**Built-in dust-protection mechanism**
A scraper with a dust lip is adopted for all rod rotating parts.

**Double-end type oil-impregnated resin bearings with a metal backing are used for all shafts.**

**Fingers synchronized by a rack and pinion mechanism.**

A large amount of gripping force is provided through the use of a double piston mechanism, while maintaining a compact design.

**Smaller auto switch mountable**
An auto switch can be mounted at 4 locations.

---

**Stroke Variation**

<table>
<thead>
<tr>
<th>Model</th>
<th>Bore size mm</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>10</td>
</tr>
<tr>
<td>MHL2-D</td>
<td>20</td>
</tr>
<tr>
<td>MHL2-D1</td>
<td>40</td>
</tr>
<tr>
<td>MHL2-D2</td>
<td>60</td>
</tr>
</tbody>
</table>

* Values of opening/closing strokes (mm)
## Parallel Type Air Gripper: Wide Type

### MHL2 Series

- **ø10, ø16, ø20, ø25, ø32, ø40**

### How to Order

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Type</th>
<th>Cylinder bore</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nil</td>
<td>M thread</td>
<td>ø10 to 25</td>
</tr>
<tr>
<td>TN</td>
<td>NPT</td>
<td>ø32 to ø40</td>
</tr>
<tr>
<td>TF</td>
<td>G</td>
<td></td>
</tr>
</tbody>
</table>

**Thread type**

- **Nil**
- **M thread**
- **Rc**
- **NPT**
- **G**

**Bore size**

- 10 mm
- 16 mm
- 20 mm
- 25 mm
- 32 mm
- 40 mm

**Number of fingers**

- 2 fingers

**Number of auto switches**

- Nil
- 2 pcs.
- S 1 pc.
- n "n" pcs.

**Double acting**

**Auto switch**

- Nil
- Without auto switch (Built-in magnet)

For the applicable auto switch model, refer to the table below.

**Opening/Closing stroke**

<table>
<thead>
<tr>
<th>Symbol</th>
<th>ø10</th>
<th>ø16</th>
<th>ø20</th>
<th>ø25</th>
<th>ø32</th>
<th>ø40</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nil</td>
<td>20</td>
<td>30</td>
<td>40</td>
<td>50</td>
<td>70</td>
<td>100</td>
</tr>
<tr>
<td>1</td>
<td>40</td>
<td>60</td>
<td>80</td>
<td>100</td>
<td>120</td>
<td>160</td>
</tr>
<tr>
<td>2</td>
<td>60</td>
<td>80</td>
<td>100</td>
<td>120</td>
<td>160</td>
<td>200</td>
</tr>
</tbody>
</table>

### Made to Order

Refer to page 499 for details.

### Applicable Auto Switches

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

#### Type

- Solid state auto switch
- Diagnosys (2-color indication)
- Water resistant (2-color indication)

#### Special functions

- Electrical entry
- Indicator light
- Wiring (Output)

#### Load voltage

- 5 V, 12 V
- 24 V

#### Auto switch model

- M9SV
- M9PV
- M9BV
- M9GWV
- M9PVW
- M9BV
- M9BWV
- M9PWV
- M9BV
- M9BWV
- M9PWV
- M9BV
- M9BWV
- M9PWV

#### Lead wire length (m)

- 0.5 (N)
- 1 (M)
- 3 (L)
- 5 (Z)

#### Pre-wired connector

- IC circuit
- Relay, PLC

#### Applicable load

**Note 1** 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.

**Note 2** When ordering the air gripper with the auto switch, the auto switch mounting bracket is included.

When ordering the auto switch separately, the auto switch mounting bracket (BMG2-012) is required.

