Low profile air gripper with space-saving design
Low Profile Air Gripper

**MHF2 Series**

Height is approximately 1/3 the size of an equivalent MHZ2 series.

<table>
<thead>
<tr>
<th>Bore size</th>
<th>Height (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>8</td>
<td>19</td>
</tr>
<tr>
<td>12</td>
<td>25</td>
</tr>
<tr>
<td>16</td>
<td>33</td>
</tr>
<tr>
<td>20</td>
<td>41</td>
</tr>
</tbody>
</table>

The low profile design saves space and reduces bending moments.

Improved accuracy with smooth operation

**Stroke selection is available.**

3 standard stroke lengths are available for each bore size. Stroke can be selected to suit the workpiece.
With positioning pin holes

Improved mounting repeatability

Auto switches can be mounted on both sides.

Linear guide provides:

High precision and high rigidity with martensitic stainless steel

Easy positioning for mounting attachments

With positioning pin holes

Piping is available from 2 directions

Piping port position can be specified using a part number.

Centralized wiring and piping are possible.

High degree of mounting flexibility

As no brackets are required, mounting height can be minimized.

Strong gripping force

Double piston construction achieves compact design with strong gripping force.

<table>
<thead>
<tr>
<th>Model</th>
<th>Bore size</th>
<th>Gripping force (N)</th>
</tr>
</thead>
<tbody>
<tr>
<td>MHF2-8D</td>
<td>8</td>
<td>19</td>
</tr>
<tr>
<td>MHZ2-10D</td>
<td>10</td>
<td>11</td>
</tr>
<tr>
<td>MHF2-12D</td>
<td>12</td>
<td>48</td>
</tr>
<tr>
<td>MHZ2-20D</td>
<td>20</td>
<td>42</td>
</tr>
<tr>
<td>MHF2-16D</td>
<td>16</td>
<td>90</td>
</tr>
<tr>
<td>MHZ2-25D</td>
<td>25</td>
<td>65</td>
</tr>
<tr>
<td>MHF2-20D</td>
<td>20</td>
<td>141</td>
</tr>
<tr>
<td>MHZ2-32D</td>
<td>32</td>
<td>158</td>
</tr>
</tbody>
</table>
Model Selection

Selection Procedure

Step 1: Confirm gripping force
Step 2: Confirm gripping point
Step 3: Confirm external force on fingers

Confirmation of Gripping Force

Confirmation of conditions: Calculation of required gripping force: Model selection from gripping force graph

Example

Gripping method: External gripping

Workpiece mass: 0.15 kg
Length of gripping point: 30 mm
Operating pressure: 0.4 MPa

Model Selection Illustration

Gripping force at least 10 to 20 times the workpiece weight

The "10 to 20 times or more of the workpiece weight" recommended by SMC is calculated with the safety margin of \( a = 4 \), which allows for impacts that occur during normal transportation, etc.

<table>
<thead>
<tr>
<th>( \mu = 0.2 )</th>
<th>( \mu = 0.1 )</th>
</tr>
</thead>
<tbody>
<tr>
<td>( F = \frac{mg}{2 \times 0.2} \times 4 )</td>
<td>( F = \frac{mg}{2 \times 0.1} \times 4 )</td>
</tr>
<tr>
<td>( = 10 \times mg )</td>
<td>( = 20 \times mg )</td>
</tr>
</tbody>
</table>

(Note) - Even in cases where the coefficient of friction is greater than \( \mu = 0.2 \), for safety reasons, SMC recommends selecting a gripping force which is at least 10 to 20 times the workpiece weight.
- It is necessary to allow a greater safety margin for high accelerations and strong impacts, etc.
**Step 1 Effective Gripping Force: MGF2 Series**

- **Expressing the effective gripping force**
  The effective gripping force shown in the graphs below is expressed as \( F \), which is the thrust of one finger when both fingers and attachments are in full contact with the workpiece as shown in the figure below.
- **Both the external and internal gripping forces are the values shown in the figure below.**

---

**MHF2-8D**

- **Graph:**
  - \( \text{Gripping force } \text{N} \)
  - \( \text{Gripping point } \text{L mm} \)
  - \( \text{Pressure } \text{0.7MPa} \)
  - \( \text{0.6MPa} \)
  - \( \text{0.5MPa} \)
  - \( \text{0.4MPa} \)
  - \( \text{0.3MPa} \)
  - \( \text{0.2MPa} \)

---

**MHF2-12D**

- **Graph:**
  - \( \text{Gripping force } \text{N} \)
  - \( \text{Gripping point } \text{L mm} \)
  - \( \text{Pressure } \text{0.7MPa} \)
  - \( \text{0.6MPa} \)
  - \( \text{0.5MPa} \)
  - \( \text{0.4MPa} \)
  - \( \text{0.3MPa} \)
  - \( \text{0.2MPa} \)

---

**MHF2-16D**

- **Graph:**
  - \( \text{Gripping force } \text{N} \)
  - \( \text{Gripping point } \text{L mm} \)
  - \( \text{Pressure } \text{0.7MPa} \)
  - \( \text{0.6MPa} \)
  - \( \text{0.5MPa} \)
  - \( \text{0.4MPa} \)
  - \( \text{0.3MPa} \)
  - \( \text{0.2MPa} \)

---

**MHF2-20D**

- **Graph:**
  - \( \text{Gripping force } \text{N} \)
  - \( \text{Gripping point } \text{L mm} \)
  - \( \text{Pressure } \text{0.7MPa} \)
  - \( \text{0.6MPa} \)
  - \( \text{0.5MPa} \)
  - \( \text{0.4MPa} \)
  - \( \text{0.3MPa} \)
  - \( \text{0.2MPa} \)
The air gripper should be operated so that the amount of overhang "H" will stay within the range given in the graphs below.

