Vacuum Unit

**ZK2 Series**

---

**Energy saving ejector**

The digital pressure switch for vacuum with an energy-saving function and the more efficient ejector allow for the supply air to be cut when the pressure reaches the desired vacuum.

**Air consumption**

93% reduction*  
*Based on SMC's measuring conditions

---

**More efficient ejector**

**Suction flow**

50% increase

Compared to other SMC single stage ejectors

---

**Compact / Lightweight**

**Volume** 88 cm³  
28% reduction

**Weight** 81 g  
59% reduction

---

**Reduced-wiring**

D-sub connector/Flat ribbon cable/Individual wiring

---

**High-noise reduction silencer added**

Low noise: 46 dB(A)  
Suction flow rate:
Improved by up to approx. 20% +2

-1 Nozzle size: Ø0.7
-2 Nozzle size: Ø1.5
(Based on SMC’s measuring conditions)

---

Current product

ZK2

---

The ZK2 series has been remodeled.  
Click [here](#) for details.

---

RoHS

---

ZK2  
ZQ  
ZR  
ZB  
ZA  
ZX  
ZM  
ZL  
ZH  
ZH-X267  
ZHP  
ZU  
VQD-V
Vacuum Unit ZK2 Series

Energy saving ejector

Digital pressure switch with energy saving function reduces air consumption by 90%.∗  
Based on SMC’s measuring conditions

More efficient ejector Air consumption 30% reduction∗  
Compared to other SMC single stage ejectors

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

Energy saving efficiency 93% reduction

Power consumption cost per year reduced by 13,070 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>Annual consumption</th>
<th>Exhaust time</th>
<th>Air consumption</th>
</tr>
</thead>
<tbody>
<tr>
<td>ZK2/With energy saving function</td>
<td>957 JPY/year</td>
<td>638 m³/year</td>
<td>0.6 s</td>
<td>58 L/min (ANR)</td>
</tr>
<tr>
<td>Current product</td>
<td>14,025 JPY/year</td>
<td>9,350 m³/year</td>
<td>6 s</td>
<td>85 L/min (ANR)</td>
</tr>
</tbody>
</table>

∗Cost conditions  
- Air unit 1.5 JPY/m³ (ANR), Annual operating cycles: 1100000 (Operating hours: 10 hours/day, Operating days: 250 days/year, 450 cycles/h, When 1 unit are used)

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

Low noise  
46 dB∗(A)  
Nozzle size: ø0.7

Improved by up to approx. 20%

Suction flow rate  
- High-noise reduction silencer exhaust
- Silencer exhaust

Improved by up to approx. 20%

Workpiece
Air
supply
Exhaust
Vacuum
Workpiece
Air
supply
Current
product
Exhaust
Vacuum
Supply valve signal
Atmospheric
pressure
Vacuum port pressure
Vacuum pressure

Supply valve signal
Current product
Energy saving on
silencer
Energy saving
exhaust
Exhaust
Current ejector
Ejector with energy saving switch

Vacuum
Exhaust
Air
supply
Exhaust
Vacuum
Workpiece

Air is supplied and exhausted intermittently when the vacuum decreases.

Air is supplied and exhausted continuously during the adsorption of the workpiece.

High-noise reduction silencer

The exhaust is discharged directly to atmosphere, cutting off the unpleasant frequency while exhibiting the maximum possible vacuum performance.

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

Reduces high frequency range from 2000 to 20000 Hz.

Noise level [dB(A)]

Frequency [Hz]

ZK2A07 (Silencer exhaust)
ZK2G07 (High-noise reduction silencer exhaust)

- High-noise reduction silencer exhaust
- Silencer exhaust

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

Approx. 20%  
- ø1.5
- 80
- 83
- 40
- 67

Smc
**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.
  
  1. The vacuum is maintained during power failure as long as air is supplied.
  2. This can prevent the workpiece from being dropped.
  3. The unit turns on by instantaneous energizing (minimum 20 ms.). Continuous energizing is not necessary.
  4. 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**

**Easier maintenance**

- Transparent filter case allows visual check of the contamination.
- Filter element and the sound absorbing material can be installed/removed without using screws.
- If there is dirt inside the case, it is possible to remove the case and clean it.

**Options**

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

**Mounting**

- Bracket
- Stopper
- Mounting bracket

**ZK2 Series**

- ZQ
- ZR
- ZB
- ZA
- ZX
- ZM
- ZL
- ZH
- ZH-X267
- ZHP
- ZU
- VOD-V
Vacuum Unit ZK2 Series

Vacuum Unit Variations

<table>
<thead>
<tr>
<th>Single Unit Variations</th>
<th>Vacuum Ejector</th>
<th>Vacuum Pump System</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Nozzle size</strong></td>
<td>Ø0.7, Ø1.0, Ø1.2, Ø1.5</td>
<td></td>
</tr>
<tr>
<td><strong>Air pressure supply (PV) port</strong></td>
<td>Ø1/4&quot; One-touch fittings</td>
<td>Ø6, Ø1/4&quot; One-touch fittings</td>
</tr>
<tr>
<td><strong>Vacuum (V) port</strong></td>
<td>Ø6, Ø8 One-touch fittings</td>
<td>Ø6, Ø8 One-touch fittings</td>
</tr>
<tr>
<td></td>
<td>Ø1/4&quot;, Ø5/16&quot; One-touch fittings</td>
<td>Ø1/16&quot;, Ø7/32&quot; One-touch fittings</td>
</tr>
<tr>
<td><strong>Vacuum switch</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Pressure sensor</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Pressure switch for vacuum</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Pressure switch for vacuum with energy saving function</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Without vacuum switch</td>
<td></td>
</tr>
<tr>
<td><strong>Combination of supply valve and release valve</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Supply valve</td>
<td>N.C</td>
</tr>
<tr>
<td></td>
<td>Release valve</td>
<td>N.C</td>
</tr>
<tr>
<td></td>
<td>Self-holding release valve (linked)</td>
<td>N.C</td>
</tr>
<tr>
<td></td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td><strong>Supply valve/Release valve: Rated voltage</strong></td>
<td>12, 24 VDC</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Manifold Variations</th>
<th>Manifold stations</th>
<th>Wiring type</th>
<th>Exhaust type</th>
<th>Air pressure supply (PV) port</th>
<th>Vacuum pressure supply (PV) port</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 to 10 stations</td>
<td></td>
<td>D-sub connector</td>
<td></td>
<td>Ø6, Ø1/4&quot;</td>
<td>Ø8, Ø5/16&quot;</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Flat ribbon cable</td>
<td></td>
<td>Ø8, Ø5/16&quot;</td>
<td>Ø8, Ø5/16&quot;</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Individual wiring</td>
<td></td>
<td>Individual supply</td>
<td>Common supply</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(Option)</td>
<td></td>
</tr>
<tr>
<td><strong>Exhaust type</strong></td>
<td></td>
<td>Complex exhaust</td>
<td></td>
<td>Common supply</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Port exhaust</td>
<td></td>
<td>Individual supply</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>High-noise reduction silencer exhaust</td>
<td></td>
<td>(Option)</td>
<td></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.

**Manifold Variations**

- Individual wiring
- D-sub connector
- Flat ribbon cable
- Individual port exhaust
- High-noise reduction silencer exhaust
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### System/Body Type

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

### 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>

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

### 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 ø is “N”</td>
</tr>
</tbody>
</table>

**Note 7)** Rated voltage for the supply and release valve

### 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”.

**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.

### 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 1 output, unit selection function</td>
</tr>
<tr>
<td>B</td>
<td></td>
<td>–100 to 100</td>
<td>NPN 2 outputs, unit selection function</td>
</tr>
<tr>
<td>C</td>
<td></td>
<td>NPN 2 outputs, unit selection function</td>
<td></td>
</tr>
<tr>
<td>D</td>
<td></td>
<td>PNP 2 outputs, unit selection function</td>
<td></td>
</tr>
<tr>
<td>E</td>
<td></td>
<td>NPN 1 output, unit selection function</td>
<td></td>
</tr>
<tr>
<td>F</td>
<td></td>
<td>PNP 1 output, unit selection function</td>
<td></td>
</tr>
<tr>
<td>G</td>
<td></td>
<td>NPN 1 output, unit selection function</td>
<td></td>
</tr>
<tr>
<td>H</td>
<td></td>
<td>PNP 1 output, unit selection function</td>
<td></td>
</tr>
<tr>
<td>J</td>
<td></td>
<td>NPN 1 output, unit selection function</td>
<td></td>
</tr>
<tr>
<td>K</td>
<td>Digital pressure switch for vacuum with energy saving function</td>
<td>–100 to 100</td>
<td>NPN 1 output, unit selection function</td>
</tr>
<tr>
<td>L</td>
<td></td>
<td>PNP 1 output, unit selection function</td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>Without pressure sensor/digital pressure switch for vacuum</td>
<td></td>
<td></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 Digitals.
### Supply Valve/Release Valve/Digital Pressure Switch for Vacuum Connector Specifications

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Type</th>
<th>Lead wire with connector for pressure switch/sensor</th>
<th>Lead wire with connector</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>A/B/G</td>
<td>C</td>
<td>√</td>
<td>×</td>
<td>Note 11</td>
</tr>
<tr>
<td>C1</td>
<td>L</td>
<td>√</td>
<td>×</td>
<td>Note 14</td>
</tr>
<tr>
<td>L</td>
<td>L1</td>
<td>×</td>
<td>×</td>
<td>Note 15</td>
</tr>
<tr>
<td>L2</td>
<td></td>
<td>×</td>
<td>√</td>
<td>Note 16</td>
</tr>
<tr>
<td>L3</td>
<td></td>
<td>×</td>
<td></td>
<td>Note 15</td>
</tr>
<tr>
<td>W</td>
<td></td>
<td>×</td>
<td></td>
<td>Note 15</td>
</tr>
<tr>
<td>Y</td>
<td></td>
<td>×</td>
<td></td>
<td>Note 15</td>
</tr>
<tr>
<td>Y1</td>
<td></td>
<td>×</td>
<td></td>
<td>Note 15</td>
</tr>
</tbody>
</table>

