# Tool Changer/ Auto Type

Work load: 5 kg, 10 kg, 20 kg





# Robot hand tool automatic exchange

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

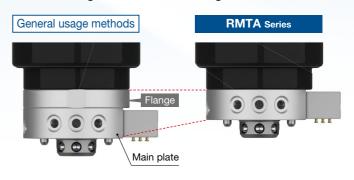


Robot and end tool connection/ release



More compact as flanges are not required.

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



**RMTA** Series



# Integrating the mounting groove of the tool holder

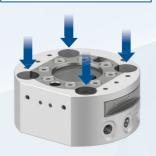
Reducing the design labour required to install the tool plate



# 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.

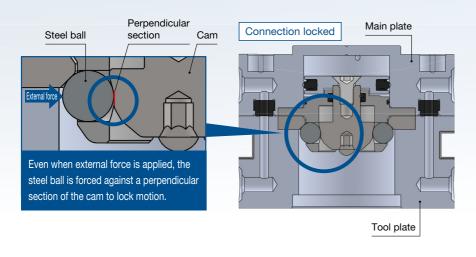
\* 10 kg type only

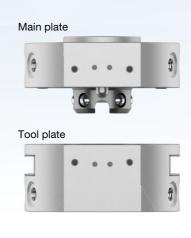


### **Drop prevention**

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

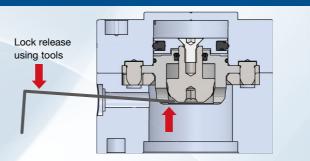
Uses a safety construction where the connection is not released even when an external force is applied





### **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.

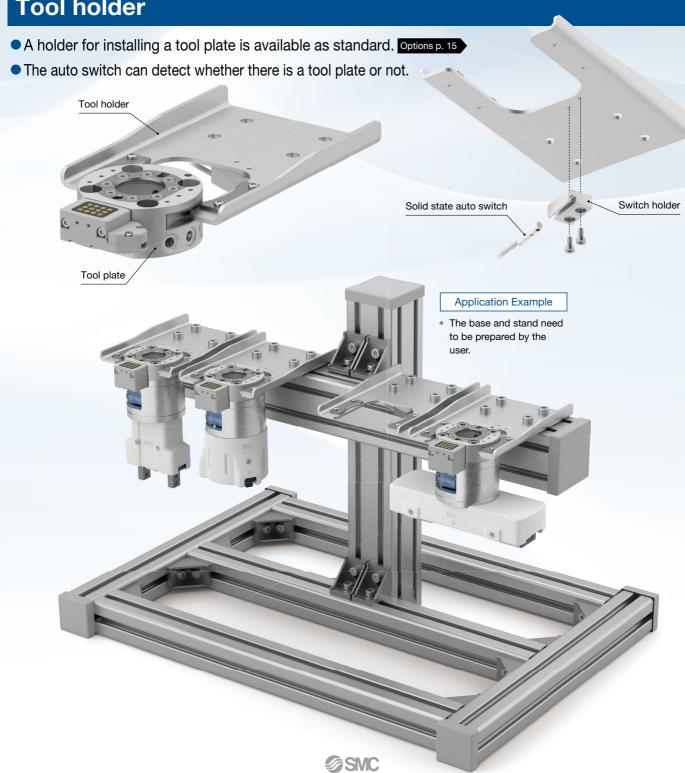




For the manual pilot port diameter, refer to the dimensions on pages 10 to 12.