If the workpiece gripping point goes beyond the range limits, this will have an adverse effect on the life of the air gripper.
### Allowable vertical load

**Fv (N)**

<table>
<thead>
<tr>
<th>Model</th>
<th>Allowable vertical load Fv (N)</th>
<th>Maximum allowable moment</th>
</tr>
</thead>
<tbody>
<tr>
<td>MHF2-8D</td>
<td>58</td>
<td>Pitch moment Mp (N·m)</td>
</tr>
<tr>
<td>MHF2-12D</td>
<td>98</td>
<td>Yaw moment My (N·m)</td>
</tr>
<tr>
<td>MHF2-16D</td>
<td>176</td>
<td>Roll moment Mr (N·m)</td>
</tr>
<tr>
<td>MHF2-20D</td>
<td>294</td>
<td></td>
</tr>
</tbody>
</table>

### Maximum allowable moment

<table>
<thead>
<tr>
<th>Model</th>
<th>Allowable vertical load Fv (N)</th>
<th>Allowable load F (N)</th>
</tr>
</thead>
<tbody>
<tr>
<td>MHF2-8D</td>
<td>58</td>
<td>M (Maximum allowable moment) (N·m)</td>
</tr>
<tr>
<td>MHF2-12D</td>
<td>98</td>
<td>L x 10^{-3}</td>
</tr>
<tr>
<td>MHF2-16D</td>
<td>176</td>
<td></td>
</tr>
<tr>
<td>MHF2-20D</td>
<td>294</td>
<td></td>
</tr>
</tbody>
</table>

### Calculation example

When a load f = 10 N is operating, which applies pitch moment to point L = 30 mm from the end of the MHF2-12D finger.

- **Allowable load F =**
  
- **M (Maximum allowable moment) =**
  
- **L x 10^{-3} =**

\[
F = \frac{0.68}{30 \times 10^3} = 22.7 \text{ (N)}
\]

Therefore, it can be used.
### How to Order

**M0F 2** —  **12**  **D**  —  **M9BW**  —

- **Number of fingers**: 2 finger
- **Bore size (mm)**:
  - 8: 8
  - 12: 12
  - 16: 16
  - 20: 20
- **Action**: Double acting
- **Stroke**:
  - Nil: Short stroke
  - 1: Medium stroke
  - 2: Long stroke
- **Auto switch**:
  - Nil: Without auto switch (Built-in magnet)
- **Body option**:
  - Nil: Axial piping type
  - R: Side piping type

**Refer to page 473 for details.**

### Applicable Auto Switches

Refer to pages 797 to 850 for further information on auto switches.

<table>
<thead>
<tr>
<th>Type</th>
<th>Special function</th>
<th>Electrical entry</th>
<th>Indicator (Output)</th>
<th>Load voltage (V)</th>
<th>Auto switch model</th>
<th>Lead wire length (m)*</th>
<th>Pre-wired connector</th>
<th>Applicable load</th>
</tr>
</thead>
<tbody>
<tr>
<td>Solid state auto switch</td>
<td>Grommet</td>
<td>Yes</td>
<td>3-wire (NPN)</td>
<td>5, 12</td>
<td>M9NV</td>
<td>0.5 (Nil)</td>
<td>Relay, PLC</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>3-wire (PNP)</td>
<td>24</td>
<td>M9PV</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2-wire</td>
<td>12</td>
<td>M9BV</td>
<td>3 (L)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>3-wire (NPN)</td>
<td>5, 12</td>
<td>M9NV</td>
<td>5</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>3-wire (PNP)</td>
<td>12</td>
<td>M9PW</td>
<td>5 (Z)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2-wire</td>
<td>5, 12</td>
<td>M9NB</td>
<td>—</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Note:** When using the 2-color indicator type, please make the setting so that the indicator is lit in red to ensure the detection at the proper position of the air gripper.

**Water resistant type auto switches can be mounted on the above models, but in such case SMC cannot guarantee water resistance.**

* Lead wire length symbols: 0.5 m ----- Nil (Example) M9NW
  1 m ----- M (Example) M9NWM
  3 m ----- L (Example) M9NWL
  5 m ----- Z (Example) M9NWZ

* Auto switches marked with "O" are made to order specification.

---

**MHF 2 Series**

RoHS

472
### Specifications

<table>
<thead>
<tr>
<th>Fluid</th>
<th>Air</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating pressure</td>
<td>ø8: 0.15 to 0.7 MPa, ø12 to 20: 0.1 to 0.7 MPa</td>
</tr>
<tr>
<td>Ambient and fluid temperature</td>
<td>−10 to 60°C (with no condensation)</td>
</tr>
<tr>
<td>Repeatability</td>
<td>±0.05 mm Note 1)</td>
</tr>
</tbody>
</table>

| Maximum operating frequency | Short stroke | 120 c.p.m. |
|                            | Medium stroke | 120 c.p.m. |
|                            | Long stroke   | 60 c.p.m.  |

| Lubrication | Not required |
| Action       | Double acting |

| Auto switch (Option) Note 2) | Solid state auto switch (3-wire, 2-wire) |

Note 1) This is the value when no offset load is applied to the finger. When an offset load is applied to the finger, the maximum value is ±0.15 mm due to the influence of backlash of the rack and pinion.

Note 2) Refer to pages 797 to 850 for further information on auto switches.

### Model

<table>
<thead>
<tr>
<th>Action</th>
<th>Model</th>
<th>Cylinder bore (mm)</th>
<th>Gripping force Effective gripping force per finger N</th>
<th>Opening/closing stroke (Both sides) mm</th>
<th>Weight (g)</th>
<th>Unobstructed capacity (cm³)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Finger open side</td>
<td>Finger close side</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| MHF2-8D | 8     | 19                | 8                                                 | 65                                     | 0.7       | 0.6                        |
| MHF2-8D1| 16    | 85                | 16                                                | 85                                     | 1.1       | 1.0                        |
| MHF2-8D2| 32    | 120               | 32                                                | 120                                    | 2.0       | 1.9                        |
| MHF2-12D| 12    | 155               | 12                                                | 155                                    | 1.9       | 1.6                        |
| MHF2-12D1| 24    | 190               | 24                                                | 190                                    | 3.3       | 3.0                        |
| MHF2-12D2| 48    | 275               | 48                                                | 275                                    | 6.1       | 5.8                        |
| MHF2-16D| 16    | 350               | 16                                                | 350                                    | 4.9       | 4.1                        |
| MHF2-16D1| 32    | 445               | 32                                                | 445                                    | 8.2       | 7.4                        |
| MHF2-16D2| 64    | 650               | 64                                                | 650                                    | 14.9      | 14.0                       |
| MHF2-20D| 20    | 645               | 20                                                | 645                                    | 8.7       | 7.3                        |
| MHF2-20D1| 40    | 850               | 40                                                | 850                                    | 15.1      | 13.7                       |
| MHF2-20D2| 80    | 1,225             | 80                                                | 1,225                                  | 28.0      | 26.6                       |

Note 1) At the pressure of 0.5 MPa, when gripping point L is 20 mm.

