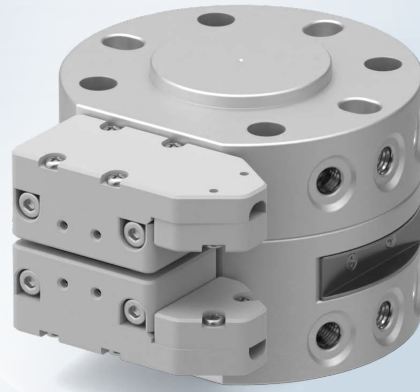


Tool Changer/ Auto Type

Work load: 5 kg, 10 kg, 20 kg

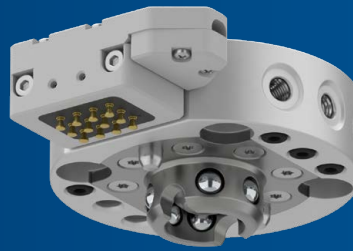


New
RoHS

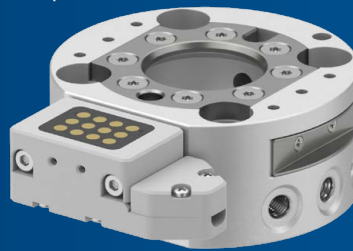
Robot hand tool automatic exchange

- Standards:
ISO9409-1 compliant
Support for direct mounting on
collaborative robots

Main plate



Tool plate



Robot and end tool connection/
release

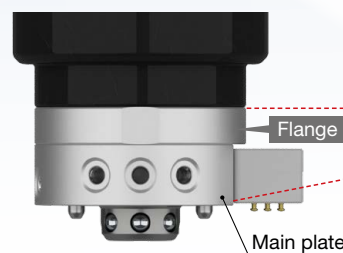


RMTA Series

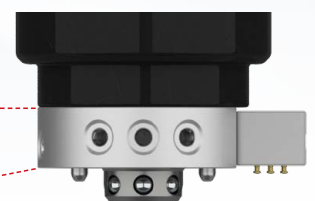
More compact as flanges are not
required.

Direct mounting on collaborative robots eliminates the
need for flanges and reduces design labor

General usage methods



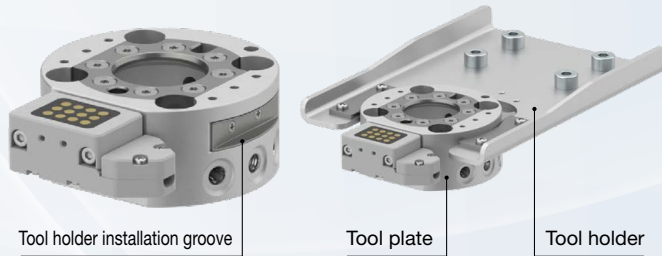
RMTA Series



CAT.ES160-13A

Integrating the mounting groove of the tool holder

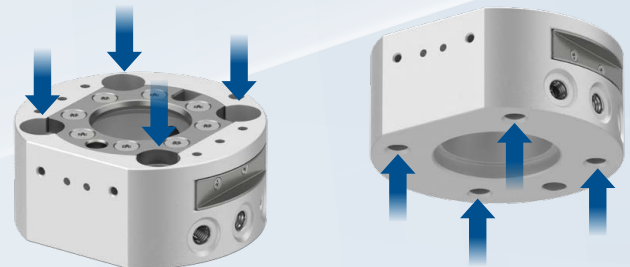
Reducing the design labor required to install the tool plate



Select the method used to install the tool plate.

Through hole mounting

Female thread mounting



High precision and high rigidity

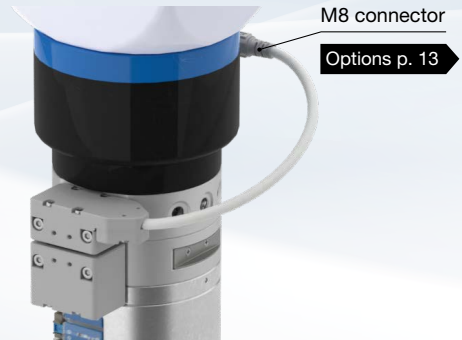
- Repeatability:
±0.01 mm (Position reproducibility)
- Allowable bending moment:
17.4 N·m (10 kg carrying capacity)

Supports a work load of up to 20 kg

- Work load: 5 kg, 10 kg, 20 kg

Direct mounting to the tool I/O is possible with an M8 connector.

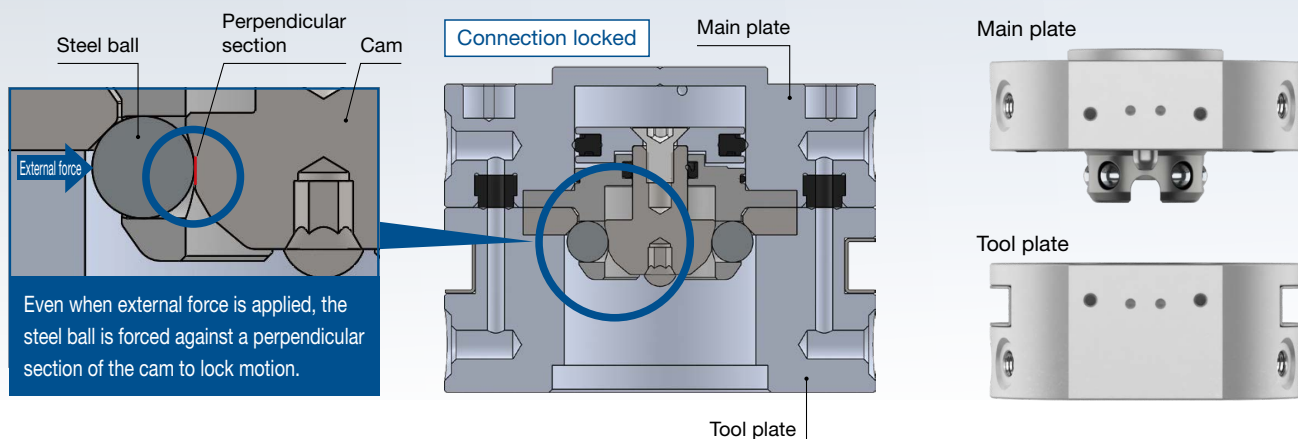
* 10 kg type only



Drop prevention

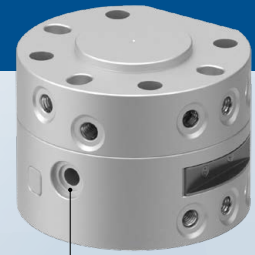
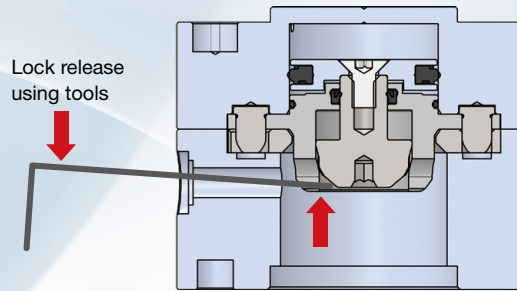
Drop prevention mechanism locks the actuator so parts remain locked in place even if air pressure drops.

Uses a safety construction where the connection is not released even when an external force is applied



Manual pilot port

The plate can be released in the event of an air pressure drop by inserting a tool into the manual operation port.

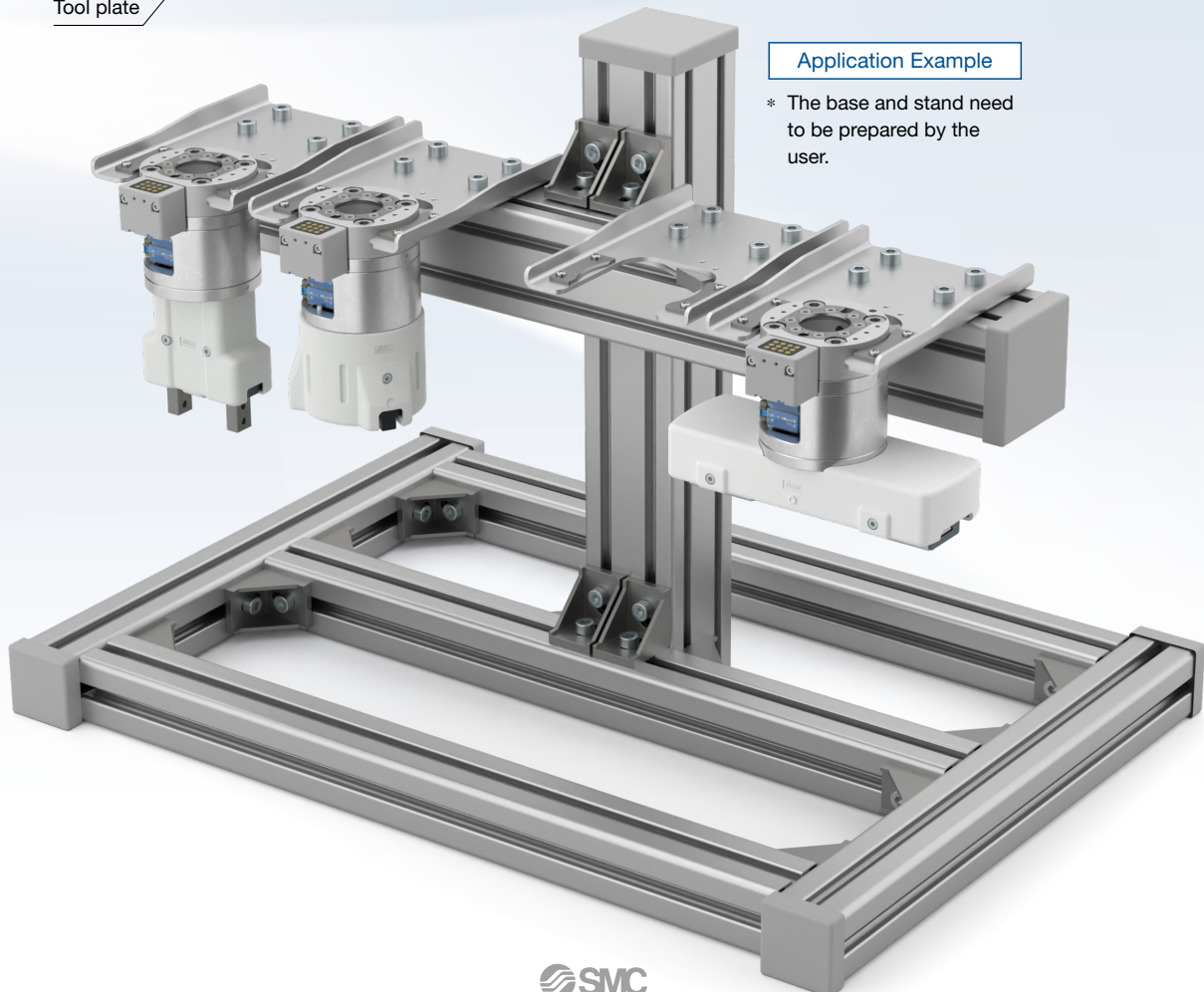
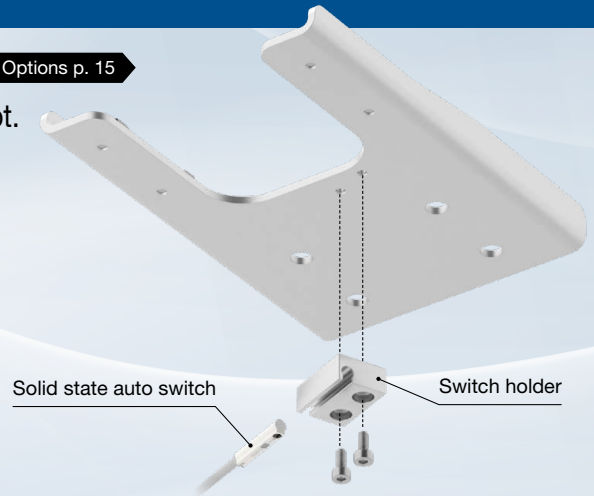
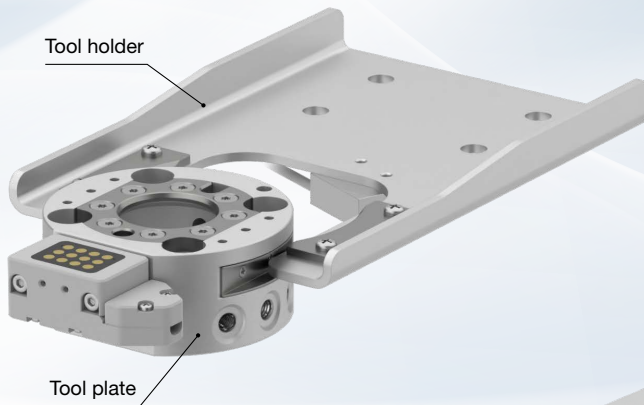


