

Auto Hand Changer

MJC Series



- **Lightest in the World**
(Compared to weight for equivalent payload of other companies)
Helps speed up robots for improved productivity

- **Many pneumatic interfaces**
4 to 13 ports, according to product

- **Size Variations** **NEW**
New 60 kg [132.3 lb], 100 kg [220.5 lb], and 150 kg [330.8 lb] payloads added to 3 kg [6.615 lb], 10 kg [22.050 lb], and 20 kg [44.100 lb] payloads

- **Various electrical interfaces** **NEW**
New solder terminals with cables, non-contact terminals, and round connectors have been added to solder terminals, D-sub connectors, and mini-connectors

Auto Hand Changer

MJC Series

* MJB series auto hand changer models were changed to MJC series.
See page 54 for details.

Auto hand changer allows robots and automated equipment to change hands and tools automatically.

Compact and lightweight to help speed up robots for improved productivity.

■ **Lightest in the World** (Compared to weight for equivalent payload of other companies)

Makes robots faster.

■ Size Variations

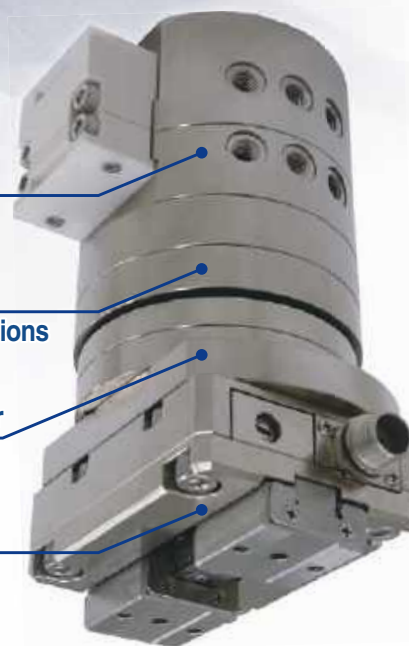
6 payload sizes at 3 kg [6.615 lb], 10 kg [22.050 lb], 20 kg [44.100 lb], 60 kg [132.3 lb], 100 kg [220.5 lb], and 150 kg [330.8 lb].

Auto hand changer
MJC series

Compliance light
Direct piping specifications

Specialized adapter

Electric hand
Flat type



		Model and payload					
Electric Interface	Number of electric connectors	MJC3□  3 kg [6.615 lb] Page 23	MJC10□  10 kg [22.050 lb] Page 25	MJC20□  20 kg [44.100 lb] Page 28	MJC60□  NEW 60 kg [132.3 lb] Page 31	MJC100□  NEW 100 kg [220.5 lb] Page 34	MJC150□  NEW 150 kg [330.8 lb] Page 37
Solder terminals 	15	●	●	●	●	●	●
Solder terminals with cables 	15	●	●	●	●	●	●
Mini-connectors 	9	●	●	●	●	●	●
D-sub connector 	15	—	●	●	●	●	●
Non-contact terminals 	12	—	●	●	●	●	●
Round connectors 	10	—	—	—	●	●	●

—:Not selectable



CAUTION

Read the Safety Precautions on page 5 before using this product.

■ Equipped with multiple pneumatic interfaces

The MJC60□ has 13 ports



■ Ample electrical interfaces

Solder terminals with cables



Eliminates on-site soldering work

D-sub connector



Mini-connectors



Round connectors



Supports large currents (13 A)

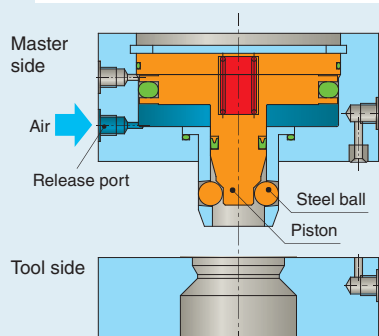
Non-contact terminals



Suitable for environments with water or cutting fluid

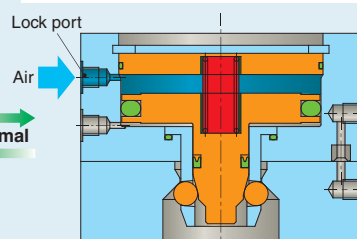
■ Explanation of operation

Separated state



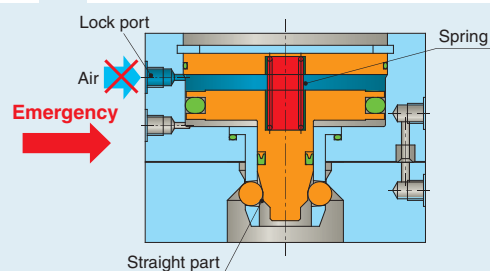
Air pressure is applied to the release port. The air presses up on the piston, which frees the steel balls. The tool side separates from the master side.

Mated state



The master side approaches the tool side. Air pressure is applied to the port for locking. The air presses down on the piston, which applies outward force to the steel balls. The balls work to lift up the tool side, so the tool side mates to the master side.

Air cut-off state (anti-drop mechanism)



If air is cut off, such as by a power failure, while air pressure is applied to the port for locking in the mated state, then the load on the tool side moves the steel balls inwards, to press up on the piston. However, the steel balls contact the straight part of the piston, so the pistons cannot be pressed any higher. The spring is applying downward force to the piston, so the piston and steel balls remain in the same positions, and the tool side does not fall.

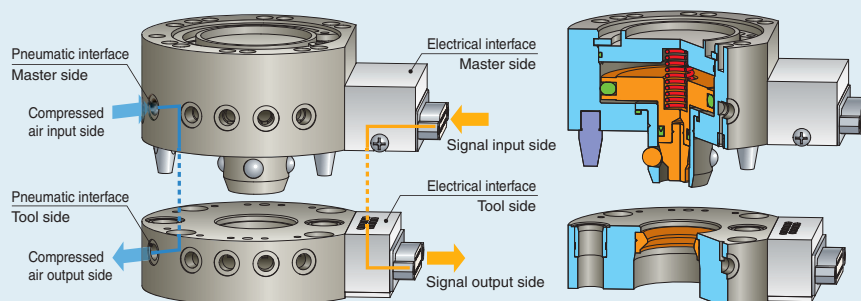
The tool changer has compressed air^{Note 1} and electric^{Note 2} interface functions that allow it to connect to the compressed air and electric signals needed on the tool side to change the handling end of the robot.

When combined with the compliance light direct piping specifications, an option is available that uses a dedicated port on the air interface to apply air pressure to lock the error correction function.

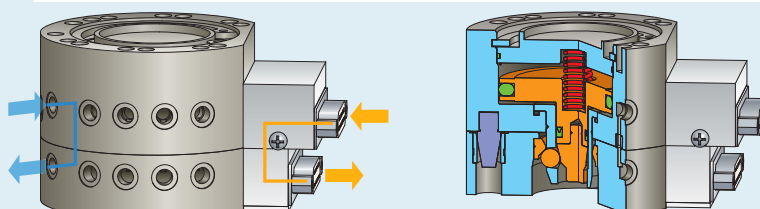
Note 1: The number and size of ports varies according to the main unit specifications. See page 14 for details.

Note 2: The types of interfaces that are supported vary according to the main unit specifications. This can be selected as an option.

Separated state



Mated state



Compliance light direct piping specifications

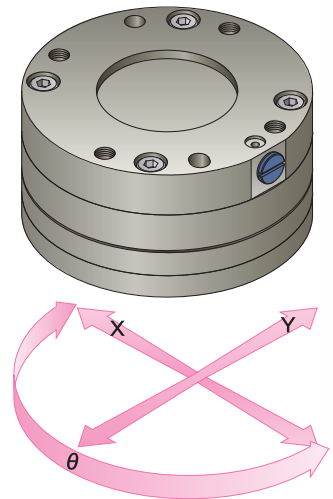
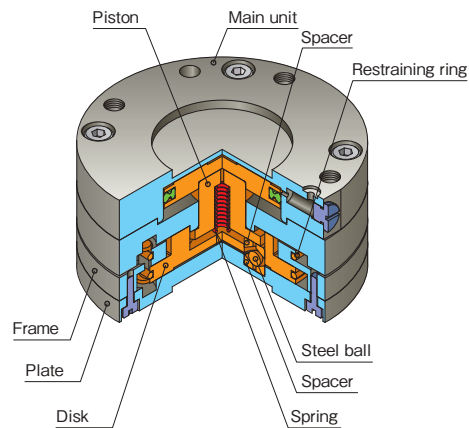
(Applicable for MJC3, 10, and 20)

Workpieces can be inserted more rapidly when the compliance light is used in combination.

Parallel type

CPLHB□F

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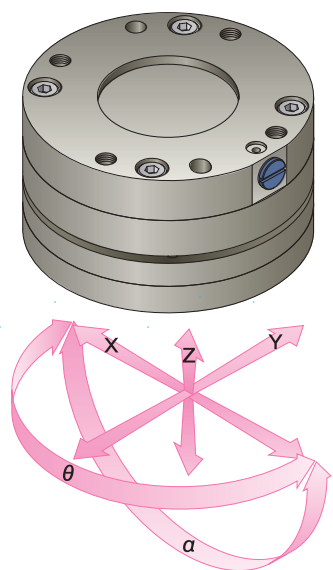
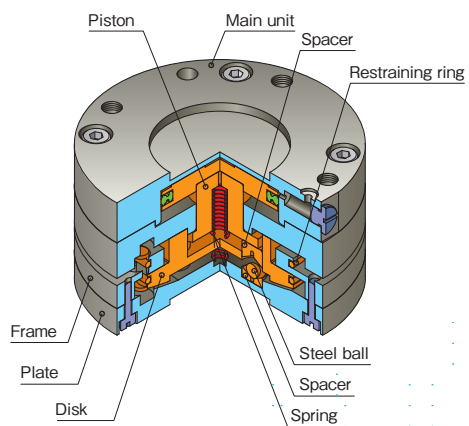
P=0.5 MPa [73 psi]	CPLHB34F	CPLHB54F	CPLHB70F
● Holding force when air pressure is applied	24 N [5.395 lbf]	64 N [14.387 lbf]	115 N [25.852 lbf]
● Maximum payload capacity	1 kg [2.205 lb]	2 kg [4.410 lb]	4 kg [8.820 lb]
● Size variations	φ34 mm [1.339 in.]	φ54 mm [2.126 in.]	φ70 mm [2.756 in.]

* Holding force based on in-house measuring methods (reference value)

Swing type

CPLHB□S

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P=0.5 MPa [73 psi]	CPLHB34S	CPLHB54S	CPLHB70S
● Holding force when air pressure is applied	24 N [5.395 lbf]	64 N [14.387 lbf]	115 N [25.852 lbf]
● Maximum payload capacity	1 kg [2.205 lb]	2 kg [4.410 lb]	4 kg [8.820 lb]
● Size variations	φ34 mm [1.339 in.]	φ54 mm [2.126 in.]	φ70 mm [2.756 in.]

* Holding force based on in-house measuring methods (reference value)



■ Additional parts

Robot adapter (for auto hand changer)

This adapter is to install auto hand changer (MJC□) to a robot.

The procedure to install the adapter uses ISO (JIS) standards, so easy installation to various types of robots is possible.

*See page 40 and the following pages for details.



Robot adapter

● Application example

Robot adapter
+
Auto hand changer



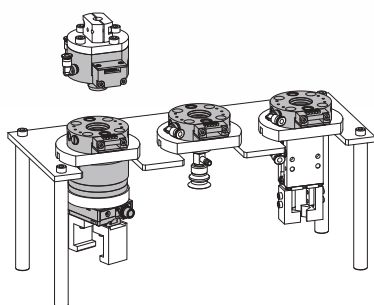
Adapter for flat type electric hand (for compliance light)

*See Catalog No. C2221 Electric Actuator Elewave Series for details.

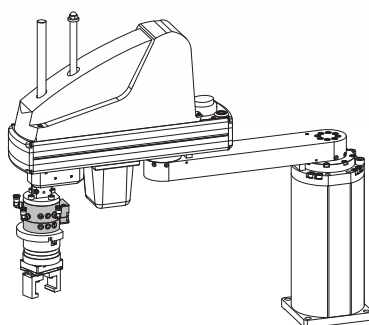
Adapter for air hand (for auto hand changer and for compliance light)

*See page 41 and the following pages for details.

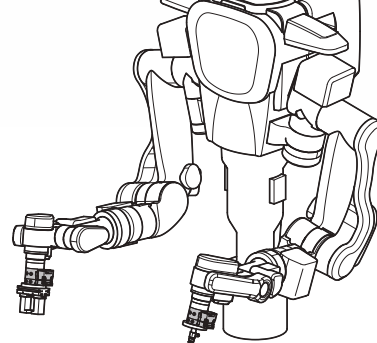
Application example for auto hand changer



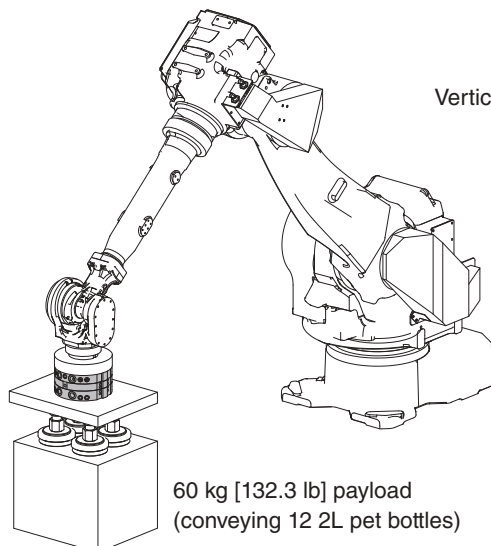
SCARA robot



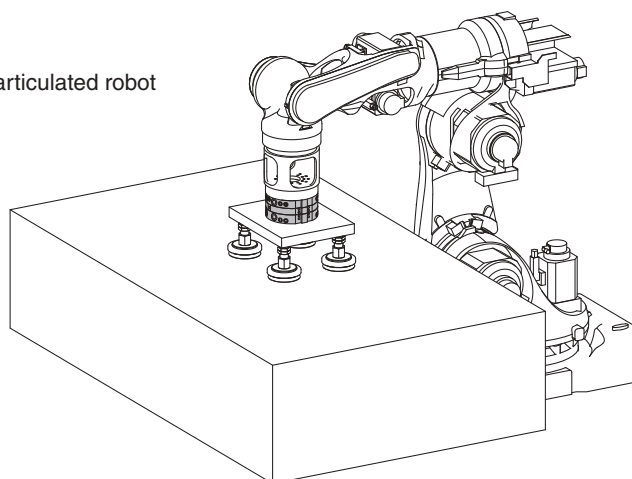
Dual arm robot



Vertical articulated robot



60 kg [132.3 lb] payload
(conveying 12 2L pet bottles)



100 kg [220.5 lb] payload (conveying 100-inch TV)

Before selecting and using products, please read all the Safety Precautions carefully to ensure proper product use.

The Safety Precautions shown below are to help you use the product safely and correctly, and to prevent injury or damage to assets.

Follow the Safety Precautions in ISO4414 (Pneumatic fluid power—General rules and safety requirements for systems and their components), JIS B 8370 (Pneumatic system regulations), and other safety regulations.

The directions are ranked according to degree of potential danger or damage: "DANGER!", "WARNING!", "CAUTION!", and "ATTENTION!".

 DANGER	Indicates situations that can be clearly predicted as dangerous. Death or serious injury may result if the situation is not avoided. It could also result in damage or destruction of assets.
 WARNING	Indicates situations that, while not immediately dangerous, could become dangerous. Death or serious injury may result if the situation is not avoided. It could also result in damage or destruction of assets.
 CAUTION	Indicates situations that, while not immediately dangerous, could become dangerous. Minor or semi-serious injury may result if the situation is not avoided. It could also result in damage or destruction of assets.
 ATTENTION	While there is no chance of injury, these points should be observed for appropriate use of the product.

■ This product was designed and manufactured as parts for use in general industrial machinery.

- In the selection and handling of the equipment, the system designer or other responsible person with fully adequate knowledge and experience should always read the Safety Precautions, Catalog, Owner's Manual and other literature before commencing operation. Incorrect handling is dangerous.
- After reading the Owner's Manual, etc., always store them where they are easily available for reference to users of this product.
- If transferring or lending the product to another person, always attach the Owner's Manual, etc., to the product where they are easily visible, to ensure that the new user can use the product safely and properly.
- The danger, warning, and caution items listed under these "Safety Precautions" do not cover all possible cases. Read the Catalog and Owner's Manual carefully, and always keep safety first.

 DANGER

- Do not use the product for the purposes listed below:
 1. Medical equipment related to maintenance or management of human lives or bodies
 2. Mechanical devices or equipment designed for the purpose of moving or transporting people
 3. Critical safety components in mechanical devices
 This product has not been planned or designed for purposes that require advanced stages of safety. It could cause loss of human life.
- Do not use the product in locations with or near dangerous substances, such as flammable or ignitable substances. This product is not explosion-proof. It could ignite or burst into flames.
- When installing the product, always firmly support and secure it (including the workpiece) in place. Injury could result if the product overturns, falls, or is operated abnormally.
- Never attempt to modify the product. Abnormal operation could result in injury.
- Never attempt inappropriate disassembly, assembly, or repair of the product relating to its basic inner construction, performance, or functions. It could result in injury.
- Do not splash water on the product. Spraying the product with water, washing it, or using it in water could result in malfunction leading to injury.
- While the product is in operation, avoid touching it with your hands or otherwise approaching too close. In addition, do not make any adjustments to the interior or to the attached mechanisms (such as disconnection of piping tubes).
The actuator may move unexpectedly, possibly resulting in injury.

 WARNING

- Do not use the product in excess of its specification range. Using the product outside of its specified range could result in product breakdowns, stop of functions, or damage. It could also drastically reduce the operating life.
- Before supplying air to the product and starting operation, always conduct a safety check within the range of machine operations. Unintentional supply of air or electricity could possibly result in injury caused by contact with moving parts.

- Do not touch the terminals or various switches, etc., while the electric power is on. There is a possibility of electric shock and abnormal operation.
- Always check the catalog and other reference materials for correct product wiring and piping. Improper wiring or piping causes abnormal operation of the actuator, etc.
- Do not throw the product into fire.
The product could explode and/or release toxic gases.
- Do not sit on the product, place your foot on it, or place other objects on it.
Doing so creates the risk of injury due to tripping or the product tipping over or falling, and erratic or runaway operation due to damage or breakage to the product.
- When conducting any kind of operation for the product, such as maintenance, inspection, repair, or replacement, always turn off the air supply completely and confirm that residual pressure inside the product or in piping connected to the product is zero before proceeding.
In particular, be aware that residual air will still be in the air compressor or air storage tank. If residual air pressure remains inside the piping, the actuator could abruptly move and cause injury.
- Do not use the actuator for equipment whose purpose is absorbing the shocks and vibrations of mechanical devices. It could break and possibly result in injury or in damage to mechanical devices.
- Use within the maximum load capacity. Using the product beyond the maximum load capacity may damage equipment or cause personal injury.
- Use safety circuits or system designs to prevent damage to machinery or injury to personnel when the machine is shut down abnormally due to emergency stop or power failure.
- In initial operations after the equipment has been idle for 48 hours or more, or has been in storage, there is a possibility that contacting parts may stick, resulting in equipment operation delays or sudden movements. For these initial operations, always run a test operation before use to check that operating performance is normal.
- Do not use the product near the ocean, in direct sunlight, near mercury vapor lamps, or near equipment that generates ozone. Deterioration of rubber parts caused by ozone may reduce performance and functions or stop functions.