- **Note 11:** Solenoid valve with light/surge voltage suppressor
- **Note 12:** Standard lead wire length for solenoid valve is 300 mm.
- **Note 13:** When the pressure sensor (P, T) is selected for Pressure Sensor/Digital Pressure Switch for Vacuum Specifications, the standard lead wire length with connector for pressure switch cannot be selected.
- **Note 16:** Select when no pressure switch for vacuum sensor, pressure switch for vacuum connector without lead wire is used.
- **Note 18:** When more than one option is selected, list the option symbols in an alphabetical order. Example: “B” 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 a 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 option, 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.
- **Note 24:** When “J” is selected for Combination of Supply Valve and Release Valve and “W” (with exhaust interference prevention valve) is selected for Optional Specifications, install a release valve or vacuum breaker.
- **Note 25:** When “K, Q, R, S” is selected for Pressure Sensor/Digital Pressure Switch for Vacuum Specifications, models with exhaust interference prevention valve is provided. So, it is not necessary to select “W”.
- **Note 26:** For “F” or “H”, when “L” is selected for Option, the vacuum break flow-adjusting needle option “K” or “JK” can be additionally selected for increased workability.
How to Order Single Unit ZK2 Vacuum Pump System

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>P</td>
<td>Vacuum pump system</td>
<td>Single unit</td>
<td>—</td>
</tr>
<tr>
<td>Q</td>
<td>For manifold</td>
<td>—</td>
<td>—</td>
</tr>
</tbody>
</table>

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

2) 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. Note 3)</td>
<td>None</td>
</tr>
<tr>
<td>R</td>
<td>Self-holding release valve linked</td>
<td>N.C.</td>
</tr>
</tbody>
</table>

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 Note 5)

<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>
</tbody>
</table>

Note 5) Rated voltage for the supply and release valve

4) Pressure Sensor/Digital Pressure Switch for Vacuum Specifications

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Type</th>
<th>Pressure [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 outputs Unit selection function Note 6)</td>
</tr>
<tr>
<td>B</td>
<td></td>
<td>–100 to 100</td>
<td>SI unit only Note 7)</td>
</tr>
<tr>
<td>C</td>
<td></td>
<td></td>
<td>PNP 2 outputs Unit selection function Note 6)</td>
</tr>
<tr>
<td>D</td>
<td></td>
<td></td>
<td>SI unit only Note 7)</td>
</tr>
<tr>
<td>E</td>
<td></td>
<td></td>
<td>NPN 2 outputs Unit selection function Note 6)</td>
</tr>
<tr>
<td>F</td>
<td></td>
<td></td>
<td>SI unit only Note 7)</td>
</tr>
<tr>
<td>G</td>
<td></td>
<td></td>
<td>NPN 2 outputs Unit selection function Note 6)</td>
</tr>
<tr>
<td>H</td>
<td></td>
<td></td>
<td>SI unit only Note 7)</td>
</tr>
<tr>
<td>J</td>
<td></td>
<td></td>
<td>NPN 2 outputs Unit selection function Note 6)</td>
</tr>
<tr>
<td>N</td>
<td>Without pressure sensor/ Digital pressure switch for vacuum</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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

RoHS
The ZK2 series has been remodeled. Click here for details.
Supply Valve/Release Valve/Digital Pressure Switch for Vacuum Connector Specifications

Supply Valve/Release Valve/Digital Pressure Switch for Vacuum Connector Specifications

Symbol
Connector type
Description

C
Common wiring (Plug-in)
Lead wire with connector for pressure switch/sensor (Note 11)

C1
(For manifold)

L
L-type plug connector

L1

L2

L3

Lead wire with connector

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 with energy saving function is used.

Optional Specifications

Symbol
Type
Port size

Nil
Without option

J
Vacuum break flow adjusting needle Round lock nut type

B
With one bracket for mounting a single unit (Mounting screw is attached.)

K
Vacuum break flow adjusting needle Screwdriver operation type

C
Pump system PE port female thread specification (M3) (Note 19)

P
Manifold common release pressure supply specification (Note 17)

D
With individual release pressure supply (PD) port (Note 10)

With individual release pressure supply (PD) port

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

Note 15) When more than one option is selected, list the option symbols in an alphabetical order. Example) -BJ
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 "D" is selected for manifold option, select "P" option for the single unit model number.
Note 18) Refer to page 91 for Function/Application.
Note 19) Use One-touch fitting (M-3AU-4) or barb fitting for piping. (O.D.: within ø5.8)

Single Unit and Options

System/Body type
Vacuum pump system part number
Combination of supply valve 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

P
00
K/R
5
6
A/B/C/D/E/F/H/J
L/L1/L2/L3
L2/L3
N
P/T
A/B/C/D/E/F/H/J
L/L1/L2/L3
L2/L3
N
P/T
A/B/C/D/E/F/H/J
L/L1/L2/L3
L2/L3
N
P/T
A/B/C/D/E/F/H/J
C/C1/L/L1/L2/L3
C/L2/L3
N
P/T
A/B/C/D/E/F/H/J
C/C1/L/L1/L2/L3
C/L2/L3
N
P/T
A/B/C/D/E/F/H/J
C/C1/L/L1/L2/L3
C/L2/L3
N
B/C/D/J/K
6
8
07
09
C

Q

K/R
J
N
P/T
A/B/C/D/E/F/H/J
L/L1/L2/L3
L2/L3
N
P/T
A/B/C/D/E/F/H/J
L/L1/L2/L3
L2/L3
N
P/T
A/B/C/D/E/F/H/J
C/C1/L/L1/L2/L3
C/L2/L3
N
P/T
A/B/C/D/E/F/H/J
C/C1/L/L1/L2/L3
C/L2/L3
N
C

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

**1 Stations**

<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.)

**2 System (Port combination)**

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

**3 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 Complex exhaust (End plate on both sides)</td>
</tr>
<tr>
<td>2</td>
<td>Individual exhaust (Individual port exhaust, High-noise reduction silencer exhaust)</td>
</tr>
</tbody>
</table>

Note 5) Select “C” for System/Body Type for the single unit model number. Air is exhausted not only from the end plate, but also from the exhaust of each station.
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.

**4 Wiring**

<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 (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 10) Select “C,” “C1” for Supply Valve/Release Valve/Digital Pressure Switch for Connector Specifications for the single unit model number.
### Option

<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</td>
</tr>
<tr>
<td>D</td>
<td>With common release pressure supply (PD) port</td>
</tr>
<tr>
<td>L</td>
<td>Manifold individual supply specification</td>
</tr>
</tbody>
</table>

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

Example) -BD

Note 12) DIN rail should be ordered separately. (Refer to page 82.)

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 -D for Optional Specifications for the vacuum pump system single unit model number. Refer to pages 73 to 79 for port layout.

Note 14) Cannot be selected when -L is N

Note 15) When “-L (individual supply)” is selected for Optional Specifications for the single unit model number, specify “-L” for manifold, too.

### How to Order Valve Manifold Assembly

**Example**

ZZK204-A1P-B

- ZZK204-A1P-B - 1 set (Manifold part number)
- ZZK207R5NC1-08 - 1 set (Common wiring specification)
- ZZK210R5NC1-08 - 1 set (Individual wiring specification)

- The asterisk denotes the symbol for assembly.
- Prefix to the single unit part number.

- When the manifold is viewed from V port, the first station starts from the left (D side).
- After the manifold part number, specify the installed single unit from the first station.
- Complex exhaust and individual port exhaust cannot be mixed in the ejector system manifold.
- DIN rail should be ordered separately. (Page 82)

### 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)</td>
</tr>
</tbody>
</table>

Note 16) Kit consists of end plates for both ends and tension bolts.
Vacuum Unit ZK2 Series

Specifications

General Specifications

Operating temperature range: –5 to 50°C (with no condensation)

Fluid

Vibration resistance

- 30 m/s²: Without pressure sensor/switch for vacuum
- 20 m/s²: With switch for vacuum

Impact resistance

- 150 m/s²: Without pressure sensor/switch for vacuum
- 100 m/s²: With switch for vacuum

Note 1) The characteristics are satisfied when tested for 2 hours in each of the X, Y and Z directions at 10 to 500 Hz without energization. (Initial value)

Note 2) The characteristics are satisfied when tested one time in each of the X, Y and Z directions without energization. (Initial value)

Ejector Specifications

<table>
<thead>
<tr>
<th>Item</th>
<th>Model</th>
<th>ZK2-07</th>
<th>ZK2-10</th>
<th>ZK2-12</th>
<th>ZK2-15</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nozzle diameter [mm]</td>
<td>0.7</td>
<td>1.0</td>
<td>1.2</td>
<td>1.5</td>
<td></td>
</tr>
<tr>
<td>Max. suction flow</td>
<td>34</td>
<td>56</td>
<td>74</td>
<td>89</td>
<td></td>
</tr>
<tr>
<td>Silencer exhaust/Complex exhaust [L/min (ANR)]</td>
<td>29</td>
<td>44</td>
<td>61</td>
<td>67</td>
<td></td>
</tr>
<tr>
<td>High-noise reduction silencer exhaust [L/min (ANR)]</td>
<td>34</td>
<td>56</td>
<td>72</td>
<td>83</td>
<td></td>
</tr>
<tr>
<td>Air consumption [L/min (ANR)]</td>
<td>24</td>
<td>40</td>
<td>58</td>
<td>80</td>
<td></td>
</tr>
<tr>
<td>Maximum vacuum pressure [kPa]</td>
<td>–91</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Supply pressure range [MPa]</td>
<td>0.35</td>
<td>0.4 (0.37)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Standard supply pressure [kPa]</td>
<td>0.35</td>
<td>0.4</td>
<td>0.4 (0.37)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note 5) Values at the standard supply pressure. Values are based on standard of SMC measurements. They depend on atmospheric pressure (weather, altitude, etc.) and measurement method.