Manual pilot port

* For the manual pilot port diameter, refer to the dimensions on pages 10 to 12.

Tool holder

- A holder for installing a tool plate is available as standard. [Options p. 15](#)
- The auto switch can detect whether there is a tool plate or not.

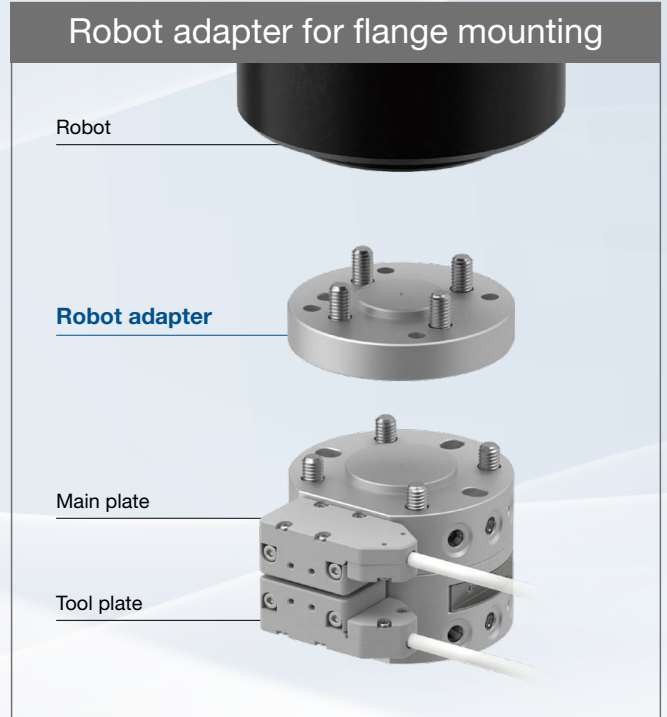
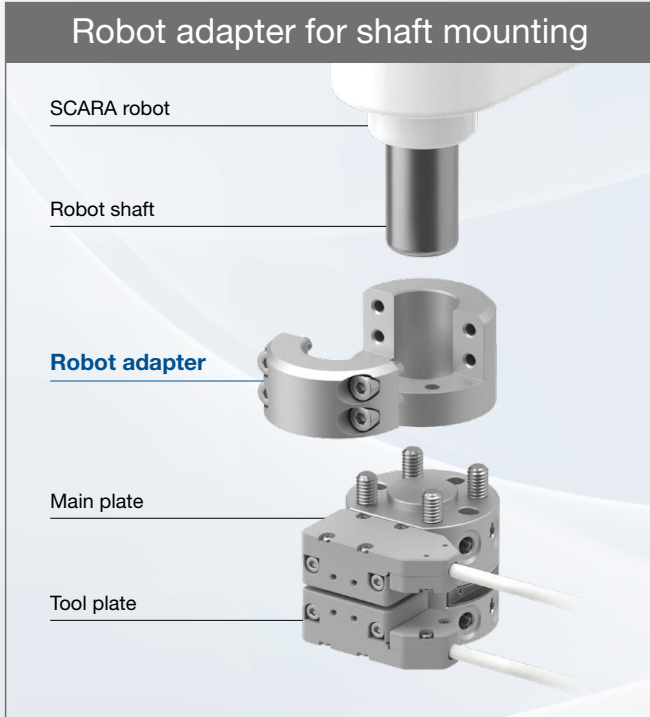


Application Example




* The base and stand need to be prepared by the user.

The robot adapter enables mounting to a wide range of robots.

Can also be used with the tool changer on shaft-mounted SCARA robots or robots with different flange mounting dimensions.



Robot Adapter Selection Table

| Workpiece mass of 5 kg or less | | | | | Workpiece mass of 10 kg or less | | | Workpiece mass of 20 kg or less | | |
|--|-----|---|----------------|----------------|---|-----|-----|---|-----|-----|
| Mounting side pitch (ISO9409-1) | | Shaft mounting | | | Mounting side pitch (ISO9409-1) | | | Mounting side pitch (ISO9409-1) | | |
| ø31.5 | ø50 | Shaft dia. ø16 | Shaft dia. ø20 | Shaft dia. ø25 | ø31.5 | ø40 | ø50 | ø50 | ø63 | ø80 |
| Robot adapters available | | | | | Robot adapters available | | | Robot adapters available | | |
|  Work load: 5 kg | | | | |  Work load: 10 kg | | |  Work load: 20 kg | | |
| Robot adapters available for use | | · Shaft mounting type · Flange mounting type | | | Robot adapters available for use | | | · Flange mounting type | | |
| Robot adapters available for use | | · Flange mounting type | | | Robot adapters available for use | | | · Flange mounting type | | |

Related Products

Air Gripper for Collaborative Robots *RMH□ Series*

Gripper with tool changer all-in-one solution

More information can be viewed here.



Standard Type



RMHZ2 Series

3-Finger Type



RMHS3 Series

Long Stroke Type

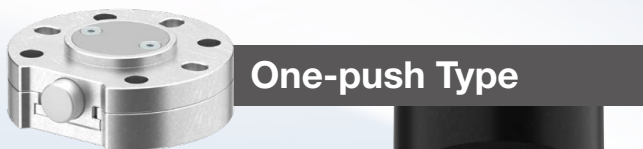


RMHF2 Series

Tool Changer Variations

We also offer the manual type tool changers.

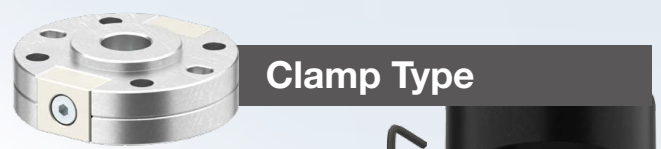
More information can be viewed here.



One-push Type

Tools can be attached/removed by the push of a button (no tools required).

- Standards: ISO9409-1-50-4-M6 compliant
- Repeatability: ±0.01 (Position reproducibility)



Clamp Type

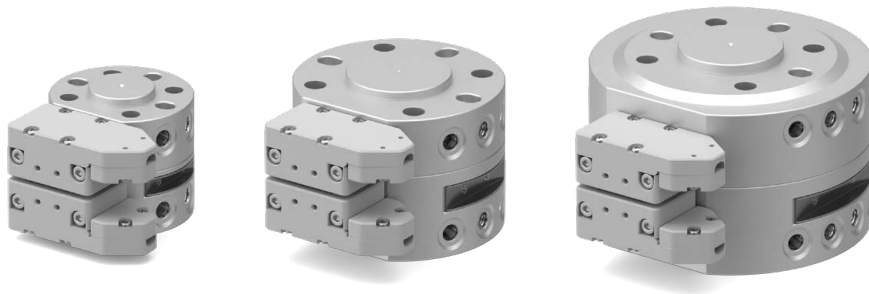
Tools can be attached/removed by clamping bolts (2 pcs).