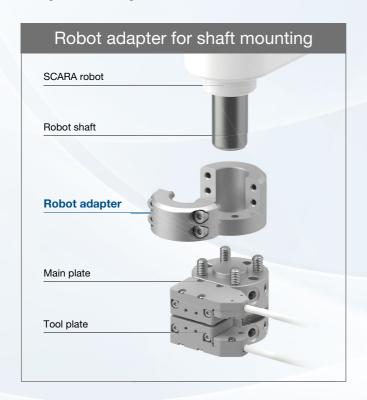
2

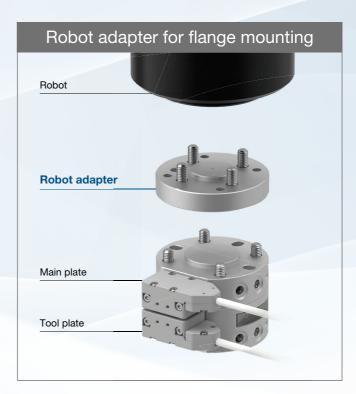




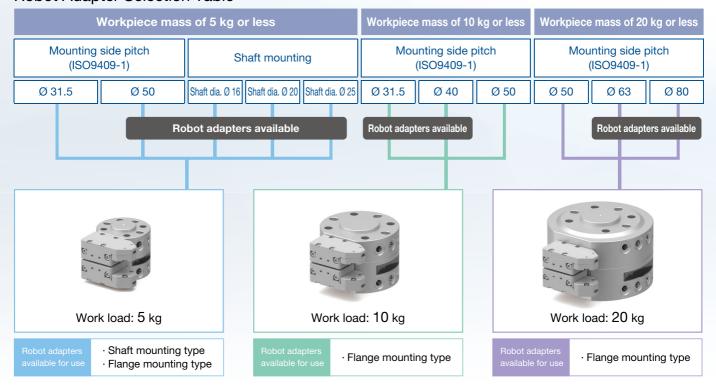
### The robot adapter enables mounting to a wide range of robots.

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





### Robot Adapter Selection Table





### **Related Products**

### Air Gripper for Collaborative Robots RMH□ Series

Gripper with tool changer all-in-one solution

More information

### **Standard** Type





3-Finger Type

Long Stroke Type



**RMHZ2** Series

**RMHS3** Series

**RMHF2** Series

### **Tool Changer Variations**

We also offer the manual type tool changers.

### **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)



More information



### **Clamp Type**

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

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



# CONTENTS

# Tool Changer/Auto Type RMTA Series







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Safety Instructions Back cover



# **Tool Changer/Auto Type**

# RMTA Series

Work load: 5 kg, 10 kg, 20 kg



### **How to Order**





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

Length of C2 discrete wire specification cable

_	1 m
M	3 m
L	5 m

### Electrode specifications •

Details p. 13

	-	Work load			
Symbol	Contents	5 kg	10 kg	20 kg	
-	No electrode	•	•	•	
C1	Soldering specifications 12 pin	•	•	•	
C2	Discrete wire specifications Lead wire length 1 m, 3 m, 5 m	•	•	•	
СЗ	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
Electrode specifications	UR□e series	CRX series	MOTOMAN-HC□DTP series
<b>C3</b> M8-8 pin socket			
Electrode specifications	Omron/Techman		
Electrode specifications	TM,TM□S series		
<b>C4</b> M8-8 pin plug			

### **How to Order**

### **Tool plate**



RMTA1-5T□



RMTA1-10T□



RMTA1-20T□

### **Tool holder**



Options p. 15



 05
 5 kg

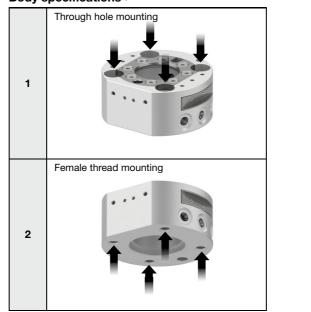
 10
 10 kg

 20
 20 kg

Length of C2 discrete wire specification cable

-	1 m
М	3 m
L	5 m

### Body specifications •



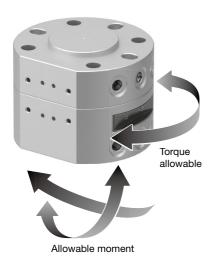
### Electrode specifications

### Details p. 13

Symbol	Contents		Nork load	t
Symbol			10 kg	20 kg
-	Without connector	•	•	•
C1	Soldering specifications 12 pin	•	•	•
C2	Discrete wire specifications Lead wire length 1 m, 3 m, 5 m	•	•	•



