12

Exhaust Characteristics

Flow Rate Characteristics

Note 8) The following graphs show the characteristics of the ejector with valve. (Please contact SMC for models without valve.)

ZK2□15

Exhaust Characteristics

Flow Rate Characteristics
**Vacuum Pump System Flow Rate Characteristics/ZK2P00**

The graph shows the suction flow rate characteristics of the vacuum pump system at different vacuum pressures.

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 ø8.)

**Vacuum Release Flow Rate Characteristics**

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

**ZK2 Series (Ejector System)**

**ZK2 Series (Pump System)**

**Vacuum Pump System Flow Rate Characteristics of Flow Path and Vacuum Release**

<table>
<thead>
<tr>
<th>Port size</th>
<th>Flow rate characteristics of V → PV (Vacuum side)</th>
<th>Flow rate characteristics of PS → V (Vacuum release side)()</th>
</tr>
</thead>
<tbody>
<tr>
<td>PV port</td>
<td>V port</td>
<td>C[dm³/(s·bar)]</td>
</tr>
<tr>
<td>ø6</td>
<td>ø8</td>
<td>0.39</td>
</tr>
</tbody>
</table>

($) When needle is fully open

**How to Read Flow Rate Characteristics Graph**

Flow rate characteristics are expressed in ejector vacuum pressure and suction flow. If suction flow changes, the vacuum pressure will also be changed. Normally this relationship is expressed in ejector standard operating pressure use. In graph, Pmax is maximum vacuum pressure and Qmax is maximum suction flow. The values are specified according to catalog use. Changes in vacuum pressure are expressed in the below order.

1. When ejector suction port is covered and made airtight, suction flow becomes zero and vacuum pressure is at maximum value (Pmax).
2. When suction port is opened gradually, air can flow through, (air leakage), suction flow increases, but vacuum pressure decreases. (condition P1 and Q1)
3. When suction port is opened further and fully opened, suction flow moves to maximum value (Qmax), but vacuum pressure is near zero (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 (V) 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 maximum suction flow become equal, the vacuum pressure becomes almost zero. In the case when ventilative or leaky work should be adsorbed, take note that vacuum pressure will not rise.
## Pressure Sensor/Digital Pressure Switch for Vacuum Specifications

### Pressure Sensor/ZK2-PS□-A
(For details, refer to the PSE series in the Best Pneumatics No. 8 catalog, and the Operation Manual.)

<table>
<thead>
<tr>
<th>Model (Sensor unit: Standard model number)</th>
<th>ZK2-PS1-A (PSE541)</th>
<th>ZK2-PS3-A (PSE543)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rated pressure range</td>
<td>0 to –101 kPa</td>
<td>–100 to 100 kPa</td>
</tr>
<tr>
<td>Proof pressure</td>
<td>500 kPa</td>
<td></td>
</tr>
<tr>
<td>Applicable fluid</td>
<td>Air/Non-corrosive gas/Incombustible gas</td>
<td></td>
</tr>
<tr>
<td>Output voltage</td>
<td>1 to 5 VDC</td>
<td></td>
</tr>
<tr>
<td>Output impedance</td>
<td>Approx. 1 kΩ</td>
<td></td>
</tr>
<tr>
<td>Power supply voltage</td>
<td>10 to 24 VDC ±10%, Ripple (P-P) 10% or less</td>
<td></td>
</tr>
<tr>
<td>Current consumption</td>
<td>15 mA or less</td>
<td></td>
</tr>
<tr>
<td>Accuracy</td>
<td>±2% F.S. (Ambient temperature at 25°C)</td>
<td></td>
</tr>
<tr>
<td>Linearity</td>
<td>±0.4% F.S.</td>
<td></td>
</tr>
<tr>
<td>Repeatability</td>
<td>±0.2% F.S.</td>
<td></td>
</tr>
<tr>
<td>Effect of power supply voltage</td>
<td>±0.8% F.S. or less</td>
<td></td>
</tr>
<tr>
<td>Temperature characteristics</td>
<td>±2% F.S. or less (Ambient temperature: 25°C reference)</td>
<td></td>
</tr>
<tr>
<td>Material Case</td>
<td>Resin case</td>
<td></td>
</tr>
<tr>
<td>Pressure sensing section</td>
<td>Sensor pressure receiving area: Silicon, O-ring: HNBR</td>
<td></td>
</tr>
<tr>
<td>Lead wire</td>
<td>Oilproof heavy-duty cable 2.7 x 3.2 mm (Elliptic), 0.15 mm² 3 cores 3 m</td>
<td></td>
</tr>
</tbody>
</table>

### Digital Pressure Switch for Vacuum/ZK2-ZS□□□□□-A
(For details, refer to the ZSE/ISE10 series in the Best Pneumatics No. 8 catalog, and the Operation Manual.)

<table>
<thead>
<tr>
<th>Model (Switch unit: Standard model number)</th>
<th>ZK2-ZSE□□□-A (ZSE10)</th>
<th>ZK2-ZSF□□□-A (ZSE10F)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rated pressure range</td>
<td>0 to –101 kPa</td>
<td>–100 to 100 kPa</td>
</tr>
<tr>
<td>Set pressure range/Pressure display range</td>
<td>10 to –105 kPa</td>
<td>–105 to 105 kPa</td>
</tr>
<tr>
<td>Proof pressure</td>
<td>500 kPa</td>
<td></td>
</tr>
<tr>
<td>Smallest settable increment</td>
<td>0.1 kPa</td>
<td></td>
</tr>
<tr>
<td>Applicable fluid</td>
<td>Air/Non-corrosive gas/Incombustible gas</td>
<td></td>
</tr>
<tr>
<td>Power supply voltage</td>
<td>12 to 24 VDC ±10%, Ripple (p-p) 10% or less (Protected against reverse connection)</td>
<td></td>
</tr>
<tr>
<td>Current consumption</td>
<td>40 mA or less</td>
<td></td>
</tr>
<tr>
<td>Switch output</td>
<td>NPN or PNP open collector 2 outputs (selectable)</td>
<td></td>
</tr>
<tr>
<td>Maximum load current</td>
<td>80 mA</td>
<td></td>
</tr>
<tr>
<td>Maximum applied voltage</td>
<td>28 V (with NPN output)</td>
<td></td>
</tr>
<tr>
<td>Residual voltage</td>
<td>2 V or less (with load current at 80 mA)</td>
<td></td>
</tr>
<tr>
<td>Response time</td>
<td>2.5 ms or less (Anti-chattering function working: 20, 100, 500, 1000 or 2000 ms selected)</td>
<td></td>
</tr>
<tr>
<td>Short circuit protection</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Repeatability</td>
<td>±0.2% F.S. ±1 digit</td>
<td></td>
</tr>
<tr>
<td>Hysteresis</td>
<td>Hysteresis mode</td>
<td>Window comparator mode</td>
</tr>
<tr>
<td></td>
<td>Variable (0 or above) (Note)</td>
<td></td>
</tr>
<tr>
<td>Display</td>
<td>Display</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3 1/2 digit, 7-segment LED, 1-color display (Red)</td>
<td></td>
</tr>
<tr>
<td>Display accuracy</td>
<td>±2% F.S. ±1 digit (Ambient temperature at 25 ±3°C)</td>
<td></td>
</tr>
<tr>
<td>Indicator light</td>
<td>Indicator</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Lights up when output is turned ON; OUT1: Green, OUT2: Red</td>
<td></td>
</tr>
<tr>
<td>Environmental resistance</td>
<td>Enclosure</td>
<td>IP40</td>
</tr>
<tr>
<td></td>
<td>Operating temperature range</td>
<td>Operating: –5 to 50°C, Storage: –10 to 60°C (with no freezing or condensation)</td>
</tr>
<tr>
<td></td>
<td>Operating humidity range</td>
<td>Operating/Storage: 35 to 85% RH (with no condensation)</td>
</tr>
<tr>
<td></td>
<td>Withstand voltage</td>
<td>1000 VAC for 1 minute between terminals and housing</td>
</tr>
<tr>
<td></td>
<td>Insulation resistance</td>
<td>50 MΩ or more (500 VDC measured via megohmmeter) between terminals and housing</td>
</tr>
<tr>
<td></td>
<td>Temperature characteristics</td>
<td>±2% F.S. (at 25°C in an operating temperature range of –5 and 50°C)</td>
</tr>
<tr>
<td></td>
<td>Lead wire</td>
<td>Oilproof heavy-duty vinyl cable 5 cores, Cross section: 0.15 mm² (AWG26), Insulator O.D.: 1.0 mm</td>
</tr>
</tbody>
</table>

### Standards
Compliant with CE marking, RoHS

Note) 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.
Digital Pressure Switch for Vacuum Specifications

### Digital Pressure Switch for Vacuum Ejector with Energy Saving Function

<table>
<thead>
<tr>
<th>Model</th>
<th>Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rated pressure range</td>
<td>−100 to 100 kPa</td>
</tr>
<tr>
<td>Set pressure range</td>
<td>−105 to 105 kPa</td>
</tr>
<tr>
<td>Proof pressure</td>
<td>500 kPa</td>
</tr>
<tr>
<td>Smallest settable increment</td>
<td>0.1 kPa</td>
</tr>
<tr>
<td>Applicable fluid</td>
<td>Air/Non-corrosive gas/Incombustible gas</td>
</tr>
<tr>
<td>Power supply voltage</td>
<td>12 to 24 VDC ±10% Ripple (P-P) 10% or less (Protected against reverse connection)</td>
</tr>
<tr>
<td>Current consumption</td>
<td>40 mA or less</td>
</tr>
<tr>
<td>Switch output</td>
<td></td>
</tr>
<tr>
<td>Maximum load current</td>
<td>NPN or PNP open collector OUT1: General purpose, OUT2: Valve control 80 mA</td>
</tr>
<tr>
<td>Maximum applied voltage</td>
<td>26.4 VDC</td>
</tr>
<tr>
<td>Residual voltage</td>
<td>2 V or less (with load current at 80 mA)</td>
</tr>
<tr>
<td>Response time</td>
<td>2.5 ms or less (Anti-chattering function working: 20, 100, 500, 1000 or 2000 ms selected)</td>
</tr>
<tr>
<td>Short circuit protection</td>
<td>Yes</td>
</tr>
<tr>
<td>Repeatability</td>
<td>±0.2% F.S. ±1 digit</td>
</tr>
<tr>
<td>Hysteresis</td>
<td></td>
</tr>
<tr>
<td>Display</td>
<td>3 1/2 digit, 7-segment LED, 1-color display (Red)</td>
</tr>
<tr>
<td>Display accuracy</td>
<td>±2% F.S. ±1 digit (Ambient temperature at 25 ±3°C)</td>
</tr>
<tr>
<td>Indicator light</td>
<td>Lights up when output is turned ON, OUT1: Green, OUT2: Red</td>
</tr>
</tbody>
</table>

#### Environmental resistance
- Enclosure: IP40
- Operating humidity range: 5 to 50°C
- 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 operating temperature range of 5 and 50°C)
- Lead wire: Cable, 5 cores ø3.5, 2 m Cross section: 0.15 mm² (AWG26) Insulator O.D.: 1.0 mm
- Standards: CE marking, RoHS

Note) 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.

### Description (Pressure Switch for Vacuum)

- **Output (OUT1) display (Green)**: Lights up when OUT1 is turned ON.
- **Output (OUT2) display (Red)**: Lights up when OUT2 is turned ON.
- **LED display**: Displays the current pressure, set mode and error code.
- **button (UP)**: Selects the mode or increases the ON/OFF set-value. Use for switching to the peak display mode.
- **button (DOWN)**: Selects the mode or decreases the ON/OFF set-value. Use for switching to the bottom display mode.
- **button (SET)**: Use for changing the mode or setting the set-value.

### Internal Circuit and Wiring Example

#### Pressure Sensor

**ZK2-PS[A]**

- Brown DC(+)
- Black OUT
- White OUT

Voltage output type: 1 to 5 V
Output impedance: Approx. 1 kΩ

#### Pressure Switch for Vacuum with Energy Saving Function

**ZK2-ZSVA[ ]**

NPN (2 Outputs)

- Brown DC(+)
- Blue OUT 1
- White OUT 2

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

*The FUNC terminal is connected when using the copy function. (Refer to the Operation Manual.)*

**ZK2-ZSVB[ ]**

PNP (2 Outputs)

- Brown DC(+)
- White OUT 1
- Blue OUT 2

Max. 80 mA
Residual voltage: 2 V or less

*The FUNC terminal is connected when using the copy function. (Refer to the Operation Manual.)*

---

*1 The gray wire (FUNC) is connected when operating the supply valve by energy-saving control (for workpiece adsorption). (Refer to the Operation Manual.)*
Supply valve: Self-holding type (R type)
Release valve: N.C. (K type)

Port combination: \( PV \neq PS = PD \)

Port combination: Common PV \neq Common PS = Common PD

Port combination: \( PV = PS = PD \)

System: Ejector
Body type: Single unit
Exhaust type: Silencer exhaust
Application and purpose: Release pressure: Same pressure as PV

Nozzle size: 12, 15

Refer to page 79 for the purpose of port and the operating pressure range.
Port Layout

Standard Products

**System**

- **PV**: Air pressure supply port/Port for vacuum source (Vacuum pump)
- **PS**: Pilot pressure supply port
- **PD**: Individual release pressure supply port
- **V**: Vacuum port
- **EXH**: Exhaust port
- **PE**: Pilot pressure exhaust port

For details ⇒ Page 79

---

**Port layout No. 4**

**Single unit: ZK2B**

- **Exhaust type**: Port exhaust
- **Application and purpose**: High-noise reduction silencer exhaust

**Port layout No. 5**

**Single unit: ZK2G**

- **Exhaust type**: High-noise reduction silencer exhaust

**Port layout No. 6**

**Single unit: ZK2C**

- **Exhaust type**: Complex exhaust

Note) The complex exhaust is a combined exhaust method of the common exhaust from the end plate and the direct exhaust from each station.

