



Operation Manual

PRODUCT NAME

Multi hand adapter

MODEL / Series / Product Number

RMMA series

SMC Corporation

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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.

*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.



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.

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. 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 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.



Safety Instructions

Caution

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 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) 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 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.

1. List of included items

1-1. Basic form

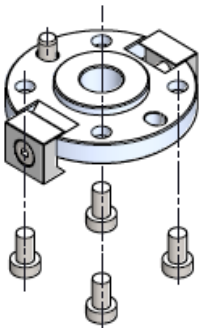
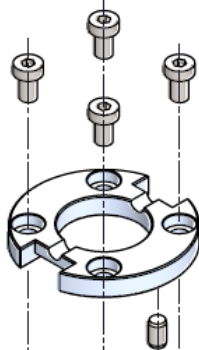
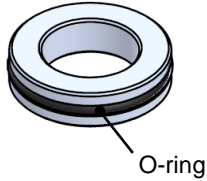
*This product is shipped as parts (in an unassembled state). Therefore, the user will need to assemble them into the product.

Mounting angle	Changer specification		
	With Main plate · Tool plate(E)	With Tool plate (F)	Without Tool plate(N)
90°	RMMA1-20T090-E 	RMMA1-20T090-F 	RMMA1-20T090-N
120°	RMMA1-20T120-E 	RMMA1-20T120-F 	RMMA1-20T120-N

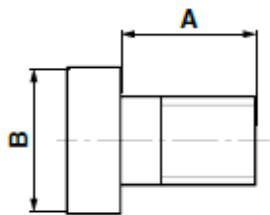
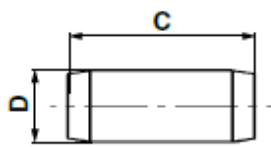
1-2. Option

Mounting angle180°Parts set	Connector cable
RMMA1-20T090-E-01 	RMH-A00-18A

1-3. Replacement parts

Main plate	Tool plate	Collar ASSY
<p>RMTM2-4M1 *Note1)</p> 	<p>RMTM2-4T1</p> 	<p>RMMA-A00-01</p>  <p>O-ring</p>

*Note 1) Two types of main plate mounting bolts and two types of parallel pins, with different lengths, are supplied with the product. Select parts that suit the robot in use.

Hexagon thin socket head bolt	Parallel pin																		
 <table border="1"> <thead> <tr> <th>Product No.</th> <th>A</th> <th>B</th> </tr> </thead> <tbody> <tr> <td>RMH-A00-14</td> <td>10</td> <td>10</td> </tr> <tr> <td>RMH-A00-15</td> <td>8</td> <td>10</td> </tr> </tbody> </table>	Product No.	A	B	RMH-A00-14	10	10	RMH-A00-15	8	10	 <table border="1"> <thead> <tr> <th>Product No.</th> <th>C</th> <th>D</th> </tr> </thead> <tbody> <tr> <td>RMH-A00-16</td> <td>10</td> <td>6h8</td> </tr> <tr> <td>RMH-A00-17</td> <td>15</td> <td>6h8</td> </tr> </tbody> </table>	Product No.	C	D	RMH-A00-16	10	6h8	RMH-A00-17	15	6h8
Product No.	A	B																	
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Product No.	C	D																	
RMH-A00-16	10	6h8																	
RMH-A00-17	15	6h8																	

*The above bolts and pins are spare replacement parts. The main plate and tool plate come with bolts.

Table of applicable bolts for replacement use on a collaborative robot manufacturer/model basis

Robot maker	Supported models	Dedicated flange	Symbol	Hexagon thin socket head bolt		Parallel pin	
				Part No.	Size	Part No.	Size
UNIVERSAL ROBOT	UR*e	-	011	RMH-A00-14	M6x10	RMH-A00-16	6x10
OMRON /TECHMAN ROBOT	TM*	-	021				
MITSUBISHI Electric	MELFA ASSISTA *Note1) (RV-5AS-D)	●	031				
YASKAWA Electric	MOTOMAN-HC10 *Note1)	●	041				
	MOTOMAN-HC10DT *Note1)	●	042				
	MOTOMAN-HC10DTP	-	043				
FANUC	CRX-*	-	051				
KUKA	LBR iiwa *Note2)	-	061				
DOOSAN ROBOTICS	M,H Series	-	071	RMH-A00-15	M6x8		
SIASUN	GCR	-	081				
JAKA	Zu*	-	091	RMH-A00-14	M6x10	RMH-A00-17	6x15
AUBO	AUBO-i*	-	101			RMH-A00-16	6x10
HAN'S ROBOT	Elfin E*	-	111				
ABB	Gofa CRB15000	-	121			RMH-A00-17	6x15

Note 1) For installation of main plate on some collaborative robots, you need to separately procure a **dedicated flange**. If a dedicated flange is required, procure it according to the table below.

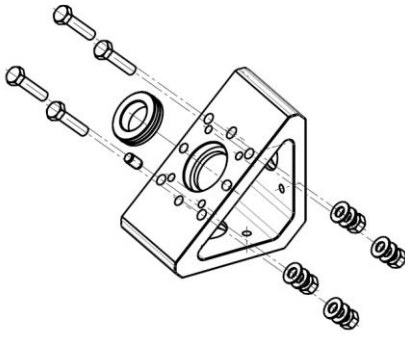




Note 2) LBR iiwa is only compatible with media flange: I/O Pneumatic.

● DEDICATED FLANGE

If dedicated flange is required, separately procure it.

Robot maker	Supported models	Part No.
MITSUBISHI Electric	MELFA ASSISTA (RV-5AS-D)	JMHZ-A16-X7400-BRK-01
YASKAWA Electric	MOTOMAN-HC10	JMHZ-A16-X7400-BRK-02
	MOTOMAN-HC10DT	JMHZ-A16-X7400-BRK-03

*The models of the above order numbers come with bolts for installing the dedicated flange on the robot.

Mounting angle180°Additional parts	Mounting angle180°Parts set
<p style="text-align: center;">RMMA-A11-01</p>  <p style="text-align: right;">Mass : 396g</p>	<p style="text-align: center;">RMMA-A00-02</p> <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;">  <p>Hexagon head bolt</p> </div> <div style="text-align: center;">  <p>Flat washer</p> </div> <div style="text-align: center;">  <p>Sprong washer</p> </div> <div style="text-align: center;">  <p>Hexagon Head bolt</p> </div> </div> <p style="text-align: right;">Quantity: 4 pieces each</p>

*If you have already procured RMMA1-20T090-E, it is possible to make its specifications same as those of RMMA1-20T90-E-01 by combining it with RMMA-A11-01.