### **Specifications**

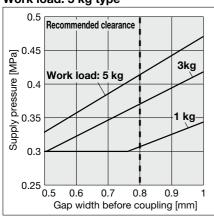


	Series		RMTA05	RMTA10	RMTA20	
Work load	Work load		5 kg	10 kg	20 kg	
Fluid				Compressed air		
Action				Double acting		
Operating p	ressure range		0.3 to 0.7 MPa	0.2 to 0	).7 MPa	
Withstand p	ressure			1.05 MPa		
Ambient an	d fluid temperatu	ires		0 to 60 °C		
Recommende	d clearance before co	oupling*1	0.8 mm or less	1.0 mm or less	1.2 mm or less	
Repeatabili	Repeatability			±0.01 mm		
Combined a	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		
	Main plate		71 g	176 g	445 g	
Weight	Tool plate	T1	55 g	174 g	350 g	
	100i piate	T2	59 g	183 g	355 g	
A:	Number of ports		4	6	8	
Air port for Port size			M5 x 0.8			
1001	Operating pressure range		-100 kPa to 0.7 MPa			
Electric	Electrode capacity		2 A/1 interface			
contact	contact Number of contact points		12			

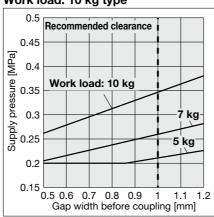
- \*1 Refer to page 19 for clearance before coupling. Check the detailed relationships among supply pressure, clearance before coupling, and work load by referring to the connection pressure graph below.
- \*2 This is the force applied in the direction of separation of the main plate and tool plate at 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**

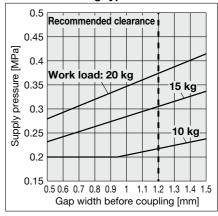
### Work load: 5 kg type



### Work load: 10 kg type

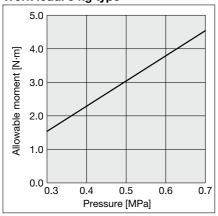


### Work load: 20 kg type

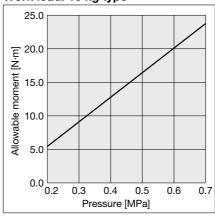


### Allowable moment for supply pressure

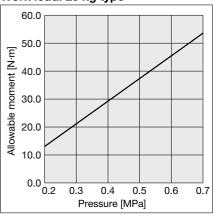
### Work load: 5 kg type



### Work load: 10 kg type



### Work load: 20 kg type



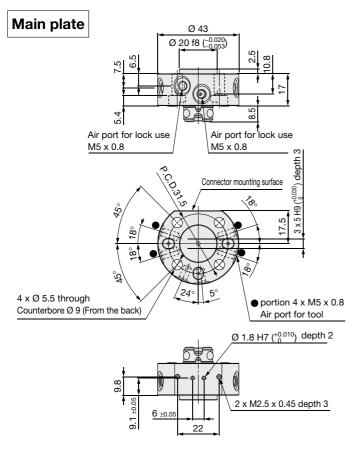
\* The connection pressure is a reference value. Use only after confirming the actual work load and the pressure at the clearance before coupling to ensure a secure coupling.

<sup>\*</sup> The allowable moment is a design value.

### Tool Changer/Auto Type **RMTA** Series

### **Dimensions**

### Work load 5 kg: RMTA1-05





### Tool plate

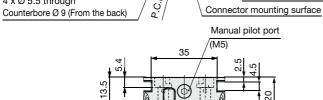
4 x Ø 5.5 through

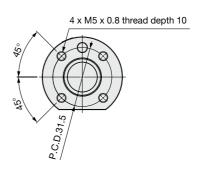


# Female thread mounting

# 2 x M2.5 x 0.45 depth 3.5 Ø 1.8 H7 (+0.010) depth 2 Ø 5 H9 ( $^{+0.030}_{0}$ ) depth 5 Ø 20 H8 (+0.033) depth 4

Through hole mounting











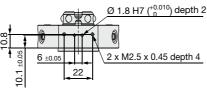
oportion 4 x M5 x 0.8 Air port for tool

### **Dimensions**

### Work load 10 kg: RMTA1-10

# Air port for lock use M5 x 0.8 Air port for tool





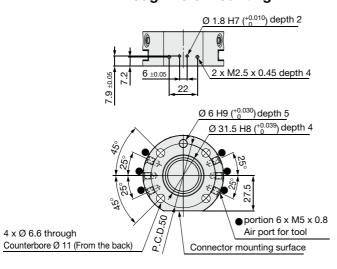
### **Tool plate**

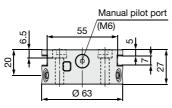
Counterbore Ø 11 (From the back)



