For electronic components and precision components up to 100 g

Modular design
Customized application function through selection of module components.

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The vacuum digital pressure switch unit (ZSE3 series) built into the ZX series vacuum module is to be discontinued. If a vacuum digital pressure switch unit is required, we recommend considering the ZQ series space saving vacuum ejector/vacuum pump system or the ZK2 series vacuum unit for use instead. (Dimensions, mounting, and specifications are not compatible.)
For electronic components and precision components up to 100 g

- Modular design
  Customized application function through selection of module components.
- Compact size and lightweight (120 g with complete unit); well suitable for actuator mounting
- Ejector nozzle size: ø0.5 to ø1.0 (Suction flow: 5 to 22 L/min (ANR))
### Series ZX

#### Modular Components Introduction

<table>
<thead>
<tr>
<th>Component equipment</th>
<th>Characteristics</th>
<th>Ejector System</th>
<th>P.866 to 901</th>
<th>Vacuum Pump System</th>
<th>P.902 to 929</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Ejector unit</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Series ZX1</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nozzle diameter (mm)</td>
<td></td>
<td>0.5, 0.7, 1.0</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Suction flow (L/min(ANR))</td>
<td></td>
<td>5, 10, 22</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Air consumption (L/min(ANR))</td>
<td></td>
<td>13, 23, 46</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maximum vacuum pressure</td>
<td></td>
<td>–84 kPa</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Exhaust release</td>
<td></td>
<td>Built-in silencer/Manifold exhaust</td>
<td>Individual exhaust port: (Rc 1/8, 1/6-NPTF)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| Valve unit ZX1-V |                   |                |               |                    |               |
| Vacuum pressure switch unit Series ZS |               |                |               |                    |               |
| Component equipment |                 |                |               |                    |               |
| Function |                 |                |               |                    |               |
| Operation |                 |                |               |                    |               |
| Power supply voltage |             |                |               |                    |               |
| Series |                 |                | Supply valve/Release valve |                    |               |
| Set pressure range |                | 0 to –101 kPa | N.C., N.O. |                    |               |
| Hysteresis |             | 3% or less | Solenoid valve/Air operated valve |                    |               |
| Applicable pad diameter (mm) |         | 2 to 25    |                |                    |               |
| Supply voltage |             | 24 VDC |                |                    |               |

| Suction filter unit ZX1-F |                   |                |               |                    |               |
| Operating pressure range |                 |                |               |                    |               |
| Filtration |                 |                |               |                    |               |
| Vacuum to 0.5 MPa |                 |                |               |                    |               |
| Filtration |                 | 30 μm |                |                    |               |

| Common specifications |                   |                |               |                    |               |
| Unit |                 |                |               |                    |               |
| Air supply port size |                 | M5 (Standard)/M6 (Semi-standard) |                    |               |
| Vacuum pad connection port size |             | M5 (Standard)/M6 (Semi-standard) |                    |               |
| Air supply port size |                 | Rc 1/8 |                    |               |
| Exhaust port size |                 | Rc 1/6 |                    |               |
| External pilot port size |             | M5 |                    |               |
| Stations |             | Max. 8 units |                    |               |

- Made to Order
  (Refer to pages 930 to 934 for details.)

- Made to Order
  (Refer to pages 866 and 867 for ejector system unit.

- Related Equipment
  (Refer to pages 894 for external vacuum supply system manifold.

- Related Equipment
  (Refer to pages 924 to 927 for units for replacement.)
The vacuum digital pressure switch unit (ZSE3 series) built into the ZX series vacuum module is to be discontinued. If a vacuum digital pressure switch unit is required, we recommend considering the ZQ series space saving vacuum ejector/vacuum pump system or the ZX2 series vacuum unit for use instead. (Dimensions, mounting, and specifications are not compatible.)

### Components

<table>
<thead>
<tr>
<th>Ejector unit</th>
<th>Valve unit N.O. type</th>
<th>Vacuum switch unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>ZX1 10 1</td>
<td>K1 5 LZ</td>
<td>EC L</td>
</tr>
<tr>
<td>ZX1 10 1</td>
<td>K3 5 LZ</td>
<td>EC L</td>
</tr>
<tr>
<td>ZX1 10 1</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Ejector unit nozzle dia.**

| Nozzle Dia | 05 0.5 mm | 07 0.7 mm | 10 1.0 mm |

**Note 1)** When port exhaust is applied to the manifold, the PV port is M5 x 0.8 with a plug. If the polarity is incorrect at DC (surge voltage suppressor), diode or switching element may be damaged.

**Caution**

- **For DC**
  - Grommet, L and M Plug Connector
  - With surge voltage suppressor: Polarity protection diode
  - Red (+) Black (−)
  - With light/surge voltage suppressor: Polarity protection diode
  - Red (+) Black (−)
  - Match the polarity of the connectors according to the (+) and (−) marks on the connectors. Do not interchange the polarities to prevent the diodes or the switching elements from becoming burned. If lead wires are pre-connected, the red wire is (+) and the black wire is (−).

- **For AC**
  - L and M Plug Connector
  - With light (2)

**How to Order**

#### Vacuum Module: Ejector System

**Series ZX**

- **Note** Refer to "How to Order" for CE-compliant products.

### Electrical entry

<table>
<thead>
<tr>
<th>L</th>
<th>LN</th>
<th>LO</th>
<th>M</th>
<th>MN</th>
<th>MO</th>
<th>G</th>
<th>H</th>
<th>Nil</th>
</tr>
</thead>
<tbody>
<tr>
<td>L plug connector type</td>
<td>Lead wire length 0.3 m</td>
<td>Without lead wire</td>
<td>Without connector</td>
<td>Lead wire length 0.3 m</td>
<td>Without connector</td>
<td>Without connector</td>
<td>Lead wire length 0.3 m</td>
<td>Air operated</td>
</tr>
<tr>
<td>Without lead wire (Applicable to DC only)</td>
<td>Without lead wire (Applicable to DC only)</td>
<td>Without lead wire (Applicable to DC only)</td>
<td>Lead wire length 0.6 m (Applicable to DC only)</td>
<td>Lead wire length 0.6 m (Applicable to DC only)</td>
<td>Lead wire length 0.6 m (Applicable to DC only)</td>
<td>Lead wire length 0.6 m (Applicable to DC only)</td>
<td>Lead wire length 0.6 m (Applicable to DC only)</td>
<td>Lead wire length 0.6 m (Applicable to DC only)</td>
</tr>
</tbody>
</table>

**Note** In the case of “K1” or “J1” (combination of supply and release valves), M type plug connector cannot be selected.

### Vacuum switch unit/Filter unit

- **Nil** None
- **E** Vacuum switch (For general purpose)(ZSE2)(PNP) Without connector (Without lead wire)
- **E5S** Vacuum switch (For general purpose)(ZSE2)(PNP) With suction filter
- **F** Only suction filter

**Note** Analog output is available only on grommet type.

### Manual operation

- **Nil** Non-locking push type
- **B** Locking slotted type

**Light/Surge voltage suppressor**

- **Nil** None
- **Z** With light/surge voltage suppressor
- **S** With surge voltage suppressor

**Note** Analog output is available only on grommet type.

### Vacuum digital pressure switch unit (ZSE3)

- **D** 2 outputs/without analog output
- **22** 2 outputs/with analog output
- **23** 1 output (with trouble detection)/without analog output
- **24** 1 output (with trouble detection)/with analog output

**Note** Analog output is available only on grommet type.

### Made to Order

(Refer to pages 930 to 934 for details.)
Table (1) Valve Unit/Combination of Supply Valve and Release Valve  (Refer to page 868 for detailed specifications.)

<table>
<thead>
<tr>
<th>Components</th>
<th>Symbol</th>
<th>Supply valve</th>
<th>N.C. (V114)</th>
<th>N.C. (SYJ324)</th>
<th>N.C. (ZX1A)</th>
<th>N.C. (SYJ324)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Solenoid (N.C.)</td>
<td>K1</td>
<td></td>
<td>●</td>
<td></td>
<td>●</td>
<td></td>
</tr>
<tr>
<td>Solenoid (N.C.)</td>
<td>K3</td>
<td></td>
<td></td>
<td>●</td>
<td>●</td>
<td></td>
</tr>
<tr>
<td>Air operated (N.C.)</td>
<td>K6</td>
<td></td>
<td></td>
<td></td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>Air operated (N.C.)</td>
<td>K8</td>
<td></td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>Solenoid (N.O.)</td>
<td>None</td>
<td></td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>Solenoid (N.O.)</td>
<td>None</td>
<td></td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Weight (g)</th>
</tr>
</thead>
<tbody>
<tr>
<td>79</td>
</tr>
<tr>
<td>112</td>
</tr>
<tr>
<td>53</td>
</tr>
<tr>
<td>83</td>
</tr>
<tr>
<td>64</td>
</tr>
<tr>
<td>84</td>
</tr>
</tbody>
</table>

• Air operated valve: Controlled by external 3 port valve.
• External release: Directly released by external 2 port valve.

Table (2) Valve Unit/Valve Plug Connector Assembly

For 100 VAC: SY100-30-1A -
For 110 VAC: SY100-30-3A -
Without lead wire: (with connector and 2 sockets only)
SY100-30-A

Table (3) Vacuum Switch/Lead Wire with Connector

For ZSE2 ZS-10-5A -
For ZSE3 ZS-20-5A -

Table (4) Ejector System/Recommended Model

Related Equipment
Combination Symbol: K1

Application: This combination is used for effecting control in accordance with electric signals. Because the supply valve is N.O., the pressure that is supplied to the ejector is not interrupted during a power outage; as a result, the state of suction can be maintained. This combination is used for preventing the workpieces from dropping during power outages.

How to Operate

<table>
<thead>
<tr>
<th>Condition</th>
<th>Valve</th>
<th>Supply valve (N.O.)</th>
<th>Release valve (N.O.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Work adsorption</td>
<td>ON</td>
<td>OFF</td>
<td></td>
</tr>
<tr>
<td>2. Vacuum release</td>
<td>OFF</td>
<td>ON</td>
<td></td>
</tr>
<tr>
<td>3. Operation stop</td>
<td>OFF</td>
<td>OFF</td>
<td></td>
</tr>
</tbody>
</table>

Combination Symbol: K8

Application: This combination is used for effecting control in accordance with air signals. A vacuum release is effected by the intrusion of air between the silencer, pad, and the workpiece. This type is used when there is no need to accelerate the vacuum release speed.

How to Operate

<table>
<thead>
<tr>
<th>Condition</th>
<th>Valve</th>
<th>Supply valve (N.O.)</th>
<th>Release valve (N.O.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Work adsorption</td>
<td>OFF</td>
<td>OFF</td>
<td></td>
</tr>
<tr>
<td>2. Vacuum release</td>
<td>ON</td>
<td>ON</td>
<td></td>
</tr>
<tr>
<td>3. Operation stop</td>
<td>ON</td>
<td>OFF</td>
<td></td>
</tr>
</tbody>
</table>

Combination Symbol: K3

Application: This combination is used for effecting control in accordance with electric signals. Because the supply valve is N.O., the pressure that is supplied to the ejector is not interrupted during a power outage; as a result, the state of suction can be maintained. This combination is used for preventing the workpieces from dropping during power outages.

How to Operate

<table>
<thead>
<tr>
<th>Condition</th>
<th>Valve</th>
<th>Supply valve (N.O.)</th>
<th>Release valve (N.O.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Work adsorption</td>
<td>OFF</td>
<td>ON</td>
<td></td>
</tr>
<tr>
<td>2. Vacuum release</td>
<td>ON</td>
<td>OFF</td>
<td></td>
</tr>
<tr>
<td>3. Operation stop</td>
<td>OFF</td>
<td>OFF</td>
<td></td>
</tr>
</tbody>
</table>

Combination Symbol: J1

Application: This combination is used for effecting control in accordance with electric signals. Because the supply valve is N.O., the pressure that is supplied to the ejector is not interrupted during a power outage; as a result, the state of suction can be maintained. This combination is used for preventing the workpieces from dropping during power outages.

How to Operate

<table>
<thead>
<tr>
<th>Condition</th>
<th>Valve</th>
<th>Supply valve (N.O.)</th>
<th>Release valve (N.O.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Work adsorption</td>
<td>OFF</td>
<td>ON</td>
<td></td>
</tr>
<tr>
<td>2. Vacuum release</td>
<td>ON</td>
<td>OFF</td>
<td></td>
</tr>
<tr>
<td>3. Operation stop</td>
<td>OFF</td>
<td>OFF</td>
<td></td>
</tr>
</tbody>
</table>

Combination Symbol: J2

Application: This combination is used for effecting control in accordance with air signals. A vacuum release is effected by the intrusion of air between the silencer, pad, and the workpiece. This type is used when there is no need to accelerate the vacuum release speed.