●RMMA-A11-01 Parts in use

No.	Replacment parts		Material properties (Surface treatment)	Qty (Pcs)	Size	
	Part No.	Part name				
1	RMMA1-20T090-N	Multi hand adapter	Aluminum alloy (Anodic oxide coating)	1	-	
2	RMMA-A00-01	Collar ASSY	Collar	Aluminum alloy (Anodic oxide coating)	1	φ31.5xφ19x8
			O-ring	NBR	1	-
3	RMH-A00-14	Parallel pin	Stainless steel	1	6x10	
4	RMMA-A00-02	Hexagon head bolt	Rolled steel (Zinc chromated)	4	M6x25	
5		Flat washer		4	For M6	
6		Spring washer		4	For M6	
7		Hexagon nut		4	For M6	

2. How to order

RMMA1-20 T 090 - E -

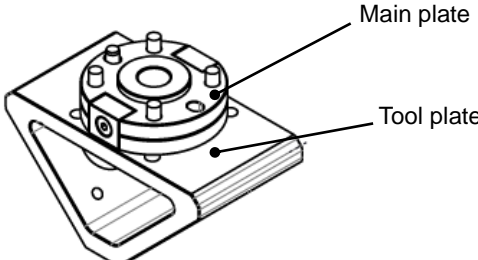
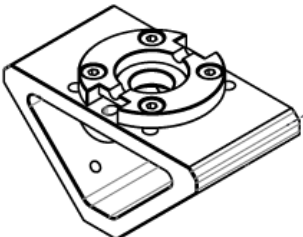
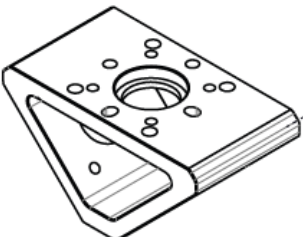
① Gripper mounting angle

090	90°
120	120°

③ Option

01	Mounting angle 180° Parts set
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② Changer specification

E	<p>With Main plate · Tool plate</p> 
F	<p>With Tool plate</p> 
N	<p>Without Tool plate</p> 

*E and F are equipped with a collar assembly.

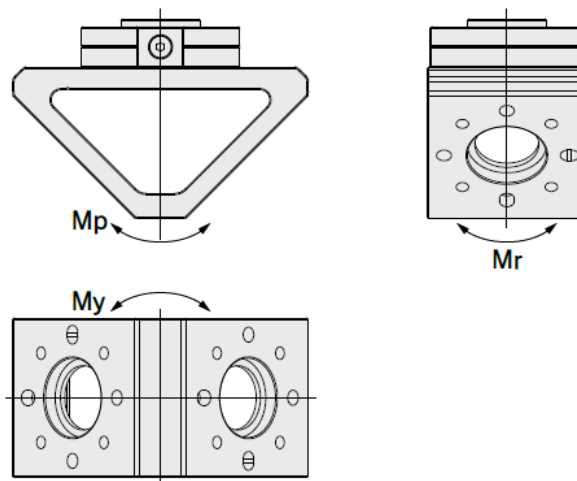
*For the gripper mounting angle of 180°, refer to page 12.

*For the connector cable to be used when two or more grippers are mounted, refer to page 18.

3. Specification

Mounting angle		90°	120°
Maximum work load		20kg *Note1)	
Moment resistance M_p , M_r		60N·m *Note1)	
Torque resistance M_y		60N·m *Note1)	
Installation standard	Robot side	ISO9409-1-50-4-M6 equivalent	
	Gripper mounting side	ISO9409-1-50-4-M6 equivalent	
Ambient temperature		-10 to 60°C	

Note 1) Use the product at the minimum tolerances of the robot and peripheral devices to be connected. Before using the product, be sure to conduct an evaluation test by yourself and judge whether the product can be used.



Mass table

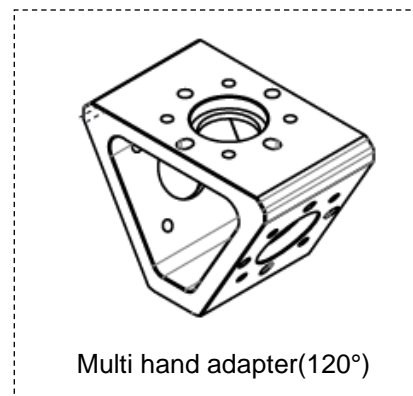
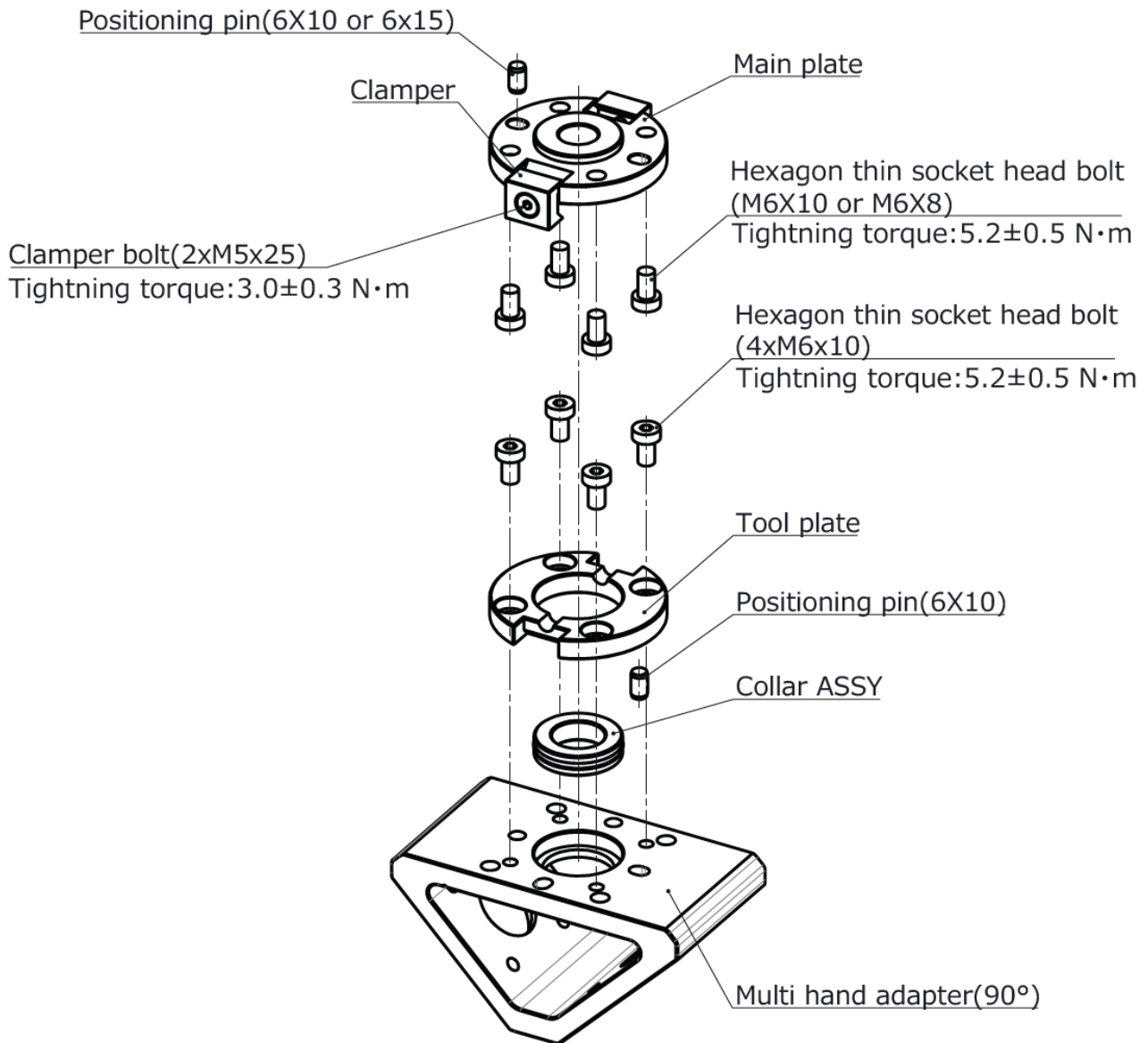
(g)

Item	Mounting angle 90°	Mounting angle 120°
With Main plate · Tool plate	420 *Note2)	550 *Note2)
With Tool plate	400 *Note2)	430 *Note2)
Without Tool plate	340	370

Note 2) Each weight contains the weights of hexagon thin socket head bolts M6×10 (4 pcs.) and parallel pin φ6×10 (1 pc.).

