MICRO EJECTORS

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Caution
Before use, be sure to read the “Safety Precautions” on p. 49.
The diffuser and ejector body are integrated into a single compact and lightweight plastic unit that is completely downsized.

- Product line-up includes the high response type GME05 and the low wattage type (power consumption 0.5W) GME07 and GME10.
- Can be mounted on the tool plate section of orthogonal robots, etc., which shortens the tubes connecting to vacuum pads to obtain high response.

Combined mounting manifolds of GME05, GME07, and GME10 enable the user to select combinations suitable for each workpiece requirement.

- Manifold types are provided with six types of end blocks to increase the selection of exhaust direction flexibility.
- Individual exhausts for single-unit use are also available as an option.

Three series of two types each to match your application needs!

**High Response Type**

- **GME05-□** (for single unit)
  - Nozzle diameter: 0.5mm [0.020in.]
  - Vacuum flow rate: 5.5 l/min [0.194ft³/min.] (ANR)
  - Vacuum: 86.7kPa [25.6in.Hg]
  - Power consumption: 3.2/1.1W (starting/holding)

- **GAME05-□** (for manifold)
  - Nozzle diameter: 0.5mm [0.020in.]
  - Vacuum flow rate: 5.5 l/min [0.194ft³/min.] (ANR)
  - Vacuum: 86.7kPa [25.6in.Hg]
  - Power consumption: 3.2/1.1W (starting/holding)

**Low Wattage Type (DC specifications)**

- **GME07-□** (for single unit)
  - Nozzle diameter: 0.7mm [0.028in.]
  - Vacuum flow rate: 11 l/min [0.39ft³/min.] (ANR)
  - Vacuum: 86.7kPa [25.6in.Hg]
  - Power consumption: 0.5W (DC5~24V)

- **GAME07-□** (for manifold)
  - Nozzle diameter: 0.7mm [0.028in.]
  - Vacuum flow rate: 11 l/min [0.39ft³/min.] (ANR)
  - Vacuum: 86.7kPa [25.6in.Hg]
  - Power consumption: 0.5W (DC5~24V)

- **GME10-□** (for single unit)
  - Nozzle diameter: 1.0mm [0.039in.]
  - Vacuum flow rate: 22 l/min [0.78ft³/min.] (ANR)
  - Vacuum: 86.7kPa [25.6in.Hg]
  - Power consumption: 0.5W (DC5~24V)

- **GAME10-□** (for manifold)
  - Nozzle diameter: 1.0mm [0.039in.]
  - Vacuum flow rate: 22 l/min [0.78ft³/min.] (ANR)
  - Vacuum: 86.7kPa [25.6in.Hg]
  - Power consumption: 0.5W (DC5~24V)

※ Value (approximate) at pressure of 0.5MPa [73psi].
### Specifications

<table>
<thead>
<tr>
<th>Item</th>
<th>Basic model</th>
<th>GME05-E1/GAME05-E1</th>
<th>GME05-E2/GAME05-E2</th>
<th>GME07-E1/GAME07-E1</th>
<th>GME07-E2/GAME07-E2</th>
<th>GME10-E1/GAME10-E1</th>
<th>GME10-E2/GAME10-E2</th>
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</thead>
<tbody>
<tr>
<td>Media</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Operating pressure range</td>
<td>MPa (min.)</td>
<td>0.1<del>0.6 [15</del>87]</td>
<td></td>
<td>0.1<del>0.6 [15</del>87]</td>
<td></td>
<td>0.2<del>0.6 [29</del>87]</td>
<td></td>
</tr>
<tr>
<td>Proof pressure</td>
<td>MPa (min.)</td>
<td>0.9 [131]</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Operating temperature range</td>
<td>°C (°F)</td>
<td>5<del>50 [41</del>122]</td>
<td></td>
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</tr>
<tr>
<td>Nozzle diameter</td>
<td>mm (in.)</td>
<td>0.5 [0.020]</td>
<td></td>
<td>0.7 [0.028]</td>
<td>1.0 [0.039]</td>
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<tr>
<td>Vacuum resistance</td>
<td>kPa (in.Hg)</td>
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<tr>
<td>Vacuum flow rate</td>
<td>mm/min (in/min) (AHR)</td>
<td>5.5 [0.194]</td>
<td>11 [0.39]</td>
<td>22 [0.78]</td>
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<tr>
<td>Compressed air consumption</td>
<td>mm/min (ft/min) (AHR)</td>
<td>11 [0.39]</td>
<td>23 [0.81]</td>
<td>46 [1.62]</td>
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<tr>
<td>Lubrication</td>
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<tr>
<td>Filtration</td>
<td>µm</td>
<td>30</td>
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<tr>
<td>Port size</td>
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<tr>
<td>Vacuum generation port</td>
<td>M5 × 0.8</td>
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<tr>
<td>Compressed air supply port</td>
<td>M5 × 0.8</td>
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<tr>
<td>Mounting direction</td>
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<tr>
<td>Main valve specifications</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Response time/AB ms</td>
<td></td>
<td>6.5/8.5</td>
<td></td>
<td></td>
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<td>18/15.5</td>
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<td>Direct operating</td>
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<td>Indirect operating</td>
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<tr>
<td>Number of positions/number of ports</td>
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<tr>
<td>Valve function</td>
<td></td>
<td>Normally closed (NC standard)</td>
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<tr>
<td>Effective area</td>
<td>mm² [Cv]</td>
<td>0.6 [0.03]</td>
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<td></td>
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<td>2.3 [0.13]</td>
<td>4.5 [0.25]</td>
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<tr>
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<td></td>
<td></td>
<td>2.3 [0.13]</td>
<td>4.5 [0.25]</td>
</tr>
<tr>
<td>Shock resistance/AB ms</td>
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<td></td>
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<td></td>
</tr>
</tbody>
</table>

Notes:
1. Value (approximate) at pressure of 0.5MPa [73psi].
2. Assumes use of pure air from which oil mist and dust, etc., have been removed.
3. Take heat radiation measures to ensure that the ambient temperature (or when used in a control box, the inside temperature of the box) always remains within the specified temperature range. Moreover, for long-term continuous operation, consult us.
4. GME is blocked with a plug.
5. The period from when a solenoid valve for controlling air is energized until generation of negative pressure is A, while the period from when a solenoid valve for controlling vacuum breaking air is energized until a generation of vacuum breaking is B.
6. Figures in parentheses ( ) are shock resistance values in the valve stem axis direction. The shock resistance values are the values where breaking of vacuum holding occurs.

### Solenoid Specifications

<table>
<thead>
<tr>
<th>Item</th>
<th>GA010LE1, GAV010LE1-11</th>
<th>GA010HE1</th>
<th>GA010E1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rated voltage</td>
<td>DC5V</td>
<td>DC6V</td>
<td>DC12V</td>
</tr>
<tr>
<td>Operating voltage range</td>
<td>V</td>
<td>4.5~5.5</td>
<td>5.4~6.6</td>
</tr>
<tr>
<td>Rated frequency</td>
<td>Hz</td>
<td>10.8~13.2</td>
<td>12.10%</td>
</tr>
<tr>
<td>Current (when applied voltage)</td>
<td>mA [m + a]</td>
<td>21.6~26.4</td>
<td>24%</td>
</tr>
<tr>
<td>Power consumption</td>
<td>0.5W</td>
<td>21.6~26.4</td>
<td>24%</td>
</tr>
<tr>
<td>Allowable circuit leakage current</td>
<td>mA [m + A]</td>
<td>10.8~13.2</td>
<td>12.10%</td>
</tr>
<tr>
<td>Power consumption, starting/holding</td>
<td>W [m + A]</td>
<td>10.8~13.2</td>
<td>12.10%</td>
</tr>
<tr>
<td>Period of starting conditions</td>
<td>m + s</td>
<td>10.8~13.2</td>
<td>12.10%</td>
</tr>
<tr>
<td>Insulation resistance</td>
<td>MΩ</td>
<td>100</td>
<td>100 or more</td>
</tr>
<tr>
<td>Wiring and lead wire length</td>
<td>Grommet type : 300mm [11.8in.], plug connector type : 300mm [11.8in.]</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Color of lead wire</td>
<td>Red (+) , Black (−)</td>
<td>Yellow</td>
<td>White</td>
</tr>
<tr>
<td>Color of LED indicator</td>
<td>Red</td>
<td>Bridge diode</td>
<td>Bridge diode</td>
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</table>

### Mounting solenoid valve

<table>
<thead>
<tr>
<th>Model</th>
<th>Voltage</th>
<th>Mounting solenoid valve</th>
</tr>
</thead>
<tbody>
<tr>
<td>GME05</td>
<td>DC</td>
<td>E1 GA010HE1, E2 GA010HE1, GAV010LE1-11</td>
</tr>
<tr>
<td>GME07</td>
<td>AC</td>
<td>GA010E1</td>
</tr>
<tr>
<td>GME10</td>
<td>DC</td>
<td>GA010LE1</td>
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</tbody>
</table>