How to Operate

<table>
<thead>
<tr>
<th>Condition</th>
<th>Valve</th>
<th>Supply valve (N.O.)</th>
<th>Release valve</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Work adsorption</td>
<td>OFF</td>
<td>None</td>
<td></td>
</tr>
<tr>
<td>2. Vacuum release</td>
<td>ON</td>
<td>None</td>
<td></td>
</tr>
<tr>
<td>3. Operation stop</td>
<td>OFF</td>
<td>None</td>
<td></td>
</tr>
</tbody>
</table>
Vacuum Module: Ejector System Series ZX

Ejector System/Construction

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>Poppet valve assembly</td>
<td>—</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Release flow rate adjusting needle</td>
<td>Stainless steel</td>
<td>ZX1-NA</td>
</tr>
<tr>
<td>3</td>
<td>Manifold base</td>
<td>Aluminum</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Vacuum switch</td>
<td>ZSE2, ZSE3</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Valve unit</td>
<td>ZX1-V, 4-□-□-□-□</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Interface plate</td>
<td>(PV-P, PS-P)</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Silencer case</td>
<td>Polycarbonate</td>
<td></td>
</tr>
</tbody>
</table>

Filter case

Table (1) How to Order Pilot Valves

<table>
<thead>
<tr>
<th>No.</th>
<th>Components</th>
<th>Material</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>①</td>
<td>Solenoid valve N.C. (V114)</td>
<td>Solenoid valve N.C. (V114)</td>
<td>Z1-V114-□-□-□-□</td>
</tr>
<tr>
<td>②</td>
<td>Solenoid valve N.O. (SYJA324)</td>
<td>Solenoid valve N.C. (V114)</td>
<td>ZX1-SYJA324-□-□-□-□</td>
</tr>
<tr>
<td>③</td>
<td>Air operated N.O. (SYJA324)</td>
<td>Air operated N.C. (SYJA314)</td>
<td>ZX1-SYJA314-□-□-□-□</td>
</tr>
</tbody>
</table>

Table (2) How to Order Solenoid Valves

<table>
<thead>
<tr>
<th>No.</th>
<th>Description</th>
<th>Material</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>①</td>
<td>Z1 ~ V114</td>
<td>ZX1-PV-0</td>
<td></td>
</tr>
<tr>
<td>②</td>
<td>K3, J2</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table (3) How to Order Air Operated Valves

<table>
<thead>
<tr>
<th>No.</th>
<th>Description</th>
<th>Material</th>
<th>Port size</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>①</td>
<td>Pilot valve</td>
<td>—</td>
<td>M5</td>
<td></td>
</tr>
<tr>
<td>②</td>
<td>Filter valve</td>
<td>PVA</td>
<td>M5 x 0.8</td>
<td></td>
</tr>
<tr>
<td>③</td>
<td>Ejector valve</td>
<td>—</td>
<td>0.5 0.7 10</td>
<td></td>
</tr>
</tbody>
</table>

Table (4) How to Order Ejector Assembly

<table>
<thead>
<tr>
<th>No.</th>
<th>Description</th>
<th>Port size</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>①</td>
<td>Ejector unit nozzle dia</td>
<td>0.5 mm 0.7 mm 10 mm</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>No.</th>
<th>Description</th>
<th>Material</th>
<th>Assembly no.</th>
<th>Ejector type (Exhaust type)</th>
</tr>
</thead>
<tbody>
<tr>
<td>①</td>
<td>ZX1-1-WD</td>
<td>—</td>
<td>05</td>
<td>With silencer</td>
</tr>
<tr>
<td>②</td>
<td></td>
<td></td>
<td>07</td>
<td>Port exhaust R/F-10</td>
</tr>
<tr>
<td>③</td>
<td></td>
<td></td>
<td>10</td>
<td>Port exhaust 10-P/11</td>
</tr>
</tbody>
</table>

Caution

Turning the vacuum release flow rate adjusting needle clockwise reduces the vacuum release flow volume; the needle valve is fully closed when the needle stops turning. Turning the needle 2 full turns counterclockwise from the fully closed position renders the needle valve fully open. The needle will fall out if it is turned more than 4 full turns. In order to prevent the needle from loosening and falling out, the release flow rate adjusting needle with lock nut (ZX1-N0-L) is also available.
Ejector Unit

Specifications

<table>
<thead>
<tr>
<th>Unit no.</th>
<th>ZX1-W05</th>
<th>ZX1-W07</th>
<th>ZX1-W10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nozzle dia. (mm)</td>
<td>0.5</td>
<td>0.7</td>
<td>1.0</td>
</tr>
<tr>
<td>Suction flow (L/min (ANR))</td>
<td>5</td>
<td>10</td>
<td>22</td>
</tr>
<tr>
<td>Air consumption (L/min (ANR))</td>
<td>13</td>
<td>23</td>
<td>46</td>
</tr>
<tr>
<td>Vacuum pressure reached</td>
<td>~84 kPa</td>
<td>0.7 MPa</td>
<td></td>
</tr>
<tr>
<td>Maximum operating pressure</td>
<td>0.2 MPa to 0.55 MPa</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Supply pressure range</td>
<td>0.45 MPa</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Standard supply pressure</td>
<td>5 to 50°C</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ejector exhaust type†</td>
<td>Code 1</td>
<td>Built-in silencer For single unit and manifold</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Code 2</td>
<td>Port exhaust For single unit and manifold</td>
<td></td>
</tr>
<tr>
<td>Weight</td>
<td>33 g</td>
<td>ZX1-W05-1 (With bracket)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>25 g</td>
<td>ZX1-W07-1-N (Without bracket)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>27 g</td>
<td>ZX1-W10-1 (With bracket)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>29 g</td>
<td>ZX1-W10-3-N (Without bracket)</td>
<td></td>
</tr>
</tbody>
</table>

†Codes 1 and 2 are corresponding to the suffixes in “How to Order” to indicate the ejector exhaust method.

How to Order

ZX1—W 05 1—

Nozzle diameter

05 0.5 mm
07 0.7 mm
10 1.0 mm

PV, V port size

NII M6 x 0.8
S Y M6 x 1 (Sem-standard)

Bracket B

NII With bracket B
S Y Without bracket B

Ejector exhaust method

1 Silencer
2 Port exhaust Rc1/8
2T Port exhaust 1/8-NPTF

Dimensions: ZX1-W□□1

Note 1) Remove the plug at external release. Note 2) Dimensions *: For mounting bracket B.
Flow Rate Characteristics/Exhaust Characteristics

**ZX1-W05**

Exhaust Characteristics

Flow Rate Characteristics

**ZX1-W07**

Exhaust Characteristics

Flow Rate Characteristics

**ZX1-W10**

Exhaust Characteristics

Flow Rate Characteristics

### Precautions

Be sure to read before handling. Refer to front matters 38 and 39 for Safety Instructions and pages 844 to 846 for Vacuum Equipment Precautions.

### Caution

Refer to the vacuum equipment model selection on pages 825 to 843 for the selection and sizing of Series ZX.
Valve Unit: ZX1-VA

### Model/Specifications

<table>
<thead>
<tr>
<th>Unit no.</th>
<th>Components</th>
<th>Operation</th>
<th>Cv factor</th>
</tr>
</thead>
<tbody>
<tr>
<td>ZX1-VA(-Q)</td>
<td>Supply valve</td>
<td>Solenoid valve</td>
<td>0.17</td>
</tr>
<tr>
<td>ZX1-VA</td>
<td>Release valve</td>
<td>Air operated</td>
<td>0.08</td>
</tr>
<tr>
<td>SYJ314</td>
<td>Pilot operated</td>
<td>N.O. (V114)</td>
<td>—</td>
</tr>
<tr>
<td>SYJ324M</td>
<td>N.O.</td>
<td>N.O. (ZK1A)</td>
<td>—</td>
</tr>
<tr>
<td>SYJ314</td>
<td>N.C.</td>
<td>N.C. (V114)</td>
<td>—</td>
</tr>
<tr>
<td>SYJ324</td>
<td>Air operated</td>
<td>N.C. (ZK1A)</td>
<td>—</td>
</tr>
<tr>
<td>ZX1A</td>
<td>External release</td>
<td>N.C. (SYJ314)</td>
<td>—</td>
</tr>
<tr>
<td>SYJA314</td>
<td>Air operated</td>
<td>N.C. (SYJ3A314)</td>
<td>—</td>
</tr>
</tbody>
</table>

- Supply pressure range of air pressure SUP (PV) port: 0.3 to 0.6 MPa
- Supply pressure range of pilot pressure SUP (PA, PB) ports for supply and release: PV port pressure to 0.6 MPa
- Max. operating frequency: 5 Hz
- Operating temperature range: 5 to 50°C
- Interface plate symbol: PV—PS—PD

**Note:** Combination of supply valve and release valve: K4, K5, K6, K7, K8, J3, J4, D4

The supply and release valves of this product have a structure which uses the pressure of the air pressure SUP (PV) port to operate them. Be sure to supply a pressure that is the pressure of the air pressure SUP (PV) port or more and 0.6 MPa or less to the pilot pressure SUP (PA, PB) ports for supply and release.

### Solenoid Valve Specifications

<table>
<thead>
<tr>
<th>V114</th>
<th>SYJ314, SYJ324M</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rated voltage</td>
<td>24, 12, 6, 5, 3 VDC/100, 110 VAC (50/60 Hz)</td>
</tr>
<tr>
<td>Electrical entry</td>
<td>L plug connector, grommet</td>
</tr>
<tr>
<td>Light/Surge voltage suppressor</td>
<td>L plug connector, M plug connector, grommet</td>
</tr>
<tr>
<td>Manual operation</td>
<td>Non-locking push type/Locking slotted type</td>
</tr>
</tbody>
</table>

* Applicable to plug connector only.

### How to Order

Refer to page 866 for details.

- **ZX1-V-A**
  - K1
  - L
  - Z

**System**

- A: Ejector system
- B: Vacuum pump system

**Combination of supply valve and release valve**

- Rated voltage
- Electrical entry
- Manual override
- Release flow rate adjusting needle/bracket
- PV/V port size
- Light/Surge voltage suppressor

**Note:** For ZX1-VA (Valve unit): Bracket C
For ZX1-VB (Valve unit): Bracket B
### Dimensions

**Normal closed**

- **A: Release flow rate adjusting needle with lock nut**
  - Needle fully open

### Circuit diagram

**Release valve**

- Release pressure output (D) port
- PI
- Release valve
- Pilot for supply
- PE
- PS
- PV
- PD

**Pilot valve for supply**

- PV
- PS
- PE

**Release flow rate adjusting needle**

- 2 x ø3.6

**Bracket C**

- Mounting hole
- 2 x ø3.6

**Air pressure SUP (PV) port**

- M5 (or M6)

**Air pressure output (A) port**

- M5 (or M6)

**Manual override**

- Bracket C
- Mounting hole

**Note**

Dimensions ∗: For mounting bracket C, ∗∗: For mounting spacer.

---

**Vacuum Module: Ejector System Series ZX**

**Related Equipment**

- ZA
- ZX
- ZR
- ZM
- ZMA
- ZQ
- ZH
- ZU
- ZL
- ZY
-ZF
- ZP
- SP
- ZCUK
- AMJ
- AMV
- AEP
- HEP
Suction Filter Unit: ZX1-F

Specifications

<table>
<thead>
<tr>
<th>Unit no.</th>
<th>ZX1-F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating pressure range</td>
<td>—100 to 500 kPa</td>
</tr>
<tr>
<td>Operating temperature range</td>
<td>5 to 50°C</td>
</tr>
<tr>
<td>Filtration efficiency</td>
<td>30 µm</td>
</tr>
<tr>
<td>Element</td>
<td>PVA</td>
</tr>
<tr>
<td>Weight</td>
<td>37 g</td>
</tr>
</tbody>
</table>

Note) If not operated within the specified range of pressure and temperature, trouble may result.

How to Order

ZX1 – F – [PV, V port size] [Bracket]

- Nil | M5 x 0.8
- Y | M6 x 1 (Semi-standard)
- Nil | With bracket A
- N | Without bracket A

Dimensions

Filter case

⚠️ Caution
1. The case is made of polycarbonate. Therefore, do not use it with or expose it to the following chemicals: paint thinner, carbon tetrachloride, chloroform, acetic ester, aniline, cyclohexane, trichloroethylene, sulfuric acid, lactic acid, water-soluble cutting oil (alkalinic), etc.
2. Do not expose it to direct sunlight.

About this product

The filter mounted on the product is a simplified one. When used in an environment with a lot of dust, the filter is likely to be clogged quickly. Select a large-volume filter such as Series ZFA, ZFB, ZFC.
Vacuum Pressure Switch Unit/Vacuum Pressure Switch: ZSE2-0X

Quick response: 10 ms
Compact size: 39H x 20W x 15D (except the connecting portion of the standard type)
Improved wiring: connector type
Uses a carrier diffusion semiconductor pressure sensor

Pressure detector
(A carrier diffusion semiconductor pressure sensor is used.)

• Filter case
  **Caution**
  1. The case is made of polycarbonate. Therefore, do not use it with or expose it to the following chemicals: paint thinner, carbon tetrachloride, chloroform, acetic ester, aniline, cyclohexane, trichloroethylene, sulfuric acid, lactic acid, water-soluble cutting oil (alkalinic), etc.
  2. Do not expose it to direct sunlight.

• Vacuum pressure setting
  **Caution**
  Observe the following precautions when setting the vacuum pressure. Lightly turn the screwdriver with your fingertips.
  To prevent damage to the trimmer groove, do not use a screwdriver that has a large grip or a tip that does not fit in the trimmer groove.

The filter mounted on the product is a simplified one. When used in an environment with a lot of dust, the filter on the unit is likely to be clogged quickly. Use with the ZFA, ZFB and ZFC series is recommended.

Refer to the pressure switch ZSE2 Series catalog for the detailed specifications of pressure switches.

### Vacuum Pressure Switch

<table>
<thead>
<tr>
<th>Unit no.</th>
<th>ZSE2-0X</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fluid</td>
<td>Air</td>
</tr>
<tr>
<td>Set pressure range</td>
<td>0 to –101 kPa</td>
</tr>
<tr>
<td>Hysteresis</td>
<td>±3% Full span or less</td>
</tr>
<tr>
<td>Repeatability</td>
<td>±1% Full span or less</td>
</tr>
<tr>
<td>Temperature characteristics</td>
<td>±3% Full span or less</td>
</tr>
<tr>
<td>Voltage</td>
<td>12 to 24 VDC (Ripple ±10% or less)</td>
</tr>
<tr>
<td>Port size</td>
<td>M5 x 0.8, M6 x 1 (Semi-standard)</td>
</tr>
<tr>
<td>Output</td>
<td>Open collector 30 V, 80 mA</td>
</tr>
<tr>
<td>Indicator light</td>
<td>Light at ON state</td>
</tr>
<tr>
<td>Current consumption</td>
<td>17 mA or less (24 VDC, at ON state)</td>
</tr>
<tr>
<td>Operating temperature range</td>
<td>0 to 60°C</td>
</tr>
<tr>
<td>Max. operating pressure</td>
<td>0.5 MPa</td>
</tr>
</tbody>
</table>

* When using ejector system, instantaneous pressure up to 0.5 MPa will not damage the switch. Note) If not operated within the specified range of pressure of temperature, trouble may result.

### Wiring

**ZSE2 connection**

-15NPN Open collector

-55PNP Open collector

### How to Order

**How to Set Vacuum Pressure**

ZSE2

• Pressure setting trimmer selects the ON pressure. Clockwise rotation increases high vacuum set point.

• When using the switch to confirm correct adsorption, the set pressure should be as low as possible. If setting the pressure lower than that, switch becomes ON in case when adsorption is not complete. If setting the pressure higher than that, switch does not become ON though it is absorbing workpieces properly.
Guidelines for Use of Vacuum Pressure Switch Unit

System circuit for work adsorption

Ejector style

Set pressure
To use for picking verification, set a vacuum pressure that can pick the workpiece without fail.