- Standards: ISO9409-1-50-4-M6 compliant
- Repeatability: ±0.02 (Position reproducibility)



CONTENTS

Tool Changer/Auto Type *RMTA Series*



| | |
|------------------------------------|------------|
| How to Order | p. 7 |
| Specifications | p. 9 |
| Model Selection | p. 9 |
| Dimensions | p. 10 |
| Options | p. 13 |
| Connector | p. 13 |
| Tool Holder | p. 15 |
| Robot Adapter | p. 17 |
| Specific Product Precautions | p. 19 |
| Safety Instructions | Back cover |

Tool Changer/Auto Type RMTA Series

Work load: 5 kg, 10 kg, 20 kg



How to Order

Main plate



RMTA1-5M1



RMTA1-10M1



RMTA1-20M1

RMTA1 - 10 M 1 - C2 M

Work load

| | |
|----|-------|
| 05 | 5 kg |
| 10 | 10 kg |
| 20 | 20 kg |

Body specifications


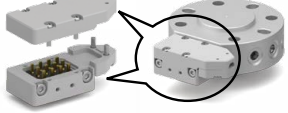
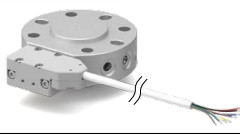
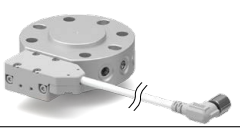
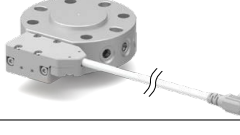
| | |
|---|-------|
| 1 | Basic |
|---|-------|

Length of C2 discrete wire specification cable





| | |
|-----|-----|
| Nil | 1 m |
| M | 3 m |
| L | 5 m |

Electrode specifications

Details p. 13

| Symbol | Contents | Work load | | |
|--------|---|-----------|-------|-------|
| | | 5 kg | 10 kg | 20 kg |
| Nil | No electrode  | ● | ● | ● |
| C1 | Soldering specifications 12 pin  | ● | ● | ● |
| C2 | Discrete wire specifications Lead wire length 1 m, 3 m, 5 m  | ● | ● | ● |
| C3 | M8 connector specifications M8-8 pin socket Lead wire length 0.14 m  | — | ● | — |
| C4 | M8 connector specifications M8-8 pin plug Lead wire length 0.11 m  | — | ● | — |

The M8-8 pin connector can be directly mounted to the following collaborative robots.

| Electrode specifications | Universal Robots | FANUC | YASKAWA Electric Corporation |
|--------------------------|--|---|---|
| | UR□e series | CRX series | MOTOMAN-HC□DTP series |
| C3 M8-8 pin socket |  |  |  |
| Electrode specifications | Omron/Techman | | |
| C4 M8-8 pin plug | TM, TM□S series  | | |

How to Order

Tool plate



RM TA1-5T □



RM TA1-10T □



RM TA1-20T □

Tool holder



Options p. 15

RM TA1 - 10 T 1 - C2 M

Work load

| | |
|----|-------|
| 05 | 5 kg |
| 10 | 10 kg |
| 20 | 20 kg |

Length of C2 discrete wire specification cable

| | |
|-----|-----|
| Nil | 1 m |
| M | 3 m |
| L | 5 m |

Body specifications

| | |
|---|----------------------------|
| 1 | Through hole mounting |
| 2 | Female thread mounting |

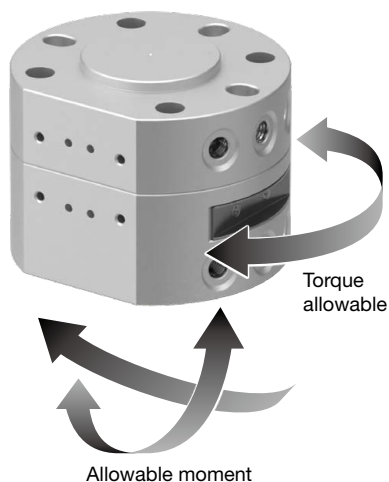
Electrode specifications

Details p. 13

| Symbol | Contents | Work load | | |
|--------|--|-----------|-------|-------|
| | | 5 kg | 10 kg | 20 kg |
| Nil | Without connector | ● | ● | ● |
| C1 | Soldering specifications 12 pin | ● | ● | ● |
| C2 | Discrete wire specifications Lead wire length 1 m, 3 m, 5 m | ● | ● | ● |

RMTA Series

Specifications



| Series | | RMTA05 | RMTA10 | RMTA20 | |
|--|---------------------------------|---------------------|----------------|----------------|-------|
| Work load | | 5 kg | 10 kg | 20 kg | |
| Fluid | | Compressed air | | | |
| Action | | Double acting | | | |
| Operating pressure range | | 0.3 to 0.7 MPa | 0.2 to 0.7 MPa | | |
| Withstand pressure | | 1.05 MPa | | | |
| Ambient and fluid temperatures | | 0 to 60°C | | | |
| Recommended clearance before coupling*1 | | 0.8 mm or less | 1.0 mm or less | 1.2 mm or less | |
| Repeatability | | ±0.01 mm | | | |
| Combined axial force*2, *3 | | 375 N | 900 N | 1500 N | |
| Allowable moment*3 | | 4 N·m | 18 N·m | 41 N·m | |
| Torque allowable | | 13 N·m | 39 N·m | 77 N·m | |
| Weight | Main plate | 71 g | 176 g | 445 g | |
| | Tool plate | T1 | 55 g | 174 g | 350 g |
| | | T2 | 59 g | 183 g | 355 g |
| Air port for tool | Number of ports | 4 | 6 | 8 | |
| | Port size | M5 x 0.8 | | | |
| | Operating pressure range | -100 kPa to 0.7 MPa | | | |
| Electric contact | Electrode capacity | 2 A/1 interface | | | |
| | Number of contact points | 12 | | | |

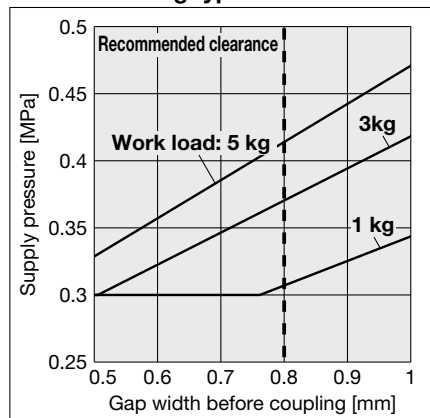
*1 Refer to page 19 for clearance before coupling. Check the detailed relationships among supply pressure, clearance before coupling, and work load by referring to the connection pressure graph below.

*2 This is the force applied in the direction of separation of the main plate and tool plate at which those plates in the connected state start to separate from each other.

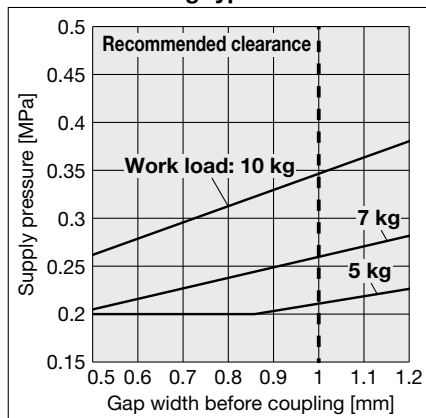
*3 The values shown are those when connected at 0.5 MPa, and will vary depending on the supply pressure.

Connection pressure

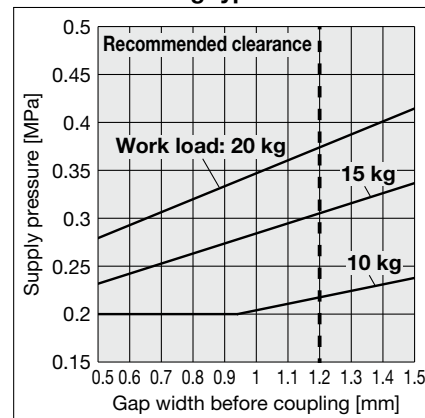
Work load: 5 kg type



Work load: 10 kg type

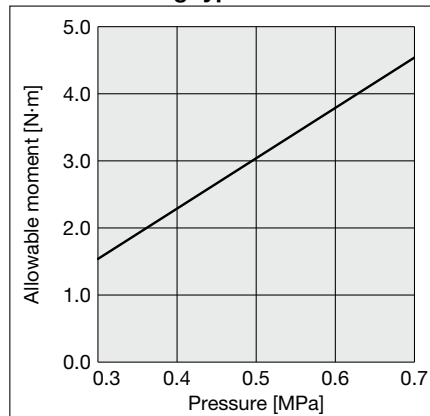


Work load: 20 kg type

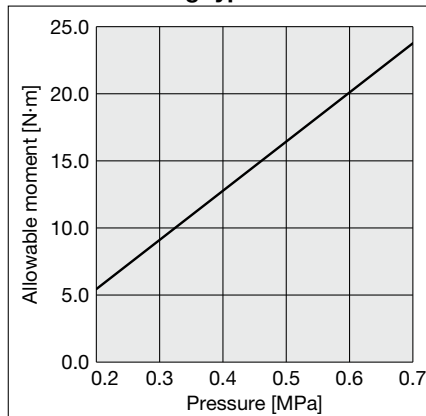


Allowable moment for supply pressure

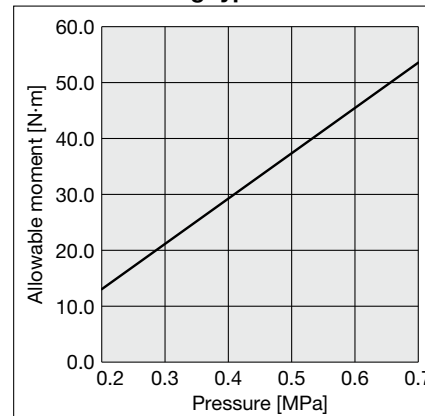
Work load: 5 kg type



Work load: 10 kg type



Work load: 20 kg type



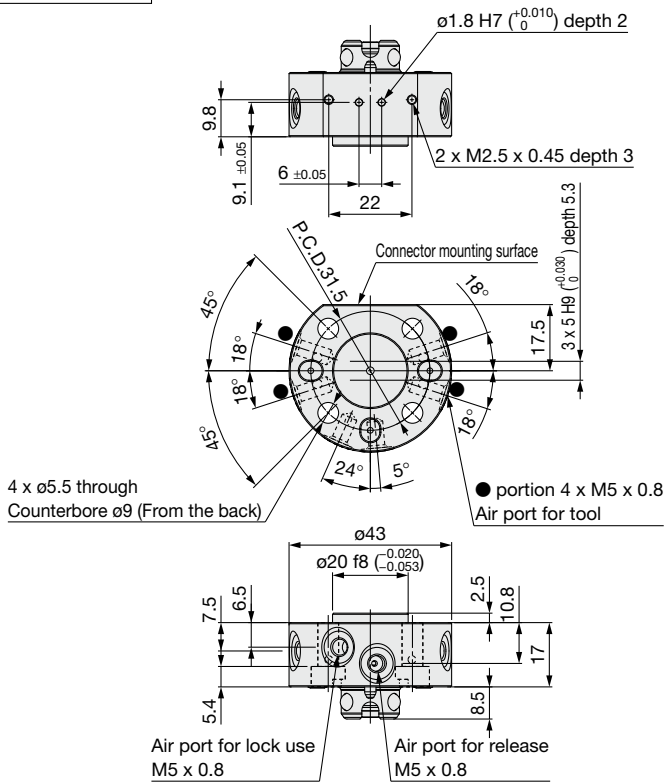
* The connection pressure is a reference value. Use only after confirming the actual work load and the pressure at the clearance before coupling to ensure a secure coupling.