* Solenoid valve for vacuum breaking.
## Electronic Vacuum Switch Specifications

### General

<table>
<thead>
<tr>
<th>Item</th>
<th>GME-05E, GME-07E, GME-10E</th>
<th>GME-05EA, GME-07EA, GME-10EA</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Model</strong></td>
<td>Switch 2-output (fixed hysteresis)</td>
<td>Switch 1-output (variable hysteresis) with analog output</td>
</tr>
<tr>
<td><strong>Pressure range</strong></td>
<td>0 ~ 100kPa [0 ~ 29.54in.Hg]</td>
<td>0 ~ 100kPa [0 ~ 29.54in.Hg]</td>
</tr>
<tr>
<td><strong>Maximum pressure</strong></td>
<td>200kPa [29psi.]</td>
<td>200kPa [29psi.]</td>
</tr>
<tr>
<td><strong>Operating temperature</strong></td>
<td>–20 ~ 70°C [–4 ~ 158°F]</td>
<td></td>
</tr>
<tr>
<td><strong>Operating ambient humidity</strong></td>
<td>35 ~ 85%RH</td>
<td></td>
</tr>
<tr>
<td><strong>Media</strong></td>
<td>Air or non-corrosive gas</td>
<td></td>
</tr>
<tr>
<td><strong>Insulation resistance</strong></td>
<td>100MΩ, MIN. (at DC500V megger)</td>
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</tr>
<tr>
<td><strong>Cable</strong></td>
<td>Shielded 4 leads X 1500mm [59in. (total length)]</td>
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</tr>
<tr>
<td><strong>Power supply</strong></td>
<td>DC10.8 ~ 30V (including ripple)</td>
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</tr>
<tr>
<td><strong>Consumption current</strong></td>
<td>25mA or less Note 1</td>
<td>17mA or less Note 1</td>
</tr>
<tr>
<td><strong>Number of outputs</strong></td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td><strong>Output type</strong></td>
<td>NPN open collector</td>
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<tr>
<td><strong>Pressure setting method</strong></td>
<td>Variable with use of a trimmer</td>
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<tr>
<td><strong>Pressure setting range</strong></td>
<td>0 ~ 100% of rated vacuum</td>
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</tr>
<tr>
<td><strong>Output display</strong></td>
<td>When ON, operation indication lamp (LED) lights up</td>
<td></td>
</tr>
<tr>
<td><strong>Accuracy</strong></td>
<td>Within ±3% F.S. Note 2</td>
<td></td>
</tr>
<tr>
<td><strong>Hysteresis</strong></td>
<td>Within 1 ~ 15% variable of the specified value (reference value)</td>
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<tr>
<td><strong>Switch capacity</strong></td>
<td>DC30V, 80mA MAX.</td>
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<tr>
<td><strong>Output voltage</strong></td>
<td>1 ~ 5V</td>
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<tr>
<td><strong>Zero-point voltage</strong></td>
<td>1 ± 0.1V</td>
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</tr>
<tr>
<td><strong>Span voltage</strong></td>
<td>4 ± 0.1V</td>
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</tr>
<tr>
<td><strong>Temperature characteristics</strong></td>
<td>±0.1% F.S./°C [±0.05% F.S./°F] Note 2</td>
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<tr>
<td><strong>Output current</strong></td>
<td>MAX. 1mA Note 2</td>
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</tr>
<tr>
<td><strong>Linearity/hysteresis</strong></td>
<td>±0.5% F.S./MAX.</td>
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<tr>
<td><strong>Vibration resistance</strong></td>
<td>98.1m/s² [10G]</td>
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<tr>
<td><strong>Shock resistance</strong></td>
<td>490m/s² [50G] (non-repeated shock)</td>
<td></td>
</tr>
</tbody>
</table>

**Notes:**
1. At power supply of DC24V, and output ON.
2. 0 ~ 50°C [32 ~ 122°F], reference point of 25°C [77°F].
3. Load resistance: 5kΩ or more.

**Remark:** Unless otherwise specified, ambient temperature is stipulated at 25±5°C [77±9°F], and power supply is DC12V.

### Port Size

<table>
<thead>
<tr>
<th>Micro ejector</th>
<th>GME05-E1, GME05-E2</th>
<th>M5×0.8</th>
<th>M5×0.8</th>
<th>M6×1</th>
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</thead>
<tbody>
<tr>
<td>GME07-E1, GME07-E2</td>
<td>Rc1/8</td>
<td>Rc1/8</td>
<td>Rc1/4</td>
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<tr>
<td>GME10-E1, GME10-E2</td>
<td>M5×0.8</td>
<td>Rc1/8</td>
<td>Rc3/8 (or muffler)</td>
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<tr>
<td>Manifold</td>
<td>GMEM-2 A (05 series)</td>
<td>M5×0.8</td>
<td>Rc1/8</td>
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<tr>
<td>GMEM-2 A (07, 10 series)</td>
<td>Rc1/8</td>
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<td>Manifold</td>
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<tr>
<td>Piping connection position</td>
<td>Ejector</td>
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### Mass

#### Body mass

<table>
<thead>
<tr>
<th>Basic models</th>
<th>-E1</th>
<th>-E2</th>
</tr>
</thead>
<tbody>
<tr>
<td>GME05</td>
<td>153 [5.40]</td>
<td>167 [5.89]</td>
</tr>
<tr>
<td>GME07</td>
<td>207 [7.30]</td>
<td>221 [7.80]</td>
</tr>
<tr>
<td>GME10</td>
<td>249 [8.78]</td>
<td>263 [9.28]</td>
</tr>
</tbody>
</table>

#### Additional mass

<table>
<thead>
<tr>
<th>Basic models</th>
<th>-E, -EA -UR -ER -EL -KR -KL -KD</th>
</tr>
</thead>
<tbody>
<tr>
<td>GME07</td>
<td>-3</td>
</tr>
<tr>
<td>GME10</td>
<td>-5</td>
</tr>
</tbody>
</table>

**Calculation example**

<table>
<thead>
<tr>
<th>Basic models</th>
<th>-E, -EA -UR -ER -EL -KR -KL -KD</th>
</tr>
</thead>
<tbody>
<tr>
<td>GME07</td>
<td>-3</td>
</tr>
<tr>
<td>GME10</td>
<td>-5</td>
</tr>
</tbody>
</table>

**Calculation example**

```
GMEM5A-ER stn.1 ~ 2
GAME05E2-E-DC24V
stn.3 ~ 4
GAME07E2-E-DC24V
stn.5
GAME10E2-E-DC24V

276 + (167 + 45) x 2 + (221 + 50) x 2 + 263 + 50 = 1555 [54.85]
```
**Ejector with Solenoid Valve Order Codes**

- **Voltage**: DC5V, DC6V, DC12V, DC24V, AC100V, AC200V
- **Lead wire length**:
  - Blank: 300mm (11.8in.)
  - 1L: 1000mm (39in.)
  - 3L: 3000mm (118in.) (Connector type only)
- **Solenoid**:
  - Blank: Grommet
  - PL: L connector, positive common
  - ML: L connector, negative common
- **Electronic vacuum switch**:
  - Blank: No vacuum switch
  - E: With 2-output type vacuum switch
  - EA: With 1-output type vacuum switch
- **Exhaust method** (for selection of GME type only):
  - Blank: Muffler exhaust
  - UR: Port exhaust
- **Solenoide valve specification**:
  - E1: Single solenoid valve for controlling supply air
  - E2: Twin solenoid valves for controlling supply air and vacuum breaking air
- **Body type (nozzle diameter: mm)**:
  - 05: ø 0.5 [0.020in.]
  - 07: ø 0.7 [0.028in.]
  - 10: ø 1.0 [0.039in.]

**Notes**:
1. Since manifolds of six or more units require a special modification, consult us for delivery times and prices.
2. Voltage for the GME05 series is limited to DC12V and DC24V. As the mounted solenoid valves vary according to the series, see the table below, and confirm it against the solenoid specifications on p.680.

**Manifold Order Codes**

- **GMEM**
  - A - [ ]
  - ... [ ]

**GAME**

- For manifold mounting

**Additional Stacking Unit Order Codes**

(For adding one unit when using manifolds)

<table>
<thead>
<tr>
<th>Model</th>
<th>Voltage</th>
<th>Mounting solenoid valve</th>
</tr>
</thead>
<tbody>
<tr>
<td>GME05</td>
<td>DC</td>
<td>E1 GA010HE1</td>
</tr>
<tr>
<td>GME07</td>
<td>AC</td>
<td>E2 GA010HE1, GA010LE1-11</td>
</tr>
<tr>
<td>GME10</td>
<td>DC</td>
<td>GA010LE1</td>
</tr>
</tbody>
</table>

*Solenoide valve for controlling vacuum breaking air.*

**Electronic Vacuum Switch Order Codes**

<table>
<thead>
<tr>
<th>GME</th>
<th>[ ]</th>
<th>[ ]</th>
</tr>
</thead>
</table>

- **Switch specification**:
  - E: Switch 2-output type
  - EA: Switch 1-output type

**Replacement Filter Order Codes** (element only)

- **GME** - [ F ]
  - (one pack five pcs.)
  - 05: For GME05
  - 07: For GME07
  - 10: For GME10

**Mounting Base Order Code** (for direct piping type)

- **GME-21** (Supplied items: one base, two spacers, two hexagon socket screws)

**Muffler Order Codes** (only for manifolds)

- **GMEM-KM**
  - R: Muffler on right side
  - L: Muffler on left side
Operation Principle and Major Parts

GME05-E2

● De-energized

When energizing a solenoid valve for controlling supply air (generating vacuum)

When energizing a solenoid valve for controlling vacuum breaking air

Major Parts and Materials

<table>
<thead>
<tr>
<th>Parts</th>
<th>Materials</th>
</tr>
</thead>
<tbody>
<tr>
<td>Valve base</td>
<td>Aluminum alloy (painted)</td>
</tr>
<tr>
<td>Nozzle</td>
<td>Brass</td>
</tr>
<tr>
<td>Diffuser body</td>
<td>Plastic</td>
</tr>
<tr>
<td>O-ring</td>
<td>Synthetic rubber</td>
</tr>
<tr>
<td>Gasket</td>
<td></td>
</tr>
<tr>
<td>End block</td>
<td>Aluminum alloy (painted)</td>
</tr>
</tbody>
</table>
**Operation Principle and Major Parts**