Vacuum pump system

Using multiple pressure switches with a single vacuum source
If a single vacuum source is divided so that vacuum switches can be used on individual lines, the vacuum pressure might not come within the values set with the switches because the pressure of the vacuum source fluctuates depending on the number of picks and non-picks. Especially, because pressure fluctuation exerts a great influence when picking with a small diameter nozzle, the countermeasures described below must be provided.

- Adjust the needle valve to reduce the pressure fluctuation between picking and non-picking.
- Stabilize the source pressure by providing a tank and a vacuum regulator.
- Provide a vacuum switch valve to individual lines. Thus, in case of an error, each valve can be turned OFF to minimize the influences on other pads.

Dimensions

Grommet: ZSE2-0X-15

Symbol

Pressure setting trimmer

Indicator light (Red)

Lead wire length

Connector: ZSE2-0X-15C

Pressure setting trimmer

Indicator light (Red)

Lead wire length
Vacuum Pressure Switch Unit/Vacuum Pressure Switch: ZSE3-0X

Built-in failure prediction output function
If the attainable amount of vacuum reduces due to a decrease in performance caused by clogging of the silencer of the vacuum system (ejectors), cracked pads, or the leakage of the vacuum pipes, this function quickly detects the abnormal condition and outputs a signal to halt the system.

Two independent pressure settings are possible
This feature is well suited for applications that require 2 separate pressure outputs due to a change in the vacuum suction pad diameters, or for applications that require 2 pressure verifications to effect line changes in the positive pressure line.

Comprehensive self diagnosis function
- Overcurrent detection function
- Overvoltage detection function
- Data error

Data saving function
Even if the power is cut off, the settings are stored for 100,000 hours (approximately 11 years) in the exclusive IC (EEPROM).

Filter case
**Caution**
1. The case is made of polycarbonate. Therefore, do not use it with or expose it to the following chemicals: paint thinner, carbon tetrachloride, chloroform, acetic ester, aniline, cyclohexane, trichloroethylene, sulfuric acid, lactic acid, water-soluble cutting oil (alkaline), etc.
2. Do not expose it to direct sunlight.

How to Order

ZSE3 - 0X [21]

PV, V port size
- Nil
- Y M5 x 0.8
- M6 x 1 (Semi-standard)

Output specifications
- 21 NPN open collector, double output
  - Without analog output
- 22 NPN open collector, double output
  - With analog output
- 23 NPN open collector 1 output/Trouble detection
  - Without analog output
- 24 NPN open collector 1 output/Trouble detection
  - With analog output

Wiring

Wiring example
General connection method
- Brown DC (+)
- Gray Analog output
- Black OUT1
- White OUT2
- Blue DC (-)

Connection with PLC
At negative COM terminal
- Brown DC (+)
- Gray Analog output
- Black OUT1
- White Trouble detection
- Blue DC (-)

How to Set Vacuum Pressure

Refer to Best Pneumatics No. 6.

Guidelines for Use of Vacuum Pressure Switch Unit

Refer to page 876.
The vacuum digital pressure switch unit (ZSE3 series) built into the ZX series vacuum module is to be discontinued. If a vacuum digital pressure switch unit is required, we recommend considering the ZQ series space saving vacuum ejector/vacuum pump system or the ZK2 series vacuum unit for use instead. (Dimensions, mounting, and specifications are not compatible.)
Without Valve Unit

Configuration and combination

<table>
<thead>
<tr>
<th>Ejector unit</th>
<th>Vacuum switch (ZSE2)</th>
<th>Filter unit (F)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ZXE</td>
<td>ZXE</td>
<td>ZXE</td>
</tr>
<tr>
<td>D</td>
<td>E</td>
<td>F</td>
</tr>
</tbody>
</table>

Vacuum switch (ZSE2)

ZX1-D-E

Vacuum switch unit

Vacuum (V) port

Port exhaust

Vacuum switch unit

Vacuum (V) port

Ejector exhaust

Filter

Vacuum switch unit

Vacuum (V) port

Vacuum switch (E)

Filter unit

Port exhaust

Circuit diagram

(Circuits other than those with vacuum switch are shown as below.)

Bracket A

(ZX1-OBA)

Vacuum (V) port

Air pressure SUP (P) port

M5 (or M6)

Plug

Release pressure

SUP (PD) port

M5 (or M6)

Plug

Pressure setting trimmer

2 x R1.8° (Mounting hole)

51.5

29.2

13.6° (Mounting hole)

10°

10°

19°

19°

Filter

Bracket A

(ZX1-OBA)

Ejector + Silencer

2 x ø3.5

(Mounting hole)

8.8

46.5

57.1

Vacuum (V) port

29.2

10°

19°

10°

Filter

Bracket A

(ZX1-OBA)

8.8

46.5

57.6

2 x ø3.5

(Mounting hole)

Note 1) Remove the plug at external release.

Note 2) Dimensions ∗: For mounting bracket A ∗∗: For mounting spacer 1.

Filter unit (F)

ZX1-D-F

Vacuum Module: Ejector System Series ZX

ZA

ZC

ZD

ZE

ZF

ZP

SP

ZCUK

AMJ

AMV

AEP

HEP

Related Equipment
Series ZX

Valve Unit: Type K1

<table>
<thead>
<tr>
<th>Configuration and combination</th>
<th>Vacuum switch (ZSE2)</th>
<th>Vacuum switch (ZSE3)</th>
<th>Filter unit (F)</th>
<th>Without switch and filter</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ejector unit + Valve unit (K1)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Model
ZX1□□□ — K1□□□□ —

E □ □ □ □ □ □
D □ □ □ □ □ □
F □ □ □ □ □ □
Nil

Vacuum switch (ZSE2)
ZX1□□□-K1□□□□-E□

Circuit diagram
(Circuits other than those with vacuum switch are shown as below.)

Vacuum switch (E)

Vacuum digital pressure switch (D)
ZSE3 (Without analog output)
ZSE3 (With analog output)

Filter unit

Without switch and filter

---

Port exhaust

Ejector + Silencer

Manual override
(Non-locking)

Spacer 1 (ZX1-S1)
(For side mounting)

78 [44.8]

2 x R1.8" (Mounting hole)

ø3.6" (Mounting hole)

2 x ø3.3 (Mounting hole)

2 x R1.8" (Mounting hole)

Release flow rate adjusting needle

(A: Release flow rate adjusting needle with lock nut)

8 (Needle fully open)

Pilot valve for supply
V114

Release valve
V114

Vacuum switch
V114

Vacuum switch (ZSE2)

Vacuum switch (ZSE3)

Vacuum switch (E)

Bracket A
(ZX1-OBA)

Release valve

Pilot valve

Vacuum (V) port

Vacuum switch

AC

DC

P Pilot pressure EXH (PE) port

M3

(Port exhaust)

M5

(Recommended fitting M-3AU-3)

Note) Dimensions —: For mounting bracket A +: For mounting spacer 1.

© 882

SMC
**Vacuum switch (ZSE3) ZX1□□□□-K□□□□-D□□□**

A: Release flow rate adjusting needle with lock nut

B: (Needle fully open)

**Filter unit**  
ZX1□□□□-K□□□□-F

**Without switch and filter**  
ZX1□□□□-K□□□□-□□□

---

**Spacer 1: ZX1-S1**

This is inserted between a wall and a switch when the switch is mounted on the wall.

---

**Related Equipment**

- ZA
- ZX
- ZR
- ZM
- ZMA
- ZQ
- ZH
- ZU
- ZL
- ZY
- ZF
- ZP
- SP
- ZCUK
- AMJ
- AMV
- AEP
- HEP

---

**Vacuum Module: Ejector System Series ZX**
Series ZX

Valve Unit: Type K3

Configuration and combination

<table>
<thead>
<tr>
<th>Ejector unit</th>
<th>Valve unit (K3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>E</td>
<td>F</td>
</tr>
<tr>
<td>D</td>
<td>Nil</td>
</tr>
</tbody>
</table>

Vacuum switch (ZSE2)

ZXE1xxxx-K3xxxx-Exxxx

Vacuum switch (ZSE3)

ZXE1xxxx-K3xxxx-Exxxx

Filter unit (F)

Without switch and filter

Circuit diagram

Vacuum switch (E)

Vacuum digital pressure switch (D)

Filter unit

With silencer

Without switch and filter

Port exhaust

EXH (EXH.) port

EXH (PE) port

Vacuum (V) port

A: Release flow rate adjusting needle with lock nut

(Please fully open)

Bracket A

Vacuum (V) port

Vacuum (V) port

Release valve

Pilot valve for supply

SYJ324M

SYJ314

AC DC

Release flow rate adjusting needle

Pilot pressure EXH (PE) port

M3

(Recommended fitting: M-3AU-3)

Air pressure SUP (PV) port

M5 (or M6)

Release valve

(Please fully open)

AC

DC

ZSE2

ZSE3

Bracket A

(ZX1-OBA)

Note) Dimensions ∗: For mounting bracket A  ∗∗: For mounting spacer 1.

Specifications:

- Dimensions
- Ejector exhaust
- Circuit diagram
- Vacuum unit Type K3
- Configuration and combination
- Ejector unit + Valve unit (K3)
- Vacuum switch (ZSE2)
- Vacuum switch (ZSE3)
- Filter unit (F)
- Without switch and filter
Filter unit (F)  
ZX-K3-F

Spacer 1: ZX1-S1

Without switch and filter  
ZX1-K3-F

Bracket B (ZXT-OBB)  
2 x ø3.6  
(Mounting hole)

Vacuum (V) port  
M5 (or M6)
Series ZX

Valve Unit: Type K6

Configuration and combination

<table>
<thead>
<tr>
<th>Ejector unit</th>
<th>Valve unit (K6)</th>
</tr>
</thead>
<tbody>
<tr>
<td>V</td>
<td></td>
</tr>
<tr>
<td>F</td>
<td></td>
</tr>
<tr>
<td>D</td>
<td></td>
</tr>
<tr>
<td>Nil</td>
<td></td>
</tr>
</tbody>
</table>

Vacuum switch (ZSE2)
ZX1-□□□□ - K6-E□

Port exhaust

Circuit diagram
(Circuits other than those with vacuum switch are shown as below.)

Vacuum switch (E)

Vacuum digital pressure switch (D)
Without switch and filter

Filter unit

Ejector + Silencer

2 x R1.8" (Mounting hole)

Spacer 1 (ZX1-S1)
(For side mounting)

A: Release flow rate adjusting needle with lock nut

Note 1) Dimensions : For mounting bracket B. ++: For mounting spacer 2.

Note 2) Combination of supply valve and release valve: K5, K6, J3

The supply and release valves of this product have a structure which uses the pressure of the air pressure SUP (PV) port to operate them. Be sure to supply a pressure that is the pressure of the air pressure SUP (PV) port or more and 0.6 MPa or less to the pilot pressure SUP (PA, PB) ports for supply and release.

© 886
Filter unit (F)  
ZX1-□□□-K6-F

Spacer 1: ZX1-S1

Without switch and filter  
ZX1-□□□-K6
Series ZX

Valve Unit: Type K8

Configuration and combination

<table>
<thead>
<tr>
<th>Model</th>
<th>Vacuum switch (ZSE2)</th>
<th>Vacuum switch (ZSE3)</th>
<th>Filter unit (F)</th>
<th>Without switch and filter</th>
</tr>
</thead>
<tbody>
<tr>
<td>ZX1□□□□□□□□□</td>
<td>□□□□□□□□□□□□□□□□□□□</td>
<td>□□□□□□□□□□□□□□□□□□□</td>
<td>□□□□□□□□□□□□□□□□□□□</td>
<td>□□□□□□□□□□□□□□□□□□□</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Vacuum switch (ZSE2)</th>
<th>Model</th>
<th>Configuration and combination</th>
</tr>
</thead>
<tbody>
<tr>
<td>ZX1□□□□□□□□□</td>
<td>K8</td>
<td>Ejector unit + Valve unit (K8)</td>
</tr>
</tbody>
</table>

Note 1) Dimensions ⦿: For mounting bracket A ⦿: For mounting spacer 1.

Note 2) Combination of supply valve and release valve: K4, K7, K8, J4, D4

The supply and release valves of this product have a structure which uses the pressure of the air pressure SUP (PV) port to operate them. Be sure to supply a pressure that is the pressure of the air pressure SUP (PV) port or more and 0.6 MPa or less to the pilot pressure SUP (PA, PB) ports for supply and release.

Circuit diagram

(Vacuum switch (ZSE2)
ZX1□□□□□□□□□ - K8 - E□□□□□□□□□□□□□□□□□□□

Vacuum switch (ZSE2) (With analog output)

Vacuum switch (ZSE2) (Without analog output)

Vacuum switch (ZSE3)

Filter unit

Without switch and filter

A: Release flow rate adjusting needle with lock nut

Note 1) Dimensions ⦿: For mounting bracket A ⦿: For mounting spacer 1.

Note 2) Combination of supply valve and release valve: K4, K7, K8, J4, D4

The supply and release valves of this product have a structure which uses the pressure of the air pressure SUP (PV) port to operate them. Be sure to supply a pressure that is the pressure of the air pressure SUP (PV) port or more and 0.6 MPa or less to the pilot pressure SUP (PA, PB) ports for supply and release.
Vacuum Module: Ejector System Series ZX

Filter unit (F)ZX1□□□-K8-F

Without switch and filterZX1□□□-K8

Spacer 1: ZX1-S1

Bracket B (ZX1-OBB)

Bracket A (ZX1-OBA)
**Series ZX**

Valve Unit: Type J1

<table>
<thead>
<tr>
<th>Model</th>
<th>ZX1-F - J1-P-P - E</th>
</tr>
</thead>
</table>

### Configuration and combination

- Ejector unit + Valve unit (J1)
- Vacuum switch (ZSE2)
- Vacuum switch (ZSE3)
- Filter unit (F)
- Without switch and filter

#### Vacuum switch (ZSE2)

**ZX1-F - J1-P-P - E**

- Port exhaust
  - Port exhaust: M1/8 (1/8-NPTF) EXH (EXH.) port
  - Manual override
  - Ejector + Silencer
  - Release flow rate adjusting needle
  - Pilot valve for supply V114

- Air pressure SUP (PV) port M5 (or M6) (Recommended fitting: M-3AU-3)
- Pilot pressure EXH (PE) port M3

### Circuit diagram

(Circuits other than those with vacuum switch are shown as below.)

