For electronic components and precision components up to 100 g

Modular design
Customized application function through selection of module components.

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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**: $\varnothing 0.5 \text{ to } \varnothing 1.0$ (Suction flow: 5 to 22 $\ell$/min (ANR))

---

**Application Example**

<table>
<thead>
<tr>
<th>Chip bonding</th>
<th>Chip mounting</th>
<th>Picking &amp; placing miniature components</th>
<th>Escorting printed matter</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image1" alt="Chip bonding" /></td>
<td><img src="image2" alt="Chip mounting" /></td>
<td><img src="image3" alt="Picking &amp; placing miniature components" /></td>
<td><img src="image4" alt="Escorting printed matter" /></td>
</tr>
</tbody>
</table>
## Modular Components Introduction

<table>
<thead>
<tr>
<th>System</th>
<th>Ejector System</th>
<th>Vacuum Pump System</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>P.866 to 901</td>
<td>P.902 to 929</td>
</tr>
</tbody>
</table>

### Ejector unit
**Series ZX1**
- **Nozzle diameter (mm)**
  - 0.5
  - 0.7
  - 1.0
- **Max. suction flow (l/min(ANR))**
  - 5
  - 10
  - 22
- **Air consumption (l/min(ANR))**
  - 13
  - 23
  - 46
- **Maximum vacuum pressure**
  - –84 kPa
- **Exhaust release**
  - Built-in silencer/Manifold exhaust
  - Individual exhaust port: (Rc 1/8)

### Valve unit
**ZX1-V/L50132**
- **Component equipment**
- **Function**
  - Supply valve/Release valve
- **Operation**
  - N.C., N.O.
- **Power supply voltage**
  - 3, 5, 6, 12, 24 VDC, 100, 110 VAC (50/60 Hz)

### Vacuum pressure switch unit
**Series ZS**
- **Set pressure range**
  - 0 to –101 kPa
  - –20 kPa to –101 kPa
- **Hysteresis**
  - 3% or less
- **Applicable pad diameter (mm)**
  - 2 to 25
  - 0.3 to 1.2
- **Supply voltage**
  - 24 VDC

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

### Common specifications
<table>
<thead>
<tr>
<th>Unit</th>
<th>M5 (Standard)/M6 (Option)</th>
<th>M5 (Standard)/M6 (Option)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Rc 1/4</td>
<td>Rc 1/4</td>
</tr>
<tr>
<td></td>
<td>M5</td>
<td>M5</td>
</tr>
<tr>
<td></td>
<td>Max. 8 units</td>
<td></td>
</tr>
</tbody>
</table>

### Additional Information
- Refer to pages 870 to 880 for detailed specifications for each unit.
- Refer to pages 866 and 867 for ejector system unit.
- Refer to page 894 for ejector system manifold.
- Refer to pages 902 and 903 for external vacuum supply system unit.

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

- Refer to page 916 for external vacuum supply system manifold.
- Refer to pages 924 to 927 for units for replacement.
### Components

<table>
<thead>
<tr>
<th>Component</th>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ejector unit</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Valve unit (D.C. type)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vacuum switch unit</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ejector unit nozzle dia.</td>
<td>05</td>
<td>0.5 mm</td>
</tr>
<tr>
<td></td>
<td>07</td>
<td>0.7 mm</td>
</tr>
<tr>
<td></td>
<td>10</td>
<td>1.0 mm</td>
</tr>
</tbody>
</table>

### Valve Unit/Combination of Supply Valve and Release Valve

Refer to "Table (1)" on page 867.

### Pilot Valve

<table>
<thead>
<tr>
<th>Valve</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DC: 1 W</td>
<td>(with indicator: 1.05 W)</td>
<td>AC</td>
</tr>
<tr>
<td>DC: 0.45 W</td>
<td>(with indicator: 0.45 W)</td>
<td>-</td>
</tr>
</tbody>
</table>

- Only 24 VDC and 12 VDC are applicable to 0.45 W.

### Solenoid Valve Rated Voltage

#### Valve

<table>
<thead>
<tr>
<th>Valve</th>
<th>Rating</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>100 VAC 50/60 Hz</td>
<td>110 VAC 50/60 Hz</td>
<td>DC: 12 VDC, DC: 5 VDC, DC: 3 VDC</td>
</tr>
</tbody>
</table>

### Electrical Entry

#### Pilot Valve

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>L</td>
<td>Lead wire length 0.3 m</td>
</tr>
<tr>
<td>MN</td>
<td>Without connector</td>
</tr>
<tr>
<td>MO</td>
<td>Without connector</td>
</tr>
<tr>
<td>H</td>
<td>Air operated (K6, K8, J3, J4, D3, D4)</td>
</tr>
</tbody>
</table>

#### Ejector Exhaust

- When port exhaust is applied to the manifold, pilot exhaust is done by common exhaust. Thus, the exhaust port on the manifold base should be open while operating.

### Vacuum Switch Unit

#### Electrical Entry

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>E</td>
<td>Ejector exhaust</td>
</tr>
<tr>
<td>K1</td>
<td>Ejector exhaust</td>
</tr>
<tr>
<td>K3</td>
<td>Ejector exhaust</td>
</tr>
</tbody>
</table>

#### Electrical Entry

- Note: CE marked products are not available for "PS" and "PB".

### Caution

- When using the AC type, the DC solenoids are operated via a rectifier. Therefore, when using this type, make sure to combine the connector assembly equipped, with a rectifier with the exclusive solenoids. Using other combinations could lead to burned coils or other types of malfunctions.

### Caution

- Using the DC type: The AC type is not equipped with a surge voltage suppressor because the rectifier assembly prevents the generation of surge voltage.

### Caution

- Using the AC type:
  - The AC type is not equipped with a surge voltage suppressor because the rectifier assembly prevents the generation of surge voltage.
  - If lead wires are pre-connected, the switching elements may be damaged.

### Release Flow Rate Adjusting Needle

- DC voltage (with surge voltage suppressor)

### Vacuum Switch Electrical Entry

- Lead wire length 0.6 m
- Lead wire length 0.6 m
- Lead wire length 0.6 m

### Vacuum Switch Unit/Filter Unit

- Without lock nut
- With light/surge suppressor

### Pressure Switch Unit

- Nozzles (0.3 to 0.7)
- Nozzles (0.5 to 1.2)

### Vacuum Digital Pressure Switch Unit (ZSE3)

- Only suction filter

- Analog output is available only on grommet type.

### Manual Operation

- Non-locking push type (ZSP1)
- Locking slotted type (ZSP3)

### Made to Order

- Refer to pages 930 to 934 for details.

---

**How to Order**

**Vacuum Module: Ejector System**

**Series ZX**

**How to Order**
### Ejector System/Recommended Model
(The models below will have shorter deliveries.)

| Nozzle diameter (mm) | Model | Electrode type | Combination | Solenoid/Valve type | Lead wire Electrical entry | Light/Surge Voltage Suppressor | General Vacuum Switch | Vacuum Switch | Connector type |
|---------------------|-------|----------------|-------------|---------------------|--------------------------|-------------------------------|----------------------------|----------------|----------------|---------------|
| 0.5                 | ZX1051-K15LZ-EC     | With silencer  | Electrode type | Electrode          | Lead wire Electrical entry | Light/Surge Voltage Suppressor | General Vacuum Switch | Vacuum Switch | Connector type |
| 0.7                 | ZX1051-K15LZ-EC     | With silencer  | Electrode type | Electrode          | Lead wire Electrical entry | Light/Surge Voltage Suppressor | General Vacuum Switch | Vacuum Switch | Connector type |
| 1.0                 | ZX1101-K15LZ-EC     | With silencer  | Electrode type | Electrode          | Lead wire Electrical entry | Light/Surge Voltage Suppressor | General Vacuum Switch | Vacuum Switch | Connector type |

### 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>Release valve</th>
<th>Mass (g)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Solenoid (N.C.)</td>
<td>K1</td>
<td>N.C. (VJ114)</td>
<td>N.C. (VJ134)</td>
<td>82</td>
</tr>
<tr>
<td>Solenoid (N.C.)</td>
<td>K3</td>
<td>N.C. (VJ324)</td>
<td>N.C. (VJ334)</td>
<td>132</td>
</tr>
<tr>
<td>Air operated (N.C.)</td>
<td>K5</td>
<td>N.C. (VJ114)</td>
<td>N.C. (VJ134)</td>
<td>58</td>
</tr>
<tr>
<td>Air operated (N.C.)</td>
<td>K8</td>
<td>N.C. (VJ324)</td>
<td>N.C. (VJ334)</td>
<td>132</td>
</tr>
<tr>
<td>Solenoid (N.C.)</td>
<td>J1</td>
<td>Nil</td>
<td>Nil</td>
<td>77</td>
</tr>
<tr>
<td>Solenoid (N.C.)</td>
<td>J2</td>
<td>Nil</td>
<td>Nil</td>
<td>100</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

<table>
<thead>
<tr>
<th>Connector assembly part no.</th>
<th>Lead wire length</th>
<th>How to order</th>
<th>For ZSE2</th>
<th>For ZSP3</th>
</tr>
</thead>
<tbody>
<tr>
<td>VJ10-20-4A-6 (For 100 VAC)</td>
<td>6 m (Standard)</td>
<td>If ordering vacuum module with 600 mm or the longer lead wire, specify both vacuum module and connector assembly part numbers. Ordering example: ZX1051-K15LZ-EC(-Q)</td>
<td>1 pc.</td>
<td>VJ10-20-4A-6</td>
</tr>
<tr>
<td>VJ10-36-1A-6 (For 110 VAC)</td>
<td>6 m (Standard)</td>
<td>Ordering example: ZX1051-K15LZ-EC(-Q)</td>
<td>1 pc.</td>
<td>VJ10-20-4A-6</td>
</tr>
<tr>
<td>VJ10-36-3A-6</td>
<td>6 m (Standard)</td>
<td>Note: If ordering a vacuum switch with 3 m lead wire, specify both the vacuum unit switch and the 3 m lead wire with connector part numbers. Ordering example: ZX1051-K15LZ-EC(-Q)</td>
<td>1 pc.</td>
<td>ZS-10-5A-50</td>
</tr>
</tbody>
</table>

* The asterisk (*) denotes the symbol for assembly.

### Table (3) Vacuum Switch/Lead Wire with Connector

<table>
<thead>
<tr>
<th>Lead wire length</th>
<th>For ZSE2</th>
<th>For ZSP3</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 m</td>
<td>ZS-10-5A-50</td>
<td>1 pc.</td>
</tr>
</tbody>
</table>

* The asterisk (*) denotes the symbol for assembly.
**Series ZX**

### Ejector System/Combination of Supply Valve and Release Valve

#### Combination Symbol: K1

**Application:** This combination is used for effecting control in accordance with electric signals.

<table>
<thead>
<tr>
<th>Condition</th>
<th>Supply valve (N.C.)</th>
<th>Release valve (N.C.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Work adsorption</td>
<td>ON</td>
<td>OFF</td>
</tr>
<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: K8

**Application:** This combination is used for preventing the workpieces from dropping during power outages.

<table>
<thead>
<tr>
<th>Condition</th>
<th>Supply valve (N.O.)</th>
<th>Release valve (N.C.)</th>
</tr>
</thead>
<tbody>
<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>ON</td>
<td>OFF</td>
</tr>
</tbody>
</table>

#### Combination Symbol: K3

**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 silencer 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.

<table>
<thead>
<tr>
<th>Condition</th>
<th>Supply valve (N.O.)</th>
<th>Release valve (N.C.)</th>
</tr>
</thead>
<tbody>
<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>ON</td>
<td>OFF</td>
</tr>
</tbody>
</table>

#### 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.

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

#### Combination Symbol: K6

**Application:** This combination is used for effecting control in accordance with air signals.

<table>
<thead>
<tr>
<th>Condition</th>
<th>Supply valve (N.O.)</th>
<th>Release valve</th>
</tr>
</thead>
<tbody>
<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: 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 combination is used when there is no need to accelerate the vacuum release speed.