- Because Koganei products may be used under a wide variety of conditions, decisions concerning conformance with a particular system should be made upon the careful evaluation by the person in charge of system design. Assurances concerning expected system performance and safety are the responsibility of the designer who decides system conformity. Be sure to use the latest catalogs and technical materials to study and evaluate specification details, to consider the possibility of machine breakdown, and to configure a system that ensures safety and reliability, such as by using fail-safes.
- Do not use the product in locations subject to direct sunlight (ultraviolet radiation), in locations with dust, salt, or iron particles, or in locations with media and/or ambient atmosphere that include organic solvents, phosphate ester type hydraulic oil, sulfur dioxide gas, chlorine gas, acids, etc. Such uses could lead to loss of functions within a short period, sudden degradation in performance, or reduced operating life. For details on materials used in the product, refer to the description of materials used in major parts.



CAUTION

- When installing the product, leave room for adequate working space around it. Failure to ensure adequate working space will make it more difficult to conduct daily inspections or maintenance, which could eventually lead to system shutdown or damage to the product.
- Do not scratch, dent, or deform the actuator by climbing on the product, using it as a scaffold, or placing objects on top of it. Doing so could damage or break the product, resulting in operation shutdown or degraded performance.
- Post "Work in Progress" signs when doing installations, adjustments, or other work, so that air or electricity is not supplied unintentionally. Unintentional supply of air or electricity could result in injury due to electric shock or sudden operation of the actuator.
- Using extremely dry air with a dew point lower than -20°C [-4°F], may affect the quality of the lubricating oil used. This creates the risk of degraded performance, loss of function, or other problems.



ATTENTION

- When considering using the product for applications that demand extreme safety, such as aviation facilities, combustion equipment, leisure equipment, safety devices, or in other ways predicted to greatly affect assets or human lives, or in situations or environments not described in the Catalog or Owner's Manual, etc., take sufficient safety precautions, such as by allowing ample rating and performance margins for the application and by implementing adequate safety measures, such as fail-safes.
Also, be sure to consult us about such applications.
- Use protective covers, etc., to isolate moving parts, such as mechanical equipment, so direct contact with a person's body is not possible.
- Do not arrange controls such that workpieces fall if there is a power failure.
Configure controls to prevent workpieces from falling in case of power failure or emergency stop of the machine.
- When handling the product, wear protective gloves, safety glasses, safety shoes, etc., as required to maintain safety.
- When the product can no longer be used, or is no longer necessary, dispose of it appropriately as industrial waste.
- Pneumatic equipment can exhibit degraded performance and function over its operating life. Always conduct daily inspections of the pneumatic equipment, and confirm that all requisite system functions are satisfactory, to prevent accidents from happening.
- For inquiries about the product, contact your nearest Koganei sales office or Koganei overseas department. The address and telephone number are shown on the back cover of this catalog.



OTHERS

- Always observe the following items.
 1. When using this product in pneumatic systems, always use genuine Koganei parts or compatible parts (recommended parts).
When doing maintenance or repairs, always use genuine Koganei parts or compatible parts (recommended parts).
Always observe the required methods.
 2. Never inappropriately disassemble or assemble the product in relation to its basic construction, performance, or functions.

Koganei bears no responsibility if all safety precautions are not properly observed.

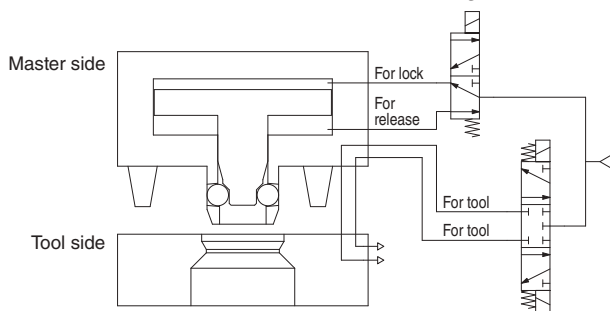


General precautions

Piping

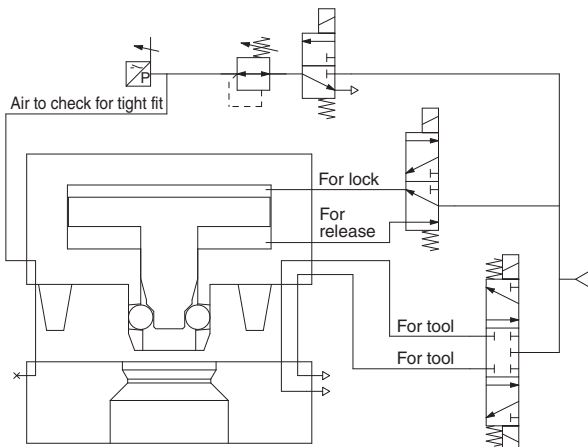
1. Before using the product, thoroughly flush the inside of the pipes (blow out with compressed air). Machining chips, sealing tape, rust and other debris remaining from the piping work may cause malfunctions, such as air leaks.
2. Even though mechanisms are equipped so the tool side does not fall if the air is turned off, to be safe, install the piping so air is supplied to the lock port even when the solenoid valve for mating/unmating is in a non-energized state.
3. Use a 3-port valve or 3 position (all port block) valve for the tool port, to cut off the air while unmated.

<Recommended circuit diagram>

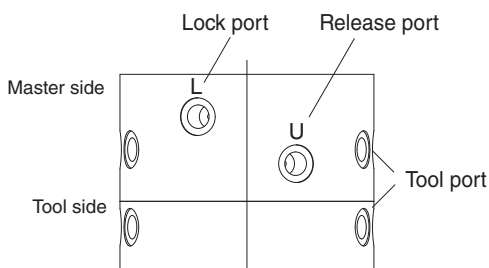


4. To check for a tight fit between the master side and the tool side, use a pressure switch between the tool port and valve, to seal the tool port.

<Reference circuit diagram (tight fit check)>



<Piping diagram>



Note: An "L" (lock) is engraved on the lock port, and a "U" (unlock) is engraved on the release port. If nothing is engraved on the tool port, the port links to the same position as the master side and tool side.

Air supply

1. Use air as the medium. For the use of any other medium, consult your nearest Koganei sales office.
2. Air used for the product should be clean air that contains no degraded compressor oil, etc. Install an air filter (filtration of 40 μm or less) near the product to remove collected liquid and dust. Also drain the air filter periodically. If liquid or dust gets into the product, it may cause defective operation.

Lubrication

The cylinder can be used without lubrication, however, if lubrication, such as a lubricator, is used, use turbine oil type 1 (ISO VG32) or an equivalent. Avoid using spindle oil or machine oil.

Environment

1. Protect the product, such as with covers, when using it in locations subject to spatter, excessive dust, dripping water, dripping oil, metal chips, etc.
2. Do not use the product in environments which may be corrosive. Using the cylinder in these types of environments may result in damage or defective operation.
3. Do not use it in excessively dry conditions.
4. Do not use it if the ambient temperature is over 60°C [140°F]. Doing so may result in damage or erratic operation. Also, consider anti-freezing measures if the temperature is less than 5°C [41°F], because moisture may freeze and result in damage or erratic operation.
5. The material used for the MJC3, 10, and 20 ball guide, housing, round pins, diamond pins, and center pin and the MJC60, 100, and 150 ball guide, tool plate, round pins, diamond pins, and center pin is stainless steel, however, rust may occur in some usage conditions. Apply anti-rust oil or grease if the product is not used for a long period. Refer to the internal construction on page 18 for the application locations.

Mounting

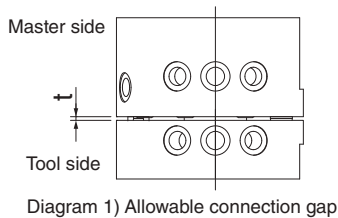
1. The mounting surface must be flat. If the cylinder twists or bends when mounted, not only will it be inaccurate, but there may be air leaks and defective operation.
2. Note that if the product's mounting surface is scratched or dented it can adversely affect flatness.
3. In cases where loosening of bolts due to impact and/or vibration may be a factor, consider looseness prevention measures. Be careful of overspreading of adhesive. If the adhesive gets into the product, it may cause defective operation.
4. Be careful that mating/unmating operations of the auto hand changer are not obstructed by piping and wiring when mounting hands, etc., to the mounting surface.
5. Tighten mounting bolts to the torque shown in the attached table. We also recommend using positioning pins to assure the characteristics of the torsion moment.
6. Arrange the wiring so the cables are not stretched when the robot moves. Otherwise, there is a possibility of defective contacts or disrupted wiring.

Handling Instructions and Precautions (Auto hand changer)

Mating and unmating

<Mating procedure>

- While air is supplied to the release port, bring the master side to above the tool side.
- Bring the master side closer to the tool side, then bring the master side close enough so the t dimension is within the following value.

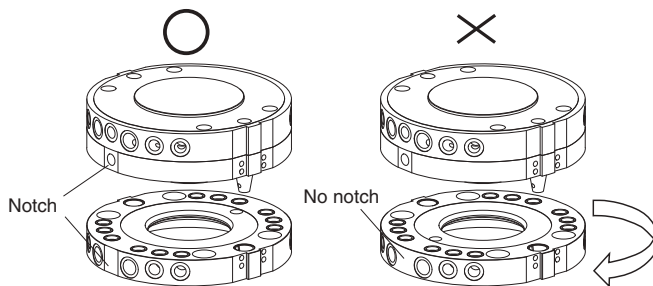


Model	Allowable connection gap t (mm [in.])
MJC3	0.6 [0.024]
MJC10	1 [0.039]
MJC20	1 [0.039]
MJC60	0.5 [0.020]
MJC100	0.5 [0.020]
MJC150	0.5 [0.020]

- Exhaust air from the release port.
- Supply air pressure to the lock port to finish mating.

<Unmating procedure>

- In the unmating position, exhaust air from the lock port.
- Supply air to the release port.
- Raise the master side so it does not hit the tool side to finish unmating.
- During mating and unmating operations, do not supply air to the tool port. Air will blow out and may damage the product or surrounding equipment.
- During mating and unmating operations, do not transmit electric signals from the master side to the tool side. Doing so causes extreme wear on the electric contacts.
- Prevent any dust, etc., from getting between the mating surfaces of the master side and tool side. It degrades the flatness and may affect product life.
- For the MJC60, 100, and 150, 100 N [22.480 lbf] of reaction force is generated at the master side and tool side when the t dimension is 1 or less, so consider this when designing peripheral equipment.
- For the MJC60, 100, and 150, mate the master side and tool side so the notches have the same orientation.



When teaching

- When teaching, the positioning error between the master side and the tool side must be within the following ranges.
Note: Set the range of motion without completely fixing the tool side and tool holder.

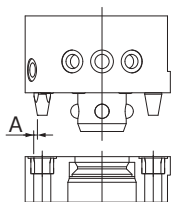


Diagram 2) Horizontal tolerance

Model	Horizontal tolerance for A (mm [in.])
MJC3	±0.7 [0.028]
MJC10	±1 [0.039]
MJC20	±1.6 [0.063]
MJC60	±1.6 [0.063]
MJC100	±2 [0.079]
MJC150	±2 [0.079]

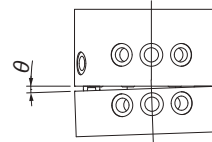


Diagram 3) Incline tolerance

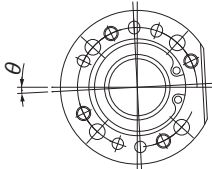


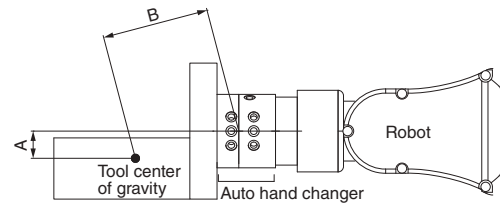
Diagram 4) Rotational tolerance

Model	Incline tolerance θ (deg)
MJC3	1.5
MJC10	1.5
MJC20	1.5
MJC60	0.3
MJC100	0.2
MJC150	0.2

Model	Rotational tolerance θ (deg)
MJC3	±3.0
MJC10	±2.0
MJC20	±3.0
MJC60	±2.0
MJC100	±2.0
MJC150	±1.5

Model selection method

When selecting a product, select a product so the inertial moment and allowable moment are not exceeded when the robot, including the payload, is operating automatically at maximum speed.



● Example calculation

<Operating conditions>

A = 0.1 m [0.328 ft]
B = 0.3 m [0.984 ft]
W = 3 kg [6.615 lb] (tool side weight)
Change in acceleration $a = 19.6 \text{ m/s}^2$ (for 2 G)

- Tool side weight (including payload)
3 kg [6.615 lb]
 - Bending moment
 $3 \text{ kg [6.615 lb]} \times 19.6 \text{ m/s}^2 [2 \text{ G}] \times 0.3 \text{ m [0.984 ft]} = 17.64 \text{ N·m [13.011 ft·lbf]}$
 - Torsional moment
 $3 \text{ kg [6.615 lb]} \times 19.6 \text{ m/s}^2 [2 \text{ G}] \times 0.1 \text{ m [0.328 ft]} = 5.88 \text{ N·m [4.337 ft·lbf]}$
- The allowable bending moment for MJC3 is 5 N·m [3.688 ft·lbf] and for the MJC10 it is 30 N·m [22.128 ft·lbf], so select the MJC10.

Maintenance (main unit)

- Periodically clean the mating surfaces of the master side and tool side. Any dirt on them could cause air leakage or affect product life.
- Apply grease all over the steel balls on the master side and the steel ball races on the tool plate (the housing for the MJC3, 10, and 20) every 100,000 operations. Applying grease to the steel balls on the master side is easier if you apply air pressure to the release port while doing the work. Grease can be ordered as additional parts.

Electrical interface (contact terminals)

● Solder-type terminals

Connect the various probes and contact pins with solder.
Recommended wire diameters: AWG24 or smaller wire diameters

● Solder terminals with cables

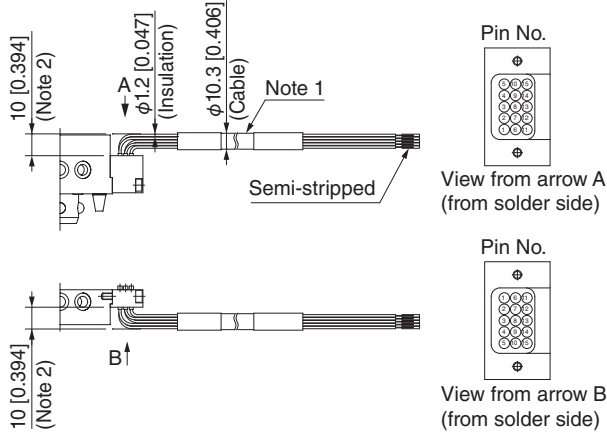


Chart of supported cables

Pin No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Insulation color	Light blue	Pink	Light green	Orange	Gray	Light blue	Pink	Light green							
Dot mark type	1 line of short dots										2 lines of short dots				
Dot color	Black	Red	Black	Red	Black	Red	Black	Red	Black	Red	Black	Red	Black	Red	Black

Note 1: The following cables are used.

Hanshin Electric Wire & Cable: MRC UL20276-SB 8P × 24AWG (Twisted pair, core wire count: 8P, shielded cable)

- When placing an adapter, or other component, on the soldered side of a soldered terminal, consider the allowable bending radius of the wire, and allow a margin of 10 mm [0.394 in.] or more above the soldered terminal.
- The * mark in the chart of supported cables indicates twisted pair cables.
- The cable's fixed bending radius is 42 mm [1.654 in.] or higher, and the cable's movable bending radius is 62 mm [2.441 in.] or higher.

● D-sub connector

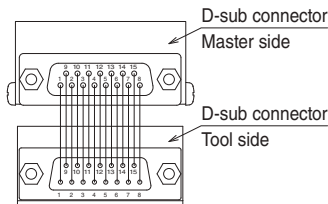
Use D-sub connectors that are equivalent to the following for connections.

Manufactured by Fujikura:

17JE-23150

Manufactured by Hirose:

RDAB-15P



Note 1: The pin numbers for the 15 electric contact pins are connected so they are the same on the master side and the tool side.

● Mini-connectors

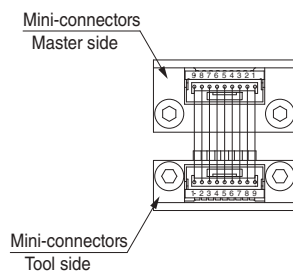
We have cables for mini-connectors, but if you are making your cables, use connectors that are equivalent to the following for connections.

Manufactured by J. S. T. MFG.

Connector: GHR-09V-S

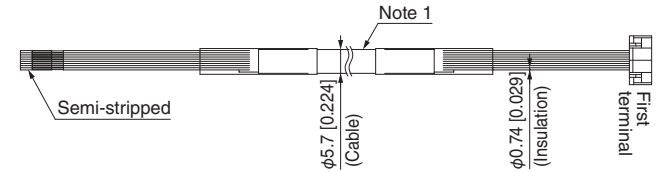
Contact: SSHL-002T-P0.2

Hand-crimping tool: YRS-1590



Note 1: The pin numbers for the 9 electric contact pins are connected so that the master side and the tool side are reversed.

● Cable for mini-connectors



<Master side>

Model: MJCE-C □ M

Chart of supported cables

Pin No.	1	2	3	4	5	6	7	8	9
Insulation color	Blue	White	Yellow	Brown	Green	Black	Red	Gray	Purple

<Tool side>

Model: MJCE-CAT

Chart of supported cables

Pin No.	1	2	3	4	5	6	7	8	9
Insulation color	Purple	Gray	Red	Black	Green	Brown	Yellow	White	Blue

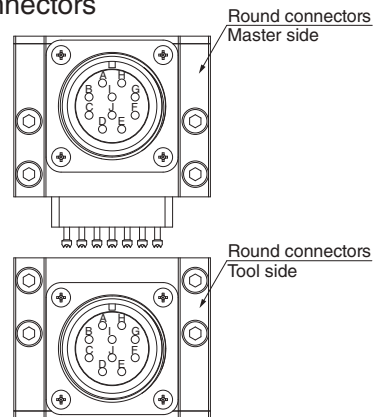
Note 1: The following cables are used.

Oki Electric Cable: ORP-SL0.1SQ × 5P(SB)(2464)

2: The * mark in the chart of supported cables indicates twisted pair cables.