#### Vacuum switch (E)

**ZSE3**

Without analog output

With analog output

#### Vacuum digital pressure switch (D)

**ZSE2**

#### Filter unit

**ZX1-F**

Without switch and filter

- 4V

### Note

Dimensions:
- *: For mounting bracket A
- **: For mounting spacer 1

© SMC

[890]
Filter unit (F)  
ZX1-J1-F

Spacer 1: ZX1-S1

Without switch and filter  
ZX1-J1-F

Vacuum (V) port  
M5 (or M6)

Ejector System  
Series ZX

Related Equipment

ZA  ZX  ZR  ZM  ZMA  ZQ  ZH  ZU  ZL  ZY  ZF  ZP  SP  ZCUK  AMJ  AMV  AEP  HEP
Valve Unit: Type J2

Configuration and combination

<table>
<thead>
<tr>
<th>Ejector unit</th>
<th>Valve unit (J2)</th>
<th>Filter unit (F)</th>
<th>Without switch and filter</th>
</tr>
</thead>
</table>

Model
ZX1-J2-E

Vacuum switch (ZSE2)
ZX1-J2-E

Vacuum switch (ZSE3)
ZX1-J2-E

Filter unit (F)

Without switch and filter

Circuit diagram
(Circuits other than those with vacuum switch are shown as below.)

Vacuum switch (E)

Vacuum digital pressure switch (D)

Filter unit

Without switch and filter

Note) Dimensions ∗: For mounting bracket A  ∗∗: For mounting spacer 1.

© 892
Filter unit (F)  
ZX1-J2-F

Spacer 1: ZX1-S1

Without switch and filter  
ZX1-J2-F

Vacuum (V) port
M5 (or M6)

Bracket B  
ZX1-OBB

Vacuum Module: Ejector System  
Series ZX
Ejector System/Manifold Specifications

How to Order Manifold

ZZX1 06 - R

Supply port location

<table>
<thead>
<tr>
<th>Port</th>
<th>L (Left)</th>
<th>R (Right)</th>
<th>B (Both sides)</th>
</tr>
</thead>
<tbody>
<tr>
<td>PV</td>
<td>○</td>
<td>●</td>
<td>○</td>
</tr>
<tr>
<td>PS</td>
<td>●</td>
<td>○</td>
<td>●</td>
</tr>
</tbody>
</table>

Note 1: PV port: Blank
Note 2: Supply port: ○: Plugged (EXH port is released to atmospheric pressure.)
Note: Blank plugs are attached to all ports of each valve unit.

Air Supply

<table>
<thead>
<tr>
<th>Station</th>
<th>1 station</th>
<th>Max. 8 units</th>
</tr>
</thead>
<tbody>
<tr>
<td>PV</td>
<td>114 g</td>
<td>45 g per additional station</td>
</tr>
</tbody>
</table>

Air Supply

<Manifold base>

<Individual spacer>

Use the individual spacer when separating the supply and pilot pressure exhaust ports of the manifold ejector.

ZX1 - R1 - 1

Individual spacer

Arrangement

- Refer to the individual spacer.
- When installed on station 1 and station 3:
- ZX106-R - 1 pc.
- ZX1101-K15LZ-EL(-Q) - 6 pcs.
- ZX1-R1-1
- ZX1-R1-3
- ZX1-R16 (Dummy spacer) - 4 pcs.

About individual spacers

- Manifold supply or valve unit supply can be selectable for each port. In the table below, ports with the symbol ○ mean that they are manifold supply, while others are individual supply from the valve unit.
- Symbols in the table below are printed on the surface of individual spacers.

<table>
<thead>
<tr>
<th>No.</th>
<th>Symbol</th>
<th>Note</th>
<th>No.</th>
<th>Symbol</th>
</tr>
</thead>
<tbody>
<tr>
<td>R1</td>
<td>PE</td>
<td></td>
<td>R9</td>
<td>PV</td>
</tr>
<tr>
<td>R2</td>
<td></td>
<td></td>
<td>R10</td>
<td></td>
</tr>
<tr>
<td>R3</td>
<td>PD</td>
<td></td>
<td>R11</td>
<td>PV</td>
</tr>
<tr>
<td>R4</td>
<td>PD</td>
<td></td>
<td>R12</td>
<td>PV</td>
</tr>
<tr>
<td>R5</td>
<td>PS</td>
<td></td>
<td>R13</td>
<td>PV</td>
</tr>
<tr>
<td>R6</td>
<td>PS</td>
<td></td>
<td>R14</td>
<td>PV</td>
</tr>
<tr>
<td>R7</td>
<td>PS</td>
<td></td>
<td>R15</td>
<td>PV</td>
</tr>
<tr>
<td>R8</td>
<td>PS</td>
<td></td>
<td>R16</td>
<td>PV</td>
</tr>
</tbody>
</table>

Caution when ordering manifold

The asterisk denotes the symbol for assembly.
Prefix it to the ejector part numbers to be mounted. When it is not added, the manifold base and ejector are shipped separately.
Manifold/System Circuit Example

When not using individual spacer

When using individual spacer (When using ZX1-R1)

PV: Air pressure SUP port
PS: Pilot pressure SUP port
PD: Release pressure SUP port
PE: Pilot pressure EXH port
EXH: Common EXH port

<System circuit example>

<System circuit example>
**Series ZX**

**Ejector System Manifold**

Note 1) The common exhaust port (EXH.) is also used as the pilot pressure exhaust (PE) port of pilot valve. Use while the port is open to the atmosphere.

Note 2) Combination of supply valve and release valve: K4, K5, K6, K7, K8, J3, J4, D4

The supply and release valves of this product have a structure which uses the pressure of the air pressure SUP (PV) port to operate them. Be sure to supply a pressure that is the pressure of the air pressure SUP (PV) port or more and 0.6 MPa or less to the pilot pressure SUP (PA, PB) ports for supply and release.

<table>
<thead>
<tr>
<th>Symbol</th>
<th>L1</th>
<th>L2</th>
<th>L3</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>33</td>
<td>45</td>
<td>50</td>
</tr>
<tr>
<td>2</td>
<td>54</td>
<td>66</td>
<td>71</td>
</tr>
<tr>
<td>3</td>
<td>75</td>
<td>87</td>
<td>92</td>
</tr>
<tr>
<td>4</td>
<td>96</td>
<td>108</td>
<td>113</td>
</tr>
<tr>
<td>5</td>
<td>117</td>
<td>129</td>
<td>134</td>
</tr>
<tr>
<td>6</td>
<td>138</td>
<td>150</td>
<td>155</td>
</tr>
<tr>
<td>7</td>
<td>159</td>
<td>171</td>
<td>176</td>
</tr>
<tr>
<td>8</td>
<td>180</td>
<td>192</td>
<td>197</td>
</tr>
</tbody>
</table>

**Legend**
- A: Release flow rate adjusting needle with lock nut
- B: (Needle fully open)
(In the case of individual spacer)

**B cross section**

- Individual spacer ZX1-R1
- Dummy spacer ZX1-R16
  - Dummy spacer ZX1-R16
- Individual spacer ZX1-R1

**A cross section**

- Pilot pressure EXH (PE) port M3
- Vacuum (V) port M5 (or M6)
- Air pressure SUP (PV) port M5 (or M6)
- Pitch = 21

**System circuit example**

**(Standard)**

- Individual spacer R1
- PV/EXH PS PD
- PE
- PS
- PV
- PD
- PE
- PS
- PV
- Adapter D

**(Semi-standard)**

**(In the case of individual spacer)**

- Individual spacer R1
- PV/EXH PS PD
- PE
- PS
- PV
- PD
- PE
- PS
- PV
- Adapter D

Related Equipment:

- ZA
- ZX
- ZR
- ZM
- ZMA
- ZQ
- ZH
- ZU
- ZL
- ZY
- ZF
- ZP
- SP
- ZCUK
- AMJ
- AMV
- AEP
- HEP
Ejector System

Manifold: Type K1

A: Release flow rate adjusting needle with lock nut

(Pitch = 21)

B: Release flow rate adjusting needle

(Pitch = 10)

Vacuum switch ZSE2

Filter

Common EXH (EXH.) port

1/8 (Rc, NPTF, G)

Common air pressure SUP (PV) port

1/8 (Rc, NPTF, G)

*1 The common exhaust port (EXH.) is also used as the pilot pressure exhaust (PE) port of pilot valve. Use while the port is open to the atmosphere.

<table>
<thead>
<tr>
<th>Symbol</th>
<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>
</tr>
</thead>
<tbody>
<tr>
<td>L1</td>
<td></td>
<td>33</td>
<td>54</td>
<td>75</td>
<td>98</td>
<td>117</td>
<td>138</td>
<td>159</td>
<td>180</td>
</tr>
<tr>
<td>L2</td>
<td></td>
<td>45</td>
<td>66</td>
<td>87</td>
<td>108</td>
<td>129</td>
<td>150</td>
<td>171</td>
<td>192</td>
</tr>
<tr>
<td>L3</td>
<td></td>
<td>50</td>
<td>71</td>
<td>92</td>
<td>113</td>
<td>134</td>
<td>155</td>
<td>176</td>
<td>197</td>
</tr>
</tbody>
</table>

(\[\text{mm}\])

- Lead wire length: Approx. 300
- Release valve: V114
- Pilot valve for supply: V114
A: Release flow rate adjusting needle with lock nut

(Needle fully open)

A: Release flow rate adjusting needle with lock nut

(Push and turn the locking type override.)

Common EXH (EXH.) port
Common air pressure SUP (PV) port
Vacuum switch ZSE2
Filter

Common EXH (EXH.) port
Common air pressure SUP (PV) port

+1 The common exhaust port (EXH.) is also used as the pilot pressure exhaust (PE) port of pilot valve. Use while the port is open to the atmosphere.

<table>
<thead>
<tr>
<th>Symbol</th>
<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>
</tr>
</thead>
<tbody>
<tr>
<td>L1</td>
<td></td>
<td>33</td>
<td>54</td>
<td>75</td>
<td>96</td>
<td>117</td>
<td>138</td>
<td>159</td>
<td>180</td>
</tr>
<tr>
<td>L2</td>
<td></td>
<td>45</td>
<td>66</td>
<td>87</td>
<td>108</td>
<td>129</td>
<td>150</td>
<td>171</td>
<td>192</td>
</tr>
<tr>
<td>L3</td>
<td></td>
<td>50</td>
<td>71</td>
<td>92</td>
<td>113</td>
<td>134</td>
<td>155</td>
<td>176</td>
<td>197</td>
</tr>
</tbody>
</table>
Vacuum Module: Vacuum Pump System

How to Order

Components

<table>
<thead>
<tr>
<th>Valve unit N.C. type</th>
<th>Vacuum switch unit</th>
<th>Valve unit N.O. type</th>
<th>Vacuum switch unit</th>
<th>Filter unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>ZX100</td>
<td>K1 5 L Z</td>
<td>ZX100</td>
<td>K1 5 L Z</td>
<td>F</td>
</tr>
</tbody>
</table>

Valve unit/Combination of supply valve and release valve
Refer to “Table (1)” on page 903.

Solenoid valve rated voltage

<table>
<thead>
<tr>
<th>1</th>
<th>Note</th>
<th>100 VAC 50/60 Hz</th>
<th>24 VDC</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>Note</td>
<td>110 VAC 50/60 Hz</td>
<td>24 VDC</td>
</tr>
<tr>
<td>5</td>
<td>6</td>
<td>12 VDC</td>
<td>6 VDC</td>
</tr>
<tr>
<td>S</td>
<td>R</td>
<td>5 VDC</td>
<td>3 VDC</td>
</tr>
<tr>
<td>Nil</td>
<td>Air operated</td>
<td>M plug</td>
<td>M plug</td>
</tr>
</tbody>
</table>

Note: CE-compliant products are not available for “1” and “3.”

Refer to “Table (2)” on page 903.

Electrical entry

<table>
<thead>
<tr>
<th>L</th>
<th>Lead wire length 0.3 m</th>
</tr>
</thead>
<tbody>
<tr>
<td>LN</td>
<td>Without lead wire (Applicable to DC only)</td>
</tr>
<tr>
<td>LO</td>
<td>Without connector</td>
</tr>
<tr>
<td>M</td>
<td>Lead wire length 0.3 m</td>
</tr>
<tr>
<td>MN</td>
<td>Without lead wire (Applicable to DC only)</td>
</tr>
<tr>
<td>MO</td>
<td>Without connector</td>
</tr>
<tr>
<td>G</td>
<td>Grommet</td>
</tr>
<tr>
<td>H</td>
<td>Lead wire length 0.3 m (Applicable to DC only)</td>
</tr>
<tr>
<td>Nil</td>
<td>Air operated</td>
</tr>
</tbody>
</table>

Note: CE-compliant products are not available for “1” and “3.”

Caution

For DC

With surge voltage suppressor

<table>
<thead>
<tr>
<th>Polarity protection diode</th>
<th>Polarity protection diode</th>
</tr>
</thead>
<tbody>
<tr>
<td>Red (+)</td>
<td>Red (+)</td>
</tr>
<tr>
<td>Black (-)</td>
<td>Black (-)</td>
</tr>
</tbody>
</table>

Match the polarity of the connectors according to the (+) and (-) marks on the connectors. Do not interchange the polarities to prevent the diodes or the switching elements from becoming burned.

For AC

With light (\(\text{L}\))

<table>
<thead>
<tr>
<th>Vanistor</th>
<th>Vanistor</th>
</tr>
</thead>
<tbody>
<tr>
<td>(--)</td>
<td>(--)</td>
</tr>
</tbody>
</table>

Note: Valve switch electrical entry

<table>
<thead>
<tr>
<th>N.</th>
<th>Type</th>
<th>Lead wire length 0.6 m</th>
</tr>
</thead>
<tbody>
<tr>
<td>L</td>
<td>Lead wire length 3 m</td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>Lead wire length 0.6 m</td>
<td></td>
</tr>
<tr>
<td>CN</td>
<td>Without lead wire assembly with connector</td>
<td></td>
</tr>
</tbody>
</table>

Vacuum digital pressure switch unit (ZSE3)

<table>
<thead>
<tr>
<th>D</th>
<th>21</th>
<th>2 outputs/without analog output</th>
</tr>
</thead>
<tbody>
<tr>
<td>22</td>
<td>2 outputs/with analog output</td>
<td></td>
</tr>
<tr>
<td>23</td>
<td>1 output (with trouble detection)/without analog output</td>
<td></td>
</tr>
<tr>
<td>24</td>
<td>1 output (with trouble detection)/with analog output</td>
<td></td>
</tr>
</tbody>
</table>

Note: Analog output is available only on grommet type.