**Solid state auto switches marked with "☆" are produced upon receipt of order.**

**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
- 1 m ······ M
- 3 m ······ L
- 5 m ······ Z

**SMC**
**Specifications**

<table>
<thead>
<tr>
<th>Model</th>
<th>Bore size (mm)</th>
<th>Max. operating frequency (c.p.m.)</th>
<th>Opening/Closing stroke (mm) (L2-L1)</th>
<th>Width at closing (mm) (L1)</th>
<th>Width at opening (mm) (L2)</th>
<th>Weight (g)</th>
</tr>
</thead>
<tbody>
<tr>
<td>MHHL2-10D</td>
<td>10</td>
<td>60</td>
<td>20</td>
<td>56</td>
<td>76</td>
<td>280</td>
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<td>MHHL2-10D1</td>
<td>16</td>
<td>40</td>
<td>40</td>
<td>78</td>
<td>118</td>
<td>345</td>
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<td>MHHL2-10D2</td>
<td>20</td>
<td>60</td>
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<td>425</td>
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<td>MHHL2-16D</td>
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<td>585</td>
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<td>MHHL2-16D1</td>
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<td>110</td>
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<td>130</td>
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<td>935</td>
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<td>MHHL2-20D</td>
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<td>60</td>
<td>60</td>
<td>82</td>
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<td>1025</td>
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<td>MHHL2-20D1</td>
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<td>1495</td>
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<td>MHHL2-20D2</td>
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<td>100</td>
<td>162</td>
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<td>1690</td>
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<td>150</td>
<td>220</td>
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<td>MHHL2-20D4</td>
<td>40</td>
<td>30</td>
<td>100</td>
<td>188</td>
<td>288</td>
<td>5270</td>
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<tr>
<td>MHHL2-20D5</td>
<td>40</td>
<td>20</td>
<td>160</td>
<td>246</td>
<td>406</td>
<td>6830</td>
</tr>
</tbody>
</table>

**Model/Stroke**

- **Symbol**: Double acting: Internal grip
- **Symbol**: Double acting: External grip

- **Symbol**: Made to Order: Individual Specifications
  - **-X28**: With adjuster bolts for adjusting closing width

- **Symbol**: Made to Order
  - **-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

**Precautions**

- **Warning**: If a workpiece is hooked onto the attachment, make sure that excessive impact will not be created at the start and the end of the movement. Failure to observe this precaution may result in shifting or dropping the workpiece, which could be dangerous.

- **Note**: The open and close time spans represent the value when the exterior of the workpiece is being held.

**Long stroke**

One unit can handle workpieces with various diameters.

A large amount of gripping force is provided through the use of a double piston mechanism, while maintaining a compact design.

Double-end type oil-impregnated resin bearings with a metal backing are used for all shafts.

Built-in dust-protection mechanism

A high degree of freedom for mounting

Auto switch mountable

Applicable for Clean Series. Refer to "Pneumatic Clean Series (CAT.E02-23) " catalog for details.
**MHL2 Series**

**Gripping Point**

- The workpiece gripping point distance should be within the gripping force ranges given for each pressure in the effective gripping force graphs below.
- If operated with the workpiece gripping point beyond the indicated ranges, the load that will be applied to the fingers or the guide will become excessively unbalanced. As a result, the fingers could become loosened and adversely affect the service life of the unit.

---

**Effective Gripping Force**

- **Indication of effective gripping force**
  The gripping force shown in the tables represents the gripping force of one finger when all fingers and attachments are in contact with the work. F = one finger thrust.

---

**Gripping Point**

- **MHL2-10D**
- **MHL2-10D\(^1\)**
- **MHL2-16D**
- **MHL2-16D\(^2\)**

---

**Gripping Point**

- **MHL2-20D**
- **MHL2-20D\(^1\)**
- **MHL2-25D**
- **MHL2-25D\(^1\)**

---

**Gripping Point**

- **MHL2-32D**
- **MHL2-32D\(^1\)**
- **MHL2-40D**
- **MHL2-40D\(^2\)**

---
Model Selection Example

**Procedure**

- **Confirmation of conditions**
- **Select possible points according to the work length**
- **Calculation of required gripping force**
- **Selection of model from gripping force graph**

**Work form**
Diameter x Length
200 mm x 20 mm plate

**Work length:** From the dimensions of models that have an opening width of 200 mm or more
- MHL2-16D2
- MHL2-20D1/D2
- MHL2-25D1/D2

**Gripping point R = 70 mm**

**Operating pressure:** 0.5 MPa

**Work mass:** 0.3 kg

**Guidelines for the selection of the gripper with respect to component 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.
- Further allowance should be provided when great acceleration or impact is expected during workpiece transfer.
- Example: For setting the gripping force to be at least 20 times the workpiece mass: Required gripping force = 0.3 kg x 20 x 9.8 m/s² = 60 N

**Selecting the MHL2-20D1**
- A gripping force of 73 N is obtained from the intersection point of gripping point position R = 70 and a pressure 0.5 MPa.
- The gripping force is 24 times greater than the workpiece mass, and therefore satisfies a gripping force setting value of 20 times or more.

