High Precision - Repeatability ±0.01 mm
Parallel opening and closing mechanism utilizing a cross roller guide produces smooth operation without play, with high precision and long life.

Low Profile
Using rotary actuators in the part of actuating portion enables a design compact.

Universal mounting
Axial side mounting
Vertical side mounting
Lateral side mounting

Possible to mount solid state switch with indicator light D-M9. Easy to locate switch to optimum set point.

MDHR2, MDHR2/MHR3, MDHR3
2-finger type: Size 10, 15, 20, 30/ 3-finger type: Size 10, 15
High rigidity
Fingers operate smoothly as the holder maintains the guide from the outside and prevents finger displacement.

Applicable for Clean Series.
Refer to “Pneumatic Clean Series (CAT.E02-23)” catalog for details.

Internal/External gripping capability

Connection port on 2 sides

Series Variations

Rotary actuated air gripper

- 2-finger type
- 3-finger type

Clean Series Rotary actuated air gripper

- 2-finger type
- 3-finger type

<table>
<thead>
<tr>
<th>(Nominal size)</th>
<th>Auto switch</th>
</tr>
</thead>
<tbody>
<tr>
<td>10 15 20 30</td>
<td></td>
</tr>
</tbody>
</table>

MHR2
MDHR2
MHR3
MDHR3

Refer to the “Pneumatic Clean Series (CAT.E02-23)” catalog.
Rotary Actuated Air Gripper/2-Finger Type

**MHR2/MDHR2 Series**

Size: 10, 15, 20, 30

---

### How to Order

**Without auto switch**

MHR 2 - 10 R -

**With auto switch** (Built-in magnet)

MDHR 2 - 10 R - M9N S -

- **Number of fingers**
  - 2 fingers

- **Nominal size**
  - 10
  - 15
  - 20
  - 30

- **Connecting port**
  - R: Body side
  - E: Axial side

---

### Applicable Auto Switches

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

**Type** | **Special function** | **Electrical entry** | **Indicator light** | **Wiring (Output)** | **Load voltage** | **Auto switch model** | **Lead wire length (m)** | **Pre-wired connector** |
--- | --- | --- | --- | --- | --- | --- | --- | --- |
Solid state auto switch | - | Grommet | Yes | 3-wire (NPN) | 5V,12V | M9NV | 0.5 (Nil) | - |
Diagnosis (2-color indication) | - | - | - | 3-wire (PNP) | 12V | M9PV | 1 (M) | - |
Water resistant (2-color indicator) | - | - | - | 2-wire | 5V,12V | M9BW | 3 (L) | - |
| | | | | 3-wire (NPN) | 12V | M9BA | 5 (Z) | - |
| | | | | 3-wire (PNP) | 24V | M9BAV | - | - |
| | | | | 2-wire | - | M9BAV | - | - |

- 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) M9N
  - 1 m - M (Example) M9NM
  - 3 m - L (Example) M9NL
  - 5 m - Z (Example) M9NZ

- Solid state auto switches marked with a "∗" symbol are produced upon receipt of order.

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.
Model/Specifications

<table>
<thead>
<tr>
<th>Nominal size</th>
<th>10</th>
<th>15</th>
<th>20</th>
<th>30</th>
</tr>
</thead>
<tbody>
<tr>
<td>Action</td>
<td>Double acting</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gripping force (N) (Effective value) at 0.5 MPa</td>
<td>12</td>
<td>24</td>
<td>33</td>
<td>58</td>
</tr>
<tr>
<td>(External grip)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Internal grip)</td>
<td>12</td>
<td>25</td>
<td>34</td>
<td>59</td>
</tr>
<tr>
<td>Opening/ Closing stroke (Both sides)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Finger closing width (mm)</td>
<td>10</td>
<td>14</td>
<td>16</td>
<td>19</td>
</tr>
<tr>
<td>Finger opening width (mm)</td>
<td>16</td>
<td>22</td>
<td>28</td>
<td>37</td>
</tr>
<tr>
<td>Stroke (mm)</td>
<td>6</td>
<td>8</td>
<td>12</td>
<td>18</td>
</tr>
<tr>
<td>Weight (g) (2)</td>
<td>100 (95)</td>
<td>180 (175)</td>
<td>390 (380)</td>
<td>760 (740)</td>
</tr>
<tr>
<td>Connection port</td>
<td>M3 x 0.5</td>
<td></td>
<td>M5 x 0.8</td>
<td></td>
</tr>
<tr>
<td>Repeatability</td>
<td>±0.01 mm</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fluid</td>
<td>Air</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Operating pressure</td>
<td>0.2 to 0.6 MPa</td>
<td>0.15 to 0.6 MPa</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ambient and fluid temperature</td>
<td>0 to 60°C</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Max. operating frequency</td>
<td>180 c.p.m</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lubrication</td>
<td>Non-lube (2)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note 1) Refer to page 520 “Effective Gripping Force” for details of Gripping force at each gripping point. Value of effective gripping force is measured at the middle of opening/closing stroke.