Manual operation

<table>
<thead>
<tr>
<th>Nil</th>
<th>Non-locking push type</th>
</tr>
</thead>
<tbody>
<tr>
<td>B</td>
<td>Locking slotted type</td>
</tr>
</tbody>
</table>

The filter mounted on the product is a simplified one. When used in an environment with a lot of dust, the filter is likely to be clogged quickly.

If the polarity is incorrect at DC voltage, the diode or switching element may be damaged.

For CE-compliant products, refer to “How to Order” for ordering the manifold.

Refer to page 916 for ordering the manifold.

Refer to pages 926 and 927 for ordering a unit for replacement.

Note: Refer to “Table (3)” on page 903 for part number of lead wire with connector.

The use of the series ZFA, ZFB and ZFC is recommended.

S is not available for AC.

Refer to “Table (2)” on page 903 for part number of lead wire with connector.
### Table (1) Valve Unit/Combination of Supply Valve and Release Valve

<table>
<thead>
<tr>
<th>Components</th>
<th>Symbol</th>
<th>Supply valve</th>
<th>Release valve</th>
<th>Weight (g)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Solenoid valve</td>
<td>Air operated</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>N.C. (V114)</td>
<td>N.O. (SYJ324)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>N.O. (SYJ324)</td>
<td>N.O. (V114)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>None</td>
<td>N.C. (V114)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>N.C. (V114)</td>
<td>N.C. (V114)</td>
<td></td>
</tr>
<tr>
<td>Supply valve</td>
<td></td>
<td>Solenoid (N.C.)</td>
<td>Solenoid (N.C.)</td>
<td>79</td>
</tr>
<tr>
<td>Release valve</td>
<td></td>
<td>Solenoid (N.O.)</td>
<td>Solenoid (N.O.)</td>
<td>112</td>
</tr>
<tr>
<td>Air operated</td>
<td></td>
<td>Air operated (N.C.)</td>
<td>External release</td>
<td>53</td>
</tr>
<tr>
<td>Air operated</td>
<td></td>
<td>Air operated (N.O.)</td>
<td>Air operated (N.O.)</td>
<td>83</td>
</tr>
</tbody>
</table>

### Table (2) Valve Unit/Valve Plug Connector Assembly

| Lead wire length | Nil | 0.3 m | 0.6 m | 1 m | 1.5 m | 2 m | 2.5 m | 3 m | 5 m |

**Warning**

When replacing a product that uses a connector assembly with rectifier, replace the connector assembly as well.

### Table (3) Vacuum Switch/Plug Connector Assembly

| Lead wire length | Nil | 0.6 m | 3 m | 5 m |

**Warning**

When replacing a product that uses a connector assembly with rectifier, replace the connector assembly as well.

### Ejector System/Recommended Model

<table>
<thead>
<tr>
<th>Model</th>
<th>Combination</th>
<th>Solenoid valve rated voltage</th>
<th>Lead wire electrical entry</th>
<th>Light/ Surge voltage suppressor</th>
<th>Vacuum switch unit / Filter unit</th>
<th>Vacuum switch electrical entry</th>
</tr>
</thead>
<tbody>
<tr>
<td>ZX100-K15LZ-F</td>
<td>Supply valve (Pilot valve)</td>
<td>N.C. (V114)</td>
<td>N.C. (V114)</td>
<td>24 VDC</td>
<td>Plug connector type</td>
<td>Connector type</td>
</tr>
<tr>
<td>ZX100-K15LZ-EC</td>
<td>Supply valve (Direct operated)</td>
<td>N.C. (V114)</td>
<td>N.C. (V114)</td>
<td>With light/surge voltage suppressor</td>
<td>Suction filter (ZX1-F)</td>
<td></td>
</tr>
<tr>
<td>ZX100-K35MZ-EC</td>
<td>Solenoid valve (SYJ324M)</td>
<td>N.O. (SYJ324M)</td>
<td>N.O. (SYJ324M)</td>
<td>Vacuum switch (ZSE2)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## Vacuum Pump System/Combination of Supply Valve and Release Valve

### Combination Symbol: K1
Application: This combination is used for effecting control in accordance with electric signals.

**How to Operate**

<table>
<thead>
<tr>
<th>Condition</th>
<th>Valve</th>
<th>Supply valve</th>
<th>Release valve</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Work adsorption</td>
<td>Solenoid</td>
<td>ON</td>
<td>OFF</td>
</tr>
<tr>
<td>2. Vacuum release</td>
<td>OFF</td>
<td>ON</td>
<td>OFF</td>
</tr>
<tr>
<td>3. Operation stop</td>
<td>OFF</td>
<td>OFF</td>
<td></td>
</tr>
</tbody>
</table>

### Combination Symbol: K6
Application: This combination is used for effecting control in accordance with air signals.

**How to Operate**

<table>
<thead>
<tr>
<th>Condition</th>
<th>Valve</th>
<th>Supply valve</th>
<th>Release valve</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Work adsorption</td>
<td>External 3 port valve</td>
<td>ON</td>
<td>OFF</td>
</tr>
<tr>
<td>2. Vacuum release</td>
<td>OFF</td>
<td>ON</td>
<td>ON</td>
</tr>
<tr>
<td>3. Operation stop</td>
<td>OFF</td>
<td>OFF</td>
<td></td>
</tr>
</tbody>
</table>

### Combination Symbol: K3
Application: This combination is used for effecting control in accordance with electric signals. Because the supply valve is N.O., the pressure that is supplied to the ejector is not interrupted during a power outage; as a result, the state of suction can be maintained. This combination is used for preventing the workpieces from dropping during power outages.

**How to Operate**

<table>
<thead>
<tr>
<th>Condition</th>
<th>Valve</th>
<th>Supply valve</th>
<th>Release valve</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Work adsorption</td>
<td>Solenoid</td>
<td>OFF</td>
<td>OFF</td>
</tr>
<tr>
<td>2. Vacuum release</td>
<td>ON</td>
<td>ON</td>
<td>ON</td>
</tr>
<tr>
<td>3. Operation stop</td>
<td>ON</td>
<td>OFF</td>
<td></td>
</tr>
</tbody>
</table>

### Combination Symbol: K8
Application: This combination is used for effecting control in accordance with air signals. Because the supply valve is N.O., the pressure that is supplied to the ejector is not interrupted during a power outage; as a result, the state of suction can be maintained. This type is used for preventing the workpieces from dropping during power outages.

**How to Operate**

<table>
<thead>
<tr>
<th>Condition</th>
<th>Valve</th>
<th>Supply valve</th>
<th>Release valve</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Work adsorption</td>
<td>Air operated valve</td>
<td>OFF</td>
<td>OFF</td>
</tr>
<tr>
<td>2. Vacuum release</td>
<td>ON</td>
<td>ON</td>
<td>ON</td>
</tr>
<tr>
<td>3. Operation stop</td>
<td>ON</td>
<td>OFF</td>
<td></td>
</tr>
</tbody>
</table>
Vacuum Pump System/Construction

**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>Poppet valve assembly</td>
<td>Stainless steel</td>
<td>ZX1-PV-0</td>
</tr>
<tr>
<td>2</td>
<td>Release flow rate adjusting needle</td>
<td>Aluminum</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Manifold base</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Vacuum switch</td>
<td>ZSE2, ZSE3</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Valve unit</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Interface plate</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Return spring</td>
<td>Stainless steel</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Filter case</td>
<td>Polycarbonate</td>
<td></td>
</tr>
</tbody>
</table>

**Replacement Parts**

<table>
<thead>
<tr>
<th>No.</th>
<th>Description</th>
<th>Material</th>
<th>Part no.</th>
</tr>
</thead>
<tbody>
<tr>
<td>9</td>
<td>Pilot valve</td>
<td>Refer to Table (2), (3).</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Filter element</td>
<td>PVA</td>
<td>ZX1-FE</td>
</tr>
<tr>
<td>11</td>
<td>Gasket</td>
<td>ZX1-FG</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Filter case assembly</td>
<td>ZX1-FK-PC</td>
<td></td>
</tr>
</tbody>
</table>

**Table (1) How to Order Pilot Valves**

<table>
<thead>
<tr>
<th>No.</th>
<th>Component equipment</th>
<th>Model</th>
<th>Combination of supply and release value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Supply valve</td>
<td>Z1-V114-</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Release valve</td>
<td>N.C. (V114)</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Solenoid valve</td>
<td>Z1-VYJ324</td>
<td></td>
</tr>
<tr>
<td></td>
<td>N.O.</td>
<td>SYJ324M</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Air operated</td>
<td>SYJ324M</td>
<td></td>
</tr>
<tr>
<td></td>
<td>N.O.</td>
<td>N.C. (SYJ314)</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Solenoid valve</td>
<td>SYJ314</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Air operated</td>
<td>N.O. (SYJA324)</td>
<td></td>
</tr>
</tbody>
</table>

**Table (2) How to Order Solenoid Valves**

**Table (3) How to Order Air Operated Valves**

**ZX1A—M5**

| Port size | M5 x 0.8 | Pilot port | External release port |

**Caution**

Turning the vacuum release flow volume adjusting needle clockwise reduces the vacuum release flow volume; the needle valve is fully closed when the needle stops turning. Turning the needle 2 full turns counterclockwise from the fully closed position renders the needle valve fully open. The needle will fall out if it is turned more than 4 full turns. In order to prevent the needle from loosening and falling out, the release flow rate adjusting needle with lock nut (ZX1-ND-L) is also available.

---

**Component parts**

- Filter case, filter element, tension bolt (including O-rings)
- Gasket (Gasket 01 is not included.)

**Note**

1. The case is made of polycarbonate. Therefore, do not use it with or expose it to the following chemicals: paint thinner, carbon tetrachloride, chloroform, acetic ester, aniline, cyclohexane, trichloroethylene, sulfuric acid, lactic acid, watersoluble cutting oil (alkalinic), etc.
2. Do not expose it to direct sunlight.

---

**Combination of supply and release valve**

- Solenoid valve Air operated
- Solenoid valve N.O.
- Solenoid valve N.C.
- Air operated N.O.
- Air operated N.C.
- Solenoid valve

---

**Rated voltage**

- 100 VAC
- 110 VAC
- 24 VDC
- 12 VDC
- 5 VDC
- 3 VDC
- 3 VDC

**Electrical entry**

- L Connector (0.3 m)
- LN Connector without lead wires
- L0 Without connector
- M Connector (0.3 m)
- MN Connector without lead wires
- MO Without connector
- S Grommet (0.3 m)
- T Grommet (0.6 m)

---

**In the case of Z1-V114, M, MN and MO cannot be selected.**
Model/Specifications

<table>
<thead>
<tr>
<th>Unit no.</th>
<th>ZX1-VB</th>
<th>ZY1-VB</th>
<th>ZY2-VB</th>
</tr>
</thead>
<tbody>
<tr>
<td>Components</td>
<td>Supply valve</td>
<td>Release valve</td>
<td></td>
</tr>
<tr>
<td>Pilot type</td>
<td>Solenoid valve</td>
<td>Air operated</td>
<td>Solenoid valve</td>
</tr>
<tr>
<td>N.C.</td>
<td>N.O.</td>
<td>N.C.</td>
<td>N.O.</td>
</tr>
<tr>
<td>V114</td>
<td>SY324</td>
<td>V114</td>
<td>SY314</td>
</tr>
<tr>
<td>Cv factor</td>
<td>0.17</td>
<td>0.008</td>
<td>0.08</td>
</tr>
<tr>
<td>Supply pressure range of vacuum pressure SUP (PV) port</td>
<td>—0.1 to 0 MPa</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Supply pressure range of pilot pressure SUP (PS) port</td>
<td>0.3 to 0.6 MPa</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Supply pressure range of pilot pressure SUP (PA, PB) ports for supply and release</td>
<td>PS port pressure to 0.6 MPa</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Max. operating frequency</td>
<td>5 Hz</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Operating temperature range</td>
<td>5 to 50°C</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Interface plate symbol</td>
<td>(PV) → (PS → PD)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Standard accessory</td>
<td>Bracket B (ZX1-OBB)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note) The supply and release valves of this product have a structure which uses the pressure of the pilot pressure SUP (PS) port to operate them. Be sure to supply a pressure that is the pressure of the pilot pressure SUP (PS) port or more and 0.6 MPa or less to the pilot pressure SUP (PA, PB) ports for supply and release.
Suction Filter Unit: ZX1-F

Refer to page 874 for details.

Specifications

<table>
<thead>
<tr>
<th></th>
<th>ZX1-F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unit no.</td>
<td></td>
</tr>
<tr>
<td>Operating pressure range</td>
<td>–100 to 500 kPa</td>
</tr>
<tr>
<td>Operating temperature range</td>
<td>5 to 50°C</td>
</tr>
<tr>
<td>Filtration efficiency</td>
<td>30 µm</td>
</tr>
<tr>
<td>Filter media</td>
<td></td>
</tr>
<tr>
<td>Weight</td>
<td></td>
</tr>
<tr>
<td>ZSE2-0X</td>
<td>37 g (With bracket A)</td>
</tr>
<tr>
<td>ZSE3-0X</td>
<td>29 g (Without bracket A)</td>
</tr>
</tbody>
</table>

Note) If not operated within the specified range of pressure and temperature, trouble may be caused.

How to Order

ZX1 – F – □ – □

PV, V port size

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Nil</td>
<td>M5 x 0.8</td>
</tr>
<tr>
<td>Y</td>
<td>M6 x 1 (Semi-standard)</td>
</tr>
</tbody>
</table>

Bracket

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Nil</td>
<td>With bracket A</td>
</tr>
<tr>
<td>N</td>
<td>Without bracket A</td>
</tr>
</tbody>
</table>

Vacuum Pressure Switch Unit/ZSE2, ZSE3

Refer to pages 875 to 880 for details.

The ZSE3 vacuum pressure switch unit is to be discontinued.