3: The cable's fixed bending radius is 23 mm [0.906 in.] or higher, and the cable's movable bending radius is 46 mm [1.811 in.] or higher.

● Round connectors



Use connectors that are equivalent to the following for connections.

Fujikura: D/MS3106A18-1P

Japan Aviation Electronics Industry: N/MS3106B18-1P

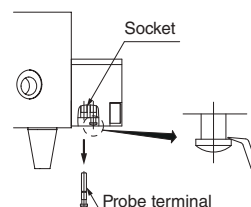
Note 1: The pin codes for the 10 electric contact pins are connected so they are the same on the master side and the tool side.

Maintenance (electrical interface)

- Periodically clean the electric contacts. If they are dirty, transmission of electric signals becomes difficult.
- If the probe terminal causes poor contact, replace the probe terminal. They are available as additional parts. The procedure for changing probe terminals is shown below.

<Extraction method>

- Hook the tip of the probe, with your fingers or pliers, and then pull it out of the socket.



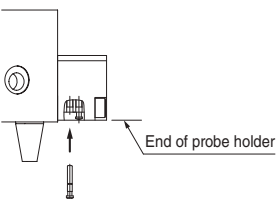
Handling Instructions and Precautions (Auto hand changer)

<Installation procedure>

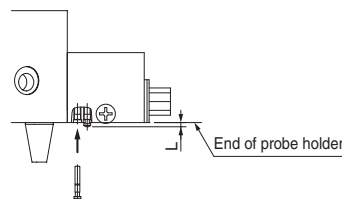
1. Use your hands to temporarily insert the probe.
 2. Use your hand or a plastic rod to press in the tip of the probe terminal.
- * For round connectors, use a plastic rod that is $\leq \phi 4.5$ [0.177]. As you push them in, when you feel the probe terminal fit into the socket, go to step 3. If you apply excessive force continuously, the position of the socket will change and affect performance.
3. Without applying force on the probe terminal, be sure to confirm the tip of the probe is in the position shown below.

Electrical interface	Position of tip of probe terminal
Solder terminals (with cables)	Flush with end of probe holder
Mini-connectors	Flush with end of probe holder
D-sub connector	L=1.2 mm [0.047 in.]
Round connectors	L=5.5 mm [0.217 in.]

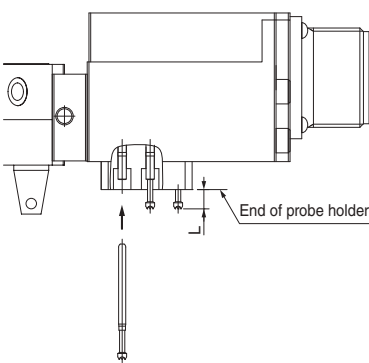
For solder terminals and mini-connectors



For D-sub connectors



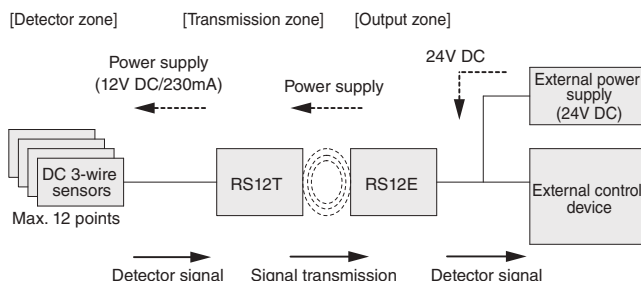
For round connectors



Electrical interface (non-contact terminals)

● Non-contact terminals

<System configuration>



[Role of each component]

Detector:

Connect a commercially available detector switch to send "Detected signals" to the "Transmitter".

Transmitter:

Supplies power to the "Detector" and does non-contact transmission of detected signals from the "Detector" to the "Output component".

Output component:

Outputs detected signals transmitted by the "Transmitter" and supplies the electric power needed to operate the "Detector" and "Transmitter".

■ Master side specifications

Model	MJCE-RM
Power supply voltage	24 VDC $\pm 10\%$ (including ripple)
Consumption current	≤ 600 mA
Output signal points	12 points + 1 point (status)
Load current	≤ 50 mA/1 output
LED indicator	Status (green), output (orange)
Circuit protection	Short protection, reverse contact protection, surge protection
Operating ambient temperature	0 to 50°C [32 to 122°F]
Protective structure	IP67 (Note 1)
Connecting cable	PUR $\phi 8.6 \times 2$ m [6.560 ft] 2 $\times 0.5$ mm ² + 13 $\times 0.18$ mm ²
Material	ABS

* Uses RS12E-422N-PU-02 manufactured by B & Plus.

■ Tool side specifications

Model	MJCE-RT
Supported sensors	DC 3-wire sensors
Drive voltage	12 V ± 1.5 VDC
Drive current	≤ 230 mA (note 2)
Input signal points	12 points
Transmission distance	5 mm [0.197 in.]
Allowable axial misalignment	± 3 mm [0.118 in.]
Operating ambient temperature	0 to 50°C [32 to 122°F]
Protective structure	IP67 (Note 1)
Connecting cable	PUR $\phi 8.6 \times 1$ m [3.280 ft] 2 $\times 0.5$ mm ² + 13 $\times 0.18$ mm ²
Material	ABS

* Uses RS12T-422-PU-01 manufactured by B & Plus.

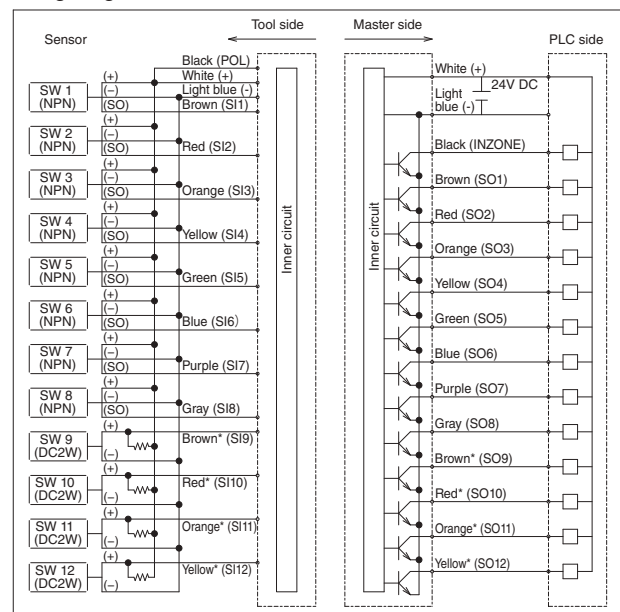
Note 1: Compatible for non-contact terminals, not including auto hand changer itself.

2: Use within a range that the total consumed current of the connected detection sensors and drive units does not exceed the drive current value.

<Usable sensors>

Power supply voltage	12 VDC
Total consumed current	≤ 230 mA
Residual voltage	≤ 3.5 V
Load current	—

<Wiring diagram>



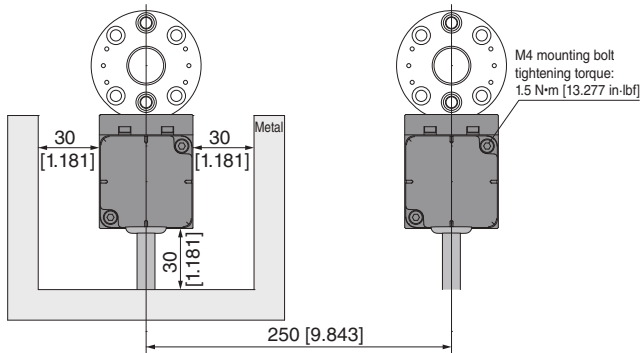
■ SW9 to 12 in the above diagram are examples using DC 2-wire wiring (use wiring for resistance of about 1 to 2 K Ω). DC 3-wire sensors can also be used.

■ Green*, blue*, and purple* cables are not used.

Handling Instructions and Precautions (Auto hand changer)

<Installation conditions>

- When installing the product, be sure to leave at least as much open space around it, as shown in the diagram, to avoid the effects of surrounding metal objects and interference with the product.



Note 1: The cables have a bending radius of 50 [1.969 in.] mm or more. Also, do not pull too strongly on the cables.

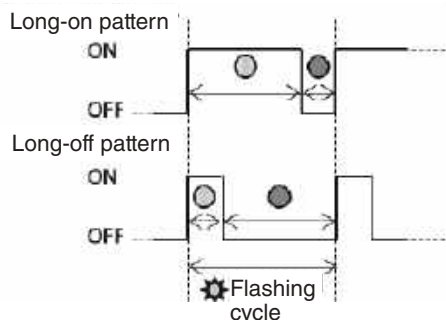
WARNING

- If the power is turned on while metal dust or chips are stuck to the transmission surface, the transmitter and the metal dust and chips stuck to it will heat up, which may lead to an unexpected accident. Be sure to remove any metal dust or chips stuck to the transmission surface before operating the system.

<Description of LED indicators>

■ Status LED (green)

State of LED	Flashing cycle	Pattern	Description
Lit	—	—	Power is being supplied correctly.
Off	—	—	Power is not being supplied.
Flashing	Slow (1.5 sec)	Long off	When temperature is abnormal.
Flashing		Long on	Over-current on oscillator circuit
Flashing	Medium speed (0.6 sec)	Long off	Voltage is high.
Flashing		Long on	Voltage is low.
Flashing	High speed (0.2 sec)	Equal interval	Short protection has activated.



■ Signal LED (orange)

The in-zone LEDs are opposite each other on the master side and the tool side, when transmission is possible, they light. Also, they flash when signals are output from the various sensors.

The information on the page is excerpted from the remote system users guide from B & Plus. For details, refer to the "Remote System Users Guide" and "Safety Precautions" provided with the non-contact terminals from B and Plus, for their correct usage.

Tightening torque

● Installing the main unit

Model	Screw size	Tightening torque (N·m [in.-lbf])
MJC3M MJC3T MJC3TC	M3	0.63 [5.576]
MJC10M MJC10T MJC10TC	M5	3 [26.553]
MJC20M MJC20T MJC20TC	M5	3 [26.553]
MJC60M MJC60T	M8	22 [194.7]
MJC100M MJC100T	M8	22 [194.7]
MJC150M MJC150T	M10	44 [389.4]

● Installing the electrical interface

Type	Model	Electrical interface		Cover		Adapter	
		Screw size	Tightening torque (N·m [in.-lbf])	Screw size	Tightening torque (N·m [in.-lbf])	Screw size	Tightening torque (N·m [in.-lbf])
Solder terminals	MJCE-PM(-3,-60) MJCE-PT(-3,-60)	M3	0.32 [2.832]	M2	0.09 [0.797]	M3 Note 1	0.63 [5.576] Note 1
						M4 Note 3	1.5 [13.277] Note 3
Solder terminals with cables	MJCE-PAM(-3,-60) MJCE-PBM(-3,-60) MJCE-PAT(-3,-60)	M3	0.32 [2.832]	M2	0.09 [0.797]	M3 Note 1	0.63 [5.576] Note 1
						M4 Note 3	1.5 [13.277] Note 3
Mini-connectors	MJCE-CM(-3,-60) MJCE-CT(-3,-60)	M3	0.32 [2.832]	—	—	M3 Note 1	0.63 [5.576] Note 1
						M4 Note 3	1.5 [13.277] Note 3
D-sub connector	MJCE-DM(-10,-60) MJCE-DT(-10,-60)	M3	0.32 [2.832]	—	—	M3 Note 2	0.63 [5.576] Note 2
						M4 Note 3	1.5 [13.277] Note 3
Non-contact terminals	MJCE-RM(-10,-60) MJCE-RT(-10,-60)	M4	1.5 [13.277]	—	—	M3 Note 2	0.63 [5.576] Note 2
						M4 Note 3	1.5 [13.277] Note 3
Round connectors	MJCE-QM(-60) MJCE-QT(-60)	M4	0.75 [6.638]	—	—	M4 Note 3	1.5 [13.277] Note 3

Note 1: When -3 is selected
2: When -10 is selected
3: When -60 is selected

● Installing the fittings

Model	Screw size	Tightening torque (N·m [in.-lbf])
MJC3M MJC3T MJC3TC	M3	0.7 [6.196]
MJC10M MJC10T MJC10TC	M5	1 to 1.5 [8.851 to 13.277]
MJC20M MJC20T MJC20TC	M5	1.0 to 1.5 [8.851 to 13.277]
MJC60M MJC60T	M5	1.0 to 1.5 [8.851 to 13.277]
	Rc1/8	4.5 to 6.5 [39.830 to 57.532]
MJC100M MJC100T	Rc1/8	4.5 to 6.5 [39.830 to 57.532]
	Rc1/4	7 to 9 [61.957 to 79.659]
MJC150M MJC150T	Rc1/8	4.5 to 6.5 [39.830 to 57.532]
	Rc1/4	7.0 to 9.0 [61.957 to 79.659]



General precautions

Piping

Before performing piping work on the product, thoroughly flush the inside of the pipes (blow out with compressed air). Machining chips, sealing tape, rust and other debris remaining from the piping work may cause malfunctions, such as air leaks.

Air supply

1. Use air as the medium. For the use of any other medium, consult your nearest Koganei sales office.
2. Air used for the product should be clean air that contains no degraded compressor oil, etc. Install an air filter (filtration of 40 μ m or less) near the product to remove collected liquid and dust. Also drain the air filter periodically. If liquid or dust gets into the product, it may cause defective operation.

Lubrication

1. The cylinder can be used without lubrication, however, if lubrication, such as a lubricator, is used, use turbine oil type 1 (ISO VG32) or an equivalent. Avoid using spindle oil or machine oil.
2. Never apply lubrication to the sliding parts of the swing type. Doing so may cause defective operation.

Environment

1. Cover the unit when using it in locations where it might be subject to excessive dust, dripping water, dripping oil, etc.
2. Do not use the product in environments which may be corrosive. Using the cylinder in these types of environments may result in damage or defective operation.
3. Do not use it in excessively dry conditions.
4. Do not use it if the ambient temperature is over 60°C [140°F]. Doing so may result in damage or erratic operation. Also, consider anti-freezing measures if the temperature is less than 5°C [41°F], because moisture may freeze and result in damage or erratic operation.

Handling

1. Confirm that there is no residual pressure in the product before starting maintenance work.
2. Displacement should not exceed the allowed range of movement in any direction. Doing so could damage or break the product, resulting in operation shutdown or degraded performance.
3. To lock or unlock the function for error correction (compliance), switch between applying and not applying air pressure. When inserting or pushing, do so in an unlocked state with no air pressure applied. When moving, do so in a locked state with air pressure applied. Moreover, install a shock absorber, etc., where the movement comes to a standstill to ensure as smooth a stop as possible. Sudden stops may cause the lock to disengage, and reduce the centripetal accuracy.
4. Use within the range for the maximum load capacity. Using this unit while exceeding the maximum load capacity may cause wear or degradation to the sliding parts.
5. The value for the allowable load is a static load. Treat it as a temporary load in a stationary state. Ensure that there are sufficient allowances if the unit is subjected to impacts. When applying pressure, use a load that is 1/10 or less of the withstand load.

6. The parallel type can also be used in a lower position. The mounted load should be less than the maximum load capacity.
7. The plate may become misaligned from the center position when air pressure is applied and not applied.
8. Avoid overhanging operation conditions by keeping the installed center of gravity positioned within the outer diameter of the plate. May cause wear or degradation to sliding parts.
9. The retaining force and retaining moment of products (-N) that have no centripetal force are the same values (reference values) as in the graph for each product.

Mounting

1. Use this unit so it is in a horizontal position when no air pressure is applied (unlocked). The mounting surface should be flat. If the cylinder twists or bends when mounted, not only will it be inaccurate, but there may be air leaks and defective operation.
2. Note that if the product's mounting surface is scratched or dented it can adversely affect flatness.
3. Be sure that the unit and the mounting bolts are strong enough.
4. In cases where loosening of bolts due to impact and/or vibration may be a factor, consider looseness prevention measures. Be careful of overspreading of adhesive. If the adhesive gets into the product, it may cause defective operation.
5. Be careful that error correction (compliance) is not obstructed by piping and wiring when mounting hands, etc., to the mounting surface.

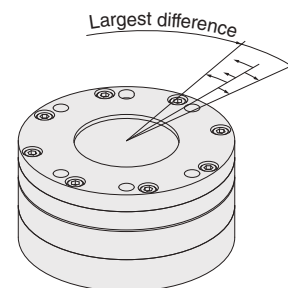
Repeatability

With no load and no air pressure applied, move the plate in a random direction, and then apply air pressure and measure the position that the plate stops. Do this measurement 10 times to find the largest difference. The repeatability accuracy is $\pm 1/2$ of the largest difference you found.

Angle repeatability

Bidirectional repeatability

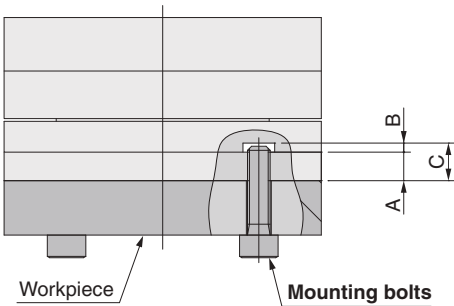
With no load and no air pressure applied, rotate the plate left or right, and then apply air pressure and measure the angle that the plate stops. Do this measurement 10 times to find the largest difference. The angle repeatability accuracy is $\pm 1/2$ of the largest difference you found.