**GME07-E2**  
**GME10-E2**  

- **De-energized**
  - Adjusting needle for vacuum breaking flow
  - Lock nut
  - Vacuum breaking air supply valve
  - Adapter
  - Solenoid valve for controlling vacuum breaking air
  - Diffuser body
  - Solenoid valve for controlling supply air
  - Air supply valve
  - Manual override
  - Vacuum switch
  - Check valve
  - Muffler
  - Valve base
  - Adapter
  - Filter

- **When energizing a solenoid valve for controlling supply air (generating vacuum)**

- **When energizing a solenoid valve for controlling vacuum breaking air**
Symbols

With single solenoid valve

- GME05-E1

With single solenoid valve and vacuum switch

- GME05-E1-E

- GME07-E1  GME10-E1

- GME07-E1-E  GME10-E1-E

With twin solenoid valves

- GME05-E2

With twin solenoid valves and vacuum switch

- GME05-E2-E

- GME07-E2  GME10-E2

- GME07-E2-E  GME10-E2-E
**Dimensions (mm)**

<table>
<thead>
<tr>
<th>Model</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>F</th>
<th>G</th>
<th>H</th>
<th>I</th>
<th>J</th>
<th>K</th>
<th>L</th>
<th>M</th>
<th>P</th>
<th>Q</th>
<th>R</th>
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</thead>
<tbody>
<tr>
<td>GME05-E1</td>
<td>64.1</td>
<td>118</td>
<td>75</td>
<td>75</td>
<td>20</td>
<td>23</td>
<td>10.5</td>
<td>5.25</td>
<td>4.25</td>
<td>17.5</td>
<td>11</td>
<td>87.5</td>
<td>13</td>
<td></td>
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<tr>
<td>GME07-E1</td>
<td>67.0</td>
<td>118</td>
<td>75</td>
<td>75</td>
<td>25</td>
<td>18</td>
<td>15.5</td>
<td>7.75</td>
<td>5.75</td>
<td>18.5</td>
<td>11</td>
<td>93.0</td>
<td>8</td>
<td></td>
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<tr>
<td>GME10-E1</td>
<td>67.0</td>
<td>128</td>
<td>75</td>
<td>85</td>
<td>25</td>
<td>18</td>
<td>15.5</td>
<td>9.25</td>
<td>9.25</td>
<td>18.5</td>
<td>21</td>
<td>95.0</td>
<td>8</td>
<td></td>
</tr>
</tbody>
</table>

**Options**

- **-PL,-ML**
  - GME05-E1: 74.7
  - GME07-E1: 77.2
  - GME10-E1: 77.2

- **-21**

- **-UR**
  - W (R: Exhaust port)

**Model**

<table>
<thead>
<tr>
<th>Model</th>
<th>S</th>
<th>T</th>
<th>U</th>
<th>W</th>
</tr>
</thead>
<tbody>
<tr>
<td>GME05-E1</td>
<td>8</td>
<td>15</td>
<td>70.8</td>
<td>M6×1</td>
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<tr>
<td>GME07-E1</td>
<td>10</td>
<td>20</td>
<td>70.8</td>
<td>Rc1/8</td>
</tr>
<tr>
<td>GME10-E1</td>
<td>10</td>
<td>23</td>
<td>70.8</td>
<td>Rc1/4</td>
</tr>
</tbody>
</table>
Drawings show examples of combined mounting of GAME05, 07, 10. For detailed dimensions of each mounted ejector, see p.686.

Example diagram GMEM5A-ER

<table>
<thead>
<tr>
<th>Number of units</th>
<th>b1 (GAME05)</th>
<th>b2 (GAME07)</th>
<th>b3 (GAME10)</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>11</td>
<td>16</td>
<td>19</td>
</tr>
<tr>
<td>2</td>
<td>22</td>
<td>32</td>
<td>38</td>
</tr>
<tr>
<td>3</td>
<td>33</td>
<td>48</td>
<td>57</td>
</tr>
<tr>
<td>4</td>
<td>44</td>
<td>64</td>
<td>76</td>
</tr>
<tr>
<td>5</td>
<td>55</td>
<td>80</td>
<td>95</td>
</tr>
</tbody>
</table>

Adjusting needle for vacuum breaking flow
2-Rc1/8 (same as the opposite side) (Compressed air supply port)

Solenoid valve for controlling vacuum breaking air
Solenoid valve for controlling supply air

Vacuum switch

Filter

4-R2.25
Counterbore ø 8
depth 4.4 (mounting hole)
Handling Instructions and Precautions

Solenoid

**Internal circuit**

- **DC5V, DC6V, DC12V, DC24V** (GA010LE1, GAV010LE1-11)
  - Solenoid with LED indicator (surge suppression)
  - Positive common
    - Lead wire: Red (+)
    - Lead wire: Black (−)

- Negative common (made to order)
  - Lead wire: Red (+)
  - Lead wire: Black (−)

- **DC12V, DC24V** (GA010HE1)
  - Solenoid with LED indicator (surge suppression)
  - Positive common
    - Lead wire: Red (+)
    - Lead wire: Black (−)

- Negative common (made to order)
  - Lead wire: Red (+)
  - Lead wire: Black (−)

- **AC100V, AC200V** (GA010E1)
  - Solenoid with LED indicator (surge suppression)
  - Lead wire: Red (+)
  - Lead wire: Black (−)

**Cautions:**

1. Do not apply meger between the lead wires.
2. The DC solenoid will not short circuit even if the wrong polarity is applied, but the valve will not operate.
3. Leakage current inside the circuit could result in failure of the solenoid valve not to return to home position or other erratic operation. Always use within the range of the allowable leakage current. If circuit conditions, etc., cause the leakage current to exceed the maximum allowable leakage current, consult us.

**Plug connector**

**Attaching and removing plug connector**

Use fingers to insert the connector into the pin, push it in until the lever claw latches onto the protruded section of the connector housing, and complete the connection.

To remove the connector, squeeze the lever along with the connector, lift the lever claw up from the protruded section of the connector housing, and pull it out.

**Crimping of connecting lead wire and contact**

To crimp lead wires into contacts, strip off 4mm [0.16in.] of the insulation from the end of the lead wire, insert it into the contact, and crimp it. Be sure to avoid catching the insulation on the exposed wire crimping section.

**Attaching and removing contact and connector**

Insert the contact with a lead wire into a plug connector into the rectangular hole until the contact hook latches on the connector and is secured to the plug connector. Confirm that the lead wire cannot be easily pulled out.

To remove it, insert a tool with a fine tip (such as a small screwdriver) into the rectangular hole on the side of the plug connector to push up on the hook, and then pull out the lead wire.

**Cautions:**

1. Do not pull hard on the lead wire. It could result in defective contacts, breaking wires, etc.
2. If the pin is bent, use a small screwdriver, etc., to gently straighten out the pin, and then complete the connection to the plug connector.
3. For crimping of connecting lead wire and contact, always use a dedicated crimping tool.

**Vacuum breaking**

**Adjustment of vacuum breaking flow rate**

Turning the adjusting needle for vacuum breaking flow (with twin solenoid valves only) in the clockwise direction reduces the breaking flow rate, while turning it in the counterclockwise direction increases the breaking flow rate.
Micro ejector

Device configuration

**Manifold assembly**

Screw the two connecting rods all the way into end block B, and then assemble the ejector bodies into the connecting rods in any order. Finally, place in end block A, and tighten hexagon socket head cap screws to secure it in place. Be sure to place both end blocks on a flat surface when tightening rods and screw.

**Additional stacking method (GCME)**

Remove two hexagon socket screws, and remove end block A. Screw the two supplied stacking rods into the connecting rods. At this time, check to see whether the connecting rods attached to end block B are secured. Insert the gaskets and O-rings into the locations prescribed in the illustration above, and assemble the ejector body and end blocks.

**Caution:** Since the ejector bodies in this GME series function as manifolds, they have no block plate. For adding units, assemble the additional stacking unit (GCME) according to the illustration above. Note that linked units cannot be reduced. Consult us in the case. (A special connecting rod is required.)