Vacuum Pressure Switch

High speed response/10 ms
Uses a carrier diffusion semiconductor pressure sensor

Vacuum Pressure Switch Specifications

Refer to Best Pneumatics No. 6 for details.

<table>
<thead>
<tr>
<th></th>
<th>ZSE2-0X</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fluid</td>
<td>Air</td>
</tr>
<tr>
<td>Set pressure range</td>
<td>0 to –101 kPa</td>
</tr>
<tr>
<td>Hysteresis</td>
<td>3% Full span or less</td>
</tr>
<tr>
<td>Repeatability</td>
<td>±1% Full span or less</td>
</tr>
<tr>
<td>Temperature characteristics</td>
<td>±3% Full span or less</td>
</tr>
<tr>
<td>Voltage</td>
<td>12 to 24 VDC (Ripple ±10% or less)</td>
</tr>
<tr>
<td>Port size</td>
<td>M5 x 0.8, M6 x 1 (Semi-standard)</td>
</tr>
</tbody>
</table>

Note) If not operated within the specified range of pressure and temperature, trouble may be caused.

• Filter case

Caution

1. The case is made of polycarbonate. Therefore, do not use it with or expose it to the following chemicals: paint thinner, carbon tetrachloride, chloroform, acetic ester, aniline, cyclohexane, trichloroethylene, sulfuric acid, lactic acid, water-soluble cutting oil (alkalineic), etc.
2. Do not expose it to direct sunlight.
Series ZX

Valve Unit: Type K1

Configuration and combination

<table>
<thead>
<tr>
<th>Valve unit (K1)</th>
<th>Vacuum switch (ZSE2)</th>
<th>Vacuum switch (ZSE3)</th>
<th>Filter unit (F)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model</td>
<td>ZX100</td>
<td>K1</td>
<td>D</td>
</tr>
<tr>
<td></td>
<td></td>
<td>F</td>
<td></td>
</tr>
</tbody>
</table>

Vacuum switch (ZSE2)
ZX100-K1-E

A: Release flow rate adjusting needle with lock nut
8 (Needle fully open)

Pilot valve for supply V114
 Release valve V114

Release flow rate adjusting needle
Pressure setting trimmer

Pressure setting trimmer
2 x ø1.8° (Mounting hole)

Vacuum switch ZSE2

Vacuum digital pressure switch (D)

Filter unit

Circuit diagram

(Circuits other than those with vacuum switch are shown as below.)

Vacuum switch (ZSE2)

ZSE2

Vacuum switch (E)

Spacer 1 (ZX1-S1)

66 [72.8]
29.2
21.6
10
20
41
51

Pressure setting trimmer
2 x ø1.8° (Mounting hole)

Spacer 1 (ZX1-S1)

66 [72.8]
29.2
21.6
10
20
41
51

Note) Dimensions ∗: For mounting bracket A ∗∗: For mounting spacer 1.
Vacuum switch (ZSE3) 
ZX100-K1111111-D

A: Release flow rate adjusting needle with lock nut

Note) At the pilot pressure SUP (PS) port, use a One-touch fitting or a barb fitting of one of the following sizes.
If the lock nut for release flow rate adjusting needle is:
- Not attached: ø8 or smaller (e.g. KQ2S04-M3G)
- Attached: ø6 or smaller (e.g. M-3AU-3)
Series ZX

Valve Unit: Type K3

Configuration and combination

Valve unit (K3) + Vacuum switch (ZSE2) + Vacuum switch (ZSE3) + Filter unit (F)

Model
ZX100  K3 □ □ □ □

Vacuum switch (ZSE2)
ZX100-K3 □ □ □ □-E □

A: Release flow rate adjusting needle with lock nut
B (Needle fully open)

Circuit diagram
(Circuits other than those with vacuum switch are shown as below.)

Vacuum switch (E)

Vacuum digital pressure switch (D)

Filter unit

Note) Dimensions: |- For mounting bracket A -++ For mounting spacer 1.
Filter unit (F)
ZX100-K3□□□□-F

Spacer 1: ZX1-S1

Vacuum Module: Vacuum Pump System Series ZX

Vacuum Pump System Series ZX

Related Equipment
**Series ZX**

**Valve Unit: Type K6**

### Configuration and combination

**Valve unit (K6)** + **Vacuum switch (ZSE2)** + **Vacuum switch (ZSE3)** + **Filter unit (F)**

**Model**

- ZX100 — K6 — F
- D□□□

### Vacuum switch (ZSE2)

**ZX100-K6-E□**

- **A:** Release flow rate adjusting needle with lock nut
  - 8 (Needle fully open)

### Circuit diagram

- **Vacuum switch (E)**
- **Vacuum digital pressure switch (D)**

### Note 1)

Dimensions □: For mounting bracket A  □□: For mounting spacer 1.

### Note 2)

Combination of supply valve and release valve: K5, K6, J3

The supply and release valves of this product have a structure which uses the pressure of the pilot pressure SUP (PS) port to operate them. Be sure to supply a pressure that is the pressure of the pilot pressure SUP (PS) port or more and 0.6 MPa or less to the pilot pressure SUP (PA, PB) ports for supply and release.

[ ]: AC

© 912 SMC
Filter unit (F)  
ZX100-K6-F

Spacer 1: ZX1-S1

2 x R1.8" (Mounting hole)  
ø3.6" (Mounting hole)

Filter

2 x ø3.5" (Mounting hole)
Series ZX

Valve Unit: Type K8

Configuration and combination

<table>
<thead>
<tr>
<th>Valve unit (K8)</th>
<th>Vacuum switch (ZSE2)</th>
<th>Vacuum switch (ZSE3)</th>
<th>Filter unit (F)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ZX100</td>
<td>E</td>
<td>F</td>
<td>D</td>
</tr>
</tbody>
</table>

Model

- Vacuum switch (ZSE2)
  - ZX100-K8-E

Vacuum digital pressure switch (D)

- Without analog output
- With analog output

Filter unit

- ZSE2
- ZSE3

Circuit diagram

(Circuits other than those with vacuum switch are shown as below.)

Vacuum switch (E)

- (For side mounting)
- (Mounting hole)

Vacuum switch (ZSE2)

- (Mounting hole)

Pressure setting trimmer

A: Release flow rate adjusting needle with lock nut

Release valve (Normally open)
(Air operated SYJA324)

Manual override (Non-locking)

Release valve (Normally closed)
(Air operated SYJA314)

Release flow rate adjusting needle

Bracket A (ZX1-OBA)

Bracket A

Spacer 1 (ZX1-S1)

Mounting hole

Pilot pressure SUP (PA) port for supply

Pilot pressure SUP (PB) port for release

Note 1) Dimensions:
- For mounting bracket A:
- For mounting spacer 1:

Note 2) Combination of supply valve and release valve: K4, K7, K8, J4, D4

The supply and release valves of this product have a structure which uses the pressure of the pilot pressure SUP (PS) port to operate them. Be sure to supply a pressure that is the pressure of the pilot pressure SUP (PS) port or more and 0.6 MPa or less to the pilot pressure SUP (PA, PB) ports for supply and release.
Filter unit (F)  
ZX100-K8-F

Spacer 1: ZX1-S1

Filter

Related Equipment

ZA  
ZX  
ZR  
ZM  
ZMA  
ZQ  
ZH  
ZU  
ZL  
ZY  
ZF  
ZP  
SP  
ZCUK  
AMJ  
AMV  
AMV  
AEP  
HEP
Vacuum Pump System/Manifold Specifications

### Specifications

<table>
<thead>
<tr>
<th>Max. number of units</th>
<th>Port size</th>
<th>Supply port (PV)</th>
<th>Exhaust port (EXH)</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max. 8 units</td>
<td></td>
<td>1/8 (Rc, NPTF, G)</td>
<td>1/8 (Rc, NPTF, G)</td>
<td>1 station: 110 g (45 g per additional station)</td>
</tr>
</tbody>
</table>

Note 1) PD port: Blank
Note 2) Vacuum from both sides of PV port for 6 or more stations of ZX100 external vacuum pump manifold.

#### Air Supply

<table>
<thead>
<tr>
<th>Supply port location</th>
<th>Left side</th>
<th>Right side</th>
</tr>
</thead>
<tbody>
<tr>
<td>PV</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PV</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PV</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>R (Left)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B (Both sides)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

○: Vacuum supply from PV port ○: Air supply from PS port ●: Plugged

Note) All ports for each valve unit are provided with plugs.

### How to Order Manifold

#### <Manifold base>

**ZX1** 06 - [R]

#### Supply port location

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Left side</th>
<th>Right side</th>
</tr>
</thead>
<tbody>
<tr>
<td>R</td>
<td>PV port on the right side</td>
<td>PS port on the right side</td>
</tr>
<tr>
<td></td>
<td>PV port on the left side</td>
<td>PS port on the left side</td>
</tr>
<tr>
<td></td>
<td>PV port on both sides</td>
<td>PS port on both sides</td>
</tr>
</tbody>
</table>

#### Thread of supply and exhaust valve

<table>
<thead>
<tr>
<th>Nil</th>
<th>Rc</th>
</tr>
</thead>
<tbody>
<tr>
<td>F</td>
<td>G  (Note)</td>
</tr>
<tr>
<td>T</td>
<td>NPTF</td>
</tr>
</tbody>
</table>

Note) G thread
The thread ridge shape is compatible with the G thread standard (JIS B 0202), but other shapes are not conforming to ISO16030 and ISO1179.

#### <Individual spacer>

**ZX1** - [R1] - 1

### Individual spacer

- Refer to the individual spacer.
- Ordering example:

  - If installed on station 1 and station 3:
    - ZZX106-R
    - ZZX100-K15LZ-EC(-Q)
    - ZZX1-R1-1
    - ZZX1-R16 (Dummy spacer)

### Arrangement

(First station from the right end of the valve side is station 1.)

- Nil
- All stations
- 1
- Station 1 only
- 8
- Station 8 only

- When spacers are mounted alternately, specify them together.
- When retrofitting, 3 pcs. of M2.5 x 32 (for ZX) are necessary. A dummy spacer (ZX1-R16) must be mounted on the stations on which individual spacers are not mounted.

### About individual spacers

- Manifold supply or valve unit supply can be selectable for each port. In the table below, ports with the symbol  mean that they are manifold supply, while others are individual supply from the valve unit.
- Symbols in the table below are printed on the surface of individual spacers.

#### Part no. | Symbol
---|---
**ZX1-R1** | R1
**ZX1-R9** | R9

#### Part no. | Symbol
---|---
R2 | PE
R3 | PD
R4 | PE
R5 | PS
R6 | PE
R7 | PS
R8 | PE
R10 | PV
R11 | PD
R12 | PD
R13 | PV
R14 | PS
R15 | PS
R16 | PV

### Caution when ordering manifold

- The asterisk denotes the symbol for assembly.
- Prefix it to the ejector part numbers to be mounted. When it is not added, the manifold base and ejector are shipped separately.
Manifold/System Circuit Example

When not using individual spacer

When using individual spacer (When using ZX1-R1)

PV: Vacuum pressure SUP port
PS: Pilot pressure SUP port
PD: Release pressure SUP port
PE: Pilot pressure EXH port
EXH: Common EXH port

<System circuit example>

<Classified information>

Vacuum Pump System
Series ZX

ZA ZM ZQ ZU ZR ZL ZY ZF ZP SP ZCUK AMJ AMV AEP HEP Related Equipment
Vacuum Pump System Manifold

**Note 1)** The common exhaust port (EXH.) is also used as the pilot pressure exhaust (PE) port of pilot valve. Use while the port is open to the atmosphere.

**Note 2)** Combination of supply valve and release valve: K4, K5, K6, K7, K8, J3, J4, D4

The supply and release valves of this product have a structure which uses the pressure of the pilot pressure SUP (PS) port to operate them. Be sure to supply a pressure that is the pressure of the pilot pressure SUP (PS) port or more and 0.6 MPa or less to the pilot pressure SUP (PA, PB) ports for supply and release.

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Station</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>
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<tbody>
<tr>
<td>L1</td>
<td></td>
<td>33</td>
<td>54</td>
<td>75</td>
<td>96</td>
<td>117</td>
<td>138</td>
<td>159</td>
<td>180</td>
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<tr>
<td>L2</td>
<td></td>
<td>45</td>
<td>66</td>
<td>87</td>
<td>108</td>
<td>129</td>
<td>150</td>
<td>171</td>
<td>192</td>
</tr>
<tr>
<td>L3</td>
<td></td>
<td>50</td>
<td>71</td>
<td>92</td>
<td>113</td>
<td>134</td>
<td>155</td>
<td>176</td>
<td>197</td>
</tr>
</tbody>
</table>

**Series ZX**
(In the case of individual spacer)

B cross section

System circuit example

(Standard)

(Semi-standard)

(In the case of individual spacer)

A cross section

Individual vacuum pressure SUP (PV) port M5 (or M6)

Vacuum (V) port M5 (or M6)

Vacuum (V) port M5 (or M6)

Individual vacuum pressure SUP (PV) port M5 (or M6)

Vacuum (V) port M5 (or M6)

Vacuum (V) port M5 (or M6)
Vacuum Pump System Manifold: Type K1

A: Release flow rate adjusting needle with lock nut

8 (Needle fully open)

<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>
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</thead>
<tbody>
<tr>
<td>L1</td>
<td>33</td>
<td>54</td>
<td>75</td>
<td>96</td>
<td>117</td>
<td>138</td>
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<td>180</td>
</tr>
<tr>
<td>L2</td>
<td>45</td>
<td>66</td>
<td>87</td>
<td>108</td>
<td>129</td>
<td>150</td>
<td>171</td>
<td>192</td>
</tr>
<tr>
<td>L3</td>
<td>50</td>
<td>71</td>
<td>92</td>
<td>113</td>
<td>134</td>
<td>155</td>
<td>176</td>
<td>197</td>
</tr>
</tbody>
</table>

The common exhaust port (EXH.) is also used as the pilot pressure exhaust (PE) port of pilot valve. Use while the port is open to the atmosphere.
The common exhaust port (EXH.) is also used as the pilot pressure exhaust (PE) port of pilot valve. Use while the port is open to the atmosphere.
Vacuum Module:
Vacuum Pump System Series ZX

Circuit diagram

Vacuum (V) port M5 (or M6)

Related Equipment

ZA
ZX
ZR
ZM
ZMA
ZQ
ZH
ZU
ZL
ZY
ZF
ZP
SP
ZCUK
AMJ
AMV
AEP
HEP

SMC
Ejector System/Unit Construction (Refer to below for unit replacement.)