---

**Parallel Type Air Gripper: Wide Type MHL2 Series**

**Model Selection Example**

- MHL2-20D1

**Gripping force (N)**
- 20
- 40
- 60
- 80
- 100
- 120

**Pressure (MPa)**
- 0.6
- 0.5
- 0.4
- 0.3
- 0.2

**Gripping point R (mm)**
- 0
- 20
- 40
- 60
- 70
- 80
- 100
- 120

**MHZ**
**MHF**
**MHL**
**MHR**
**MHK**
**MHS**
**MHC**
**MHT**
**MHY**
**MHW**
**MRHQ**
**MA**
**D**
**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>Finger</td>
<td>Aluminum alloy</td>
<td>Hard anodized</td>
</tr>
<tr>
<td>3</td>
<td>Piston rod</td>
<td>Stainless steel</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Rack</td>
<td>Stainless steel</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Pinion</td>
<td>Carbon steel</td>
<td>Nitriding</td>
</tr>
<tr>
<td>6</td>
<td>Pinion cover</td>
<td>Carbon steel</td>
<td>Electroless nickel plated</td>
</tr>
<tr>
<td>7</td>
<td>Pinion axis</td>
<td>Stainless steel</td>
<td>Nitriding</td>
</tr>
<tr>
<td>8</td>
<td>Piston</td>
<td>Brass</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Piston A</td>
<td>Brass</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Piston B</td>
<td>Brass</td>
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</tr>
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<td>11</td>
<td>Piston A</td>
<td>Stainless steel</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Rod cover</td>
<td>Aluminum alloy</td>
<td>Chromate treated</td>
</tr>
<tr>
<td>13</td>
<td>Bumper</td>
<td>Urethane rubber</td>
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</tr>
<tr>
<td>14</td>
<td>Clip</td>
<td>Stainless steel spring wire</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>Rubber magnet</td>
<td>Synthetic rubber</td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>Magnet</td>
<td>—</td>
<td>Nickel plated</td>
</tr>
</tbody>
</table>

**Replacement Parts**

<table>
<thead>
<tr>
<th>Description</th>
<th>MHL2-10③</th>
<th>MHL2-16③</th>
<th>MHL2-20③</th>
<th>MHL2-25③</th>
<th>MHL2-32③</th>
<th>MHL2-40③</th>
<th>Main parts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Seal kit</td>
<td>MHL10-PS</td>
<td>MHL16-PS</td>
<td>MHL20-PS</td>
<td>MHL25-PS</td>
<td>MHL32-PS</td>
<td>MHL40-PS</td>
<td>30/27/26/23/20</td>
</tr>
<tr>
<td>Piston assembly</td>
<td>MHL2-③</td>
<td>MHL-A1001</td>
<td>MHL-A1601</td>
<td>MHL-A2001</td>
<td>MHL-A2501</td>
<td>MHL-A3201</td>
<td>MHL-A4001</td>
</tr>
<tr>
<td>Rod cover</td>
<td>MHL2-③</td>
<td>MHL-A1004</td>
<td>MHL-A1604</td>
<td>MHL-A2004</td>
<td>MHL-A2504</td>
<td>MHL-A3204</td>
<td>MHL-A4004</td>
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<tr>
<td>Rod Cover assembly</td>
<td>MHL2-③</td>
<td>MHL-A1005</td>
<td>MHL-A1605</td>
<td>MHL-A2005</td>
<td>MHL-A2505</td>
<td>MHL-A3205</td>
<td>MHL-A4005</td>
</tr>
<tr>
<td>Finger assembly</td>
<td>MHL-A1006</td>
<td>MHL-A1606</td>
<td>MHL-A2006</td>
<td>MHL-A2506</td>
<td>MHL-A3206</td>
<td>MHL-A4006</td>
<td>③</td>
</tr>
<tr>
<td>Nut set</td>
<td>MHL-A1607</td>
<td>MHL-A2007</td>
<td>MHL-A2507</td>
<td>MHL-A3207</td>
<td>MHL-A4007</td>
<td>③</td>
<td>③</td>
</tr>
<tr>
<td>U nut assembly</td>
<td>MHL-A170A</td>
<td>MHL-A171A</td>
<td>MHL-A201A</td>
<td>MHL-A251A</td>
<td>MHL-A321A</td>
<td>MHL-A401A</td>
<td>②</td>
</tr>
</tbody>
</table>

* Order one finger assembly, pinion assembly, nut set and U nut assembly per unit.
* For piston assembly and rack, order 2 pieces per unit.
* For rod cover assembly, order 4 pieces per unit.