**Port combination: PV = PS = PD**

- **Supply valve**: N.C.
- **Release valve**: Without release valve (J type)

**Circuit example**

**Port combination: PV (≠ PS = PD)**

- **Supply valve**: N.C.
- **Release valve**: N.C. (K type)

**Circuit example**

**Port combination: Common PV = Common PS = Common PD**

**Circuit example**

Note) For complex exhaust type, individual exhaust port is provided to each station.

Refer to page 79 for the purpose of port and the operating pressure range.
System depends on vacuum source (vacuum pump/vacuum ejector).

Port Layout

Standard Products

Port combination: Common PV = Common PS = Common PD

Circuit example

Option -D

Port combination: PV ≠ PS ≠ PD

Circuit example

Refer to page 79 for the purpose of port and the operating pressure range.
Option -D

Port combination: Common PV ≠ Common PS ≠ Common PD

Circuit example

Port combination: PV = PS ≠ PD

Circuit example

Port combination: PV = PS ≠ PD

Circuit example

Refer to page 79 for the purpose of port and the operating pressure range.

System depends on vacuum source (vacuum pump/vacuum ejector).
**Option -D**

### Port Combination: PV = PS ≠ PD

**Supply valve:** Self-holding type  
**Release valve:** N.C. (R type)

### Circuit Example

#### Note
- For complex exhaust type, individual exhaust port is provided to each station.

### Port Combination: Common PV = Common PS ≠ Common PD

**Supply valve:** Self-holding type  
**Release valve:** N.C. (K type)

### Circuit Example

#### Note
- For complex exhaust type, individual exhaust port is provided to each station.

---

**System depends on vacuum source (vacuum pump/ vacuum ejector).**
Port Layout

**Option -D**

Port combination: Common PV = Common PS ≠ Common PD

Circuit example

![Diagram of Option -D](image)

**Option -L**

Port combination: Individual PV ≠ Common PS = Common PD

Circuit example

![Diagram of Option -L](image)

**Port combination: Individual PV ≠ Common PS = Common PD**

![Diagram of Port combination](image)

Refer to page 79 for the purpose of port and the operating pressure range.

Note: System depends on vacuum source (vacuum pump/vacuum ejector).
**Application and Operating Pressure Range of Each Port**

<table>
<thead>
<tr>
<th>Port</th>
<th>Description</th>
<th>Vacuum Ejector System</th>
<th>Vacuum Pump System</th>
</tr>
</thead>
<tbody>
<tr>
<td>PV</td>
<td>Air pressure supply port</td>
<td>Compressed air supply for operating ejector</td>
<td>0.3 to 0.6 MPa&lt;sup&gt;1)&lt;/sup&gt;</td>
</tr>
<tr>
<td></td>
<td>(Operating pressure range)</td>
<td></td>
<td>Vacuum source (Vacuum pump)</td>
</tr>
<tr>
<td>PS</td>
<td>Pilot pressure supply port</td>
<td></td>
<td>Compressed air supply for pilot valve</td>
</tr>
<tr>
<td></td>
<td>(Operating pressure range)</td>
<td></td>
<td>0.3 to 0.6 MPa</td>
</tr>
<tr>
<td>PD</td>
<td>Individual release pressure supply port</td>
<td>Release pressure Compressed air supply for individual setting (Option)</td>
<td>0 to 0.6 MPa (PD ≤ PV)</td>
</tr>
<tr>
<td></td>
<td>(Operating pressure range)</td>
<td></td>
<td>0 to 0.6 MPa (PD ≤ PS)</td>
</tr>
<tr>
<td>V</td>
<td>Vacuum port</td>
<td>For connecting adsorption equipment including pad</td>
<td>—</td>
</tr>
<tr>
<td>EXH</td>
<td>Exhaust port</td>
<td>Exhaust when ejector operates&lt;sup&gt;2)&lt;/sup&gt;</td>
<td>—</td>
</tr>
<tr>
<td>PE</td>
<td>Pilot pressure exhaust port</td>
<td>Exhaust when valve operates&lt;sup&gt;3)&lt;/sup&gt;</td>
<td>—</td>
</tr>
</tbody>
</table>

<sup>1</sup) For models without valve, pressure can be 0.3 MPa or less.
<sup>2</sup) For ejectors with silencer, air exhausts from A (slit on both sides). For port exhaust type, air exhausts from B.
<sup>3</sup) Pilot pressure for ejectors is exhausted from the ejector and the common exhaust. Pump system exhausts air from PE port on the spacer.

---

- PV: Air pressure supply port/Port for vacuum source (Vacuum pump)
- PS: Pilot pressure supply port
- PD: Individual release pressure supply port
- V: Vacuum port
- EXH: Exhaust port
- PE: Pilot pressure exhaust port

Refer to the table below for details.

---

**System depends on vacuum source (vacuum pump/vacuum ejector).**
Component Parts

<table>
<thead>
<tr>
<th>No.</th>
<th>Description</th>
<th>Material</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Valve body assembly</td>
<td>Resin</td>
<td>HNBR, NBR and steel are also used.</td>
</tr>
<tr>
<td>2</td>
<td>Needle assembly</td>
<td>Brass, Electroless nickel plated brass, resin, steel and NBR are used.</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Ejector body assembly</td>
<td>Resin</td>
<td>HNBR, NBR and steel are also used.</td>
</tr>
<tr>
<td>4</td>
<td>Ejector assembly</td>
<td>Resin</td>
<td>NBR is also used.</td>
</tr>
<tr>
<td>5</td>
<td>Filter case assembly</td>
<td>Resin Case body: Polycarbonate (Refer to Specific Product Precautions on page 95.)</td>
<td></td>
</tr>
</tbody>
</table>

Replacement Parts

<table>
<thead>
<tr>
<th>No.</th>
<th>Description</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>Valve assembly</td>
<td>Connector for solenoid valve 3 wire (For double), 2 wire (For single)</td>
</tr>
<tr>
<td>7</td>
<td>Connector assembly</td>
<td>Standard supply (PV) port: ø6, ø1/4&quot;</td>
</tr>
<tr>
<td>8</td>
<td>One-touch fitting assembly</td>
<td>10 pcs. per set</td>
</tr>
<tr>
<td>9</td>
<td>Sound absorbing material</td>
<td>With One-touch fitting and filter element (Case material: Polycarbonate)</td>
</tr>
<tr>
<td>10</td>
<td>Vacuum port adapter assembly</td>
<td>Nominal filtration rating: 30 μm, 10 pcs. per set</td>
</tr>
<tr>
<td>11</td>
<td>Filter element</td>
<td>For replacement or addition for manifold exhaust interference prevention (10 pcs. per set)</td>
</tr>
<tr>
<td>12</td>
<td>Check valve</td>
<td>With 2 screws and 1 gasket</td>
</tr>
<tr>
<td>13</td>
<td>Vacuum pressure switch assembly</td>
<td>With sound absorbing material (Part number: ZK2-SE4-6-A)</td>
</tr>
<tr>
<td>14</td>
<td>Lead wire with connector</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>Pressure sensor assembly</td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>High-noise reduction silencer case assembly</td>
<td>With sound absorbing material (Part number: ZK2-SE4-6-A)</td>
</tr>
</tbody>
</table>
Replacement Parts/How to Order

**6. Valve assembly**

- **ZK2 - VA**
  - **A**
  - **K**
  - **5**
  - **L**
  - **- A**

**Applicable system**
- **A** For ejector system
- **P** For vacuum pump system

**Valve type**
- **K** Supply valve N.C., Release valve N.C.
- **R** Supply valve, self-holding type (Linked to release valve)
- **L** Supply valve only (Single)

**7. Connector assembly**

- **ZK2 - LV**
  - **W**
  - **- A**

**Applicable valve type**
- **W** Valve type K/R
  - (With supply valve and release valve)
- **S** Valve type J
  - (Supply valve only)

**Lead wire entry direction**
- **C** For plug-in (Manifold common wiring)
- **L** L-type plug connector with lead wire (individual wiring)
- **LO** L-type plug connector, without connector

Select the ZK2-VAK/L0-A for a switch with energy saving function. This assembly does not include special cable assembly for a switch with energy saving function.

**8. One-touch fitting assembly**

(Purchasing order is available in units of 10 pieces.)

- **KJH04 - C2**

<table>
<thead>
<tr>
<th>Port size</th>
<th>Ø4 One-touch fitting (Straight)</th>
<th>Ø6 One-touch fitting (Straight)</th>
<th>Ø5/32” One-touch fitting (Straight)</th>
<th>Ø1/4” One-touch fitting (Straight)</th>
</tr>
</thead>
<tbody>
<tr>
<td>04</td>
<td>Nil</td>
<td>300 mm</td>
<td>600 mm</td>
<td>1000 mm</td>
</tr>
<tr>
<td>06</td>
<td>Nil</td>
<td>600 mm</td>
<td>1000 mm</td>
<td>2000 mm</td>
</tr>
<tr>
<td>03</td>
<td>Nil</td>
<td>300 mm</td>
<td>600 mm</td>
<td>2000 mm</td>
</tr>
<tr>
<td>07</td>
<td>Nil</td>
<td>300 mm</td>
<td>600 mm</td>
<td>3000 mm</td>
</tr>
</tbody>
</table>

**9. Sound absorbing material** (10 pcs. per set)

- **ZK2 - SE1 - 1 - A**

- Sound absorbing material holes diameter
  - 1 300 µm

**10. Vacuum port adapter assembly**

- **ZK2 - VA1S**
  - **8**
  - **- A**

- One-touch fitting size
  - Ø6 One-touch fitting
  - Ø8 One-touch fitting
  - Ø1/4” One-touch fitting
  - Ø5/16” One-touch fitting

**11. Filter element** (10 pcs. per set)

- **ZK2 - FE1 - 3 - A**

- Nominal filtration rating
  - 3 30 µm

**12. Check valve** (10 pcs. per set)

- **ZK2 - CV - A**

Note) When mounting a check valve additionally, the workpiece may not be removed unless vacuum release pressure is applied.

**13. Pressure switch for vacuum assembly**

- **ZK2 - ZS**
  - **E**
  - **A**
  - **M**
  - **G**
  - **- A**

**Rated pressure range and function**
- **E** 0 to –101 kPa
- **F** –100 to 100 kPa
- **V** –100 to 100 kPa

**Output specifications**
- **A** NPN open collector
- **B** PNP open collector

**Unit specifications**
- **Nil** Unit selection function
- **M** SI unit only

Note 1) Unit selection function is not available in Japan due to measurement law.

Note 2) Fixed unit: kPa

**14. Lead wire with connector for pressure switch for vacuum**

(When individual lead wire is necessary, order with the port number below.)

- Lead wire with connector for pressure switch for vacuum
- Lead wire with connector for switch with energy saving function

**15. Pressure sensor assembly**

- **ZK2 - PS**
  - **1**
  - **- A**

**Rated pressure range and specifications**
- **1** 0 to –101 kPa, Output: 1 to 5 V, Accuracy: ±2% F.S. or less
- **3** –100 to 100 kPa, Output: 1 to 5 V, Accuracy: ±2% F.S. or less

**Mounting**
- **Nil** Mounted to the single unit
- **L** Mounted to the manifold

The screw length mounted to the ejector is different.

Note) When ordering an ejector without valve, select Nil for mounting.