<table>
<thead>
<tr>
<th>Condition</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>
</tr>
<tr>
<td>2. Vacuum release</td>
<td>ON</td>
<td>None</td>
</tr>
<tr>
<td>3. Operation stop</td>
<td>OFF</td>
<td>None</td>
</tr>
</tbody>
</table>
### 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>ZK1-PV-0</td>
</tr>
<tr>
<td>2</td>
<td>Release flow rate adjustment needle</td>
<td>Stainless steel</td>
<td>ZK1-NA</td>
</tr>
<tr>
<td>3</td>
<td>Manifold base</td>
<td>—</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Vacuum switch</td>
<td>Aluminum</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Valve unit</td>
<td>—</td>
<td>ZK1-VA0000-0-D</td>
</tr>
<tr>
<td>6</td>
<td>Interface plate</td>
<td>—</td>
<td>(PV ☐ PS ☐ PD)</td>
</tr>
<tr>
<td>7</td>
<td>Silencer case</td>
<td>Polycarbonate</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Filter case</td>
<td>—</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>Air operated</td>
<td>—</td>
</tr>
<tr>
<td>10</td>
<td>Filter element</td>
<td>PVF</td>
<td>ZK1-FE</td>
</tr>
<tr>
<td>11</td>
<td>Ejector assembly</td>
<td>—</td>
<td>Refer to “Table (1)”,“(2)”,“(3)”.</td>
</tr>
<tr>
<td>12</td>
<td>Gasket</td>
<td>—</td>
<td>ZK1-P6</td>
</tr>
<tr>
<td>13</td>
<td>Silencer element</td>
<td>—</td>
<td>ZK1-SAE</td>
</tr>
<tr>
<td>14</td>
<td>Seal set</td>
<td>—</td>
<td>ZK1-PK</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>No.</th>
<th>Supply valve</th>
<th>Release valve</th>
<th>Model</th>
<th>Combination of supply and release valve</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Solenoid valve N.C. (VJ114)</td>
<td>Solenoid valve N.C. (VJ114)</td>
<td>ZK1-VJ114-C□□□□□</td>
<td>K1, J1</td>
</tr>
<tr>
<td>2</td>
<td>Solenoid valve N.O. (VJ324)</td>
<td>Solenoid valve N.C. (VJ114)</td>
<td>ZK1-VJ324-C□□□□□</td>
<td>K2</td>
</tr>
<tr>
<td>3</td>
<td>Air operated N.O. (VJ334)</td>
<td>Air operated N.C. (VJ334)</td>
<td>ZK1-VJ334-C□□□□□</td>
<td>K3</td>
</tr>
</tbody>
</table>

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

**ZX1-VJ114**
- 5LZ

**ZX1-VJ324**
- 5LZ

**Type of actuation**
- 1: N.C. Normally closed
- 2: N.O. Normally open

**Body option**
- 1: Pilot valve Individual exhaust
- 2: Common exhaust

**Rated voltage**
- 5: 100 VAC
- 6: 120 VAC
- 7: 24 VDC
- 8: 12 VDC
- 9: 6 VDC
- 10: 5 VDC

**Pilot valve**
- 1: DC 12 V (With light) 1.5 W
- 2: DC 12 V (No light) 0.6 W

- Only 5VDC and 12VDC are applicable to 0.45 W. Note: Screw length of VJ100 and VJ300 for series ZX is different from that of the standard model. Screw length of VJ100-M1.7 x 15 VJ300-M1.7 x 22

**Manual override**
- 1: Non-locking push type
- 2: Locking slotted type

**Light/Surge voltage suppressor**
- 1: Without surge voltage suppressor
- 2: With surge voltage suppressor

**Electrical entry**
- 1: Connector (0.3 m)
- 2: Connector (for 0.5 m)
- 3: Connector (for 1 m)
- 4: Without connector

**Note**
- Caution when handling filter case
1. The case is made of polycarbonate. Therefore, do not use 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 (alkaline), etc.
2. Do not expose it to direct sunlight.

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

**ZX1A - M3**
- Port size
- M3: M3 x 0.5
- M5: M5 x 0.6

**Table (4) How to Order Ejector Assembly**

**ZX1-WD 05**
- Ejector assembly
- 1: Combination/ ZX-WD□

**Note**
- An adapter should be attached to the assembly to be used as a unit. PV port and V port can be connected.

**Caution**
- Turning the vacuum release flow volume adjustment 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 volume adjustment needle with lock nut is also available.
### Series ZX

**Ejector Unit**

#### Specifications

<table>
<thead>
<tr>
<th>Unit no.</th>
<th>Nozzle dia. (mm)</th>
<th>Max. suction flow (l/min (ANR))</th>
<th>Air consumption (l/min (ANR))</th>
<th>Maximum vacuum pressure</th>
<th>Maximum operating pressure</th>
<th>Supply pressure range</th>
<th>Standard supply pressure</th>
<th>Operating temperature range</th>
<th>Ejector exhaust type</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0.5</td>
<td>5</td>
<td>13</td>
<td>–84 kPa</td>
<td>0.7 MPa</td>
<td>0.2 MPa to 0.55 MPa</td>
<td>0.45 MPa</td>
<td>5 to 50°C</td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.7</td>
<td>10</td>
<td>23</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1.0</td>
<td>22</td>
<td>46</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- **Code ①**: Built-in silencer (for single unit and manifold)
- **Code ②**: Individual exhaust (for single unit and manifold)

#### 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**
  - M5 x 0.8
  - M6 x 1 (Option)

- **Ejector exhaust method**
  - 1: Silencer
  - 2: Individual exhaust Rc 1/8

#### Dimensions: ZX1-W□□

- **JIS Symbol**
  - Silencer exhaust
  - Port exhaust

- **Release pressure SUP port (PD)**
  - M5 (or M6)
  - Plug

- **Air pressure SUP port (P)**
  - M5 (or M6)

- **Bracket B**
  - ZX1-OBB (Standard accessory)

- **Port exhaust**
  - EXH port (EXH.)
  - Rc 1/8

- **EXH port (EXH.)**
  - 2 x ø3.6 (Mounting hole)

- **Vacuum port (V)**
  - M5 (or M6)

- **Vacuum port (V)**
  - 5.4 °

#### Note

1. Remove the plug at external release.
2. Dimensions ✮: For mounting bracket B.
Flow Characteristics/Exhaust Characteristics

**ZX1-W05**

**Exhaust Characteristics**

- Vacuum pressure
- Suction flow rate
- Air consumption

**Flow Characteristics**

- Vacuum pressure
- Suction flow rate (l/min (ANR))
- Air consumption (l/min (ANR))

**How to Read Flow Characteristics Graph**

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

In graph, $P_{\text{max}}$ is max. vacuum pressure and $Q_{\text{max}}$ is max. suction flow. The valves are specified according to catalog use. Changes in vacuum pressure are expressed in the below order.

1. When ejector suction port is covered and made airtight, suction flow becomes 0 and vacuum pressure is at maximum value ($P_{\text{max}}$).
2. When suction port is opened gradually, air can flow through (air leakage), suction flow increases, but vacuum pressure decreases. (condition $P_1$ and $Q_1$)
3. When suction port is opened further, suction flow moves to maximum value ($Q_{\text{max}}$), but vacuum pressure is near 0. (atmospheric pressure)

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

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

**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>ZX1-VA/L50132/L50132/L50132/L50132/L50132/L50132</th>
</tr>
</thead>
</table>

Components

<table>
<thead>
<tr>
<th>Operation</th>
<th>Pilot operated</th>
<th>Air operated</th>
<th>Direct operated</th>
</tr>
</thead>
<tbody>
<tr>
<td>Solenoid valve</td>
<td>N.C. (VJ114)</td>
<td>N.O. (VJ324M)</td>
<td>N.C. (VJA324)</td>
</tr>
<tr>
<td>Release valve</td>
<td>N.C. (VJ314)</td>
<td>N.O. (VJ114)</td>
<td>N.C. (VJA314)</td>
</tr>
</tbody>
</table>

Cv factor

- N.C. Main valve: 0.17
- N.O. Operating pressure range: 0.3 to 0.6 MPa
- Operating pressure range: 5 Hz
- Operating temperature range: 5 to 50°C

Interface plate symbol

- PV: Port size
- PS: Port size
- PD: Port size

Standard accessory

- Bracket C

Solenoid Valve Specifications

<table>
<thead>
<tr>
<th>Model</th>
<th>Rated voltage</th>
<th>Electrical entry</th>
<th>Light/Surge voltage suppressor</th>
<th>Manual operation</th>
<th>Model/Solenoid Valve</th>
<th>Supply valve</th>
<th>Solenoid valve</th>
<th>Air operated</th>
<th>None</th>
</tr>
</thead>
<tbody>
<tr>
<td>VJ114</td>
<td>24, 12, 6, 5, 3 VDC/100, 110 VAC * (50/60 Hz)</td>
<td>L plug connector, grommet</td>
<td>L plug connector, M plug connector, grommet</td>
<td>With or Without</td>
<td>Solenoid valve</td>
<td>N.C. (VJ114)</td>
<td>K1 [82]</td>
<td>K5 [73]</td>
<td>D1 [77]</td>
</tr>
<tr>
<td>VJ314, VJ324</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>External release (ZX1A)</td>
<td>K2 [73]</td>
<td>K3 [132]</td>
<td>D2 [100]</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Release valve</td>
<td>K2 [73]</td>
<td>K6 [58]</td>
<td>D3 [41]</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Air operated</td>
<td>K4 [119]</td>
<td>—</td>
<td>D2 [100]</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>None</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td></td>
</tr>
</tbody>
</table>

* Applicable to plug connector only. Connector assembly with rectifier is attached.

Model/Solenoid Valve

<table>
<thead>
<tr>
<th>Model</th>
<th>Solenoid valve</th>
<th>Solenoid valve</th>
<th>Air operated</th>
<th>None</th>
</tr>
</thead>
<tbody>
<tr>
<td>N.C. (VJ114)</td>
<td>K1 [82]</td>
<td>—</td>
<td>K5 [73]</td>
<td>D1 [77]</td>
</tr>
<tr>
<td>N.C. (VJ314)</td>
<td>—</td>
<td>K3 [132]</td>
<td>—</td>
<td>D2 [100]</td>
</tr>
<tr>
<td>External release (ZX1A)</td>
<td>K2 [73]</td>
<td>—</td>
<td>K6 [58]</td>
<td>D3 [41]</td>
</tr>
<tr>
<td>Air operated</td>
<td>—</td>
<td>K4 [119]</td>
<td>—</td>
<td>D2 [100]</td>
</tr>
<tr>
<td>None</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
</tbody>
</table>

[ ] Mass (g)

How to Order

Refer to page 866 for details.