4. Components and assembly

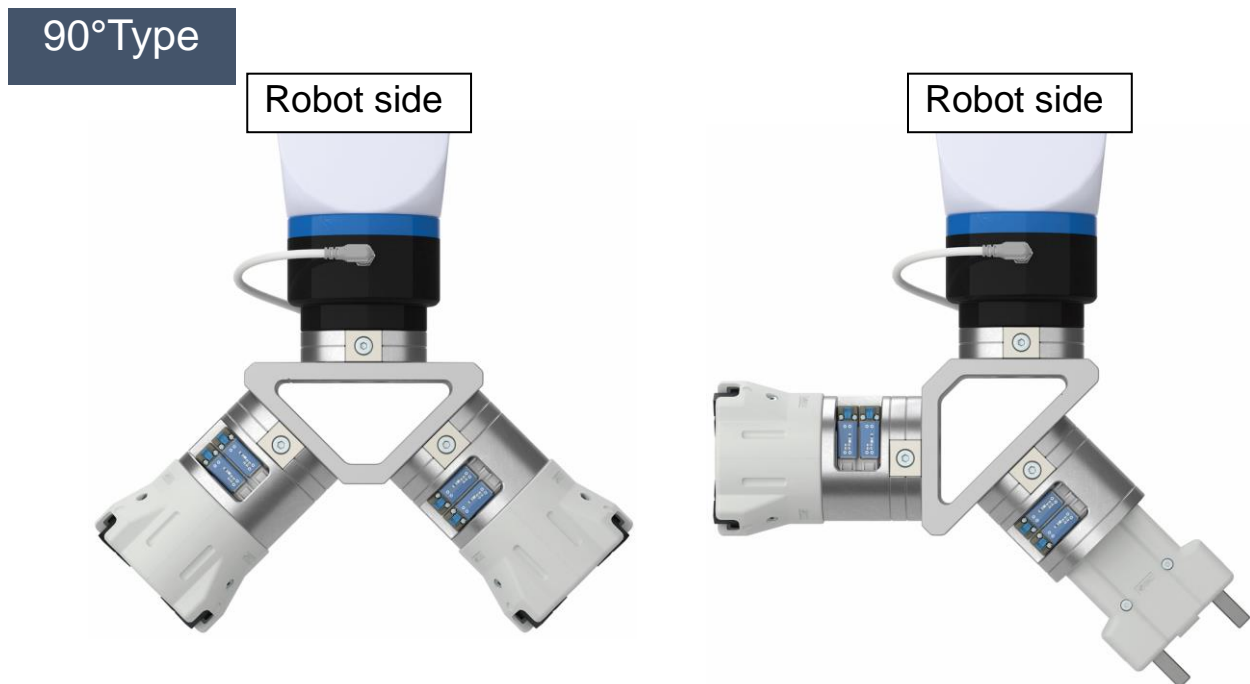
4-1. RMMA1-20T090-(E/F/N) 、 RMMA1-20T120-(E/F/N)



Parts used and replacement parts

Replacement parts		Description	Material properties (Surface treatment)	Qty (Pcs)	Size	Assembled and paced	Changer specification		
Product No.	Description						E	F	N
RMMA1-20T***-N	Multi hand adapter	Multi hand adapter	Aluminum alloy (Anodic oxide coating)	1	-	Include	●	●	●
RMTM2-4M1	Main plate (Tool changer clamp type)	Body	Aluminum alloy (Anodic oxide coating)	1	-	Include (Temporary assembly)	●	-	-
		Clamper	Stainless steel	2	-				
		Clamper bolt		2	M5x25	Include			
		Hexagon thin socket head bolt	Chromium molybdenum steel (Zinc chromated)	4	M6x10				
		Hexagon thin socket head bolt		4	M6x8				
		Positioning pin		1	6x10				
	Positioning pin	Stainless steel	1	6x15					
RMTM2-4T1	Tool plate (Tool changer clamp type)	Tool plate	Aluminum alloy (Anodic oxide coating)	1	-	Include	●	●	-
		Hexagon thin socket head bolt	Chromium molybdenum steel (Zinc chromated)	4	M6x10	Include			
		Positioning pin	Stainless steel	1	6x10				
RMMA-A00-01	Collar ASSY	Collar	Aluminum alloy (Anodic oxide coating)	1	-	Include	●	●	-
		O-ring	NBR	1	-				
RMH-A00-14	Hexagon thin socket head bolt		Chromium molybdenum steel	-	M6x10	/			
RMH-A00-15	Hexagon thin socket head bolt		Chromium molybdenum steel (Zinc chromated)	-	M6x8				
RMH-A00-16	Positioning pin			-	6x10				
RMH-A00-17	Positioning pin		Stainless steel	-	6x15				