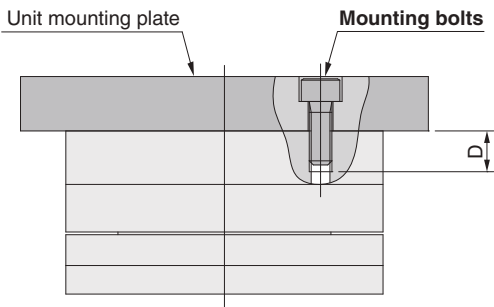
Bidirectional repeatability

Tightening torque

● Mounting a workpiece



● Installing the main unit



Type	Model	Bolt	Maximum tightening torque (N•m [in.-lbf])	A (mm [in.])	B (mm [in.])	C (mm [in.])	D (mm [in.])
Parallel type	CPLHB34F	M3 × 0.5	0.63 [5.576]	4.3 [0.169]	1 [0.039]	5.3 [0.209]	6 [0.236]
	CPLHB54F	M5 × 0.8	3 [26.553]	5.2 [0.205]	1.5 [0.059]	6.7 [0.264]	10 [0.394]
	CPLHB70F	M5 × 0.8	3 [26.553]	6.3 [0.248]	1.5 [0.059]	7.8 [0.307]	11 [0.433]
Swing type	CPLHB34S	M3 × 0.5	0.63 [5.576]	4.8 [0.189]	1 [0.039]	5.8 [0.228]	6 [0.236]
	CPLHB54S	M5 × 0.8	3 [26.553]	6.7 [0.264]	1.5 [0.059]	8.2 [0.323]	10 [0.394]
	CPLHB70S	M5 × 0.8	3 [26.553]	7.8 [0.307]	1.5 [0.059]	9.3 [0.366]	11 [0.433]

Auto hand changer

MJC series



Specifications

● Main unit specifications

Basic type ^{Note 1}		Master side	MJC3M		MJC10M		MJC20M	
Item		Tool side	MJC3T	MJC3TC	MJC10T	MJC10TC	MJC20T	MJC20TC
Maximum payload		kg [lb]	3 [6.615]		10 [22.050]		20 [44.100]	
Mated axial force ^{Note 2}		N [lbf]	500 [112.4]		1300 [292.2]		3200 [719.4]	
Mass	Master side	g [oz]	45 [1.59]		160 [5.64]		305 [10.76]	
	Tool side	g [oz]	20 [0.71]		75 [2.65]		165 [5.82]	
	Both sides	g [oz]	65 [2.29]		235 [8.29]		470 [16.58]	
Port size			M3		M5		M5	
Bending moment ^{Note 2}		N•m [in-lbf]	5 [44.255]		30 [265.5]		75 [663.8]	
Torsional moment		N•m [in-lbf]	15 [132.8]		45 [398.3]		100 [885.1]	
Operating pressure range		MPa [psi]	0.35 to 0.7 [51 to 102]					
Operating type			Double acting type (with anti-drop)					
Medium			Air					
Proof pressure		MPa [psi]	1.05 [152]					
Operating temperature range		°C [°F]	0 to 60 [32 to 140] ^{Note 3}					
Lubrication	Cylinder parts		Not required					
	Steel balls and sliding parts		Required (additional parts GR-HA-030) ^{Note 4}					
Repeatability		mm [in.]	±0.01 [0.0003]					
Pneumatic interface	Operating pressure range	MPa [psi]	-0.1 to 0.7 [-15 to 102]					
	Number/size		4•M3	3•M3	6•M5	5•M5	10•M5	9•M5
	Orifice diameter		φ1.5					
Electrical interface	Solder terminals		○		○		○	
	Solder terminals with cables		○		○		○	
	Mini-connectors		○		○		○	
	D-sub connector		-		○		○	
	Non-contact terminals		-		○		○	

Basic type		Master side	MJC60M	MJC100M	MJC150M
		Tool side	MJC60T	MJC100T	MJC150T
Item					
Maximum payload		kg [lb]	60 [132.3]	100 [220.5]	150 [330.8]
Mated axial force ^{Note 2}		N [lbf]	6300 [1416]	10200 [2293]	15700 [3529]
Mass	Master side	g [oz]	1000 [35.27]	1800 [63.49]	2700 [95.24]
	Tool side	g [oz]	600 [21.16]	1100 [38.80]	1500 [52.91]
	Both sides	g [oz]	1600 [56.44]	2900 [102.29]	4200 [148.15]
Port size			M5	Rc1/8	Rc1/8
Bending moment ^{Note 2}		N•m [in•lbf]	200 [1770]	390 [3452]	730 [6461]
Torsional moment		N•m [in•lbf]	180 [1593]	310 [2744]	710 [6284]
Operating pressure range		MPa [psi]	0.35 to 0.7 [51 to 102]		
Operating type			Double acting type (with anti-drop)		
Medium			Air		
Proof pressure		MPa [psi]	1.05 [152]		
Operating temperature range		°C [°F]	0 to 60 [32 to 140] ^{Note 3}		
Lubrication	Cylinder parts		Not required		
	Steel balls and sliding parts		Required (additional parts GR-HA-030) ^{Note 4}		
Repeatability		mm [in.]	±0.003 [0.0001]		
Pneumatic interface	Operating pressure range	MPa [psi]	-0.1 to 0.7 [-15 to 102]		
	Number/size		4•Rc1/8, 9•M5	4•Rc1/4, 6•Rc1/8	4•Rc1/4, 8•Rc1/8
	Orifice diameter		Rc1/8:φ6, M5:φ1.5	Rc1/4:φ9, Rc1/8:φ6	Rc1/4:φ9, Rc1/8:φ6
Electrical interface	Solder terminals		○	○	○
	Solder terminals with cables		○	○	○
	Mini-connectors		○	○	○
	D-sub connector		○	○	○
	Non-contact terminals		○	○	○
	Round connectors		○	○	○

Note 1: For chart comparing previous models, see page 64.

2: For applied pressure of 0.5 MPa [73 psi] ○: Selectable, -: Not selectable

3: When using non-contact terminals, 0 to 50°C [32 to 122°F]

4: As a guideline, apply grease to steel balls and sliding parts every 100,000 operations. See page 8 for details.

Specifications

● Electrical interface specifications

Basic type		Master side	MJCE-PM	MJCE-PAM	MJCE-PBM	MJCE-CM
		Tool side	MJCE-PT	MJCE-PAT	—	MJCE-CT
Wiring type			Solder terminals	Solder terminals with 1-m [3.280 ft] cables	Solder terminals with 3-m [9.840 ft] cables	Mini-connectors
Number of connectors		pc	15	15	15	9
Rated current		A	3	2.3	2.3	1
Mass	Master side	Terminal g [oz]	11 [0.39]	11 [0.39]	11 [0.39]	9 [0.32]
		(Adapter additional mass) g [oz]	When -3 is selected: +6 [0.21]	When -3 is selected: +6 [0.21]	When -3 is selected: +6 [0.21]	When -3 is selected: +6 [0.21]
		(Adapter additional mass) g [oz]	When -60 is selected: +20 [0.71]	When -60 is selected: +20 [0.71]	When -60 is selected: +20 [0.71]	When -60 is selected: +20 [0.71]
		Cable	—	+150	+450	—
	Tool side	Terminal g [oz]	7 [0.25]	7 [0.25]	—	8 [0.28]
		(Adapter additional mass) g [oz]	When -3 is selected: +4 [0.14]	When -3 is selected: +4 [0.14]	—	When -3 is selected: +4 [0.14]
		(Adapter additional mass) g [oz]	When -60 is selected: +20 [0.71]	When -60 is selected: +20 [0.71]	—	When -60 is selected: +20 [0.71]
		Cable	—	+150	—	—

Basic type		Master side	MJCE-DM	MJCE-QM	MJCE-RM	MJCE-CAM	MJCE-CBM
		Tool side	MJCE-DT	MJCE-QT	MJCE-RT	MJCE-CAT	-
Wiring type			D-sub connector	Round connectors	Non-contact terminals	1-m [3.280 ft] cable for mini-connectors	3-m [9.840 ft] cable for mini-connectors
Number of connectors		pc	15	10	12	9	9
Rated current		A	3	13 ^{Note 1}	— ^{Note 2}	1	1
Mass	Master side	Terminal g [oz]	29 [1.02]	180 [6.35]	80 [2.82]	5 [0.18]	5 [0.18]
		(Adapter additional mass) g [oz]	When -10 is selected: +20 [0.71]	When -60 is selected: +40 [1.41]	When - is selected: +60 [2.12]	—	—
		(Adapter additional mass) g [oz]	When -60 is selected: +20 [0.71]	—	When -60 is selected: +60 [2.12]	—	—
		Cable	—	—	+210	+50	+150
	Tool side	Terminal g [oz]	22 [0.78]	180 [6.35]	80 [2.82]	5 [0.18]	—
		(Adapter additional mass) g [oz]	When -10 is selected: +13 [0.46]	When -60 is selected: +40 [1.41]	When -10 is selected: +60 [2.12]	—	—
		(Adapter additional mass) g [oz]	When -60 is selected: +20 [0.71]	—	When -60 is selected: +60 [2.12]	—	—
		Cable	—	—	+105	+50	—

Note 1: If applying a current of 3 A or higher, limit it to 5 minutes. Also, keep the total current load for all 10 electric contact pins to 57.2 A or less.

2: To confirm the specifications for current values, see the non-contact terminals specifications below.

● Non-contact terminals specifications (excerpt)

■ Master side specifications

Model	MJCE-RM
Power supply voltage	24 VDC ±10% (including ripple)
Consumption current	≤ 600mA
Output signal points	12 points + 1 point (status)
Load current	≤ 50 mA/1 output
LED indicator	Status (green), output (orange)
Circuit protection	Short protection, reverse contact protection, surge protection
Operating ambient temperature	0 to 50°C [32 to 122°F]
Protective structure	IP67 (Note 1)
Connecting cable	PUR φ 8.6 × 2 m [6.560 ft] 2 × 0.5mm ² +13 × 0.18mm ²
Material	ABS

* Manufactured by B and Plus
Uses RS12E-422N-PU-02.

■ Tool side specifications

Model	MJCE-RT
Supported sensors	DC 3-wire sensors
Drive voltage	12 V ± 1.5 VDC
Drive current	≤ 230 mA (note 2)
Input signal points	12 points
Transmission distance	5 mm [0.197 in.]
Allowable axial misalignment	±3 mm [0.118 in.]
Operating ambient temperature	0 to 50°C [32 to 122°F]
Protective structure	IP67 (Note 1)
Connecting cable	PUR φ 8.6 × 1 m [3.280 ft] 2 × 0.5mm ² +13 × 0.18mm ²
Material	ABS

* Manufactured by B and Plus
Uses RS12T-422-PU-01.

Note 1: Compatible for non-contact terminals, not including auto hand changer itself.

2: Use within a range that the total consumed current of the connected detection sensors and drive units does not exceed the drive's current value.

* See page 10 for details of the specifications.

Mass

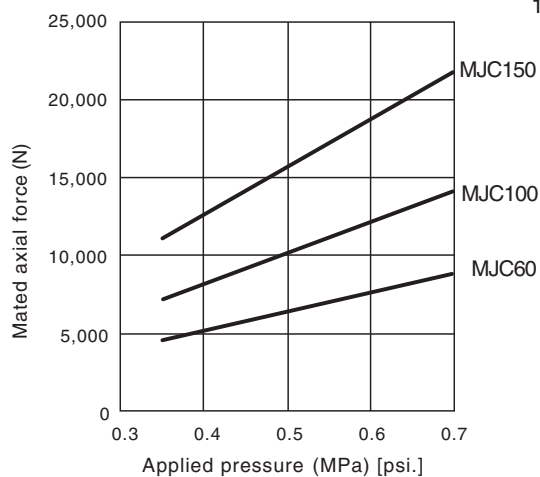
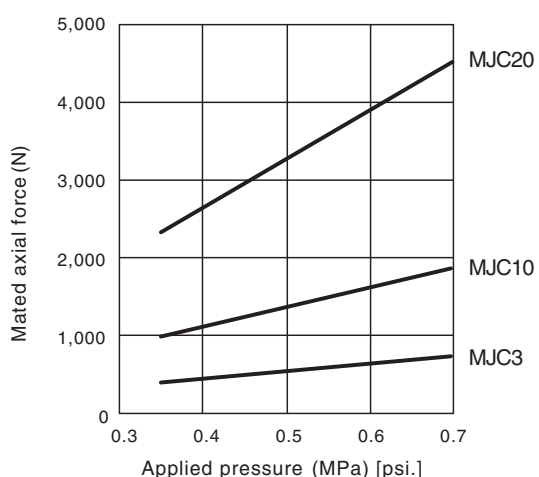
● Robot adapter

Basic type	RA-MJC3-A	RA-MJC3-B	RA-MJC10-B	RA-MJC10-C	RA-MJC20-C	RA-MJC20-D
Mass	42 [1.48]	63 [2.22]	118 [4.16]	153 [5.40]	150 [5.29]	354 [12.49]

● Adapter for air hand

Basic type	HA-MJC3-A	HA-MJC3-N	HA-MJC10-A	HA-MJC10-N	HA-MJC20-A	HA-MJC20-N
Mass	34 [1.20]	19 [0.67]	83 [2.93]	66 [2.33]	518 [18.27]	129 [4.55]

Mated axial force



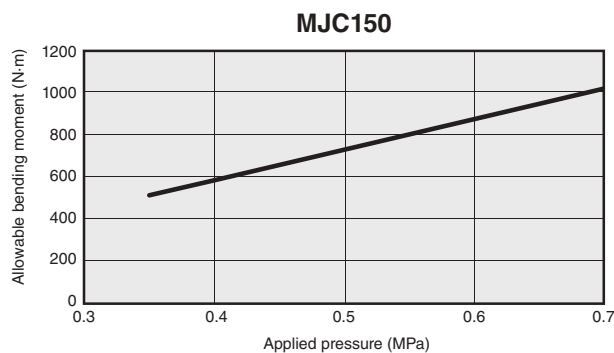
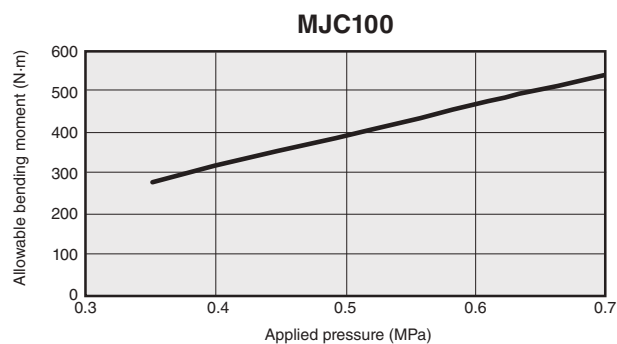
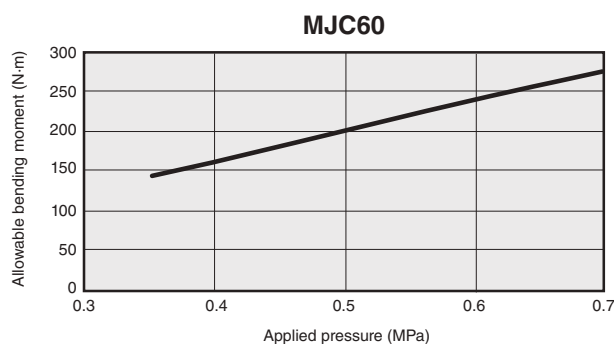
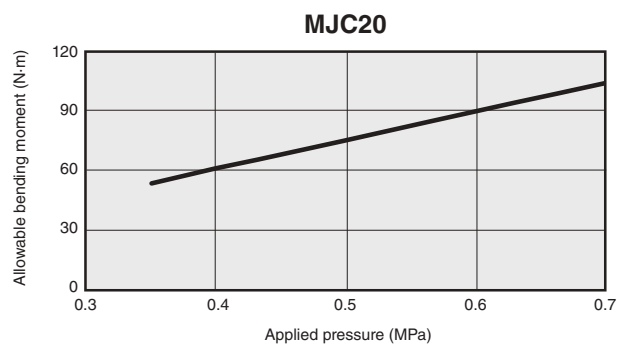
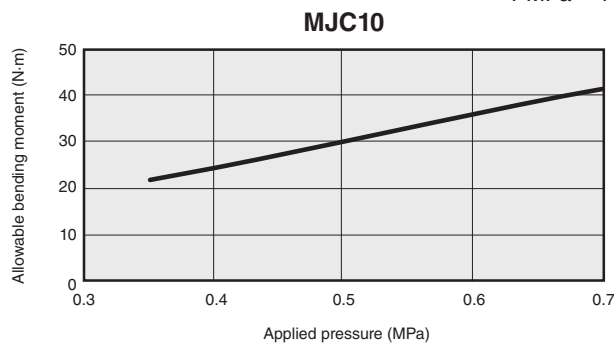
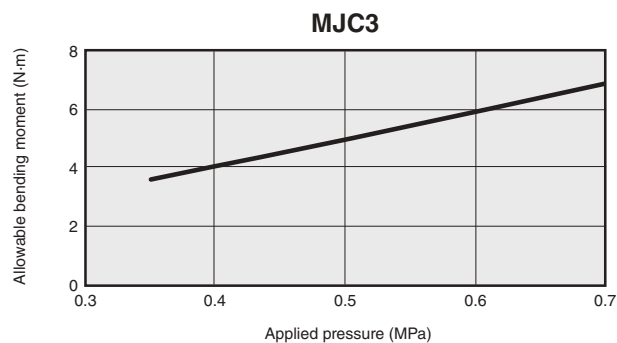
1 MPa = 145 psi

Bending moment

● Allowable bending moment in relation to applied pressure

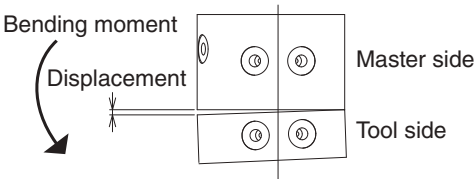
1 N·m = 8.851 in·lbf

1 MPa = 145 psi

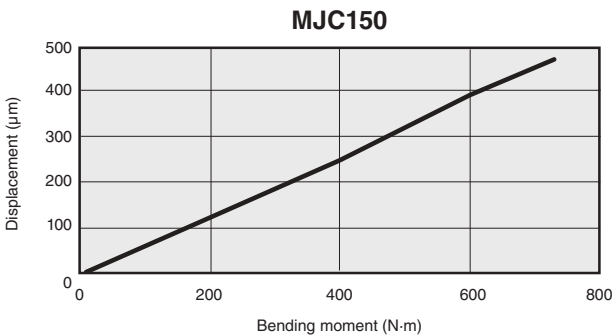
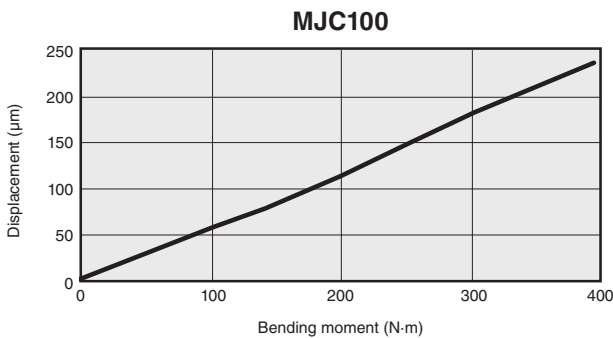
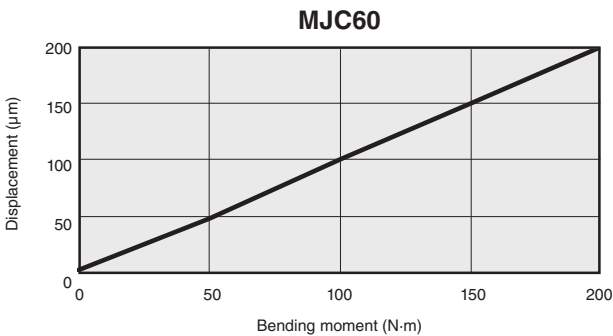
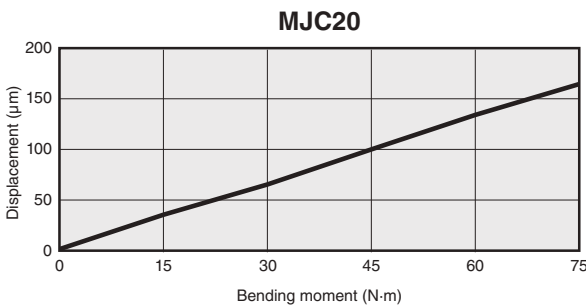
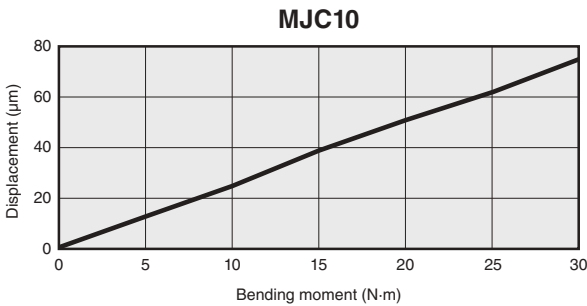
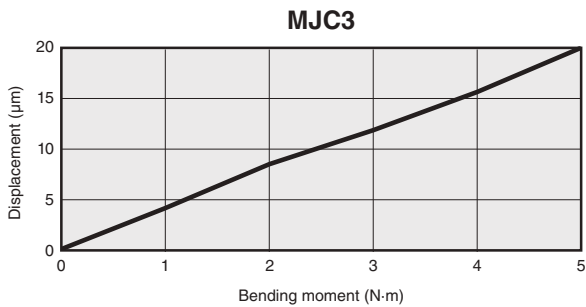