* The allowable moment is a design value.

Dimensions

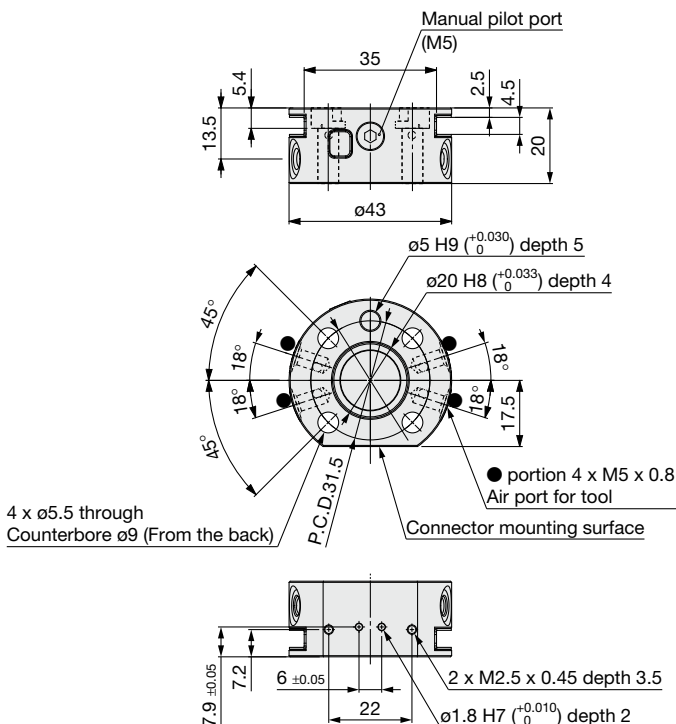
Work load 5 kg: RMTA1-05

Main plate

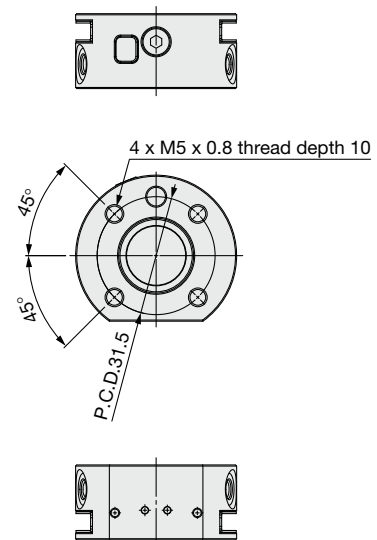
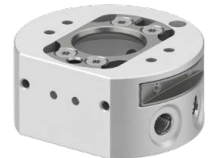


Tool plate

Through hole mounting



Female thread mounting

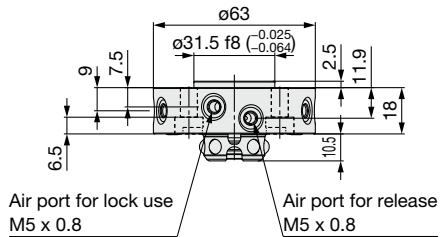
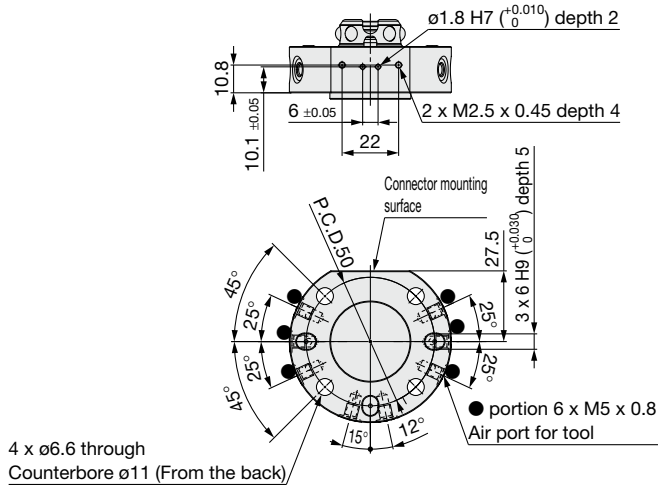


RMTA Series

Dimensions

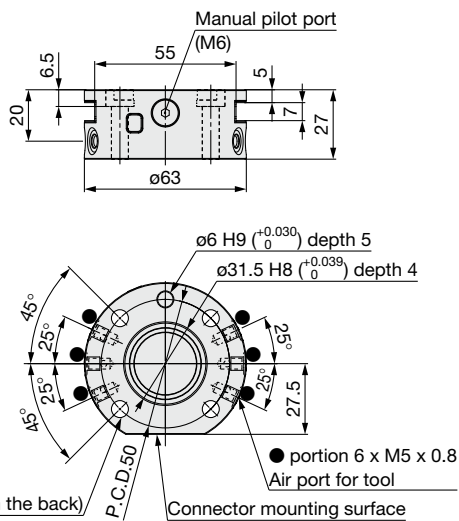
Work load 10 kg: RMTA1-10

Main plate

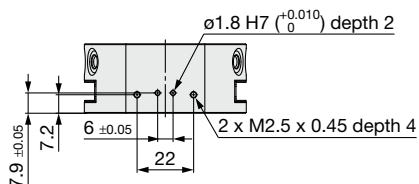
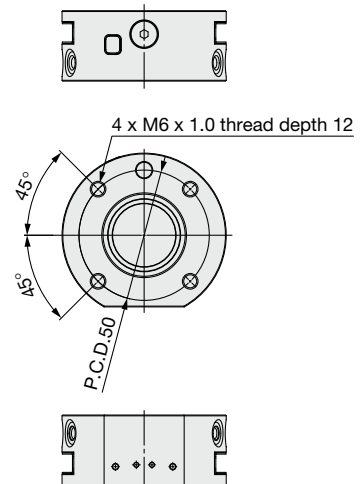


Tool plate

Through hole mounting



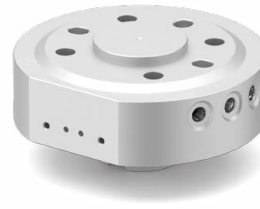
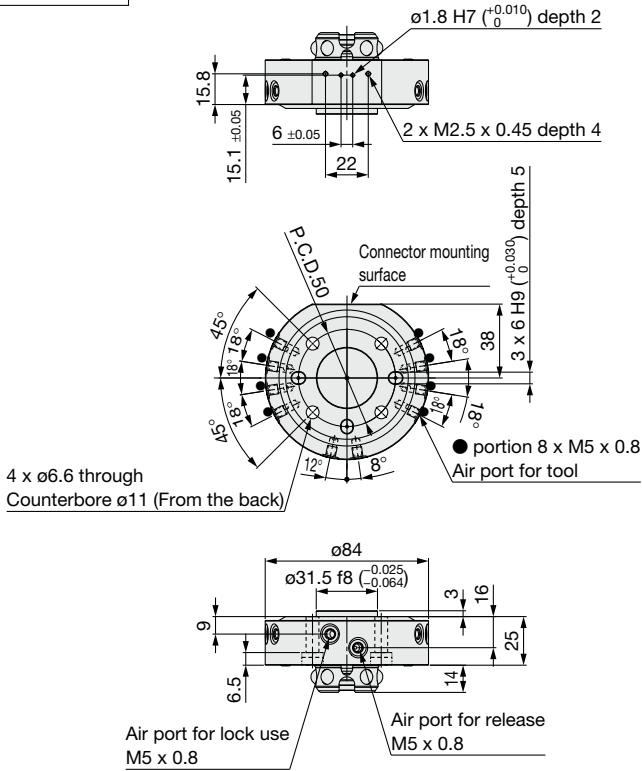
Female thread mounting



Dimensions

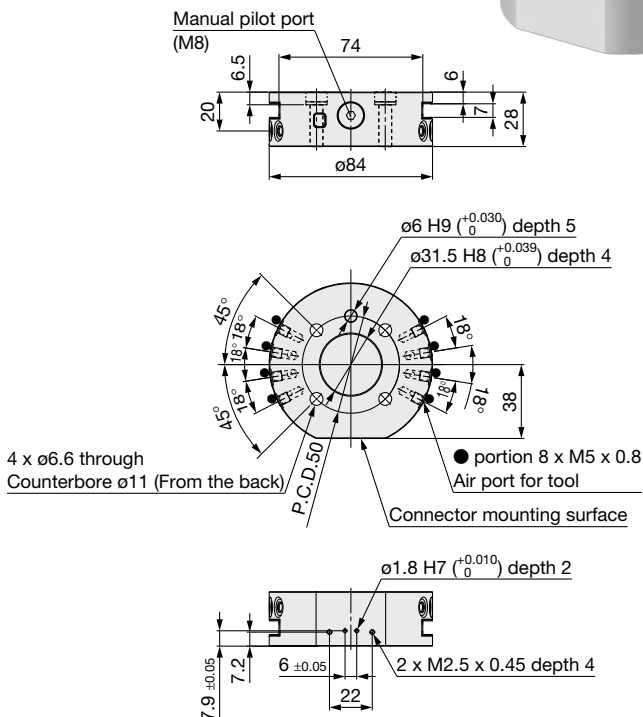
Work load 20 kg: RMTA1-20

Main plate

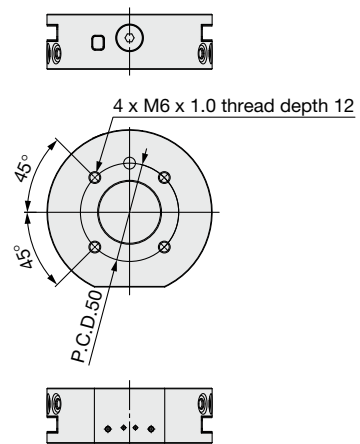


Tool plate

Through hole mounting



Female thread mounting

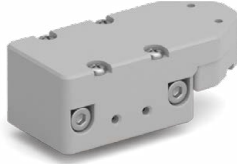


RMTA Series

Options: Connector

How to Order

RMTA1 - **M** **C2** **M**



RMTA1-MC□



RMTA1-TC□

Mounting body



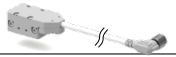

| | |
|----------|------------|
| M | Main plate |
| T | Tool plate |

Length discrete wire specification cable

| | |
|------------|-----|
| Nil | 1 m |
| M | 3 m |
| L | 5 m |

* Refer to page 14 for details.