**16. High-noise reduction silencer case assembly**

- **ZK2 - SC3 - 4 - A**

- Exhaust port size
  - 4 Ø4 For nozzle size 07, 10
  - 6 Ø6 For nozzle size 12, 15
How to increase manifold stations

[Individual wiring specifications]
1) Remove two tension bolts.
2) Remove the end plate U.
   (Be careful not to drop the gasket.)
3) Mount a single unit to the end surface of U side.
   (Do not let the gasket get caught.)
4) Mount the end plate U with the appropriate length of
   tension bolts for the number of stations required.
   (Tightening torque: 0.75 N·m)

Component Parts

<table>
<thead>
<tr>
<th>No.</th>
<th>Description</th>
<th>Material</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>End plate D assembly</td>
<td>Resin</td>
<td>HNBR, NBR and steel are also used.</td>
</tr>
<tr>
<td>2</td>
<td>End plate U assembly</td>
<td>Resin</td>
<td>Electroless nickel plated brass, resin, steel and NBR are used.</td>
</tr>
</tbody>
</table>

Replacement Parts

<table>
<thead>
<tr>
<th>No.</th>
<th>Description</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>Tension bolt assembly</td>
<td>2 pcs. per set</td>
</tr>
<tr>
<td>4</td>
<td>Port plug assembly</td>
<td>Plug for changing PV port to single side supply type (Common for mm and inch type)</td>
</tr>
<tr>
<td>5</td>
<td>Port plug assembly</td>
<td>Plug for changing PS or PD port to single side supply type (Common for mm and inch type)</td>
</tr>
<tr>
<td>6</td>
<td>One-touch fitting assembly</td>
<td>Metric size: ø8, Inch size: ø5/16&quot;</td>
</tr>
<tr>
<td>7</td>
<td>Sound absorbing material</td>
<td>2 pcs. per set - Material: Non-woven cloth (Silencer cover is not included.)</td>
</tr>
<tr>
<td>8</td>
<td>DIN rail</td>
<td>Refer to Dimensions (from page 88 and after) for the recommended length for each number of manifolds stations.</td>
</tr>
<tr>
<td>9</td>
<td>Connector housing assembly</td>
<td>Available connector is even number only. If you need a connector for odd number, specify the connector of the number you need + 1 station.</td>
</tr>
</tbody>
</table>

Note) When ordering a manifold “ZZK2[l]llll-A” on page 64, 1 to 3 are delivered as a set.

Replacement Parts/How to Order

3) Tension bolt assembly (2 pcs. per set)
   ZK2 – TB1 - 05 - A

4) Port plug assembly
   (Purchasing order is available in units of 1 piece.)
   VVQZ2000 – CP

5) Port plug assembly
   (Purchasing order is available in units of 1 piece.)
   ZK2 – MP1C6 – A

6) One-touch fitting assembly
   (Purchasing order is available in units of 10 pieces.)
   VVQ1000 – 51A – C8

7) Sound absorbing material (2 pcs. per set)
   ZK2 – SE2 – 1 – A

8) DIN rail
   AXT100 – DR – 5
   Length symbols
   
<table>
<thead>
<tr>
<th>L = 23</th>
<th>1 to 40</th>
</tr>
</thead>
<tbody>
<tr>
<td>L = 510.5</td>
<td></td>
</tr>
</tbody>
</table>

   Length symbols
   |
   |
   |
   |
   |
   |
   |
   |

L Dimension

<table>
<thead>
<tr>
<th>L Dimension</th>
<th>L = 12.5 x n + 10.5</th>
</tr>
</thead>
<tbody>
<tr>
<td>No.</td>
<td>1 2 3 4 5 6 7 8 9 10</td>
</tr>
<tr>
<td>L Dimension</td>
<td>23 35.5 48 60.5 73 85.5 98 110.5 123 135.5</td>
</tr>
<tr>
<td>L Dimension</td>
<td>148 160.5 173 185.5 198 210.5 223 235.5 248 260.5</td>
</tr>
<tr>
<td>L Dimension</td>
<td>273 285.5 298 310.5 323 335.5 348 360.5 373 385.5</td>
</tr>
<tr>
<td>L Dimension</td>
<td>398 410.5 423 435.5 448 460.5 473 485.5 498 510.5</td>
</tr>
</tbody>
</table>

No. 1 2 3 4 5 6 7 8 9 10
| L Dimension | 23 35.5 48 60.5 73 85.5 98 110.5 123 135.5 |
| L Dimension | 148 160.5 173 185.5 198 210.5 223 235.5 248 260.5 |
| L Dimension | 273 285.5 298 310.5 323 335.5 348 360.5 373 385.5 |
| L Dimension | 398 410.5 423 435.5 448 460.5 473 485.5 498 510.5 |
Exploded View of Manifold ZK2 Series

How to increase manifold stations

To increase the number of stations from odd number (1, 3, 5, 7, 9) in common wiring type to even number (2, 4, 6, 8, 10)

- Remove the tension bolt.
- Remove the end plate U.
- Remove the valve assembly of a single unit for extra station(s) for manifold.
- Remove the switch assembly if it is present. (Be careful not to drop the O-ring. Refer to Fig.1)
- Remove the junction box B (top) using a precision screwdriver. (Refer to Fig.3-A)
- Mount the connector to the junction box B. (Refer to Fig.3-A)
- Mount a single unit for extra station(s) for manifold to the end surface of U side. (Do not let the gasket or lead wire get caught.)
- Mount the end plate U with the appropriate length of tension bolts for the number of stations required. (Tightening torque: 0.75 N·m.)
- Mount the junction box B to the junction box A.
- Assemble the valve assembly. (Tightening torque: 0.15 N·m)
- For products with a switch, mount the assembly. (Be careful not to drop the O-ring. Tightening torque: 0.08 to 0.10 N·m)

To increase the number of stations from even number to odd number, or increase two stations or more

- Remove the valve assembly for all stations. (Single unit for extra station is also removed.)
- Remove the switch assembly if it is present. (Be careful not to drop the O-ring. Refer to Fig.1)
- Remove the junction box B (top) for all stations using a precision screwdriver. (Refer to Fig.2) (Remove the junction box B from D side.)
- Remove all connectors mounted to the junction box B. (Be careful not to break the connector clip.)
- Remove the tension bolt.
- Remove the end plate D assembly.
- Remove the connector housing assembly from the end plate D assembly. (Refer to Fig.4-A)
- Mount the connector housing assembly for all station(s) to the end plate D assembly. (Refer to Fig.4-A) (Insert two clips of the housing mounting surface to the square holes of the end plate, and slide the connector housing assembly.)
- Remove the end plate U. (Be careful not to drop the gasket.)
- Mount a single unit for extra station(s) for manifold to the end surface of U side. Do not let the gasket get caught.
- Mount the end plate U and D with the appropriate length of tension bolts for the number of stations required. (Tightening torque: 0.75 N·m.)
- Mount the connector for all stations to the junction box B. (Refer to Fig.3-A) (Engage the recess of the connector and add an O-ring for even number stations.
- Mount the junction box A to the junction box B.
- Push the wires down the side and mount the junction box A to the junction box B following a decreasing mark tube numbers from U side. (Do not let the lead wire get caught.)
- Assemble the valve assembly. (Tightening torque: 0.15 N·m)
- For products with a switch, mount the assembly. (Be careful not to drop the O-ring. Tightening torque: 0.08 to 0.10 N·m)

Plug (For One-touch fitting)

(Purchasing order is available in units of 10 pieces.)

Mounted onto ports which are not used (PV, PS, PD, etc.)

Model and dimensions

Purchasing order is available in units of 10 pieces.)

Mount onto ports which are not used (PV, PS, PD, etc.)

Applicable stations

<table>
<thead>
<tr>
<th>Number</th>
<th>Station Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>02</td>
<td>For 2 stations manifold</td>
</tr>
<tr>
<td>04</td>
<td>For 4 stations manifold</td>
</tr>
<tr>
<td>06</td>
<td>For 6 stations manifold</td>
</tr>
<tr>
<td>08</td>
<td>For 8 stations manifold</td>
</tr>
<tr>
<td>10</td>
<td>For 10 stations manifold</td>
</tr>
</tbody>
</table>

Connector type

<table>
<thead>
<tr>
<th>Number</th>
<th>Connector Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>D sub-connector (25 pins)</td>
</tr>
<tr>
<td>2</td>
<td>Flat ribbon cable (26 pins)</td>
</tr>
</tbody>
</table>

Applicable size

<table>
<thead>
<tr>
<th>Number</th>
<th>Size</th>
<th>A</th>
<th>L</th>
<th>ΦD</th>
<th>Weight [g]</th>
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<tbody>
<tr>
<td>06</td>
<td>ø6</td>
<td>18</td>
<td>35</td>
<td>8</td>
<td>1</td>
</tr>
<tr>
<td>08</td>
<td>ø8</td>
<td>20.5</td>
<td>39</td>
<td>10</td>
<td>2</td>
</tr>
<tr>
<td>07</td>
<td>ø1/4”</td>
<td>18</td>
<td>35</td>
<td>8.5</td>
<td>1</td>
</tr>
<tr>
<td>09</td>
<td>ø5/16”</td>
<td>20.5</td>
<td>39</td>
<td>10</td>
<td>2</td>
</tr>
</tbody>
</table>
**ZK2 Series**

**Dimensions: Single Unit**

**ZK2□□□NL2-□**

**Ejector system, Single unit, With supply valve/release valve, Without pressure sensor/switch**

**For high-noise reduction silencer exhaust**

- Exhaust port
- High-noise reduction silencer case assembly

**For port exhaust**

- Exhaust (EXH) port
- Metric size: 08 (ø8)
- Inch size: 09 (ø5/16”)

**PV port type**

<table>
<thead>
<tr>
<th>Metric size</th>
<th>ø6</th>
<th>9.7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inch size</td>
<td>ø1/4</td>
<td>12.3</td>
</tr>
</tbody>
</table>

**V port type**

| Metric size | ø8      | 8.25| 4 |
|-------------|---------|-----|  |
| Inch size   | ø1/4    | 11.4| 6 |

**PE port female thread specification**

**Pilot pressure exhaust port**

- Metric size: ø4
- Inch size: ø5/32”

**PV port type**

| Metric size | ø6      | 8.25| 4 |
|-------------|---------|-----|  |
| Inch size   | ø1/4    | 11.4| 6 |

**V port type**

| Metric size | ø8      | 11.4| 6 |
|-------------|---------|-----|  |
| Inch size   | ø1/4    | 10.8| 4.76|

---

**ZK2P00□□□NL2-□**

**Vacuum pump system, Single unit, With supply valve/release valve, Without pressure sensor/switch**

**PV port type**

<table>
<thead>
<tr>
<th>Metric size</th>
<th>ø6</th>
<th>9.7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inch size</td>
<td>ø1/4</td>
<td>12.3</td>
</tr>
</tbody>
</table>

**V port type**

| Metric size | ø8      | 8.25| 4 |
|-------------|---------|-----|  |
| Inch size   | ø1/4    | 11.4| 6 |

---

*4 Refer to page 87 for dimensions with a mounting bracket.

*5 Nozzle size 12 and 15 have exhaust port.

*6 Refer to page 96 for the part number and maintenance of the high-noise reduction silencer case assembly.

---

*1 For silencer exhaust type, air is exhausted from the slit on both sides. (Do not cover both sides. Release at least one side.)

*2 For port exhaust type, air is exhausted from the One-touch fitting.

*3 Pilot pressure exhaust is common with ejector exhaust.

---

**Dimensions: Single Unit**

**PV port type**

<table>
<thead>
<tr>
<th>Metric size</th>
<th>ø6</th>
<th>9.7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inch size</td>
<td>ø1/4</td>
<td>12.3</td>
</tr>
</tbody>
</table>

**V port type**

| Metric size | ø8      | 8.25| 4 |
|-------------|---------|-----|  |
| Inch size   | ø1/4    | 11.4| 6 |

---

*1 Refer to page 87 for dimensions with a mounting bracket.

*4 Refer to page 87 for dimensions with a mounting bracket.
Dimensions: Single Unit

**ZK2G□J□NL2□**

Ejector system, Single unit, With supply valve, Without pressure sensor/switch

- Exhaust port
- High-noise reduction silencer case assembly

**ZK2G□N0NN□**

Ejector system, Single unit, Without valve, Without pressure sensor/switch

- Exhaust port
- High-noise reduction silencer case assembly

---

For high-noise reduction silencer exhaust

For port exhaust

- Exhaust port
- High-noise reduction silencer case assembly

---

For high-noise reduction silencer exhaust

For port exhaust

- Exhaust port
- High-noise reduction silencer case assembly

---

**ZK2 Series**

Vacuum Unit

---

**PV port type**

- Metric size: 06 ø6 9.7
- Inch size: 07 ø1/4" 12.3

**V port type**

- Metric size: 06 ø6 8.25 4
- 08 ø8 11.4 6
- 09 ø5/16" 11.4 6

---

For high-noise reduction silencer exhaust

For port exhaust

- Exhaust port
- High-noise reduction silencer case assembly

---

For high-noise reduction silencer exhaust

For port exhaust

- Exhaust port
- High-noise reduction silencer case assembly

---

**PV port type**

- Metric size: 06 ø6 9.7
- Inch size: 07 ø1/4" 12.3

**V port type**

- Metric size: 06 ø6 8.25 4
- 08 ø8 11.4 6
- 09 ø5/16" 11.4 6

---

**Notes:**

- For silencer exhaust type, air is exhausted from the slit on both sides. Do not cover both sides. Release at least one side.
- For port exhaust type, air is exhausted from the One-touch fitting.
- For pilot pressure exhaust, air is exhausted with ejector exhaust.
- Nozzle size 12 and 15 have exhaust port.
- Refer to page 96 for the part number and maintenance of the high-noise reduction silencer case assembly.