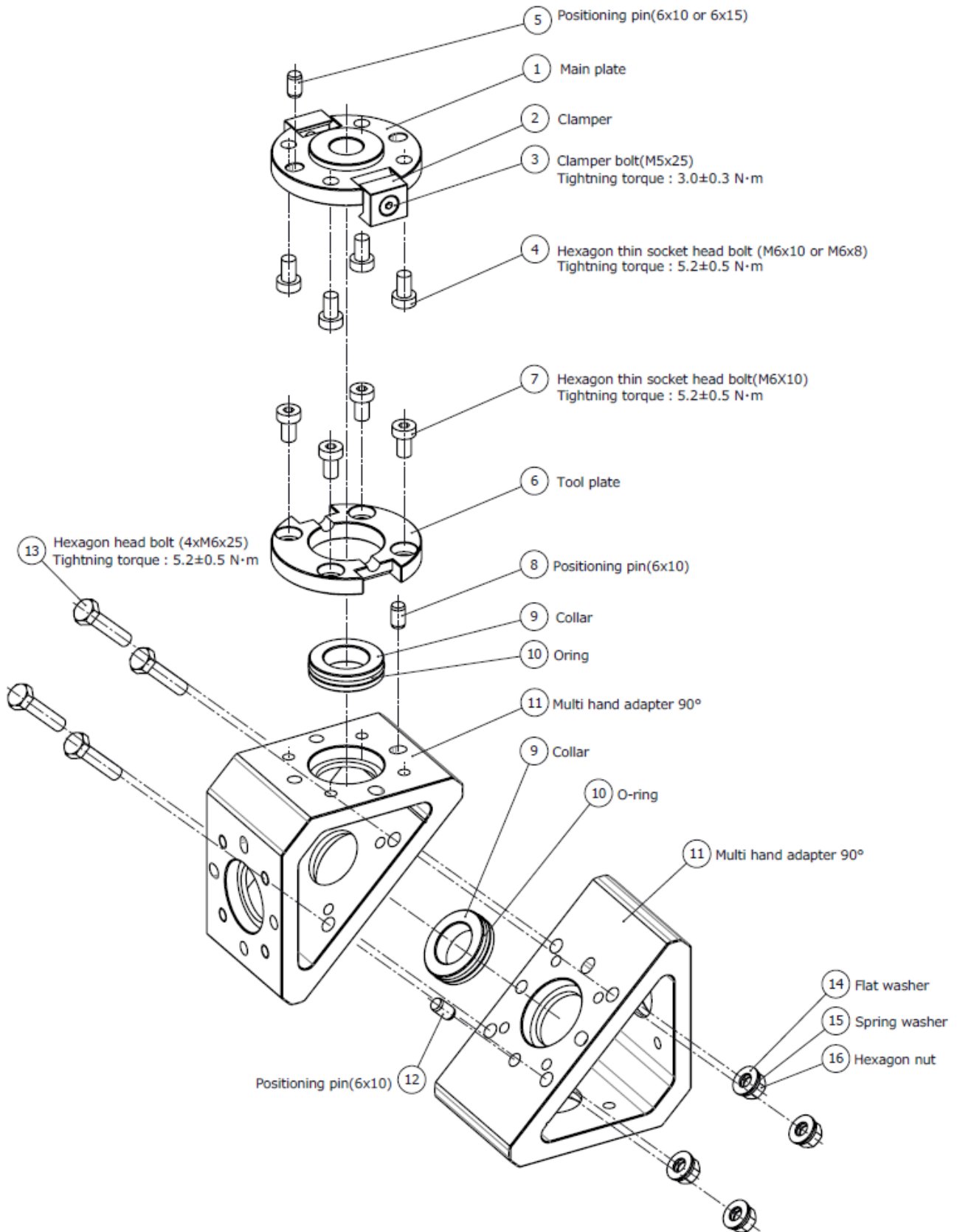
● Gripper mounting example



*Separately procure the gripper.

*Prepare a connector cable (RMH-A00-18A, 3-m cable not equipped with connector at one end).
(Refer to page 18) If it is required, separately procure it.

4-2. RMMA1-20T090-E-01 / Mounting angle 180° Parts set

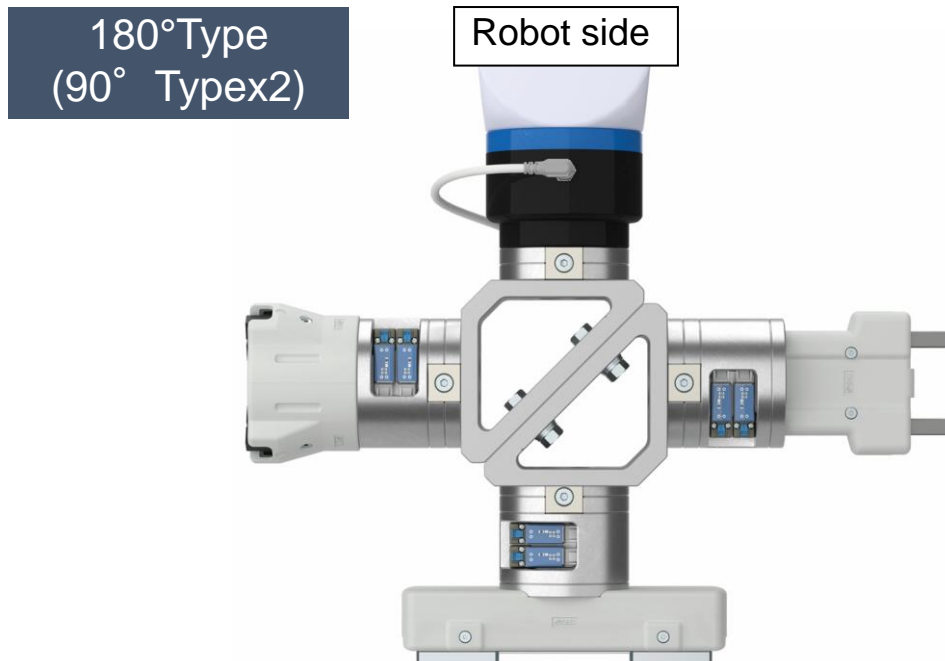


Mass : 919g

Parts used and replacement parts

Replacement parts		Parts name		Material properties (Surface treatment)	Qty (Pcs)	Remarks
Product No.	Description	No.	Description			
RMTM2-4M1	Main plate (Tool changer clamp type)	1	Main plate	Aluminum alloy (Anodic oxide coating)	1	-
		2	Clamper	Stainless steel	2	-
		3	Clamper bolt	Rolled steel (Zinc chromated)	2	M5x25
		4	Hexagon thin socket head bolt		4	M6x10
		4	Hexagon thin socket head bolt		4	M6x8
		5	Positioning pin	Stainless steel	1	6x10
1	Positioning pin	Stainless steel	1	6x15		
RMTM2-4T1	Tool plate (Tool changer clamp type)	6	Tool plate	Aluminum alloy (Anodic oxide coating)	1	4xM6 Depth of counterbore
		7	Hexagon thin socket head bolt	Rolled steel (Zinc chromated)	4	M6x10
		8	Positioning pin	Stainless steel	1	6x10
RMMA-A00-01	Collar ASSY	9	Collar	Aluminum alloy (Anodic oxide coating)	2	φ 31.5x φ 19x8
		10	O-ring	NBR	2	30x26x2
RMMA1-20T090-N	Multi hand adapter 90°	11	Multi hand adapter 90°	Aluminum alloy (Anodic oxide coating)	2	-
RMH-A00-14	Positioning pin	12	Positioning pin	Stainless steel	1	6x10
RMMA-A00-02	Mounting angle 180° Bolt set	13	Hexagon head bolt	Rolled steel (Zinc chromated)	4	M6x25
		14	Flat washer		4	For M6
		15	Spring washer		4	For M6
		16	Hexagon nut		4	For M6