**Replacement part: grease pack part no.**

<table>
<thead>
<tr>
<th>MHL2-③</th>
<th>GR-S-010 (10 g)</th>
</tr>
</thead>
<tbody>
<tr>
<td>MHL2-③</td>
<td>GR-S-010 (10 g)</td>
</tr>
<tr>
<td>MHL2-③</td>
<td>GR-S-010 (10 g)</td>
</tr>
<tr>
<td>MHL2-③</td>
<td>GR-S-020 (20 g)</td>
</tr>
<tr>
<td>MHL2-③</td>
<td>GR-S-010 (10 g)</td>
</tr>
<tr>
<td>MHL2-③</td>
<td>GR-S-010 (10 g)</td>
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<td>MHL2-③</td>
<td>GR-S-010 (10 g)</td>
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<td>MHL2-③</td>
<td>GR-S-020 (20 g)</td>
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<td>GR-S-010 (10 g)</td>
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<td>MHL2-③</td>
<td>GR-S-020 (20 g)</td>
</tr>
<tr>
<td>MHL2-③</td>
<td>GR-S-010 (10 g)</td>
</tr>
</tbody>
</table>
Dimensions

MHL2-10D

2 x M4 x 0.7 thread depth 5
(Mounting thread)

2 x ø4.5 through
(Body mounting hole)

ø3H9       depth 3
+0.025

4 x M4 x 0.7 thread depth 8
(Mounting thread)

ø18H9       depth 1.5
+0.043

3H9       depth 3
+0.025

Dimensions of auto switch mounting groove (Enlarged view)

Auto switch mounting groove (4 locations)

4 x M5 x 0.8
(Finger opening port)

M5 x 0.8
(Finger closing port)

4 x M5 x 0.8
(Piston rod and rack screw)

$\star$ Dimensions of auto switch mounting groove (Enlarged view)

Auto switch mounting groove (4 locations)$^*$

4 x M4 x 0.7 through
(Thread for mounting attachment)

<table>
<thead>
<tr>
<th>Model</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
<th>H</th>
<th>J</th>
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<tbody>
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<td>38</td>
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<td>57</td>
<td>146</td>
</tr>
</tbody>
</table>

Note 1) J dimension is at fully closed.
Note 2) D1 is different from D2 at finger closed because shaft is ejected from finger end. J dimension is different from the value which is subtracted stroke from G dimension.
**MHL2 Series**

**Dimensions**

**MHL2-16D**

![Diagram of MHL2-16D](image)

<table>
<thead>
<tr>
<th>Model</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
<th>H</th>
<th>J</th>
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</thead>
<tbody>
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<td>210</td>
<td>240</td>
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<td>192</td>
</tr>
</tbody>
</table>

*Note 1* J dimension is at fully closed.

*Note 2* D1 is different from D2 at finger closed because shaft is ejected from finger end. J dimension is different from the value which is subtracted stroke from G dimension.
Parallel Type Air Gripper: Wide Type *MHL2* Series

**Dimensions**

**MHL2-20D**

2 x M6 x 1 thread depth 7
(Mounting thread)

2 x ø6.6 through
(Body mounting hole)

ø4H9       depth 4
+0.030

4 x M6 x 1 thread depth 12
(Mounting thread)

ø27H9       depth 1.5
+0.052

4H9       depth 4
+0.030

∗ Dimensions of auto switch mounting groove (Enlarged view)

Auto switch mounting groove (4 locations)∗

4 x M6 x 1 through
(Thread for mounting attachment)

4 x M6 x 1 through
(Finger closing port)

M5 x 0.8
(Finger opening port)

M5 x 0.8
(Finger closing port)

Piston rod and rack screw

Width across flats 10
(4 locations)

4 x M6 x 1 through
(4 locations)