Note 2) ( ) Value shows MDHR weight, but it does not include auto switch weight.

Note 3) This product should be used without lubrication. If it is lubricated, it could lead to sticking or slipping.

When the finger opening/closing speed is set as the total stroke of 0.2 seconds or more, it may cause the product to stick or completely stop its movement.

Made to Order: Individual Specifications
(For details, refer to page 544.)

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Specifications/Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>-X32</td>
<td>Grease change for rotary actuated part</td>
</tr>
</tbody>
</table>

Made to Order
Click here for details

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Specifications/Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>-X63</td>
<td>Fluorine grease</td>
</tr>
</tbody>
</table>
Gripping Point

- Workpiece gripping point should be within the gripping point range: The range shown for each operating pressure given in the graphs to the right.
- When the gripping point distance becomes large, the finger attachment applies an excessively large load to the finger sliding section, causing excessive play of the fingers and possibly leading to premature failure.

External grip

![External grip diagram]

Internal grip

![Internal grip diagram]

Limitation of Gripping: External Grip/Internal Grip

<table>
<thead>
<tr>
<th>Gripping Point L (mm)</th>
<th>Pressure</th>
<th>H (mm)</th>
<th>L (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0.2 MPa</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>10</td>
<td>0.3 MPa</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>20</td>
<td>0.4 MPa</td>
<td>20</td>
<td>20</td>
</tr>
<tr>
<td>30</td>
<td>0.5 MPa</td>
<td>30</td>
<td>30</td>
</tr>
<tr>
<td>40</td>
<td>0.6 MPa</td>
<td>40</td>
<td>40</td>
</tr>
<tr>
<td>50</td>
<td>0.7 MPa</td>
<td>50</td>
<td>50</td>
</tr>
</tbody>
</table>

Gripping Point

- Workpiece gripping point should be within the gripping point range: The range shown for each operating pressure given in the graphs to the right.
- When the gripping point distance becomes large, the finger attachment applies an excessively large load to the finger sliding section, causing excessive play of the fingers and possibly leading to premature failure.

External grip

![External grip diagram]

Internal grip

![Internal grip diagram]
Effective Gripping Force

Guidelines for the selection of the gripper with respect to workpiece mass
• Although conditions differ according to the workpiece shape and the coefficient of friction between the attachments and the workpiece, select a model that can provide a gripping force of 10 to 20 times the workpiece mass, or more.
• If high acceleration, deceleration or impact forces are encountered during motion a further margin of safety should be considered.

External grip

![External Grip Diagram]

Internal grip

![Internal Grip Diagram]

Indication of effective gripping force
The effective gripping force shown in the graphs to the right 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.