Note 6) The value in ( ) is for without valve.

Maximum Number of Manifold Stations that Can Operate Simultaneously

<table>
<thead>
<tr>
<th>Item</th>
<th>Model (Nozzle size)</th>
<th>ZK2-07</th>
<th>ZK2-10</th>
<th>ZK2-12</th>
<th>ZK2-15</th>
</tr>
</thead>
<tbody>
<tr>
<td>Complex exhaust</td>
<td>Supply from one side</td>
<td>8</td>
<td>5</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>Individual port exhaust, High-noise reduction silencer exhaust</td>
<td>Supply from both sides</td>
<td>10</td>
<td>7</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>High-noise reduction silencer exhaust</td>
<td>Supply from one side</td>
<td>8</td>
<td>6</td>
<td>6</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Supply from both sides</td>
<td>10</td>
<td>9</td>
<td>9</td>
<td>6</td>
</tr>
</tbody>
</table>

Notes:
- Note 7) The value in ( ) is for without valve. For nozzle size 07 to 12, the value is common to the ejectors with valve and without valve.
- Note 8) As long as the number of stations operated simultaneously is the value on the table or less, then the manifold is available up to 10 stations.

Noise level (Reference values)

<table>
<thead>
<tr>
<th>Item</th>
<th>Model</th>
<th>ZK2-07</th>
<th>ZK2-10</th>
<th>ZK2-12</th>
<th>ZK2-15</th>
</tr>
</thead>
<tbody>
<tr>
<td>Noise level [dB(A)]</td>
<td>ZK2G (High-noise reduction silencer exhaust)</td>
<td>46</td>
<td>55</td>
<td>63</td>
<td>69</td>
</tr>
<tr>
<td></td>
<td>ZK2A (Silencer exhaust)</td>
<td>59</td>
<td>66</td>
<td>75</td>
<td>76</td>
</tr>
</tbody>
</table>

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

Weight

**Single Unit**

- Single unit model
- Weight [g]
  - ZK2P00K (Vacuum pump system, Single unit, Without pressure sensor/switch for vacuum) | 83 |
  - ZK2A (Ejector system, Single unit, Without pressure sensor/switch for vacuum) | 81 |
  - ZK2-CN0NN (Ejector system, Single unit, Without valve) | 54 |
  - ZK2 (One station for manifold, Without pressure sensor/switch for vacuum) | 85 |

**Pressure Sensor/Pressure Switch for Vacuum**

- Pressure sensor/Pressure switch for vacuum model
- Weight [g]
  - ZK2-PS-A (Except cable portion) | 5 |
  - ZK2-ZS0-A (Except lead wire assembly with connector) | 14 |
  - ZK2-ZSV0-A (Except special lead wire assembly with connector) | 14 |

**Manifold Base**

<table>
<thead>
<tr>
<th>Weight [g]</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>129</td>
<td>132</td>
<td>135</td>
<td>138</td>
<td>141</td>
<td>144</td>
<td>147</td>
<td>149</td>
<td>152</td>
<td>155</td>
<td></td>
</tr>
</tbody>
</table>

**Calculation of Weight for the Manifold Type**

((Single unit weight x Number of stations) + (Pressure sensor/Pressure switch for vacuum weight x Number of stations) + Manifold base weight) weight

Example) 5-station manifold with pressure sensors: 85 g x 5 pcs. + 5 g x 5 pcs. + 141 g = 591 g
Ejector Exhaust Characteristics/Flow Rate Characteristics (Representative value)  

**ZK2 Series**

**ZK2-07**

### Exhaust Characteristics

- Suction flow (Port exhaust)
- Suction flow (Silencer exhaust)
- Vacuum pressure
- Air consumption

### Flow Rate Characteristics

- Vacuum pressure
- Suction flow [L/min (ANR)]
- Air consumption

**ZK2-10**

### Exhaust Characteristics

- Suction flow (Port exhaust)
- Suction flow (Silencer exhaust)
- Vacuum pressure
- Air consumption

### Flow Rate Characteristics

- Vacuum pressure
- Suction flow [L/min (ANR)]
- Air consumption

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

**ZK2□12**

**Exhaust Characteristics**

<table>
<thead>
<tr>
<th>Vacuum pressure [kPa]</th>
<th>Suction flow (Port exhaust)</th>
<th>Vacuum pressure</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Suction flow (High-noise reduction silencer exhaust)</td>
<td>Air consumption</td>
</tr>
</tbody>
</table>

**Flow Rate Characteristics**

<table>
<thead>
<tr>
<th>Vacuum pressure [kPa]</th>
<th>Suction flow [L/min (ANR)]</th>
<th>Air consumption</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Port exhaust</td>
<td>Silencer exhaust/Complex exhaust</td>
</tr>
</tbody>
</table>

**ZK2□15**  Note 8) The following graphs show the characteristics of the ejector with valve. (Please contact SMC for models without valve.)

**Exhaust Characteristics**

<table>
<thead>
<tr>
<th>Vacuum pressure [kPa]</th>
<th>Suction flow (Port exhaust)</th>
<th>Vacuum pressure</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Suction flow (High-noise reduction silencer exhaust)</td>
<td>Air consumption</td>
</tr>
</tbody>
</table>

**Flow Rate Characteristics**

<table>
<thead>
<tr>
<th>Vacuum pressure [kPa]</th>
<th>Suction flow [L/min (ANR)]</th>
<th>Air consumption</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Port exhaust</td>
<td>Silencer exhaust/Complex exhaust</td>
</tr>
</tbody>
</table>

**Flow Rate Characteristics**

<table>
<thead>
<tr>
<th>Vacuum pressure [kPa]</th>
<th>Suction flow [L/min (ANR)]</th>
<th>Air consumption</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Port exhaust</td>
<td>Silencer exhaust/Complex exhaust</td>
</tr>
</tbody>
</table>

**Flow Rate Characteristics**

<table>
<thead>
<tr>
<th>Vacuum pressure [kPa]</th>
<th>Suction flow [L/min (ANR)]</th>
<th>Air consumption</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Port exhaust</td>
<td>Silencer exhaust/Complex exhaust</td>
</tr>
</tbody>
</table>

**Flow Rate Characteristics**

<table>
<thead>
<tr>
<th>Vacuum pressure [kPa]</th>
<th>Suction flow [L/min (ANR)]</th>
<th>Air consumption</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Port exhaust</td>
<td>Silencer exhaust/Complex exhaust</td>
</tr>
</tbody>
</table>

**Flow Rate Characteristics**

<table>
<thead>
<tr>
<th>Vacuum pressure [kPa]</th>
<th>Suction flow [L/min (ANR)]</th>
<th>Air consumption</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Port exhaust</td>
<td>Silencer exhaust/Complex exhaust</td>
</tr>
</tbody>
</table>

© SMC
Vacuum Pump System Flow Rate Characteristics/ZK2P00

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

Vacuum Pump System Flow Rate Characteristics

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

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, $P_{max}$ is maximum vacuum pressure and $Q_{max}$ 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 ($P_{max}$).
2. When suction port is opened gradually, air can flow through, (air leakage), suction flow increases, but vacuum pressure decreases. (condition $P_1$ and $Q_1$)
3. When suction port is opened further and fully opened, suction flow moves to maximum value ($Q_{max}$), 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>
</tbody>
</table>

**Provenance**

- **Applicable fluid**: Air/Non-corrosive gas/Incombustible gas
- **Output voltage**: 1 to 5 VDC
- **Output impedance**: Approx. 1 kΩ
- **Power supply voltage**: 10 to 24 VDC ±10%, Ripple (P-P) 10% or less
- **Current consumption**: 15 mA or less
- **Accuracy**: ±2% F.S. (Ambient temperature at 25°C)
- **Linearity**: ±0.4% F.S. or less
- **Repeatability**: ±0.2% F.S. or less
- **Effect of power supply voltage**: ±0.8% F.S. or less
- **Temperature characteristics**: ±2% F.S. or less (Ambient temperature: 25°C reference)
- **Material**
  - **Case**: Resin
  - **Pressure sensing section**: Sensor pressure receiving area: Silicon, O-ring: HNBR
- **Lead wire**: Oilproof heavy-duty cable 2.7 x 3.2 mm (Elliptic), 0.15 mm² 3 cores 3 m

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

<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>NPN or PNP open collector OUT1: General purpose, OUT2: Valve control</td>
</tr>
</tbody>
</table>

| Maximum load current    | 80 mA |
| Maximum applied voltage | 26.4 VDC |
| Residual voltage        | 2 V or less (with load current at 80 mA) |
| Response time           | 2.5 ms or less (Anti-chattering function working: 20, 100, 500, 1000 or 2000 ms selected) |
| Short circuit protection| Yes |

| Repeatability           | ±0.2% F.S. ±1 digit |
| Hysteresis              | Hysteresis mode: Variable (0 or above) |
| Display                 | 3 1/2 digit, 7-segment LED, 1-color display (Red) |
| Display accuracy        | ±2% F.S. ±1 digit (Ambient temperature at 25 ±3°C) |
| Indicator light         | Lights up when output is turned ON. OUT1: Green, OUT2: Red |

| 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 OUT1 is turned ON.
LED display                    Displays the current pressure, set mode and error code.
button (UP)                    Use for switching to the peak display mode.
button (DOWN)                  Selects the mode or decreases the ON/OFF set-value.
button (SET)                   Use for changing the mode or setting the set-value.