Width across flats 10

54
58
71
38
82
122
68
195

A B C D E F G H J

MH2L-20D
MH2L-20D1

54 58 71 38 82 122 68 195

116 120 133 100 162 262 300 88 235

Note 1) J dimension is at fully closed.
Note 2) D1 is different from D2 at finger closed because shaft is ejected from finger end. J dimension is different from the value which is subtracted stroke from G dimension.
### Dimensions

#### MHL2-25D

<table>
<thead>
<tr>
<th>Model</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
<th>H</th>
<th>J</th>
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</thead>
<tbody>
<tr>
<td>MHL2-25D</td>
<td>66</td>
<td>70</td>
<td>88</td>
<td>48</td>
<td>100</td>
<td>150</td>
<td>196</td>
<td>38</td>
<td>146</td>
</tr>
<tr>
<td>MHL2-25D1</td>
<td>120</td>
<td>124</td>
<td>142</td>
<td>102</td>
<td>182</td>
<td>282</td>
<td>328</td>
<td>86</td>
<td>244</td>
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<tr>
<td>MHL2-25D2</td>
<td>138</td>
<td>142</td>
<td>160</td>
<td>120</td>
<td>200</td>
<td>320</td>
<td>366</td>
<td>104</td>
<td>282</td>
</tr>
</tbody>
</table>

Note 1) J dimension is at fully closed.

Note 2) D1 is different from D2 at finger closed because shaft is ejected from finger end. J dimension is different from the value which is subtracted stroke from G dimension.

---

*Dimensions of auto switch mounting groove (Enlarged view)*

*4 x M8 x 1.25 thread depth 7 (Mounting thread)*

*2 x Ø9 through (Body mounting hole)*

*Ø4H9 45° depth 4.5*

*Ø32H9 45° depth 1.5 +0.052 0*

*4 x M8 x 1.25 thread depth 16 (Mounting thread)*

*Finger closing port M5 x 0.8*

*Finger opening port M5 x 0.8 (Piston rod and rack screw)*

*4 x M8 x 1.25 through (Thread for mounting attachment)*

---

**Closed J**

**Closed E**

**Open F**

**Closed F**

**Dimensions of auto switch mounting groove (4 locations)**

**M5 x 9.8 (Finger closing port)**

**M5 x 0.8 (Finger opening port)**

---

**MHL2 Series**

---

**Note 1) J dimension is at fully closed.**

**Note 2) D1 is different from D2 at finger closed because shaft is ejected from finger end. J dimension is different from the value which is subtracted stroke from G dimension.**
Parallel Type Air Gripper: Wide Type **MHL2 Series**

**Dimensions**

**MHL2-32D**

- **2 x M8 x 1.25 thread depth 11** (Mounting thread)
- **ø6H9° depth 8**
- **ø32H9° depth 2.5**
- **4 x M8 x 1.25 thread depth 16** (Mounting thread)
- **ø6H9° depth 8**
- **Rc 1/8 (G 1/8, NPT 1/8)** (Finger closing port)
- **Rc 1/8 (G 1/8, NPT 1/8)** (Finger opening port)
- **4 x M10 x 1.5** (Piston rod and rack screw)
- **Auto switch mounting groove (4 locations)**
- **Dimensions of auto switch mounting groove (Enlarged view)**
- **Closed J**
- **Dimensions of auto switch mounting groove (Enlarged view)**
- **Width across flats 17 (4 locations)**

**Model**

<table>
<thead>
<tr>
<th>Model</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
<th>H</th>
<th>J</th>
</tr>
</thead>
<tbody>
<tr>
<td>MHL2-32D</td>
<td>86</td>
<td>110</td>
<td>60</td>
<td>150</td>
<td>220</td>
<td>272</td>
<td>56</td>
<td>202</td>
</tr>
<tr>
<td>MHL2-32D1</td>
<td>134</td>
<td>158</td>
<td>108</td>
<td>198</td>
<td>318</td>
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<td>104</td>
<td>282</td>
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<tr>
<td>MHL2-32D2</td>
<td>178</td>
<td>202</td>
<td>152</td>
<td>242</td>
<td>402</td>
<td>454</td>
<td>148</td>
<td>366</td>
</tr>
</tbody>
</table>

**Note 1)** J dimension is at fully closed.
**Note 2)** D1 is different from D2 at finger closed because shaft is ejected from finger end. J dimension is different from the value which is subtracted stroke from G dimension.
**MHL2 Series**