Electrode specifications

| Symbol | Contents |
|-----------|--|
| C1 | Soldering specifications 12 pin  |
| C2 | Discrete wire specifications Lead wire length 1 m, 3 m, 5 m  |
| C3 | M8 connector specifications M8-8 pin socket Lead wire length 0.14 m  |
| C4 | M8 connector specifications M8-8 pin plug Lead wire length 0.11 m  |

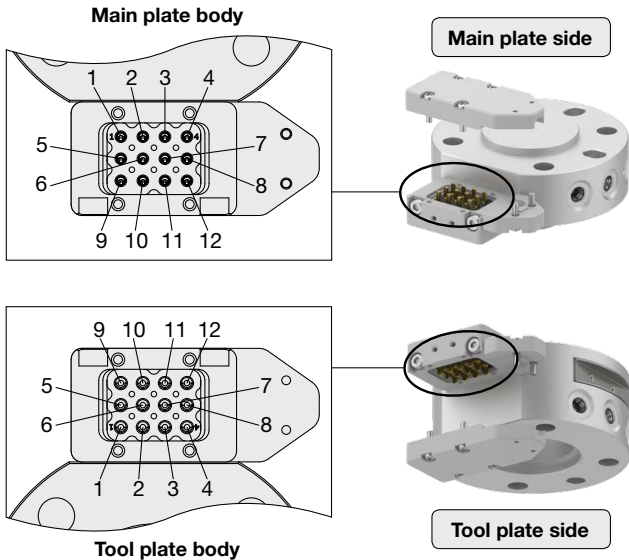
* C3 and C4 can be selected only for RMTA1-M□□□.

Specifications

| | | |
|-----------------------------|------------------------|------|
| Rated current | 2 A/1 interface | |
| Number of electrodes | 12 pcs. | |
| Weight | Main plate side | 50 g |
| | Tool plate side | 50 g |

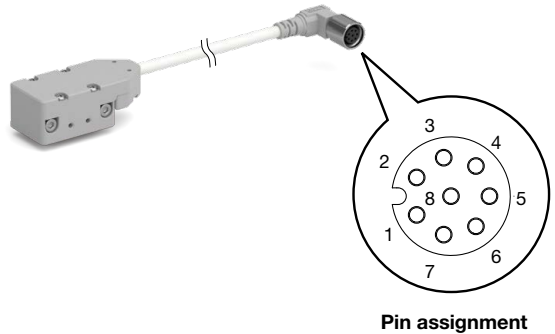
Wiring

Soldering specifications: Pin assignment



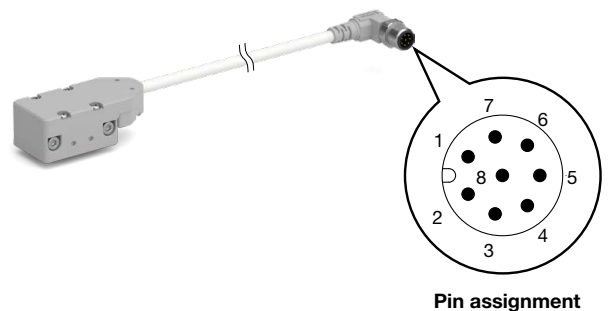
M8 connector specifications

M8-8 pin socket: Pin assignment



M8 connector specifications

M8-8 pin plug: Pin assignment



Discrete wire specifications: Circuit diagram

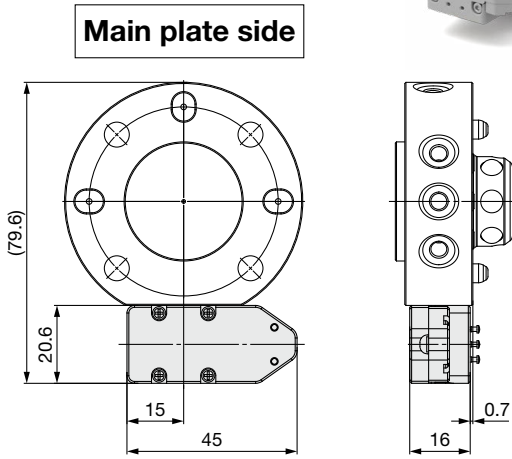
| Pin no. | Lead wire color |
|---------|-----------------|
| 1 | White |
| 2 | Brown |
| 3 | Green |
| 4 | Yellow |
| 5 | Gray |
| 6 | Black |
| 7 | Blue |
| 8 | Red |



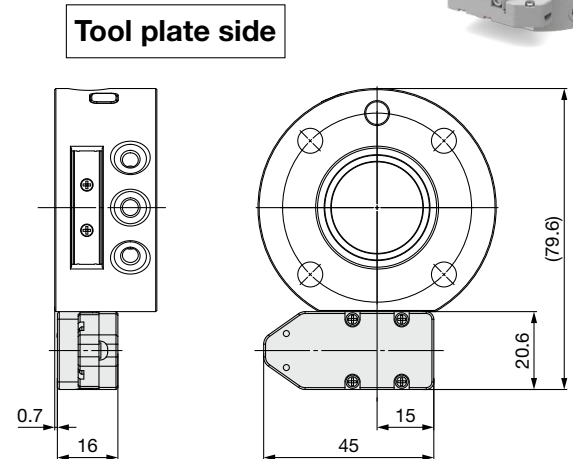
* Conductor AWG26

Dimensions

Soldering specifications: **RM_{TA}1-(M/T)C1**

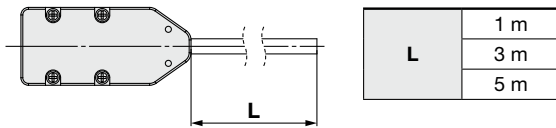


* The above figure shows the RM_{TA}1-10M1-C1.

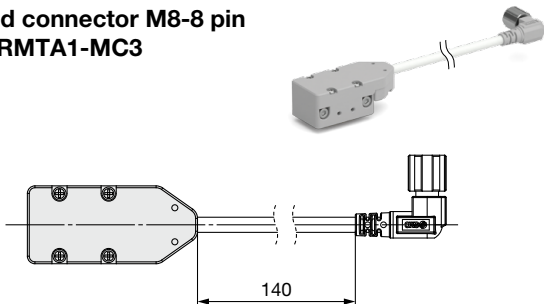


* The above figure shows the RM_{TA}1-10T□-C1.

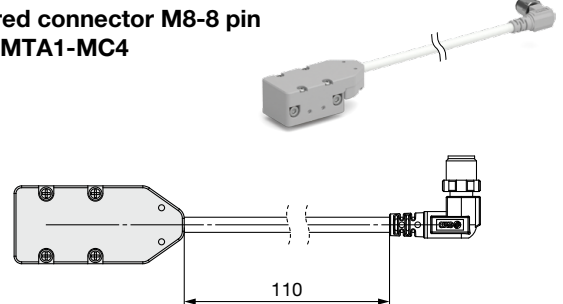
Discrete wire specifications: **RM_{TA}1-(M/T)C2**



Pre-wired connector M8-8 pin
Socket: **RM_{TA}1-MC3**



Pre-wired connector M8-8 pin
Plug: **RM_{TA}1-MC4**



RMTA Series

Options: Tool Holder

How to Order



RMTA1 - 10 S1 A - M9N

● **Tool changer work load**

| | |
|----|-------|
| 05 | 5 kg |
| 10 | 10 kg |
| 20 | 20 kg |

● **Switch holder**

| | |
|-----|--------------------|
| Nil | None |
| A | With switch holder |

● **Auto switch type**

| | |
|-----|-------------------------|
| Nil | Without auto switch |
| M9□ | Solid state auto switch |

* For applicable auto switches, refer to the table below.

| Type | Special function | Electrical entry | Indicator light | Wiring (Output) | Load voltage | | Auto switch model | | Lead wire length [m] | | | | Pre-wired connector | Applicable load | | |
|-------------------------|------------------|------------------|-----------------|-----------------|--------------|-----------|-------------------|---------|----------------------|-------|-------|-------|---------------------|-----------------|------------|------------|
| | | | | | DC | AC | Perpendicular | In-line | 0.5 (Nil) | 1 (M) | 3 (L) | 5 (Z) | | IC circuit | Relay, PLC | |
| Solid state auto switch | — | Grommet | Yes | 3-wire (NPN) | 24 V | 5 V, 12 V | — | M9NV | M9N | ● | ● | ● | ○ | ○ | IC circuit | Relay, PLC |
| | | | | 3-wire (PNP) | | | | M9PV | M9P | ● | ● | ● | ○ | ○ | | |
| | 2-wire | | | M9BV | | | | M9B | ● | ● | ● | ○ | ○ | — | | |
| | 3-wire (NPN) | | | M9NVV | | | | M9NW | ● | ● | ● | ○ | ○ | IC circuit | | |
| | 3-wire (PNP) | | | M9PWV | | | | M9PW | ● | ● | ● | ○ | ○ | IC circuit | | |
| | 2-wire | | | M9BWV | | | | M9BW | ● | ● | ● | ○ | ○ | — | | |