Pressure Sensor
ZK2-PS□□□-A

Pressure Switch for Vacuum with Energy Saving Function
ZK2-ZSS□□□-A NPN (Output)
ZK2-ZSVB□□□-A PNP (Output)

Pressure Switch for Vacuum Ejector with Energy Saving Function
ZK2-ZS□□□-A NPN (2 Outputs)
ZK2-ZSV□□□-A PNP (2 Outputs)

Internal Circuit and Wiring Example

ZK2 Series

Digital pressure switch for vacuum with energy saving function

Connector terminal
Lead wire with connector

Output (OUT1) display (Green)
Output (OUT2) display (Red)

button (SET)
button (UP)
button (DOWN)

LED display

button (Set)
button (Down)
button (Up)

Digital pressure switch (NPN Output)

Digital pressure switch (PNP Output)

Pilot valve for release
Pilot valve for supply

Connector assembly (ZK2-LWA20-A)

Connector assembly (ZK2-LWB20-A)

*1 The gray wire (FUNC) is connected when operating the supply valve by energy-saving control (for workpiece adsorption). (Refer to the Operation Manual.)
Port Layout

Standard Products

Port combination: PV ≠ PS = PD

Circuit example

Port combination: Common PV ≠ Common PS = Common PD

Circuit example

Port combination: PV = PS = PD

Circuit example

Note) Nozzle size: 12, 15

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

Port combination: PV = PS = PD

Circuit example

Port combination: PV (≠ PS = PD)

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.
### Standard Products

#### Port Layout

<table>
<thead>
<tr>
<th>Port layout No.</th>
<th>Single unit: ZK2F</th>
<th>Manifold: ZZK2-A2</th>
</tr>
</thead>
<tbody>
<tr>
<td>System</td>
<td>Ejector</td>
<td></td>
</tr>
<tr>
<td>Body type</td>
<td>Manifold</td>
<td></td>
</tr>
<tr>
<td>Exhaust type</td>
<td>Individual port  exhaust</td>
<td></td>
</tr>
<tr>
<td>Application and purpose</td>
<td>Vacuum pressure</td>
<td>Common for each station</td>
</tr>
<tr>
<td></td>
<td>Exhaust</td>
<td>High-noise reduction silencer exhaust</td>
</tr>
<tr>
<td></td>
<td>Release pressure</td>
<td>Same pressure as common PV</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Port layout No.</th>
<th>Single unit: ZK2H</th>
<th>Manifold: ZZK2-A2</th>
</tr>
</thead>
<tbody>
<tr>
<td>System</td>
<td>Ejector</td>
<td></td>
</tr>
<tr>
<td>Body type</td>
<td>Manifold</td>
<td></td>
</tr>
<tr>
<td>Exhaust type</td>
<td>Individual port  exhaust</td>
<td></td>
</tr>
<tr>
<td>Application and purpose</td>
<td>Vacuum pressure</td>
<td>Common for each station</td>
</tr>
<tr>
<td></td>
<td>Exhaust</td>
<td>High-noise reduction silencer exhaust</td>
</tr>
<tr>
<td></td>
<td>Release pressure</td>
<td>Same pressure as common PV</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Port layout No.</th>
<th>Single unit: ZK2P00K-D</th>
</tr>
</thead>
<tbody>
<tr>
<td>System</td>
<td>Vacuum pump</td>
</tr>
<tr>
<td>Body type</td>
<td>Single unit</td>
</tr>
<tr>
<td>Exhaust type</td>
<td>Without silencer</td>
</tr>
<tr>
<td>Application and purpose</td>
<td>Vacuum pressure</td>
</tr>
<tr>
<td></td>
<td>Exhaust</td>
</tr>
<tr>
<td></td>
<td>Release pressure</td>
</tr>
</tbody>
</table>

#### Circuit example

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

**Circuit example**

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

**Port combination: PV ≠ PS ≠ PD**

**Circuit example**

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

Refer to page 79 for the purpose of port and the operating pressure range.
### ZK2 Series

**Port Layout**

#### Option -D

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

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

**Circuit example**

![Circuit example](image1)

**Note** Nozzle size: 12, 15

---

**Port combination: PV = PS ≠ PD**

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

**Circuit example**

![Circuit example](image2)

**Note** Nozzle size: 12, 15

---

**Port combination: PV = PS ≠ PD**

- **Supply valve:** N.C.
- **Release valve:** N.C.

**Circuit example**

![Circuit example](image3)

---

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

---

- **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

For details ⇒ Page 79

---

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

Option -D

Port combination: PV = PS ≠ PD

Circuit example

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

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: Common PV = Common PS ≠ Common PD

Circuit example

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

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

Port combination: Common PV = Common PS ≠ Common PD

Circuit example

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

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

Option -D
Port combination: Common PV = Common PS ≠ Common PD

Circuit example

Option -L
Port combination: Individual PV ≠ Common PS = Common PD

Circuit example

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

Port combination: Individual PV ≠ Common PS = Common PD

Circuit example

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

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

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>Vacuum source (Vacuum pump)</td>
</tr>
<tr>
<td>PS</td>
<td>Pilot pressure supply port</td>
<td>Compressed air supply for pilot valve</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 –100 kPa</td>
</tr>
<tr>
<td>V</td>
<td>Vacuum port</td>
<td>For connecting adsorption equipment including pad</td>
<td>0 to 0.6 MPa (PD ≤ PV)</td>
</tr>
<tr>
<td>EXH</td>
<td>Exhaust port</td>
<td>Exhaust when ejector operates*3</td>
<td>0 to 0.6 MPa (PD ≤ PS)</td>
</tr>
<tr>
<td>PE</td>
<td>Pilot pressure exhaust port</td>
<td>Exhaust when valve operates*3</td>
<td></td>
</tr>
</tbody>
</table>

*1) For models without valve, pressure can be 0.3 MPa or less.
*2) For ejectors with silencer, air exhausts from A (slit on both sides). For port exhaust type, air exhausts from B.
*3) Pilot pressure for ejectors is exhausted from the ejector and the common exhaust. Pump system exhausts air from PE port on the spacer. (Female thread type (M3) is available by option (-C) for PE port of the pump system.)
### Construction

**With Pressure Sensor**

**With Pressure Switch for Vacuum**

**With High-noise Reduction Silencer**

---

#### 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</td>
<td>Case body: Polycarbonate (Refer to Specific Product Precautions on page 95.)</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>With One-touch fitting and filter element (Case material: Polycarbonate)</td>
</tr>
<tr>
<td>9</td>
<td>Sound absorbing material</td>
<td>Nominal filtration rating: 30 μm, 10 pcs. per set</td>
</tr>
<tr>
<td>10</td>
<td>Vacuum port adapter assembly</td>
<td>For replacement or addition for manifold exhaust interference prevention (10 pcs. per set)</td>
</tr>
<tr>
<td>11</td>
<td>Filter element</td>
<td>With 2 screws and 1 gasket</td>
</tr>
<tr>
<td>12</td>
<td>Check valve</td>
<td>With sound absorbing material (Part number: ZK2-SE4-6-A)</td>
</tr>
</tbody>
</table>
Replacement Parts/How to Order

**Valve assembly**

- ZK2 - VA: For ejector system
- ZK2 - VA: For vacuum pump system

**Applicable system**

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

**Valve type**

- For double
- For single

**Rated pressure range and function**

- E: 0 to –101 kPa
- F: –100 to 100 kPa
- V: –100 to 100 kPa

**Rated pressure range and function**

- Pressure switch for vacuum: Open collector 2 outputs
- Pressure switch with energy saving function: Open collector 1 output

**Output specifications**

- A: NPN
- B: PNP

**Unit specifications**

- Nil: Unit selection function
- M: SI unit only

**Lead wire with connector**

- Nil when ending with connector (Length 2 m)
- Mounted to the single unit
- Mounted to the manifold

**Mounting**

- Nil: Mounted to the single unit
- L: Mounted to the manifold

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

- When E or F: For pressure switch for vacuum, Lead wire with connector (Length 2 m)
- When V: For switch with energy saving function, Lead wire with connector (Length 2 m)

**Sound absorbing material**

- ZK2 - SE1: 1 – A
- Nil: Mounted to the single unit
- L: Mounted to the manifold

**Sound absorbing material holes diameter**

- 300 μm

**One-touch fitting assembly**

- Purchasing order is available in units of 10 pieces.
- KJH: 04 – C2

**Port size**

- 04: ø4 One-touch fitting (Straight)
- 06: ø6 One-touch fitting (Straight)
- 03: ø5/32” One-touch fitting (Straight)
- 07: ø1/4” One-touch fitting (Straight)

**Nominal filtration rating**

- 30 μm

**Pressure sensor assembly**

- 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

**Exhaust port size**

- 04: ø4 For nozzle size 07, 10
- 06: ø6 For nozzle size 12, 15

**Check valve**

- ZK2 - CV: 10 pcs. per set

Note: When mounting a check valve additionally, the workpiece may not be removed unless vacuum release pressure is applied.
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, HNBR, NBR and steel are also used.</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>End plate U assembly</td>
<td>Resin, Electroless nickel plated brass, resin, steel and NBR are used.</td>
<td></td>
</tr>
</tbody>
</table>

Replacement Parts

<table>
<thead>
<tr>
<th>No.</th>
<th>Description</th>
<th>Material</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>Tension bolt assembly</td>
<td>2 pcs. per set</td>
<td></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>
<td></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>
<td></td>
</tr>
<tr>
<td>6</td>
<td>One-touch fitting assembly</td>
<td>Metric size: ø8, Inch size: ø5/16&quot;</td>
<td></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>
<td></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>
<td></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>
<td></td>
</tr>
</tbody>
</table>

Note) When ordering a manifold “ZZK2-01-01-A” on page 64, 1 to 3 are delivered as a set.