### Dimensions

#### MHL2-40D

- **Closed J**
- **K cross view (Fingers closed)**
- **Dimensions of auto switch mounting groove (Enlarged view)**

#### MHL2-40D1

#### MHL2-40D2

---

<table>
<thead>
<tr>
<th>Model</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
<th>H</th>
<th>J</th>
</tr>
</thead>
<tbody>
<tr>
<td>MHL2-40D</td>
<td>116</td>
<td>148</td>
<td>80</td>
<td>188</td>
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<td>348</td>
<td>72</td>
<td>252</td>
</tr>
<tr>
<td>MHL2-40D1</td>
<td>174</td>
<td>206</td>
<td>138</td>
<td>246</td>
<td>406</td>
<td>466</td>
<td>130</td>
<td>370</td>
</tr>
<tr>
<td>MHL2-40D2</td>
<td>214</td>
<td>246</td>
<td>178</td>
<td>286</td>
<td>486</td>
<td>546</td>
<td>170</td>
<td>450</td>
</tr>
</tbody>
</table>

**Note 1)** J dimension is at fully closed.  
**Note 2)** D1 is different from D2 at finger closed because shaft is ejected from finger end. J dimension is different from the value which is subtracted stroke from G dimension.

---

(MM)

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508
**MHL2 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>Position of fingers fully opened</td>
<td>Position when gripping a workpiece</td>
<td>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**

- One auto switch
  - One position, any of 1, 2, and 3 can be detected.

- Two auto switches
  - Two positions of 1, 2, and 3 can be detected.

**Pattern**

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>●</td>
<td>●</td>
<td>—</td>
</tr>
<tr>
<td>●</td>
<td>—</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 following drawing.

Step 3) Slide the auto switch in the direction of the arrow until the indicator light illuminates. Move the switch further 0.3 to 0.5 mm in the direction of the arrow and fasten it.

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>
<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>Position of fingers fully closed</td>
<td>Position when gripping a workpiece</td>
<td>Position of fingers fully opened</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Operation of auto switch</th>
<th>Auto switch turned ON when fingers return. (Light ON)</th>
<th>Auto switch turned ON when gripping a workpiece. (Light ON)</th>
<th>When a workpiece is not held (Abnormal operation): Auto switch to turn ON (Light ON)</th>
</tr>
</thead>
</table>

### Detection combinations

- **One auto switch**
  - One position, any of 1, 2, and 3 can be detected.

- **Two auto switches**
  - Two positions of 1, 2, and 3 can be detected.

<table>
<thead>
<tr>
<th>Pattern</th>
<th>A</th>
<th>B</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operation</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### How to determine auto switch installation position

1. Confirmation of fingers in reset position
2. Confirmation of workpiece held
3. Confirmation of workpiece released

- Step 1) Fully close the fingers.
- Step 1) Position fingers for gripping a workpiece.
- Step 1) Fully open the fingers.

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

Step 2) Insert the auto switch into the auto switch installation groove in the direction shown in the following drawing.

Step 3) Move the auto switch in the direction of the arrow until the light illuminates and fasten it at a position 0.3 to 0.5 mm in the direction of the arrow beyond the position where the indicator light illuminates.

Step 3) Slide the auto switch in the direction of the arrow until the indicator light illuminates.

Step 4) Slide the auto switch a further distance 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.
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 Mounting

1. To set the auto switch, insert the auto switch into the installation groove of the cylinder as shown below and set it roughly.
2. Insert the auto switch into the auto switch bracket installation groove.
3. After confirming the detecting position, tighten the set screws (M2.5) attached to the auto switch and set it.
4. Be sure to change the detecting position in the state of (2).

Note) Use a watchmaker’s screwdriver with a grip diameter of 5 to 6 mm to tighten the set screws (M2.5).
   The tightening torque should be 0.05 to 0.1 N·m.
   As a rule, it should be turned about 90° beyond the point at which tightening can be felt.

Auto Switch Mounting Bracket: Part No.