Note 2) Excluding the auto switch weight.

——

**Symbol**

- Double acting: Internal grip
- Double acting: External grip

**Made to Order: Individual Specifications**

(For details, refer to pages 492 to 494.)

**Symbol Specifications/Description**

- X4: Heat resistance (100°C)
- X5: Fluororubber seal
- X50: Without magnet
- X53: EPDM seal/Fluorine grease
- X63: Fluorine grease
- X79: Grease for food processing machines. Fluorine grease
- X79A: Grease for food processing machines
- X81A: Anti-corrosive treatment of finger
- X81B: Anti-corrosive treatment of finger, guide and joint
- X83: With an adjustable opening/closing finger positioning

**Made to Order**

Click here for details

**Symbol Specifications/Description**

- X4: Heat resistance (100°C)
- X5: Fluororubber seal
- X50: Without magnet
- X53: EPDM seal/Fluorine grease
- X63: Fluorine grease
- X79: Grease for food processing machines. Fluorine grease
- X79A: Grease for food processing machines
- X81A: Anti-corrosive treatment of finger
- X81B: Anti-corrosive treatment of finger, guide and joint
- X83: With an adjustable opening/closing finger positioning

**Moisture Control Tube IDK Series**

When operating an actuator with a small diameter and a short stroke at a high frequency, the dew condensation (water droplet) may occur inside the piping depending on the conditions. Simply connecting the moisture control tube to the actuator will prevent dew condensation from occurring. For details, refer to the IDK series in the Best Pneumatics No. 6.
MHF2 Series

Construction

MHF2-8D, MHF2-8D1

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>Body</td>
<td>Aluminum alloy</td>
<td>Hard anodized</td>
</tr>
<tr>
<td>2</td>
<td>Piston</td>
<td>Stainless steel</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Joint</td>
<td>Stainless steel</td>
<td>Heat treatment</td>
</tr>
<tr>
<td>4</td>
<td>Guide rail</td>
<td>Stainless steel</td>
<td>Heat treatment</td>
</tr>
<tr>
<td>5</td>
<td>Finger</td>
<td>Stainless steel</td>
<td>Heat treatment</td>
</tr>
<tr>
<td>6</td>
<td>Roller stopper</td>
<td>Stainless steel</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Pinion</td>
<td>Carbon steel</td>
<td>Nitriding</td>
</tr>
<tr>
<td>8</td>
<td>Cap A</td>
<td>Aluminum alloy</td>
<td>Clear anodized</td>
</tr>
<tr>
<td>9</td>
<td>Cap B</td>
<td>Aluminum alloy</td>
<td>Clear anodized</td>
</tr>
<tr>
<td>10</td>
<td>Cap C</td>
<td>Aluminum alloy</td>
<td>Clear anodized</td>
</tr>
</tbody>
</table>

Replacement Parts

<table>
<thead>
<tr>
<th>Description</th>
<th>Kit no.</th>
<th>Contents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Seal kit</td>
<td>MHF2-8D</td>
<td>12, 20, 21</td>
</tr>
<tr>
<td>Finger assembly</td>
<td>MHF-A0802</td>
<td>3, 4, 5, 6, 15, 17, 19</td>
</tr>
</tbody>
</table>

Replacement part/Grease pack part no.:
Guide unit: GR-S-010 (10 g)
Cylinder unit: GR-L-00S (6 g)

Component Parts

<table>
<thead>
<tr>
<th>No.</th>
<th>Description</th>
<th>Material</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>11</td>
<td>Head damper</td>
<td>Urethane rubber</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Clip</td>
<td>Stainless steel wire</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>Rack</td>
<td>Stainless steel</td>
<td>Nitriding</td>
</tr>
<tr>
<td>14</td>
<td>Magnet</td>
<td>--</td>
<td>Nickel plated</td>
</tr>
<tr>
<td>15</td>
<td>Steel balls</td>
<td>High carbon chromium bearing steel</td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>Wear ring</td>
<td>Synthetic resin</td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>Roller</td>
<td>High carbon chromium bearing steel</td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>Needle roller</td>
<td>High carbon chromium bearing steel</td>
<td></td>
</tr>
<tr>
<td>19</td>
<td>Parallel pin</td>
<td>Stainless steel</td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>Piston seal</td>
<td>NBR</td>
<td></td>
</tr>
<tr>
<td>21</td>
<td>Gasket</td>
<td>NBR</td>
<td></td>
</tr>
</tbody>
</table>

Bolts for Body Through-hole Mounting

<table>
<thead>
<tr>
<th>Part no.</th>
<th>Number of pieces</th>
</tr>
</thead>
<tbody>
<tr>
<td>MHF-B08</td>
<td>MHF2-8D 2 pieces/unit</td>
</tr>
<tr>
<td></td>
<td>MHF2-8D1 2 pieces/unit</td>
</tr>
<tr>
<td></td>
<td>MHF2-8D2 4 pieces/unit</td>
</tr>
</tbody>
</table>

* The bolts for body through-hole mounting are attached to the product. They are also provided at an order of 1 piece or more with the above part numbers.
Construction