Replacement Parts/How to Order

1. Remove two tension bolts.
2. Be careful not to drop the gasket.
3. Mount a single unit to the end surface of U side.
4. Tightening torque: 0.75 N·m
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)]

1) Remove the tension bolt.
2) Remove the end plate U.
3) Remove the valve assembly of a single unit for extra station(s) for manifold.
4) Remove the switch assembly if it is present. (Be careful not to drop the O-ring. Refer to Fig.1)
5) Remove the junction box B (top) using a precision screwdriver. (Refer to Fig.2)
6) Mount the extra connector to the junction box B. (Refer to Fig.3-A) (Engage the recess of the connector and the protrusion of the junction box B. (Refer to Fig.3-A)
7) 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.)
8) Mount the end plate U with the appropriate length of tension bolts for the number of stations required. (Tightening torque: 0.75 N·m.)
9) Mount the junction box B to the junction box A.
10) Assemble the valve assembly. (Tightening torque: 0.15 N·m)
11) For products with a switch, mount the switch assembly.

(Refer to the dimensional drawing of the product for 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]

1) Remove the valve assembly for all stations. (Single unit for extra station is also removed.)
2) Remove the switch assembly if it is present. (Be careful not to drop the O-ring. Refer to Fig.1)
3) Remove the junction box B (top) for all stations using a precision screwdriver. (Refer to Fig.2)
4) Remove all connectors mounted to the junction box B. (Be careful not to break the connector clip.)
5) Remove the tension bolt.
6) Remove the end plate D assembly.
7) Remove the connector housing assembly from the end plate D assembly. (Refer to Fig.4)
8) Mount the connector housing assembly for extra station(s) to the end plate D assembly. (Refer to Fig.4) (Insert two clips of the housing mounting surface to the square holes of the end plate, and slide the connector housing assembly.)
9) Remove the end plate U. (Be careful not to drop the gasket.)
10) Mount a single unit for extra station(s) for manifold to the end surface of U side. Do not let the gasket get caught.
11) 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.)
12) Mount the connector for all stations to the junction box B. (Refer to Fig.3-A) (Engage the recess of the connector and the protrusion of the junction box B. (Refer to Fig.3-A)
13) 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.)
14) Assemble the valve assembly. (Tightening torque: 0.15 N·m)
15) For products with a switch, mount the switch assembly.

(Refer to the dimensional drawing of the product for tightening torque: 0.08 to 0.10 N·m)

When adding a pump system, the pump spacer for extra station is also removed.

Connector housing assembly

ZK2 – CH 204 – A

Applicable stations

<table>
<thead>
<tr>
<th>Station</th>
<th>Description</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>Description</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>

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.)

KQ2P – 06

Model and dimensions

<table>
<thead>
<tr>
<th>Code</th>
<th>Applicable size</th>
<th>A</th>
<th>L</th>
<th>D</th>
<th>Weight (g)</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>06</td>
<td>ø6</td>
<td>18</td>
<td>35</td>
<td>8</td>
<td>1</td>
<td>White</td>
</tr>
<tr>
<td>08</td>
<td>ø8</td>
<td>20.5</td>
<td>36</td>
<td>10</td>
<td>2</td>
<td>White</td>
</tr>
<tr>
<td>07</td>
<td>ø1/4&quot;</td>
<td>18</td>
<td>35</td>
<td>8.5</td>
<td>1</td>
<td>Orange</td>
</tr>
<tr>
<td>09</td>
<td>ø5/16&quot;</td>
<td>20.5</td>
<td>36</td>
<td>10</td>
<td>2</td>
<td>Orange</td>
</tr>
</tbody>
</table>

ZK2 ZQ ZR ZB ZA ZX ZM ZL ZH ZH-X267 ZHP ZU VQD-V
**ZK2 Series**

**Dimensions: Single Unit**

**ZK2G□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: ø8 (ø8)

Inch size: ø9 (ø5/16")

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

+5 Nozzle size 12 and 15 have exhaust port.

+6 Refer to page 66 for the part number and maintenance of the high-noise reduction silencer case assembly.

**ZK2P00□NL2□**

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

**PE port female thread specification**

Pilot pressure exhaust port

Vacuum pressure supply (PV) port

Pilot pressure supply (PS) port

Metric size: ø4

Inch size: ø5/32"

**PV port type**

<table>
<thead>
<tr>
<th>Metric size</th>
<th>ø6</th>
<th>ø6</th>
<th>ø7/16</th>
<th>ø7/16</th>
</tr>
</thead>
<tbody>
<tr>
<td>9.7</td>
<td>12.3</td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

**V port type**

<table>
<thead>
<tr>
<th>Metric size</th>
<th>ø6</th>
<th>ø6</th>
<th>ø7</th>
<th>ø7</th>
</tr>
</thead>
<tbody>
<tr>
<td>8.25</td>
<td>10.8</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

+1 Refer to page 87 for dimensions with a mounting bracket.
### Dimensions: Single Unit

**ZK2**

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

#### ZK2 □ J □ NL2 □

- Manual override (Supply valve)
- Exhaust port
- High-noise reduction silencer case assembly

#### ZK2 □ H □ N0NN □

- Locking position
- Suction filter
- 2 x ø4.5 Mounting hole

---

**For high-noise reduction silencer exhaust**

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

**For port exhaust**

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

---

**ZK2 Series**

Vacuum Unit

---

**PV port type**

<table>
<thead>
<tr>
<th>Metric size</th>
<th>06</th>
<th>ø6</th>
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</thead>
<tbody>
<tr>
<td>Inch size</td>
<td>07</td>
<td>ø1/4&quot;</td>
<td>12.3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>V port type</th>
<th>A</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Metric size</td>
<td>06</td>
<td>ø6</td>
</tr>
<tr>
<td>Inch size</td>
<td>08</td>
<td>ø3/32&quot;</td>
</tr>
</tbody>
</table>

---

**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>06</th>
<th>ø6</th>
<th>9.7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inch size</td>
<td>07</td>
<td>ø1/4&quot;</td>
<td>12.3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>V port type</th>
<th>A</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Metric size</td>
<td>06</td>
<td>ø6</td>
</tr>
<tr>
<td>Inch size</td>
<td>08</td>
<td>ø3/32&quot;</td>
</tr>
</tbody>
</table>

---

**Notes:**

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. Nozzle size 12 and 15 have exhaust port.
5. Refer to page 96 for the part number and maintenance of the high-noise reduction silencer case assembly.
6. Refer to page 87 for dimensions with a mounting bracket.
Dimensions: Single Unit

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

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

+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.

---

**For high-noise reduction silencer exhaust**

**For port exhaust**

---

**Connector terminal**

OUT2 display (Red)
OUT1 display (Green)
S button (SET)
LED display
button (UP)
button (DOWN)

---

+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**

**V port type**

<table>
<thead>
<tr>
<th>A</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Metric</td>
<td>06 ø6</td>
</tr>
<tr>
<td>Inch</td>
<td>07 ø1/4&quot;</td>
</tr>
</tbody>
</table>

**PV port type**

<table>
<thead>
<tr>
<th>B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Metric</td>
</tr>
<tr>
<td>Inch</td>
</tr>
</tbody>
</table>

---

**ZK2 Series**
Dimensions: Single Unit

**ZK2**

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

- **Connector terminal**
- **OUT2 display (Red)**
- **OUT1 display (Green)**
- **S button (SET)**
- **LED display**
- **button (UP)**
- **button (DOWN)**

- **Manual override (Supply valve)**
- **Manual override (Release valve)**

*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.

<table>
<thead>
<tr>
<th>V port type</th>
<th>A</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Metric size</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ø6</td>
<td>8.25</td>
<td>4</td>
</tr>
<tr>
<td>Ø8</td>
<td>11.4</td>
<td>6</td>
</tr>
<tr>
<td>Inch size</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ø1/4&quot;</td>
<td>10.8</td>
<td>4.76</td>
</tr>
<tr>
<td>Ø5/16&quot;</td>
<td>11.4</td>
<td>6</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>PV port type</th>
<th>B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Metric size</td>
<td></td>
</tr>
<tr>
<td>Ø6</td>
<td>9.7</td>
</tr>
<tr>
<td>Ø1/4&quot;</td>
<td>12.3</td>
</tr>
<tr>
<td>Inch size</td>
<td></td>
</tr>
</tbody>
</table>

With bracket

- **2 x Ø4.6**
- **2 x 4.5 Mounting hole**
- **Vacuum (V) port**

*Mounting bracket for single unit (Option). [Nuts and bolts are included.]