**Piping**

1. Connect air supply to the compressed air supply port, and connect vacuum pads, etc., to vacuum generation ports.
2. For piping to the micro ejector, use nylon or urethane tubes with inner diameters of $\phi 2.5 \sim \phi 6$ (0.098 \sim 0.236 in.). For vacuum generation ports, tubes in the following sizes are recommended.
   - GME05: $\phi 4 \times \phi 2.5$
   - GME07: $\phi 6 \times \phi 4$
   - GME10: $\phi 8 \times \phi 6$

**Cautions:**
1. Use a fitting that does not reduce inner diameter. A small inner diameter can result in degradation of performance, including flow rate and pressure shortages, insufficient vacuum, or longer periods of time before the vacuum level is reached.
2. Avoid use of coil tubes and other curved piping. Also, avoid use of elbow fittings, etc., between the micro ejector and vacuum pad, and use piping that is as straight as possible.
3. In manifolds with many units, where a large number of micro ejectors are operating simultaneously, or where the operation frequency is very high, supply air from $P$ ports on both ends.
Electronic Vacuum Switch

Settings

- **E**: Switch 2-output (fixed hysteresis) type
- **EA**: Switch 1-output (variable hysteresis) + analog output type

Wiring instructions

**Basic connections**

- **GME-E**: Switch 2-output (fixed hysteresis) type
- **GME-EA**: Switch 1-output (variable hysteresis) + analog output type

Connections to programmable controller

- **GME-E**: Switch 2-output (fixed hysteresis) type
- **GME-EA**: Switch 1-output (variable hysteresis) + analog output type

General precautions

1. Although any mounting direction is allowed, always ensure that the ejector body is not directly under strong shocks or vibrations.
2. Avoid using in the locations or environments listed below, because they could be the cause of valve malfunctions. If use in such areas cannot be avoided, always use a cover or take other sufficient protective measures.
   - Locations where the valve is directly subject to dripping water, dripping oil, etc.
   - Environments where the valve body is subject to condensation
   - Locations where the valve is directly subject to chips, dust, etc.
   - Locations subject to salt, corrosive gases, or conductive particles
3. Always thoroughly blow off (use compressed air) the piping before connecting it to the micro ejector. Intrusion into the piping of chips, sealing tape, rust, or other foreign material generated during piping operations could result in valve air leaks or a degradation in micro ejector performance.
4. Use clean air that does not contain deteriorated compressor oil or other contaminants. Install an air filter (with filtration of a minimum 40 μm) close to the micro ejector to eliminate any collected liquid or dust in air line. Always use a mist filter for cases where the compressed air contains large amounts of oils. Moreover, drain the air filter at regular intervals.
5. Use a regulator to adjust the pressure of air supplied to the micro ejector. Where the piping length to the micro ejector is long, set the pressure at a little higher than normal. If using an air supply valve, use a valve with an effective area that is at least three times as large as the area of the micro ejector nozzle.
6. Use one vacuum pad for one micro ejector. Use of two or more pads could result in picking errors, and extend the amount of time required to reach the set vacuum level.
7. Periodically replace the filter installed as standard equipment (Order code: GME-E/F) with the micro ejector body.
8. Do not use corrosive gases or fluids for the media.
9. Do not apply pressure to the vacuum switch that exceeds the maximum pressure.
10. Do not subject lead wires to strong tension or excessive bending force. In addition, always carry the product by the body for handling, and do not apply excessive force to the power cord.
11. A mounting base (GME-21) is available for mounting the micro ejector as a single unit. Use the base and a spacer to assemble the micro ejector into place, and tighten hexagon socket head cap screws (tightening torque 59N·cm) [5.2in·lb].

**Mounting**

**Wiring**

After completing all wiring, be sure to check for no error in the wiring connections.
Air Consumption, Vacuum and Vacuum Flow Rate

**Calculation of the Micro Ejector Response Time**

Use the following equation and table of constants to calculate the picking time, and allow for sufficient margin in making the selection.

\[ T = \left( \frac{L}{C} \right)^a \]

- \( L \): Vacuum piping internal capacity \( (\ell) \)
- \( C \): Constant of vacuum
- \( a \): Index of nozzle diameter
- \( T \): Time to reach vacuum \( (s) \)

<table>
<thead>
<tr>
<th>Basic models</th>
<th>(-40kPa) ([-11.8in.Hg])</th>
<th>(-53.3kPa) ([-15.7in.Hg])</th>
<th>(-66.7kPa) ([-19.7in.Hg])</th>
<th>(-80kPa) ([-23.6in.Hg])</th>
<th>(-86.7kPa) ([-25.6in.Hg])</th>
<th>( a )</th>
</tr>
</thead>
<tbody>
<tr>
<td>GME05</td>
<td>0.23</td>
<td>0.12</td>
<td>0.065</td>
<td>0.035</td>
<td>0.025</td>
<td>0.98</td>
</tr>
<tr>
<td>GME07</td>
<td>0.42</td>
<td>0.25</td>
<td>0.14</td>
<td>0.08</td>
<td>0.055</td>
<td>0.98</td>
</tr>
<tr>
<td>GME10</td>
<td>0.77</td>
<td>0.46</td>
<td>0.29</td>
<td>0.16</td>
<td>0.1</td>
<td>0.94</td>
</tr>
</tbody>
</table>

**Example**

- Calculate the piping capacity.
  - Calculate the piping capacity from the vacuum generation port to the vacuum pad.

In **GME05**, when the vacuum piping is \( \phi 4 \times \phi 2.5 \) (O.D. \( \times \) I.D.), with length 50cm, and vacuum \(-80kPa\)

\[
L = 0.0025\left( \ell \right) \left( \frac{\pi \times (2.5/25.4)^2}{4} \times 50 \div 1000 \right)
\]

\[
C = 0.035
\]

\[
a = 0.98
\]

\[
T = \frac{0.0025\left( \ell \right)}{0.035} = 0.08\ (s)
\]
### Specifications

<table>
<thead>
<tr>
<th>Item</th>
<th>Type</th>
<th>Media</th>
<th>ME03-E1</th>
<th>ME05-E1</th>
<th>AME05-E2</th>
<th>ME07-E1</th>
<th>AME07-E2</th>
</tr>
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<tbody>
<tr>
<td>Item</td>
<td>Basic model</td>
<td>ME03</td>
<td>ME05</td>
<td>AME05</td>
<td>ME07</td>
<td>AME07</td>
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#### Solenoid Specifications

<table>
<thead>
<tr>
<th>Item</th>
<th>Rated voltage</th>
<th>Micro ejector basic model</th>
<th>ME03-E1</th>
<th>ME05-E1</th>
<th>AME05-E2</th>
<th>ME07-E1</th>
<th>AME07-E2</th>
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<tbody>
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<td>ME05</td>
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<th>ME03-E1</th>
<th>ME05-E1</th>
<th>AME05-E2</th>
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<th>AME07-E2</th>
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<th>ME07-E1</th>
<th>AME07-E2</th>
</tr>
</thead>
</table>

### Electronic Vacuum Switch Specifications

<table>
<thead>
<tr>
<th>Item</th>
<th>Mode</th>
<th>PSD31GE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Media</td>
<td>Air or non-corrosive gas</td>
<td></td>
</tr>
<tr>
<td>Operating temperature range °C [°F]</td>
<td>−10 to 60 [14 to 140] (No freezing)</td>
<td></td>
</tr>
<tr>
<td>Operating humidity range %RH</td>
<td>35 to 95</td>
<td></td>
</tr>
<tr>
<td>Operating pressure range kPa [in.Hg]</td>
<td>−101.3 to −29.92</td>
<td></td>
</tr>
<tr>
<td>Pressure setting range kPa [psi.]</td>
<td>−101.3 to 10.1 [−14.7 to 1.5]</td>
<td></td>
</tr>
<tr>
<td>Repeatability</td>
<td>Within ±3%FS (0 to 32°C) [32°F to 90°F]</td>
<td></td>
</tr>
</tbody>
</table>

#### Mechanical characteristics

<table>
<thead>
<tr>
<th>Item</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vibration resistance</td>
<td>10 to 55Hz (total amplitude 1.5mm [0.06in.]) or less</td>
</tr>
<tr>
<td>Mechanical lock resistance</td>
<td>98.1m/s² [2G] (2 hours at each X-, Y-, Z-axis MAX.)</td>
</tr>
</tbody>
</table>

#### Lead wire

<table>
<thead>
<tr>
<th>Item</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lead wire material</td>
<td>PVC, 0.145sq</td>
</tr>
</tbody>
</table>

#### Mounting direction

<table>
<thead>
<tr>
<th>Item</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mounting direction</td>
<td>Any</td>
</tr>
</tbody>
</table>

#### Materials (Body cover)

<table>
<thead>
<tr>
<th>Item</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plastic</td>
<td></td>
</tr>
</tbody>
</table>

Note: Values are at a set pressure of −86.7kPa [−25.6in.Hg].

---

### Port Size

<table>
<thead>
<tr>
<th>Item</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Basic model</td>
<td>M5x0.8</td>
</tr>
<tr>
<td>Port size</td>
<td>M5x0.8</td>
</tr>
</tbody>
</table>

---

### Notes:

1. Value (approximate) at pressure of 0.5MPa [73psi]. For details, see page 702.
2. For details, see the port size table.

---

*Note: ME003-E1 can be manufactured at DC5V and DC6V. For delivery times, consult us.*
## Micro Ejector Order Codes

### Micro ejector single unit (without solenoid valve)

**ME**

**Body model** nozzle diameter: Maximum flow rate on vacuum side

- **03**: 0.3 : 3.0 l/min. \( [\text{0.012in.}, 0.1068/l/min.] \) (ANR)
- **05**: 0.5 : 6.3 l/min. \( [\text{0.020in.}, 0.2228/l/min.] \) (ANR)
- **07**: 0.7 : 12.5 l/min. \( [\text{0.028in.}, 0.441/l/min.] \) (ANR)

### Micro ejector with solenoid valve

**Voltage**

- **DC12V** (only for ME03-E1)
- **DC24V**
- **AC100V** (only for ME05 and 07)
- **AC200V** (only for ME05 and 07)

**Solenoid**

- **Blank**
- **Grommet**
- **PSL**
- **PLL**

**Manual override**

- **Blank**
- **Non-locking type**
- **B3**

**Solenoid valve function**

- **Blank**
- **Normally closed (NC)**
- **11**

**Solenoid valve specifications**

- **E1**
- **E2**

**Body model** nozzle diameter: Maximum flow rate on vacuum side

- **03**: 0.3 : 3.0 l/min. \( [\text{0.012in.}, 0.1068/l/min.] \) (ANR)
- **05**: 0.5 : 6.3 l/min. \( [\text{0.020in.}, 0.2228/l/min.] \) (ANR)
- **07**: 0.7 : 12.5 l/min. \( [\text{0.028in.}, 0.441/l/min.] \) (ANR)

## Manifold Order Codes

### Manifold basic model

- **ME03M**
- **ME05M**
- **ME07M**

### Mounting micro ejector model

- **AME03-E1**
- **AME05-E**
- **AME07-E**

### Station

(Station positions are listed from the left with the vacuum generation port in front.)