● Gripper mounting example



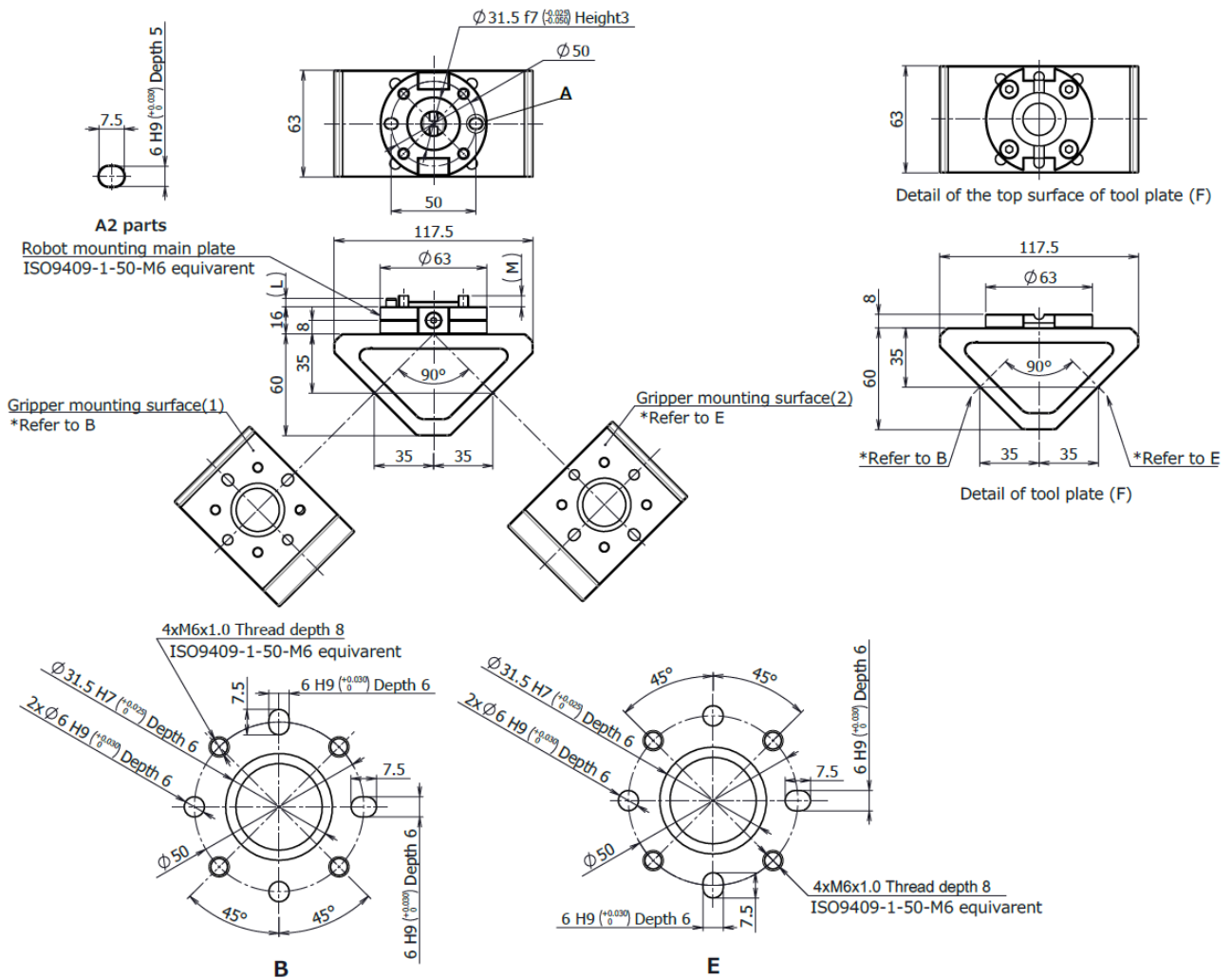
*Separately procure the gripper.

*Prepare a connector cable (RMH-A00-18A, 3-m cable not equipped with connector at one end).
(Refer to page 18) If it is required, separately procure it.

5. Dimensions

5-1. RMMA1-20T090-E / With Main plate · Tool plate

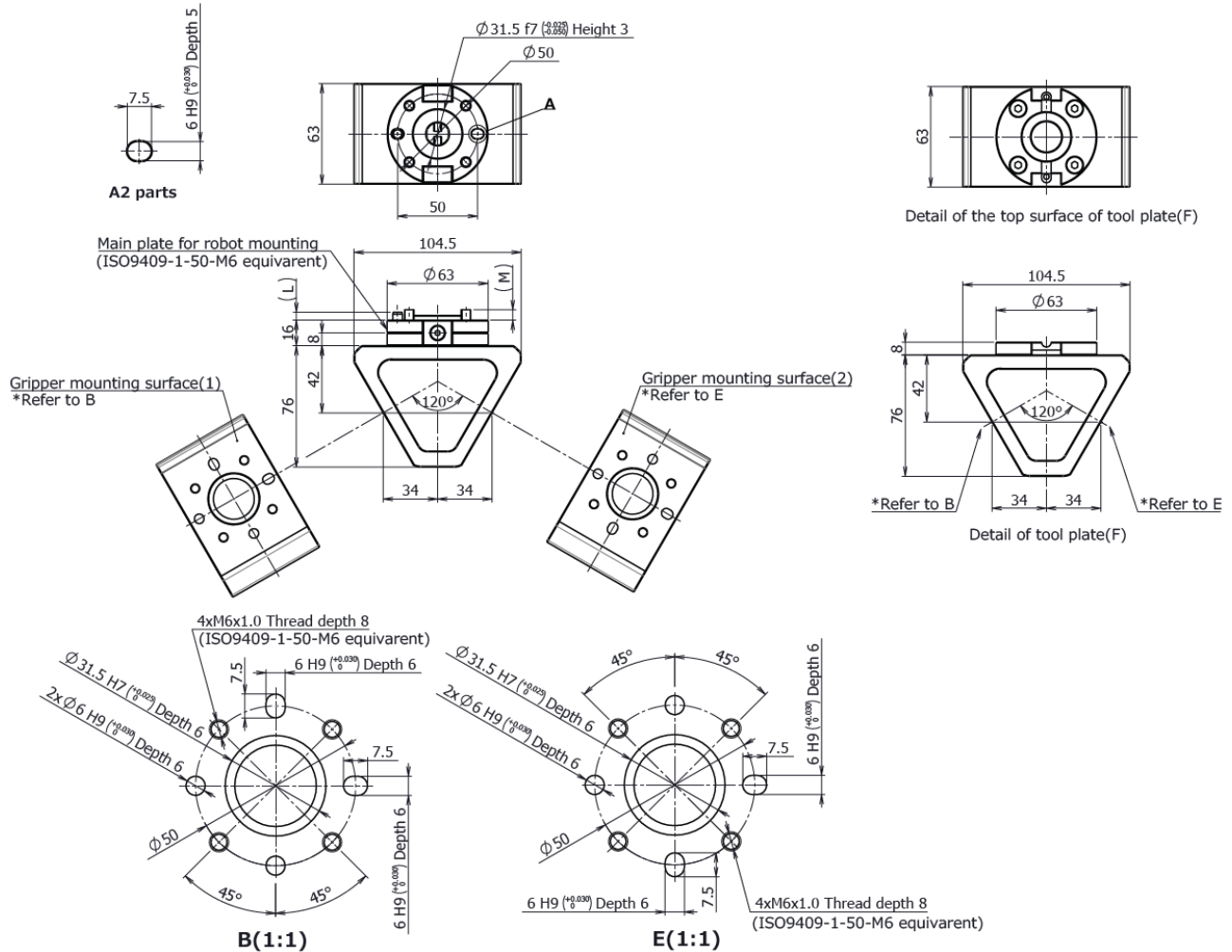
*The dimensions of the model with tool plate (F) are the same as those of the model with main plate/tool plate except for the detailed portions.



Part name	Size	M
Hexagon thin socket head bolt	M6x10	6.5
	M6x8	4.5
Part name	Size	L
Parallel pin	6x10	5
	6x15	10

5-2. RMMA1-20T120-E / With Main plate · Tool plate

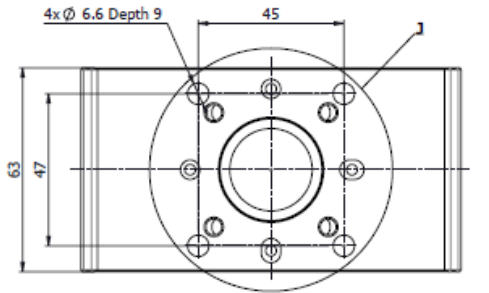
*The dimensions of the model with tool plate (F) are the same as those of the model with main plate/tool plate except for the detailed portions.