Part number: ZK2-BK1-A
For port exhaust
Exhaust (EXH) port
Metric size: ø8
Inch size: ø5/16

For high-noise reduction silencer exhaust

PS and PD port dimensions *1, *4

<table>
<thead>
<tr>
<th>Port type</th>
<th>A</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>
</tr>
<tr>
<td>Inch size</td>
<td>08</td>
<td>11.4</td>
<td>6</td>
<td>—</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Number of stations</th>
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<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
</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>
<td>135</td>
<td>150</td>
<td>165</td>
</tr>
<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>
<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>
<td>L4</td>
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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>
<td>187.5</td>
<td>202.5</td>
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<td>125</td>
<td>137.5</td>
<td>150</td>
<td>162.5</td>
<td>185.7</td>
<td>200</td>
</tr>
<tr>
<td>L6</td>
<td>73</td>
<td>85.5</td>
<td>98</td>
<td>123.5</td>
<td>135.5</td>
<td>148</td>
<td>160.5</td>
<td>173</td>
<td>198</td>
<td>210.5</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 Only 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)
**Dimensions: Manifold D-sub Connector**

**ZZK2□-□□F**

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

---

**Port Exhaust**

- **PE port female thread specification (ZZK2□-□□F)**
- **Pilot pressure exhaust port**
- **Common supply (PD) port**
- **Common exhaust (EXH) port**
- **Vacuum (V) port**

**For high-noise reduction silencer exhaust**

**For port exhaust**

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

**Number of stations**

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10

---

**Table: Port Exhaust Specifications**

<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>
<td>Metric</td>
<td>06</td>
<td>8.3 4 9.7 8.7</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>07</td>
<td>10.8 4.76 12.3 11.3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inch size</td>
<td>09</td>
<td>11.4 6</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

---

**Notes:**

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□-□-□-□-□-□**

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

---

**Common pilot pressure supply (PS) port**

**Common exhaust (EXH) port**

**Common supply (PD) port**

**Inch size: 2 x ø5/16”**

**Metric size: 2 x ø8**

**Common supply (PV) port**

**n x Vacuum (V) port** (Built-in suction filter)

**Vacuum break flow adjusting needle**

---

**For port exhaust**

**PE port female thread specification (ZZK2□-□-□-□-□)**

**Pilot pressure exhaust port**

**M3**

---

**For high-noise reduction silencer exhaust**

**PS and PD port dimensions**

---

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

**4 x M4 Mounting hole**

---

<table>
<thead>
<tr>
<th>Port type</th>
<th>A</th>
<th>Hexagon width across flats B</th>
<th>C</th>
<th>D</th>
</tr>
</thead>
<tbody>
<tr>
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<td>8.3</td>
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<td>9.7</td>
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<tr>
<td>Inch size</td>
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<td>10.8</td>
<td>4.76</td>
<td>12.3</td>
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<tr>
<td>08</td>
<td>11.4</td>
<td>6</td>
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<td>—</td>
</tr>
<tr>
<td>09</td>
<td>11.4</td>
<td>6</td>
<td>—</td>
<td>—</td>
</tr>
</tbody>
</table>

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**Number of stations**

<table>
<thead>
<tr>
<th>L1</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
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<th>6</th>
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<tbody>
<tr>
<td>30</td>
<td>45</td>
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<td>90</td>
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<td>146.8</td>
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<td>198</td>
<td>210.5</td>
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</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 (26P)(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</td>
<td>(+)</td>
</tr>
<tr>
<td>2 stations</td>
<td>2</td>
<td>(+)</td>
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<tr>
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<td>(+)</td>
</tr>
<tr>
<td>COM</td>
<td>COM</td>
<td>(+)</td>
</tr>
</tbody>
</table>

Positive common specification

(+) Negative common specification

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

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

Flat Ribbon Cable 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</td>
<td>(+)</td>
</tr>
<tr>
<td>2 stations</td>
<td>2</td>
<td>(+)</td>
</tr>
<tr>
<td>3 stations</td>
<td>3</td>
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<tr>
<td>7 stations</td>
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</tr>
<tr>
<td>8 stations</td>
<td>8</td>
<td>(+)</td>
</tr>
<tr>
<td>9 stations</td>
<td>9</td>
<td>(+)</td>
</tr>
<tr>
<td>10 stations</td>
<td>10</td>
<td>(+)</td>
</tr>
<tr>
<td>11</td>
<td>11</td>
<td>(+)</td>
</tr>
<tr>
<td>12</td>
<td>12</td>
<td>(+)</td>
</tr>
<tr>
<td>13</td>
<td>13</td>
<td>(+)</td>
</tr>
<tr>
<td>14</td>
<td>14</td>
<td>(+)</td>
</tr>
<tr>
<td>15</td>
<td>15</td>
<td>(+)</td>
</tr>
<tr>
<td>16</td>
<td>16</td>
<td>(+)</td>
</tr>
<tr>
<td>17</td>
<td>17</td>
<td>(+)</td>
</tr>
<tr>
<td>18</td>
<td>18</td>
<td>(+)</td>
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<tr>
<td>19</td>
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<td>(+)</td>
</tr>
<tr>
<td>20</td>
<td>20</td>
<td>(+)</td>
</tr>
<tr>
<td>21</td>
<td>21</td>
<td>(+)</td>
</tr>
<tr>
<td>22</td>
<td>22</td>
<td>(+)</td>
</tr>
<tr>
<td>23</td>
<td>23</td>
<td>(+)</td>
</tr>
<tr>
<td>24</td>
<td>24</td>
<td>(+)</td>
</tr>
<tr>
<td>25</td>
<td>25</td>
<td>(+)</td>
</tr>
<tr>
<td>COM</td>
<td>COM</td>
<td>(+)</td>
</tr>
</tbody>
</table>

Positive common specification

(+) Negative common specification

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

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

Optional Specifications/Functions/Applications

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Type</th>
<th>Function/Application</th>
</tr>
</thead>
<tbody>
<tr>
<td>B</td>
<td>Bracket</td>
<td>Use when a single unit is mounted to the floor in an upright position is requested. (When ordering only bracket, refer to page 87)</td>
</tr>
<tr>
<td>C</td>
<td>PE port</td>
<td>Use for pilot pressure exhaust piping (Standard pump system is released to the atmosphere)</td>
</tr>
<tr>
<td>D</td>
<td>PD port</td>
<td>Use when supply pressure for vacuum release which pressure is different from the ejector supply pressure is requested.</td>
</tr>
<tr>
<td>J</td>
<td>Vacuum break adjusting needle</td>
<td>Round lock nut improves operability when manifold, pump system, or exhaust port type is used.</td>
</tr>
<tr>
<td>K</td>
<td>Screwdriver operation type</td>
<td>Slotted type improves fine adjustment performance when manifold, pump system, or exhaust port type is used.</td>
</tr>
<tr>
<td>L</td>
<td>Individual supply port</td>
<td>Adjust the supply pressure individually for manifold in order to adjust the vacuum pressure reached by each ejector.</td>
</tr>
<tr>
<td>P</td>
<td>Common release pressure supply specification</td>
<td>When selecting &quot;D&quot; (with common release pressure supply (PD) port) for manifold option, supplying a pressure which is different from common PV to common PD is requested.</td>
</tr>
<tr>
<td>W</td>
<td>Exhaust interference prevention valve</td>
<td>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.</td>
</tr>
</tbody>
</table>
## ZK2 Series

### Cable Assembly

**D-sub Connector**

<table>
<thead>
<tr>
<th>Cable Assembly (Option)</th>
<th>Assembly part number</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cable length (L)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.5 m</td>
<td>AXT100-DS25-015</td>
<td></td>
</tr>
<tr>
<td>3.0 m</td>
<td>AXT100-DS25-030</td>
<td></td>
</tr>
<tr>
<td>5.0 m</td>
<td>AXT100-DS25-050</td>
<td></td>
</tr>
</tbody>
</table>

For other commercial connectors, use a 25-pin type with female connector conforming to MIL-C-24308.

Cannot be used for movable wiring.

---

### Flat Ribbon Cable Connector Assembly (Option)

<table>
<thead>
<tr>
<th>Cable length (L)</th>
<th>Assembly part number</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.5 m</td>
<td>AXT100-FC26-1</td>
</tr>
<tr>
<td>3.0 m</td>
<td>AXT100-FC26-2</td>
</tr>
<tr>
<td>5.0 m</td>
<td>AXT100-FC26-3</td>
</tr>
</tbody>
</table>

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

Cannot be used for movable wiring.

---

### Electrical Characteristics

<table>
<thead>
<tr>
<th>Item</th>
<th>Property</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conductor resistance W/km, 20°C</td>
<td>65 or less</td>
</tr>
<tr>
<td>Voltage limit V, 1 min, AC</td>
<td>1000</td>
</tr>
<tr>
<td>Insulation resistance MΩ/km, 20°C</td>
<td>5 or more</td>
</tr>
</tbody>
</table>

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

---

### Connector manufacturers' example

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


**Supply Valve / Release Valve**

**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.

   ![Valve assembly diagram]

   - 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)

   ![Wiring diagram]

   - 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.

6. Air leakage
   - Zero air leakage is not guaranteed for the supply valve or release valve. Be aware that because there is a chance of air and vacuum leakage, the pressure may change if the V port side is tightly sealed.
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.

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.

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.

| ZK2-LVSC-A | Connector assembly for single (For with supply valve, no release valve) |
| ZK2-LVWM-A | Connector assembly for double (For with both supply valve and release valve) |

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

Note) Do not pull the lead wire with a force of 25 N or more, as this may damage the connector or cover.

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.

• 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.)

• 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”</td>
<td>6</td>
</tr>
<tr>
<td>ø1/4”</td>
<td>4.76</td>
</tr>
</tbody>
</table>

Surge Voltage Intrusion

Suction Filter

Plug Connector

Caution

Be sure to read this before handling the products.
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).

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.

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.

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).

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.

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 inadequate for adhesion, 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 graph]

**Caution**

**Port Size of Single Unit**

**Port Size**

<table>
<thead>
<tr>
<th>Port</th>
<th>Size</th>
<th>Ejector System</th>
<th>Vacuum Pump System</th>
</tr>
</thead>
<tbody>
<tr>
<td>PV</td>
<td>ø6</td>
<td>ø1/4&quot;</td>
<td>ø6</td>
</tr>
<tr>
<td>V</td>
<td>ø8</td>
<td>ø1/4&quot;, ø5/16&quot;</td>
<td>ø8, ø8</td>
</tr>
<tr>
<td>EXH</td>
<td>ø8</td>
<td>ø5/16&quot;</td>
<td>—</td>
</tr>
<tr>
<td>PE</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>PS</td>
<td>—</td>
<td>—</td>
<td>ø4, ø5/32&quot;</td>
</tr>
<tr>
<td>PD</td>
<td>ø62</td>
<td>M3</td>
<td>—</td>
</tr>
</tbody>
</table>

---: Not applicable

*1 Piping for PE port is available as an option (M3). (Refer to page 63.)

*2 A model with PD port is available as an option. (Refer to pages 61 and 63.)