Single unit

How to Order Unit for Replacement

1. Valve unit
ZX1 – V A K1 5 L Z B – L – D – S –

For ejector system

Combination of supply valve and release valve (Refer to page 867 for details.)

Solenoid valve rated voltage

<table>
<thead>
<tr>
<th>Voltage</th>
<th>Rated Voltage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1&quot;</td>
<td>100 VAC 50/60 Hz</td>
</tr>
<tr>
<td>3&quot;</td>
<td>110 VAC 50/60 Hz</td>
</tr>
<tr>
<td>5</td>
<td>24 VDC</td>
</tr>
<tr>
<td>6</td>
<td>12 VDC</td>
</tr>
<tr>
<td>V</td>
<td>6 VDC</td>
</tr>
<tr>
<td>S</td>
<td>5 VDC</td>
</tr>
<tr>
<td>R</td>
<td>3 VDC</td>
</tr>
</tbody>
</table>

* Applicable to plug connector only. When replacing a product that uses a connector assembly with rectifier, replace the connector assembly as well. (Table (2) on page 867)

2. Ejector assembly
ZX1 – W D 05 1

Unit for replacement

Nozzle diameter

<table>
<thead>
<tr>
<th>Diameter</th>
<th>Unit for replacement</th>
</tr>
</thead>
<tbody>
<tr>
<td>05</td>
<td>0.5 mm</td>
</tr>
<tr>
<td>07</td>
<td>0.7 mm</td>
</tr>
<tr>
<td>10</td>
<td>1.0 mm</td>
</tr>
</tbody>
</table>

How to order

Valve unit (Supply valve: N.O.) (For replacement)
ZX1-VAK3 0X K15 L D S D

How to order

Valve unit (Supply valve: N.C.) (For replacement)
ZX1-VAK1 0X K15 L D S D

How to order

Valve unit (Supply valve: Air operated) (For replacement)
ZX1-VAK6 0X K15 L D S D

How to order

Vacuum switch unit

ZSE2 0X C D 15

Unit for replacement

Piping specifications

<table>
<thead>
<tr>
<th>Specification</th>
<th>Pipe Material</th>
</tr>
</thead>
<tbody>
<tr>
<td>15</td>
<td>NPN open collector</td>
</tr>
<tr>
<td>55</td>
<td>PNP open collector</td>
</tr>
</tbody>
</table>

Output specifications

<table>
<thead>
<tr>
<th>Output Specifications</th>
<th>Pin Assignment</th>
</tr>
</thead>
<tbody>
<tr>
<td>21</td>
<td>2 outputs/without analog output</td>
</tr>
<tr>
<td>22</td>
<td>2 outputs/with analog output</td>
</tr>
<tr>
<td>23</td>
<td>1 output (with trouble detection)/without analog output</td>
</tr>
<tr>
<td>24</td>
<td>1 output (with trouble detection)/with analog output</td>
</tr>
</tbody>
</table>

Note) Analog output is available only on grommet type.

D: Unit for replacement
Ex.) If a filter unit is replaced for a vacuum switch on ZX1071-K15LZ-F, indicate as ZSE2-0X-15C-D. In this case, mounting screws AC00378 (M2.5 x 51) (2 pcs.) are required.

If the unit is used on its own, not combined with others, “D” is not required. (Valve unit, ejector assembly and switch unit)
Ex.) ZSE2-0X-15C, ZX1-VAK15LZ, ZX1-W051

How to Order

Valve unit (Supply valve: N.O.) (For replacement)
ZX1-VAK3 0X K15 L D S D

How to Order

Valve unit (Supply valve: N.C.) (For replacement)
ZX1-VAK1 0X K15 L D S D

How to Order

Valve unit (Supply valve: Air operated) (For replacement)
ZX1-VAK6 0X K15 L D S D

How to Order

Vacuum switch unit

ZSE2 0X C D 15

Unit for replacement

Piping specifications

<table>
<thead>
<tr>
<th>Specification</th>
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<td>15</td>
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</tr>
</tbody>
</table>

Note) Analog output is available only on grommet type.

D: Unit for replacement
Ex.) If a filter unit is replaced for a vacuum switch on ZX1071-K15LZ-F, indicate as ZSE2-0X-15C-D. In this case, mounting screws AC00378 (M2.5 x 51) (2 pcs.) are required.

If the unit is used on its own, not combined with others, “D” is not required. (Valve unit, ejector assembly and switch unit)
Ex.) ZSE2-0X-15C, ZX1-VAK15LZ, ZX1-W051
Manifold

How to Order Unit for Replacement

1. Valve unit
   - Refer to page 872 for details.
   - ZX1-V A K1 5 L Z B - L - D - M -
     - For ejector system
     - Combination of supply valve and release valve
     - Solenoid valve rated voltage
     - Electrical entry
     - Light/Surge voltage suppressor
     - Manual operation
   - How to order ① Valve unit (Supply valve: N.C.) (For replacement)
     ZX1-VAK3-000 D-M
   - Philips screw
     AC00347 (M2.5 x 28)

2. Manifold base
   - ZZX1 05 R A C
   - Station
     01 1
     08 8
   - Thread type
     Nil R M5 x 0.8
     T G M6 x 1 (Semi-standard)
   - Supply port location
     R Right side
     L Left side
     B Both sides
   - How to order ② Manifold base
     ZZX1 05 R A C
     - Nil Without lock nut
     - L With lock nut

3. Ejector assembly
   - ZX1-W D 05 1
   - CE-compliant
   - Unit for replacement
   - Nozzle diameter
     05 0.5 mm
     07 0.7 mm
     10 1.0 mm
   - Release flow rate adjusting needle
     Nil Without lock nut
     L With lock nut
   - For ejector system
     (PD and PS ports are equipped with plugs.)
   - How to order ③ Ejector assembly
     ZW1-WD

4. Vacuum switch unit
   - ZSE2-0X 15 C D
   - Piping specifications
     Nil Grommet (0.6 m)
     L Grommet (3 m)
     C Connector (0.6 m)
     CL Connector (3 m)
     CN Without connector
   - Output specifications
     15 NPN open collector
     55 PNP open collector
   - PV, V port size
     M5 x 0.8
   - Unit for replacement

5. Vacuum digital pressure switch unit
   - ZSE3-0X 21 C D
   - Piping specifications
     Nil Grommet (0.6 m)
     L Grommet (3 m)
     C Connector (0.6 m)
     CL Connector (3 m)
     CN Without connector
   - Output specifications
     21 2 outputs/without analog output
     22 2 outputs/with analog output
     23 1 output (with trouble detection)/without analog output
     24 1 output (with trouble detection)/with analog output
   - Note) Analog output is available only on grommet type.
Vacuum Pump System/Unit Construction (Refer to below for unit replacement.)

Single unit

How to Order Unit for Replacement

1. Valve unit
   **ZX1-VB**
   K1 15 L Z B
   For vacuum pump system
   Combination of supply valve and release valve
   (Refer to page 903 for details.)
   - Solenoid valve rated voltage
     - CE-compliant
     - 1" 100 VAC 50/60 Hz
     - 3" 110 VAC 50/60 Hz
     - 5 24 VDC
     - 6 12 VDC
     - S 5 VDC
     - R 3 VDC
   - *Applicable to plug connector only.
   - When replacing a product that uses a connector assembly with rectifier, replace the connector assembly as well. (Table 2 on page 903)

2. Vacuum switch unit
   **ZSE2-0X**
   - PV, V port size
     - Nil M5 x 0.8
     - L M6 x 1 (Semi-standard)
   - Manual operation
     - Nil Non-locking push type
     - B Locking slotted type
   - Light/Surge voltage suppressor
     - Nil Without light/surge voltage suppressor
     - Z With light/surge voltage suppressor
   - Electrical entry
     - L L plug connector
   - Unit for replacement
   - Single unit
     - (PD port is equipped with plug.)
     - Release flow rate adjusting needle
     - Nil Without lock nut
     - L With lock nut
   - Piping specifications
     - Nil Grommet (0.6 m)
     - L Grommet (3 m)
     - C Connector (0.6 m)
     - CL Connector (3 m)
     - CN Without connector
   - Output specifications
     - Nil —
     - Q CE-compliant
     - T5 NPN open collector
     - S5 PNP open collector
   - CE-compliant
   - Output specifications

3. Vacuum digital pressure switch unit
   **ZSE3-0X**
   - PV, V port size
     - Nil M5 x 0.8
     - L M6 x 1 (Semi-standard)
   - Manual operation
     - Nil Non-locking push type
     - B Locking slotted type
   - Light/Surge voltage suppressor
     - Nil Without light/surge voltage suppressor
     - Z With light/surge voltage suppressor
   - Electrical entry
     - L L plug connector
   - Unit for replacement
   - Single unit
     - (PD port is equipped with plug.)
     - Release flow rate adjusting needle
     - Nil Without lock nut
     - L With lock nut
   - Piping specifications
     - Nil Grommet (0.6 m)
     - L Grommet (3 m)
     - C Connector (0.6 m)
     - CL Connector (3 m)
     - CN Without connector
   - Output specifications
     - 21 2 outputs/without analog output
     - 22 2 outputs/with analog output
     - 23 1 output (with trouble detection)/without analog output
     - 24 1 output (with trouble detection)/with analog output
   - CE-compliant
   - (PD port is equipped with plug.)

D: Unit for replacement
Ex.) If a filter unit is replaced for a vacuum switch on ZX100-K15LZ-F, indicate as ZSE2-0X-15C-D. In this case, mounting screws AC00796 (M2.5 x 39) (2 pcs.) are required.
If the unit is used on its own, not combined with others, “D” is not required.
Ex.) ZSE2-0X, ZX1-VBK1SLZ
How to Order Unit for Replacement

**Manifold**

1. **Valve unit**
   - Refer to page 906 for details.
   - **ZX1-V B K1 5 L Z B - L - D - M**
     - For vacuum pump system
     - Combination of supply valve and release valve
     - Solenoid valve rated voltage
     - Electrical entry
     - Light/Surge voltage suppressor
     - Manual operation

2. **Manifold base**
   - Refer to page 916 for details.
   - **ZZX1 06 - R - B**
     - System for external vacuum
     - Supply port location
     - **Thread type**
       - Nil: Rc 1/8
       - F: G
       - T: NPTF

3. **Vacuum switch unit**
   - **ZSE2-0X [15] C-D**
     - PV, V port size
     - Output specifications
     - Piping specifications
     - Unit for replacement

4. **Vacuum digital pressure switch unit**
   - **ZSE3-0X [21] C-D**
     - PV, V port size
     - Output specifications
     - Piping specifications
     - Unit for replacement

---

**Note 1)** PV port size: M5
PV port size: Please contact SMC if an M6 is required.

**Note 2)** V port (M5): ZX1-AS-001
V port (M6): ZX1-AS-002

---

**Related Equipment**

- ZA
- ZK
- ZM
- ZQ
- ZH
- ZU
- ZL
- ZY
- ZF
- ZP
- SP
- ZCUK
- AMJ
- AMV
- AEP
- HEP

---

**How to order**

- Valve unit (Supply valve: N.O.) (For replacement)
  - ZX1-VBK1 [D-M]

- Valve unit (Supply valve: Air operated) (For replacement)
  - ZX1-VBK6 [D-M]

- Valve unit (Supply valve: N.C.) (For replacement)
  - ZX1-VBK3 [D-M]

- Manifold base
  - ZZX1 [R-B]

---

**Philips screw**

- AC00347 (M2.5 x 28)
- AC00376 (M2.5 x 51)
- AC00649 (M2.5 x 39)
- AC00347 (M2.5 x 28)
- AC00376 (M2.5 x 51)
- AC00347 (M2.5 x 12)
- AC00106 (M2.5 x 12)

---

**Related Equipment**

- Filter unit: ZX1-P-D
- Adapter B assembly: ZX1-AS-002
- Adapter B with V port plug: P3200156-P
- Filter unit: ZX1-P-D
- Adapter B assembly: ZX1-AS-002
- Adapter B with V port plug: P3200156-P

---

**Thread type**

- Nil: Rc 1/8
- F: G
- T: NPTF
Vacuum Pump System/Manifold Assembly from Individual Unit

Manifold Assembly from individual unit
1. Remove Philips screws.
2. Remove cross-recessed head machine screw for precision machinery.
3. Mount plugs to valve unit.
4. Mount valve unit with Philips screws AC00347 (M2.5 x 39) 3 pcs.
5. Mount vacuum switch to manifold with Philips screws 2 pcs.
Follow tightening screw torque on Table (1).

Note 1)
Even though screw type in use differs depending on the combination (Table (2)), screws for an individual unit and a manifold are common.

Table (2)

<table>
<thead>
<tr>
<th>Combination</th>
<th>Part no.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vacuum switch ZSE3</td>
<td>AC00378 (M2.5 x 51)</td>
</tr>
<tr>
<td>Vacuum switch ZSE2</td>
<td>AC00849 (M2.5 x 39)</td>
</tr>
<tr>
<td>Filter unit ZX1-F</td>
<td>AC00347 (M2.5 x 28)</td>
</tr>
</tbody>
</table>

Table (1)

<table>
<thead>
<tr>
<th>Part no.</th>
<th>Description</th>
<th>Quantity</th>
<th>Recommended tightening screw torque</th>
<th>In the case of manifold</th>
<th>Single unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Note 1)</td>
<td>Philips screw</td>
<td>2</td>
<td>0.28 ± 0.1 (N·m)</td>
<td>Necessary</td>
<td>Necessary</td>
</tr>
<tr>
<td>P3200150</td>
<td>Plate A</td>
<td>1</td>
<td>0.28 ± 0.1 (N·m)</td>
<td>Not necessary</td>
<td>Necessary</td>
</tr>
<tr>
<td>AD00014 (M2.5 x 5)</td>
<td>Cross-recessed head machine screw for precision machinery</td>
<td>1</td>
<td>0.28 ± 0.1 (N·m)</td>
<td>Not necessary</td>
<td>Necessary</td>
</tr>
<tr>
<td>M-3P</td>
<td>Plug</td>
<td>2</td>
<td>0.46 ± 0.05 (N·m)</td>
<td>Necessary</td>
<td>Not necessary</td>
</tr>
<tr>
<td>ZX1-MP1</td>
<td>Plug</td>
<td>1</td>
<td>1.6 ± 0.15 (N·m)</td>
<td>Necessary</td>
<td>Not necessary</td>
</tr>
<tr>
<td>AC00347 (M2.5 x 28)</td>
<td>Philips screw</td>
<td>3</td>
<td>0.28 ± 0.1 (N·m)</td>
<td>Necessary</td>
<td>Not necessary</td>
</tr>
</tbody>
</table>

*1 If the PV port is M6 x 1, the plug for M6 (M-5P-M6 x 1-X73) is available. Or, please consider replacing the valve unit with a valve unit for manifold (① on page 927).
Ejector System/Manifold Assembly from Individual Unit

Manifold Assembly from individual unit

1. Remove Philips screws.
2. Remove Philips screws, and then remove ejector assembly from valve unit.
3. Mount plugs to valve unit.
4. Mount valve unit with Philips screws AC00347 (M2.5 x 28) 3 pcs.
5. Mount ejector assembly to manifold with Philips screw AC00777 (M2.5 x 14) 1 pc.
6. Mount vacuum switch to manifold with Philips screws 2 pcs.