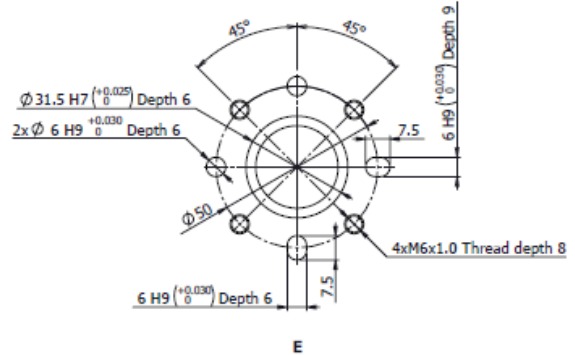
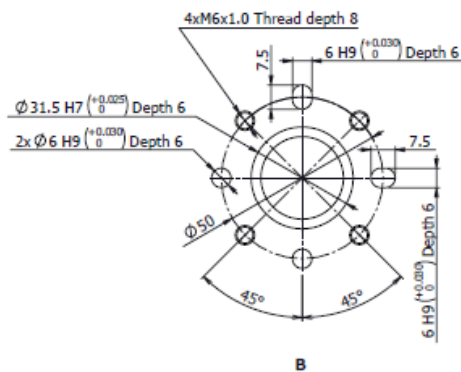
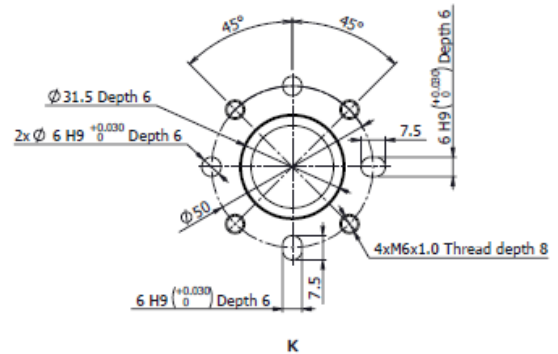
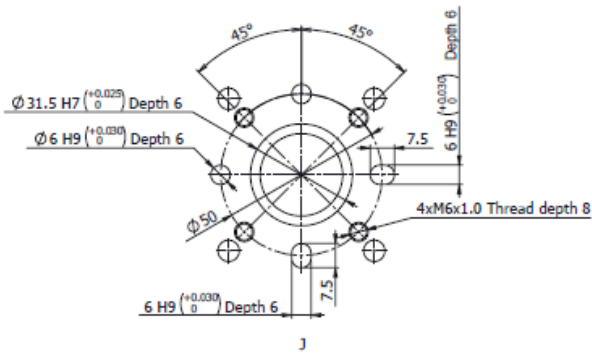
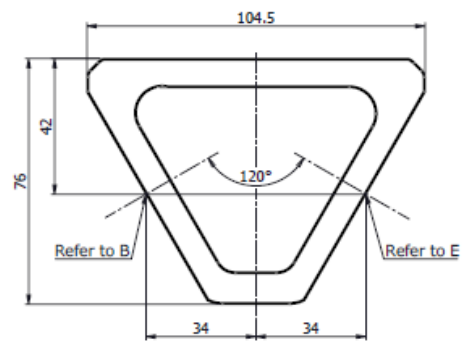
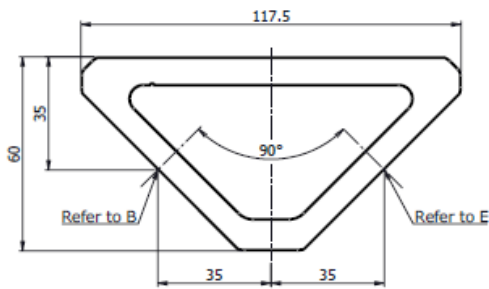
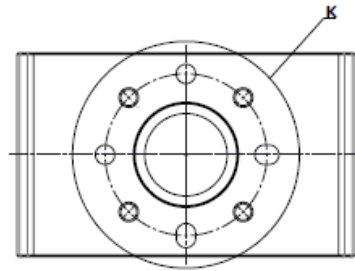
Part name	Size	M
Hexagon thin socket head bolt	M6x10	6.5
	M6x8	4.5
Part name	Size	L
Parallel pin	6x10	5
	6x15	10