ZX1 – V A K1 5 L Z — —

System

- A: Ejector system
- B: External vacuum supply

Combination of supply valve and release valve

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

* Refer to page 906 for the specifications of ZX1-VA.
Connector Assembly for 100 VAC
Connector assembly with rectifier attached.

Connector Assembly with Rectifier Part No.

### VJ10 – 36 – A –

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Rated voltage</th>
<th>Lead wire length</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>100 VAC 50/60 Hz</td>
<td>L mm</td>
</tr>
<tr>
<td>3</td>
<td>110 VAC 50/60 Hz (115 VAC 60 Hz)</td>
<td></td>
</tr>
</tbody>
</table>

Valve Unit

**Normally closed**

A: Release flow rate adjusting needle with lock nut

(Note) Dimensions ∗: For mounting bracket C ∗∗: For mounting spacer.
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>Vacuum to 0.5 MPa</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>PVF</td>
</tr>
<tr>
<td>Mass</td>
<td>35 g</td>
</tr>
<tr>
<td>Standard accessory</td>
<td>Bracket A (ZX1-OBA)</td>
</tr>
</tbody>
</table>

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

Filter

JIS Symbol

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.

Note) Dimensions ∗: For A mounting bracket.
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

Vacuum Pressure Switch

<table>
<thead>
<tr>
<th>Fluid</th>
<th>ZSE-0X</th>
</tr>
</thead>
<tbody>
<tr>
<td>Set pressure range</td>
<td>0 to –101 kPa</td>
</tr>
<tr>
<td>Hysteresis</td>
<td>±1% Full span or less</td>
</tr>
<tr>
<td>Repeatability</td>
<td>±1% Full span or less</td>
</tr>
<tr>
<td>Temperature characteristics</td>
<td>±13% 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 (Option)</td>
</tr>
<tr>
<td>Mass</td>
<td>50 g</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>

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

Sensor chip

Filter case

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

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.

ZSE2 – 0X

PV, V port size: M5 x 0.8
Output specifications: NPN Open collector 30 V 80 mA

Electrical entry
Nil Grommet (0.6 m)
L Grommet (0.6 m)
C Connector (0.6 m)
CL Connector (3 m)
ON Without connector

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.

Filter case

Caution

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.

ZSE2 connection

Wiring

How to Order

ZSE2

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

• 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.
Guidelines for Use of Vacuum Pressure Switch Unit

System circuit for work adsorption

Ejector style

External vacuum supply style

Vacuum line

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

Using a small diameter picking nozzle
If the nozzle diameter is approximately 1 mm, the adsorption confirmation with ZSE2/ZSE3 may not be possible since the pressure difference between ON and OFF becomes smaller. At times like this, consider using an adsorption confirmation switch, ZSP1 (page 879).

Note: Note that the performance of ejectors and pumps influence the conditions.

External vacuum supply 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.

Vacuum Pressure Switch: ZSE2-0X-15

Grommet: ZSE2-0X-15

Connector: ZSE2-0X-15C

JIS Symbol

Pressure setting trimmer

Indicator light (Red)

Lead wire length

Vacuum port (V)

M5 (or M6)

Vacuum pressure SUP port (PV)

M5 (or M6)

Adapter

2 x ø3.3 (mounting hole)
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.

Vacuum Pressure Switch

<table>
<thead>
<tr>
<th>Unit no.</th>
<th>ZSE3-0X</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 mode</td>
<td>Variable (can be changed from 0)</td>
</tr>
<tr>
<td>Accuracy</td>
<td>±1% Full span or less</td>
</tr>
<tr>
<td>Operating voltage</td>
<td>12 to 24 VDC (Ripple ±10% or less)</td>
</tr>
<tr>
<td>Port size</td>
<td>M6 x 0.8, M6 x 1 (Option)</td>
</tr>
<tr>
<td>Mass</td>
<td>50 g</td>
</tr>
<tr>
<td>Indicator light</td>
<td>Light 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>

Wiring

Connection with PLC
At negative COM terminal

How to Order

ZSE3 – 0X [ ] 21

PV, V port size
- M6 x 0.8
- M6 x 1 (Option)

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

Wiring specifications
- Grommet (0.6 m)
- Grommet (3 m)
- Connector (0.6 m)
- Connector (3 m)
- Without connector

Note: Analog output is available only for grommet type.

How to Set Vacuum Pressure

Refer to Best Pneumatics No. 6.

Guidelines for Use of Vacuum Pressure Switch Unit

Refer to page 876.
**Series ZX**

**Vacuum Pressure Switch Unit/Vacuum Pressure Switch: ZSE3-0X**

**Vacuum Pressure Switch/ZSE3-0X□-21, 22, 23, 24**

- **Grommet: ZSE3-0X□-□**
- **Connector: ZSE3-0X□-□C**

**JIS Symbol**
Vacuum Pressure Switch Unit/Adsorption Confirmation Switch: ZSP1-∞

Small diameter nozzle/ø0.3 to ø1.2

With suction filter
Improved wiring: connector type
Uses a carrier diffusion semiconductor pressure sensor

Adsorption Confirmation Switch Specifications

<table>
<thead>
<tr>
<th>Fluid</th>
<th>Unit no.</th>
<th>ZSP1-S</th>
<th>ZSP1-B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating pressure range</td>
<td>–20 kPa to –101 kPa</td>
<td>0 to 60°C (No condensation)</td>
<td></td>
</tr>
<tr>
<td>Applicable adsorption nozzle dia.</td>
<td>0.3 to 0.7 mm (Refer to Graph (1))</td>
<td>0.5 to 1.2 mm (Refer to Graph (2))</td>
<td></td>
</tr>
<tr>
<td>Hysteresis</td>
<td>0.5 kPa</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Internal orifice</td>
<td>ø0.5</td>
<td>ø0.8</td>
<td></td>
</tr>
<tr>
<td>Mass</td>
<td>62 g</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Voltage</td>
<td>12 to 24 VDC (Ripple ±10% or less)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Output</td>
<td>NPN Open collector 30 V 80 mA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Indicator light</td>
<td>Light at ON state</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Current consumption</td>
<td>17 mA (24 VDC, at ON state)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Operating temperature range</td>
<td>0 to 60°C (No condensation)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Port size</td>
<td>M5 x 0.8, M6 x 1 (Option)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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

Applicable Adsorption Nozzle

Supply pressure and nozzle diameter are expressed in the graphs below.

Graph (1)/ZSP1-S
[Graph Image]

Graph (2)/ZSP1-B
[Graph Image]

Pneumatic Circuit and Principle

Comprised of a pneumatically operated bridge circuit, this function puts the S4 picking nozzle into the non-picking state, and uses the S2 adjustment needle to balance (P1 ≅ P2) the pressure that is applied to the pressure sensor. The small pressure difference (P2 – P1) that is created when a part is picked by the (S4) picking nozzle and is detected by the pressure sensor.

Wiring is the same as ZSE2.

How to Order

ZSP1 – S 0X – 15

Circuit and Wiring

Brown lead wire — Connected to positive COM for main circuit.
Black lead wire — Load is connected. (PLC or relay)
Blue lead wire — Connected to power source GND terminal.

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.
Vacuum Pressure Switch Unit/Adsorption Confirmation Switch: ZSP1-SB

**Hysteresis**

Hysteresis is the difference in pressure when the output signal is ON and OFF. The pressure to be set is the ON pressure.

**How to Set Adsorption Confirmation Needle**

1. Apply a vacuum and current. Turn the adjusting needle clockwise until it stops, thus fully closing the needle valve.
2. Without attaching a workpiece to the picking nozzle, turn the adjusting needle counterclockwise and verify the position in which the indicator light turns ON.
3. From the state described in step 2, turn back the adjusting needle clockwise 1/4 turn to 1 full turn.
4. Pick a workpiece with the nozzle and readjust the adjusting needle so that the indicator light turns ON when the nozzle has picked the workpiece successfully.

---

Adsorption Confirmation Switch: ZSP1-□0X□-15

**Connector: ZSP1-□0X□-15**

---

Note: Remove the adapter when mounted on the ejector.
Without Valve Unit

Configuration and combination

**Ejector unit** + **Vacuum switch (ZSE2)**

**Adsorption confirmation switch (ZSP1)**

**Filter unit (F)**

**Model**

ZX1 - P - F - D

Vacuum switch (ZSE2)

ZX1-E

Vacuum port (V)
M5 (or M6)

Air pressure SUP port (P)
M5 (or M6)

**Release pressure SUP port (PD)**
M5 (or M6)
Plug (1)

Ejector exhaust

Filter

Pressure setting trimmer

2 x R1.8" (Mounting hole)

Vacuum switch (ZSE2)

Port exhaust

Vacuum port (V)
M5 (or M6)

Bracket A
(Standard accessory)

Pipe 1/8 EXH port (EXH)

Vacuum switch (E)

Adsorption confirmation switch (P)

Filter unit (F)

Note 1) Remove the plug at external release.

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

**Adsorption confirmation switch (ZSP1)**

ZX1-P-F

Adjusting needle

Ejector + Silencer

Adsorption confirmation switch (ZSP1)

Filter

2 x R3.5" (Mounting hole)

Vacuum port (V)
M5 (or M6)

Bracket A
(Standard accessory)

ZX1-OBA

**Filter unit (F)**

ZX1-F

Ejector + Silencer

Filter

2 x R3.5" (Mounting hole)

Vacuum port (V)
M5 (or M6)

Bracket A
(Standard accessory)

Related Equipment
Series ZX

Valve Unit: Type K1

Configuration and combination

<table>
<thead>
<tr>
<th>Ejector unit</th>
<th>Valve unit (K1)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Vacuum switch (ZSE2)
ZX1□□□□-K1□□□□-E□

Port exhaust
Rc 1/8
EXH port (EXH)

Vacuum switch (ZSE3)

Adsorption confirmation switch (ZSP1)

Filter unit (F)

Without switch and filter

Model
ZX1□□□□ — K1□□□□ —

E●●
D●●
P●●
F●
Nil

Release flow rate adjusting needle

Interface plate

Pilot valve for supply
VJ114

Without switch and filter

Vacuum switch (ZSE3)

(Please refer to the diagram)

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

882
Vacuum switch (ZSE3)
ZX1□□□-K1□□□-D□□□
A: Release flow rate adjusting needle with lock nut
   (Needle fully open)

Adsorption confirmation switch (ZSP1)
ZX1□□□-K1□□□-P□□□

Filter unit
ZX1□□□-K1□□□-F

Without switch and filter
ZX1□□□-K1□□□-F

Spacer 1: ZX1-S1
Series ZX

Valve Unit: Type K3

Configuration and combination

<table>
<thead>
<tr>
<th>Ejector unit</th>
<th>Valve unit (K3)</th>
<th>Vacuum switch (ZSE2)</th>
<th>Vacuum switch (ZSE3)</th>
<th>Adsorption confirmation switch (ZSP1)</th>
<th>Filter unit (F)</th>
<th>Without switch and filter</th>
</tr>
</thead>
<tbody>
<tr>
<td>ZX1</td>
<td>K3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Model

ZX1□□□□ — K3□□□□ —

E □
P □
F
D □ □ □
Nil

Vacuum switch (ZSE2)
ZX1□□□□ — K3□□□□ — E □

Port exhaust

A: Release flow rate adjusting needle with lock nut

Pilot valve for supply (N.O.)
VJ324M

Re: 1/8
EXH port (EXH.)