- **stn.1**
- **stn.2**
- **stn.5**

### Micro ejector

**ME**

- **For single unit**
- **AME**

- **For manifold mounting**

## Electronic Vacuum Switch Order Codes

- **DC24V**

### Lead wire length

- **Blank**
- **L**

### Switch for DC12~24V

- **Blank**

## Additional Parts (to be ordered separately)

### Block-off plate

**ME MA-BP**

**Replacement filter**

**ME MA-F**

**Notes:**

1. For mountings of micro ejector options, see the micro ejector order codes.
2. Lead wires in the 2000mm [79 in.] length are available as made to order for the electronic vacuum switch.

---

**Notes:**

1. Only for solenoid valve for controlling supply air. The solenoid valve for controlling vacuum breaking air is normally closed (NC) only.
2. Lead wires in the 1L: 1000mm [39 in.] and 3L: 3000mm [118 in.] lengths are available as made to order for the plug connector type.
Operation Principle and Major Parts

● De-energized

![Diagram of de-energized solenoid valve](image)

- Adjusting needle for vacuum breaking flow
- Lock nut
- Manual override

- Solenoid valve for controlling vacuum breaking air
- Adapter
- Nozzle, diffuser
- O-ring
- Gasket
- Plunger
- Column

- V (Vacuum generation port)
- P (Compressed air supply port)

● When energizing a solenoid valve for controlling supply air (generating vacuum)

![Diagram of energized solenoid valve](image)

- Mulller
- Check valve
- Filter
- Manifold

- V (Vacuum generation port)
- P (Compressed air supply port)

● When energizing solenoid valve for controlling vacuum breaking air

![Diagram of energized solenoid valve](image)

- Adjusting needle for vacuum breaking flow
- Lock nut
- Manual override

- Solenoid valve for controlling vacuum breaking air
- Adapter
- Nozzle, diffuser
- O-ring
- Gasket
- Plunger
- Column

- V (Vacuum generation port)
- P (Compressed air supply port)

Major Parts and Materials

<table>
<thead>
<tr>
<th>Parts</th>
<th>Materials</th>
</tr>
</thead>
<tbody>
<tr>
<td>Body</td>
<td>Aluminum alloy (anodized)</td>
</tr>
<tr>
<td>Adapter</td>
<td>Brass</td>
</tr>
<tr>
<td>Nozzle, diffuser</td>
<td>Synthetic rubber (NBR)</td>
</tr>
<tr>
<td>O-ring</td>
<td>Magnetic stainless steel</td>
</tr>
<tr>
<td>Gasket</td>
<td></td>
</tr>
<tr>
<td>Plunger</td>
<td></td>
</tr>
<tr>
<td>Column</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Micro ejector</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Body</td>
<td>Aluminum alloy (anodized)</td>
</tr>
<tr>
<td>Seal</td>
<td>Synthetic rubber (NBR)</td>
</tr>
<tr>
<td>Filter</td>
<td>Plastic (PVF)</td>
</tr>
<tr>
<td>Block-off plate</td>
<td>Mild steel (nickel plated)</td>
</tr>
</tbody>
</table>
Symbols

Single unit
● ME03 ● ME05 ● ME07

With single solenoid valve
● ME03-E1 ● ME05-E1 ● ME07-E1

With single solenoid valve
● AME03-E1 ● AME05-E1 ● AME07-E1
(Manifold mounted)

With single solenoid valve and vacuum switch
● AME05-E1-˘-E ● AME07-E1-˘-E
(AS type manifold mounted)

With twin solenoid valves
● AME05-E2 ● AME07-E2
(Manifold mounted)

With twin solenoid valves and vacuum switch
● AME05-E2-˘-E ● AME07-E2-˘-E
(AS type manifold mounted)

Mass

Micro ejectors

<table>
<thead>
<tr>
<th>Item</th>
<th>Basic model</th>
<th>ME03 (g)</th>
<th>ME05 (g)</th>
<th>ME07 (g)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Without solenoid valve</td>
<td></td>
<td>9 [0.32]</td>
<td>34 [1.20]</td>
<td>52 [1.83]</td>
</tr>
<tr>
<td>With single solenoid valve ME7-E1</td>
<td></td>
<td>24 [0.85]</td>
<td>80 [2.82]</td>
<td>103 [3.63]</td>
</tr>
</tbody>
</table>

With electronic vacuum switch

<table>
<thead>
<tr>
<th>Item</th>
<th>g [oz.]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Micro ejectors</td>
<td></td>
</tr>
<tr>
<td>With electronic vacuum switch</td>
<td></td>
</tr>
<tr>
<td>PS310E (For mounting AS type manifold)</td>
<td>21g [0.74oz.]</td>
</tr>
<tr>
<td>PS310E-01 (For mounting single unit)</td>
<td>38g [1.34oz.]</td>
</tr>
</tbody>
</table>

Manifolds

<table>
<thead>
<tr>
<th>Item</th>
<th>Model</th>
<th>ME03</th>
<th>ME05</th>
<th>ME05M</th>
<th>ME07</th>
<th>ME07M</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manifold body for number of units</td>
<td></td>
<td>ME03M</td>
<td>ME05M</td>
<td>ME05M</td>
<td>ME07M</td>
<td>ME07M</td>
</tr>
<tr>
<td>Additional mass</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>With single solenoid valve AME7-E1</td>
<td></td>
<td>25 [0.88]</td>
<td>83 [2.93]</td>
<td>108 [3.81]</td>
<td></td>
<td></td>
</tr>
<tr>
<td>With twin solenoid valve AME7-E2</td>
<td></td>
<td>167 [5.89]</td>
<td></td>
<td>216 [7.62]</td>
<td></td>
<td></td>
</tr>
<tr>
<td>With electronic vacuum switch-E</td>
<td></td>
<td></td>
<td>21 [0.74]</td>
<td></td>
<td>21 [0.74]</td>
<td></td>
</tr>
<tr>
<td>Block-off plate -BP</td>
<td></td>
<td>2 [0.07]</td>
<td>6 [0.21]</td>
<td></td>
<td>13 [0.46]</td>
<td></td>
</tr>
</tbody>
</table>

Calculation example: ME05M5AS

\[ \text{mass of BP} + 299 + (83 \times 2) + (167 + 21) \times 2 + 6 = 847 \text{g [29.88oz.]} \]
**Dimensions of ME03 (mm)**

**ME03**

**Single unit**

**ME03-E1**

**With solenoid valve**

**ME03M**: A type manifold

Options

- Solenoid with straight connector: -PSL
- Solenoid with L connector: -PLL
- Lead wire length: -PSL, -PLL: 300

**Unit dimensions**

<table>
<thead>
<tr>
<th>Model</th>
<th>L</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>ME03M2A</td>
<td>34.2</td>
<td>27.2</td>
</tr>
<tr>
<td>3A</td>
<td>44.4</td>
<td>37.4</td>
</tr>
<tr>
<td>4A</td>
<td>54.6</td>
<td>47.6</td>
</tr>
<tr>
<td>5A</td>
<td>64.8</td>
<td>57.8</td>
</tr>
</tbody>
</table>

**Dimensions**

- Exhaust port
- Compressed air supply port
- Vacuum generation port
- Mounting hole
- Manual override
- LED indicator

**AME03-E1**

**Block-off plate**

**Filter**

**AME03-E1**

**Exhaust port**

**Vacuum generation port**

**Compressed air supply port**

**Mounting hole**

**Manual override**

**LED indicator**

**(Micro ejector overall length)**

- 27.5 (To the bottom surface of manifold)

- 32 (To the bottom surface of manifold)

**Option**

- Solenoid with straight connector: -PSL
- Solenoid with L connector: -PLL
Dimensions of ME05 (mm)

**ME05**
Single unit

**ME05-E1**
With solenoid valve

---

**ME05M□A**
A type manifold

- In the case of 1 unit

---

**Unit dimensions**

<table>
<thead>
<tr>
<th>Model</th>
<th>L</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>ME05M2A</td>
<td>50</td>
<td>40</td>
</tr>
<tr>
<td>3A</td>
<td>66</td>
<td>56</td>
</tr>
<tr>
<td>4A</td>
<td>82</td>
<td>72</td>
</tr>
<tr>
<td>5A</td>
<td>98</td>
<td>88</td>
</tr>
</tbody>
</table>
Dimensions of ME05 (mm)

**ME05M□AS**

AS type manifold

- Manual override
  - Non-locking type : standard
  - Locking protruding type : -83

- Compressed air supply port
  - 1 unit : Rc1/8
  - (1 place on the right side)
  - 2~5 units : 2-Rc1/8
  - (both sides, with 1 plug)

- Exhaust port
  - M5 \( \times 0.8 \)

- Vacuum generation port
  - Block-off plate \(-BP\)

- Filter

- Adjusting needle for vacuum breaking flow

- Compressed air supply port
  - 1 unit: Rc1/8
  - (1 place on the right side)
  - 2~5 units: 2-Rc1/8
  - (both sides, with 1 plug)

