Air Gripper with Finger Changer Function

Automatic tool changer unit for robots

The wiring and piping are bundled together in the body of the air gripper (robot side).

- Improves electric contact during tool changes, reduces air leakage due to defective piping connections, etc.
- Various workpieces can be handled by a single robot.
  Increased productivity due to reduced attachment replacement and positioning work.

---

**Application Example**

For workpiece selection

---

**MHF2-X7076A**

**Overall length:** Reduced by 82% or more

(Compared with the existing model (MA210 + MHF2), size ø8)

**Weight:** Reduced by 69% or more

(485 g → 150 g)

(Compared with the existing model (MA210 + MHF2), size ø8)
Configured for improved function and easier maintenance

Improved mounting repeatability
With positioning pin holes

Finger assembly separation port
Separates when air pressure is supplied

Linear guide provides:
High precision and high rigidity with martensitic stainless steel

Easy positioning for mounting attachments
With positioning pin holes

Mounting is possible from 2 directions.

Top mounting (Body tapped)
Body through-hole

Working Principle

The needle roller pushes the taper of the connecting finger with a spring force when pressure is not supplied to the finger assembly separation port to generate an axial force when connected to make the connection.

When pressurized from the finger assembly separation port

When pressure is supplied to the finger assembly separation port, while the lock piston moves outward, the finger assembly is separated by the spring force of the plunger.
Air Gripper with Finger Changer Function

How to Order

MHF2-8D1R-M9BW-X7076A

1 Number of fingers
2 Bore size [mm]
3 Action
4 Opening/Closing stroke (Both sides)
5 Body option
6 Auto switch
7 Number of auto switches

Finger assembly

MHF-A0802-1-X7076A

1 Bore size [mm]
2 Opening/Closing stroke (Both sides)

Applicable Auto Switches

<table>
<thead>
<tr>
<th>Type</th>
<th>Special function</th>
<th>Electrical entry</th>
<th>Wiring (Output)</th>
<th>Load voltage</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>—</td>
<td>Grommet Yes</td>
<td>3-wire (NPN)</td>
<td>DC 5 V, 12 V</td>
<td>M9NV M9N</td>
<td>0.5 1 3 5</td>
<td>(Nil) (M) (L) (Z)</td>
<td>IC circuit</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2-wire</td>
<td>12 V</td>
<td>M9PV M9P</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>3-wire (NPN)</td>
<td>24 V</td>
<td>M9BV M9B</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>3-wire (PNP)</td>
<td></td>
<td>M9NWV M9NW</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2-wire</td>
<td>12 V</td>
<td>M9PVW M9PW</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>3-wire (NPN)</td>
<td></td>
<td>M9NAV M9NA</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>3-wire (PNP)</td>
<td></td>
<td>M9PAV M9PA</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2-wire</td>
<td>12 V</td>
<td>M9BAY M9BA</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- For applicable auto switches, refer to the table below.
- Water-resistant type auto switches can be mounted on the above models, but SMC cannot guarantee water resistance.
- Auto switches marked with "v" are produced upon receipt of order.

Specifications

<table>
<thead>
<tr>
<th>Bore size [mm]</th>
<th>8</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fluid</td>
<td>Air</td>
</tr>
<tr>
<td>Action</td>
<td>Gripper unit Double acting</td>
</tr>
<tr>
<td></td>
<td>Changer unit Single acting (Normally connected)</td>
</tr>
<tr>
<td>Operating pressure [MPa]</td>
<td>Gripper unit 0.15 to 0.7</td>
</tr>
<tr>
<td></td>
<td>Changer unit 0.45 to 0.6</td>
</tr>
<tr>
<td>Ambient temperature [°C]</td>
<td>-10 to 60</td>
</tr>
<tr>
<td>Axial force when connected (Theoretical value) [N]</td>
<td>98</td>
</tr>
<tr>
<td>Finger position holding force [N]</td>
<td>4.3</td>
</tr>
<tr>
<td>Position of fingers when fully open</td>
<td>0.6</td>
</tr>
<tr>
<td>Gripping force per finger at 0.5 MPa (Effective value) [N]</td>
<td>19</td>
</tr>
<tr>
<td>Opening/Closing stroke (Both sides) [mm]</td>
<td>16</td>
</tr>
<tr>
<td>Max. operating frequency [c.p.m]</td>
<td>120</td>
</tr>
<tr>
<td>Lubricant</td>
<td>Non-lube</td>
</tr>
<tr>
<td>Weight [g]</td>
<td>150 (Finger assembly: 38)</td>
</tr>
</tbody>
</table>

*1 The theoretical holding force (reference value) which fixes the finger position when the finger assembly is separated.
Dimensions

Air Gripper with Finger Changer Function
MHF2-8D1R-X7076A

When closed ±0.1
When open ±0.1

2 x ø2 H9 (+0.025) depth 2
4 x M2.5 x 0.45 thread depth 3

Screw for body through-hole mounting
M2.5 x 0.45
Accessory: Hexagon socket head cap screw (special screws)

Finger assembly
MHF-A08021-X7076A

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

Accessory: Hexagon socket head cap screw (special screws)
**Caution**

1. While pressure is being supplied to the finger opening/closing ports, the finger assembly may be difficult to separate.
   Use the exhaust center solenoid valve or 3-port solenoid valve together to separate the finger assembly after the pressure from the finger opening/closing ports has been released.

   **Recommended Circuit Examples**

   ![Recommended Circuit Examples Diagram]

2. It is recommended that the finger assembly be separated while the fingers are in a fully open state.
   (If the finger assembly is separated while the fingers are not in a fully open state, the force to fix the finger position will be reduced.)

3. When connecting, align the guide rail holes and pins (2 locations), and confirm that the convex part of each joint is aligned with the concave part of the rack. Then, tightly connect the body and guide rail.

   ![Connection Method Diagram]

4. If the separated state is not maintained, such as when the fingers or piston are operated while the finger assembly is separated, the pieces will no longer be able to connect as is.
   Align the convex part of each joint and the concave part of the rack to make the connection.
⚠️ Safety Instructions ⚠️ Be sure to read the “Handling Precautions for SMC Products” (M-E03-3) and “Operation Manual” before use.