MHF2-12D □ to 20D □

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>Body</td>
<td>Aluminum alloy</td>
<td>Hard anodized</td>
</tr>
<tr>
<td>2</td>
<td>Piston</td>
<td>Aluminum alloy</td>
<td>Clear anodized</td>
</tr>
<tr>
<td>3</td>
<td>Joint</td>
<td>Stainless steel</td>
<td>Heat treatment</td>
</tr>
<tr>
<td>4</td>
<td>Guide rail</td>
<td>Stainless steel</td>
<td>Heat treatment</td>
</tr>
<tr>
<td>5</td>
<td>Finger</td>
<td>Stainless steel</td>
<td>Heat treatment</td>
</tr>
<tr>
<td>6</td>
<td>Roller stopper</td>
<td>Stainless steel</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Pinion</td>
<td>Carbon steel</td>
<td>Nitrizing</td>
</tr>
<tr>
<td>8</td>
<td>Cap A</td>
<td>Aluminum alloy</td>
<td>Clear anodized</td>
</tr>
<tr>
<td>9</td>
<td>Cap B</td>
<td>Aluminum alloy</td>
<td>Clear anodized</td>
</tr>
<tr>
<td>10</td>
<td>Cap C</td>
<td>Aluminum alloy</td>
<td>Clear anodized</td>
</tr>
<tr>
<td>11</td>
<td>Head damper</td>
<td>Urethane rubber</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Rack</td>
<td>Stainless steel</td>
<td>Nitrizing</td>
</tr>
</tbody>
</table>

Replacement Parts

<table>
<thead>
<tr>
<th>Description</th>
<th>Kit no.</th>
<th>Contents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Seal kit</td>
<td>MHF12-PS</td>
<td>MHF12-PS 20, 21, 22</td>
</tr>
<tr>
<td>Finger assembly</td>
<td>MHF-A1202</td>
<td>MHF-A1202-1, MHF-A1202-2 3, 4, 5, 6, 14, 16, 19 Mounting screw</td>
</tr>
</tbody>
</table>

Bolts for Body Through-hole Mounting

- The bolts for body through-hole mounting are attached to the product. They are also provided at an order of 1 piece or more with the above part numbers.
- When mounting MHF2-16D □ or MHF2-20D □ with the body through-holes, use hexagon socket head screws available on the market.

Replacement part/Grease pack part no.:

| MHF2-□□□D, D1 (ø12, 16, 20) | GR-S-010 (10 g) (Guide unit) |
| MHF2-□□□D2 (ø12)            | GR-L-005 (5 g) (Cylinder unit) |
| MHF2-□□□D2 (ø16, 20)        | GR-S-010 (10 g) (Guide unit) |
|                              | GR-L-010 (10 g) (Cylinder unit) |
**Auto Switch Mounting Groove Dimensions**

- **Groove for auto switch mounting**

**Dimensions**

**MHF2-8D**

**MHF2 Series**

- **Groove for auto switch mounting**
- **2 x M3 x 0.5 thread depth 7**
  - (Mounting thread)
- **ø2.5H9 +0.025 depth 2.5**
- **2 x ø4.5**
- **2 x ø2.6 through (Mounting hole)**
- **2 x M3 x 0.5 thread depth 4**
  - (Mounting thread)

**Detail of part A**

- **E-E**
- **2 x ø2.6 through (Mounting hole)**
- **Close: 0**
- **Open: 8 ± 1**
- **Use the attached hexagon socket head screws for mounting holes.**

**Accessory option:**

- **Hexagon socket head screw (special screws)**
  - **M2.5 x 0.45 thread depth 3**
  - (Attachment mounting thread)
- **2 x M3 x 0.5 thread depth 4**
  - (Mounting thread)
- **2 x ø2H9 +0.025 depth 2**
Low Profile Air Gripper  
**MHF2 Series**

### Dimensions

#### MHF2-8D1

![Diagram of MHF2-8D1 dimensions](image)

- **ø2.5H9 +0.025 depth 2.5**
- **2 x M3 x 0.5 thread depth 7**
  - (Mounting thread)
- **2 x ø4.5 through (Mounting hole)**
- **2 x M2.5 x 0.45 thread depth 3**
  - (Attachment mounting thread)
- **4 x M3 x 0.5 thread depth 4**
  - (Mounting thread)
- **4 x M2.5 x 0.45 thread depth 3**
  - (Attachment mounting thread)
- **2 x M3 x 0.5 thread depth 4**
  - (Mounting thread)
- **2 x ø2H9 +0.025 depth 2**

**Note:** Use the attached hexagon socket head screws for mounting holes.

**Auto Switch Mounting Groove Dimensions**

![Diagram of auto switch mounting groove dimensions](image)

- **Groove for auto switch mounting**
- **2 x M3 x 0.5 thread depth 4**
  - (Mounting thread)
MHF2 Series

Dimensions

MHF2-8D2

Auto Switch Mounting Groove Dimensions

Accessory option: Hexagon socket head screw (special screws)

Groove for auto switch mounting

Finger reference plane

Finger closing port

Finger opening port

4 x Ø2.6 through (Mounting hole)*

4 x Ø4.5

Use the attached hexagon socket head screws for mounting holes.

Open: 32 ± 1

Close: 0 + 0.1

4 x M3 x 0.5 thread depth 4 (Mounting thread)

8 x M2.5 x 0.45 thread depth 3 (Attachment mounting thread)

2 x Ø2H9 +0.025 0 depth 2

M2.5 x 0.45

4 x M3 x 0.5 thread depth 4 (Mounting thread)
Low Profile Air Gripper **MHF2 Series**

**Dimensions**

**MHF2-12D**

2 x M4 x 0.7 thread depth 10
(Mounting thread)

Finger reference plane

M5 x 0.8
Finger opening port

M5 x 0.8
Finger closing port

2 x ø3H9 +0.025
depth 3

 ø3H9 -0.1
(Attachment mounting thread)

4 x M3 x 0.5
thread depth 4
(Mounting thread)

4 x M4 x 0.7 screw (special screws)
(Mounting hole)

Groove for auto switch mounting

**Auto Switch Mounting Groove Dimensions**

* Use the attached hexagon socket head screws for mounting holes.
**MHF2 Series**

### Dimensions

**MHF2-12D1**

- **Finger opening port:** M5 x 0.8
- **Finger closing port:** M5 x 0.8
- **Finger reference plane:** M5 x 0.8
- **Groove for auto switch mounting:**
  - 4 x M4 x 0.7 thread depth 5
  - (Mounting thread)
  - 8 x M3 x 0.5 thread depth 4
  - (Attachment mounting thread)
  - 2 x M4 x 0.7 thread depth 5
  - (Mounting thread)
- **Auto Switch Mounting Groove Dimensions:**
  - 4 x M4 x 0.7 thread depth 5
  - (Mounting thread)
  - 8 x M3 x 0.5 thread depth 4
  - (Attachment mounting thread)
  - 2 x M4 x 0.7 thread depth 5
  - (Mounting thread)

*Use the attached hexagon socket head screws for mounting holes.