**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.

- To hold the ejector onto the DIN rail, hold it from both sides using the stopper brackets.

![Diagram showing how to mount a single unit]

2. To mount a single unit onto the floor, use the optional bracket.
Specific Product Precautions 6

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.

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.

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.

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>Common PV port</th>
<th>Common PS/PD ports</th>
<th>Application</th>
</tr>
</thead>
<tbody>
<tr>
<td>ø8 One-touch</td>
<td>Ejector common exhaust + PV = PS = PD specification</td>
<td></td>
</tr>
<tr>
<td>ø6 One-touch</td>
<td>Ejector individual exhaust + PV = PS = PD</td>
<td></td>
</tr>
<tr>
<td>ø6 One-touch</td>
<td>Pump system + PV is PD</td>
<td></td>
</tr>
<tr>
<td>ø6 One-touch</td>
<td>Pump system + PV ≠ PS = PD</td>
<td></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 tighten the handle 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

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

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.

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.

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.

Environment

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.
ZK2 Series
Specific Product Precautions 8
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 Digital Pressure Switch with Energy Saving Function

| 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

93% reduction*2

*2 Based on SMC’s measuring conditions

The digital pressure switch for vacuum with an energy-saving function and the more efficient ejector allow for the supply air to be cut when the pressure reaches the desired vacuum.

Typical Operation Pattern

- For single unit: -X188
- For manifold: -X211

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

How to Order Single Unit

**Single unit**

<table>
<thead>
<tr>
<th>Symbol</th>
<th>System</th>
<th>Body type</th>
<th>Exhaust type</th>
<th>Nominal nozzle size</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>A</td>
<td>12</td>
<td>MO</td>
<td>Ø6 (mm), Ø1/4&quot; (inch)</td>
</tr>
</tbody>
</table>

Supply valve: N.O./Release valve: N.C.  
*With light/surge voltage suppressor  
*M plug connector, Without connector

**For manifold**

<table>
<thead>
<tr>
<th>Symbol</th>
<th>System</th>
<th>Body type</th>
<th>Exhaust type</th>
<th>Nominal nozzle size</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>C</td>
<td>12</td>
<td>MO</td>
<td>Ø8 (mm), Ø5/16&quot; (inch)</td>
</tr>
</tbody>
</table>

**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>

**Digital pressure switch for vacuum connector specifications**

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Type</th>
<th>Pressure range [kPa]</th>
</tr>
</thead>
</table>
| K      | Digital pressure switch for vacuum with energy-saving function | Unit selection function 
| Q      | Digital pressure switch for vacuum with energy-saving function | Unit selection function 
| R      | Vacuum break flow-adjusting needle | Round lock nut type |
| S      | Vacuum break flow-adjusting needle | Screwdriver operation type |

**Optional specifications (Single unit)**

<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 one bracket for mounting a single unit (Mounting screws are attached)</td>
</tr>
<tr>
<td>D</td>
<td>With individual release pressure supply (PD port)</td>
</tr>
<tr>
<td>E</td>
<td>Long lock nut specification: Screwdriver operation type</td>
</tr>
<tr>
<td>J</td>
<td>Vacuum break flow-adjusting needle: Round lock nut type</td>
</tr>
<tr>
<td>K</td>
<td>Vacuum break flow-adjusting needle: Screwdriver operation type</td>
</tr>
</tbody>
</table>

**Optional specifications (For manifold)**

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>E</td>
<td>Long lock nut specification: Screwdriver operation type</td>
</tr>
<tr>
<td>J</td>
<td>Vacuum break flow-adjusting needle: Round lock nut type</td>
</tr>
<tr>
<td>K</td>
<td>Vacuum break flow-adjusting needle: Screwdriver operation type</td>
</tr>
<tr>
<td>L</td>
<td>Manifold individual supply specification</td>
</tr>
<tr>
<td>P</td>
<td>With common release pressure supply (PD) port</td>
</tr>
</tbody>
</table>

**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>Metric size</td>
<td>Ø8 One-touch fitting</td>
</tr>
<tr>
<td>07</td>
<td>Inch size</td>
<td>Ø1/4&quot; One-touch fitting</td>
</tr>
<tr>
<td>09</td>
<td>Inch size</td>
<td>Ø5/16&quot; One-touch fitting</td>
</tr>
</tbody>
</table>

Supply port (PV) size of single unit: Ø6 (mm), Ø1/4" (inch)  
*4 Rated voltage for the supply and release valve

---

1. Port size: Ø6 (mm), Ø5/8" (inch)  
2. The complex exhaust method combines the common exhaust from the end plate and the direct exhaust from each station.

---

5. When more than one option is selected, list the option symbols in alphabetical order. Example) BJK  
6. Fixed unit: kPa

---

11. When more than one option is selected, list the option symbols in alphabetical order. Example) FJK  
12. For **System/Body type** "F" or "H," when "L" is selected for  
13. Select the body for the manifold. Select "L" for the manifold type. When the common supply and individual supply are mixed, please contact SMC.  
14. When "D" is selected as a manifold option, select option "P" for the single unit model number.  
15. Combinations of "EJ," "EK," and "EJK" are not available.
Vacuum Ejector with Energy-saving Function ZK2☐-X188/ZK2☐-X211

How to Order Manifold

ZZK2 04- A1 L - - - X211

1 Stations
Symbol | Stations
--- | ---
01 | 1 station
10 | 10 stations

2 System (Port combination)
Symbol | System | Port | Standard
--- | --- | --- | ---
A | Ejector system | Common PV: ø8 | Inch size
AN | Ejector system | Common PV: ø5/16" | Metric size

3 Exhaust
Symbol | Type
--- | ---
1 | Ejector system: Complex exhaust¹,³
2 | Ejector system: Individual exhaust²
(Individual port exhaust, High-noise reduction silencer exhaust)

- Select “C” for System/Body type for the single unit model number. Air is exhausted not only from the end plate but also from the exhaust of each station.
- Select “F” or “H” for System/Body type for the single unit model number.
- Select “C” for System/Body type for the single unit model number.
- The complex exhaust method combines the common exhaust from the end plate and the direct exhaust from each station.

4 Option
Symbol | Type
--- | ---
A | With vacuum pressure switch
B | With vacuum pressure switch
C | With vacuum pressure switch
D | With DIN rail mounting bracket
E | With DIN rail mounting bracket
L | With common release pressure supply (PD) port
M | Without option

- When more than one option is selected, list the option symbols in alphabetical order.
- Select “B” for DIN rail mounting.
- Select option “P” for the ejector system single unit model number.
- When “L (individual supply)” is selected for Optional specifications for the single unit model number, specify “-L” for the manifold, too.
- A combination of “DL” is not available.

5 Manifold Assembly (Delivery condition)
Symbol | Type
--- | ---
A | Individual units assembled delivered as a manifold
B | Delivered as individual parts (not assembled)

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

How to Order Valve Manifold Assembly

Example

ZK2C12A5MOZQW-08-X211
ZK2C10A5MOZQW-08-X211
ZZK204-A1L-B-X211

Valve Specifications

<table>
<thead>
<tr>
<th>Model</th>
<th>Supply valve</th>
<th>Release valve</th>
</tr>
</thead>
<tbody>
<tr>
<td>ZK2☐-X188</td>
<td>SYJ524-SMOZ-Q</td>
<td>SYJ524-SMOZ-Q</td>
</tr>
<tr>
<td>ZK2☐-X211</td>
<td>SYJ314-SMOZ-Q</td>
<td>SYJ314-SMOZ-Q</td>
</tr>
</tbody>
</table>

Type of actuation
- N.O.: Normally Open
- N.C.: Normally Closed

Rated voltage
- 0.15 MPa to 0.6 MPa
- 24 VDC
- 0.4 W

Maximum vacuum pressure
- 0.45 (For X211)

Supply pressure range
- 0.15 to 0.6

Standard supply pressure
- 0.35
- 0.45 (For X211)

*9 For details, refer to the Web Catalog of each model (For the SYJ series, click here.) For the SY series, click here.) and the ’3/4/5-Port Solenoid Valve Precautions.’

Ejector Specifications

<table>
<thead>
<tr>
<th>Item</th>
<th>Model</th>
<th>ZK2☐-X188</th>
<th>ZK2☐-X211</th>
<th>ZK2☐-X188</th>
<th>ZK2☐-X211</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nozzle diameter</td>
<td>[mm]</td>
<td>0.7</td>
<td>1.0</td>
<td>1.2</td>
<td>1.5</td>
</tr>
<tr>
<td>Max. suction flow</td>
<td>[L/min (ANR)]</td>
<td>34</td>
<td>56</td>
<td>74</td>
<td>89</td>
</tr>
<tr>
<td>Port exhaust</td>
<td>[L/min (ANR)]</td>
<td>29</td>
<td>44</td>
<td>61</td>
<td>67</td>
</tr>
<tr>
<td>Silencer exhaust</td>
<td>[L/min (ANR)]</td>
<td>34</td>
<td>56</td>
<td>72</td>
<td>83</td>
</tr>
<tr>
<td>High-noise reduction silencer exhaust</td>
<td>[L/min (ANR)]</td>
<td>24</td>
<td>40</td>
<td>58</td>
<td>90</td>
</tr>
<tr>
<td>Air consumption</td>
<td>[kPa]</td>
<td>–91</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maximum vacuum pressure</td>
<td></td>
<td>0.15 to 0.6</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Supply pressure range</td>
<td></td>
<td>0.35</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Standard supply pressure</td>
<td></td>
<td>0.45 (For X211)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*10 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>Weight (g)</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>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>
<td></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

For digital pressure switch for vacuum specifications: R, S

Timing Chart (Typical operation pattern)