---

**Dimensions: Single Unit**

**ZK2G□J□NL2□**

- Exhaust port
- High-noise reduction silencer case assembly

**ZK2G□N0NN□**

- Exhaust port
- High-noise reduction silencer case assembly

---

**PV port type**

- Metric size: 06 ø6 9.7
- Inch size: 07 ø1/4" 12.3

**V port type**

- Metric size: 06 ø6 8.25 4
- 08 ø8 11.4 6
- 09 ø5/16" 11.4 6

---

**Notes:**

- For silencer exhaust type, air is exhausted from the slit on both sides. Do not cover both sides. Release at least one side.
- For port exhaust type, air is exhausted from the One-touch fitting.
- For pilot pressure exhaust, air is exhausted with ejector exhaust.
- Nozzle size 12 and 15 have exhaust port.
- Refer to page 96 for the part number and maintenance of the high-noise reduction silencer case assembly.

---

**Dimensions:**

- PV port type
- V port type

---

**ZK2 Series**

Vacuum Unit
Ejector system, Single unit, With supply valve/release valve, With pressure sensor

For high-noise reduction silencer exhaust

Exhaust port

High-noise reduction silencer case assembly

For port exhaust

Exhaust (EXH) port

Metric size: ø8 (ø5/16")

Inch size: ø8 (ø5/16")

V port type

Metric size

Inch size

PV port type

Metric size

Inch size

A C

B

A C

B

V port type

Metric size

Inch size

PV port type

Metric size

Inch size

For high-noise reduction silencer exhaust

Exhaust port

High-noise reduction silencer case assembly

For port exhaust

Exhaust (EXH) port

Metric size: ø8 (ø5/16")

Inch size: ø8 (ø5/16")

V port type

Metric size

Inch size

PV port type

Metric size

Inch size

A C

B

A C

B

ZK2 Series

Dimensions: Single Unit

ZK2 G  K  L-

Ejector system, Single unit, With supply valve/release valve, With pressure sensor

For high-noise reduction silencer exhaust

Exhaust port

High-noise reduction silencer case assembly

For port exhaust

Exhaust (EXH) port

Metric size: ø8 (ø5/16")

Inch size: ø8 (ø5/16")

V port type

Metric size

Inch size

PV port type

Metric size

Inch size

A C

B

A C

B

V port type

Metric size

Inch size

PV port type

Metric size

Inch size

A C

B

A C

B

+1 For silencer exhaust type, air is exhausted from the slit on both sides. (Do not cover both sides. Release at least one side.)

+2 For port exhaust type, air is exhausted from the One-touch fitting.

+3 Pilot pressure exhaust is common with ejector exhaust.

+4 Refer to page 87 for dimensions with a mounting bracket.

+5 Nozzle size 12 and 15 have exhaust port.

+6 Refer to page 96 for the part number and maintenance of the high-noise reduction silencer case assembly.

ZK2 G  K  L-

A to J

Ejector system, Single unit, With supply valve/release valve, With pressure switch

For high-noise reduction silencer exhaust

Exhaust port

High-noise reduction silencer case assembly

For port exhaust

Exhaust (EXH) port

Metric size: ø8 (ø5/16")

Inch size: ø8 (ø5/16")

V port type

Metric size

Inch size

PV port type

Metric size

Inch size

A C

B

A C

B

V port type

Metric size

Inch size

PV port type

Metric size

Inch size

A C

B

A C

B

+1 For silencer exhaust type, air is exhausted from the slit on both sides. (Do not cover both sides. Release at least one side.)

+2 For port exhaust type, air is exhausted from the One-touch fitting.

+3 Refer to page 87 for dimensions with a mounting bracket.

+4 Pilot pressure exhaust is common with ejector exhaust.

+5 Nozzle size 12 and 15 have exhaust port.

+6 Refer to page 96 for the part number and maintenance of the high-noise reduction silencer case assembly.
Dimensions: Single Unit

ZK2 G K W K to S

Ejector system, Single unit, With supply valve/release valve, Pressure switch with energy saving function

*1 For silencer exhaust type, air is exhausted from the slit on both sides. (Do not cover both sides. Release at least one side.)
*2 Refer to the following for dimensions with a mounting bracket.
*3 Pilot pressure exhaust is common with ejector exhaust.

With bracket

*Mounting bracket for single unit (Option). [Nuts and bolts are included.]
Part number: ZK2-BK1-A
### Dimensions: Manifold Individual Wiring

#### ZZK2□□□□□□L

- **Ejector system, Vacuum pump system, Individual wiring manifold, With supply valve/release valve**, Without pressure sensor/switch

#### Options
- **DIN rail mounting bracket**
  - Option symbol (-B)^±5
- **Exhaust (EXH) port**
  - Metric size: ø8
  - Inch size: ø5/16
- **Pilot pressure exhaust port**
  - Metric size: M3

#### For port exhaust
- **PE port female thread**
  - Specification (ZZK2□□□□□□L)
  - DIN rail mounting bracket (When Option -B is selected)^±5

#### For high-noise reduction silencer exhaust
- **Individual exhaust port**

#### PE port dimensions^±1,±4

#### Port dimensions

<table>
<thead>
<tr>
<th>Port type</th>
<th>A</th>
<th>Hexagon with across flats</th>
<th>B</th>
<th>C</th>
<th>D</th>
</tr>
</thead>
<tbody>
<tr>
<td>Metric size</td>
<td>06</td>
<td>8.3</td>
<td>4</td>
<td>9.7</td>
<td>8.7</td>
</tr>
<tr>
<td>08</td>
<td>11.4</td>
<td>6</td>
<td>—</td>
<td>—</td>
<td></td>
</tr>
<tr>
<td>Inch size</td>
<td>07</td>
<td>10.8</td>
<td>4.76</td>
<td>12.3</td>
<td>11.3</td>
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<tr>
<td>09</td>
<td>11.4</td>
<td>6</td>
<td>—</td>
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</table>

#### Table: Number of stations

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<thead>
<tr>
<th>Number of stations</th>
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<th>2</th>
<th>3</th>
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<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
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</tr>
</thead>
<tbody>
<tr>
<td>L1</td>
<td>30</td>
<td>45</td>
<td>60</td>
<td>75</td>
<td>90</td>
<td>105</td>
<td>120</td>
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<td>60</td>
<td>75</td>
<td>90</td>
<td>105</td>
<td>120</td>
<td>135</td>
<td>150</td>
<td>165</td>
<td>180</td>
</tr>
<tr>
<td>L3</td>
<td>56.8</td>
<td>71.8</td>
<td>86.8</td>
<td>101.8</td>
<td>116.8</td>
<td>131.8</td>
<td>146.8</td>
<td>161.8</td>
<td>176.8</td>
<td>191.8</td>
</tr>
<tr>
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<td>82.5</td>
<td>97.5</td>
<td>112.5</td>
<td>127.5</td>
<td>142.5</td>
<td>157.5</td>
<td>172.5</td>
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<td>87.5</td>
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<tr>
<td>L6</td>
<td>73</td>
<td>85.5</td>
<td>98</td>
<td>133.5</td>
<td>148</td>
<td>160.5</td>
<td>173</td>
<td>198</td>
<td>210.5</td>
<td></td>
</tr>
</tbody>
</table>

^1 Common pilot pressure supply port is available for vacuum pump system or option L (Manifold individual supply specification). (mm: ø6 inch: ø1/4")

^2 Pump system with individual exhaust port type does not have exhaust port.

^3 When individual exhaust port type is selected (Body type: F)

^4 Only when common PD port type option (Symbol: -D) is selected (mm: ø6 inch: ø1/4")

^5 To fix the manifold to DIN rail, select an option for the manifold model number.

^6 For complex exhaust type, air is also exhausted from the individual exhaust port of each station in addition to the common exhaust. (Ejector system)
**Vacuum Unit ZK2 Series**

### Dimensions: Manifold D-sub Connector

**ZK2□□□□□F**

Ejector system, Vacuum pump system, Common wiring manifold, With supply valve/release valve, With pressure sensor

---

#### For port exhaust

DIN rail mounting bracket

Option symbol (-B)\(^{15}\)

<table>
<thead>
<tr>
<th>Hexagon width across flats</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>Full-open 10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Metric</td>
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</tr>
<tr>
<td>Inch</td>
<td>11.4</td>
<td>11.3</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

PE port female thread specification (ZK2□□□□□F)

Pilot pressure exhaust port M3

<table>
<thead>
<tr>
<th>Port type</th>
<th>A</th>
<th>Hexagon with across flats B</th>
<th>C</th>
<th>D</th>
</tr>
</thead>
<tbody>
<tr>
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<td>9.7</td>
<td>8.7</td>
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</tr>
<tr>
<td>Inch</td>
<td>11.4</td>
<td>11.3</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

---

#### For high-noise reduction silencer exhaust

Exhaust (EXH) port

Metric size: 08 (ø8)

Inch size: 09 (ø5/16)

---

#### PE and PD port dimensions\(^{1,4}\)

<table>
<thead>
<tr>
<th>Number of stations</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
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<td>165</td>
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<tr>
<td>L2</td>
<td>45</td>
<td>60</td>
<td>75</td>
<td>90</td>
<td>105</td>
<td>120</td>
<td>135</td>
<td>150</td>
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<tr>
<td>L3</td>
<td>56.8</td>
<td>71.8</td>
<td>86.8</td>
<td>101.8</td>
<td>116.8</td>
<td>131.8</td>
<td>146.8</td>
<td>161.8</td>
<td>176.8</td>
<td>191.8</td>
</tr>
<tr>
<td>L4</td>
<td>73.5</td>
<td>88.5</td>
<td>103.5</td>
<td>118.5</td>
<td>133.5</td>
<td>148.5</td>
<td>163.5</td>
<td>178.5</td>
<td>193.5</td>
<td>208.5</td>
</tr>
<tr>
<td>L5</td>
<td>75</td>
<td>100</td>
<td>125</td>
<td>150</td>
<td>175</td>
<td>200</td>
<td>225</td>
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<td>235.5</td>
<td>260.5</td>
<td>285.5</td>
<td>310.5</td>
</tr>
</tbody>
</table>

---

1. Common pilot pressure supply port is available for vacuum pump system or option L (Manifold individual supply specification). (mm: ø6 inch: ø1/4”)

2. Pump system with individual exhaust port type does not have exhaust port.

3. When individual exhaust port type is selected (Body type: F)

4. Only when common PD port type option (Symbol: -D) is selected (mm: ø6 inch: ø1/4”)

5. To fix the manifold to DIN rail, select an option for the manifold model number.

6. For complex exhaust type, air is also exhausted from the individual exhaust port of each station in addition to the common exhaust. (Ejector system)
### ZK2 Series

#### Dimensions: Manifold Flat Ribbon Cable

**ZZK2□-□-□-P**

Ejector system, Common wiring manifold, With supply valve/release valve, With pressure switch

DIN rail clamping screw (When Option -B is selected)

- 2 x Common pilot pressure supply (PS) port
- 4 x M4 Mounting hole
- 2 x Common exhaust (EXH) port
- 2 x Common supply (PD) port

- Inch size: 2 x ø5/16"
- Metric size: 2 x ø8

- Common supply (PV) port
- Vacuum (V) port
- Vacuum break flow adjusting needle
- Manual override (Release valve)
- Manual override (Supply valve)

<table>
<thead>
<tr>
<th>Port type</th>
<th>A (mm)</th>
<th>B (mm)</th>
<th>C (mm)</th>
<th>D (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Metric size</td>
<td>9.4</td>
<td>11.4</td>
<td>8.7</td>
<td>8.7</td>
</tr>
<tr>
<td>Inch size</td>
<td>10.8</td>
<td>11.4</td>
<td>8.7</td>
<td>8.7</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Number of stations</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
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</thead>
<tbody>
<tr>
<td>L1</td>
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<td>75</td>
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<td>90</td>
<td>105</td>
<td>120</td>
<td>135</td>
<td>150</td>
<td>165</td>
<td>180</td>
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<tr>
<td>L3</td>
<td>56.8</td>
<td>71.8</td>
<td>86.8</td>
<td>101.8</td>
<td>116.8</td>
<td>131.8</td>
<td>146.8</td>
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<td>191.8</td>
</tr>
<tr>
<td>L4</td>
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<td>193.5</td>
<td>208.5</td>
</tr>
<tr>
<td>L5</td>
<td>75</td>
<td>100</td>
<td>112.5</td>
<td>125</td>
<td>137.5</td>
<td>150</td>
<td>175</td>
<td>187.5</td>
<td>200</td>
<td>212.5</td>
</tr>
<tr>
<td>L6</td>
<td>85.5</td>
<td>110.5</td>
<td>123</td>
<td>135.5</td>
<td>148</td>
<td>160.5</td>
<td>185.5</td>
<td>198</td>
<td>210.5</td>
<td>223</td>
</tr>
</tbody>
</table>