8 (Needle fully open)

Interface plate

Release valve
VJ314

Interface plate

Release flow rate adjusting needle

Air pressure SUP port (PV)
M5 (or M6)

Pilot pressure EXH port (PE)
M5

Vacuum switch
ZSE2

Vacuum port (V)

Bracket A
(ZX1-0BA)
(Standard accessory)

Vacuum switch (E)
(D)

Adsorption confirmation switch (P)

(Release to atmospheric pressure)

Filter unit (F)

Without switch and filter

Note) Dimensions □: For mounting bracket A □□: For mounting spacer 1.
Vacuum Module: Ejector System Series ZX

Adsorption confirmation switch (ZSP1)

Filter unit (F)

Without switch and filter

A: Release flow rate adjusting needle with lock nut

Filter unit (F)

Without switch and filter

Bracket A (Standard accessory)

Bracket B (Standard accessory)

Vacuum port (V)

M5 (or M6)

A: Release flow rate adjusting needle with lock nut

(Needle fully open)
Series ZX

Valve Unit: Type K6

<table>
<thead>
<tr>
<th>Configuration and combination</th>
<th>Vacuum switch (ZSE2)</th>
<th>Vacuum switch (ZSE3)</th>
<th>Adsorption confirmation switch (ZSP1)</th>
<th>Filter unit (F)</th>
<th>Without switch and filter</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ejector unit + Valve unit (K6)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Model
ZX1□□□ □□□ K6□□□ □□□ F □□□ D □□□ Nil

Vacuum switch (ZSE2)
ZX1□□□ □□□ - K6-E □□□

Port exhaust

External release port

Vacuum switch (E)
(D)

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

Vacuum port (V)

Adsorption confirmation switch (P)

Filter unit (F)

Without switch and filter

Note) Dimensions ∗: For mounting bracket B ∗∗: For mounting spacer 2.
**Adsorption confirmation switch (ZSP1)**

ZX1-□□□-K6-P□□

**Filter unit (F)**

ZX1-□□□-K6-F

**Without switch and filter**

ZX1-□□□-K6

---

**Vacuum Module: Ejector System Series ZX**

---

**Spacer 1: ZX1-S1**

---

**A:** Release flow rate adjusting needle with lock nut

(Needle fully open)
Series ZX

Valve Unit: Type K8

Configuration and combination
Ejector unit + Valve unit (K8)
- Vacuum switch (ZSE2)
- Vacuum switch (ZSE3)
- Adsorption confirmation switch (ZSR1)
- Filter unit (F)
- Without switch and filter

Model
ZX1[...K8[...]
  E  
  P  
  F  
  D  
  Nil

Vacuum switch (ZSE2)
ZX1[...K8-E[...]

Port exhaust
M3 x 0.5
(Supply valve pilot port)
M3 x 0.5
(Release valve pilot port)

Ejector + Silencer
2 x R1.8" (Mounting hole)

Vacuum switch (ZSE2)

A: Release flow rate adjusting needle with lock nut

Release valve
(Air operated VJA314)
Manual override
(Non-locking)
Interface plate

Release flow rate
adjusting needle

Vacuum port (V)
M5 (or M6)

Note) Dimensions *: For mounting bracket A ++: For mounting spacer 1.
**Adsorption confirmation switch (ZSP1)**

ZX1□□□□K8-P□□

A: Release flow rate adjusting needle with lock nut

(Needle fully open)

**Filter unit (F)**

ZX1□□□□K8-F

**Without switch and filter**

ZX1□□□□K8

---

**Vacuum Module: Ejector System Series ZX**

---

**Spacer 1: ZX1-S1**

---

**Filter**

Bracket A (Standard accessory) ZX1-OBA

---

**Without switch and filter**

Bracket B (Standard accessory) ZX1-OB8

---

**Vacuum port (V)**

M5 (or M6)
Series ZX

Valve Unit: Type J1

Configuration and combination

<table>
<thead>
<tr>
<th>Ejector unit</th>
<th>Valve unit (J1)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Vacuum switch (ZSE2)

Vacuum switch (ZSE3)

Adsorption confirmation switch (ZSP1)

Filter unit (F)

Without switch and filter

Model

ZX1□□□□ — J1□□□□ —

E□
P□□
F
D□□□
Nil

Vacuum switch (ZSE2)
ZX1□□□□—J1□□□□—E□

Port exhaust

Pc 1/8
EXH port (EXH.)

Other ports:

2 x R1.8° (Mounting hole)
3.6° (Mounting hole)

A: Release flow rate adjusting needle with lock nut

Release flow rate adjusting needle

Interface plate

Pilot valve for supply
VJ14

Air pressure SUP port (PV)
M5 (or M6)

Pilot pressure EXH port (PE)
M3

A

A: Release flow rate adjusting needle with lock nut

Vacuum switch (ZSE2)

Vacuum switch port (V)

Vacuum switch (E)

Circuit diagram

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

Adsorption confirmation switch (P)

Filter unit (F)

Without switch and filter

Bracket A

(ZX1-OBA)

(Standard accessory)

Pressure sensor

(Release to atmospheric pressure)

Manual override
(Non-locking)

Ejector + Silencer

Spacer 1

(ZX1-S1)

(For side mounting)

15.5

8

41.6

4.7

5

51

2 x R1.8° (Mounting hole)
3.6° (Mounting hole)

4.7

5

51

2 x R1.8° (Mounting hole)
3.6° (Mounting hole)

8
(Needle fully open)

10

10

8

Air pressure SUP port (PV)
M5 (or M6)

Pilot pressure EXH port (PE)
M3

Interface plate

Pilot valve for supply
VJ14

A

A: Release flow rate adjusting needle with lock nut

Vacuum switch (ZSE2)

Vacuum switch port (V)

Vacuum switch (E)

Circuit diagram

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

Adsorption confirmation switch (P)

Filter unit (F)

Without switch and filter

Bracket A

(ZX1-OBA)

(Standard accessory)

Pressure sensor

(Release to atmospheric pressure)

Manual override
(Non-locking)

Ejector + Silencer

Spacer 1

(ZX1-S1)

(For side mounting)

15.5

8

41.6

4.7

5

51

2 x R1.8° (Mounting hole)
3.6° (Mounting hole)

8
(Needle fully open)

10

10

8

Air pressure SUP port (PV)
M5 (or M6)

Pilot pressure EXH port (PE)
M3

Interface plate

Pilot valve for supply
VJ14

A

A: Release flow rate adjusting needle with lock nut

Vacuum switch (ZSE2)

Vacuum switch port (V)

Vacuum switch (E)

Circuit diagram

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

Adsorption confirmation switch (P)

Filter unit (F)

Without switch and filter

Bracket A

(ZX1-OBA)

(Standard accessory)

Pressure sensor

(Release to atmospheric pressure)

Manual override
(Non-locking)

Ejector + Silencer

Spacer 1

(ZX1-S1)

(For side mounting)

15.5

8

41.6

4.7

5

51

2 x R1.8° (Mounting hole)
3.6° (Mounting hole)

8
(Needle fully open)

10

10

8

Air pressure SUP port (PV)
M5 (or M6)

Pilot pressure EXH port (PE)
M3

Interface plate

Pilot valve for supply
VJ14

A

A: Release flow rate adjusting needle with lock nut

Note) Dimensions ∗: For mounting bracket A ∗∗: For mounting spacer 1.
Adsorption confirmation switch (ZSP1)

ZX1-L50132-L50132-L50132-J1

A: Release flow rate adjusting needle with lock nut

(Needle fully open)

Filter unit (F)
ZX1-L50132-L50132-L50132-J1

Without switch and filter
ZX1-L50132-L50132-L50132-J1

Spicer 1: ZX1-S1

ZX1-L50132-L50132-L50132-J1

Related Equipment

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

Valve Unit: Type J2

<table>
<thead>
<tr>
<th>Configuration and combination</th>
<th>Vacuum switch (ZSE2)</th>
<th>Vacuum switch (ZSE3)</th>
<th>Adsorption confirmation switch (ZSPI)</th>
<th>Filter unit (F)</th>
<th>Without switch and filter</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ejector unit + Valve unit (J2)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Model

ZX1——J2——E——

Vacuum switch (ZSE2)

Vacuum port (V)

Air pressure SUP port (PV)

Vacuum port (V)

Pilot valve for supply (N.O.)

VJ324M

Vacuum switch (ZSE3)

M5 (or M6)

Air pressure SUP port (PV)

M5 (or M6)

Model

ZX1——J2——E——

Circuit diagram

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

Vacuum switch (E)

(D)

Adsorption confirmation switch (P)

Filter unit (F)

Without switch and filter

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

Release flow rate adjusting needle with lock nut

A: Release flow rate adjusting needle

Manual override

(Push and turn the locking type override)

Ejector + Silencer

2 x ø1.8" (Mounting hole)

ø3.6" (Mounting hole)

Pressure setting trimmer

Bracket A (ZX1-OBA)

(Standard accessory)

Pressure sensor

Interface plate

Release flow rate adjusting needle

Manual override

2 x ø3.3" (Mounting holes)

Vacuum switch ZSE2

Bracket A (ZX1-OBA)

(Standard accessory)

Ejector exhaust

Note) Dimensions ∗: For mounting bracket A ∗∗: For mounting spacer 1.
Vacuum Module: Ejector System Series ZX

Adsorption confirmation switch (ZSP1)
ZX1□□□□-J2□□□□-P□□□□

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

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

Vacuum port (V)
M5 (or M6)

Bracket A
(Standard accessory)
ZX1-OBA

Filter unit (F)
ZX1□□□□-J2□□□□-F

Without switch and filter
ZX1□□□□-J2□□□□
Ejector System/Manifold Specifications

How to Order Manifold

Max. number of units: 8 units

Port size:
- Supply port (PV): 1/8 (Rc, NPT, G)
- Exhaust port (EXH): 1/8 (Rc, NPT, G)

Mass: 1 station: 73 g (50 g per additional station)

Note 1) PD port: Blank
Note 2) Exhaust air from both sides for 4 or more stations of ZX1103 manifold.

Air Supply

Supply port location

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

- Supply port location
- ☐: Supply
- ●: Plugged (EXH port is released to atmospheric pressure.)

Note) Blank plugs are attached to all ports of each valve unit.

Supply port location

- Viewed from the front side of valve unit, confirm the port location on the right and/or left side.
- EXH ports are released to atmospheric pressure in both sides.

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.

Note)
- 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

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>

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>
Series ZX

Ejector System Manifold

End plate
Manifold base
Manual override (Push and turn the locking type override.)
Manual override (Simply turn the locking type override.)
Body (Air operated type) (ZX1A)
M5 x 0.8 (Pilot port)
M5 x 0.8 (External release port)
Adapter D
Individual spacer ZX1-R1

A: Release flow rate adjusting needle with lock nut

8 mm
(Needle fully open)

Release valve (VJ314) (Normally closed)
Pilot valve for supply (VJ324M) (Normally open)
Manual override (Simply turn the locking type override.)