---

**Detail of part A**

- 2 x M4 x 0.7 thread depth 10
  - (Mounting thread)
- 3H9 +0.025 depth 3
- 3H9 +0.025 depth 3

---

**Auto Switch Mounting Groove Dimensions**

- 4 x M4 x 0.7 thread depth 5
  - (Mounting thread)
- 8 x M3 x 0.5 thread depth 4
  - (Attachment mounting thread)
- 2 x M4 x 0.7 thread depth 5
  - (Mounting thread)

---

**Accessory option:**
- Hexagon socket head screw (special screws)

---

**SMC**
Low Profile Air Gripper **MHF2 Series**

**Dimensions**

**MHF2-12D2**

**Auto Switch Mounting Groove Dimensions**

- **Auto Switch Mounting**
  - Groove for auto switch mounting

**Groove Dimensions**

- **Groove for auto switch mounting**
  - 4 x M4 x 0.7 thread depth 10 (Mounting thread)

**Attachment mounting thread**

- **Mounting thread**
  - 2 x M4 x 0.7 thread depth 5 (Mounting hole)

**Finger opening port**

- **Finger reference plane**
  - M5 x 0.8

**Finger closing port**

- **Finger reference plane**
  - M5 x 0.8

**Detail of part A**

- **Use the attached hexagon socket head screws for mounting holes.**

**Accessory option:**

- **Hexagon socket head screw (special screws) 3H9 +0.025 depth 3**
- **2 x ø2.5H9 +0.025 depth 2.5**
- **2 x M4 x 0.7 thread depth 5 (Mounting thread)**
- **8 x M3 x 0.5 thread depth 4 (Attachment mounting thread)**

**MHZ**

**MHF**

**MHL**

**MHR**

**MHK**

**MHS**

**MHC**

**MHT**

**MHY**

**MHW**

**MRHQ**

**MA**

**D-**

---

* Use the attached hexagon socket head screws for mounting holes.

---

**SMC**

---

481
**MHF2 Series**

**Dimensions**

**MHF2-16D**

- **2 x ø7.5** through (Mounting hole)
- **2 x ø4.3** through (Mounting hole)
- **2 x M5 x 0.8** thread depth 5.5 (Mounting thread)
- **8 x M4 x 0.7** thread depth 4 (Attachment mounting thread)
- **4 x M5 x 0.8** thread depth 5.5 (Mounting thread)
- **2 x M5 x 0.8** thread depth 12 (Mounting thread)
- **2 x M5 x 0.8** thread depth 5.5 (Mounting thread)

**Auto Switch Mounting Groove Dimensions**

- **Groove for auto switch mounting**

---

**Dimensions**

- **38**
- **57.5**
- **5**
- **15**
- **0.3**
- **52**
- **26**
- **10.6**
- **24**
- **50**
- **72**
- **52**
- **36**
- **2 x ø3H9 +0.025 0 depth 3**
- **2 x M5 x 0.8** thread depth 12 (Mounting thread)
- **2 x ø4.3 through (Mounting hole)**
- **2 x ø7.5**

---

**Notes**

- Finger reference plane
- Finger closing port
- Finger opening port
- **Finger closing port**
- **Finger opening port**

---

**Auto Switch Mounting Groove Dimensions**

- Groove for auto switch mounting

---

**SMC**
Dimensions

MHF2-16D1

Auto Switch Mounting Groove Dimensions

MHZ MHF MHL MHR MHK MHS MHC MHT MHY MHW -X MRHQ MA D-
MHF2 Series

Dimensions

MHF2-16D2

Auto Switch Mounting Groove Dimensions
Low Profile Air Gripper  **MHF2 Series**

### Dimensions

**MHF2-20D**

- **Finger closing port**: Open: 20 ± 1
- **Finger opening port**: Close: 0.0 ± 0.1
- **Groove for auto switch mounting**
  - **Auto Switch Mounting Groove Dimensions**
  - **M5 x 0.8** Finger reference plane
  - 2 x M6 x 1 thread depth 15 (Mounting thread)
  - 2 x ø5.2 through (Mounting hole)
  - 2 x M6 x 1 thread depth 6 (Mounting thread)
  - 2 x ø6 through (Mounting hole)
  - 8 x M4 x 0.7 thread depth 4 (Attachment mounting thread)
  - 2 x M6 x 1 thread depth 6 (Mounting thread)
  - 2 x ø3H9 +0.025 depth 3
  - 2 x ø6.2 through (Mounting hole)

**Detail of part A**

- 2 x M6 x 1 thread depth 15 (Mounting thread)
- 2 x ø6 through (Mounting hole)

**Low Profile Air Gripper**

- MHZ
- MHD
- MHL
- MHR
- MHK
- MHS
- MHC
- MHT
- MHY
- MHW
- MHC
- MA
- D-
Low Profile Air Gripper **MHF2 Series**

**Dimensions**

**MHF2-20D2**

![Diagram of MHF2-20D2](image)

**Auto Switch Mounting Groove Dimensions**

![Diagram of Auto Switch Mounting Groove](image)

**Referenced Diagrams**

![Diagram of MHZ](image)

![Diagram of MHT](image)

![Diagram of MHK](image)

![Diagram of MHR](image)

![Diagram of MHL](image)

![Diagram of MHS](image)

![Diagram of MHC](image)

![Diagram of MHF](image)

![Diagram of MHY](image)

![Diagram of MHW](image)

![Diagram of MRHQ](image)

![Diagram of MA](image)