- 1 Common pilot pressure supply port is available for vacuum pump system or option L (Manifold individual supply specification). (mm: ø6 inch: ø1/4")
- 2 Pump system with individual exhaust port type does not have exhaust port.
- 3 When individual exhaust port type is selected (Body type: F)
- 4 Only when common PD port type option (Symbol: -D) is selected (mm: ø6 inch: ø1/4")
- 5 To fix the manifold to DIN rail, select an option for the manifold model number.
- 6 Applicable connector: Connector for flat ribbon cable (SP2) (MIL-C-83503 compliant)
- 7 For complex exhaust type, air is also exhausted from the individual exhaust port of each station in addition to the common exhaust. (Ejector system)
Electrical Wiring Specifications

D-sub Connector

<table>
<thead>
<tr>
<th>Connector terminal no.</th>
<th>Terminal number</th>
<th>Polarity</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 station</td>
<td>1 to 14</td>
<td>(+)</td>
</tr>
<tr>
<td>2 stations</td>
<td>15 to 28</td>
<td>(+)</td>
</tr>
<tr>
<td>3 stations</td>
<td>29 to 42</td>
<td>(+)</td>
</tr>
<tr>
<td>4 stations</td>
<td>43 to 56</td>
<td>(+)</td>
</tr>
<tr>
<td>5 stations</td>
<td>57 to 69</td>
<td>(+)</td>
</tr>
<tr>
<td>6 stations</td>
<td>70 to 83</td>
<td>(+)</td>
</tr>
<tr>
<td>7 stations</td>
<td>84 to 97</td>
<td>(+)</td>
</tr>
<tr>
<td>8 stations</td>
<td>98 to 111</td>
<td>(+)</td>
</tr>
<tr>
<td>9 stations</td>
<td>112 to 125</td>
<td>(+)</td>
</tr>
<tr>
<td>10 stations</td>
<td>126 to 139</td>
<td>(+)</td>
</tr>
</tbody>
</table>

Positive common specification

(+) The valve installed onto the product is non-polar type. Can be used as negative common.

Optional Specifications/Functions/Applications

- **B**: With one bracket for mounting a single unit (Mounting screw is attached.)
  - **Function/Application**: Use when a single unit is mounted to the floor in an upright position is requested. (When ordering only bracket, refer to page 87.)

- **C**: Pump system PE port female thread specification
  - **Type**: PE port
  - **Function/Application**: Use for pilot pressure exhaust piping (Standard pump system is released to the atmosphere)

- **D**: With individual release pressure supply (PD) port
  - **Type**: PD port
  - **Function/Application**: Use when supply pressure for vacuum release which pressure is different from the ejector supply pressure is requested.

- **J**: Vacuum break flow adjusting needle Round lock nut type
  - **Type**: Vacuum break flow adjusting needle
  - **Function/Application**: Thicker than standard hexagon type. More suitable for hand tightening. Round lock nut improves operability when manifold, pump system, or exhaust port type is used.

- **K**: Vacuum break flow adjusting needle Screwdriver operation type
  - **Type**: Vacuum break flow adjusting needle
  - **Function/Application**: Slotted type improves fine adjustment performance when manifold, pump system, or exhaust port type is used.

- **L**: Manifold individual supply specification
  - **Type**: Individual supply port
  - **Function/Application**: Adjust the supply pressure individually for manifold in order to adjust the vacuum pressure reached by each ejector.

- **P**: Manifold common release pressure supply specification
  - **Type**: Individual supply port
  - **Function/Application**: When selecting "D" (with common release pressure supply (PD) port) for manifold option, supplying a pressure which is different from for common PV to common PD is requested.

- **W**: With exhaust interference prevention valve
  - **Type**: Exhaust interference prevention valve
  - **Function/Application**: When ejectors are operated individually, exhausted air may flow backward from the V port of ejectors that are turned off. Exhaust interference prevention valve prevents backflow.

A D-sub connector (25P) conforming to MIL standards is used.

A flat ribbon cable connector (26P) conforming to MIL standards is used.
**Cable Assembly**

### D-sub Connector

**Connector**

- **Type:** DB-25SF-N
- **Manufacturer:** Japan Aviation Electronics Industry, Limited.

**Molded cover**

- **Material:** 2 x M2.6 x 0.45
- **Note:** Terminal no.

###Flat Ribbon Cable Connector

**Connector**

- **Type:** Flat Ribbon Cable Connector
- **Manufacturer:** HIROSE ELECTRIC CO., LTD.

**Cable Assembly (Option)**

- **Part Numbers:**
  - AX100-DS25-015
  - AX100-DS25-030
  - AX100-DS25-050

**Wire Color by Terminal Number**

- **Terminal number**
  - 1: Black
  - 2: Brown
  - 3: Red
  - 4: Orange
  - 5: Yellow
  - 6: Pink
  - 7: Blue
  - 8: Purple
  - 9: Gray
  - 10: White
  - 11: Red
  - 12: Yellow
  - 13: Black
  - 14: White
  - 15: Red
  - 16: Yellow
  - 17: Orange
  - 18: Black
  - 19: Red
  - 20: Yellow
  - 21: Orange
  - 22: Black
  - 23: Red
  - 24: Yellow
  - 25: Orange

**Note:** The minimum bending inner radius of D-sub connector cable is 20 mm.

### Electrical Characteristics

- **Conductor resistance**
  - 65 or less
- **Voltage limit**
  - 1000
- **Insulation resistance**
  - 5 or more

**Connector manufacturers’ example**

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

**Flat Ribbon Cable Connector Assembly (Option)**

- **Part Numbers:**
  - AX100-FC26-1
  - AX100-FC26-2
  - AX100-FC26-3

**Note:** For other commercial connectors, use a 26-pin type with strain relief conforming to MIL-C-83503.

**Cannot be used for movable wiring.**

---

**ZK2 Series**
Warning

1. Manual override operation
   - Manual override is non-locking push type. Push the manual override with a screwdriver of a diameter smaller than indicated in the diagram until it reaches the end.
   - Confirm that the product operates safely before the manual override is operated.

   Note) When the linked type supply and release valves operation is selected, the supply valve can hold the position and will not switch off even if the supply valve manual override operation is finished unless the release valve manual override is pressed.

2. Self-holding function of supply valve
   For valve assemblies where the supply and release valves are linked the supply valve is a self-holding type. Instantaneous energization (20 ms or more) of the supply valve allows the supply valve to hold. Continuous energization is not necessary. Energize the release valve to turn the supply valve off.

   Note 1) Main valve in the valve assembly is made of elastic seal. Self-holding is performed by friction resistance of the seal. Do not apply impact resistance in the direction of the main valve shaft during the installation to moving parts. When the self-holding valve is applied with impact, energize it continuously, or use K type. (Refer to Combination of Supply Valve and Release Valve on pages 5 and 7.) (Vibration and impact should be 50 m/s² or less.)

   Note 2) Self-holding type valve cannot use a digital switch for vacuum with energy saving function.

3. Default setting
   When the valve assembly is delivered, the supply valve is on the OFF position, but it may be on the ON position due to the vibration or impact during transportation or device installation. Turn to the OFF position manually or by energizing before use.

Warning

4. Wiring specifications and light/surge voltage suppressor
   Wiring should be connected as shown below. Connect with the power supply respectively. (Solenoid valve is non-polar type.)

   Single solenoid (Without release valve)  Double solenoid (With release valve)

   Light/surge voltage suppressor circuit is equipped for both single and double solenoid. Red LED turns on when supply valve (SOL.a) is energized. Green LED turns on when release valve (SOL.b) is energized.

5. Continuous duty
   If a supply valve/release valve is energized continuously for a long time, the rise in temperature due to heat-up of the coil may cause a decline in solenoid valve performance, reduce service life, or have adverse effects on peripheral equipment. When the energizing time per day is longer than non-energizing time, use self-holding linked type valve using instantaneous energizing.
ZK2 Series
 Specific Product Precautions 2
Be sure to read this before handling the products. Refer to back page 50 for Safety Instructions and pages 49 to 51 for Vacuum Equipment Precautions.

**Surge Voltage Intrusion**

⚠️ **Caution**
The surge voltage created when the power supply is cut off could apply to the de-energized load equipment through the output circuit. In cases where the energized load equipment has a larger capacity (power consumption) and is connected to the same power supply as the product, the surge voltage could malfunction and/or damage the internal circuit element of the product and the internal device of the output equipment. To avoid this situation, place an diode which can suppress the surge voltage between the COM lines of the load equipment and output equipment.

**Plug Connector**

⚠️ **Caution**

1. Installation/Removal of connector
   • To install the connector, hold the cover and insert the connector straight pushing the connector lever with your finger. Ensure that the connector lever clip is properly inserted onto mating part.
   • To remove the connector, hold the cover and pull out the connector straight pushing the connector lever clip.

2. Part number of connector assembly and lead wire length
   The standard lead wire length for the connector assembly is 300 mm. For other lengths, refer to the table below.

<table>
<thead>
<tr>
<th>Nil</th>
<th>300 mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>600 mm</td>
</tr>
<tr>
<td>10</td>
<td>1000 mm</td>
</tr>
<tr>
<td>20</td>
<td>2000 mm</td>
</tr>
<tr>
<td>30</td>
<td>3000 mm</td>
</tr>
</tbody>
</table>

Note) When ordering, put the connector assembly part number to the product part number without connector.

**Suction Filter**

⚠️ **Caution**

1. Replacement procedure for filter element
   • To pull out the vacuum port adapter, rotate the adapter by about 90 degrees in direction A and pull in direction B. The adapter can be removed with the suction filter from the filter case.
   • Remove the suction filter from the vacuum port adapter and replace it with a new suction filter.

   ![Diagram of filter element and vacuum port adapter]

- When installing the filter, insert the filter to the end so that there is no gap or bending between the filter and the vacuum port adapter. The gap or bending will cause the element to deform inside the case.
- Put the filter back into the filter case following this procedure in reverse.
- To mount the vacuum port adapter into the filter case, turn the adapter so that the mating mark of the adapter and the case are aligned. (Rotation stops there.)

   ![Diagram of adapter and filter case]

- If it is difficult to remove the vacuum port adapter, you can remove the adapter with a hexagon wrench using the hexagonal hole in V port. The table shows the port size and the width across flats.

<table>
<thead>
<tr>
<th>V port size</th>
<th>Width across flats</th>
</tr>
</thead>
<tbody>
<tr>
<td>ø5</td>
<td>4</td>
</tr>
<tr>
<td>ø8, ø5/16&quot;</td>
<td>6</td>
</tr>
<tr>
<td>ø1/4&quot;</td>
<td>4.76</td>
</tr>
</tbody>
</table>

**Caution**

Be sure to read this before handling the products. Refer to back page 50 for Safety Instructions and pages 49 to 51 for Vacuum Equipment Precautions.
**Caution**

2. Filter case maintenance

- When the filter case is dirty, it can be removed and cleaned.

  To remove the filter case, insert a precision screwdriver into the groove of the release lever and push in direction (1), and slide the filter case in direction (2).

  ![Filter case maintenance diagram]

  Note) Surface A of the filter case is the sealing surface when vacuum is generated. Handle with care so that the surface is not scratched or damaged.

  ![Filter case maintenance diagram]

  Note) Filter case 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).

  Note) Do not expose the filter case to direct sunlight for a long period of time.

- Put the filter case back into the ejector by the following procedure.
  1) Make sure that body gasket (B) and the check valve are installed correctly onto the ejector. If they are out of the place, vacuum leakage may occur. In addition, pressure switches with the energy-saving function come equipped with 2 check valves.

  ![Check valve and body gasket diagram]

  2) Push the filter case in direction (1). Be careful the filter case hook (A) and hook (B) do not touch the body of the ejector.

  3) Slide the filter case in direction (2) while pushing the filter case gently in contact with the ejector. Make sure that the clip (C) is locked and there is no gap in part (D).

  ![Filter case back into ejector diagram]

  Note) If excess force is applied to the filter case, hook A and B may break. Handle with care.

**Caution**

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

  ![Exhaust slit diagram]

  For port exhaust type, back pressure may increase depending on the piping size and length. Ensure that the back pressure does not exceed 0.005 MPa (5 kPa).

  In addition, the exhaust port should not be blocked or pressurized.

  - If the sound absorbing material is clogged, it will cause a reduction in the 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 sound absorbing material is recommended.)

Replacement Procedure for Sound Absorbing Material (for Silencer Exhaust)

1) Remove the filter case following the procedure of filter case maintenance.