Pilot valve for supply (VJ114) (Normally closed)
Release valve (VJ114) (Normally closed)
Release flow rate adjusting needle
Release pressure supply port (PD)
M5
Individual air pressure supply port (PV) M5 (or M6)
Pitch = 21

Common EXH port (EXH.)
1/8 (Rc, NPTF, G)
Common air pressure SUP port (PV)
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>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>33</td>
<td>54</td>
<td>75</td>
<td>96</td>
<td>117</td>
<td>138</td>
<td>169</td>
<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>

(mm)
Vacuum Module:
Ejector System  **Series ZX**

**System circuit example**

**(Standard)**

**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 port (PE) M3
  - Vacuum port (V) M5 (or M6)
  - Vacuum Port (V) M5 (or M6)

**Option**

**In the case of individual spacer**

- Individual air supply port PV
  - Individual air supply port PV
  - Individual air supply port PV
  - Individual air supply port PV

Related Equipment

**Dummy spacer**

- ZX1-R16

**Individual spacer**

- ZX1-R1

Related Equipment

**Vacuum Module:**

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

**Ejector System**

**Manifold: Type K1**

---

A: Release flow rate adjusting needle with lock nut

(Needle fully open)

---

<table>
<thead>
<tr>
<th>Symbol</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>
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<tr>
<td>L1</td>
<td>33</td>
<td>54</td>
<td>75</td>
<td>96</td>
<td>117</td>
<td>138</td>
<td>169</td>
<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>

---

*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.
Circuit diagram

Vacuum port (V)
M5 (or M6)

Related Equipment

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

Ejector System

Manifold: Type K3

A: Release flow rate adjusting needle with lock nut

(Pitch = 21)

Manual override
(Push and turn the locking type override.)

Pilot valve for supply (N.O.) VJ324M

Release valve VJ314

Release flow rate adjusting needle

Pressure setting trimmer

Ejector + Silencer

Pressure setting trimmer

Ejector System Manifold: Type K3

Vacuum port (V)

Common air pressure SUP port (PV)

Common EXH port (EXH)

Stations Symbol

900 Series ZX

Symbol Material 1 2 3 4 5 6 7 8

L1 33 54 75 96 117 138 169 180

L2 45 66 87 108 129 150 171 192

L3 50 71 92 113 134 155 176 197

Notes:

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.

Filter unit

Vacuum switch ZSE2

Ejector + Silencer

Pressure setting trimmer

Ejector System Manifold: Type K3

Vacuum port (V)

Common air pressure SUP port (PV)

Common EXH port (EXH)

Stations Symbol

900 Series ZX

Symbol Material 1 2 3 4 5 6 7 8

L1 33 54 75 96 117 138 169 180

L2 45 66 87 108 129 150 171 192

L3 50 71 92 113 134 155 176 197

Notes:

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.
Vacuum Module: Ejector System Series ZX

Circuit diagram

Vacuum port (V)
M5 (or M6)

Related Equipment

ZA
ZX
ZR
ZM
ZMA
ZQ
ZH
ZU
ZL
ZY
ZF
ZP
SP
ZCUK
AMJ
AMV
AEP
HEP
**Vacuum Module: Vacuum Pump System**

**Series ZX**

**How to Order**

**Components**

- **Valve unit (N.O. type)**
- **Valve unit (N.C. type)**
- **Filter unit**

**Valve unit/Combination of supply valve and release valve**
- Refer to "Table (1)" on page 903.

**Caution**

When using the AC type, the DC solenoids are operated via a rectifier. Therefore, when using this type, make sure to combine the connector assembly equipped with a rectifier with the exclusive solenoids. Using other combinations could lead to burned coils or other types of malfunctions.

**Soleno id valve rated voltage**

- **DC: 1 W (With indicator light 1.05 W)**
- **AC: 0.45 W**

Only 4 VDC and 12 VDC are applicable to 0.45 W.

**Electrical entry**

- **Pilot valve**
  - DC: 0.45 W
  - AC: 0.45 W

**Connector**

- **Y**: Lead wire length 0.6 m
- **L**: Lead wire length 0.3 m
- **R**: Lead wire length 0.3 m
- **N**: Without lead wire

**Release flow rate adjusting needle**

- **Nil**: 
- **G**: With lock nut

**Vacuum switch electrical entry**

- **Note)** CE marked products are not available for "PS" and "PB".

**Vacuum switch unit/Filter unit**

- **Nil**: Non-locking push type
- **S**: Locking slotted type

**Manual operation**

- **S** is not available for AC.

**Light/Surge voltage suppressor**

- **Nil**: None
- **Z**: With surge voltage suppressor
- **S**: With surge voltage suppressor

**Surge voltage suppressor**

- **Red**: (+)
- **Black**: (–)
- **LED**: (+) and (–)

**Using the DC type**

- 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.

**Using the AC type**

- The AC type is not equipped with a surge voltage suppressor because the rectifier assembly prevents the generation of surge voltage.
### Table (1) Valve Unit/Combination of Supply Valve and Release Valve

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Supply valve</td>
<td>Solenoid (N.C.)</td>
<td>Solenoid (N.C.)</td>
<td>K1</td>
<td>⬤</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>82</td>
</tr>
<tr>
<td>Release valve</td>
<td>Solenoid (N.C.)</td>
<td>Solenoid (N.C.)</td>
<td>K3</td>
<td>⬤</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>132</td>
</tr>
<tr>
<td>Solenoid (N.O.)</td>
<td>Air operated (N.C.)</td>
<td>External release</td>
<td>K6</td>
<td>⬤</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>58</td>
</tr>
<tr>
<td>Air operated (N.O.)</td>
<td>Air operated (N.C.)</td>
<td>K8</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>132</td>
</tr>
</tbody>
</table>

- Nil: Without valve module

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

<table>
<thead>
<tr>
<th>Connector assembly part no.</th>
<th>Lead wire length</th>
<th>How to order</th>
</tr>
</thead>
<tbody>
<tr>
<td>VJ10-20-4A-6 (For DC)</td>
<td>0.6 m</td>
<td>If ordering vacuum module with 600 mm or the longer lead wire, specify both vacuum module and connector assembly part numbers.</td>
</tr>
<tr>
<td>VJ10-36-1A-6 (For 100 VAC)</td>
<td>1 m</td>
<td>(Ordering example) ZK100-K152Z-EC(-Q) — 1 pc. +VJ10-20-4A-6 — 2 pcs.</td>
</tr>
<tr>
<td>VJ10-36-3A-6 (For 110 VAC)</td>
<td>1.5 m</td>
<td>The asterisk (•) denotes the symbol for assembly.</td>
</tr>
</tbody>
</table>

**Example:**
- **Ordering example:**
  - ZX100-K152Z-EC(-Q) — 1 pc.
  - +VJ10-20-4A-6 — 2 pcs.

### Ejector System/Recommended Model

<table>
<thead>
<tr>
<th>Model</th>
<th>Combination</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>N.C. (VJ114)</td>
<td>N.C. (VJ114)</td>
<td>24 VDC</td>
<td>Suction filter (ZX1-F)</td>
<td>Connector type</td>
</tr>
<tr>
<td>ZX100-K15LZ-EC</td>
<td>N.C. (VJ114)</td>
<td>N.C. (VJ114)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ZX100-K35MZ-EC</td>
<td>N.C. (VJ2324M)</td>
<td>N.C. (VJ2314)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*The above models are for express delivery.*
Series ZX

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.

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

**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.

**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

**Supply valve**

<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 valve</td>
<td>ON</td>
<td>OFF</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>

**Release valve**

<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 valve</td>
<td>ON</td>
<td>OFF</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>
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>ZX1-PV-0</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Release flow rate adjusting</td>
<td>Stainless steel</td>
<td></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, ZSP1, ZSE2</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Valve unit</td>
<td>ZX1-VJ114-0-0-0</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Interface plate</td>
<td>PV(P)</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>

Table (1) How to Order Pilot Valves

<table>
<thead>
<tr>
<th>No.</th>
<th>Model</th>
<th>Component equipment</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>ZX1-VJ114-0-0-0</td>
<td>Solenoid valve N.C. (VJ114)</td>
<td>K1, J1</td>
</tr>
<tr>
<td>2</td>
<td>ZX1-VJ3-4</td>
<td>Solenoid valve N.O. (VJ314)</td>
<td>K3, J2</td>
</tr>
<tr>
<td>3</td>
<td>ZX1-VJ3-14</td>
<td>Air operated N.O. (VJ314)</td>
<td>K6</td>
</tr>
</tbody>
</table>
| 4   | ZX1-VJ3-14 | Air operated Solenoid valve | No 2 and 3 models only are applicable | Indicate each part number.

Table (2) How to Order Solenoid Valves

<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>PVF</td>
<td>ZX1-PF</td>
</tr>
<tr>
<td>10</td>
<td>Filter element</td>
<td>PVF</td>
<td>ZX1-PG</td>
</tr>
<tr>
<td>11</td>
<td>Gasket</td>
<td>PVF</td>
<td>ZX1-PG</td>
</tr>
</tbody>
</table>

Note) Caution when handling filter case:
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, amline, cyclohexane, trichloroethylene, sulfuric acid, lactic acid, watersoluble cutting oil (alkaline), etc.
2. Do not expose it to direct sunlight.

Table (3) How to Order Air Operated Valves

<table>
<thead>
<tr>
<th>Model</th>
<th>Body option</th>
<th>Light/Surge voltage suppressor</th>
<th>Electrical entry</th>
</tr>
</thead>
<tbody>
<tr>
<td>ZX1-VJ114</td>
<td>N.C. (Normally closed)</td>
<td>Without light/surge voltage suppressor</td>
<td>Without connector</td>
</tr>
<tr>
<td>ZX1-VJ3-2</td>
<td>N.O. (Normally open)</td>
<td>Without light/surge voltage suppressor</td>
<td>Without connector</td>
</tr>
</tbody>
</table>

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, a special product is also available.
## Series ZX

### Valve Unit: ZX1-VB

Refer to page 872 for details.

#### Model/Specifications

<table>
<thead>
<tr>
<th>Unit no.</th>
<th>ZX1-VB-xxxxx-0</th>
</tr>
</thead>
<tbody>
<tr>
<td>Components</td>
<td>Supply valve</td>
</tr>
<tr>
<td>Pilot type</td>
<td>Direct operated type</td>
</tr>
<tr>
<td>Solenoid valve</td>
<td>Air operated</td>
</tr>
<tr>
<td>Cv factor</td>
<td>0.17</td>
</tr>
<tr>
<td>Operating pressure range</td>
<td>0.3 to 0.6 MPa</td>
</tr>
<tr>
<td>Max. operating frequency</td>
<td>5 Hz</td>
</tr>
<tr>
<td>Operating temperature range</td>
<td>5 to 50°C</td>
</tr>
<tr>
<td>Interface plate symbol</td>
<td>(PV)-</td>
</tr>
<tr>
<td>Standard accessory</td>
<td>Bracket B (ZX1-OBB)</td>
</tr>
</tbody>
</table>

#### Components

- **K1 (Normally closed)**
  - Pilot valve for supply: VJ114
  - Pilot pressure EXH port (PE): M3
  - Pilot pressure SUP port (PS): M3
  - Vacuum pressure SUP port (PV): M5 (or M6)
  - Release valve
  - Manual override (Non-locking) Bracket B (Standard accessory) ZX1-OBB
  - Interface plate symbol: 2 x ø3.6 (Mounting hole)
  - Dimensions: 57.4° (Needle fully open)

- **K3 (Normally open)**
  - Pilot valve for supply (N.O.): VJ324M
  - Pilot pressure EXH port (PE): M3
  - Pilot pressure SUP port (PS): M3
  - Vacuum pressure supply port (PV): M5 (or M6)
  - Release valve
  - Manual override (Non-locking) Bracket B (Standard accessory) ZX1-OBB
  - Interface plate symbol: 2 x ø3.6 (Mounting hole)
  - Dimensions: 79.1° (Needle fully open)

#### Note

- Dimensions: ∗ For mounting bracket B  ∗∗ For mounting spacer
**Suction Filter Unit: ZX1-F**

Refer to page 874 for details.