Bending moment

● Displacement in relation to bending moment when 0.5 MPa [73 psi] pressure

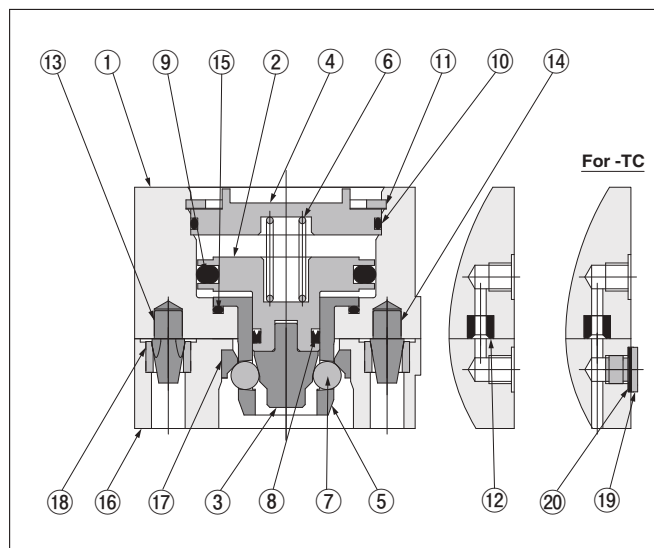


1 N·m = 8.851 in·lbf



Inner construction

MJC3-10-20



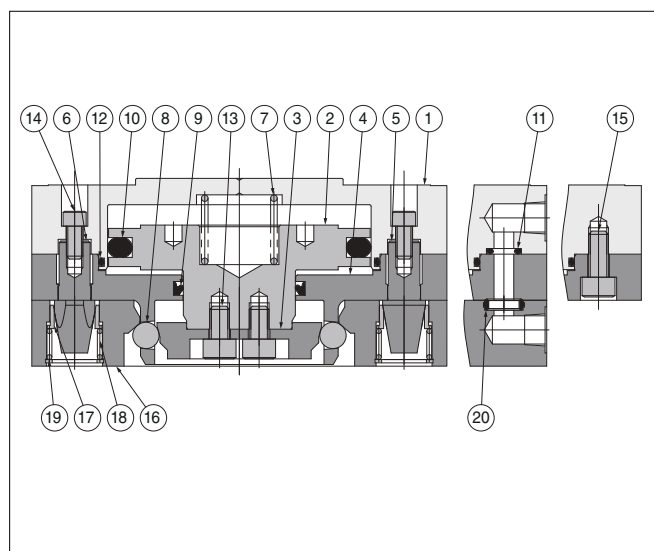
Major parts and materials

MJC3-10-20

No.	Model Name	MJC3M	MJC10M	MJC20M
①	Master plate	Aluminum alloy (electroless nickel plated)		
②	Piston	Aluminum alloy (anodized)		
③	Center pin	Stainless steel (heat-treated)		
④	Head cover	Aluminum alloy (anodized)		
⑤	Hole guide	Stainless steel (heat-treated)		
⑥	Spring	Piano wire		
⑦	Steel ball	Hard steel		
⑧	Rod packing	Synthetic rubber (NBR)		
⑨	Piston packing	Synthetic rubber (NBR)		
⑩	O-ring	Synthetic rubber (NBR)		
⑪	Retaining ring	Steel (electroless nickel plated)		
⑫	Packing	Synthetic rubber (NBR)		
⑬	Diamond pin	Stainless steel (heat-treated)		
⑭	Round pin	Stainless steel (heat-treated)		
⑮	O-ring	Synthetic rubber (NBR)		

No.	Model Name	MJC3T MJC3TC	MJC10T MJC10TC	MJC20T MJC20TC
⑯	Tool plate	Aluminum alloy (electroless nickel plated)		
⑰	Housing	Stainless steel (heat-treated)		
⑱	Bushing	Stainless steel		
⑲	Plug	Stainless steel		
⑳	Packing	Stainless steel + synthetic rubber (NBR)		

MJC60-100-150

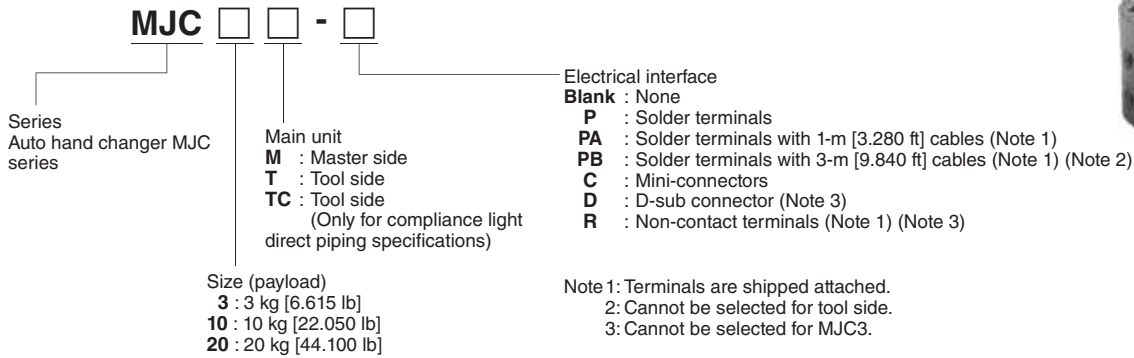


MJC60-100-150

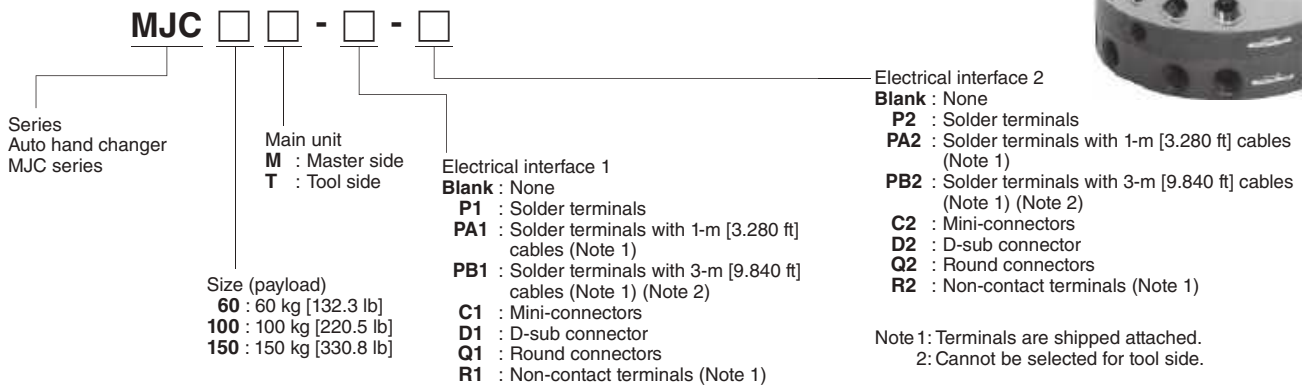
No.	Model Name	MJC60M	MJC100M	MJC150M
①	Master plate	Aluminum alloy (electroless nickel plated)		
②	Piston	Aluminum alloy (anodized)		
③	Center pin	Stainless steel (heat-treated)		
④	Hole guide	Stainless steel (heat-treated)		
⑤	Round pin	Stainless steel (heat-treated)		
⑥	Diamond pin	Stainless steel (heat-treated)		
⑦	Spring	Piano wire		
⑧	Steel ball	Hard steel		
⑨	Rod packing	Synthetic rubber (NBR)		
⑩	Piston packing	Synthetic rubber (NBR)		
⑪	O-ring	Synthetic rubber (NBR)		
⑫	O-ring	Synthetic rubber (NBR)		
⑬	Bolt	Stainless steel		
⑭	Bolt	Stainless steel		
⑮	Bolt	Stainless steel		

No.	Model Name	MJC60T	MJC100T	MJC150T
⑯	Tool plate	Stainless steel (heat-treated)		
⑰	Bushing	Stainless steel		
⑱	Spring	Piano wire		
⑲	Retaining ring	Stainless steel		
⑳	Air packing	Synthetic rubber (NBR)		

● Main unit model (MJC3·10·20)



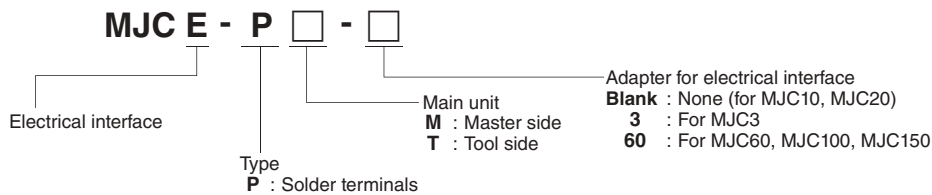
● Main unit model (MJC60·100·150)



Additional Parts

● Electrical interface

• Solder terminals



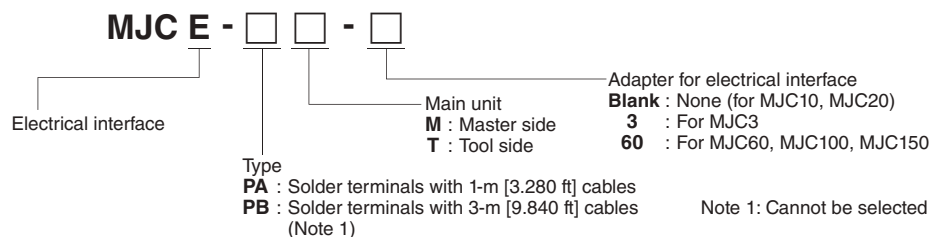
Set contents

Model	Part name	Material	Count
MJCE-PM MJCE-PT	Terminal(*)	—	1
	Hexagon socket head bolt M3 × 0.5, length under head 16 [0.630]	Stainless steel	2
MJCE-PM-3 MJCE-PT-3	Terminal(*)	—	1
	Hexagon socket head bolt M3 × 0.5, length under head 16 [0.630]	Stainless steel	2
	Adapter(*)	Aluminum alloy (electroless nickel plated)	1
MJCE-PM-60 MJCE-PT-60	Hexagon socket head bolt M3 × 0.5, length under head 6 [0.236]	Stainless steel	2
	Terminal(*)	—	1
	Hexagon socket head bolt M3 × 0.5, length under head 16 [0.630]	Stainless steel	2
	Adapter	Aluminum alloy (electroless nickel plated)	1
	Hexagon socket head bolt M4 × 0.7, length under head 10 [0.394]	Stainless steel	2
	Parallel pin JIS B 1354 B type 4 × 8	Stainless steel	2

Note: The * mark indicates parts with different shapes for the master side and the tool side.

Additional Parts

• Solder terminals with cables

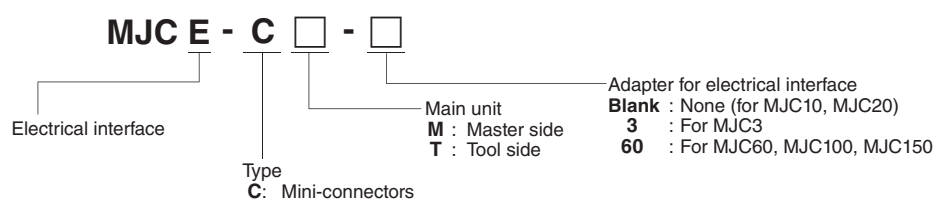


Set contents

Model	Part name	Material	Count
MJCE-PAM MJCE-PBM MJCE-PAT	Terminal(*)	—	1
	Hexagon socket head bolt M3 × 0.5, length under head 16 [0.630]	Stainless steel	2
	Adapter(*)	Aluminum alloy (electroless nickel plated)	1
MJCE-PAM-3 MJCE-PBM-3 MJCE-PAT-3	Terminal(*)	—	1
	Hexagon socket head bolt M3 × 0.5, length under head 16 [0.630]	Stainless steel	2
	Adapter(*)	Aluminum alloy (electroless nickel plated)	1
MJCE-PAM-60 MJCE-PBM-60 MJCE-PAT-60	Hexagon socket head bolt M3 × 0.5, length under head 6 [0.236]	Stainless steel	2
	Terminal(*)	—	1
	Hexagon socket head bolt M3 × 0.5, length under head 16 [0.630]	Stainless steel	2
	Adapter	Aluminum alloy (electroless nickel plated)	1
MJCE-PAM-60 MJCE-PBM-60 MJCE-PAT-60	Hexagon socket head bolt M4 × 0.7, length under head 10 [0.394]	Stainless steel	2
	Parallel pin JIS B 1354 B type 4 × 8	Stainless steel	2

Note: The * mark indicates parts with different shapes for the master side and the tool side.

• Mini-connectors

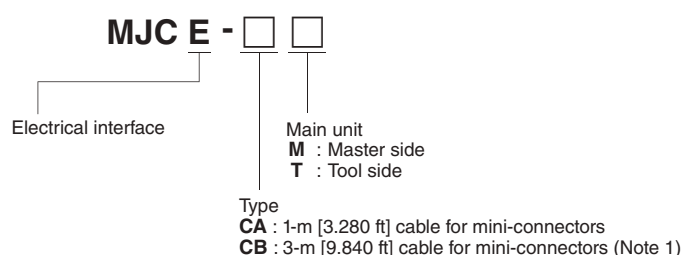


Set contents

Model	Part name	Material	Count
MJCE-CM MJCE-CT	Terminal(*)	—	1
	Hexagon socket head bolt M3 × 0.5, length under head 16 [0.630]	Stainless steel	2
MJCE-CM-3 MJCE-CT-3	Terminal(*)	—	1
	Hexagon socket head bolt M3 × 0.5, length under head 16 [0.630]	Stainless steel	2
	Adapter(*)	Aluminum alloy (electroless nickel plated)	1
MJCE-CM-60 MJCE-CT-60	Hexagon socket head bolt M3 × 0.5, length under head 6 [0.236]	Stainless steel	2
	Terminal(*)	—	1
	Hexagon socket head bolt M3 × 0.5, length under head 16 [0.630]	Stainless steel	2
	Adapter	Aluminum alloy (electroless nickel plated)	1
MJCE-CM-60 MJCE-CT-60	Hexagon socket head bolt M4 × 0.7, length under head 10 [0.394]	Stainless steel	2
	Parallel pin JIS B 1354 B type 4 × 8	Stainless steel	2

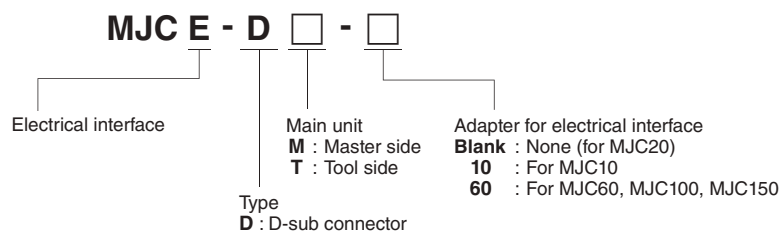
Note: The * mark indicates parts with different shapes for the master side and the tool side.

• Cable for mini-connectors



Additional Parts

• D-sub connector

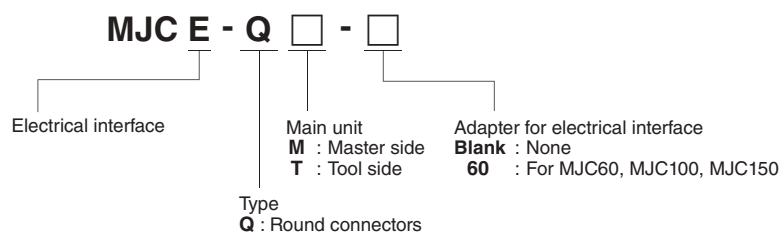


Set contents

Model	Part name	Material	Count
MJCE-DM MJCE-DT	Terminal(*)	—	1
	Specialized bolt (*)	Mild steel (nickel plated)	2
MJCE-DM-10 MJCE-DT-10	Terminal(*)	—	1
	Specialized bolt (*)	Mild steel (nickel plated)	2
	Adapter(*)	Aluminum alloy (anodized)	1
	Hexagon socket head bolt M3 × 0.5, length under head 6 [0.236]	Stainless steel	2
MJCE-DM-60 MJCE-DT-60	Terminal(*)	—	1
	Specialized bolt (*)	Mild steel (nickel plated)	2
	Adapter	Aluminum alloy (anodized)	1
	Hexagon socket head bolt M4 × 0.7, length under head 10 [0.394]	Stainless steel	2
	Parallel pin JIS B 1354 B type 4 × 8	Stainless steel	2

Note: The * mark indicates parts with different shapes for the master side and the tool side.

• Round connectors



Set contents

Model	Part name	Material	Count
MJCE-QM MJCE-QT	Terminal(*)	—	1
	Hexagon socket head bolt M4 × 0.7, length under head 60 [2.362]	Stainless steel	4
	Parallel pin JIS B 1354 B type 4 × 8	Stainless steel	2
MJCE-QM-60 MJCE-QT-60	Terminal(*)	—	1
	Hexagon socket head bolt M4 × 0.7, length under head 60 [2.362]	Stainless steel	4
	Parallel pin JIS B 1354 B type 4 × 8	Stainless steel	4
	Adapter	Aluminum alloy (anodized)	1
	Hexagon socket head bolt M4 × 0.7, length under head 10 [0.394]	Stainless steel	2

Note: The * mark indicates parts with different shapes for the master side and the tool side.