2) Flip the ejector, push the release lever again with a finger or precision screwdriver until the release lever stops.
Replacement Procedure for High-noise Reduction Silencer Case Assembly

**Caution**

Refer to the replacement procedure of the sound absorbing material (silencer exhaust) to replace the assembly.

Note) When a high-noise reduction silencer case assembly is attached to body type "A" (silencer exhaust), the silencing effect cannot be acquired.

When only replacing the sound absorbing material (for high-noise reduction silencer exhaust)

1) Use the notch to remove the cap.
2) Use a precision screwdriver to remove the sound absorbing material.
3) Insert the new sound absorbing material, and return the cap.

**Operating Supply Pressure**

**Caution**

- Use the product within the specified supply pressure range. Operation over the maximum 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.

Supply air containing foreign matter, moisture, oil content, drain, etc. can cause a malfunction. Refer to the Air Preparation Equipment Selection Guide in Best Pneumatics No. 6 (page 2) and use supply air of a quality equal to or higher than compressed air purity class "2:6:3" as stipulated by the ISO 8573-1:2010 (JIS B 8392-1:2012) standard. Flush the piping sufficiently to remove foreign matter before piping the product.
ZK2 Series
Specific Product Precautions 5
Be sure to read this before handling the products.
Refer to back page 50 for Safety Instructions and pages 49 to 51 for Vacuum Equipment Precautions.

Exhaust Noise

Caution

- When vacuum 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 vacuum pressure unstable. If the vacuum pressure range is adequate for adsorption, there should not be a 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.

![Pressure range of the noise](image)

How to Mount a Single Unit

Caution

1. Single unit can be mounted to DIN rail or wall using the holes in the body (2 x ø4.5).
   - When mounting the ejector to DIN rail, unlock the filter case assembly beforehand. (Refer to the maintenance procedure on page 95.)
   - Hook the ejector onto the DIN rail from direction (①).
   - Mount the ejector onto the DIN rail by pushing it down in direction (②).
   - Push the filter case assembly in direction (③) until it is locked.

2. To mount a single unit onto the floor, use the optional bracket.
   - To hold the ejector onto the DIN rail, hold it from both sides using the stopper brackets.

Port Size of Single Unit

Caution

- Port size

<table>
<thead>
<tr>
<th>Port</th>
<th>Ejector System</th>
<th>Vacuum Pump System</th>
</tr>
</thead>
<tbody>
<tr>
<td>PV</td>
<td>ø6/Metric, ø1/4&quot;/Inch</td>
<td>ø6/Metric, ø1/4&quot;/Inch</td>
</tr>
<tr>
<td>V</td>
<td>ø6/ø6, ø1/4&quot;/ø5/16&quot;, ø6/ø6, ø1/4&quot;/ø5/16&quot;</td>
<td></td>
</tr>
<tr>
<td>EXH</td>
<td>ø8/ø5/16&quot;</td>
<td>—/—</td>
</tr>
<tr>
<td>PE</td>
<td>EXH Common Port</td>
<td>Port open to atmosphere *1)</td>
</tr>
<tr>
<td>PS</td>
<td>—</td>
<td>ø4/ø5/32&quot;</td>
</tr>
<tr>
<td>PD</td>
<td>M3</td>
<td>—/M3</td>
</tr>
</tbody>
</table>

*1) Not applicable

+ Piping for PE port is available as an option (M3). (Refer to page 63.)
+ A model with PD port is available as an option. (Refer to pages 61 and 63.)

---

Part number: TXE1-SMC
M4 x 20
(Tightening torque: 0.75 N·m)

*Mounting bracket for single unit (Option), [Nuts and bolts are included.] Part number: ZK2-BK1-A
How to Mount a Manifold

**Caution**
- Manifolds can be mounted onto the floor using M4 holes on the end plate.
- It is possible to mount the manifold onto the DIN rail by manifold option.
  - Hook the mounting bracket of the end plate to DIN rail from direction (1).
  - Mount the ejector onto the DIN rail by pushing it down in direction (2).
- Use a 50 mm or longer Phillips screwdriver to tighten the mounting bracket (3). (Tightening torque: 0.9 ±0.1 N-m)
- Removal should be performed by following the mounting procedure in reverse.

![Diagram showing manifold mounting process](image)

**Manifold Silencer**

**Caution**
- Ejector system manifold silencer common exhaust type has a sound absorbing material in the end plate. If the sound absorbing material is clogged, ejector performance is deteriorated, leading to suction failure or response delay. Regular replacement of the sound absorbing material is recommended.

**Replacement Procedure**
- Insert a precision screwdriver to notch (A) of the end plate and remove a clip (L) (3).
- Insert a precision screwdriver to notch (B) and remove the silencer cover (2).
- Pull out the sound absorbing material from the silencer cover (3).
- Mounting of a new element should be performed by following the removal procedure in reverse.

![Diagram showing manifold silencer](image)

**Manifold Ports**

**Caution**
- Manifold ports are common at the end plate. Port description and application are the same as the single unit. (Refer to page 79 for application and operating pressure range of each port.)
- Refer to page 67 for the number of stations that can operate simultaneously for each ejector size.
- If one side is not used for air supply, plug the unused port or change to the dedicated port plug as shown below.

<table>
<thead>
<tr>
<th>Standard</th>
<th>Plug part number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Common PV port</td>
<td>ø8 One-touch VVQZ2000-CP</td>
</tr>
<tr>
<td>Common PS port</td>
<td>ø6 One-touch ZK2-MP1C6-A</td>
</tr>
</tbody>
</table>

* There are 4 types depending on the manifold port specification.

**Vacuum Break Flow Adjusting Needle**

**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 vary due to the range of the specifications of the product.
2. The needle has a retaining mechanism, so it will not turn further when it reaches the rotation stop position. Turning the needle too far may cause damage.
3. Do not do not tighten with tools such as nippers. This can result in breakage due to idle turning.
4. Do not over tighten the lock nut.
   It is possible to tighten the standard lock nut (hexagon) manually. When tightening further with tools, tighten by approximately 15° to 30°. Over tightening may cause breakage.
5. When screwdriver operation type needle is selected as option (-K), make sure the lock nut is not loose to prevent the nut from coming off due to vibration.
**ZK2 Series**

**Specific Product Precautions 7**

Be sure to read this before handling the products. Refer to back page 50 for Safety Instructions and pages 49 to 51 for Vacuum Equipment Precautions.

### Handling of Pressure Sensor Assembly

**Handling**

**Caution**

1. Do not drop, bump or apply excessive impact (980 m/s²) when handling.
   
   Even if the sensor body is not damaged, the internal parts may get damaged, leading to malfunction.

2. The tensile strength of the power cord is within 50 N, and pulling it with a greater force can cause failure.
   
   Hold the body when handling the product.

3. Refer to the Operation Manual of the pressure sensor PSE540 series for how to connect the connectors for sensor.

**Environment**

**Caution**

1. The use of resin piping can cause static electricity to be generated, depending on the fluid.
   
   Therefore, when connecting this sensor, take appropriate measures against static electricity at the equipment side to which this product is mounted, and separate the grounding for the product from the grounding for any equipment which generates a strong electromagnetic noise or high frequency. Otherwise, static electricity can break the sensor.

### Handling of Pressure Switch for Vacuum Assembly

**Handling**

**Caution**

1. Do not drop, bump or apply excessive impact (100 m/s²) when handling.
   
   Even if the sensor body is not damaged, the internal parts may get damaged, leading to malfunction.

2. The tensile strength of the power cord is within 35 N, and pulling it with a greater force can cause failure.
   
   Hold the body when handling the product.

3. Do not allow repeated bending or stretching forces to be applied to lead wires.

Wiring arrangements in which repeated bending stress or stretching force is applied to the lead wires can cause broken wires.

If the lead wire can move, fix it near the body of the product. The recommended bending radius of the lead wire is 6 times the outside diameter of the sheath, or 33 times the outside diameter of the insulation material, whichever is larger. Replace the damaged lead wire with a new one. For details, please consult with SMC.

### Handling of Pressure Switch for Vacuum Assembly

**Handling**

**Caution**

1. Incorrect wiring can cause the switch to be damaged or malfunction. Connections should only be made when the power supply is turned off.

2. Do not attempt to insert or pull out the connector from the switch while the power is on.

   Otherwise, it may cause switch output malfunction.

3. Malfunctions stemming from noise may occur if the wire is installed in the same route as that of power or high-voltage cable.

   Wire the switch independently.

4. Be sure to ground the frame ground (FG) terminal when using a commercially available switching power supply.

**Environment**

**Warning**

1. The structure of pressure switches is not intended to prevent explosion.

   Never use in an atmosphere of flammable gas or explosive gas.

**Caution**

1. The product is CE marked, but not immune to lightning strikes.

   Take measures against lightning strikes in your system.

2. Do not use the switches in locations where static electricity would be problematic.

   Otherwise, it may result in the system failure and trouble.

### Assembling / Removing Connectors

**Caution**

- When assembling the connector to the switch housing, push the connector straight onto the pins until the level locks into the housing slot.

- When removing the connector from the switch housing, push the section A (lever) down with your thumb to unlock it from the slot and then withdraw the connector straight off of the pins.

- Do not attempt to insert or pull out the connector from the switch while the power is on. Otherwise, it may cause switch output malfunction.
Mounting

⚠ Caution

1. **Tighten to the specified tightening torque.**
   If the tightening torque is exceeded, the mounting screws and the pressure switch may break. Insufficient torque may cause displacement of the pressure switch and loosening of the mounting screws.
   Tightening torque: 0.08 to 0.10 N·m

2. **Be sure to ground the frame ground (FG) terminal when using a commercially available switching power supply.**

3. **Do not drop, hit or apply shock to the product.**
   Otherwise, the internal parts of the pressure switch may get damaged and cause malfunction.

4. **Do not pull the lead wire with force, or lift the product by pulling the lead wire.** (Tensile strength within 20 N)
   Hold the product body when handling to prevent damage, failure or malfunction. Otherwise, the pressure switch will be damaged, leading to failure and malfunction.

5. **Eliminate any dust left in the piping by using a blast of air before connecting the piping to the product.**
   Otherwise, failure or malfunction may occur.

6. **Do not insert metal wires or other foreign matter into the pressure port.**
   Otherwise, the pressure sensor may get damaged, leading to failure and malfunction.

7. **If the fluid contains foreign matter, install and connect a filter or mist separator to the inlet.**
   Otherwise, failure, malfunction or inaccurate measurements from the pressure switch may occur.

---

Other Tube Brands

⚠ Caution

1. **When tubing of brands other than SMC’s are used, verify that the tubing O.D. satisfies the following accuracy;**
   1) Nylon tubing: Within ±0.1 mm
   2) Soft nylon tubing: Within ±0.1 mm
   3) Polyurethane tubing: Within +0.15 mm, within −0.2 mm
   Do not use tubing which does not meet these outside diameter tolerances.
   It may not be possible to connect them, or they may cause other trouble, such as air leakage or the tube pulling out after connection.
Vacuum Ejector

Supply valve: N.O. specification

Can hold vacuum*¹ even when the power goes out or is turned off

Prevents the sudden dropping of workpieces*¹

*¹ Supposing the supply pressure is being maintained

Vacuum ejector with energy-saving function

90% reduction*²

*² Based on SMC’s measuring conditions

The digital pressure switch for vacuum with energy-saving function cuts supply air when the pressure reaches the desired vacuum.

● Typical Operation Pattern

ZK2□-X188: For Single Unit  
ZK2□-X211: For Manifold
### Vacuum Ejector with Energy-saving Function

#### ZK2□-X188

#### ZK2□-X211

#### How to Order Single Unit

<table>
<thead>
<tr>
<th>Symbol</th>
<th>System/Body type</th>
<th>Exhaust type</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Single unit</td>
<td>Silencer exhaust</td>
</tr>
<tr>
<td>B</td>
<td>Single unit</td>
<td>Port exhaust</td>
</tr>
<tr>
<td>G</td>
<td>Ejector system</td>
<td>High-noise reduction silencer exhaust</td>
</tr>
<tr>
<td>C</td>
<td>For manifold</td>
<td>Complex exhaust</td>
</tr>
<tr>
<td>F</td>
<td>For manifold</td>
<td>Individual port exhaust</td>
</tr>
<tr>
<td>H</td>
<td>For manifold</td>
<td>High-noise reduction silencer exhaust</td>
</tr>
</tbody>
</table>

1. Port size: ø8 (mm), ø5/16” (inch)
2. The complex exhaust method combines the common exhaust from the end plate and the direct exhaust from each station.