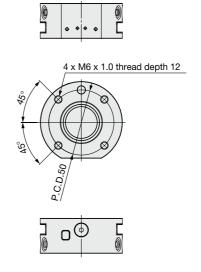


### Through hole mounting





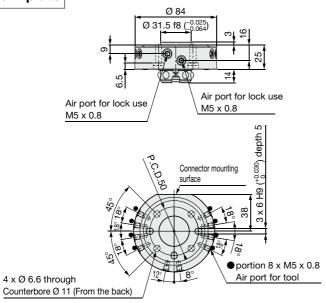
### Female thread mounting



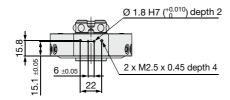
### **Dimensions**

### Work load 20 kg: RMTA1-20

### Main plate

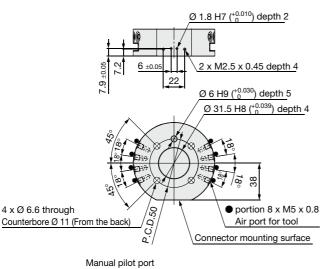






### **Tool plate**

# Through hole mounting

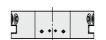


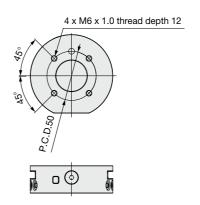
Ø 84

(M8)



### Female thread mounting







# **Options: Connector**

### **How to Order**



RMTA1-MC□

RMTA1-TC□

### RMTA1-MC2M

### Mounting body

М	Main plate
Т	Tool plate

Length discrete wire specification cable

_	1 m
M	3 m
L	5 m

\* Refer to page 14 for details.

### Electrode specifications

LICCI	Liectione specifications				
Symbol	Contents				
C1	Soldering specifications 12 pin				
C2	Discrete wire specifications Lead wire length 1 m, 3 m, 5 m				
СЗ	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				

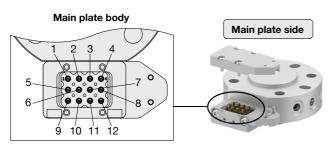
C3 and C4 can be selected only for RMTA1-M□□□.

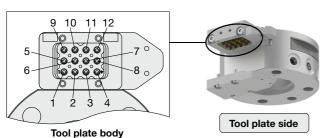
### Specifications

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

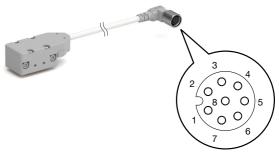
### Wiring

### Soldering specifications: Pin assignment





### M8 connector specifications M8-8 pin socket: Pin assignment



Pin assignment

### M8 connector specifications M8-8 pin plug: Pin assignment

# 7 6 6 8 • • 5 2 • • 4 3 4

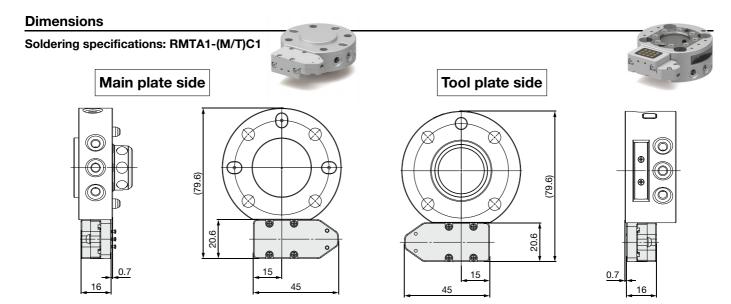
Pin assignment

### Discrete wire specifications: Circuit diagram

Pin	no.	Lead wire colou	r	
1		White		
2		Brown		
3		—— Green		
4		—— Yellow		
5		—— Grey		
6		Black		3.3
7		Blue	1111	9.
8		Red		
	* C	anductor AMC26		

13

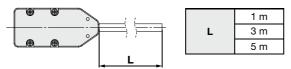
### Options: Connector **RMTA** Series



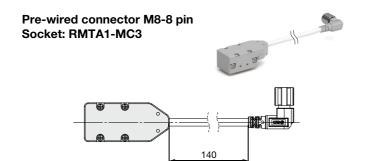
\* The above figure shows the RMTA1-10M1-C1.