● Air packing for pneumatic interface

MJCZ - PK - ☐

Size
Blank: For tool port M3, M5 (10 per bag)
R: For tool port Rc1/8, Rc1/4 (12 per bag)



● Probe terminal for electrical interface

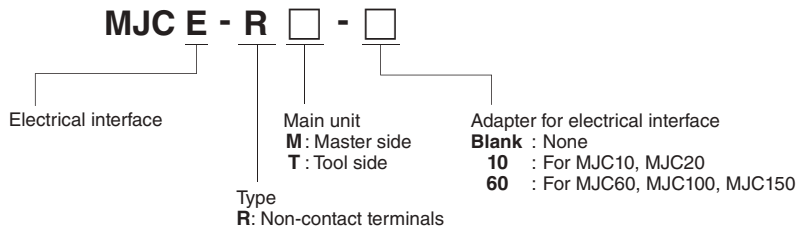
MJCZ - PR - ☐

Terminal
Blank: For solder terminals, solder terminals with cables, mini-connectors, D-sub connectors (15 per bag)
Q: For round connectors (10 per bag)



Additional Parts

• Non-contact terminals



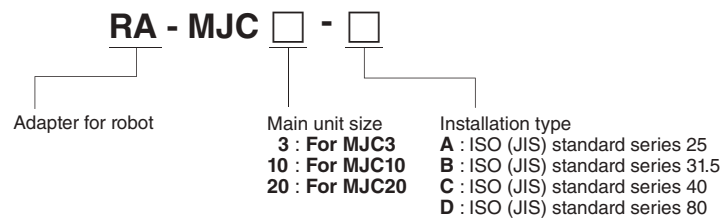
Set contents

Model	Part name	Material	Count
MJCE-RM MJCE-RT	Terminal(*)	ABS	1
	Hexagon socket head bolt M4 × 0.7, length under head 12 [0.472]	Stainless steel	2
MJCE-RM-10 MJCE-RT-10	Terminal(*)	ABS	1
	Hexagon socket head bolt M4 × 0.7, length under head 12 [0.472]	Stainless steel	2
	Adapter	Aluminum alloy (anodized)	1
	Hexagon socket head bolt M3 × 0.5, length under head 10 [0.394]	Stainless steel	2
	Parallel pin JIS B 1354 B type 3 × 6	Stainless steel	2
MJCE-RM-60 MJCE-RT-60	Terminal(*)	ABS	1
	Hexagon socket head bolt M4 × 0.7, length under head 12 [0.472]	Stainless steel	2
	Adapter	Aluminum alloy (anodized)	1
	Hexagon socket head bolt M4 × 0.7, length under head 10 [0.394]	Stainless steel	2
	Parallel pin JIS B 1354 B type 4 × 8	Stainless steel	2

Note: The * mark indicates parts with different shapes for the master side and the tool side.

● Adapter

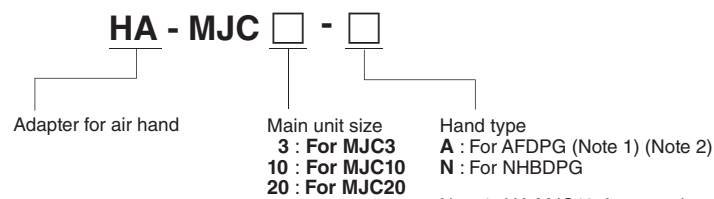
• Robot adapter



* The following table shows combinations of unit size and installation type

Size \ Type	-A	-B	-C	-D
3	○	○	—	—
10	—	○	○	—
20	—	—	○	○

• Adapter for air hand



* The following table shows air hand and adapter compatibility

Size \ Type	-A	-N
3	For AFDPG-8	For NHBPG-8
10	For AFDPG-14 (Note 1)	For NHBPG-16
20	For AFDPG-25 (Note 2)	For NHBPG-25

Note 1: HA-MJC10-A cannot be used with MJC10T-PA or MJC10T-R.
 2: HA-MJC20-A cannot be used with MJC20T-R.

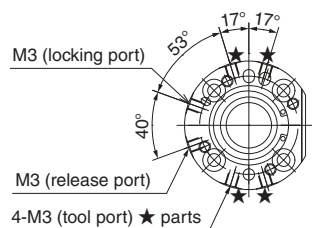
● Grease

GR - HA - 030

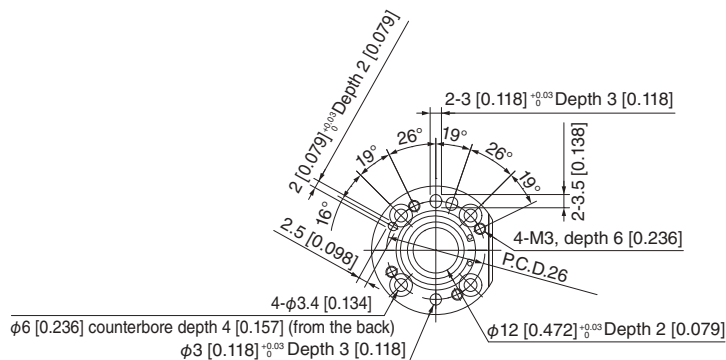
* 30 g [1.06 oz] of NSF standard H1 certified grease

Note: Apply this grease to steel balls and sliding parts every 100,000 operations. See page ⑧ for application method.

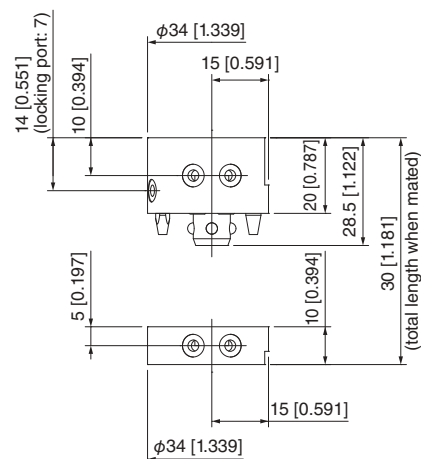
MJC3M



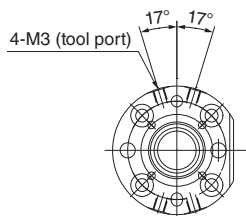
Piping dimensions diagram



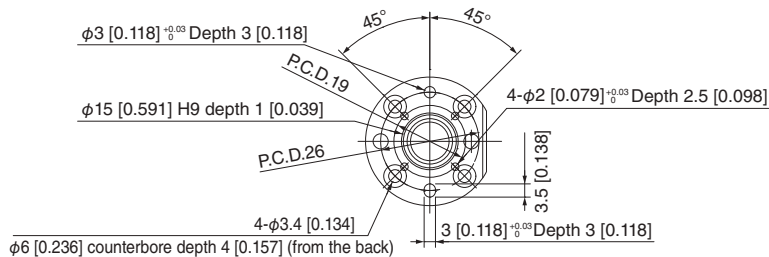
Mounting dimensions diagram



MJC3T



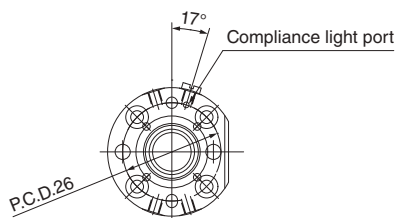
Piping dimensions diagram



Mounting dimensions diagram

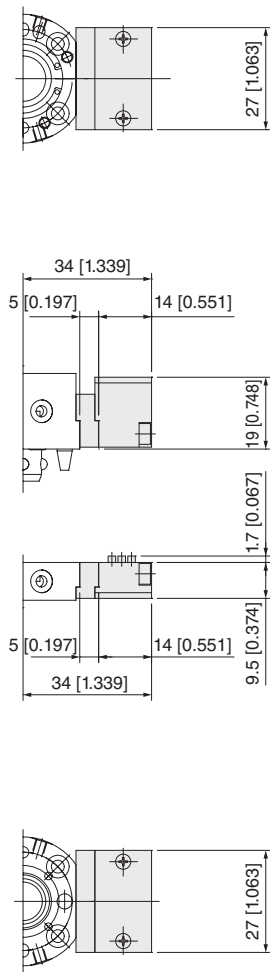
MJC3TC

* The following diagram shows the only difference to the MJC3T.

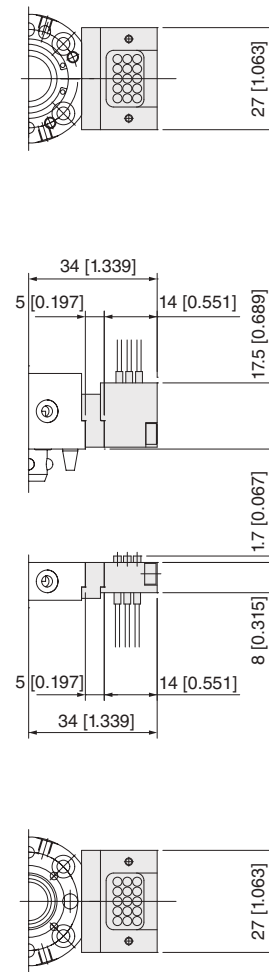


MJC3

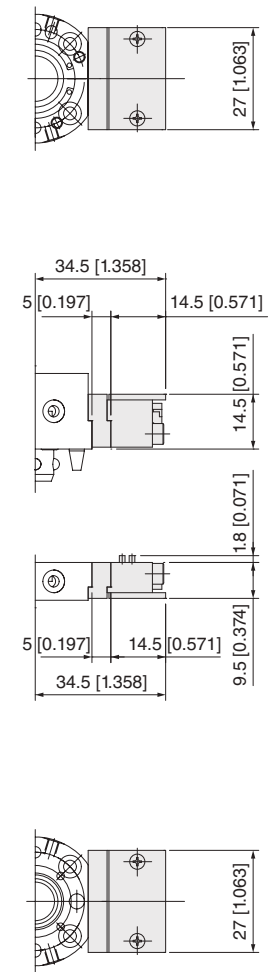
For -P



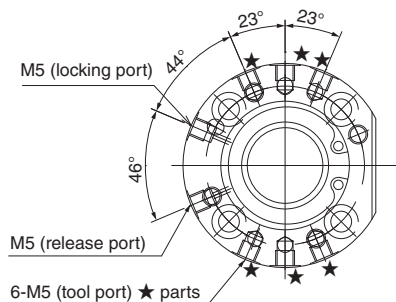
For -PA, -PB



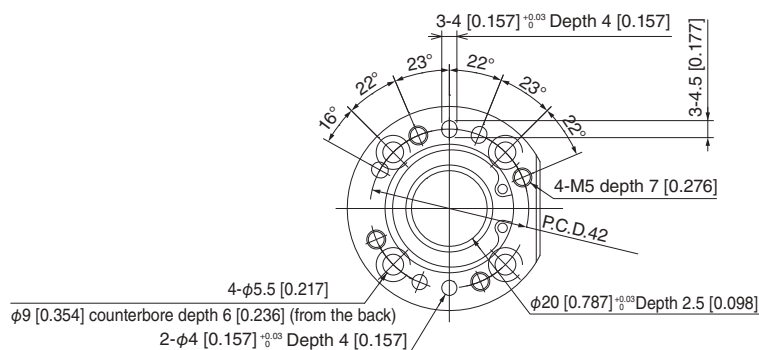
For -C



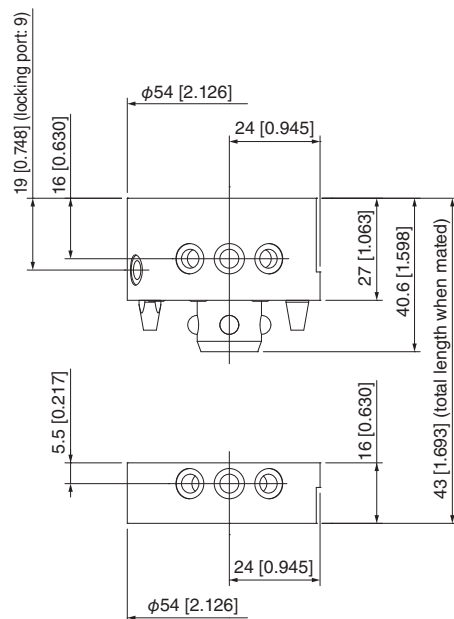
MJC10M



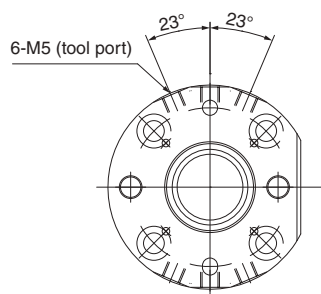
Piping dimensions diagram



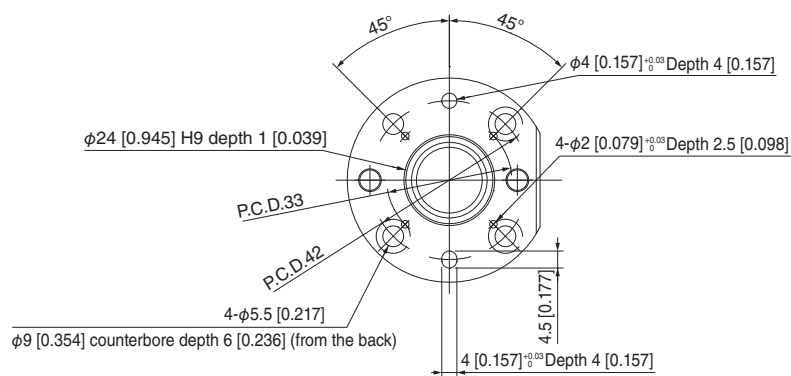
Mounting dimensions diagram



MJC10T



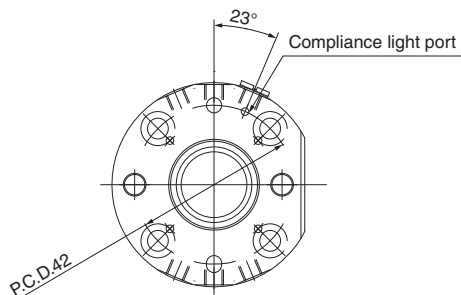
Piping dimensions diagram



Mounting dimensions diagram

MJC10TC

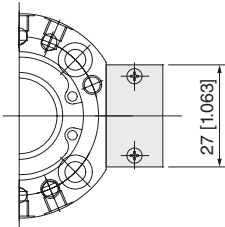
* The following diagram shows the only difference to the MJC10T.



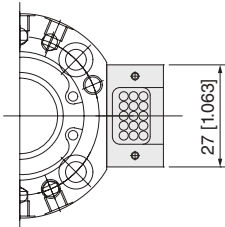
Piping dimensions diagram

MJC10□

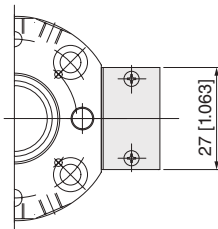
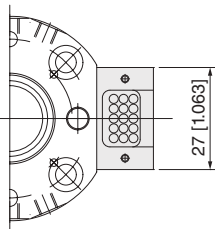
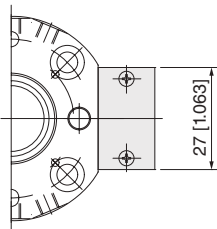
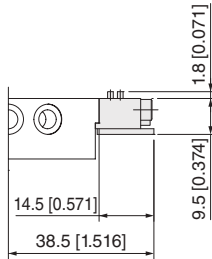
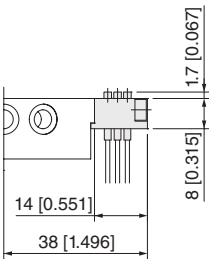
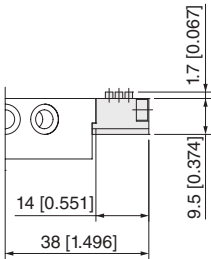
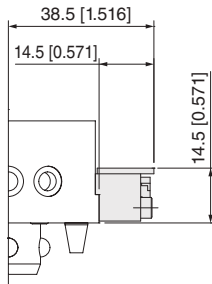
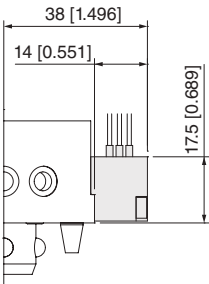
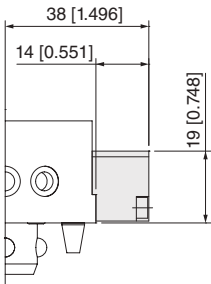
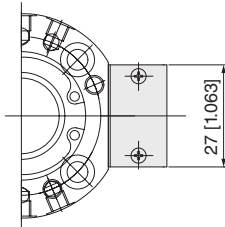
For -P



For -PA, -PB

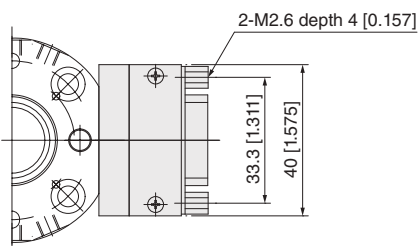
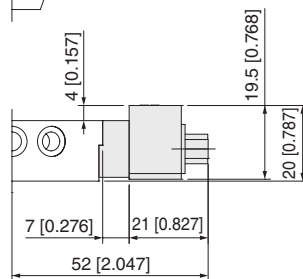
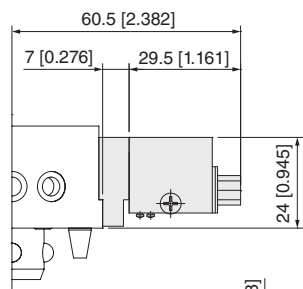
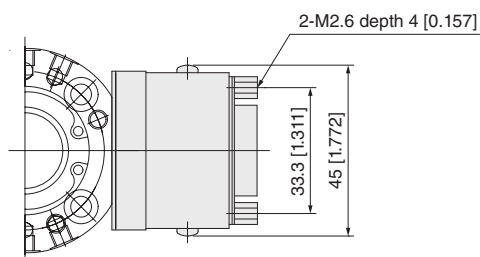