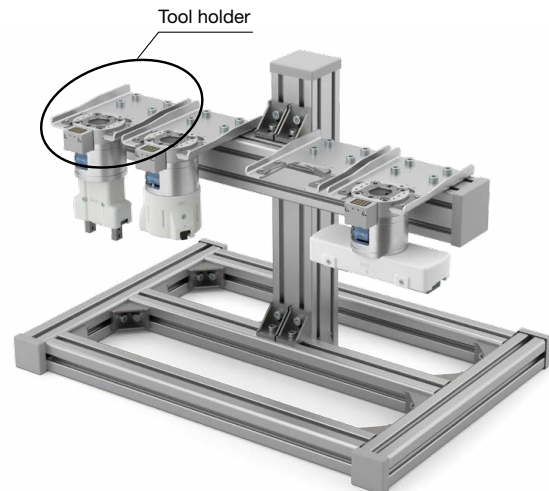
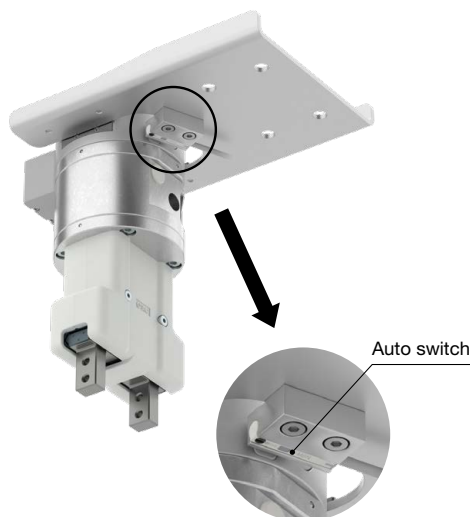
* Solid state auto switches marked with a "○" are produced upon receipt of order.

* Auto switches are shipped together with the product but do not come assembled.

* 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

Application Example

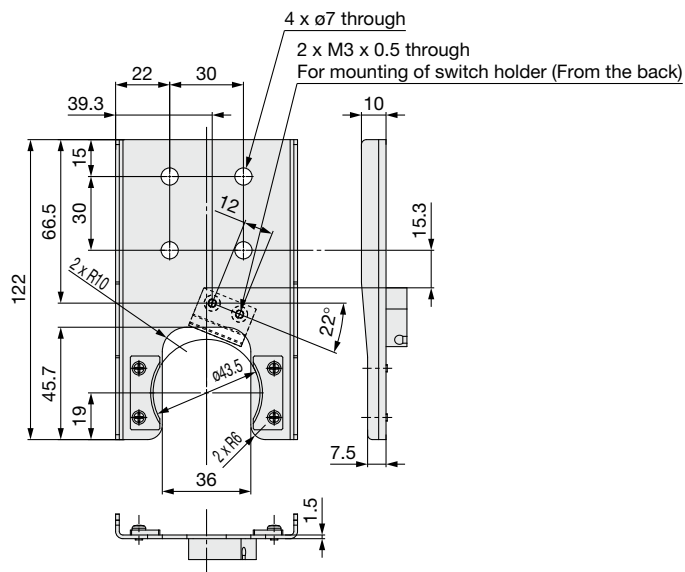
· Detect holder attachment with the auto switch



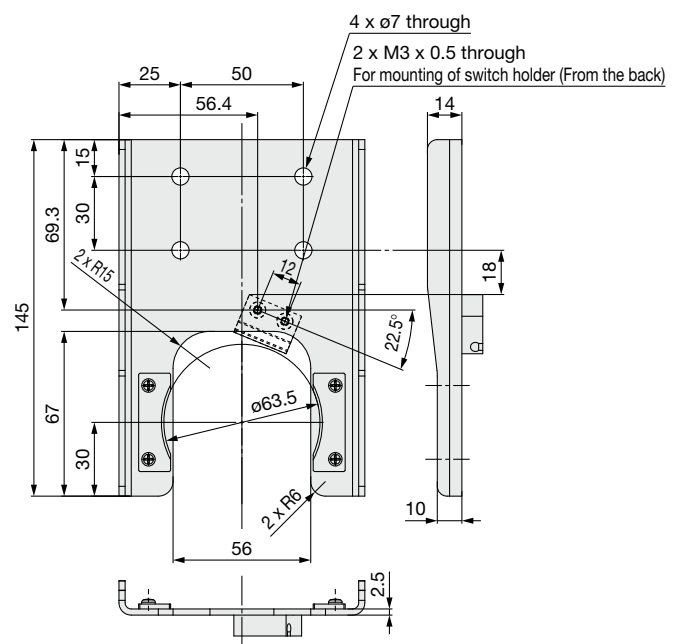
* The base and stand need to be prepared by the user.

Dimensions

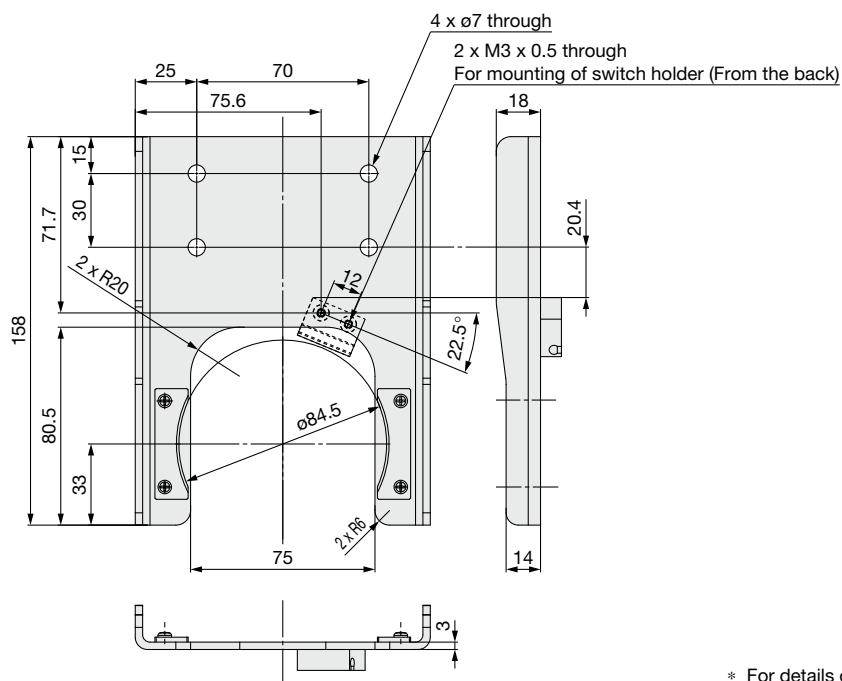
Holder for a tool changer work load of 5 kg



Holder for a tool changer work load of 10 kg



Holder for a tool changer work load of 20 kg



* For details on mounting the switch holder, refer to page 20.

RMTA Series

Options: Robot Adapter

Robot Adapter



Use the robot adapter to use the tool changer on shaft-mounted SCARA robots or robots with different mounting dimensions.

How to Order

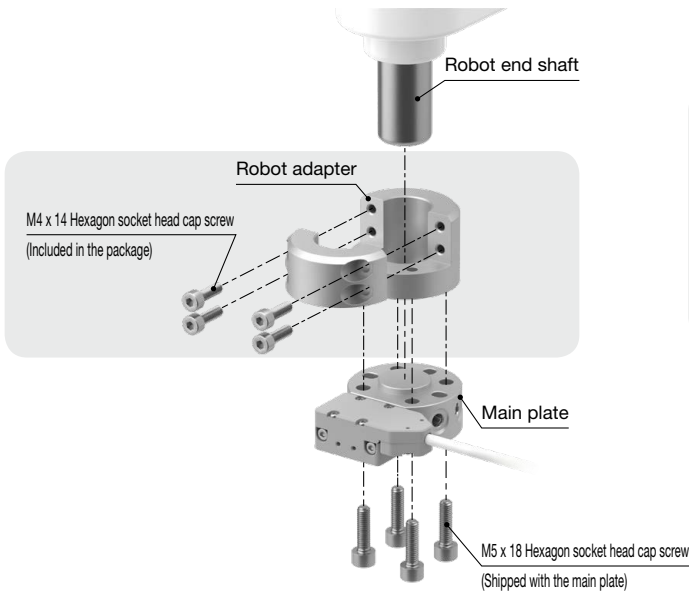
RMTA1-10C1



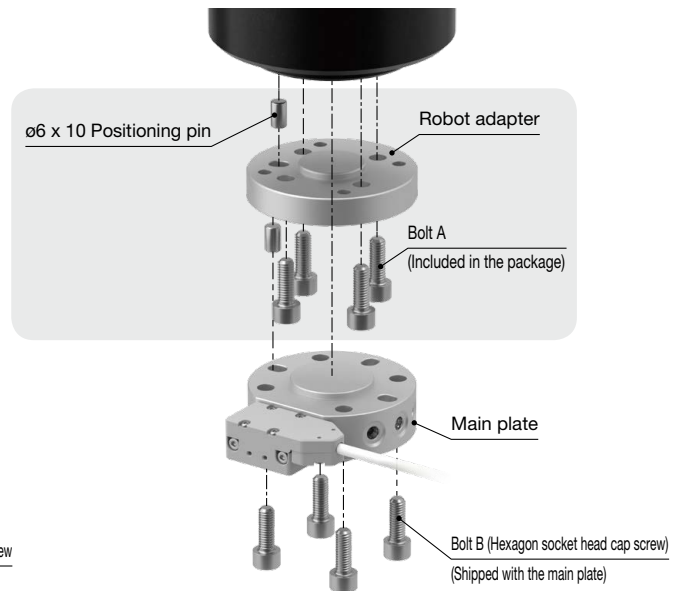
• Adapter

| Symbol | Type | Mounting main plate | Interface after conversion | |
|--------|-----------------|---------------------|--------------------------------------|---|
| 05CR16 | Rod mounting | RMTA-05 | For ø16 shaft |  |
| 05CR20 | | RMTA-05 | For ø20 shaft | |
| 05CR25 | | RMTA-05 | For ø25 shaft | |
| 05C4 | Flange mounting | RMTA-05 | P.C.D.50, For M6, 4 pcs., Pin 1pc. |  |
| 10C2 | | RMTA-10 | P.C.D.31.5, For M5, 4 pcs., Pin 1pc. | |
| 10C3 | | RMTA-10 | P.C.D.40, For M6, 4 pcs., Pin 1pc. | |
| 20C5 | | RMTA-20 | P.C.D.63, For M6, 4 pcs., Pin 1pc. | |
| 20C6 | | RMTA-20 | P.C.D.80, For M8, 6 pcs., Pin 1pc. | |