#### Nominal nozzle size

<table>
<thead>
<tr>
<th>Symbol</th>
<th>System</th>
<th>Nominal size</th>
</tr>
</thead>
<tbody>
<tr>
<td>07</td>
<td>Ejector system</td>
<td>ø0.7</td>
</tr>
<tr>
<td>10</td>
<td>Ejector system</td>
<td>ø1.0</td>
</tr>
<tr>
<td>12</td>
<td>Ejector system</td>
<td>ø1.2</td>
</tr>
<tr>
<td>15</td>
<td>Ejector system</td>
<td>ø1.5</td>
</tr>
</tbody>
</table>

- Standard supply pressure for nozzle size
  - 07 to 12: 0.35 MPa (ZK2□-X188)
  - 15: 0.4 MPa (ZK2□-X211)

#### Digital pressure switch for vacuum connector specifications

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Type</th>
<th>Pressure range (kPa)</th>
<th>Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>K</td>
<td>Digital pressure switch for vacuum system</td>
<td>-100 to 100</td>
<td>Unit selection function</td>
</tr>
<tr>
<td>Q</td>
<td>Digital pressure switch for vacuum with energy-saving function</td>
<td>1 output</td>
<td>Si unit only</td>
</tr>
<tr>
<td>R</td>
<td>Vacuum break flow-adjusting needle</td>
<td>1 output</td>
<td>Unit selection function</td>
</tr>
<tr>
<td>S</td>
<td>Vacuum break flow-adjusting needle</td>
<td>1 output</td>
<td>Si unit only</td>
</tr>
</tbody>
</table>

- When more than one option is selected, list the option symbols in alphabetical order. Example) -EJK

#### Optional specifications (Single unit)\(^a\)

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Type</th>
<th>Nil</th>
</tr>
</thead>
<tbody>
<tr>
<td>B</td>
<td>With one bracket for mounting a single unit (Mounting screws are attached.)</td>
<td>Without option</td>
</tr>
<tr>
<td>D</td>
<td>With individual release pressure supply (PD) port</td>
<td>Without option</td>
</tr>
<tr>
<td>E</td>
<td>Long lock nut specification: Screwdriver operation type</td>
<td>Without option</td>
</tr>
<tr>
<td>J</td>
<td>Vacuum break flow-adjusting needle: Round lock nut type</td>
<td>Without option</td>
</tr>
<tr>
<td>K</td>
<td>Vacuum break flow-adjusting needle: Screwdriver operation type</td>
<td>Without option</td>
</tr>
</tbody>
</table>

- Only M3 is available for the PD port size. Use a One-touch fitting or barb fitting (M-3AU-4) for piping. (O.D.: Within ø6.2)

#### Optional specifications (For manifold)\(^{11, 12}\)

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Type</th>
<th>Nil</th>
</tr>
</thead>
<tbody>
<tr>
<td>E</td>
<td>Long lock nut specification: Screwdriver operation type</td>
<td>Without option</td>
</tr>
<tr>
<td>J</td>
<td>Vacuum break flow-adjusting needle: Round lock nut type</td>
<td>Without option</td>
</tr>
<tr>
<td>K</td>
<td>Vacuum break flow-adjusting needle: Screwdriver operation type</td>
<td>Without option</td>
</tr>
<tr>
<td>L</td>
<td>Manifold individual supply specification</td>
<td>Without option</td>
</tr>
<tr>
<td>P</td>
<td>With common release pressure supply (PD) port</td>
<td>Without option</td>
</tr>
</tbody>
</table>

- When more than one option is selected, list the option symbols in alphabetical order. Example) -JK

- Select the body for the manifold. Select “-L” for the manifold type. When the common supply and individual supply are mixed, please contact SMC.

### Additional Notes

1. Supply port (PV) size of single unit: ø6 (mm), ø1/4” (inch)
2. Rated voltage: 24 VDC
3. Optional specifications, the vacuum break flow-adjusting needle option “E,” “K,” or “JK” can be additionally selected for increased workability.
4. Select the body for the manifold. Select “-L” for the manifold type.
5. When “-D” is selected as a manifold option, select option “-P” for the single unit model number.
6. Combinations of “EJ,” “EK,” and “EJK” are not available.
How to Order Valve Manifold Assembly

**ZZK2 04-A1L-X211**

**1** Stations

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>1 station</td>
</tr>
<tr>
<td>10</td>
<td>10 stations</td>
</tr>
</tbody>
</table>

**2** System (Port combination)

<table>
<thead>
<tr>
<th>Symbol</th>
<th>System</th>
<th>Port</th>
<th>Standard</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Ejector</td>
<td>Common PV: ø8</td>
<td>Metric size</td>
</tr>
<tr>
<td>AN</td>
<td>System</td>
<td>Common PV: ø5/16&quot;</td>
<td>inch size</td>
</tr>
</tbody>
</table>

**3** Exhaust

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Ejector system: Complex exhaust**,1, **,3</td>
</tr>
<tr>
<td>2</td>
<td>Ejector system: Individual exhaust**,2</td>
</tr>
</tbody>
</table>

**4** Option **4**

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nil</td>
<td>Without option</td>
</tr>
<tr>
<td>B</td>
<td>With DIN rail mounting bracket**5</td>
</tr>
<tr>
<td>D</td>
<td>With common release pressure supply (PD) port**6</td>
</tr>
<tr>
<td>L</td>
<td>Manifold individual supply specification**7</td>
</tr>
</tbody>
</table>

**5** Manifold Assembly (Delivery condition)

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nil</td>
<td>Individual units assembled delivered as a manifold</td>
</tr>
<tr>
<td>A</td>
<td>Delivered as individual parts (not assembled)**9</td>
</tr>
</tbody>
</table>

### Example

- **ZZK204-A1L-B-X211**
- **ZZK2C12A5MOZQW-08-X211**
- **ZZK2C10A5MOZQW-08-X211**
- **ZZK204-A1L-B-X211**

- Kit consists of end plates for both ends and tension bolts.

### Valve Specifications

**Solenoid valve**

- **Model**: ZK2**-**X188
- **Supply valve**: SYJ225-SMOZ-Q
- **Release valve**: SYJ314-SMOZ-Q
- **Operating pressure range**: 0.15 MPa to 0.6 MPa
- **Rated voltage**: 24 VDC
- **Power consumption**: 0.4 W

### Ejector Specifications

<table>
<thead>
<tr>
<th>Item</th>
<th>Model</th>
<th>ZK2**-**X188</th>
<th>ZK2**-**X188</th>
<th>ZK2**-**X188</th>
<th>ZK2**-**X188</th>
<th>ZK2**-**X188</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>ZK2**-**X188</td>
<td>1.2</td>
<td>1.5</td>
<td>1.2</td>
<td>1.5</td>
<td>1.2</td>
</tr>
<tr>
<td>Nozzle diameter [mm]</td>
<td>0.7</td>
<td>1.0</td>
<td>1.2</td>
<td>1.5</td>
<td>1.2</td>
<td>1.5</td>
</tr>
<tr>
<td>Max. suction flow<strong>1</strong> [L/min (ANR)]</td>
<td>34</td>
<td>56</td>
<td>74</td>
<td>89</td>
<td>72</td>
<td>83</td>
</tr>
<tr>
<td>Port exhaust</td>
<td>29</td>
<td>44</td>
<td>61</td>
<td>67</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Silencer exhaust</td>
<td>34</td>
<td>56</td>
<td>72</td>
<td>83</td>
<td>72</td>
<td>83</td>
</tr>
<tr>
<td>High-noise reduction silencer exhaust</td>
<td>24</td>
<td>40</td>
<td>58</td>
<td>90</td>
<td>58</td>
<td>90</td>
</tr>
<tr>
<td>Air consumption<strong>1</strong> [L/min (ANR)]</td>
<td>34</td>
<td>56</td>
<td>72</td>
<td>83</td>
<td>72</td>
<td>83</td>
</tr>
<tr>
<td>Maximum vacuum pressure<strong>1</strong> [kPa]</td>
<td>0.15 to 0.6</td>
<td>0.4 (For X188)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Supply pressure range [MPa]</td>
<td></td>
<td>0.4 (For X188)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Standard supply pressure [MPa]</td>
<td>0.35</td>
<td>0.45 (For X188)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**1** Values are based on SMC’s measurement standards. They depend on atmospheric pressure (weather, altitude, etc.) and the measurement method.

### Manifold Weight

<table>
<thead>
<tr>
<th>Stations</th>
<th>1 station</th>
<th>2 stations</th>
<th>3 stations</th>
<th>4 stations</th>
<th>5 stations</th>
<th>6 stations</th>
<th>7 stations</th>
<th>8 stations</th>
<th>9 stations</th>
<th>10 stations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight [g]</td>
<td>345</td>
<td>560</td>
<td>780</td>
<td>1000</td>
<td>1215</td>
<td>1435</td>
<td>1650</td>
<td>1875</td>
<td>2100</td>
<td>2320</td>
</tr>
</tbody>
</table>

Single unit weight: 200 g (With vacuum pressure switch)

Specifications not listed are the same as those of the standard product. For details, refer to the Web Catalog.
**Wiring Examples**

For digital pressure switch for vacuum specifications: K, Q

- Digital pressure switch (NPN output)

- Main circuit
  - OUT1
  - OUT2
  - FUNC

- Pilot valve for supply
- Pilot valve for release

- Connector cord assembly (ZK2-LW10-A)

- 24 VDC

For digital pressure switch for vacuum specifications: R, S

- Digital pressure switch (PNP output)

- Main circuit
  - OUT1
  - OUT2
  - FUNC

- Pilot valve for supply
- Pilot valve for release

- Connector cord assembly (ZK2-LW11-A)

- 24 VDC

**Timing Chart (Typical operation pattern)**

- Suction command signal (FUNC)
  - ON
  - OFF

- Switch output (OUT1)
  - ON
  - OFF

- Pilot valve for supply: Open
- Energy-saving automatic control: OUT2: Close

- Atmospheric pressure
  - P_1

- Vacuum port pressure
  - H_1

- Vacuum pressure
  - H_2

- Achievable vacuum pressure

= 1 A minute after the power supply is turned on again, the energy-saving control and the switch's output (OUT1) are initiated.
Port Layout

**Port combination: PV = PD**

**Circuit example**

<table>
<thead>
<tr>
<th>Port layout no. 1</th>
<th>Single unit: ZK2A□ASMOZ□□□-X188</th>
</tr>
</thead>
<tbody>
<tr>
<td>Port layout</td>
<td>1</td>
</tr>
<tr>
<td>System</td>
<td>Ejector</td>
</tr>
<tr>
<td>Body type</td>
<td>Single unit</td>
</tr>
<tr>
<td>Exhaust type</td>
<td>Silencer exhaust</td>
</tr>
<tr>
<td>Application and</td>
<td>Exhaust</td>
</tr>
<tr>
<td>purpose</td>
<td>Released within the operating environment</td>
</tr>
<tr>
<td>Pressure</td>
<td>Same pressure as PV</td>
</tr>
</tbody>
</table>

**Port combination: PV = PD**

**Circuit example**

<table>
<thead>
<tr>
<th>Port layout no. 2</th>
<th>Single unit: ZK2B□ASMOZ□□□-X188</th>
</tr>
</thead>
<tbody>
<tr>
<td>Port layout</td>
<td>2</td>
</tr>
<tr>
<td>System</td>
<td>Ejector</td>
</tr>
<tr>
<td>Body type</td>
<td>Single unit</td>
</tr>
<tr>
<td>Exhaust type</td>
<td>Port exhaust</td>
</tr>
<tr>
<td>Application and</td>
<td>Exhaust</td>
</tr>
<tr>
<td>purpose</td>
<td>Released within the operating environment</td>
</tr>
<tr>
<td>Pressure</td>
<td>Same pressure as PV</td>
</tr>
</tbody>
</table>

**Port combination: PV = PD**

**Circuit example**

<table>
<thead>
<tr>
<th>Port layout no. 3</th>
<th>Single unit: ZK2G□ASMOZ□□□-X188</th>
</tr>
</thead>
<tbody>
<tr>
<td>Port layout</td>
<td>3</td>
</tr>
<tr>
<td>System</td>
<td>Ejector</td>
</tr>
<tr>
<td>Body type</td>
<td>Single unit</td>
</tr>
<tr>
<td>Exhaust type</td>
<td>High-noise reduction silencer exhaust</td>
</tr>
<tr>
<td>Application and</td>
<td>Exhaust</td>
</tr>
<tr>
<td>purpose</td>
<td>Released within the operating environment</td>
</tr>
<tr>
<td>Pressure</td>
<td>Same pressure as PV</td>
</tr>
</tbody>
</table>

**High-noise reduction silencer exhaust**

<table>
<thead>
<tr>
<th>Supply valve</th>
<th>Release valve</th>
</tr>
</thead>
<tbody>
<tr>
<td>PV</td>
<td>EXH.</td>
</tr>
</tbody>
</table>

**EXH.**

<table>
<thead>
<tr>
<th>Port exhaust</th>
<th>EXH.</th>
</tr>
</thead>
<tbody>
<tr>
<td>PV</td>
<td>EXH.</td>
</tr>
</tbody>
</table>

**NOZZLE SIZE:** 12, 15

Vacuum Ejector with Energy-saving Function ZK2□-X188/ZK2□-X211
Port Layout

Port combination: Common PV = Common PD

Circuit example

Port layout no. 4
Single unit: ZK2C.A5MOZ-X188/ZK2C.X211
Manifold: ZZK2C.A2C1L-X188/ZK2C.X211

System: Ejector
Body type: Manifold
Exhaust type: Complex exhaust
Application and purpose:
Vacuum pressure: Common for each station
Exhaust: Released within the operating environment
Release pressure: Same pressure as common PV

+1 The complex exhaust method combines the common exhaust from the end plate and the direct exhaust from each station.