For -C

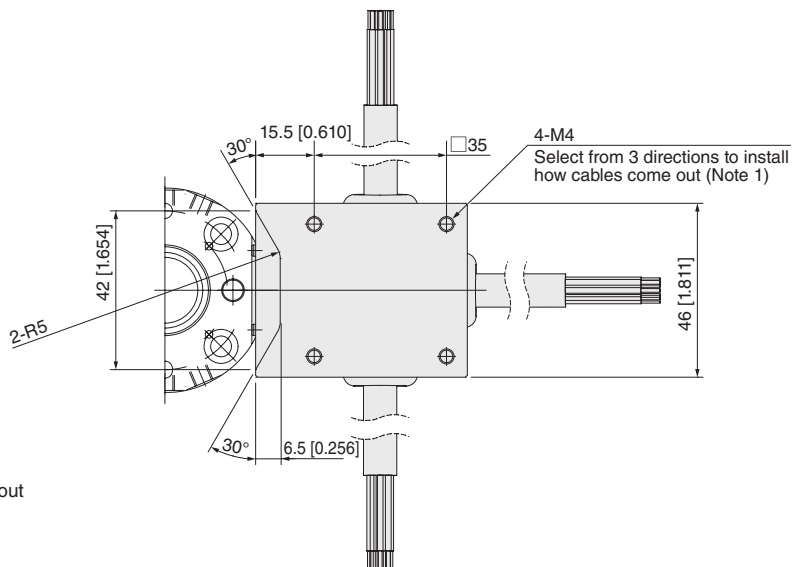
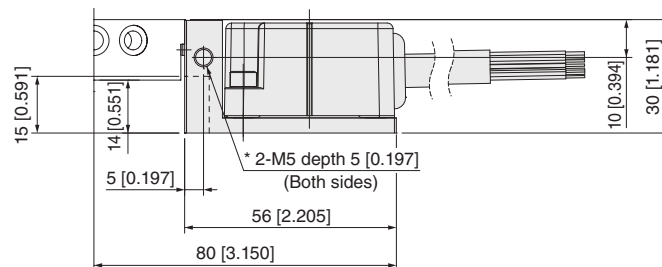
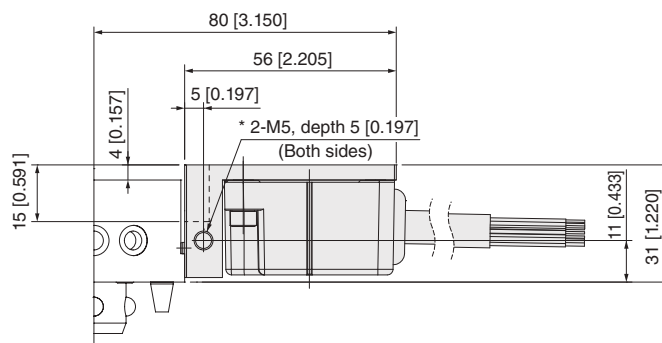
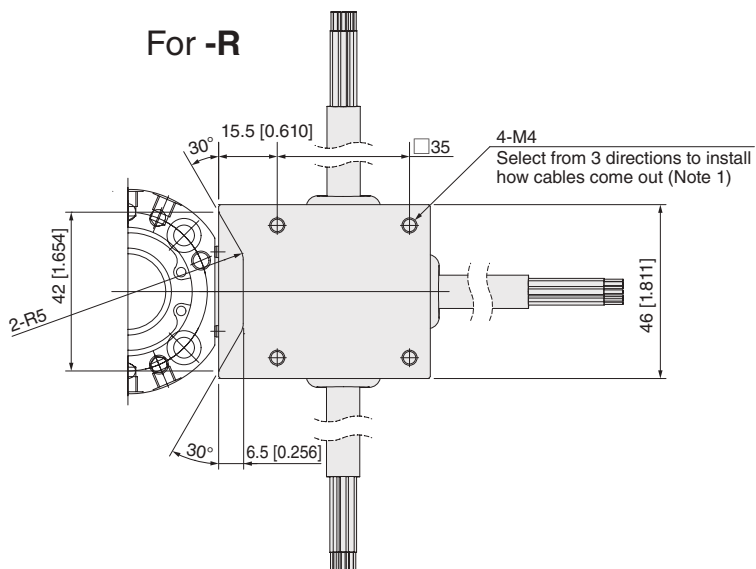


MJC10□

For -D



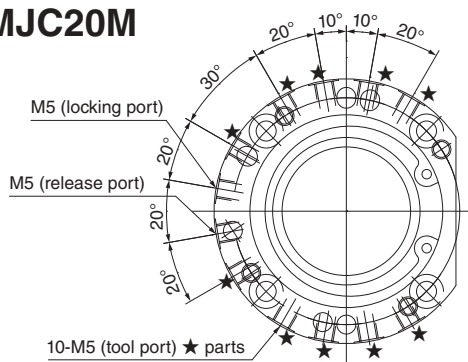
For -R



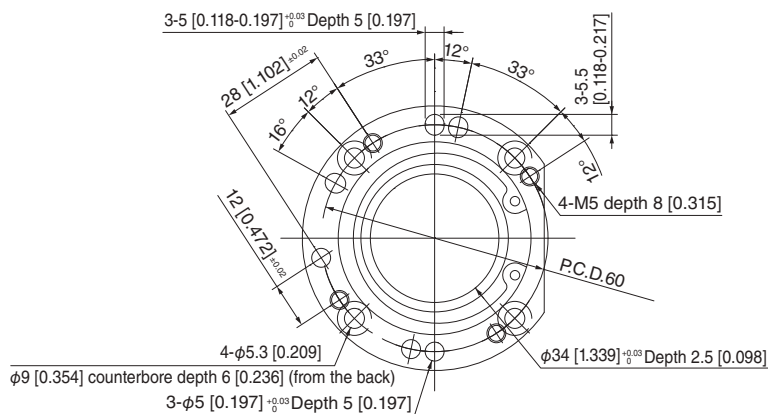
Note 1: Transmission is possible even when the cables come out in different directions on the master side and tool side.

2: The * marks are parts (2-M5) for cable clips. Please purchase cable clips separately.

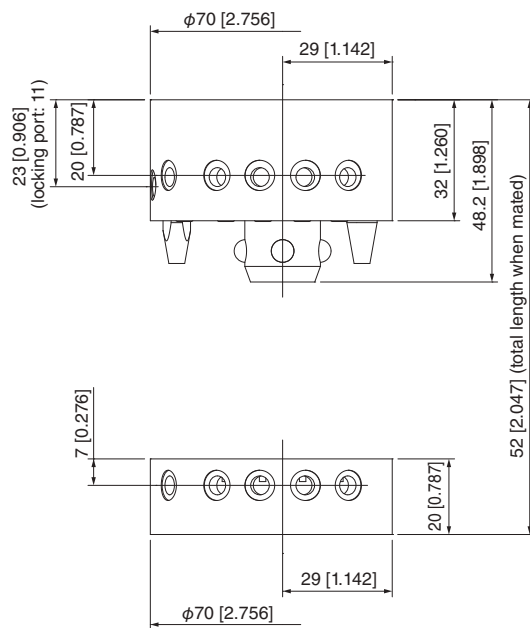
MJC20M



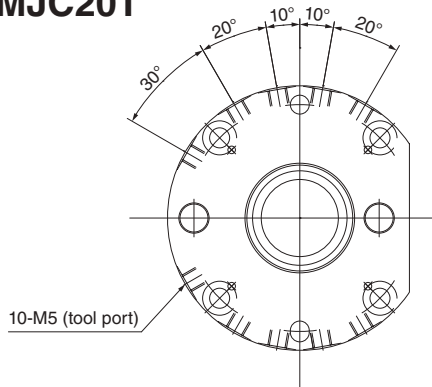
Piping dimensions diagram



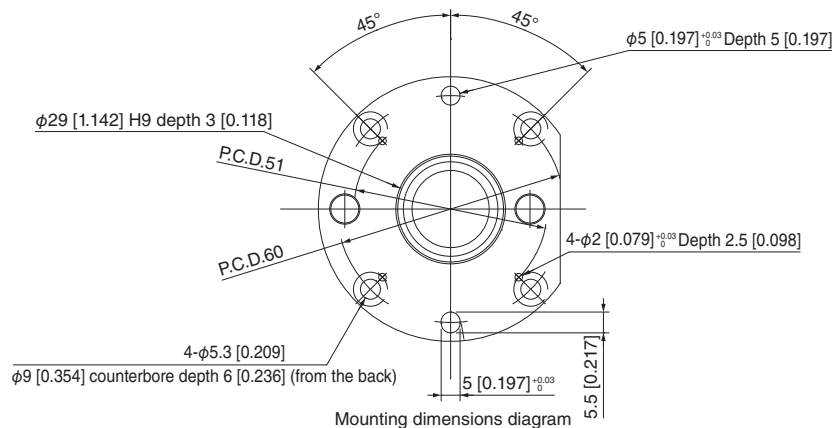
Mounting dimensions diagram



MJC20T



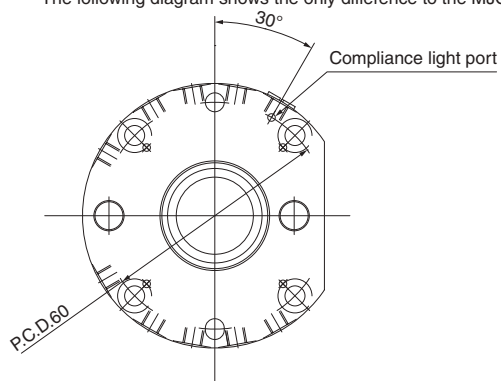
Piping dimensions diagram



Mounting dimensions diagram

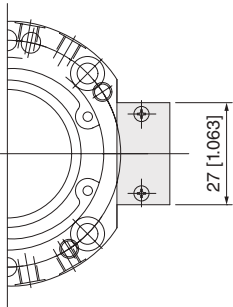
MJC20TC

* The following diagram shows the only difference to the MJC20T.

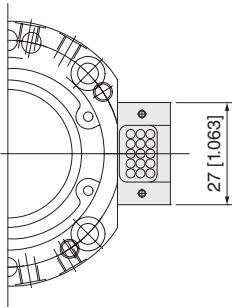


MJC20□

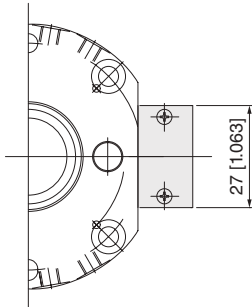
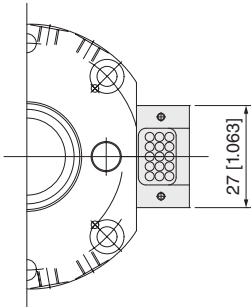
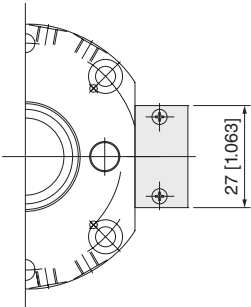
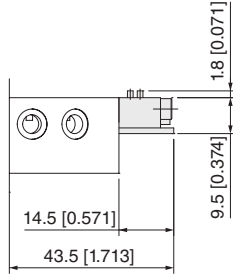
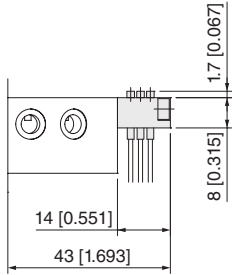
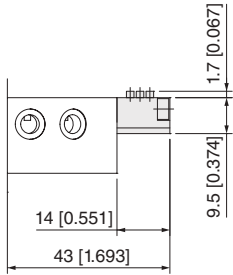
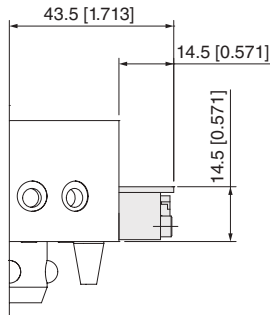
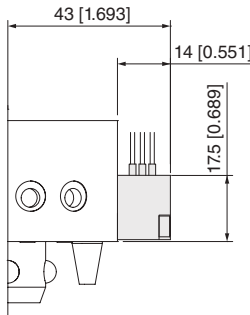
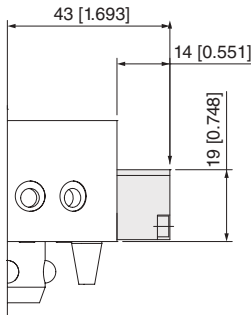
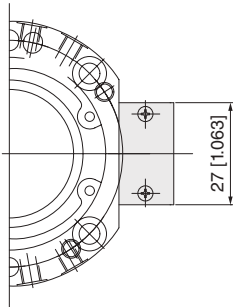
For -P



For -PA, -PB

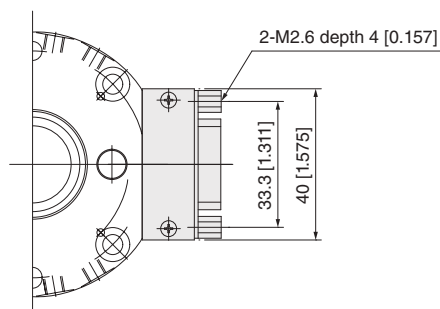
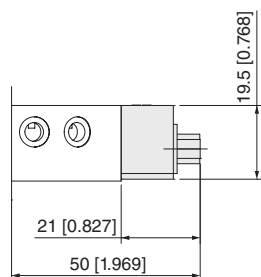
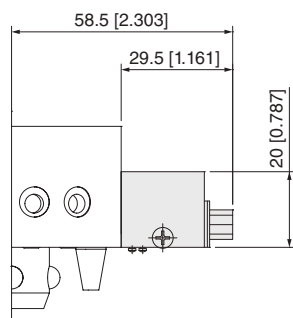
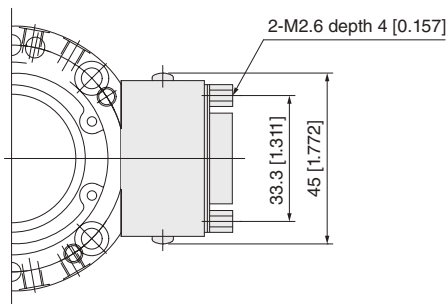


For -C

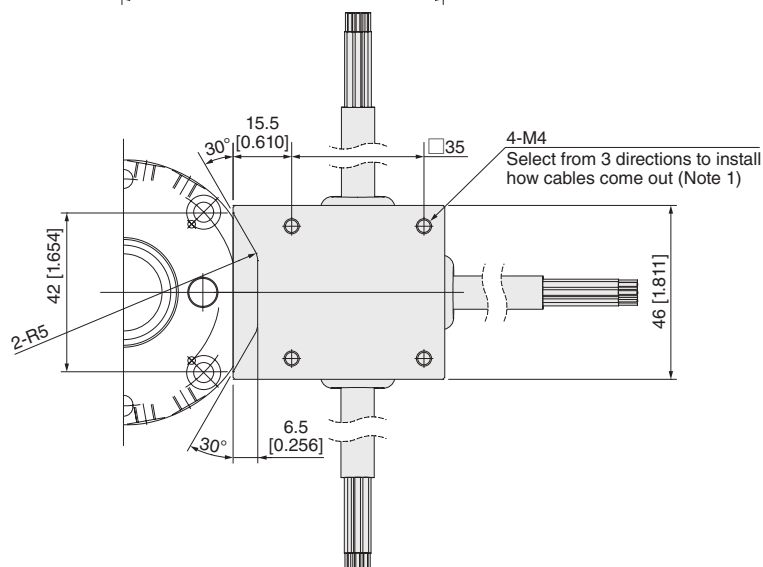
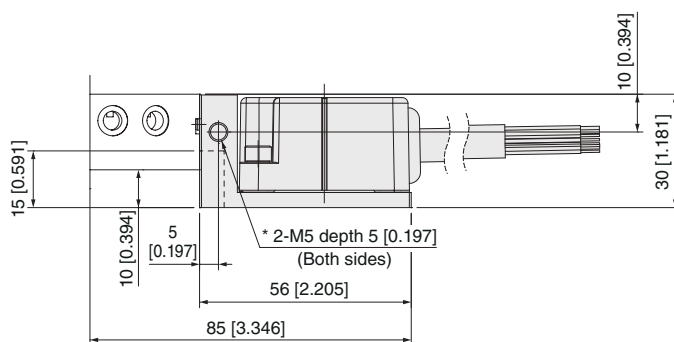
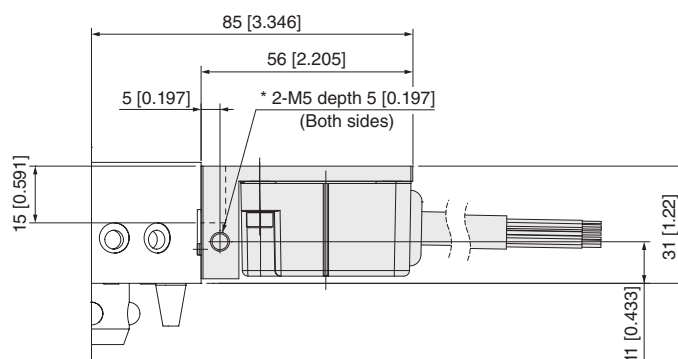
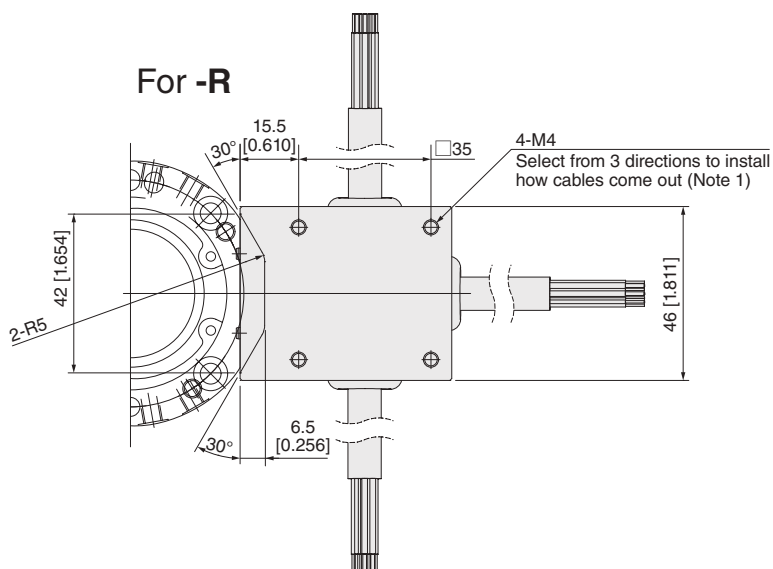


MJC20□

For -D

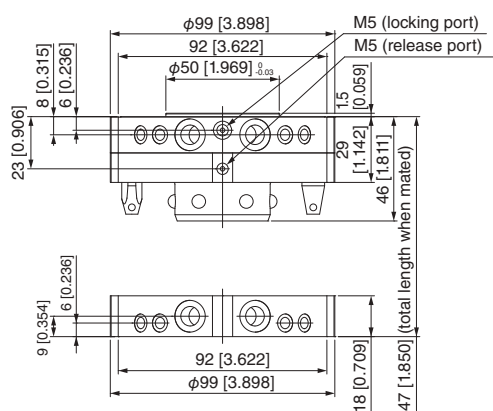
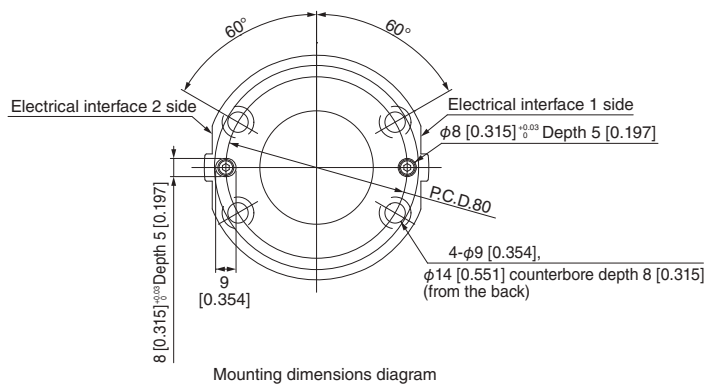
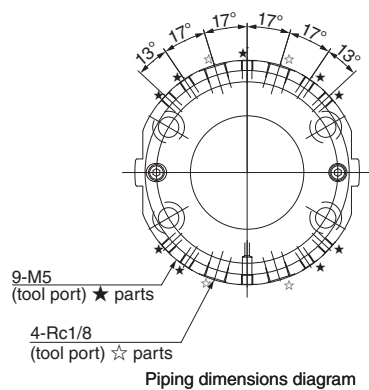


For -R

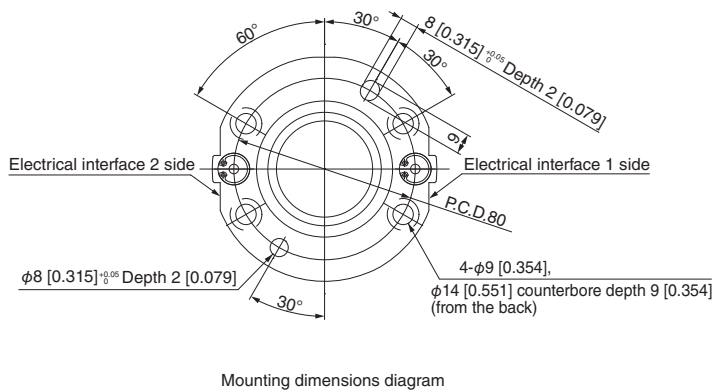
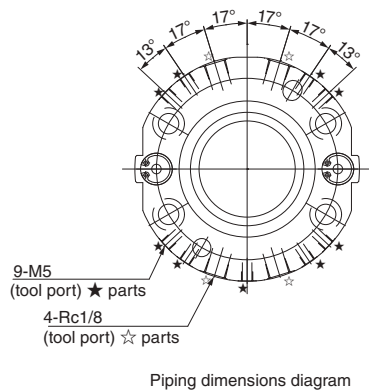


Note 1: Transmission is possible even when the cables come out in different directions on the master side and tool side.
 2: The * marks are parts (2-M5) for cable clips. Please purchase cable clips separately.