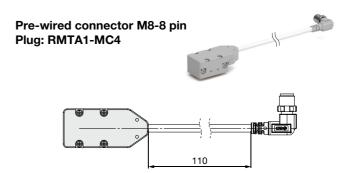
### \* The above figure shows the RMTA1-10T $\square$ -C1.

### Discrete wire specifications: RMTA1-(M/T)C2









## **Options: Tool Holder**

### **How to Order**





Tool changer work load

	05	5 kg
r	10	10 kg
2	20	20 kg

Switch holder

_	None
Α	With switch holder

Auto switch type

to the table below.

_	Without auto switch
M9□	Solid state auto switch
For ap	oplicable auto switches, refer

Lead	wire I	ength	[m] r			
0.5 (—)	1 (M)	3 (L)	5 (Z)	connector	Applicable load	

		Electrical	light	VA (See See See	L	oad volta	ge	Auto swit	ch model	Lead	wire I	ength	n [m]	Due sedered		
Type	Special function	Electrical entry	Indicator	Wiring (Output)	D	C	AC	Perpendicular	In-line	0.5 (—)	1 (M)	3 (L)	5 (Z)	Pre-wired connector	Applical	ble load
ಲ				3-wire (NPN)		5 V. 12 V		M9NV	M9N	•	•	•	0	0	C	
ari				3-wire (PNP)		5 V, 12 V		M9PV	M9P	•	•	•	0	0	circuit	
state		Grommet	Yes	2-wire	24 V	12 V		M9BV	M9B	•	•	•	0	0	-	Relay,
ski	Dia ana antin'i antina tiana	Grommet	168	3-wire (NPN)		5 V. 12 V	_	M9NWV	M9NW	•	•	•	0	0	IC	PLC
Solids	Diagnostic indication (2-colour indicator)			3-wire (PNP)		5 V, 12 V		M9PWV	M9PW	•	•	•	0	0	circuit	
Ō	(2-coloui ilidicator)			2-wire		12 V		M9BWV	M9BW	•	•	•	0	0	_	

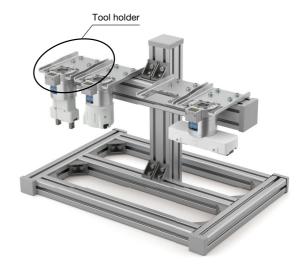
- \* Solid state auto switches marked with a "O" are produced upon receipt
- \* Auto switches are shipped together with the product but do not come assembled.
- \* Lead wire length symbols: 0.5 m····· (Example) M9NW
  - 1 m······ M (Example) M9NWM

  - 3 m----- L (Example) M9NWL 5 m----- Z (Example) M9NWZ

### **Application Example**

· Detect holder attachment with the auto switch



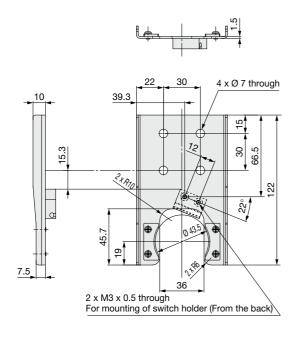


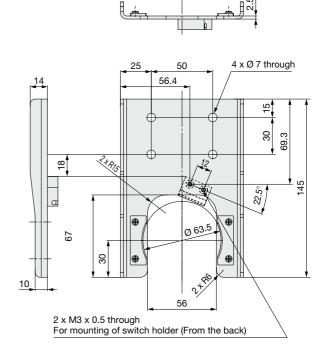
\* The base and stand need to be prepared by the user.