<table>
<thead>
<tr>
<th>Specifications</th>
<th>ZX1-F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating pressure range</td>
<td>Vacuum to 0.5 MPa</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>PVF</td>
</tr>
<tr>
<td>Mass</td>
<td>35 g</td>
</tr>
<tr>
<td>Standard accessory</td>
<td>Bracket A (ZX1-OBA)</td>
</tr>
</tbody>
</table>

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

**Vacuum Pressure Switch Unit/ZSE2, ZSE3, ZSP1**

Refer to pages 875 to 880 for details.

**Vacuum Pressure Switch**

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

**Adsorption Confirmation Switch**

Suitable for small size adsorption nozzle ø0.3 to ø1.2
With suction filter
Improved wiring: connector type
Uses a carrier diffusion semiconductor pressure sensor

**Vacuum Pressure Switch Specifications**

Refer to Best Pneumatics Vol.6 for details.

<table>
<thead>
<tr>
<th>Specifications</th>
<th>ZSE2-0X</th>
<th>ZSE3-0X</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fluid</td>
<td>Air</td>
<td></td>
</tr>
<tr>
<td>Set pressure range</td>
<td>0 to –101 kPa</td>
<td></td>
</tr>
<tr>
<td>Hysteresis</td>
<td>3% Full span or less</td>
<td></td>
</tr>
<tr>
<td>Repeatability</td>
<td>±1% Full span or less</td>
<td></td>
</tr>
<tr>
<td>Temperature characteristics</td>
<td>±3% Full span or less</td>
<td></td>
</tr>
<tr>
<td>Voltage</td>
<td>12 to 24 VDC (Ripple ±10% or less)</td>
<td></td>
</tr>
<tr>
<td>Port size</td>
<td>M5 x 0.8, M6 x 1 (Option)</td>
<td></td>
</tr>
</tbody>
</table>

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

**Adsorption Confirmation Switch Specifications**

<table>
<thead>
<tr>
<th>Specifications</th>
<th>ZSP1-S</th>
<th>ZSP1-B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fluid</td>
<td>Air</td>
<td></td>
</tr>
<tr>
<td>Operating pressure range</td>
<td>–20 to –101 kPa</td>
<td></td>
</tr>
<tr>
<td>Applicable adsorption nozzle dia.</td>
<td>0.3 to 0.7 mm</td>
<td>0.5 to 1.2 mm</td>
</tr>
<tr>
<td>Hysteresis</td>
<td>0.5 kPa</td>
<td></td>
</tr>
<tr>
<td>Internal orifice</td>
<td>0.5 mm</td>
<td>0.8 mm</td>
</tr>
</tbody>
</table>

- **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.

- **Other caution**
  - **Caution**
  It might not be possible to successfully pick a workpiece if a picking nozzle or a picking pad that is out of the applicable range is used.
Series ZX

Valve Unit: Type K1

Configuration and combination

Valve unit (K1) +

Vacuum switch (ZSE2)
Vacuum switch (ZSE3)
Adsorption confirmation switch (ZSP1)
Filter unit (F)

Model
ZX100 — K1 — — — —

Vacuum switch (ZSE2)
ZX100-K1 — — — — —

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

Vacuum pressure SUP port (PV)
M5 (or M6)

Pilot pressure SUP port (PS)
M3

Release flow rate adjusting needle

Pilot valve for supply
VJ114

Release valve
VJ114

Interface plate

Pilot pressure EXH port (PE)
M3

Pilot pressure SUP port (PV)
M5 (or M6)

Vacuum pressure SUP port (PV)
M5 (or M6)

2 x ø3.3 (Mounting hole)

Pressure setting trimmer

Manual override (Non-locking)

Vacuum switch (ZSP1)

Bracket A
(ZX1-OBA)

(Standard accessory)

Bracket A
(ZX1-OBA)

(Release to atmospheric pressure)

Filter unit (F)

Vacuum switch (E) (D)

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

Circuit diagram

Vacuum port (V)

Note) Dimensions *: For mounting bracket A **: For mounting spacer 1.
Vacuum switch (ZSE3) 
ZX100-K1-L50132-D

A: Release flow rate adjusting needle with lock nut

(Needle fully open)

Vacuum Pump System Series ZX

Filter unit (F) 
ZX100-K1-L50132-F

Adsorption confirmation switch (ZSP1) 
ZX100-K1-L50132-P

 related equipment
Series ZX

Valve Unit: Type K3

Configuration and combination

<table>
<thead>
<tr>
<th>Valve unit (K3)</th>
<th>Vacuum switch (ZSE2)</th>
<th>Vacuum switch (ZSE3)</th>
<th>Adsorption confirmation switch (ZSP1)</th>
<th>Filter unit (F)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model ZX100</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>K3 □ □ □</td>
</tr>
</tbody>
</table>

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

A: Release flow rate adjusting needle with lock nut

(Needle fully open)

2 x ø3.3 (Mounting hole)

Bracket A (ZX1-OBA)
(Standard accessory)

Vacuum port (V)
M5 (or M6)

Vacuum switch (ZSE2)

2 x ø3.3 (Mounting hole)

Release to atmospheric pressure

Filter unit (F)

Pilot valve for supply (N.O.)
VJ324M

Interface plate

Release flow rate adjusting needle

Pressure setting trimmer
2 x R1.8" (Mounting hole)

Manual override
(Push and turn the locking type override.)

Vacuum pressure supply port (PV)
M3

Pilot pressure
SUP port (PS)
M3

Vacuum port (V)
M5 (or M6)

Bracket A (ZX1-OBA)
(Standard accessory)

Note) Dimensions
• For mounting bracket A
• For mounting spacer 1.
Adsorption confirmation switch (ZSP1)
ZX100-K3-L50132/L50132/L50132/L50132-F

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

Filter unit (F)
ZX100-K3-L50132-L50132-L50132-L50132-F
Series ZX

Valve Unit: Type K6

Configuration and combination

<table>
<thead>
<tr>
<th>Valve unit (K6)</th>
<th>Vacuum switch (ZSE2)</th>
<th>Vacuum switch (ZSE3)</th>
<th>Adsorption confirmation switch (ZSP1)</th>
<th>Filter unit (F)</th>
</tr>
</thead>
</table>

Model

- ZX100  —  K6  —

Vacuum switch (ZSE2)
ZX100-K6-E

A: Release flow rate adjusting needle with lock nut

Supply valve
Air operated
(ZX1A)

Release valve
External release
(ZX1A)

Interface plate

Pilot pressure
EXH port (PE)
M3

Release flow rate adjusting needle

Pilot pressure
SUP port (PS)
M3

Vacuum pressure
SUP port (PV)
M5 (or M6)

Bracket A
(ZX1-OBA)
(Standard accessory)

Note) Dimensions ∗: For mounting bracket A ∗∗: For mounting spacer 1.
Adsorption confirmation switch (ZSP1)  
ZX100-K6-P□□

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

Filter unit (F)  
ZX100-K6-F

Spacer 1: ZX1-S1

Bracket A  
(Standard accessory)  
ZX1-OBA

Filter unit
## 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>Adsorption confirmation switch (ZSP1)</th>
<th>Filter unit (F)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model</td>
<td>ZX100 — — K8 — —</td>
<td></td>
<td></td>
<td>E □</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>□ □ □ □</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>P □ □ □ □</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>F □ □ □ □</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>D □ □ □ □</td>
</tr>
</tbody>
</table>

#### Vacuum switch (ZSE2)

**ZX100-K8-E □**

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

#### Vacuum port (V)

- **M3** (Pilot port for supply valve)
- **M3** (Pilot port for release valve)

#### Pressure setting trimmer

- 2 x R1.8" (Mounting hole)
- M3 (Pilot port for supply valve)
- M3 (Pilot port for release valve)

#### Pressure sensor

(Release to atmospheric pressure)

#### Interface plate

- 2 x ø3.3 (Mounting hole)

#### Supply valve N.O.

(Air operated VJA324)

- Manual override (Non-locking)

#### Release valve

(Air operated VJA314)

- Release flow rate adjusting needle
- Interface plate

- Pilot pressure EOX port (PE) M3

- Vacuum pressure SUP port (PV) M5 (or M6)

- 2 x ø3.3 (Mounting hole)

#### Bracket A

(ZX1-OBA)

(Standard accessory)

### Circuit diagram

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

- Vacuum switch (E)
- Adsorption confirmation switch (P)
- Filter unit (F)

### Note

Dimensions □ □: For mounting bracket A □ □ □ □: For mounting spacer 1.
Adsorption confirmation switch (ZSP1)
ZX100-K8-P

A: Release flow rate adjusting needle with lock nut

(A) Needle fully open

Filter unit (F)
ZX100-K8-F
Vacuum Pump System/Manifold Specifications

### Specifications

<table>
<thead>
<tr>
<th>Max. number of units</th>
<th>Max. 8 units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Port size</td>
<td></td>
</tr>
<tr>
<td>Supply port (PV)</td>
<td>1/8 (Rc, NPTF, G)</td>
</tr>
<tr>
<td>Exhaust port (EXH)</td>
<td>1/8 (Rc, NPTF, G)</td>
</tr>
<tr>
<td>Mass</td>
<td>1 station: 73 g (50 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>PV</th>
<th>PS</th>
<th>PV</th>
<th>PS</th>
</tr>
</thead>
<tbody>
<tr>
<td>L (Left)</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>R (Right)</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>B (Both sides)</td>
<td>○</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>**

**ZZX1**

- **Stations**
  - 01: 1
  - 02: 2
  - 08: 8

- **Thread of supply and exhaust valve**
  - φG
  - φNPTF

**<Individual spacer>**

Specify the individual spacer when separating the supply and exhaust ports of the manifold ejector.

**ZX1**

- **Individual spacer**
  - R1
  - R16

- **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.