Shaft mounting



Flange mounting



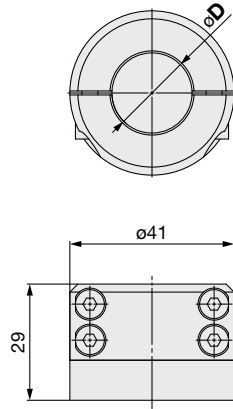
Flange Mounting Hexagon Socket Head Cap Screw Size Chart

| Main plate | RMTA1-05M1 | | RMTA1-10M1 | | RMTA1-20M1 | |
|---------------|------------|---------|------------|---------|------------|---------|
| Robot adapter | Bolt A | Bolt B | Bolt A | Bolt B | Bolt A | Bolt B |
| RMTA1-05C4 | M6 x 12 | M5 x 18 | — | — | — | — |
| RMTA1-10C2 | — | — | M5 x 8 | M6 x 16 | M5 x 8 | M6 x 25 |
| RMTA1-10C3 | — | — | M6 x 12 | M6 x 16 | M6 x 12 | M6 x 25 |
| RMTA1-10C5 | — | — | M6 x 12 | M6 x 16 | M6 x 12 | M6 x 25 |
| RMTA1-10C6 | — | — | M8 x 14 | M6 x 16 | M8 x 14 | M6 x 25 |

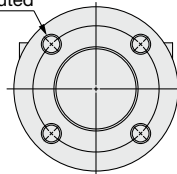
Dimensions

Robot adapter for shaft

RMTA1-05CR16
RMTA1-05CR20
RMTA1-05CR25



4 x M5 x 0.8 thread depth 10
 P.C.D.31.5 90° evenly distributed



| Model | øD |
|---------------------|----|
| RMTA1-05CR16 | 16 |
| RMTA1-05CR20 | 20 |
| RMTA1-05CR25 | 25 |

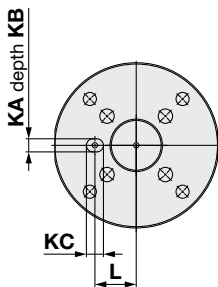
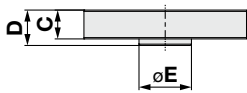
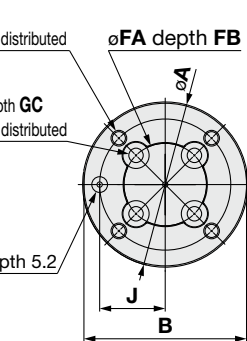
Robot adapter for flange

RMTA1-05C4
RMTA1-10C2

4 x HA depth HB
 P.C.D.HC 90° evenly distributed

4 x øGA through
 øGB counterbore depth GC
 P.C.D.GD 90° evenly distributed

øPH9 (+0.030/0) depth 5.2

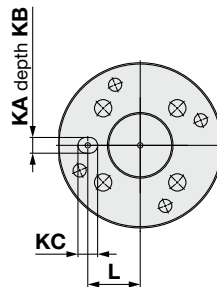
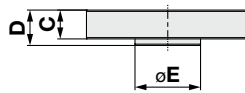
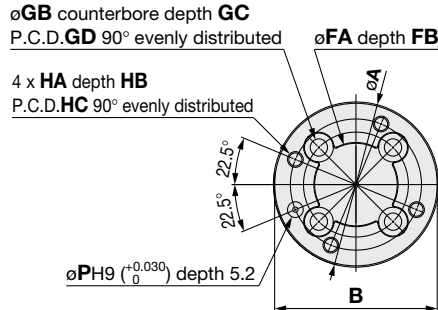


RMTA1-10C3
RMTA1-20C5

4 x øGA through
 øGB counterbore depth GC
 P.C.D.GD 90° evenly distributed

4 x HA depth HB
 P.C.D.HC 90° evenly distributed

øPH9 (+0.030/0) depth 5.2

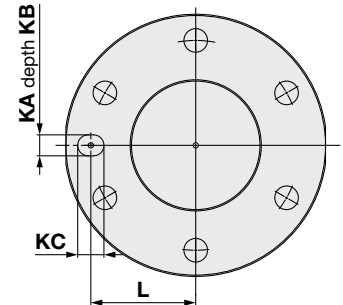
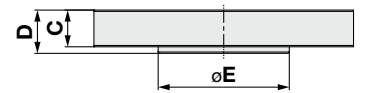
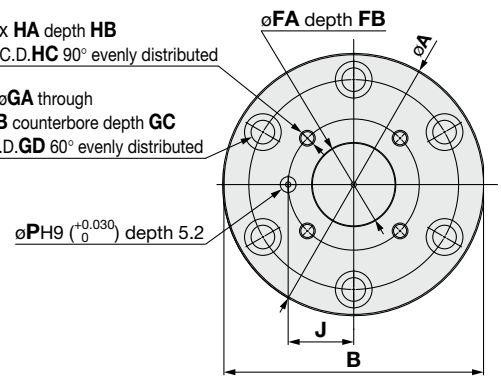


RMTA1-20C6

4 x HA depth HB
 P.C.D.HC 90° evenly distributed

6 x øGA through
 øGB counterbore depth GC
 P.C.D.GD 60° evenly distributed

øPH9 (+0.030/0) depth 5.2



| Model | A | B | C | D | E | FA | FB | GA | GB | GC | GD | HA | HB | HC | J | KA | KB | KC | L | P |
|-------------------|-----|----|----|------|-------------------------|--------------------|----|-----|----|-----|------|----------|----|------|-------|-----------------|-----|-----|-------|---|
| RMTA1-05C4 | 63 | 62 | 11 | 13.5 | ø31.5f8 (-0.025/-0.064) | ø20H8 (+0.033/0) | 5 | 6.6 | 11 | 6.5 | 50 | M5 x 0.8 | 7 | 31.5 | 15.75 | ø6H9 (+0.030/0) | 5.2 | 7.5 | 25 | 5 |
| RMTA1-10C2 | 63 | 62 | 11 | 13.5 | ø20f8 (-0.020/-0.053) | ø31.5H8 (+0.039/0) | 3 | 5.5 | 10 | 8.4 | 31.5 | M6 x 1 | 8 | 50 | 25 | ø5H9 (+0.030/0) | 5.2 | 6.5 | 15.75 | 6 |
| RMTA1-10C3 | 63 | 62 | 11 | 13.5 | ø25f8 (-0.020/-0.053) | ø31.5H8 (+0.039/0) | 3 | 6.6 | 11 | 6.5 | 40 | M6 x 1 | 8 | 50 | — | ø6H9 (+0.030/0) | 5.2 | 7.5 | 20 | 6 |
| RMTA1-20C5 | 84 | 83 | 11 | 13.5 | ø40f8 (-0.025/-0.064) | ø31.5H8 (+0.039/0) | 3 | 6.6 | 11 | 6.5 | 63 | M6 x 1 | 8 | 50 | — | ø6H9 (+0.030/0) | 5.2 | 7.5 | 31.5 | 6 |
| RMTA1-20C6 | 100 | 99 | 14 | 16.5 | ø50f8 (-0.025/-0.064) | ø31.5H8 (+0.039/0) | 5 | 9 | 14 | 8 | 80 | M6 x 1 | 8 | 50 | 25 | ø8H9 (+0.036/0) | 7.5 | 10 | 40 | 6 |



RMTA Series Specific Product Precautions 1

Be sure to read this before handling the products. Refer to the back cover for safety instructions. For air gripper and auto switch precautions, refer to the “Handling Precautions for SMC Products” and the “Operation Manual” on the SMC website: <https://www.smcworld.com>

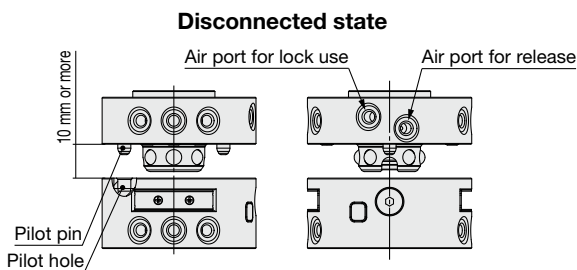
Connection/Disconnection Method

Connection method

1. Supply compressed air to the air port for release.
2. Align the main plate with the tool plate, and then insert the pilot pin into the pilot hole.
3. Adjust the t dimensions until they match the values in Table 1.
4. Supply compressed air to the air port for lock use while simultaneously releasing compressed air from the air port for release.

Disconnection method

1. Supply compressed air to the air port for release while simultaneously releasing compressed air from the air port for lock use.
2. Raise the main plate 10 mm or more.



Connected state

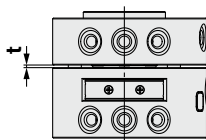


Table 1. Clearance amount at time of recommended connection*1

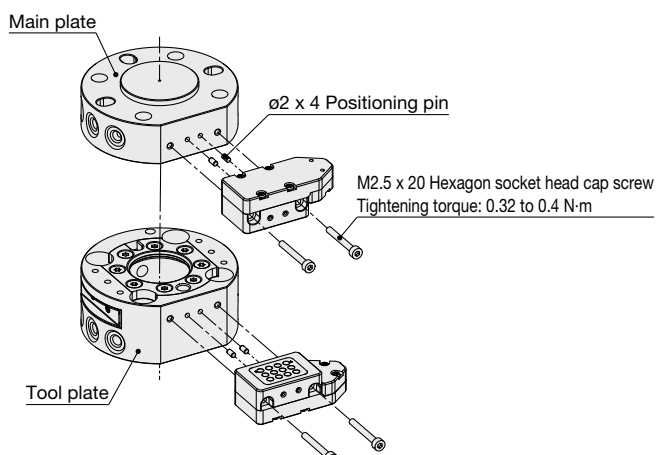
| | t |
|-------|--------|
| 5 kg | 0.8 mm |
| 10 kg | 1 mm |
| 20 kg | 1.2 mm |

*1 The smaller the clearance, the lower the supply pressure required during connection to provide a stable operation.