5-3. Multi hand adapter Single unit mounting angle 90° ,120°

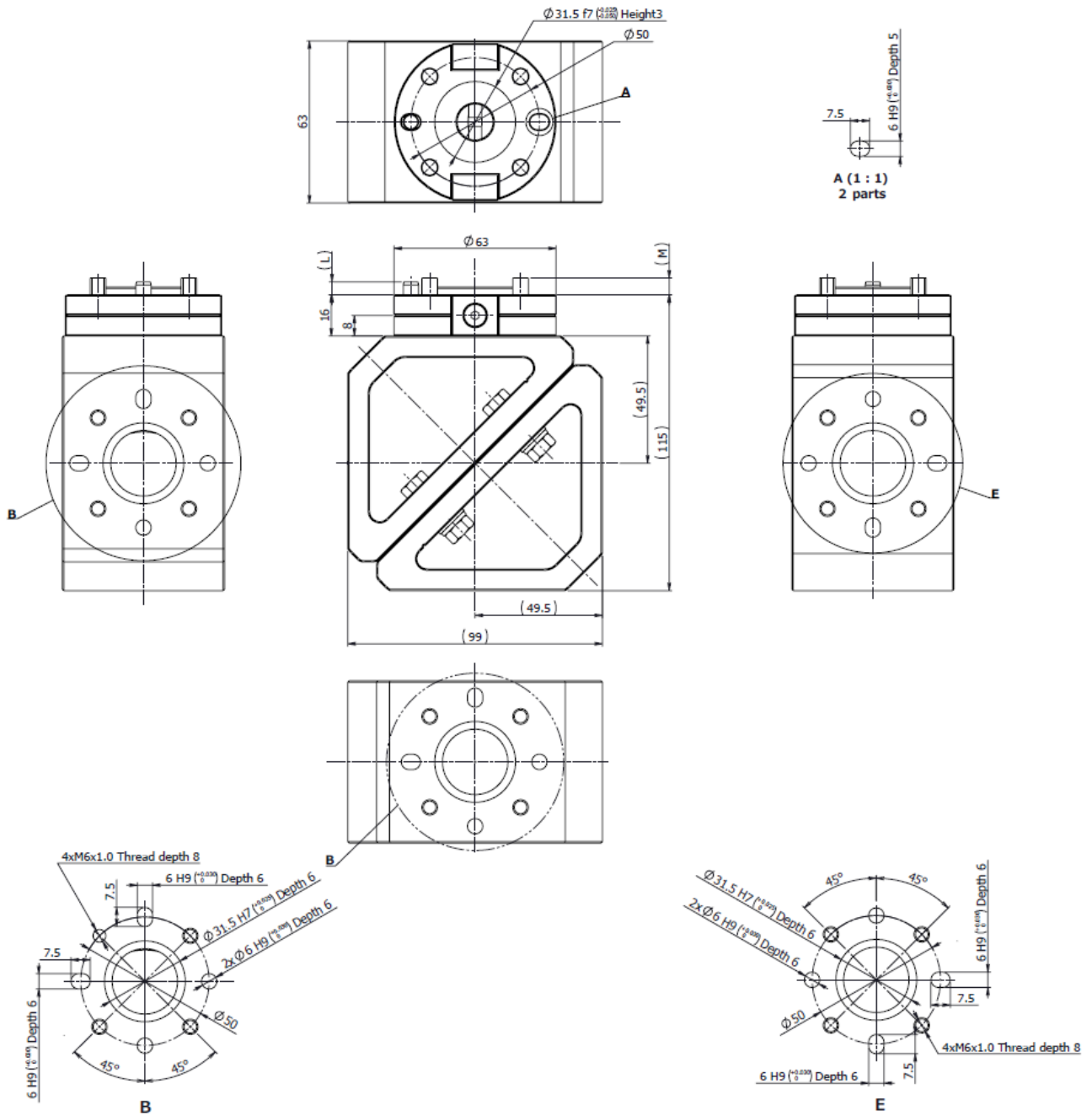
RMMA1-20T090-N/Mounting angle 90°



RMMA1-20T120-N/Mounting angle 120°



5-4. RMMA1-20T090-E-01 / Mounting angle 180° Parts set



Part name	Size	M
Hexagon thin socket head bolt	M6x10	6.5
	M6x8	4.5
Part name	Size	L
Parallel pin	6x10	5
	6x15	10

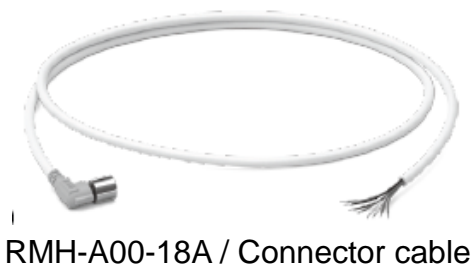
6. Cable option

6-1. RMH-A00-18A / Connector cable

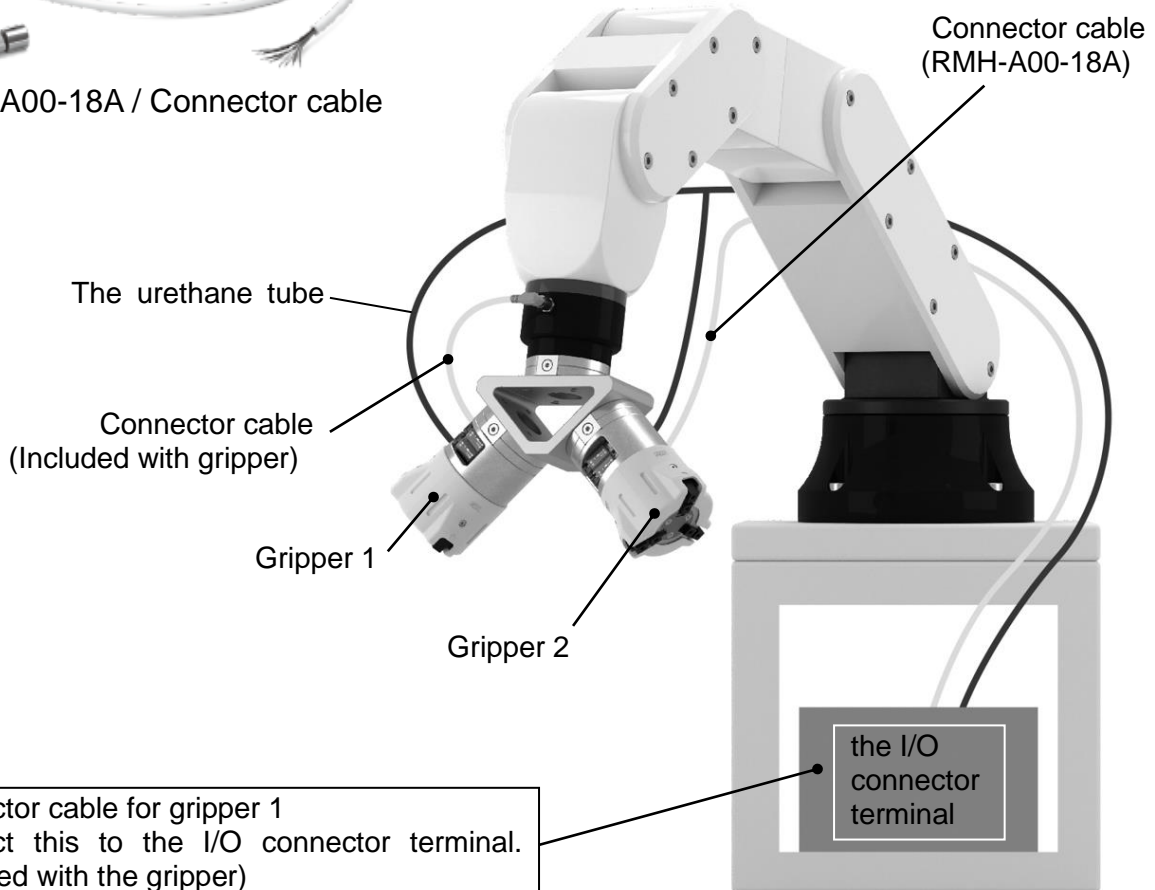
When you use two or more grippers, separately procure the connector cable for electric wiring.

Connect the connector to the gripper.

One end of the cable is not equipped with a connector. Make connection to the I/O terminal for additional installation use on the robot controller.



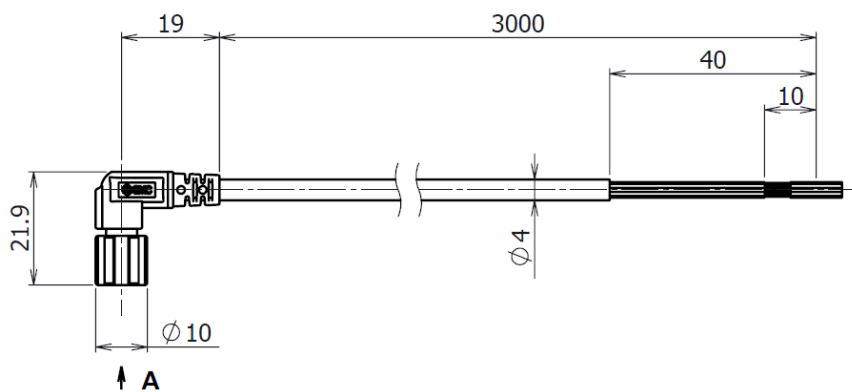
*The RMH series does not come with the urethane tube for air piping.
Note that it needs to be procured by the user.



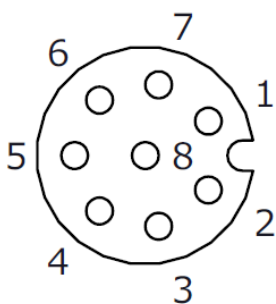
Connector cable for gripper 1
Connect this to the I/O connector terminal.
(Supplied with the gripper)

Connector cable for gripper 2 (not equipped with connector)
Connect this cable to the I/O terminal for additional installation of robot and to the electric wiring connector on the gripper side.
(This cable should be procured by the user.)