### 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.

**Part no.**

<table>
<thead>
<tr>
<th>RX1-R1</th>
<th>RX1-R6</th>
<th>RX1-R16</th>
</tr>
</thead>
<tbody>
<tr>
<td>R1</td>
<td>R2</td>
<td>R3</td>
</tr>
<tr>
<td>R2</td>
<td>R2</td>
<td>R3</td>
</tr>
<tr>
<td>R3</td>
<td>R4</td>
<td>R5</td>
</tr>
<tr>
<td>R4</td>
<td>R5</td>
<td>R6</td>
</tr>
<tr>
<td>R5</td>
<td>R6</td>
<td>R7</td>
</tr>
<tr>
<td>R6</td>
<td>R7</td>
<td>R8</td>
</tr>
</tbody>
</table>

**Symbol**

- PE
- PD
- PV
- PS

**Part no.**

<table>
<thead>
<tr>
<th>RX1-R9</th>
<th>RX1-R10</th>
<th>RX1-R11</th>
<th>RX1-R12</th>
<th>RX1-R13</th>
<th>RX1-R14</th>
<th>RX1-R15</th>
<th>RX1-R16</th>
</tr>
</thead>
<tbody>
<tr>
<td>R1</td>
<td>R2</td>
<td>R3</td>
<td>R4</td>
<td>R5</td>
<td>R6</td>
<td>R7</td>
<td>R8</td>
</tr>
</tbody>
</table>

- NPTF
- G

**Note**

- PV port on the right side
- PV port on the left side
- PV port on both sides
- PS port on the right side
- PS port on the left side
- PS port on both sides

- 1 Viewed from the front side of valve unit, confirm the port location on the right and/or left side.
- 2 EXH ports are released to atmospheric pressure in both sides. Plugs are always attached to PD ports and all ports of the valve unit.

- (Ordering example)
  - ZXX106-R: 1 pc.
  - ZX100-K15SL-EIC(-Q): 6 pcs.
  - ZX1-R1: 1 pc.
  - ZX1-R1-3: 1 pc.
  - ZX1-R16 (Dummy spacer): 4 pcs.

- Part no. Symbol
- ZXX1-R1 | R1 | R2 | R3 | R4 | R5 | R6 | R7 | R8 |
- ZXX1-R9 | R9 | R10 | R11 | R12 | R13 | R14 | R15 | R16 |
- ZXX1-R10 | R10 | R11 | R12 | R13 | R14 | R15 | R16 |
- ZXX1-R11 | R11 | R12 | R13 | R14 | R15 | R16 |
- ZXX1-R12 | R12 | R13 | R14 | R15 | R16 |
- ZXX1-R13 | R13 | R14 | R15 | R16 |
- ZXX1-R14 | R14 | R15 | R16 |
- ZXX1-R15 | R15 |
- ZXX1-R16 | R16 |

- All stations
- Station 1 only
- 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.

**Note**

- The thread ridge shape is compatible with the G thread standard (JIS B0203), but other shapes are not conforming to ISO16030 and ISO1179.
Manifold/System Circuit Example

When not using individual spacer

![Diagram showing circuit example without individual spacer.]

When using individual spacer (When using ZX1-R1)

![Diagram showing circuit example with individual spacer.]

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**

**Diagram showing circuit example.**
Series ZX

Vacuum Pump System Manifold

A: Release flow rate adjusting needle with lock nut

B: (Needle fully open)

---

<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>
</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>

---

*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.
Vacuum Module: Vacuum Pump System Series ZX

(In the case of individual spacer)

B cross section

A cross section

System circuit example

(Standard)

(Option)

(In the case of individual spacer)
Vacuum Pump System Manifold: Type K1

A: Release flow rate adjusting needle with lock nut

(Needle fully open)

Pilot valve for supply
VJ114

Release valve
VJ114

Release flow rate adjusting needle

Pressure setting trimmer

Manifold base

End plate

Manual override

Common vacuum pressure SUP port (PV)

Common pilot pressure SUP port (PS)

Common EXH port (EXH)

Common pilot pressure SUP port (PS)

Common vacuum pressure SUP port (PV)

Common EXH port (EXH)

Common air pressure SUP port (PV)

A: Release flow rate adjusting needle

(needle fully open)

Symbol Materials

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

*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.
 Vacuum Pump System Manifold: Type K3

A: Release flow rate adjusting needle with lock nut

(Pitch = 21)

B: Manual override

(Push and turn the locking type override.)

C: Pilot valve for supply (N.O.)

VJ324M

D: Release valve

VJ314

E: Release flow rate adjusting needle

F: Common pilot pressure SUP port (PS)

2 x M5

G: Common EXH port (EXH.)

1/8 (Rc, NPTF, G)

H: Common EXH port (EXH.)

1/8 (Rc, NPTF, G)

I: Common air pressure SUP port (PV)

1/8 (Rc, NPTF, G)

J: 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>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>169</td>
<td>171</td>
<td>176</td>
</tr>
<tr>
<td>8</td>
<td>180</td>
<td>192</td>
<td>197</td>
</tr>
</tbody>
</table>
Vacuum Module:
Vacuum Pump System *Series ZX*

**Vacuum Port (V)**
M5 (or M6)

**Circuit Diagram**

- **PV**
- **EXH**
- **PS**
- **PD**
- **PDx**
- **PEx**
- **PSx**
- **PVx**

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

**Dimensions:**
- 42 mm
- 21 mm
- 22.5 mm

---

*SMC*

923
**Series ZX**

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

**Single**

How to Order Unit for Replacement

(1) Valve unit

<table>
<thead>
<tr>
<th>Valve unit</th>
<th>Model</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ZX1-V A K1</td>
<td>L Z B L D S</td>
<td>Single (PD and PS ports are equipped with plugs.)</td>
</tr>
</tbody>
</table>

How to order (5) Digital vacuum switch unit (For replacement)

- Unit for replacement
- Nil

- Unit for replacement
- Nil

- With light/surge voltage suppressor
- Z

How to order (6) Adsorption confirmation switch unit (For replacement)

- Unit for replacement
- Nil

- With light/surge voltage suppressor
- Z

(2) Adsorption confirmation switch unit

**ZSP1-B0X**

- Applicable nozzle diameter

<table>
<thead>
<tr>
<th>Diameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>S</td>
<td>0.3 to 0.7mm</td>
</tr>
<tr>
<td>B</td>
<td>0.5 to 1.2mm</td>
</tr>
</tbody>
</table>

How to order (1) Valve unit (Supply valve: N.O.) (For replacement)

- Plate A

- How to order (3) Ejector assembly

- How to order (4) Vacuum switch unit

- ZSP2-E0X-15C-D

- Unit for replacement

- With light/surge voltage suppressor

- Z

(3) Ejector assembly

**ZX1-W D 05 1**

- Ejector exhaust

- Built-in silencer

- Unit for replacement

- Nil

- Ejector exhaust

- Built-in silencer

- Unit for replacement

- Nil

- 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

(4) Vacuum switch unit

**ZSE2-0X**

- Unit for replacement

- Nil

- Electrical entry

- L Plug connector

(5) Digital vacuum switch unit

**ZSE3-0X**

- Unit for replacement

- Nil

- Electrical entry

- L Plug connector

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

D: Unit for replacement.

Ex: If an adsorption confirmation switch is replaced for a vacuum switch on ZX1071-K15LZ-PBC, indicate as ZSE2-0X-15C-D. In this case, mounting screws 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

**Solenoid valve rated voltage**

<table>
<thead>
<tr>
<th>Voltage</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>100 VAC 50/60 Hz</td>
</tr>
<tr>
<td>2</td>
<td>110 VAC 50/60 Hz</td>
</tr>
<tr>
<td>3</td>
<td>24 VDC</td>
</tr>
<tr>
<td>4</td>
<td>12 VDC</td>
</tr>
<tr>
<td>5</td>
<td>6 VDC</td>
</tr>
<tr>
<td>6</td>
<td>3 VDC</td>
</tr>
</tbody>
</table>

*Applicable to plug connector only. (Connector assembly with rectifier is attached.)*

**Pilot valve**

<table>
<thead>
<tr>
<th>Valve</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nil</td>
<td>DC: 1 W (With indicator light: 1.05 W)</td>
</tr>
<tr>
<td>Y</td>
<td>DC: 0.45 W (With indicator light: 0.95 W)</td>
</tr>
</tbody>
</table>

* Only 24 VDC and 12 VDC are applicable to 0.45 W.

**Output specifications**

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

**Piping specifications**

<table>
<thead>
<tr>
<th>Piping</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nil</td>
<td>Grommet (0.6 m)</td>
</tr>
<tr>
<td>L</td>
<td>Grommet (3 m)</td>
</tr>
<tr>
<td>C</td>
<td>Connector (0.6 m)</td>
</tr>
<tr>
<td>CL</td>
<td>Connector (3 m)</td>
</tr>
<tr>
<td>CN</td>
<td>Without connector</td>
</tr>
</tbody>
</table>

**Release flow rate adjusting needle**

<table>
<thead>
<tr>
<th>Needle</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nil</td>
<td>without lock nut</td>
</tr>
<tr>
<td>L</td>
<td>With lock nut</td>
</tr>
</tbody>
</table>

**Special features**

- Built-in silencer

- With light/surge voltage suppressor

- Z

**Solenoid valve rated voltage**

<table>
<thead>
<tr>
<th>Voltage</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>24 VDC</td>
</tr>
<tr>
<td>6</td>
<td>12 VDC</td>
</tr>
<tr>
<td>7</td>
<td>6 VDC</td>
</tr>
<tr>
<td>8</td>
<td>3 VDC</td>
</tr>
<tr>
<td>9</td>
<td>2 VDC</td>
</tr>
<tr>
<td>10</td>
<td>1 VDC</td>
</tr>
<tr>
<td>11</td>
<td>0.6 VDC</td>
</tr>
</tbody>
</table>

**Applicable nozzle**

<table>
<thead>
<tr>
<th>Diameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>S</td>
<td>0.3 to 0.7mm</td>
</tr>
<tr>
<td>B</td>
<td>0.5 to 1.2mm</td>
</tr>
<tr>
<td>C</td>
<td>0.7 to 1.2mm</td>
</tr>
<tr>
<td>D</td>
<td>1.0 to 1.2mm</td>
</tr>
</tbody>
</table>

**Output specifications**

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

**Piping specifications**

<table>
<thead>
<tr>
<th>Piping</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nil</td>
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</tr>
<tr>
<td>C</td>
<td>Connector (0.6 m)</td>
</tr>
<tr>
<td>CL</td>
<td>Connector (3 m)</td>
</tr>
<tr>
<td>CN</td>
<td>Without connector</td>
</tr>
</tbody>
</table>

**Applicable nozzle**

<table>
<thead>
<tr>
<th>Diameter</th>
<th>Description</th>
</tr>
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<tbody>
<tr>
<td>S</td>
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<td>B</td>
<td>0.5 to 1.2mm</td>
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<td>C</td>
<td>0.7 to 1.2mm</td>
</tr>
<tr>
<td>D</td>
<td>1.0 to 1.2mm</td>
</tr>
</tbody>
</table>

**Special features**

- Built-in silencer

- With light/surge voltage suppressor

- Z
**Manifold**

How to order (6) Digital vacuum switch unit (For replacement)

How to order (5) Vacuum switch unit (For replacement)

How to order (4) Adsorption confirmation switch unit (For replacement)

Output specifications

Manifold

Supply port location

Exhaust

PV port size

Release flow rate adjusting needle

Adjustable nozzle diameter

Applicable nozzle diameter

Manifold

Unit for replacement

Release flow rate

Unit for replacement

ZM

ZQ

ZU

ZL

ZY

ZF

ZP

SP

ZCUK

AMJ

AMV

AEP

HEP

Related Equipment

**How to Order Unit for Replacement**

(1) Valve unit

Refer to page 872 for details.