![Diagram of D-](image)
### MHF2 Series
#### Body Option: Side Piping Type

**MHF2-8DR**  
MHF2-8D1R

![Port side of axial piping type](image1)

**Body Option Dimension**  

<table>
<thead>
<tr>
<th>Model</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
</tr>
</thead>
<tbody>
<tr>
<td>MHF2-8DR</td>
<td>5.5</td>
<td>25</td>
<td>11</td>
<td>M3 x 0.5</td>
</tr>
<tr>
<td>MHF2-8D1R</td>
<td>37</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**MHF2-8D2R**  
MHF2-12D□R  
MHF2-16D□R  
MHF2-20D□R

![Port side of axial piping type](image2)

**Body Option Dimension**  

<table>
<thead>
<tr>
<th>Model</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
</tr>
</thead>
<tbody>
<tr>
<td>MHF2-8D2R</td>
<td>5.5</td>
<td>61</td>
<td>11</td>
<td>M3 x 0.5</td>
</tr>
<tr>
<td>MHF2-12DR</td>
<td>7</td>
<td>38</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MHF2-12D1R</td>
<td>54</td>
<td>44</td>
<td>14.8</td>
<td>M5 x 0.8</td>
</tr>
<tr>
<td>MHF2-12D2R</td>
<td>90</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MHF2-16DR</td>
<td>54</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MHF2-16D1R</td>
<td>76</td>
<td>94</td>
<td>19</td>
<td>M5 x 0.8</td>
</tr>
<tr>
<td>MHF2-16D2R</td>
<td>124</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MHF2-20DR</td>
<td>66</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MHF2-20D1R</td>
<td>94</td>
<td>154</td>
<td>23</td>
<td>M5 x 0.8</td>
</tr>
<tr>
<td>MHF2-20D2R</td>
<td>154</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*For dimensions not given above, please refer to the table of dimensions on pages 476 to 487.*
## MHF2 Series

### Auto Switch Installation Examples and Mounting Positions

Various auto switch applications are possible through different combinations of auto switch quantities and detecting positions.

#### 1) Detection when Gripping Exterior of Workpiece

<table>
<thead>
<tr>
<th>Detection example</th>
<th>1. Confirmation of fingers in reset position</th>
<th>2. Confirmation of workpiece held</th>
<th>3. Confirmation of workpiece released</th>
</tr>
</thead>
<tbody>
<tr>
<td>Position to be detected</td>
<td><img src="image1" alt="Position of fingers fully opened" /></td>
<td><img src="image2" alt="Position when gripping workpiece" /></td>
<td><img src="image3" alt="Position of fingers fully closed" /></td>
</tr>
<tr>
<td>Operation of auto switch</td>
<td>Auto switch turned on when fingers return. (Light ON)</td>
<td>Auto switch turned on when gripping a workpiece. (Light ON)</td>
<td>When a workpiece is not held (Abnormal operation): Auto switch to turn ON (Light ON)</td>
</tr>
</tbody>
</table>

#### Detection combinations

<table>
<thead>
<tr>
<th>One auto switch</th>
<th>Two auto switches</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image4" alt="Pattern A" /></td>
<td><img src="image5" alt="Pattern B" /></td>
</tr>
<tr>
<td><img src="image6" alt="Pattern C" /></td>
<td></td>
</tr>
</tbody>
</table>

#### How to determine auto switch installation position

At no pressure or low pressure, connect the auto switch to a power supply, and follow the directions.

#### Step 1)

*Fully open the fingers.*

#### Step 2)

Insert the auto switch into the auto switch installation groove in the direction shown in the drawing.

#### Step 3)

Slide the auto switch in the direction of the arrow until the indicator light illuminates.

Step 4) Slide the auto switch further in the direction of the arrow until the indicator light goes out.

Step 5) Move the auto switch in the opposite direction and fasten it at a position 0.3 to 0.5 mm beyond the position where the indicator light illuminates.

### Note 1)

It is recommended that gripping of a workpiece be performed close to the center of the finger stroke.

### Note 2)

When holding a workpiece close at the end of open/close stroke of fingers, detecting performance of the combinations listed in the above table may be limited, depending on the hysteresis of an auto switch, etc.
Various auto switch applications are possible through different combinations of auto switch quantities and detecting positions.

2) Detection when Gripping Interior of Workpiece

### Table: Auto Switch Installation Examples and Mounting Positions

<table>
<thead>
<tr>
<th>Detection example</th>
<th>1. Confirmation of fingers in reset position</th>
<th>2. Confirmation of workpiece held</th>
<th>3. Confirmation of workpiece released</th>
</tr>
</thead>
<tbody>
<tr>
<td>Position to be detected</td>
<td><img src="image" alt="Position of fingers fully closed" /></td>
<td><img src="image" alt="Position when gripping workpiece" /></td>
<td><img src="image" alt="Position of fingers fully opened" /></td>
</tr>
<tr>
<td>Operation of auto switch</td>
<td>Auto switch turned on when fingers return. (Light ON)</td>
<td>Auto switch turned on when gripping a workpiece. (Light ON)</td>
<td>When a workpiece is not held (Abnormal operation): Auto switch to turn ON (Light ON)</td>
</tr>
<tr>
<td>Detection combinations</td>
<td><img src="image" alt="One auto switch - Any position, any of q, w, and e can be detected" /></td>
<td><img src="image" alt="Two auto switches - Two positions of q, w, and e can be detected" /></td>
<td><img src="image" alt="Two auto switches - Any position, any of q, w, and e can be detected" /></td>
</tr>
<tr>
<td>How to determine auto switch installation position</td>
<td><img src="image" alt="Step 1) Fully close the fingers." /></td>
<td><img src="image" alt="Step 1) Position fingers for gripping a workpiece." /></td>
<td><img src="image" alt="Step 1) Fully open the fingers." /></td>
</tr>
<tr>
<td>At no pressure or low pressure, connect the auto switch to a power supply, and follow the directions.</td>
<td><img src="image" alt="Step 2) Insert the auto switch into the auto switch installation groove in the direction shown in the drawing." /></td>
<td><img src="image" alt="Step 3) Slide the auto switch in the direction of the arrow until the indicator light illuminates and fasten it at a position 0.3 to 0.5 mm beyond the position where the indicator light illuminates." /></td>
<td><img src="image" alt="Step 4) Slide the auto switch further in the direction of the arrow until the indicator light goes out." /></td>
</tr>
<tr>
<td></td>
<td><img src="image" alt="Step 3) Slide the auto switch in the direction of the arrow until the indicator light illuminates." /></td>
<td><img src="image" alt="Step 4) Slide the auto switch further in the direction of the arrow until the indicator light goes out." /></td>
<td><img src="image" alt="Step 5) Move the auto switch in the opposite direction and fasten it at a position 0.3 to 0.5 mm beyond the position where the indicator light illuminates." /></td>
</tr>
</tbody>
</table>

Note 1) It is recommended that gripping of a workpiece be performed close to the center of the finger stroke.