<table>
<thead>
<tr>
<th>Auto switch part no.</th>
<th>Auto switch mounting bracket part no.</th>
</tr>
</thead>
<tbody>
<tr>
<td>D-M9□(V)</td>
<td>BMG2-012</td>
</tr>
<tr>
<td>D-M9□W(V)</td>
<td></td>
</tr>
<tr>
<td>D-M9□A(V)</td>
<td></td>
</tr>
</tbody>
</table>

Auto Switch Mounting Brackets: Precautions

When auto switch is set on the mounting side as shown below, allow at least 2 mm runoff space on mounting plate since the auto switch is protruded from the gripper edge.

Auto Switch Hysteresis

The auto switch hysteresis is shown in the table below.
Please refer to the table as a guide when setting auto switch positions.

<table>
<thead>
<tr>
<th>Auto switch part no.</th>
<th>Air gripper model</th>
</tr>
</thead>
<tbody>
<tr>
<td>MHL2-10D</td>
<td>D-Y9□/Y69□/Y7P/Y7PV</td>
</tr>
<tr>
<td>MHL2-16D</td>
<td>D-Y7□W/Y7□WV</td>
</tr>
<tr>
<td>MHL2-20D</td>
<td>D-M9□(V)</td>
</tr>
<tr>
<td>MHL2-25D</td>
<td>M9□W(V)</td>
</tr>
<tr>
<td>MHL2-32D</td>
<td>M9□A(V)</td>
</tr>
<tr>
<td>MHL2-40D</td>
<td></td>
</tr>
</tbody>
</table>

Run off space 2 mm or more

Note: Use a watchmaker’s screwdriver with a grip diameter of 5 to 6 mm to tighten the set screws (M2.5).
The tightening torque should be 0.05 to 0.1 N·m.
As a rule, it should be turned about 90° beyond the point at which tightening can be felt.
**MHL2 Series**

**Made to Order: Individual Specifications**

1. **With An Adjuster for Closing Stroke Adjustment**
   
   Finger closing stroke can be fine-tuned by an adjustment bolt.

   **How to Order**
   
   **Standard part number**
   
   -X28

   **Specifications**

<table>
<thead>
<tr>
<th>Bore size (mm)</th>
<th>10, 16, 20, 25, 32</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adjustment range/Adjustment bolt position</td>
<td>Refer to the dimensions and figures below.</td>
</tr>
<tr>
<td>Specifications/dimensions other than the above</td>
<td>Same as the standard type</td>
</tr>
</tbody>
</table>

   Note) Please contact SMC for the MHL2 series ø40.

   **Dimensions**

   (Dimensions other than specified below are the same as the standard type.)

   ![Diagram of MHL2 Series]

   - Closing stroke adjustment: F
   - Width across flats: D
   - Maximum when adjusted: E

   **Specifications/dimensions**

   
<table>
<thead>
<tr>
<th>Model</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>MM</th>
</tr>
</thead>
<tbody>
<tr>
<td>MHL2-10D-X28</td>
<td>22</td>
<td>15.5</td>
<td>2.5</td>
<td>7</td>
<td>4</td>
<td>2</td>
<td>M5 x 0.8</td>
</tr>
<tr>
<td>MHL2-10D1-X28</td>
<td>11</td>
<td>16</td>
<td>9.5</td>
<td>9</td>
<td>13.5</td>
<td>20</td>
<td>M6 x 1</td>
</tr>
<tr>
<td>MHL2-16D-X28</td>
<td>27.5</td>
<td>18.5</td>
<td>3</td>
<td>8</td>
<td>7.5</td>
<td>7</td>
<td>M8 x 1</td>
</tr>
<tr>
<td>MHL2-16D1-X28</td>
<td>13.5</td>
<td>20</td>
<td>9</td>
<td>9</td>
<td>13.5</td>
<td>20</td>
<td>M10 x 1</td>
</tr>
<tr>
<td>MHL2-20D-X28</td>
<td>32.5</td>
<td>21</td>
<td>4</td>
<td>12</td>
<td>8.5</td>
<td>9</td>
<td>M10 x 1.5</td>
</tr>
<tr>
<td>MHL2-20D1-X28</td>
<td>8.5</td>
<td>9</td>
<td>14</td>
<td>7.5</td>
<td>15</td>
<td>18</td>
<td>M12 x 1.75</td>
</tr>
<tr>
<td>MHL2-25D-X28</td>
<td>38</td>
<td>26</td>
<td>5</td>
<td>17</td>
<td>32.5</td>
<td>51</td>
<td></td>
</tr>
<tr>
<td>MHL2-25D1-X28</td>
<td>15</td>
<td>18</td>
<td>14</td>
<td>7.5</td>
<td>15</td>
<td>18</td>
<td>M12 x 1.75</td>
</tr>
<tr>
<td>MHL2-32D-X28</td>
<td>41</td>
<td>32</td>
<td>6</td>
<td>19</td>
<td>32.5</td>
<td>51</td>
<td>M12 x 1.75</td>
</tr>
<tr>
<td>MHL2-32D1-X28</td>
<td>32.5</td>
<td>51</td>
<td>32.5</td>
<td>51</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>MHL2-32D2-X28</td>
<td>32.5</td>
<td>51</td>
<td>32.5</td>
<td>51</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
**MHL2 Series**