***Our air gripper RMH* series for collaborative robot does not come with the urethane tube for air piping. It should be procured by the user.**



A (Pin No.) (5 : 1)



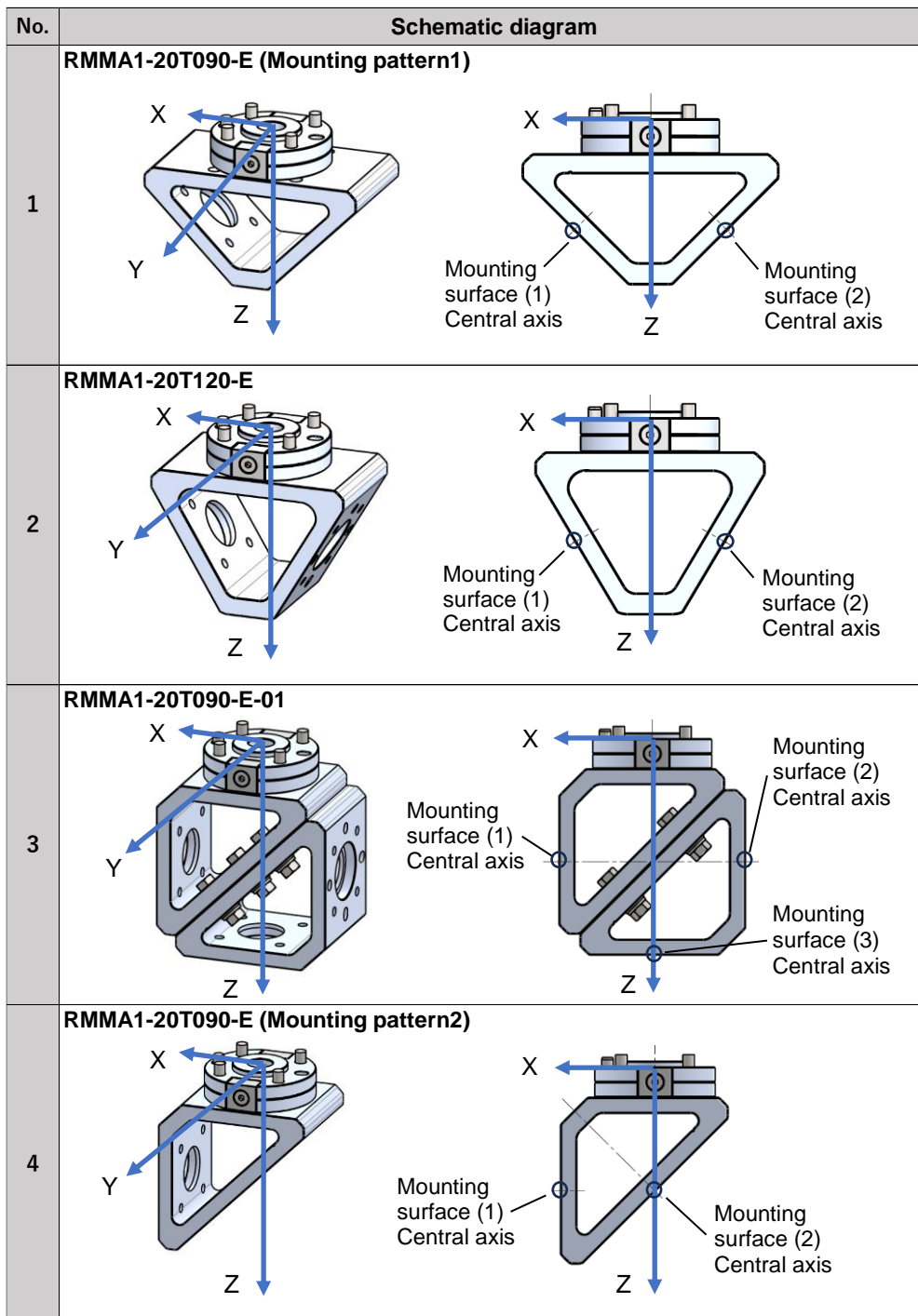
Connector	Pin No.	Wiring color
M8-8 Pin Angle Connector (Socket)	1	White
	2	Brown
	3	Green
	4	Yellow
	5	Gray
	6	Black
	7	Blue
	8	Red

Specification

Standard	IEC61076-2-104 equivalent
Connector type	M8 Socket
Polar number	8
Keying	A
Rated voltage	DC30V
Rated current	1A
Conductor	AWG26
Terminal processing	Half strip
Ambient temp. and operating frequency	-10~+60°C

7. Center of gravity and TCP

No.	Model	Gripper mounting surface No.	TCP(Tool Center Point)			Weight[kg]	Center of gravity[mm]			Moment of inertia[kg ^m ²]		
			X	Y	Z		M	Lx	Ly	Lz	Ix	Iy
1	RMMA1-20T090-E (Mounting pattern 1)	1	35	0	35	0.521	0.01	-10.93	-0.01	0.00041	0.00061	0.00067
		2	-35	0	35							
2	RMMA1-20T120-E	1	34	0	42	0.553	0.03	-16.89	-0.01	0.00057	0.00062	0.00081
		2	-34	0	42							
3	RMMA1-20T090-E-01	1	49.5	0	65.5	0.919	0.11	60.91	-0.01	0.00103	0.00154	0.00191
		2	49.5	0	65.5							
		3	0	0	131							
4	RMMA1-20T090-E (Mounting pattern 2)	1	35	0	35	0.521	0.01	-10.93	-0.01	0.00036	0.00080	0.00080
		2	0	0	35							



8. Precautions for Design

Warning

1. This product is a gripper peripheral device for collaborative robot. Do not use the product for any other purpose than the above.
2. Use this product at the minimum tolerances of moment resistance and torque resistance among those of this product and peripheral devices in use.

9. Precautions for assembly and use

Warning

1. This product is shipped as parts (in an unassembled state). Therefore, the user needs to assemble them into the product.
2. Assemble the product after carefully reading and understanding the operation manual. After reading this document, keep it safe.
3. When assembling the multi hand adapter body with the tool plate and/or additional parts for the 180° mounting angle, separately use clamping tools or equivalent. After fixing those parts with a clamping tool or equivalent, we recommend that you tighten screws at various locations.
4. Appropriately tighten the screws at various parts to torque values within the limiting range. Tightening to a torque beyond the limiting range may cause the seat surface to collapse, the screw ridges to be broken, and the bolts to be loosened or broken.
5. Apply commercially available screw lock agent in combination as necessary.
6. At the time of assembly, pay close attention not to get injured by the outer circumference of the main plate or tool plate or the edge of the clasper.
7. Pay attention not to scratch or gouge the tool plate mounting surface or gripper mounting surface of the multi hand adapter body. Even a small gouge, scratch, or deformation may cause an abnormality with the positional accuracy of the tip of the gripper installed on this product.
8. The main plate comes with multiple bolts and pins. After checking the installation dimensions on your robot, select appropriate bolts.
9. Do not drop, hit, or apply excessive shock to the product.
10. During a robot operation, pay close attention not to have your finger or other body part pinched by the multi hand adapter.

10. Maintenance and Inspection

Warning

1. Perform periodical maintenance inspections to see whether the screws at various parts are loosened. Improper handling can cause an injury, damage and/or malfunction of equipment and machinery.
2. If you observe collision, gouge, or scratch of the product during its use, conduct an inspection to see whether there is any abnormal component and, if an abnormality is found, replace the component with the abnormality.
3. When installing the products, allow access for maintenance.

Revision history
1 : P16 add, P18 Added part names in Fig
2 : P8,P11,P13 Correction of errors

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Note: Specifications are subject to change without prior notice and any obligation on the part of the manufacturer.
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