Note 2) When holding a workpiece close at the end of open/close stroke of fingers, detecting performance of the combinations listed in the above table may be limited, depending on the hysteresis of an auto switch, etc.
**Auto Switch Hysteresis**

Auto switches have hysteresis similar to micro switches. Use the table below as a guide when adjusting auto switch positions.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>MHF2-8D</td>
<td>0.2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MHF2-12D</td>
<td>0.3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MHF2-16D</td>
<td>0.2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MHF2-20D</td>
<td>0.5</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Auto Switch Mounting**

Insert the auto switch into the auto switch mounting groove in the air chuck in the direction shown below, and after setting the mounting position, tighten the attached switch mounting screw with a flat head watchmaker’s screwdriver.

**Caution**

When using an auto switch on the mounting plate side, the switch will protrude from the end face as shown in the right figure. Please provide a run off space of 2 mm or more on the mounting plate.

**Protrusion of Auto Switch from Edge of Body**

- The amount of auto switch protrusion from the body end surface is shown in the table below.
- Use this as a standard when mounting, etc.

**Protrusion of Auto switch**

- **Lead wire type**: In-line entry, Perpendicular entry
- **Illustration**: Auto switch finger position
- **Model**: Auto switch

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>MHF2-8D</td>
<td>Open 6.5</td>
<td>8.5</td>
<td>4.5</td>
<td>6.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Close 6.5</td>
<td>8.5</td>
<td>4.5</td>
<td>6.5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MHF2-8D1</td>
<td>Open 0.5</td>
<td>2.5</td>
<td>—</td>
<td>—</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Close 0.5</td>
<td>2.5</td>
<td>—</td>
<td>—</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MHF2-12D</td>
<td>Open 3</td>
<td>5</td>
<td>1</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Close 3</td>
<td>5</td>
<td>1</td>
<td>3</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MHF2-12D1</td>
<td>Open 1</td>
<td>3</td>
<td>—</td>
<td>—</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Close 1</td>
<td>3</td>
<td>—</td>
<td>—</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MHF2-12D2</td>
<td>Open —</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MHF2-12D2</td>
<td>Close —</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MHF2-16D</td>
<td>Open —</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MHF2-16D1</td>
<td>Close —</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MHF2-16D2</td>
<td>Open —</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MHF2-16D2</td>
<td>Close —</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MHF2-20D</td>
<td>Open —</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MHF2-20D1</td>
<td>Close —</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MHF2-20D2</td>
<td>Open —</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note) There is no protrusion for sections of the table with no values entered.
With An Adjustable Opening/Closing Finger Positioning

- Stroke can be adjusted to suit the workpiece
- 3 types of opening/closing finger stroke adjustments (Adjustable finger opening/closing position type, Adjustable finger opening position type, Adjustable finger closed position type)

### Various strokes
- Standardized 3 stroke types and 2 stroke adjustment types for fine tuning.

<table>
<thead>
<tr>
<th>Bore size (mm)</th>
<th>Short stroke</th>
<th>Medium stroke</th>
<th>Long stroke</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Full stroke</td>
<td>Stroke adjustable width</td>
<td>Full stroke</td>
</tr>
<tr>
<td>Ø8</td>
<td>8 mm</td>
<td>Short Adjuster 4 mm</td>
<td>16 mm</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Long Adjuster 8 mm</td>
<td></td>
</tr>
<tr>
<td>Ø12</td>
<td>12 mm</td>
<td>Short Adjuster 8 mm</td>
<td>24 mm</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Long Adjuster 12 mm</td>
<td></td>
</tr>
<tr>
<td>Ø16</td>
<td>16 mm</td>
<td>Short Adjuster 10 mm</td>
<td>32 mm</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Long Adjuster 14 mm</td>
<td></td>
</tr>
<tr>
<td>Ø20</td>
<td>20 mm</td>
<td>Short Adjuster 8 mm</td>
<td>40 mm</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Long Adjuster 18 mm</td>
<td></td>
</tr>
</tbody>
</table>

### How to Order

MHF2 – **Standard part number** – X83 A 2

- **Stroke adjustable width**
  1. Short Adjuster
  2. Long Adjuster

- **Stroke adjustable side**
  A. Both sides
  B. Opening side
  C. Closed side

- With an adjustable opening/closing finger positioning
### Finger stroke adjustable width for opening/closing position