### **Dimensions**

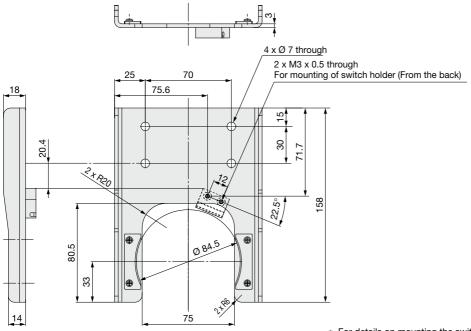
### Holder for a tool changer work load of 5 kg

### Holder for a tool changer work load of 10 kg





### Holder for a tool changer work load of 20 kg



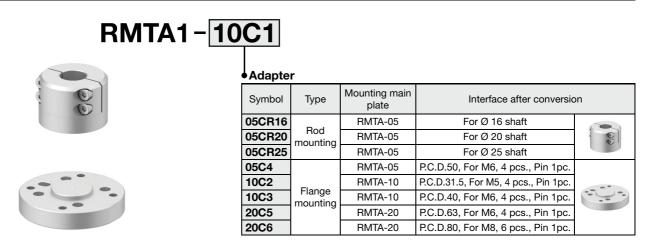
st For details on mounting the switch holder, refer to page 20.

## **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**



# Shaft mounting Robot end shaft Robot adapter Main plate Ms x 18 Hexagon socket head cap screw (Included in the package) Ms x 18 Hexagon socket head cap screw (Shipped with the main plate) Shaft mounting Robot adapter Robot adapter

### Flange Mounting Hexagon Socket Head Cap Screw Size Chart

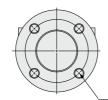
i lange meaning	g Hexago.	· Cooket i	icaa Cap c	OICH CIE	Onare	
Main plate	RMTA1	I-05M1	RMTA1	I-10M1	RMTA1	I-20M1
Robot adapter	Bolt A	Bolt B	Bolt A	Bolt B	Bolt A	Bolt B
RMTA1-05C4	M6 x 12	M5 x 18	_	_	_	-
RMTA1-10C2	_	_	M5 x 8	M6 x 16	M5 x 8	M6 x 25
RMTA1-10C3	_	_	M6 x 12	M6 x 16	M6 x 12	M6 x 25
RMTA1-10C5	_	_	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



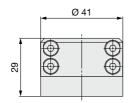
### **Dimensions**

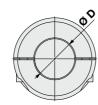
Robot adapter for shaft

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



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

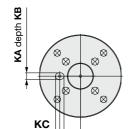


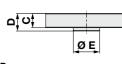


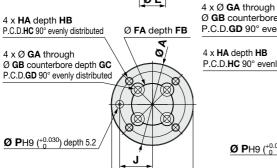
Model	ØD
RMTA1-05CR16	16
RMTA1-05CR20	20
RMTA1-05CR25	25

### Robot adapter for flange

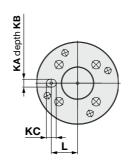
RMTA1-05C4 RMTA1-10C2

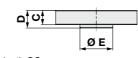


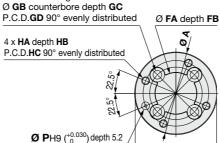




RMTA1-10C3 RMTA1-20C5



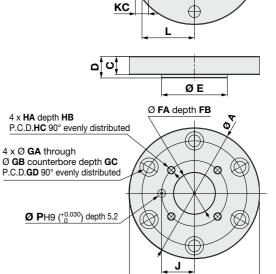




**RMTA1-20C6** 

KA depth KB

8



В

Model	Α	В	С	D	E	FA	FB	GA	GB	GC	GD	HA	НВ	нс	J	KA	KB	кс	L	Р
RMTA1-05C4	63	62	11	13.5	Ø 31.5f8 (-0.025)	Ø 20H8 (+0.033)	5	6.6	11	6.5	50	M5 x 0.8	7	31.5	15.75	Ø 6H9 (+0.030)	5.2	7.5	25	5
RMTA1-10C2	63	62	11	13.5	Ø 20f8 (-0.020)	Ø 31.5H8 (+0.039)	3	5.5	10	8.4	31.5	M6 x 1	8	50	25	Ø 5H9 (+0.030)	5.2	6.5	15.75	6
RMTA1-10C3	63	62	11	13.5	Ø 25f8 (-0.020)	Ø 31.5H8 (+0.039)	3	6.6	11	6.5	40	M6 x 1	8	50	- 1	Ø 6H9 (+0.030)	5.2	7.5	20	6
RMTA1-20C5	84	83	11	13.5	Ø 40f8 (-0.025)	Ø 31.5H8 (*0.039)	3	6.6	11	6.5	63	M6 x 1	8	50	-	Ø 6H9 (+0.030)	5.2	7.5	31.5	6
RMTA1-20C6	100	99	14	16.5	Ø 50f8 (-0.025)	Ø 31.5H8 (+0.039)	5	9	14	8	80	M6 x 1	8	50	25	Ø 8H9 (+0.036)	7.5	10	40	6

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# 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.smc.eu

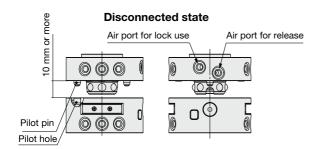
### **Connection/Disconnection Method**

### 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.
- Supply compressed air to the air port for lock use while simultaneously releasing compressed air from the air port for release.