Port layout no. 5
Single unit: ZK2C.A5MOZ-X188/ZK2C.X211
Manifold: ZZK2C.A2C2L-X188/ZK2C.X211

System: Ejector
Body type: Manifold
Exhaust type: Individual port exhaust
Application and purpose:
Vacuum pressure: Common for each station
Exhaust: After piping, individual exhaust is necessary
Release pressure: Same pressure as common PV

Port layout no. 6
Single unit: ZK2C.A5MOZ-X188/ZK2C.X211
Manifold: ZZK2C.A2C2L-X188/ZK2C.X211

System: Ejector
Body type: Manifold
Exhaust type: High-noise reduction silencer exhaust
Application and purpose:
Vacuum pressure: Common for each station
Exhaust: Released within the operating environment
Release pressure: Same pressure as common PV

*1 For the complex exhaust type, an individual exhaust port is provided to each station.
### Port Layout

**Option -D**

#### Port combination: PV ≠ PD

**Circuit example**

#### Port combination: PV ≠ PD

**Circuit example**

#### Port combination: PV ≠ PD

**Circuit example**

<table>
<thead>
<tr>
<th>Port layout no.</th>
<th>Single unit: ZK2A□A5MOZ□□□□□□□□-X188</th>
</tr>
</thead>
<tbody>
<tr>
<td>System</td>
<td>Ejector</td>
</tr>
<tr>
<td>Body type</td>
<td>Single unit</td>
</tr>
<tr>
<td>Exhaust type</td>
<td>Silencer exhaust</td>
</tr>
<tr>
<td>Application</td>
<td>Vacuum pressure</td>
</tr>
<tr>
<td>and purpose</td>
<td>Exhaust</td>
</tr>
<tr>
<td></td>
<td>Released within the operating</td>
</tr>
<tr>
<td></td>
<td>environment</td>
</tr>
<tr>
<td></td>
<td>Release pressure</td>
</tr>
<tr>
<td></td>
<td>PD pressure has to be supplied with</td>
</tr>
<tr>
<td></td>
<td>PV pressure</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Port layout no.</th>
<th>Single unit: ZK2B□A5MOZ□□□□□□□□-X188</th>
</tr>
</thead>
<tbody>
<tr>
<td>System</td>
<td>Ejector</td>
</tr>
<tr>
<td>Body type</td>
<td>Single unit</td>
</tr>
<tr>
<td>Exhaust type</td>
<td>Port exhaust</td>
</tr>
<tr>
<td>Application</td>
<td>Vacuum pressure</td>
</tr>
<tr>
<td>and purpose</td>
<td>Exhaust</td>
</tr>
<tr>
<td></td>
<td>Released within the operating</td>
</tr>
<tr>
<td></td>
<td>environment</td>
</tr>
<tr>
<td></td>
<td>Release pressure</td>
</tr>
<tr>
<td></td>
<td>PD pressure has to be supplied with</td>
</tr>
<tr>
<td></td>
<td>PV pressure</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Port layout no.</th>
<th>Single unit: ZK2G□A5MOZ□□□□□□□□-X188</th>
</tr>
</thead>
<tbody>
<tr>
<td>System</td>
<td>Ejector</td>
</tr>
<tr>
<td>Body type</td>
<td>Single unit</td>
</tr>
<tr>
<td>Exhaust type</td>
<td>Silencer exhaust</td>
</tr>
<tr>
<td>Application</td>
<td>Vacuum pressure</td>
</tr>
<tr>
<td>and purpose</td>
<td>Exhaust</td>
</tr>
<tr>
<td></td>
<td>Released within the operating</td>
</tr>
<tr>
<td></td>
<td>environment</td>
</tr>
<tr>
<td></td>
<td>Release pressure</td>
</tr>
<tr>
<td></td>
<td>PD pressure has to be supplied with</td>
</tr>
<tr>
<td></td>
<td>PV pressure</td>
</tr>
</tbody>
</table>
Port Layout

Option -D

Port combination: Common PV ≠ Common PD

Circuit example

1. The complex exhaust method combines the common exhaust from the end plate and the direct exhaust from each station.

2. For the complex exhaust type, an individual exhaust port is provided to each station.

Single unit: ZK2C5MOZ-P-X211
Manifold: ZZZ2C5X2L-D-X211

Common PV
Common PD
Common EXH
(Including PE)

Common PV
Common PD
Common EXH
(Including PE)

Common PV
Common PD
Individual EXH
(Including PE)

Common PV
Common PD
Individual EXH
(Including PE)

System | Ejector
---|---
Body type | Manifold
Exhaust type | Complex exhaust
Application and purpose | Vacuum pressure: Common for each station, Exhaust pressure: Released within the operating environment

Single unit: ZK2H5MOZ-P-X211
Manifold: ZZZ2H5X2L-D-X211

Common PV
Common PD
Common EXH
(Including PE)

Common PV
Common PD
Common EXH
(Including PE)

Common PV
Common PD
Individual EXH
(Including PE)

Common PV
Common PD
Individual EXH
(Including PE)

System | Ejector
---|---
Body type | Manifold
Exhaust type | High-noise reduction silencer exhaust
Application and purpose | Vacuum pressure: Common for each station, Exhaust pressure: Released within the operating environment

+− +− +−
Common PD
Common PV
Common PD
Common PV

+− +− +−
Common EXH
(Including PE)
Common PV
Common PV

EXH.
Individual exhaust port

EXH.
Individual exhaust port

EXH.
Individual exhaust port

EXH.
Individual exhaust port

EXH.
Individual exhaust port

EXH.
Individual exhaust port

EXH.
Individual exhaust port

EXH.
Individual exhaust port

EXH.
Individual exhaust port
Port Layout

Option -L

Port combination: Individual PV ≠ Common PD

Circuit example

+1 The complex exhaust method combines the common exhaust from the end plate and the direct exhaust from each station.

System | Ejector  
--- | ---  
Body type | Manifold 
Exhaust type | Complex exhaust
Application and purpose | Vacuum pressure: PV pressure can be changed per station. Exhaust: Released within the operating environment. Release pressure: Common PD pressure has to be supplied with individual PV.

Port layout no. 13

Single unit: ZK2CA5MOZ-LLL-X211 
Manifold: ZZK2C-LLL-X211

Port layout no. 14

Single unit: ZK2FA5MOZ-LLL-X211 
Manifold: ZZK2F-LLL-X211

Port layout no. 15

Single unit: ZK2HA5MOZ-LLL-X211 
Manifold: ZZK2H-LLL-X211

For the complex exhaust type, an individual exhaust port is provided to each station.

System | Ejector  
--- | ---  
Body type | Manifold 
Exhaust type | Individual port exhaust
Application and purpose | Vacuum pressure: PV pressure can be changed per station. Exhaust: Released within the operating environment. Release pressure: Common PD pressure has to be supplied with individual PV.
### Dimensions: Single Unit

#### V Port Dimensions

<table>
<thead>
<tr>
<th>V port type</th>
<th>A</th>
<th>B</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Metric size</td>
<td>06</td>
<td>ø6</td>
<td>8.25</td>
</tr>
<tr>
<td></td>
<td>08</td>
<td>ø8</td>
<td>11.4</td>
</tr>
<tr>
<td>Inch size</td>
<td>07</td>
<td>ø1/4&quot;</td>
<td>10.8</td>
</tr>
<tr>
<td></td>
<td>09</td>
<td>ø5/16&quot;</td>
<td>11.4</td>
</tr>
</tbody>
</table>

*1 For the silencer exhaust type, air is exhausted from the slit on both sides. (Do not cover both sides. Allow release from at least one side.)

*2 For the port exhaust type, air is exhausted from the One-touch fitting.

*3 Refer to the Web Catalog for dimensions with a mounting bracket.

*4 Nozzle sizes 12 and 15 have an exhaust port.

*5 Do not apply any external force in the directions of the arrows shown beside G.

*6 When the product is mounted by using a 2 x ø4.5 mounting hole, it is recommended that the M4 screw be tightened with a tightening torque of 0.73 to 0.75 N·m.

*7 Do not block the exhaust port. Otherwise, backflow of exhausted air, which can cause the failure of the product, may occur.

* These figures show the ZK2□-X188/ZK2□-X211.

---

**For high-noise reduction silencer exhaust**

<table>
<thead>
<tr>
<th>Body type: G</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exhaust port*7</td>
</tr>
<tr>
<td>High-noise reduction silencer case assembly</td>
</tr>
</tbody>
</table>

**For port exhaust**

<table>
<thead>
<tr>
<th>Body type: B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exhaust (EXH) port</td>
</tr>
<tr>
<td>Metric size: 06 (ø6)</td>
</tr>
<tr>
<td>Inch size: 09 (ø5/16)</td>
</tr>
</tbody>
</table>

**F (2 : 1)**

With PD port

**H (2 : 1)**

ZK2□-A5MOZ□□□□□□□□-X188

Vacuum break flow-adjusting needle
Dimensions: Manifold

For high-noise reduction silencer exhaust (Body type: H)

For individual port exhaust (Body type: F)

Port Dimensions

<table>
<thead>
<tr>
<th>V port type</th>
<th>A (Hexagon width across flats)</th>
<th>B</th>
<th>C</th>
<th>D</th>
</tr>
</thead>
<tbody>
<tr>
<td>Metric</td>
<td>06 ø6</td>
<td>8.3</td>
<td>4</td>
<td>9.7</td>
</tr>
<tr>
<td></td>
<td>08 ø8</td>
<td>11.4</td>
<td>6</td>
<td>12.3</td>
</tr>
<tr>
<td>Inch</td>
<td>ø1/4&quot;</td>
<td>10.8</td>
<td>4.76</td>
<td></td>
</tr>
<tr>
<td></td>
<td>ø5/16&quot;</td>
<td>11.4</td>
<td>6</td>
<td></td>
</tr>
</tbody>
</table>

Manifold Dimensions

<table>
<thead>
<tr>
<th>Station</th>
<th>L1</th>
<th>L2</th>
<th>L3</th>
<th>L4</th>
<th>L5</th>
<th>L6</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>30</td>
<td>45</td>
<td>60</td>
<td>75</td>
<td>90</td>
<td>105</td>
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<tr>
<td>2</td>
<td>45</td>
<td>60</td>
<td>75</td>
<td>90</td>
<td>105</td>
<td>120</td>
</tr>
<tr>
<td>3</td>
<td>56.8</td>
<td>71.8</td>
<td>86.8</td>
<td>101.8</td>
<td>116.8</td>
<td>131.8</td>
</tr>
<tr>
<td>4</td>
<td>67.5</td>
<td>82.5</td>
<td>97.5</td>
<td>112.5</td>
<td>127.5</td>
<td>142.5</td>
</tr>
<tr>
<td>5</td>
<td>67.5</td>
<td>82.5</td>
<td>97.5</td>
<td>112.5</td>
<td>127.5</td>
<td>142.5</td>
</tr>
<tr>
<td>6</td>
<td>62.5</td>
<td>75</td>
<td>87.5</td>
<td>112.5</td>
<td>125</td>
<td>137.5</td>
</tr>
<tr>
<td>7</td>
<td>73</td>
<td>85.5</td>
<td>98</td>
<td>123</td>
<td>135.5</td>
<td>148</td>
</tr>
<tr>
<td>8</td>
<td>135</td>
<td>150</td>
<td>165</td>
<td>180</td>
<td>195</td>
<td>210.5</td>
</tr>
<tr>
<td>9</td>
<td>150</td>
<td>165</td>
<td>180</td>
<td>205</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>165</td>
<td>180</td>
<td>205</td>
<td>220</td>
<td>235</td>
<td></td>
</tr>
</tbody>
</table>

*1 The individual port exhaust type and high-noise reduction silencer exhaust type do not have exhaust ports.

*2 Do not block the exhaust port. Otherwise, backflow of exhausted air, which can cause the failure of the product, may occur.

*3 Only when common PD port type option (Symbol: -D) is selected (mm: ø6 inch: ø1/4")

*4 Only when the individual supply specification (Symbol: -L) is selected (mm: ø6 inch: ø1/4")

*5 To secure the manifold to the DIN rail, select an option for the manifold model number.

*6 For the complex exhaust type, air is also exhausted from the individual exhaust port of each station in addition to the common exhaust.
⚠️ **Safety Instructions** Be sure to read the “Handling Precautions for SMC Products” (M-E03-3) and “Operation Manual” before use.