<table>
<thead>
<tr>
<th>External Grip</th>
<th>Internal Grip</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>MHR2-10/MDHR2-10</strong></td>
<td><strong>MHR2-10/MDHR2-10</strong></td>
</tr>
<tr>
<td><img src="image1.png" alt="Graph" /></td>
<td><img src="image2.png" alt="Graph" /></td>
</tr>
<tr>
<td><strong>MHR2-10/MDHR2-10</strong></td>
<td><strong>MHR2-10/MDHR2-10</strong></td>
</tr>
<tr>
<td><img src="image3.png" alt="Graph" /></td>
<td><img src="image4.png" alt="Graph" /></td>
</tr>
<tr>
<td><strong>MHR2-15/MDHR2-15</strong></td>
<td><strong>MHR2-15/MDHR2-15</strong></td>
</tr>
<tr>
<td><img src="image5.png" alt="Graph" /></td>
<td><img src="image6.png" alt="Graph" /></td>
</tr>
<tr>
<td><strong>MHR2-20/MDHR2-20</strong></td>
<td><strong>MHR2-20/MDHR2-20</strong></td>
</tr>
<tr>
<td><img src="image7.png" alt="Graph" /></td>
<td><img src="image8.png" alt="Graph" /></td>
</tr>
<tr>
<td><strong>MHR2-30/MDHR2-30</strong></td>
<td><strong>MHR2-30/MDHR2-30</strong></td>
</tr>
<tr>
<td><img src="image9.png" alt="Graph" /></td>
<td><img src="image10.png" alt="Graph" /></td>
</tr>
</tbody>
</table>
### Construction

#### MHR2

![Diagram of MHR2]

#### MDHR2

![Diagram of MDHR2]

### 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>Adaptor body</td>
<td>Aluminum alloy</td>
<td>Hard anodized</td>
</tr>
<tr>
<td>3</td>
<td>Guide holder</td>
<td>Stainless steel</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Cam</td>
<td>Cold rolled steel</td>
<td>Nitriding</td>
</tr>
<tr>
<td>5</td>
<td>Finger assembly</td>
<td>Stainless steel</td>
<td>Heat treated</td>
</tr>
<tr>
<td>6</td>
<td>Guide</td>
<td>Stainless steel</td>
<td>Heat treated</td>
</tr>
<tr>
<td>7</td>
<td>Pin</td>
<td>Carbon steel</td>
<td>Heat treated Electroless nickel plated</td>
</tr>
<tr>
<td>8</td>
<td>Pin roller</td>
<td>Stainless steel</td>
<td>Nitriding</td>
</tr>
<tr>
<td>9</td>
<td>Vane shaft</td>
<td>Stainless steel, NBR</td>
<td>M: HR2-30 is carbon steel NBR</td>
</tr>
<tr>
<td>10</td>
<td>Joint bolt</td>
<td>Chrome molybdenum steel</td>
<td>Zinc chromated</td>
</tr>
</tbody>
</table>

### 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>Stopper</td>
<td>Resin</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Back-up ring</td>
<td>Stainless steel plate</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>Hexagon socket head bolt</td>
<td>Stainless steel</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>Bearing</td>
<td>High carbon chrome bearing steel</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>Cylindrical roller</td>
<td>—</td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>Magnet</td>
<td>Stainless steel</td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>Magnet holder</td>
<td>Aluminum alloy</td>
<td>Hard anodized</td>
</tr>
<tr>
<td>18</td>
<td>Roller</td>
<td>Stainless steel</td>
<td></td>
</tr>
<tr>
<td>19</td>
<td>O-ring</td>
<td>NBR</td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>Stopper seal</td>
<td>NBR</td>
<td></td>
</tr>
</tbody>
</table>

SMC
Nominal Size 10

Without auto switch: MHR2-10R

MHR2-10E Port Location

3 x M3 x 0.5 thread depth 6
P.C.D.24 (Mounting thread)

M3 x 0.5
Finger closing port

M3 x 0.5
Finger opening port

ø36

33.4
32
30

120°

25°

25°

ø9h9.1

ø3-1

10

8.5

6 x M3 x 0.5 thread depth 6
(A, B, C common view)

2 x M3 x 0.5 thread depth 6
(Thread for mounting attachment)
With auto switch (Built-in magnet): MDHR2-10R

**MDHR2-10E Port Location**

- **A**
  - M3 x 0.5
  - Finger closing port
- **B**
  - M3 x 0.5
  - Finger opening port
- **C**

**Dimensional Differences between MHR and MDHR**

The following dimensions are different between MHR and MDHR series. And also, body shapes are different depending on auto switch mounting groove.