Note 1)
Even though screw type in use differs depending on the combination (Table (2)), screws for an individual unit and a manifold are common. Follow tightening screw torque on Table (1).

Table (2)

<table>
<thead>
<tr>
<th>Combination</th>
<th>Part no.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vacuum switch ZSE3</td>
<td>AC00439 (M2.5 x 63)</td>
</tr>
<tr>
<td>Vacuum switch ZSE2</td>
<td>AC00378 (M2.5 x 51)</td>
</tr>
<tr>
<td>Filter unit ZX1-F</td>
<td>AC00649 (M2.5 x 39)</td>
</tr>
</tbody>
</table>

Table (1)

<table>
<thead>
<tr>
<th>Part no.</th>
<th>Description</th>
<th>Quantity</th>
<th>Recommended tightening screw torque</th>
<th>In the case of manifold</th>
<th>Single unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Note 1)</td>
<td>Philips screw</td>
<td>2</td>
<td>0.28 ± 0.1 (N·m)</td>
<td>Necessary</td>
<td>Necessary</td>
</tr>
<tr>
<td>P3200150</td>
<td>Plate A</td>
<td>1</td>
<td>Not necessary</td>
<td>Necessary</td>
<td>Necessary</td>
</tr>
<tr>
<td>AC00777</td>
<td>Philips screw</td>
<td>1</td>
<td>0.28 ± 0.1 (N·m)</td>
<td>Necessary</td>
<td>Not necessary</td>
</tr>
<tr>
<td>M-3P</td>
<td>Plug</td>
<td>1</td>
<td>0.46 ± 0.05 (N·m)</td>
<td>Necessary</td>
<td>Necessary</td>
</tr>
<tr>
<td>ZX1-MP1</td>
<td>Plug</td>
<td>1</td>
<td>1.6 ± 0.15 (N·m)</td>
<td>Necessary</td>
<td>Not necessary</td>
</tr>
<tr>
<td>AC00347</td>
<td>Philips screw</td>
<td>3</td>
<td>0.28 ± 0.1 (N·m)</td>
<td>Necessary</td>
<td>Not necessary</td>
</tr>
</tbody>
</table>

*1 If the PV port is M6 x 1, the plug for M6 (M-5P-M6 x 1-X73) is available. Or, please consider replacing the valve unit with a valve unit for manifold (1) on page 925.

+ Use AC00018 (M2.5 x 32) when individual spacers are used.
Valve Unit/Other Combinations of Supply Valve and Release Valve (Ejector unit)

Ejector Unit

If those other than the standard combination of supply valves and release valves (Refer to page 867.) are required, select from the following combinations. (Refer to page 866 for "How to Order").

**Combination Symbol: K2**

Application: The supply pressure is controlled by electric signals and a vacuum release is effected by external air.

**Combination Symbol: K7**

Application: The supply pressure is controlled by external air signals and a vacuum release is effected by the solenoid valve. Because the supply valve is N.O., the pressure that is supplied to the ejector is not interrupted during a power outage; as a result, the state of suction can be maintained. This combination is used for preventing the workpieces from dropping during power outages.

**Combination Symbol: K4**

Application: The supply pressure is restricted by electric signals and a vacuum release is effected by air signals. Because the supply valve is N.O., the pressure that is supplied to the ejector is not interrupted during a power outage; as a result, the state of suction can be maintained. This combination is used for preventing the workpieces from dropping during power outages.

**Combination Symbol: J1**

Application: This combination is used for effecting control in accordance with electric signals. A vacuum release is effected by the intrusion of air between the silencer, pad, and the workpiece. This combination is used when there is no need to accelerate the vacuum release speed.

**Combination Symbol: K5**

Application: The supply pressure is controlled by external air signals and a vacuum release is effected by the solenoid valve.

**Combination Symbol: J2**

Application: It is used for controlling the supply pressure through electric signals. Because the supply valve is N.O., the pressure that is supplied to the ejector is not interrupted during a power outage; as a result, the state of suction can be maintained. This is used for preventing the workpieces from dropping during power outages. A vacuum release is effected by the intrusion of air between the silencer, pad, and the workpiece. This combination is used when there is no need to accelerate the vacuum release speed.

**How to Operate**

<table>
<thead>
<tr>
<th>Condition</th>
<th>Valve</th>
<th>Supply valve</th>
<th>Release valve</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Work adsorption</td>
<td>ON</td>
<td>OFF</td>
<td></td>
</tr>
<tr>
<td>2. Vacuum release</td>
<td>OFF</td>
<td>ON</td>
<td></td>
</tr>
<tr>
<td>3. Operation stop</td>
<td>OFF</td>
<td>OFF</td>
<td></td>
</tr>
</tbody>
</table>

**How to Operate**

<table>
<thead>
<tr>
<th>Condition</th>
<th>Valve</th>
<th>Supply valve</th>
<th>Release valve</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Work adsorption</td>
<td>OFF</td>
<td>OFF</td>
<td></td>
</tr>
<tr>
<td>2. Vacuum release</td>
<td>ON</td>
<td>ON</td>
<td></td>
</tr>
<tr>
<td>3. Operation stop</td>
<td>OFF</td>
<td>OFF</td>
<td></td>
</tr>
</tbody>
</table>
Application: The supply pressure is controlled by external air signals. A vacuum release is effected by the intrusion of air between the silencer, pad, and the workpiece. This is used when there is no need to accelerate the vacuum release speed.

Application: The supply pressure is controlled by the external valve and a vacuum release is effected by the solenoid valve.

Application: The supply pressure is controlled by external air signals. Because the supply valve is N.O., the pressure that is supplied to the ejector is not interrupted during a power outage; as a result, the state of suction can be maintained. This is used for preventing the workpieces from dropping during power outages. A vacuum release is effected by the intrusion of air between the silencer, pad, and the workpiece. This type is used when there is no need to accelerate the vacuum release speed.

Application: The supply pressure is controlled by the external valve and a vacuum release is effected by the external 2 port valve (vacuum valve).

Application: The supply pressure is controlled by the external valve and a vacuum release is effected by external air signals.
Vacuum Pump System

If those other than the standard combination of supply valves (Refer to page 903.) and release valves are required, select from the following combinations. (Refer to page 902 for "How to Order").

**Combination Symbol: K2**

Application: The supply pressure is controlled by electric signals and a vacuum release is effected by external air.

**How to Operate**

<table>
<thead>
<tr>
<th>Valve</th>
<th>Supply valve</th>
<th>Release valve</th>
</tr>
</thead>
<tbody>
<tr>
<td>Condition</td>
<td>Solenoid valve</td>
<td>Status/principle</td>
</tr>
<tr>
<td>1. Work adsorption</td>
<td>OFF</td>
<td>OFF</td>
</tr>
<tr>
<td>2. Vacuum release</td>
<td>ON</td>
<td>ON</td>
</tr>
<tr>
<td>3. Operation stop</td>
<td>OFF</td>
<td>OFF</td>
</tr>
</tbody>
</table>

**Combination Symbol: K7**

Application: The supply pressure is controlled by external air signals and a vacuum release is effected by the solenoid valve. Because the supply valve is the N.O., the pressure that is supplied to the ejector is not interrupted during a power outage; as a result, the state of suction can be maintained. This combination is used for preventing the workpieces from dropping during power outages.

**How to Operate**

<table>
<thead>
<tr>
<th>Valve</th>
<th>Supply valve</th>
<th>Release valve</th>
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<tbody>
<tr>
<td>Condition</td>
<td>Solenoid valve</td>
<td>Status/principle</td>
</tr>
<tr>
<td>1. Work adsorption</td>
<td>OFF</td>
<td>OFF</td>
</tr>
<tr>
<td>2. Vacuum release</td>
<td>ON</td>
<td>ON</td>
</tr>
<tr>
<td>3. Operation stop</td>
<td>OFF</td>
<td>OFF</td>
</tr>
</tbody>
</table>

**Combination Symbol: K4**

Application: The supply pressure is controlled by electric signals and a vacuum release is effected by air signals. Because the supply valve is N.O., the pressure that is supplied to the ejector is not interrupted during a power outage; as a result, the state of suction can be maintained. This combination is used for preventing the workpieces from dropping during power outages.

**How to Operate**

<table>
<thead>
<tr>
<th>Valve</th>
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<td>2. Vacuum release</td>
<td>ON</td>
<td>ON</td>
</tr>
<tr>
<td>3. Operation stop</td>
<td>OFF</td>
<td>OFF</td>
</tr>
</tbody>
</table>

**Combination Symbol: J1**

Application: This combination is used for controlling the pressure by electric signals. Normally, the workpiece is released due to the air leakage that occurs between the pad and the workpiece. However, if there is no air leakage, the workpiece will not detach because the vacuum state is maintained even when the supply valve is turned ON. To effect releasing, an external 2 port valve (vacuum valve) must be provided.

**How to Operate**

<table>
<thead>
<tr>
<th>Valve</th>
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<th>Release valve</th>
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</thead>
<tbody>
<tr>
<td>Condition</td>
<td>Solenoid valve</td>
<td>Status/principle</td>
</tr>
<tr>
<td>1. Work adsorption</td>
<td>OFF</td>
<td>OFF</td>
</tr>
<tr>
<td>2. Vacuum release</td>
<td>OFF</td>
<td>OFF</td>
</tr>
</tbody>
</table>

**Combination Symbol: J2**

Application: Used for controlling with electric signals. Because the supply N.O., the pressure is not interrupted during a power outage. This prevents the workpieces from dropping. Normally, the workpiece is released due to leakage. However, if no air leakage, the workpiece will not detach because the vacuum state is maintained even when the supply valve is turned ON. To release, an external 2 port valve (vacuum valve) must be used.

**How to Operate**

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<tr>
<td>3. Operation stop</td>
<td>OFF</td>
<td>OFF</td>
</tr>
</tbody>
</table>
**External release pressure**

**SUP (PB) port**

---

**Application:** The supply pressure is controlled by external air signals. Normally, the workpiece is released due to the air leakage that occurs between the pad and the workpiece. However, if there is no air leakage, the workpiece will not become detached because the vacuum state is maintained even when the supply valve is turned OFF. To effect releasing, an external 2 port valve (vacuum valve) must be provided.

**How to Operate**

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<tr>
<th>Valve</th>
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<td>2. Vacuum release</td>
<td>OFF</td>
<td></td>
</tr>
<tr>
<td>3. Operation stop</td>
<td>OFF</td>
<td></td>
</tr>
</tbody>
</table>

**Combination Symbol:** J3

---

**Application:** The supply pressure is controlled by external 2 port valve (vacuum valve) and a vacuum release is effected by the solenoid.

**How to Operate**

<table>
<thead>
<tr>
<th>Valve</th>
<th>Supply valve</th>
<th>Release valve</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Work adhesion</td>
<td>ON</td>
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<tr>
<td>2. Vacuum release</td>
<td>OFF</td>
<td>ON</td>
</tr>
<tr>
<td>3. Operation stop</td>
<td>OFF</td>
<td>OFF</td>
</tr>
</tbody>
</table>

**Combination Symbol:** D2

---

**Application:** The supply pressure is controlled by external air signals. Because the valve is N.O., the pressure is not interrupted during a power outage. This prevents the workpieces from dropping. Normally, the workpiece is released due to leakage. However, if no leakage, the workpiece will not detach because the vacuum state is maintained even when the valve is turned ON. To release, an external 2 port valve (vacuum valve) must be provided.

**How to Operate**

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<td>3. Operation stop</td>
<td>OFF</td>
<td></td>
</tr>
</tbody>
</table>

**Combination Symbol:** J4

---

**Application:** The supply pressure is controlled by an external 2 port valve (vacuum valve) and a vacuum release is effected by the solenoid.

**How to Operate**

<table>
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<tr>
<th>Valve</th>
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<tr>
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</tr>
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</table>

**Combination Symbol:** D1

---

**Application:** The supply pressure is controlled by an external 2 port valve (vacuum valve) and a vacuum release is effected by the solenoid.

**How to Operate**

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</tr>
<tr>
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<td>OFF</td>
<td></td>
</tr>
</tbody>
</table>

**Combination Symbol:** D3

---

**Application:** The supply pressure is controlled by the external 2 port valve (vacuum valve) and vacuum release is also effected by the external 2 port valve.

**How to Operate**

<table>
<thead>
<tr>
<th>Valve</th>
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<tr>
<td>3. Operation stop</td>
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<td>OFF</td>
</tr>
</tbody>
</table>

**Combination Symbol:** D4

---

**Application:** The supply pressure is controlled by an external 2 port valve (vacuum valve) and a vacuum release is effected by external air signals.

**How to Operate**

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<td>3. Operation stop</td>
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</tr>
</tbody>
</table>

**Combination Symbol:** D3
3 High Noise Reduction Silencer Assembly

ZX1  Nozzle diameter  Exhaust style  —  Valve  Voltage  Electrical entry  X121  —  CE-compliant

High noise reduction silencer assembly

Reduction in the exhaust noise from the ejector (Silencing effect 8 dB (A) Standard silencer assembly comparison)

Ordering example
ZX1101-K35LZ-D23C-X121

Noise reduction silencer assembly ZX1-HS1
(Silencer element: ZX1-SAE-X121)