**Unit dimensions**

<table>
<thead>
<tr>
<th>Model</th>
<th>L</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>ME05M2AS</td>
<td>50</td>
<td>40</td>
</tr>
<tr>
<td>3AS</td>
<td>66</td>
<td>56</td>
</tr>
<tr>
<td>4AS</td>
<td>82</td>
<td>72</td>
</tr>
<tr>
<td>5AS</td>
<td>98</td>
<td>88</td>
</tr>
</tbody>
</table>

**Options**

- Solenoid with straight connector : -PSL
- Solenoid with L connector : -PLL
- Locking protruding type manual override : -83

<table>
<thead>
<tr>
<th>Model</th>
<th>Code</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>( \ell ) (Lead wire length)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ME05-E1, AME05-E1</td>
<td>84</td>
<td>59</td>
<td>76</td>
<td>70</td>
<td>|</td>
<td>-PSL, -PLL : 300</td>
</tr>
<tr>
<td>AME05-E2</td>
<td>131.5</td>
<td>72</td>
<td>115.5</td>
<td>83</td>
<td>Made to order: 1L: 1000, 3L: 3000</td>
<td></td>
</tr>
</tbody>
</table>
Dimensions of ME07 (mm)

**ME07**
Single unit

**ME07-E1**
With solenoid valve

---

**AME07-E1**
Exhaust port
Rc1/8
Vacuum generation port

**AME07-E2**
Block-off plate (-BP)
Filter

---

**ME07M[□]A**
A type manifold

- In the case of 1 unit

---

**Unit dimensions**

<table>
<thead>
<tr>
<th>Model</th>
<th>L</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>ME07M2A</td>
<td>59</td>
<td>49</td>
</tr>
<tr>
<td>3A</td>
<td>78</td>
<td>68</td>
</tr>
<tr>
<td>4A</td>
<td>97</td>
<td>87</td>
</tr>
<tr>
<td>5A</td>
<td>116</td>
<td>106</td>
</tr>
</tbody>
</table>
**Dimensions of ME07 (mm)**

**ME07M-AS**

AS type manifold

- In the case of 1 unit

---

**Unit dimensions**

<table>
<thead>
<tr>
<th>Model</th>
<th>L</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>ME07M2AS</td>
<td>59</td>
<td>49</td>
</tr>
<tr>
<td>3AS</td>
<td>78</td>
<td>68</td>
</tr>
<tr>
<td>4AS</td>
<td>97</td>
<td>87</td>
</tr>
<tr>
<td>5AS</td>
<td>116</td>
<td>106</td>
</tr>
</tbody>
</table>

**Options**

- Solenoid with straight connector: **-PSL**
- Solenoid with L connector: **-PLL**
- Locking protruding type manual override: **-83**

---

**Model Code**

<table>
<thead>
<tr>
<th>Model</th>
<th>Code</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>ℓ (Lead wire length)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ME07-E1, AME07-E1</td>
<td></td>
<td>95.2</td>
<td>68.5</td>
<td>87.2</td>
<td>79.5</td>
<td>-PSL, -PLL : 300</td>
</tr>
<tr>
<td>AME07-E2</td>
<td></td>
<td>138.2</td>
<td>85.5</td>
<td>122.2</td>
<td>96.5</td>
<td>Made to order: 1L : 1000, 3L : 3000</td>
</tr>
</tbody>
</table>
**Dimensions of Electronic Vacuum Switch (mm)**

**PS310E-01**

**Air Consumption, Vacuum and Vacuum Flow Rate**

- **ME03**
- **ME05**
- **ME07**

![Graphs showing air consumption, vacuum, and vacuum flow rate for ME03, ME05, and ME07](image)

**Note:** Graphs are for each single ejector unit. If the unit with solenoid valve requires the same vacuum level, set the supply pressure 0.03~0.05MPa (4.4~7.3psi.) higher than the single ejector unit’s case.

- **Time to Reach Vacuum and Vacuum Breaking Time**

**Measurement method**

- **ME01**

![Diagram showing measurement method](image)

- **ME02**

**Response time**

<table>
<thead>
<tr>
<th>Chamber capacity cm³ [in³]</th>
<th>5 [0.305]</th>
<th>10 [0.610]</th>
<th>20 [1.22]</th>
<th>50 [3.05]</th>
<th>100 [6.10]</th>
<th>200 [12.2]</th>
<th>500 [30.5]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time [s]</td>
<td>t₁</td>
<td>t₂</td>
<td>t₃</td>
<td>t₁</td>
<td>t₂</td>
<td>t₃</td>
<td>t₁</td>
</tr>
<tr>
<td>ME03</td>
<td>0.4</td>
<td>0.1</td>
<td>---</td>
<td>0.7</td>
<td>0.2</td>
<td>---</td>
<td>1.1</td>
</tr>
<tr>
<td>ME05</td>
<td>0.2</td>
<td>0.1</td>
<td>0.1</td>
<td>0.3</td>
<td>0.1</td>
<td>0.1</td>
<td>0.5</td>
</tr>
<tr>
<td>ME07</td>
<td>0.1</td>
<td>0.1</td>
<td>0.1</td>
<td>0.2</td>
<td>0.1</td>
<td>0.1</td>
<td>0.3</td>
</tr>
</tbody>
</table>

**Note:** Some degree of variation may occur due to piping size and chamber shape. The figures can be viewed as a guide.
Handling Instructions and Precautions

The illustration shows ME05M2AS stn.1-AME05-E2-
sten.2-AME05-E1-□-E.

Micro Ejector

Device configuration

Micro ejector body with twin solenoid valves

- Gasket
- Check valve
- Adapter
- Muffler
- Adapter cover
- End cover
- Manifold body
- Filter
- O-ring
- Filter cap

Micro ejector body with single solenoid valve

- Gasket
- Lock pin
- O-ring
- Plug

Vacuum switch

Spring pin

Piping

1. Connect air supply to the compressed air supply port, and a vacuum pad, etc., to the vacuum generation port.
2. In manifolds with two or more units, P ports (compressed air supply ports) are located on both ends of the manifold, and the piping direction can be selected according to the mounting location. At time of delivery, a port on one side is temporarily blocked off with a plug. Remove the plug and then use sealing tape or other sealing material to re-tighten.
3. Use a block-off plate (order code: ME-MA-BP) to block off unused stations on the manifold.

For piping to the micro ejector, use a nylon or urethane tube with inner diameter of \( \frac{3}{16} \) in. For vacuum generation ports, tubes of the following sizes are recommended.

- ME03: \( \frac{3}{16} \times \frac{3}{16} \)
- ME05: \( \frac{3}{16} \times \frac{3}{16}, \frac{3}{8} \times \frac{3}{8} \)
- ME07: \( \frac{3}{8} \times \frac{3}{8} \)

Cautions:

1. Use a fitting that does not reduce inner diameter. A small inner diameter can result in degradation of performance, including pressure shortages, insufficient vacuum, or longer periods of time before the vacuum level is reached.
2. Avoid use of coil tubes and other curved piping. Also, avoid use of elbow fittings, etc., between the micro ejector and vacuum pad, and use piping that is as straight as possible.
3. In manifolds with many units, where a large number of micro ejectors are operating simultaneously, or where the operation frequency is very high, supply air from P ports on both ends.

Start

Stop

Relay

Relay contact

Solenoid valve for controlling supply air

Relay contact

Black

Brown

PS310E

Blue

Remark: The above diagram shows the case when the solenoid valve for controlling supply air is normally open (NO; order code: -11).

Functions

In addition to a single unit, the Micro Ejector ME03/05/07 series offer models with single solenoid valves for controlling supply air, and with twin solenoid valves for controlling supply air and vacuum breaking air (twin solenoid valves are for AME05/07 only). The unit with twin solenoid valves uses supply of pressurized air to the vacuum side to enable vacuum breaking and blow-off release, and makes use of an adjusting needle for vacuum breaking flow to enable flexible setting of breaking flow. In addition, a built-in check valve ensures that the setting of vacuum level can be maintained even when the power to the solenoid valve for controlling supply air has been switched off, attaining energy savings.
The figure shows ME05-E1.

Contact

Solenoid

Internal circuit

- DC12V, DC24 (surge suppression)
  - Standard solenoid

  Short circuit protection diode
  - Lead wire: DC12V: Brown, DC24V: Red

  Flywheel diode
  - Lead wire: Black

Solenoid with LED indicator

Order code: -PSL, -PLL

- LED indicator: Light emitting diode

  - Lead wire: DC12V: Brown, DC24V: Red

  - LED indicator: Red

- AC100V, AC200V (surge suppression)
  - Standard solenoid

  - Lead wire: AC100V: Yellow, AC200V: White

Solenoid with LED indicator

Order code: -PSL, -PLL

- LED indicator: Light emitting diode

  - Lead wire: AC100V: Yellow, AC200V: White

  - LED indicator: AC100V: Yellow, AC200V: Green

Cautions:
1. Do not apply megger between the lead wires.
2. For DC12V, DC24V, while there is no danger with a solenoid of a short circuit by the wrong polarity, the valve will not operate.
3. Leakage current inside the circuit could result in failure of the solenoid valve not to return to home position or other erratic operation. Always use within the range of the allowable leakage current. If circuit conditions, etc., cause the leakage current to exceed the maximum allowable leakage current, consult us.

Plug connector

Attaching and removing plug connector

Use fingers to insert the connector into the pin, push it in until the lever claw latches onto the protruded section on the connector housing, and complete the connection.

To remove the connector, squeeze the lever along with the connector, lift the lever claw up from the protruded section of the connector housing, and pull it out.

To crimp, strip off 4mm [0.16in.] of the insulation from the end of the lead wire, insert it into the contact, and crimp it. Be sure to avoid catching the insulation on the exposed wire crimping section.