<table>
<thead>
<tr>
<th>Model</th>
<th>A</th>
<th>B</th>
</tr>
</thead>
<tbody>
<tr>
<td>MHR2</td>
<td>-10R</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>-10E</td>
<td>—</td>
</tr>
<tr>
<td>MDHR2</td>
<td>-10R</td>
<td>4.7</td>
</tr>
<tr>
<td></td>
<td>-10E</td>
<td>—</td>
</tr>
</tbody>
</table>
Nominal Size 15

Without auto switch: MHR2-15R

MHR2-15E Port Location

M3 x 0.5 Finger closing port
M3 x 0.5 Finger opening port

Nominal Size 15

Without auto switch: MHR2-15R

MHR2-15E Port Location

M3 x 0.5 Finger closing port
M3 x 0.5 Finger opening port
With auto switch (Built-in magnet): MDHR2-15R

MDHR2-15E Port Location

M3 x 0.5 Finger closing port
M3 x 0.5 Finger opening port

Auto switch mounting groove

3 x M3 x 0.5 thread depth 6
(P.C.D.29 (Mounting thread))

(A, B, C common view)

6 x M3 x 0.5 thread depth 6

(M3 x 0.5 Finger closing port)

3 x ø3.5 depth 6

(A, B, C common view)

3 x M3 x 0.5 Finger closing port

Finger opening port

M3 x 0.5

Finger opening port

M3 x 0.5

Finger closing port

(A, B, C common view)

2 x M3 x 0.5 thread depth 6

(Thread for mounting attachment)

Open: 22 Closed: 14

ø3.5

ø3.5

ø3.5-12\text{mm}

ø12h9-12\text{mm}

2 x 3

2 x 3

2 x ø4.2

ø4.2

ø4.2

ø4.5

MHR2/MDHR2 Series
Rotary Actuated Air Gripper
2-Finger Type

MHZ
MHF
MHL
MHR
MHK
MHS
MHC
MHT
MHY
MHW
MRHQ
MA
D-
MHR2/MDHR2 Series

Nominal Size 20

Without auto switch: MHR2-20R

MHR2-20E Port Location

M5 x 0.8
Finger closing port

M5 x 0.8
Finger opening port

6 x M4 x 0.7 thread depth 8
(A, B, C common view)

3 x ø4.58d depth 8
(A, B, C common view)

2 x M4 x 0.7 thread depth 8
(Thread for mounting attachment)

Nominal Size 20
With auto switch (Built-in magnet): MDHR2-20R

**MDHR2-20E Port Location**

- M5 x 0.8 Finger closing port
- M5 x 0.8 Finger opening port
- 3 x M4 x 0.7 thread depth 8 (P.C.D.36 (Mounting thread))
- 6 x M4 x 0.7 thread depth 8 (A, B, C common view)
- 3 x ø4 mm depth 8 (A, B, C common view)

**Auto switch mounting groove**

- Open: 28
- Closed: 16
- 2 x M4 x 0.7 thread depth 8 (Thread for mounting attachment)
MHR2/MDHR2 Series

Nominal Size 30
Without auto switch: MHR2-30R

MHR2-30E Port Location

- 3 x M5 x 0.8 thread depth 10
  P.C.D.43 (Mounting thread)

- M5 x 0.8 Finger opening port
- M5 x 0.8 Finger closing port

- 6 x M5 x 0.8 thread depth 10
  (A, B, C common view)

- 3 x ø5.5∅ thread depth 10
  (A, B, C common view)

- 2 x M5 x 0.8 thread depth 10
  (Thread for mounting attachment)
With auto switch (Built-in magnet): MDHR2-30R

### MDHR2-30E Port Location

- **B**: 15.5
- **P.C.D.43 (Mounting thread)**

### Dimensional Differences between MHR and MDHR

The following dimensions are different between the MHR and MDHR series. And also, body shapes are different depending on auto switch mounting groove.

<table>
<thead>
<tr>
<th>Model</th>
<th>B</th>
</tr>
</thead>
<tbody>
<tr>
<td>MHR2-30</td>
<td>25</td>
</tr>
<tr>
<td>MDHR2-30</td>
<td>25.5</td>
</tr>
</tbody>
</table>