**Specific Product Precautions**

Be sure to read this before handling the products.

### Mounting Air Grippers/MHL2 Series

Possible to mount from 2 directions.

#### Axial Mounting

- **Body tapped**

#### Lateral mounting

- **Body ø10 to ø25**

<table>
<thead>
<tr>
<th>Model</th>
<th>Applicable bolts</th>
<th>Max. tightening torque (N·m)</th>
<th>Max. screw-in depth (Lmm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>MHL2-10D</td>
<td>M4 x 0.7</td>
<td>2.1</td>
<td>8</td>
</tr>
<tr>
<td>MHL2-16D</td>
<td>M5 x 0.8</td>
<td>4.3</td>
<td>10</td>
</tr>
<tr>
<td>MHL2-20D</td>
<td>M6 x 1</td>
<td>7.3</td>
<td>12</td>
</tr>
<tr>
<td>MHL2-25D</td>
<td>M8 x 1.25</td>
<td>17.7</td>
<td>16</td>
</tr>
<tr>
<td>MHL2-32D</td>
<td>M8 x 1.25</td>
<td>18</td>
<td>16</td>
</tr>
<tr>
<td>MHL2-40D</td>
<td>M10 x 1.5</td>
<td>36</td>
<td>20</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Model</th>
<th>Applicable bolts</th>
<th>Max. tightening torque (N·m)</th>
<th>Max. screw-in depth (Lmm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>MHL2-10D</td>
<td>M4 x 0.7</td>
<td>1.4</td>
<td>5</td>
</tr>
<tr>
<td>MHL2-16D</td>
<td>M5 x 0.8</td>
<td>2.8</td>
<td>7</td>
</tr>
<tr>
<td>MHL2-20D</td>
<td>M6 x 1</td>
<td>4.8</td>
<td>7</td>
</tr>
<tr>
<td>MHL2-25D</td>
<td>M8 x 1.25</td>
<td>12.0</td>
<td>7</td>
</tr>
<tr>
<td>MHL2-32D</td>
<td>M8 x 1.25</td>
<td>12.0</td>
<td>11</td>
</tr>
<tr>
<td>MHL2-40D</td>
<td>M10 x 1.5</td>
<td>24.0</td>
<td>12</td>
</tr>
</tbody>
</table>

### How to Mount the Attachment to the Finger

1. Make sure that the piston rod is retracted so as not to apply undue strain on the piston rod while an attachment is being mounted to the finger.
2. Do not scratch or dent the sliding portion of the piston rod. Damage to the bearings or seals may cause air leaks or faulty operation.
3. Refer to the table below for the proper tightening torque on the bolt used for securing the attachment to the finger.

<table>
<thead>
<tr>
<th>Model</th>
<th>Applicable bolts</th>
<th>Max. tightening torque (N·m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>MHL2-10D</td>
<td>M4 x 0.7</td>
<td>1.4</td>
</tr>
<tr>
<td>MHL2-16D</td>
<td>M5 x 0.8</td>
<td>2.8</td>
</tr>
<tr>
<td>MHL2-20D</td>
<td>M6 x 1</td>
<td>4.8</td>
</tr>
<tr>
<td>MHL2-25D</td>
<td>M8 x 1.25</td>
<td>12.0</td>
</tr>
<tr>
<td>MHL2-32D</td>
<td>M8 x 1.25</td>
<td>12.0</td>
</tr>
<tr>
<td>MHL2-40D</td>
<td>M10 x 1.5</td>
<td>24.0</td>
</tr>
</tbody>
</table>

---

![Diagram of mounting options](image-url)