### **Disconnection method**

- 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**

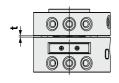


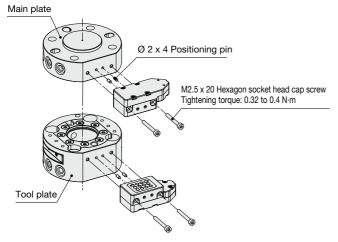
Table 1. Clearance amount at time of recommended connection\*1

	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.

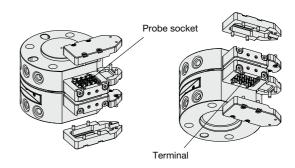
### **Connector Mounting**

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



### Piping/Wiring

- 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.
- 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.





# RMTA 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.smc.eu

### **Maintenance (Cleaning)**

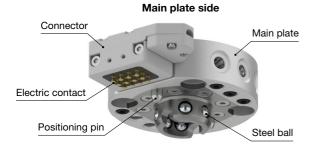
# Cleaning of main plate and tool plate If this product is used while wear particles, dirt, for eign matter, or other substance is adhered on the main plate, tool plate positioning pin, steel ball, or seating surface, an operation failure or air leakage may be caused. Perform regular cleaning, including

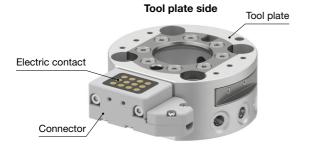
wiping off any dirt and other grime. For details, refer to the operation manual.

### 2. Cleaning of connector

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

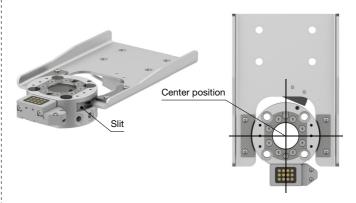
Perform regular cleaning, including wiping off any dirt and other grime. For details, refer to the operation manual.



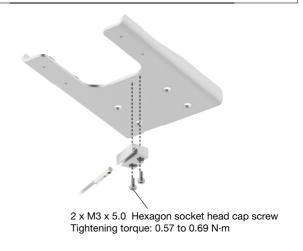


### How to Use the Tool Holder

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.

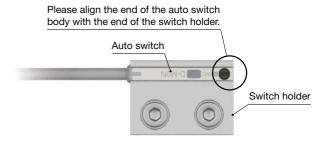


### How to Mount the Switch Holder



### 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.





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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

Marning:

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

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

### 

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 catalogue 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. Our products cannot be used beyond their specifications. Our products are not developed, designed, and manufactured to be used under the following conditions or environments. Use under such conditions or environments is not covered.
  - 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, fuel 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 catalogues 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.

### 

We develop, design, and manufacture our products to be used for automatic control equipment, and provide them for peaceful use in manufacturing industries. Use in non-manufacturing industries is not covered.

Products we manufacture and sell cannot be used for the purpose of transactions or certification specified in the

Measurement Act. The new Measurement Act prohibits use of any unit other than SI units in Japan.

### Limited warranty and **Disclaimer/Compliance** Requirements

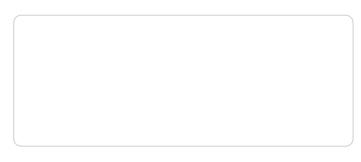
The product used is subject to the following "Limited warranty and Disclaimer" and "Compliance Requirements". Read and accept them before using the product.

### **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
- 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 catalogue for the particular products.
- 2) Vacuum pads are excluded from this 1 year warranty. A 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 vacuum pad or failure due to the deterioration of rubber material are not covered by the limited

### 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



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