· Confirm the connection clearance and operating pressure for the intended application, and verify that the connection is actually secure before use.

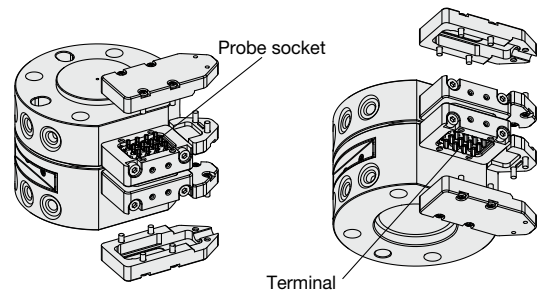
Connector Mounting

When mounting the connector later, or replacing the connector, mount the connector as shown in the diagram below.



Piping/Wiring

1. Use SMC compact One-touch fittings, one-touch mini (M5), or miniature fittings (M5). Thoroughly flush out the connection piping, taking care to prevent any debris or machining chips from entering the device.
2. For the wiring in the soldering specifications, solder connections to the probe socket of the main plate and the terminal of the tool plate. It is recommended that you insulated connected components with heat-shrinkable tube, or something similar.
3. Take care to avoid applying an external force, such as tension or twisting, to the piping or wiring.





RM-TA Series

Specific Product Precautions 2

Be sure to read this before handling the products. Refer to the back cover for safety instructions. For air gripper and auto switch precautions, refer to the “Handling Precautions for SMC Products” and the “Operation Manual” on the SMC website: <https://www.smcworld.com>

Maintenance (Cleaning)

1. Cleaning of main plate and tool plate

If this product is used while wear particles, dirt, foreign matter, or other substance is adhered on the main plate, tool plate positioning pin, steel ball, or seating surface, an operation failure or air leakage may be caused. Perform regular cleaning, including wiping off any dirt and other grime.

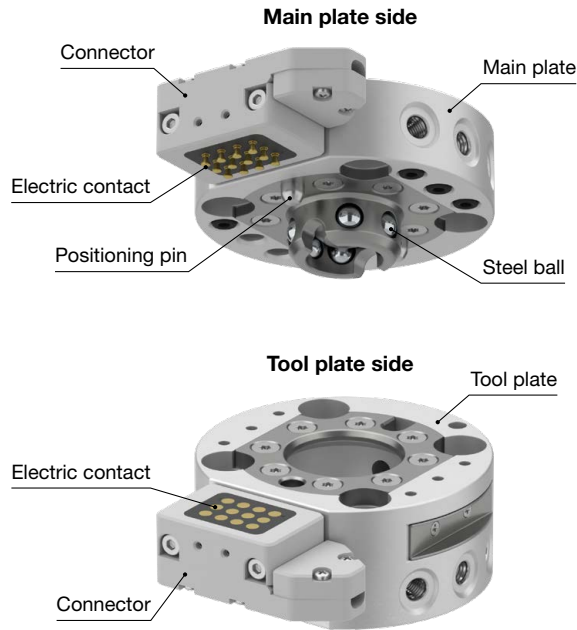
For details, refer to the operation manual.

2. Cleaning of connector

When dirt adheres to the electric contact, conduction between contacts becomes unlikely to occur.

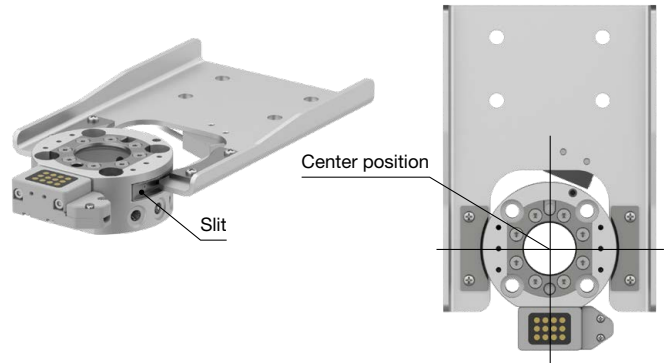
Perform regular cleaning, including wiping off any dirt and other grime.

For details, refer to the operation manual.

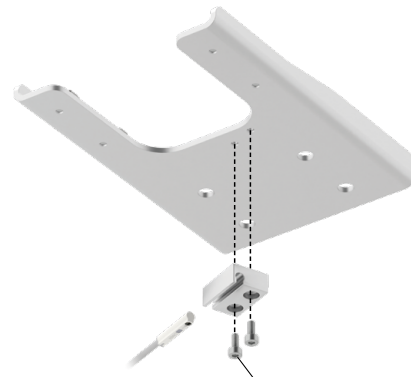


How to Use the Tool Holder

Use the slit on the body of the device to set the main plate to the tool holder. Release the main plate connection at the center of the set position.



How to Mount the Switch Holder

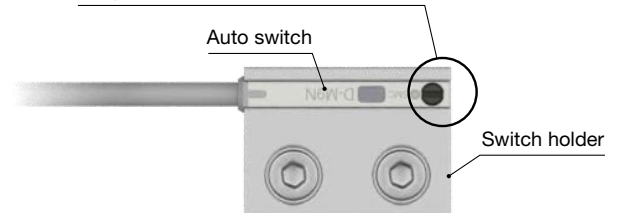


2 x M3 x 5.0 Hexagon socket head cap screw
Tightening torque: 0.57 to 0.69 N·m

Guideline for the fixed position of the auto switch


Check whether the auto switch is reacting in your operating environment, making minor adjustments as necessary.


Please align the end of the auto switch body with the end of the switch holder.




Safety Instructions

These safety instructions are intended to prevent hazardous situations and/or equipment damage. These instructions indicate the level of potential hazard with the labels of “**Caution**,” “**Warning**” or “**Danger**.” They are all important notes for safety and must be followed in addition to International Standards (ISO/IEC)*1), and other safety regulations.

 **Danger :** **Danger** indicates a hazard with a high level of risk which, if not avoided, will result in death or serious injury.

 **Warning:** **Warning** indicates a hazard with a medium level of risk which, if not avoided, could result in death or serious injury.

 **Caution:** **Caution** indicates a hazard with a low level of risk which, if not avoided, could result in minor or moderate injury.

*1) ISO 4414: Pneumatic fluid power - General rules and safety requirements for systems and their components
ISO 4413: Hydraulic fluid power - General rules and safety requirements for systems and their components
IEC 60204-1: Safety of machinery - Electrical equipment of machines - Part 1: General requirements
ISO 10218-1: Robots and robotic devices - Safety requirements for industrial robots - Part 1: Robots etc.

Warning

1. The compatibility of the product is the responsibility of the person who designs the equipment or decides its specifications.

Since the product specified here is used under various operating conditions, its compatibility with specific equipment must be decided by the person who designs the equipment or decides its specifications based on necessary analysis and test results. The expected performance and safety assurance of the equipment will be the responsibility of the person who has determined its compatibility with the product. This person should also continuously review all specifications of the product referring to its latest catalog information, with a view to giving due consideration to any possibility of equipment failure when configuring the equipment.

2. Only personnel with appropriate training should operate machinery and equipment.

The product specified here may become unsafe if handled incorrectly. The assembly, operation and maintenance of machines or equipment including our products must be performed by an operator who is appropriately trained and experienced.

3. Do not service or attempt to remove product and machinery/equipment until safety is confirmed.

1. The inspection and maintenance of machinery/equipment should only be performed after measures to prevent falling or runaway of the driven objects have been confirmed.
2. When the product is to be removed, confirm that the safety measures as mentioned above are implemented and the power from any appropriate source is cut, and read and understand the specific product precautions of all relevant products carefully.
3. Before machinery/equipment is restarted, take measures to prevent unexpected operation and malfunction.

4. SMC products cannot be used beyond their specifications. They are not developed, designed, and manufactured to be used under the following conditions or environments. Use under such conditions or environments is not allowed.

1. Conditions and environments outside of the given specifications, or use outdoors or in a place exposed to direct sunlight.
2. Use for nuclear power, railways, aviation, space equipment, ships, vehicles, military application, equipment affecting human life, body, and property, combustion equipment, entertainment equipment, emergency shut-off circuits, press clutches, brake circuits, safety equipment, etc., and use for applications that do not conform to standard specifications such as catalogs and operation manuals.
3. Use for interlock circuits, except for use with double interlock such as installing a mechanical protection function in case of failure. Please periodically inspect the product to confirm that the product is operating properly.

Caution

SMC develops, designs, and manufactures products to be used for automatic control equipment, and provides them for peaceful use in manufacturing industries.

Use in non-manufacturing industries is not allowed.

Products SMC manufactures and sells cannot be used for the purpose of transactions or certification specified in the Measurement Act of each country. The new Measurement Act prohibits use of any unit other than SI units in Japan.

Limited warranty and Disclaimer/ Compliance Requirements

The product used is subject to the following “Limited warranty and Disclaimer” and “Compliance Requirements”.

Read and accept them before using the product.

Limited warranty and Disclaimer

1. The warranty period of the product is 1 year in service or 1.5 years after the product is delivered, whichever is first.*2)
Also, the product may have specified durability, running distance or replacement parts. Please consult your nearest sales branch.
2. For any failure or damage reported within the warranty period which is clearly our responsibility, a replacement product or necessary parts will be provided.
This limited warranty applies only to our product independently, and not to any other damage incurred due to the failure of the product.
3. Prior to using SMC products, please read and understand the warranty terms and disclaimers noted in the specified catalog for the particular products.

*2) **Suction cups (Vacuum pads) are excluded from this 1 year warranty.**

A suction cup (vacuum pad) is a consumable part, so it is warranted for a year after it is delivered.

Also, even within the warranty period, the wear of a product due to the use of the suction cup (vacuum pad) or failure due to the deterioration of rubber material are not allowed by the limited warranty.

Compliance Requirements

1. The use of SMC products with production equipment for the manufacture of weapons of mass destruction (WMD) or any other weapon is strictly prohibited.
2. The exports of SMC products or technology from one country to another are governed by the relevant security laws and regulations of the countries involved in the transaction. Prior to the shipment of a SMC product to another country, assure that all local rules governing that export are known and followed.

Safety Instructions

Be sure to read the “Handling Precautions for SMC Products” (M-E03-3) and “Operation Manual” before use.