ZX1-V...K1...L...B...L-D-M

For ejector system

Combination of supply valve and release valve

Pilot valve

Solenoid valve rated voltage

Electrical entry

Light/Surge voltage suppressor

Manual operation

(2) Manifold base

ZZX1...05...R-A-C

Stations

01 1
08 8

Thread type

Nil Rc 1/4
F G

T NPT

(3) Ejector assembly

ZX1-W...D...05...1

Unit for replacement

Nozzle diameter

05 0.5 mm

07 0.7 mm

10 1.0 mm

1 Built-in silencer

2 Port exhaust

Rc 1/4

3 Manifold common exhaust
Vacuum Pump System/Unit Construction (Refer to below for unit replacement.)

How to Order Unit for Replacement

(1) Valve unit

**ZX1-V B K1 S L Z B L-D-S**

- Single
  - Pilot valve
    - Nil (DC: 1 W, AC: 0.45 W)
    - Y (DC: 1 W, AC: 1.05 W)
  - PV port size
    - Nil: Nil
    - Y: M5 x 0.8
  - Manual operation
    - Nil: Non-locking push type
    - Y: M6 x 1 (Option)
  - Light/Surge voltage suppressor
    - Nil
    - Z: With light/surge voltage suppressor
  - Electrical entry
    - L: L plug connector

- Unit for replacement
  - Release flow rate adjusting needle
    - Nil: Without lock nut
    - L: With lock nut

- Solenoid valve rated voltage
  - DC: 100 VAC 50/60 Hz
  - AC: 110 VAC 50/60 Hz
  - 24 VDC
  - 12 VDC
  - 6 VDC
  - 5 VDC
  - 3 VDC

- D: Unit for replacement
  - Ex.) If an adsorption confirmation switch is replaced for a vacuum switch unit, indicate as ZX100-K15LZ-PBC.
  - If the unit is used on its own, not combined with others, "D" is not required.
  - Ex.) ZSE2-0X-15C, ZX1-VBK15LZ

(2) Adsorption confirmation switch unit

**ZSP1-BOX C D**

- Single
  - Applicable nozzle diameter
    - S: 0.3 to 0.7 mm
    - B: 0.5 to 1.2 mm
  - Piping specifications
    - Nil: Grommet (0.6 m)
    - L: Grommet (3 m)
    - C: Connector (0.6 m)
    - CL: Connector (3 m)
    - CN: Without connector

(3) Vacuum switch unit

**ZSE2-0X C D**

- Output specifications
  - NPN open collector
    - Nil: Grommet (0.6 m)
    - L: Grommet (3 m)
    - C: Connector (0.6 m)
    - CL: Connector (3 m)
    - CN: Without connector
  - PNP open collector

(4) Digital vacuum switch unit

**ZSE3-0X C D**

- Output specifications
  - 2 outputs/without analog output
    - Nil: Grommet (0.6 m)
    - L: Grommet (3 m)
    - C: Connector (0.6 m)
    - CL: Connector (3 m)
    - CN: Without connector
  - 2 outputs/with analog output
  - 1 output (with trouble detection)/without analog output
  - 1 output (with trouble detection)/with analog output

Note) Analog output is available only on grommet type.
### Manifold

**How to Order Unit for Replacement**

#### Valve unit (Supply valve: N.O.) (For replacement)
- Philips screw (M2.5 x 28)

#### Valve unit (Supply valve: N.C.) (For replacement)
- Philips screw (M2.5 x 28)

#### Valve unit (Supply valve: Air operated) (For replacement)
- Philips screw (M2.5 x 28)

#### Note 1) M5: Suffix -4, M6: Suffix -1
- Refer to page 906 for details.

#### Note 2) M5: Suffix -1, M6: Suffix -2
- Refer to page 926 for details.

#### Adapter B (M2.5 x 8)
- Philips screw

#### Adapter D (M2.5 x 12)
- Philips screw

#### Adapter D individual spacer R1 assembly
- Assembly no. ZX1-DR1

#### Related Equipment
- Vacuum Pump System Series ZX

#### Output specifications
- 2 outputs/without analog output
- 2 outputs/with analog output
- 1 output (with trouble detection)/without analog output
- 1 output (with trouble detection)/with analog output

#### Note) Analog output is available only on grommet type.

---

#### Piping specifications

<table>
<thead>
<tr>
<th>System for external vacuum</th>
<th>Unit for replacement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grommet (0.6 m)</td>
<td>Grommet (3 m)</td>
</tr>
<tr>
<td>Connector (0.6 m)</td>
<td>Connector (3 m)</td>
</tr>
<tr>
<td>Without connector</td>
<td>Without connector</td>
</tr>
</tbody>
</table>

#### 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

---

#### Station Management

<table>
<thead>
<tr>
<th>Number</th>
<th>Station</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>1</td>
</tr>
<tr>
<td>02</td>
<td>1</td>
</tr>
<tr>
<td>03</td>
<td>2</td>
</tr>
<tr>
<td>04</td>
<td>2</td>
</tr>
<tr>
<td>05</td>
<td>3</td>
</tr>
<tr>
<td>06</td>
<td>3</td>
</tr>
<tr>
<td>07</td>
<td>4</td>
</tr>
<tr>
<td>08</td>
<td>4</td>
</tr>
</tbody>
</table>

#### Thread type

<table>
<thead>
<tr>
<th>Type</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nil</td>
<td>Rc1/8</td>
</tr>
<tr>
<td>F</td>
<td>G</td>
</tr>
<tr>
<td>T</td>
<td>NPTF</td>
</tr>
</tbody>
</table>

---

#### PV port size

| Nil | M5 x 0.8 |
| Y   | M6 x 1 (Option) |

---

#### Release flow rate adjusting needle

| Nil | Without lock nut |
| Y   | With lock nut   |

---

#### Notes

1. M5: Suffix -4, M6: Suffix -1
2. M5: Suffix -1, M6: Suffix -2

---

#### Valve unit

- Refer to page 906 for details.

#### Vacuum switch unit (For replacement)
- Philips screw

#### Adsorption confirmation switch unit
- Philips screw

#### Filter unit (For replacement)
- Philips screw

#### Digital vacuum switch unit
- Philips screw

---

#### How to Order Unit for Replacement

- Refer to page 926 for details.

#### Manifold base

- Refer to page 926 for details.
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 (P3200152-12) 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>
<thead>
<tr>
<th>Combination</th>
<th>Part no.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vacuum switch ZSE3, ZSP1</td>
<td>M2.5 x 51</td>
</tr>
<tr>
<td>Vacuum switch ZSE2</td>
<td>P3270148-39H1</td>
</tr>
<tr>
<td></td>
<td>(M2.5 x 39)</td>
</tr>
<tr>
<td>Filter unit ZX1-F</td>
<td>P3200152-12</td>
</tr>
<tr>
<td></td>
<td>(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) Philips screw</td>
<td>2</td>
<td>0.28 ± 0.1 (N·m)</td>
<td>Necessary</td>
<td>Necessary</td>
<td></td>
</tr>
<tr>
<td>P3200152</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>P3200152-24</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>M-5P</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>P3200152-12</td>
<td>Philips screw</td>
<td>3</td>
<td>0.28 ± 0.1 (N·m)</td>
<td>Necessary</td>
<td>Not necessary</td>
</tr>
<tr>
<td></td>
<td>(M2.5 x 28)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Use M2.5 x 32 when individual spacers are used.
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 (P3200152-12) 3 pcs.
5. Mount ejector assembly to manifold with Philips screw (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, ZSP1</td>
<td>M2.5 x 63</td>
</tr>
<tr>
<td>Vacuum switch ZSE2</td>
<td>M2.5 x 51</td>
</tr>
<tr>
<td>Filter unit ZX1-F</td>
<td>P3270148-39#1 (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>M2.5 x 14</td>
<td>Philips screw</td>
<td>1</td>
<td>0.28 ± 0.1 (N·m)</td>
<td>Necessary</td>
<td>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>Not necessary</td>
</tr>
<tr>
<td>M-5P</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>P3200152-12</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>

* Use 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.

How to Operate

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

Combination Symbol: K4

Application: The supply pressure is restricted by electric signals and a vacuum release is effected by 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>Valve Condition</th>
<th>Supply valve</th>
<th>Release valve</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Work adsorption</td>
<td>OFF</td>
<td>OFF</td>
</tr>
<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: 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.

How to Operate

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

Combination Symbol: K5

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

How to Operate

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

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>Valve Condition</th>
<th>Supply valve</th>
<th>Release valve</th>
</tr>
</thead>
<tbody>
<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>
<tr>
<td>3. Operation stop</td>
<td>OFF</td>
<td>OFF</td>
</tr>
</tbody>
</table>

Combination Symbol: J3

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

How to Operate

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

Series ZX
Made to Order Specifications:
Please consult with SMC for detailed size, specifications and delivery.
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 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 external air signals.

How to Operate

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

How to Operate

<table>
<thead>
<tr>
<th>Valve Condition</th>
<th>Supply Valve</th>
<th>Release Valve</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Work adsorption</td>
<td>ON</td>
<td>OFF</td>
</tr>
<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: J3

Combination Symbol: D2

Combination Symbol: J4

Combination Symbol: D3

Combination Symbol: D1

Combination Symbol: D4

Made to Order Specifications
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 Condition</th>
<th>Supply valve</th>
<th>Solenoid valve</th>
<th>Electromagnetic valve</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Work adsorption</td>
<td>ON</td>
<td>OFF</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>ON</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 Condition</th>
<th>Supply valve</th>
<th>Release valve</th>
</tr>
</thead>
<tbody>
<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>ON</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 Condition</th>
<th>Supply valve</th>
<th>Solenoid valve</th>
</tr>
</thead>
<tbody>
<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>ON</td>
<td>ON</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 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**

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

<table>
<thead>
<tr>
<th>Valve Condition</th>
<th>Supply valve</th>
<th>Release valve</th>
</tr>
</thead>
<tbody>
<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>
<tr>
<td>3. Operation stop</td>
<td>ON</td>
<td>ON</td>
</tr>
</tbody>
</table>
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

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

Combination Symbol: J3

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>
<thead>
<tr>
<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>
</tr>
<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 the external 2 port valve (vacuum valve) and releasing is also effected by the external 2 port valve.

How to Operate

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

Combination Symbol: J4

Application: Supply 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

<table>
<thead>
<tr>
<th>Valve</th>
<th>Supply valve</th>
<th>Release valve</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Work adsorption</td>
<td>OFF</td>
<td>ON</td>
</tr>
<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: D3

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>
<thead>
<tr>
<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>
</tr>
<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: D1

Application: The supply pressure is controlled by an external 2 port valve (vacuum valve) and 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 adsorption</td>
<td>ON</td>
<td>OFF</td>
</tr>
<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: D4

Application: The supply pressure is controlled by the external 2 port valve (vacuum valve) and vacuum release is effected by external air signals.
### 3 High Noise Reduction Silencer Assembly

**ZX1**  
- **Nozzle diameter**  
- **Exhaust style**  
- **Valve**  
- **Voltage**  
- **Electrical entry**  
- **X121**

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**High noise reduction silencer assembly**

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

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**Ordering example**

ZZX102-R  
1 pc.

ZX1101-K15LZ-EC-X121  
2 pcs.

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**Made to Order Specifications:**

Please consult with SMC for detailed size, specifications and delivery.