<table>
<thead>
<tr>
<th>Model</th>
<th>Full stroke</th>
<th>Adjustable stroke width for opening position</th>
<th>Adjustable stroke width for closed position</th>
</tr>
</thead>
<tbody>
<tr>
<td>MHF2-8D</td>
<td>8</td>
<td>4 to 8</td>
<td>4 to 8</td>
</tr>
<tr>
<td>MHF2-8D1</td>
<td>16</td>
<td>6 to 16</td>
<td>6 to 16</td>
</tr>
<tr>
<td>MHF2-8D2</td>
<td>32</td>
<td>12 to 22</td>
<td>12 to 22</td>
</tr>
<tr>
<td>MHF2-12D</td>
<td>8</td>
<td>0 to 8</td>
<td>0 to 8</td>
</tr>
<tr>
<td>MHF2-12D1</td>
<td>24</td>
<td>8 to 16</td>
<td>8 to 16</td>
</tr>
<tr>
<td>MHF2-12D2</td>
<td>48</td>
<td>14 to 28</td>
<td>14 to 28</td>
</tr>
<tr>
<td>MHF2-16D</td>
<td>16</td>
<td>10 to 6</td>
<td>10 to 6</td>
</tr>
<tr>
<td>MHF2-16D1</td>
<td>32</td>
<td>8 to 14</td>
<td>8 to 14</td>
</tr>
<tr>
<td>MHF2-16D2</td>
<td>64</td>
<td>16 to 28</td>
<td>16 to 28</td>
</tr>
<tr>
<td>MHF2-20D</td>
<td>20</td>
<td>8 to 12</td>
<td>8 to 12</td>
</tr>
<tr>
<td>MHF2-20D1</td>
<td>40</td>
<td>10 to 20</td>
<td>10 to 20</td>
</tr>
<tr>
<td>MHF2-20D2</td>
<td>80</td>
<td>40 to 80</td>
<td>40 to 80</td>
</tr>
</tbody>
</table>

#### Note)
Specifications and details other than above are the same as standard type.

### How to Adjust Finger Stroke

**After adjusting the opening/closing width adjustment thread, tighten the nut to fix.**

#### Nut tightening torque

<table>
<thead>
<tr>
<th>Part no.</th>
<th>Thread size</th>
<th>Tightening torque (N·m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>MHF2-8D</td>
<td>M4 x 0.7</td>
<td>1.5</td>
</tr>
<tr>
<td>MHF2-8D1</td>
<td>M5 x 0.8</td>
<td>3.0</td>
</tr>
<tr>
<td>MHF2-8D2</td>
<td>M6 x 1.0</td>
<td>5.2</td>
</tr>
<tr>
<td>MHF2-12D</td>
<td>M8 x 1.25</td>
<td>12.5</td>
</tr>
</tbody>
</table>

#### Warning

1. **Adjust the stroke adjustment screw within the adjustable width.**
   - If you adjust the adjustment screw beyond the maximum value, the adjustment screw may fall out and may cause damage to human bodies or equipment/devices.

2. **Do not adjust stroke when air pressure is applied to the adjustment screw side.**
   - If air pressure is applied to the adjustment screw, the adjustment screw may fall out in some adjustment statuses. When applying pressure, make sure the adjustment screw is tightened enough.
Dimensions (The dimensions below are the same as the standard type.)

Adjustable finger opening/closing position type/MHF2\-\-X83A1

Adjustable finger opening/closing position type/MHF2\-\-X83A2

Adjustable finger opening/closing position type/MHF2\-\-X83B1

Adjustable finger opening/closing position type/MHF2\-\-X83B2

Adjustable finger closing position type/MHF2\-\-X83C1

Adjustable finger closing position type/MHF2\-\-X83C2
### MHF2 Series
#### Specific Product Precautions 1

Be sure to read this before handling the products.

---

### Warning

1. Do not scratch or dent the air gripper by dropping or bumping it when mounting.
   Slight deformation can cause inaccuracy or a malfunction.

2. Tighten the screw within the specified torque range when mounting the attachment.
   Tightening with a torque above the limit can cause malfunction, while insufficient tightening can cause slippage and dropping.

How to Mount Attachment to the Finger

Make sure to mount the attachments on fingers with the tightening torque in the table below by using bolts, etc., for the female threads on fingers.

<table>
<thead>
<tr>
<th>Model</th>
<th>Bolt</th>
<th>Max. tightening torque N·m</th>
</tr>
</thead>
<tbody>
<tr>
<td>MHF2-8D</td>
<td>M2.5 x 0.45</td>
<td>0.36</td>
</tr>
<tr>
<td>MHF2-12D</td>
<td>M3 x 0.5</td>
<td>0.63</td>
</tr>
<tr>
<td>MHF2-16D</td>
<td>M4 x 0.7</td>
<td>1.5</td>
</tr>
<tr>
<td>MHF2-20D</td>
<td>M4 x 0.7</td>
<td>1.5</td>
</tr>
</tbody>
</table>

3. Tighten the screw within the specified torque range when mounting the air gripper.
   Tightening with a torque above the limit can cause malfunction, while insufficient tightening can cause slippage and dropping.

How to Mount Air Grippers

Top mounting (Body tapped)

<table>
<thead>
<tr>
<th>Model</th>
<th>Bolt</th>
<th>Max. tightening torque N·m</th>
<th>Max. screw-in depth L mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>MHF2-8D</td>
<td>M3 x 0.5</td>
<td>0.95</td>
<td>7</td>
</tr>
<tr>
<td>MHF2-12D</td>
<td>M4 x 0.7</td>
<td>2.2</td>
<td>10</td>
</tr>
<tr>
<td>MHF2-16D</td>
<td>M5 x 0.8</td>
<td>4.5</td>
<td>12</td>
</tr>
<tr>
<td>MHF2-20D</td>
<td>M6 x 1</td>
<td>7.8</td>
<td>15</td>
</tr>
</tbody>
</table>

---

### Caution

Use caution for the anti-corrosiveness of the linear guide section.
Martensitic stainless steel is used for the finger guide rail, so make sure that anti-corrosiveness is inferior to the austenitic stainless steel.
In particular, watch for rust in environments where waterdrops are likely to adhere due to condensation.
Caution
How to Locate Finger and Attachment

● Positioning in the finger’s open/close direction
Position the finger and the attachment by inserting the finger's pin into the attachment's pin insertion hole.
Provide the following pin insertion hole dimensions: shaft-basis fitting dimension \( C \) for the open/close direction; slotted hole with relief \( B \) for the cross direction.

● Positioning in the finger’s cross direction
Perform the positioning from the reference plane of the finger and the side \( A \) of the attachment.

Finite orbit type guide is used in the actuator finger part. By using this, when there are inertial force which cause by movements or rotation to the actuator, steel ball will move to one side and this will cause a large resistance and degrade the accuracy. When there are inertial force which cause by movements or rotation to the actuator, operate the finger to full stroke.
Especially in long stroke type, the accuracy of finger may degrade.