*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 layout no. 1

**Single unit:** ZK2A5MOZ-XXXX-X188

<table>
<thead>
<tr>
<th>System</th>
<th>Ejector</th>
</tr>
</thead>
<tbody>
<tr>
<td>Body type</td>
<td>Single unit</td>
</tr>
<tr>
<td>Exhaust type</td>
<td>Silencer exhaust</td>
</tr>
<tr>
<td>Application and purpose</td>
<td>Vacuum pressure — Exhaust Released within the operating environment Release pressure Same pressure as PV</td>
</tr>
</tbody>
</table>

## Port combination: PV = PD

### Circuit example

```
PV
\[\rightarrow\] EXH
\[\rightarrow\] PV
\[\rightarrow\] EXH
```

+1 Nozzle size: 12, 15

## Port layout no. 2

**Single unit:** ZK2B5MOZ-XXXX-X188

<table>
<thead>
<tr>
<th>System</th>
<th>Ejector</th>
</tr>
</thead>
<tbody>
<tr>
<td>Body type</td>
<td>Single unit</td>
</tr>
<tr>
<td>Exhaust type</td>
<td>Port exhaust</td>
</tr>
<tr>
<td>Application and purpose</td>
<td>Vacuum pressure — Exhaust Released within the operating environment Release pressure Same pressure as PV</td>
</tr>
</tbody>
</table>

## Port combination: PV = PD

### Circuit example

```
PV
\[\rightarrow\] EXH
\[\rightarrow\] PV
\[\rightarrow\] EXH
```

## Port layout no. 3

**Single unit:** ZK2G5MOZ-XXXX-X188

<table>
<thead>
<tr>
<th>System</th>
<th>Ejector</th>
</tr>
</thead>
<tbody>
<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 purpose</td>
<td>Vacuum pressure — Exhaust Released within the operating environment Release pressure Same pressure as PV</td>
</tr>
</tbody>
</table>

## Port combination: PV = PD

### Circuit example

```
PV
\[\rightarrow\] EXH
\[\rightarrow\] PV
\[\rightarrow\] EXH
```

High-noise reduction silencer exhaust

---

V (Including PE) (Including PE)

EXH EXH

PV(= PD) PV(= PD)

EXH EXH

PV PV

EXH EXH
Port Layout

Port combination: Common PV = Common PD

Circuit example

Port layout no. 4

Single unit: ZK2□A5MOZ□□□-X211
Manifold: ZZK2□A□□□L□□□-X211

System
Body type
Exhaust type
Application and purpose

Ejector
Manifold
Complex exhaust*1
Vacuum pressure
Common for each station
Exhaust
Released within the operating environment
Release pressure
Same pressure as common PV

Common PV (= Common PD)
Common PV (= Common PD)
Common EXH (Including PE)
Common EXH (Including PE)

*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: ZK2□A5MOZ□□□-X211
Manifold: ZZK2□A□□□L□□□-X211

Common PV (= Common PD)
Common PV (= Common PD)
Individual EXH (Including PE)

System
Body type
Exhaust type
Application and purpose

Ejector
Manifold
Individual port exhaust
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: ZK2□A5MOZ□□□-X211
Manifold: ZZK2□A□□□L□□□-X211

Common PV (= Common PD)
Common PV (= Common PD)
Individual EXH (Including PE)

System
Body type
Exhaust type
Application and purpose

Ejector
Manifold
High-noise reduction silencer exhaust
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

<table>
<thead>
<tr>
<th>Port layout no.</th>
<th>Port combination: PV ≠ PD</th>
<th>Circuit example</th>
</tr>
</thead>
<tbody>
<tr>
<td>7</td>
<td></td>
<td><img src="" alt="Circuit diagram" /></td>
</tr>
<tr>
<td>8</td>
<td></td>
<td><img src="" alt="Circuit diagram" /></td>
</tr>
<tr>
<td>9</td>
<td></td>
<td><img src="" alt="Circuit diagram" /></td>
</tr>
</tbody>
</table>

**Single unit: ZK2□-A5MOZ-□□□□-D-X188**

**System** | Ejector
---|---
**Body type** | Single unit
**Exhaust type** | Silencer exhaust
**Application and purpose** | Vacuum pressure — Exhaust Released within the operating environment

**Single unit: ZK2□-A5MOZ-□□□□-D-X188**

**System** | Ejector
---|---
**Body type** | Single unit
**Exhaust type** | Port exhaust
**Application and purpose** | Vacuum pressure — Exhaust After piping, individual exhaust is necessary

**Single unit: ZK2□-A5MOZ-□□□□-D-X188**

**System** | Ejector
---|---
**Body type** | Single unit
**Exhaust type** | High-noise reduction silencer exhaust
**Application and purpose** | Vacuum pressure — Exhaust Released within the operating environment

---

*1 Nozzle size: 12, 15"
Port Layout

Option -D

Circuit example

Port combination: Common PV ≠ Common PD

**Port layout no. 10**

Single unit: ZK2F-AMOZ-□□□□-P-X211

Manifold: ZZK2□□□□-□□□□-□□□□-□□□□-D-X211

<table>
<thead>
<tr>
<th>System</th>
<th>Ejector</th>
</tr>
</thead>
<tbody>
<tr>
<td>Body type</td>
<td>Manifold</td>
</tr>
<tr>
<td>Exhaust type</td>
<td>Complex exhaust*1</td>
</tr>
</tbody>
</table>

Application and purpose

- Vacuum pressure: Common for each station
- Exhaust: Released within the operating environment
- Release pressure: Common PD pressure has to be supplied with 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. 11**

Single unit: ZK2F-AMOZ-□□□□-P-X211

Manifold: ZZK2□□□□-□□□□-□□□□-□□□□-D-X211

<table>
<thead>
<tr>
<th>System</th>
<th>Ejector</th>
</tr>
</thead>
<tbody>
<tr>
<td>Body type</td>
<td>Manifold</td>
</tr>
<tr>
<td>Exhaust type</td>
<td>Individual port exhaust</td>
</tr>
</tbody>
</table>

Application and purpose

- Vacuum pressure: Common for each station
- Exhaust: Released within the operating environment
- Release pressure: Common PD pressure has to be supplied with common PV.

**Port layout no. 12**

Single unit: ZK2F-AMOZ-□□□□-P-X211

Manifold: ZZK2□□□□-□□□□-□□□□-□□□□-D-X211

<table>
<thead>
<tr>
<th>System</th>
<th>Ejector</th>
</tr>
</thead>
<tbody>
<tr>
<td>Body type</td>
<td>Manifold</td>
</tr>
<tr>
<td>Exhaust type</td>
<td>High-noise reduction silencer exhaust</td>
</tr>
</tbody>
</table>

Application and purpose

- Vacuum pressure: Common for each station
- Exhaust: Released within the operating environment
- Release pressure: Common PD pressure has to be supplied with common PV.

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

---

ZK2□□-X188/ZK2□□-X211

---

Port exhaust

High-noise reduction silencer exhaust EXH.
Port Layout

Option -L

Port combination: Individual PV ≠ Common PD

Circuit example

Port layout no. 13
Single unit: ZK2C-AMOZ
Manifold: ZZK2-L-L-X211

Common PD
Common EXH (Including PE)
Individual PV

+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
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. 14
Single unit: ZK2F-AMOZ
Manifold: ZZK2-L-L-X211

Common PD
Common EXH (Including PE)
Individual PV

System  Ejector  Body type  Manifold  Exhaust type  Individual port exhaust
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.

Port layout no. 15
Single unit: ZK2H-AMOZ
Manifold: ZZK2-L-L-X211

Common PD
Common EXH (Including PE)
Individual PV

System  Ejector  Body type  Manifold  Exhaust type  High-noise reduction silencer exhaust
Exhaust type  High-noise reduction silencer 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.

EXH. Individual exhaust port

+1 For the complex exhaust type, an individual exhaust port is provided to each station.

Vacuum Ejector with Energy-saving Function ZK2□-X188/ZK2□-X211
**Dimensions: Single Unit**

---

**V Port Dimensions**

<table>
<thead>
<tr>
<th>V port type</th>
<th>A (mm)</th>
<th>B (mm)</th>
<th>C (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Metric size</td>
<td>06 ø6</td>
<td>8.25</td>
<td>9.7</td>
</tr>
<tr>
<td></td>
<td>08 ø8</td>
<td>11.4</td>
<td></td>
</tr>
<tr>
<td>Inch size</td>
<td>07 ø1/4</td>
<td>10.8</td>
<td>12.3</td>
</tr>
<tr>
<td></td>
<td>09 ø5/16</td>
<td>11.4</td>
<td></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 ZK2A□A5MOZ□-□-□-□-□-□-□-□-X188.
Vacuum Ejector with Energy-saving Function ZK2□-X188/ZK2□-X211

Dimensions: Manifold

Port Dimensions [mm]

<table>
<thead>
<tr>
<th>V port type</th>
<th>A</th>
<th>B (measured with screw)</th>
<th>C</th>
<th>D</th>
</tr>
</thead>
<tbody>
<tr>
<td>Metric</td>
<td>ø6</td>
<td>8.6</td>
<td>6</td>
<td>9.9</td>
</tr>
<tr>
<td>Inch</td>
<td>ø1/4&quot;</td>
<td>10.8</td>
<td>6</td>
<td>11.8</td>
</tr>
<tr>
<td></td>
<td>ø5/16&quot;</td>
<td>11.4</td>
<td>6</td>
<td>11.3</td>
</tr>
</tbody>
</table>

Manifold Dimensions [mm]

<table>
<thead>
<tr>
<th>Stations</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td>l</td>
<td>30</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>
<td>165</td>
</tr>
<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>
<td>165</td>
<td>180</td>
</tr>
<tr>
<td>L3</td>
<td>56.8</td>
<td>71.8</td>
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<td>160.5</td>
<td>173</td>
<td>198</td>
<td>210.5</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: ø1/8")
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.