Vacuum breaking

Adjustment of vacuum breaking flow rate

Rotate the adjusting needle for vacuum breaking flow (with twin solenoid valves only) in the clockwise direction to reduce the breaking flow rate, and in the counterclockwise direction to increase the breaking flow rate.

Cautions:
1. Do not pull hard on the lead wire. It could result in defective contacts, breaking wires, etc.
2. If the pin is bent, use a small screwdriver, etc., to gently straighten out the pin, and then complete the connection to the plug connector.
3. For crimping of connecting the lead wire and contact, always use a dedicated crimping tool.

Contact:
- Model 702062-2M
- Manufactured by Sumiko Tech, Inc.

Crimping tool:
- Model F1-702062
- Manufactured by Sumiko Tech, Inc.

To operate non-locking type, use a tool with a thin tip (such as a small screwdriver) to press the manual override all the way down. The micro ejector works the same as an energized state as long as the manual override is pushed down, and returns to the reset position upon release.

To lock the locking protruding type manual override, use fingertips or a small screwdriver to push down on the manual override all the way and turn it 45 degrees or more. Either turning direction at this time is acceptable. When locked, turning the manual override from the locking position releases a spring on the manual override, returns it to its original position, and release the lock. If manual override is not turned, this type acts just like the non-locking type. The micro ejector works the same as an energized state as long as the manual override is pushed down, and returns to the reset position upon release.

Cautions:
1. Do not apply megger between the lead wires.
2. For DC12V, DC24V, while there is no danger with a solenoid of a short circuit by the wrong polarity, the valve will not operate.
3. Leakage current inside the circuit could result in failure of the solenoid valve not to return to home position or other erratic operation.

Always release the lock on the locking protruding type manual override before commencing normal operation.
Handling Instructions and Precautions

Electronic Vacuum Switch

**Pressure regulation**

Rotate the pressure adjusting screw (SET) to set the pressure. Rotating the pressure adjusting screw to the right (clockwise) increases the vacuum setting. In addition, use the hysteresis adjusting screw (HYS) to set the hysteresis. Rotating the hysteresis adjusting screw to the right (clockwise) increases the hysteresis by shifting the OFF position.

**Wiring instructions**

1. As subjecting the vacuum switch to strong shocks could lead to damage or erratic operation, be careful when handling it.
2. Do not apply a wrench to the body cover when mounting as a single unit (PS310E-01). When tightening, always apply the wrench to the metal part of the adapter.

**Cautions**: 1. Do not subject the lead wires to strong pulling force or excessive bending.
2. Pay attention to the lead wire colors to connect. While the lead wires between brown and blue, for connecting to the power supply, are protected by diodes for protection of reverse current, the output circuits do not have a surge current protection function. Miswiring could cause damage to the output transistor.
3. Do not connect and use the vacuum switch with a load that exceeds its switching capacity.

**Mounting**

1. If using in locations subject to dripping water, dripping oil, etc., or to large amounts of dust, use a cover to protect the unit.
2. Always thoroughly blow off (use compressed air) the piping before connecting it to the micro ejector.
3. Use clean air that does not contain deteriorated compressor oil or other contaminants. Install an air filter (with filtration of a minimum 40 μm) close to the micro ejector to eliminate any collected liquids or dust in air line. Always use a mist filter for cases where the pressurized air contains large amounts of oils. Moreover, drain the air filter at regular intervals.
4. Use a regulator to adjust the pressure of air supplied to the micro ejector. Where the piping length to the micro ejector is long, set the pressure at a little higher than normal. If using an air supply valve, use a valve with an effective area that is at least three times as large as the area of the micro ejector nozzle.
5. Use one vacuum pad for one micro ejector. Use of two or more pads could result in picking errors, and extend the amount of time required to reach the set vacuum level.
6. At periodic intervals, replace the filters (order code: ME-MA-F) installed as standard equipment with the micro ejector body.

**General precautions**

1. To set the pressure and hysteresis, use the special screwdriver provided or a small screwdriver of appropriate size, and adjust by rotating them carefully without applying excessive force.
2. To ensure accurate pressure setting, use a pressure gauge to perform the setting while switching the vacuum switch on and off.
3. Do not apply pressure to the pressure detection area of more than 0.2MPa (29psi).

---

Reverse current protection diode

Brown (leton)

Load

Blue (leton)

Direct-current

Display LED

Zener diode

Black

Sensor

Main circuit

Cautions: 1. Do not apply a wrench to the body cover when mounting as a single unit (PS310E-01). When tightening, always apply the wrench to the metal part of the adapter.
### Specifications

#### Micro ejectors

<table>
<thead>
<tr>
<th>Item</th>
<th>ME12</th>
<th>ME25</th>
<th>ME60</th>
</tr>
</thead>
<tbody>
<tr>
<td>Media</td>
<td>Air</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Operating pressure</td>
<td>0.1 ~ 0.6 [15 ~ 87]</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Operating temperature</td>
<td>0 ~ 50 [32 ~ 122] (No freezing)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nozzle diameter</td>
<td>0.7 [0.028]</td>
<td>1.0 [0.039]</td>
<td>1.5 [0.059]</td>
</tr>
<tr>
<td>Vacuum (kPa)</td>
<td>92 [-27.2]</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vacuum flow rate (ANR)</td>
<td>12.5 [0.441]</td>
<td>25 [0.88]</td>
<td>58 [2.05]</td>
</tr>
<tr>
<td>Compressed air</td>
<td>23 [0.81]</td>
<td>46 [1.62]</td>
<td>107 [3.78]</td>
</tr>
<tr>
<td>Lubrication</td>
<td>Prohibited</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Port size</td>
<td>Rc1/8</td>
<td>Rc1/4</td>
<td></td>
</tr>
</tbody>
</table>

Note: Value is measured at air pressure of 0.5MPa [73psi].

#### Single and twin solenoid valves

<table>
<thead>
<tr>
<th>Item</th>
<th>For ME12</th>
<th>For ME25, ME60</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operation type</td>
<td>Direct operating</td>
<td>Direct operating</td>
</tr>
<tr>
<td>Number of ports</td>
<td>2 ports (NC, NO)</td>
<td>2 ports (NC)</td>
</tr>
<tr>
<td>Port size</td>
<td>Rc1/8</td>
<td>Rc1/4</td>
</tr>
<tr>
<td>Proof pressure</td>
<td>1.03 [149]</td>
<td>1.03 [149]</td>
</tr>
<tr>
<td>Effective area</td>
<td>1.5 [0.08]</td>
<td>3 [0.16]</td>
</tr>
<tr>
<td>Maximum operating frequency</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Mounting direction</td>
<td>Any</td>
<td>Any</td>
</tr>
<tr>
<td>Voltage type</td>
<td>AC100V (Lead wire: yellow) DC24V (Lead wire: red, black)</td>
<td>AC100V (Lead wire: yellow, black) DC24V (Lead wire: red, black)</td>
</tr>
<tr>
<td>Operating voltage range</td>
<td>AC100V 90 ~ 110V (100V ± 10%)</td>
<td>AC100V 90 ~ 110V (100V ± 10%)</td>
</tr>
<tr>
<td></td>
<td>AC200V 180 ~ 220V (200V ± 10%)</td>
<td>AC200V 180 ~ 220V (200V ± 10%)</td>
</tr>
<tr>
<td></td>
<td>DC24V 21.6 ~ 26.4V (24V ± 10%)</td>
<td>DC24V 21.6 ~ 26.4V (24V ± 10%)</td>
</tr>
<tr>
<td>Current mA</td>
<td>50Hz</td>
<td>60Hz</td>
</tr>
<tr>
<td></td>
<td>AC100V 40</td>
<td>32</td>
</tr>
<tr>
<td></td>
<td>AC200V 23</td>
<td>17</td>
</tr>
<tr>
<td>Insulation resistance</td>
<td>MΩ</td>
<td>100 or more</td>
</tr>
<tr>
<td>Wiring</td>
<td>Grammet type (Lead wire length 300mm)</td>
<td>Grammet type (Lead wire length 300mm)</td>
</tr>
<tr>
<td>Manual override</td>
<td>Locking and non-locking type</td>
<td>Locking type</td>
</tr>
<tr>
<td>Surge suppression</td>
<td>Flywheel diode (only DC)</td>
<td></td>
</tr>
</tbody>
</table>

Note: While there are two solenoids in the twin solenoid valves, for vacuum generation use and vacuum breaking use, the configuration prevents power from being sent to both of them at the same time.

#### Vacuum switches

<table>
<thead>
<tr>
<th>Item</th>
<th>Operation</th>
<th>When NO</th>
<th>When NC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Setting vacuum (kPa)</td>
<td>-26.7 ~ -80 [-7.89 ~ -23.6]</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Response differential (kPa)</td>
<td>-5.3 ~ -13.3 [-1.57 ~ -3.94]</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Color of connected lead wire</td>
<td>Black, white</td>
<td>Black, red</td>
<td></td>
</tr>
<tr>
<td>Electric rating</td>
<td>5A/AC250V, 5A/DC24V (resistance load)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Remark: For the internal switch, JIS-S2H1PO1 or equivalent is used.

#### Mass

<table>
<thead>
<tr>
<th>Model</th>
<th>Body mass</th>
<th>Additional mass</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>With filter</td>
<td>With vacuum switch</td>
</tr>
<tr>
<td>ME12</td>
<td>40 [1.41]</td>
<td>25 [0.88]</td>
</tr>
</tbody>
</table>

Calculation example: Mass of ME25 with a vacuum switch and twin solenoid valves is 335 + 160 + 230 = 725g [25.57oz.]

---

**MICRO EJECTORS**

**ME12, ME25, ME60**
**Order Codes**

### ME

- **Filter** (only for ME12)
  - Blank: No filter
  - F: With filter

- **Vacuum switch** (only for ME25, 60)
  - Blank: No vacuum switch
  - M: With vacuum switch

- **Standard equipment for ME25, 60.**

### Optional products

- **Model**
  - MEF12: Dedicated filter for ME12 (With two mounting screws, one O-ring)
  - MEM25: Vacuum switch for ME25, 60
  - ME12E1: Dedicated single solenoid valve for ME12 (NC)
  - ME12E1-11: Dedicated single solenoid valve for ME12 (NO)
  - 125EE1: Single solenoid valve for ME25, 60
  - 125EE2: Twin solenoid valves for ME25, 60

- **Voltage** (only for solenoid valve)
  - AC100V
  - AC200V
  - DC24V

### Operation Principle and Major Parts

#### Not in operation

- Muffler
- Filter
- Check valve
- Diffuser
- Nozzle
- Compressed air supply port
- Adjusting valve for vacuum breaking flow
- Vacuum generation valve
- Vacuum generation port
- Vacuum breaking valve
- Control nut
- Micro switch
- Black (COM)
- Red (NC)
- White (NO)

#### When vacuum generation valve is ON

- Compressed air is supplied from the nozzle into the diffuser, and a vacuum is generated when air is sucked into the diffuser from the gap between the nozzle and the diffuser. The vacuum level rises until it exceeds the set vacuum level, causing the vacuum switch to activate.

#### When vacuum breaking valve is operating
Air Consumption, Vacuum and Vacuum Flow Rate

Symbols

Single unit
●ME12

With filter
●ME12F  ●ME25  ●ME60

With vacuum switch and filter
●ME25-M  ●ME60-M

With single solenoid valve
●ME12-S

With single solenoid valve and filter
●ME12F-S  ●ME25-S  ●ME60-S

With vacuum switch, single solenoid valve, and filter
●ME25-M-S  ●ME60-M-S

With twin solenoid valves and filter
●ME25-T  ●ME60-T

With vacuum switch, twin solenoid valves, and filter
●ME25-M-T  ●ME60-M-T

1MPa = 145psi  1kPa = 0.145psi  100kPa = 29.54in.Hg  1 l/min = 0.0353ft³/min.

MICRO EJECTORS
Dimensions of ME12 (mm)

ME12

- 2 × 3.2 M10 mounting hole
- Compressed air supply port
- Vacuum generation port
- Approx. 300mm

ME12-S

- 2 × 3.2 M10 mounting hole
- Manual override
- Compressed air supply port
- Vacuum generation port
- Approx. 300mm

ME12F

- 2 × 3.2 M10 mounting hole
- Compressed air supply port
- Vacuum generation port

ME12F-S

- 2 × 3.2 M10 mounting hole
- Manual override
- Compressed air supply port
- Vacuum generation port
Dimensions of ME25, ME60 (mm)

**ME25**
- 2·ф4.2
- Mounting hole
- ø44
- Vacuum generation port

**ME60**
- 2·ф4.2
- Mounting hole
- ø44
- Vacuum generation port

**ME25-M**
- 2·ф4.2
- Mounting hole
- ø44
- Vacuum generation port

**ME60-M**
- 2·ф4.2
- Mounting hole
- ø44
- Vacuum generation port

**ME25-S**
- 2·ф4.2
- Mounting hole
- ø44
- Vacuum generation port

**ME60-S**
- 2·ф4.2
- Mounting hole
- ø44
- Vacuum generation port

**ME25-M-S**
- 2·ф4.2
- Mounting hole
- ø44
- Vacuum generation port

**ME60-M-S**
- 2·ф4.2
- Mounting hole
- ø44
- Vacuum generation port

**ME25-T**
- 2·ф4.2
- Mounting hole
- ø44
- Vacuum generation port

**ME60-T**
- 2·ф4.2
- Mounting hole
- ø44
- Vacuum generation port
Handling Instructions and Precautions

Micro ejector

Device configuration

**ME12**

- **Ejector body**
- **Solenoid valve** ME12
- **Filter body** MEF12
  - (With two mounting screws and one O-ring)

**ME25, 60**

- **Rear cover**
- **Gasket**
- **Check valve**
- **Nozzle**
- **Ejector body**
- **Muffler cap**
- **Filter cap**
- **Filter element**
- **Vacuum switch**
- **MEM25**
- **Single solenoid valve**
- **Twin solenoid valves**

Piping

1. Connect air supply to the compressed air supply port, and a vacuum pad, etc., to the vacuum generation port.
2. For piping to the micro ejector, use a nylon or urethane tube with inner diameter of $\frac{4}{6}$ in.
   - ME12: $\phi 4 \times 2.5 \sim \phi 6 \times 4$
   - ME25: $\phi 6 \times 4 \sim \phi 8 \times 6$
   - ME60: $\phi 8 \times 6 \sim \phi 10 \times 8$

Cautions:
1. Use a fitting that does not reduce inner diameter. A small inner diameter can result in degradation of performance, including flow rate and pressure shortages, insufficient vacuum, or longer periods of time before the vacuum level is reached.
2. Avoid using coil tubes and other forms of spiraled piping. Also, avoid use of elbow fittings, etc., between the micro ejector and vacuum pad, and use piping that is as straight as possible.

Vacuum switch

When vacuum reaches the set vacuum level which is adjusted by a control nut, a micro switch operates, and an electrical signal is obtained. Move the cover in the direction of the arrow, and rotate the control nut to adjust the vacuum level. Rotate the control nut in the ↓ direction to increase the set vacuum level to rise, and rotate it in the ↑ direction to reduce the vacuum level.

Solenoid valve

The micro ejector includes an optional single solenoid valve for vacuum generation, and optional twin solenoid valves for vacuum generation and vacuum breaking air (twin solenoid valves are for ME25 and 50 only). The twin solenoid valves option uses supply pressurized air to the vacuum side to enable vacuum breaking and blow-off release, and makes use of a breaking flow adjustment valve to allow flexible setting of breaking and release time. In addition, a built-in check valve ensures that the vacuum level setting can be maintained even when the power to the vacuum generation solenoid valve has been switched off, enabling energy savings.

**Energy-saving circuit for maintaining vacuum over long periods**

**Solenoid internal circuit**

**ME12**

- DC24V (surge suppression)
  - **Short circuit protection diode**
  - **Flywheel diode**
  - **Solenoid**
  - **Lead wire DC24V (↑): red, (↓): black**
  - **AV100V: Yellow, black**
  - **AC200V: White, black**

**ME25, ME60**

- For DC and AC (DC surge suppression)
  - **Short circuit protection diode**
  - **Flywheel diode**
  - **Solenoid**
  - **Lead wire DC24V (↑): red, (↓): black**
  - **AV100V: Yellow, black**
  - **AC200V: White, black**

Cautions:
1. Do not apply megger between the lead wires.
2. The DC solenoid will not short circuit even if the wrong polarity is applied, but the valve will not operate.
3. Leakage current inside the circuit could result in failure of the solenoid valve to return, or other erratic operation. Always use it within the range of the allowable leakage current. If circuit conditions, etc., cause the leakage current to exceed the maximum allowable leakage current, consult us.

**Adjustment of breaking flow rate**

Rotate the adjusting needle for vacuum breaking flow rate in the clockwise direction to reduce the vacuum breaking flow rate and lengthen vacuum breaking time, and in the counterclockwise direction to increase the vacuum breaking flow rate and shorten breaking time.
Time to Reach Vacuum and Vacuum Breaking Time

● Measurement circuits and conditions

![Diagram of measurement circuits and conditions]

● Measurement method

Air pressure: 0.5MPa [73psi.]  
$t_1$: Time to reach $73.3kPa \,[\sim 21.65in.\text{Hg}]$ in the chamber after energizing S1.  
$t_2$: Time to reach $18.7kPa \,[\sim 5.52in.\text{Hg}]$ in the chamber after energizing S2.

● Chamber capacity cm$^3$ [in.\text{3}]

<table>
<thead>
<tr>
<th>Model</th>
<th>ME12</th>
<th>ME25</th>
<th>ME60</th>
</tr>
</thead>
<tbody>
<tr>
<td>10 ,[0.610],,</td>
<td>1.5 ,</td>
<td>1.0 ,</td>
<td>0.5 ,</td>
</tr>
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<td>2.0 ,</td>
<td>1.3 ,</td>
<td>1.0 ,</td>
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<tr>
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<td>0.1 ,</td>
<td>0.1 ,</td>
</tr>
<tr>
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<td>0.2 ,</td>
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<tr>
<td>5000 ,[305],,</td>
<td>50.0 ,</td>
<td>13.0 ,</td>
<td>10.0 ,</td>
</tr>
</tbody>
</table>

Note: Some degree of variation may occur due to piping size and chamber shape. The figures can be viewed as a guide.

● Manual operation

ME12E1
To lock the manual override, use a small screwdriver to push down the manual override all the way and turn it 45 degrees or more. Either turning direction at this time is acceptable.
When locked, turning the manual override from the locking position releases a spring on the manual override, returns it to its original position, and release the lock.

125EE1, 125EE2
To lock, use a screwdriver to rotate the manual override 45 degrees and tilt the screw groove 45 degrees. Either turning direction at this time is acceptable.
To release the lock, rotate the manual override by 45 degrees, and return the screw groove to horizontal.

Caution: Always release the lock on the manual override before commencing normal operation.