MJC60M

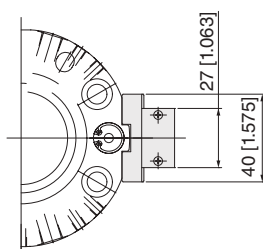
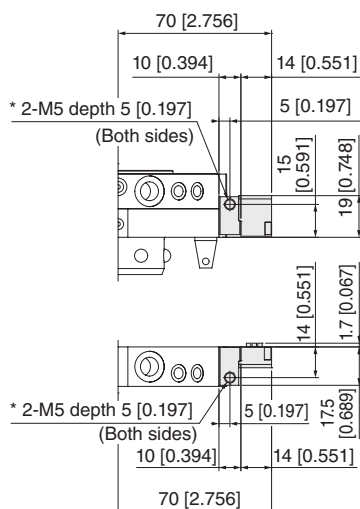
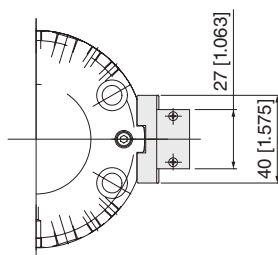


MJC60T

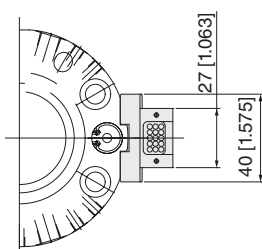
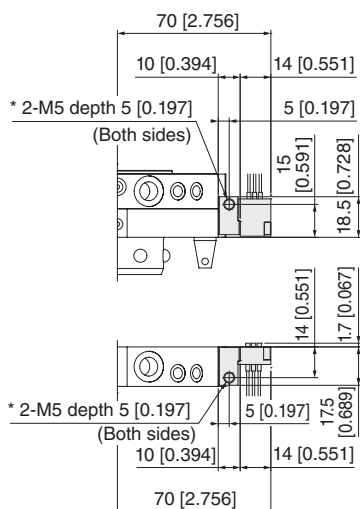
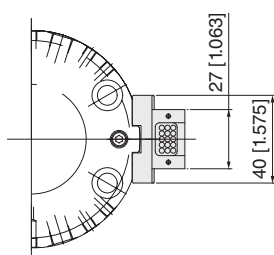


MJC60□

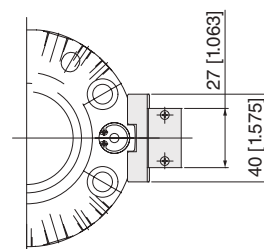
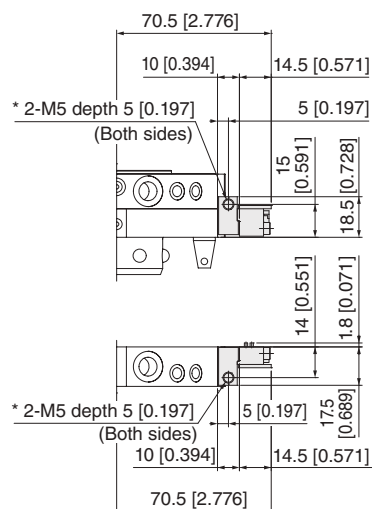
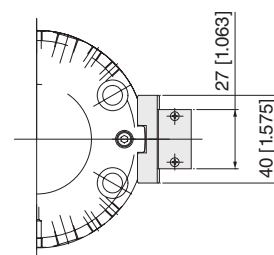
For -P1



For -PA1, -PB1



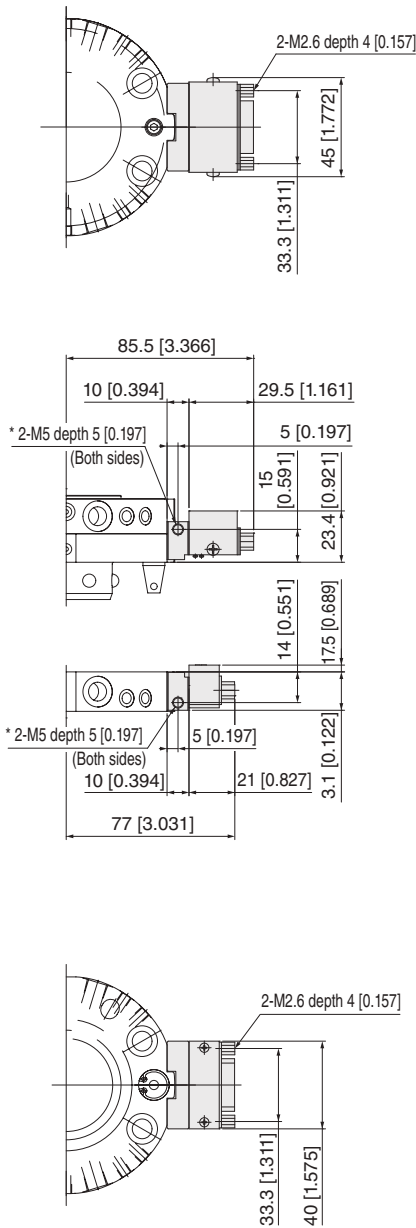
For -C1



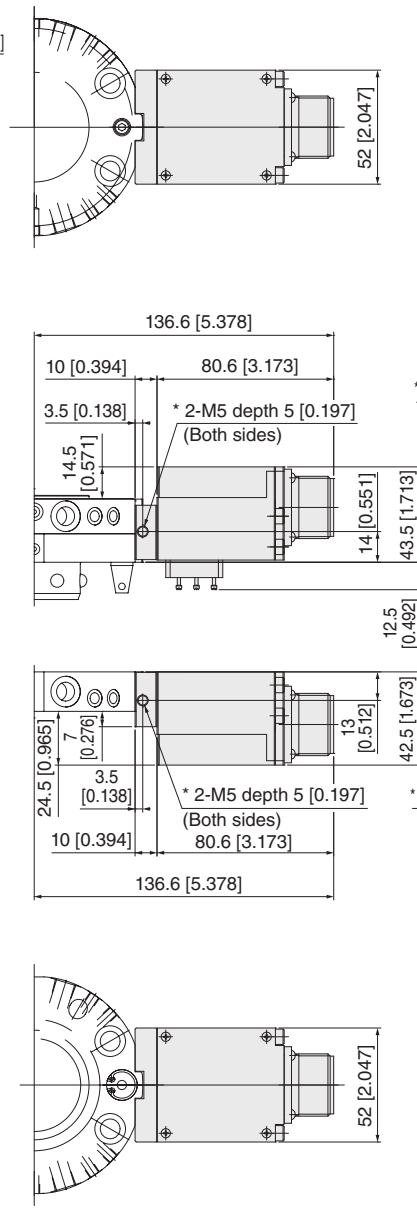
Note 1: For dimensions of the electrical interface 2 side (- □ 2), refer to the electrical interface 1 side (- □ 1).
 2: The * marks are parts (2-M5) for cable clips. Please purchase cable clips separately.

MJC60□

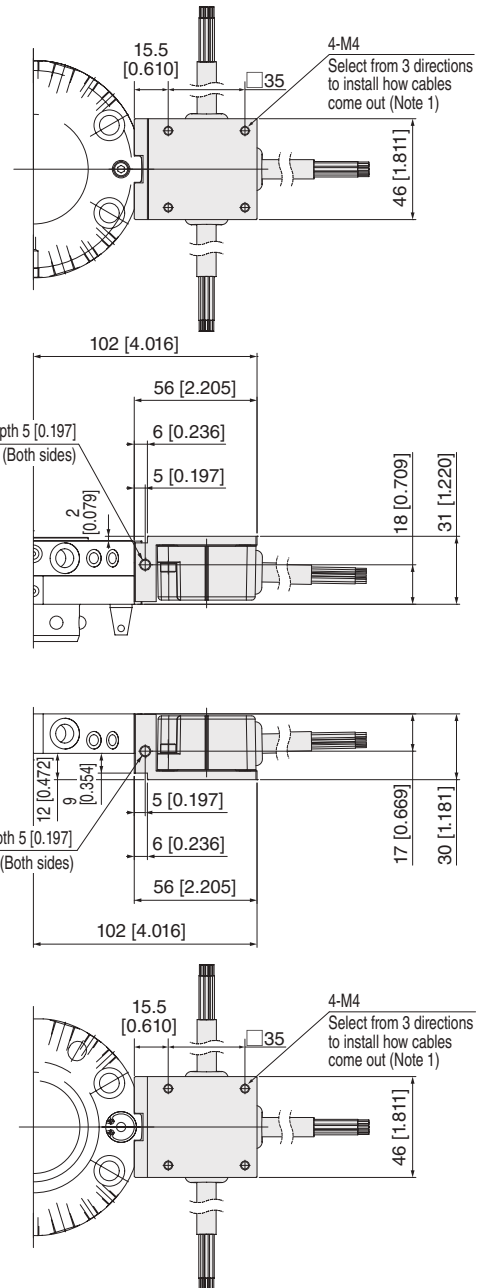
For -D1



For -Q1



For -R1

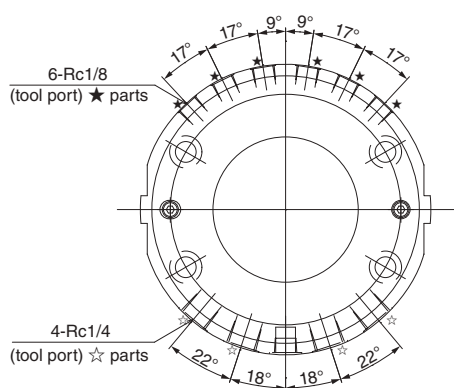


Note 1: Transmission is possible even when the cables come out in different directions on the master side and tool side.

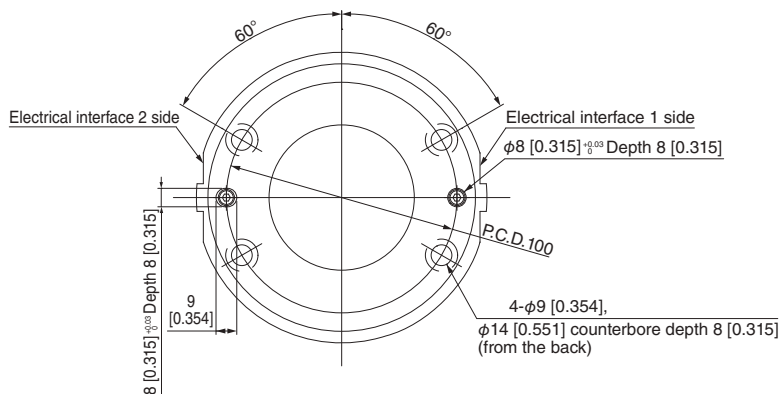
2: The * marks are parts (2-M5) for cable clips. Please purchase cable clips separately.

3: For dimensions of the electrical interface 2 side (- □ 2), refer to the electrical interface 1 side (- □ 1).

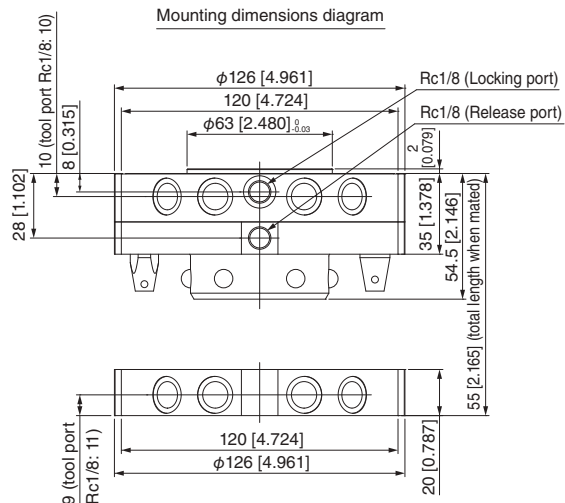
MJC100M



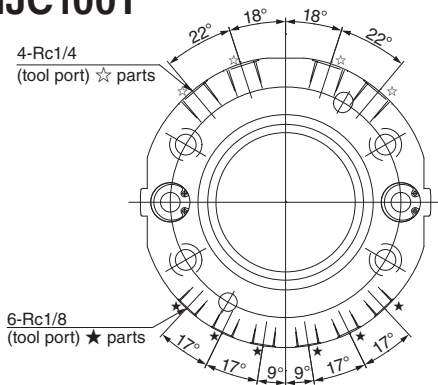
Piping dimensions diagram



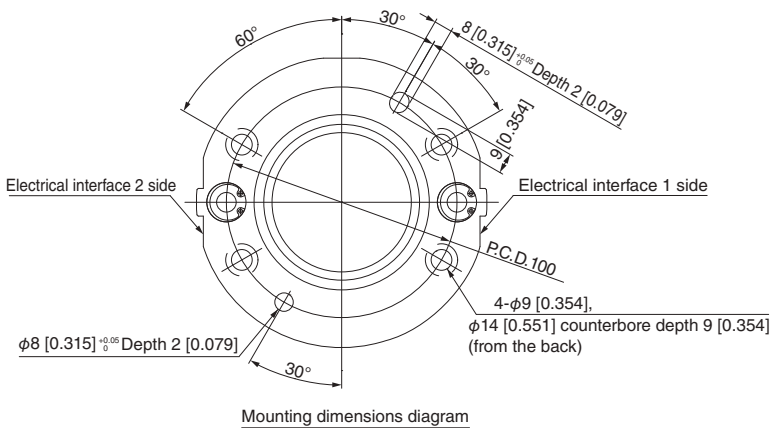
Mounting dimensions diagram



MJC100T



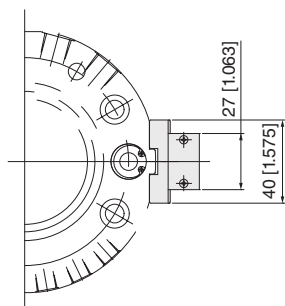
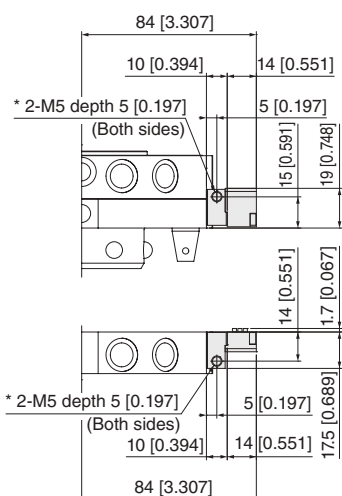
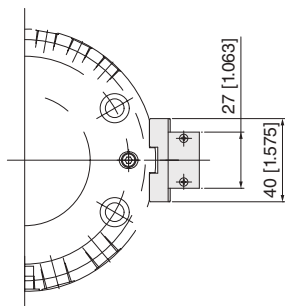
Piping dimensions diagram



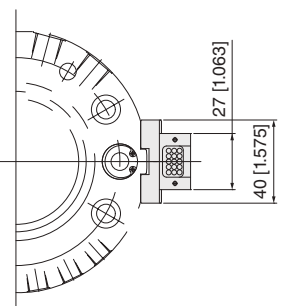
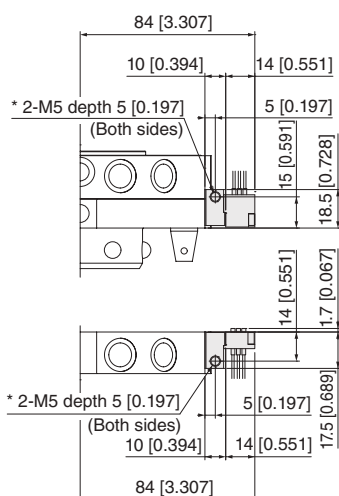
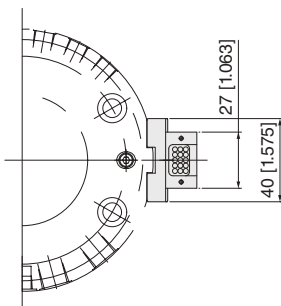
Mounting dimensions diagram

MJC100□

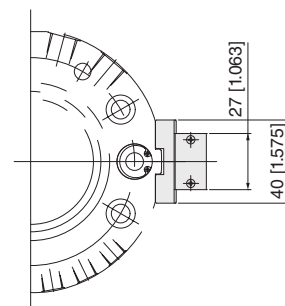
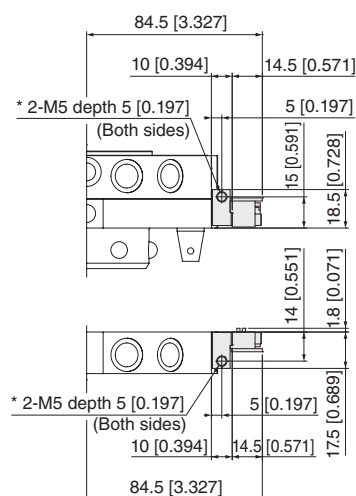
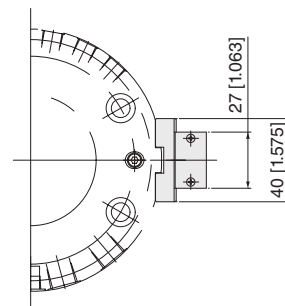
For -P1



For -PA1, -PB1



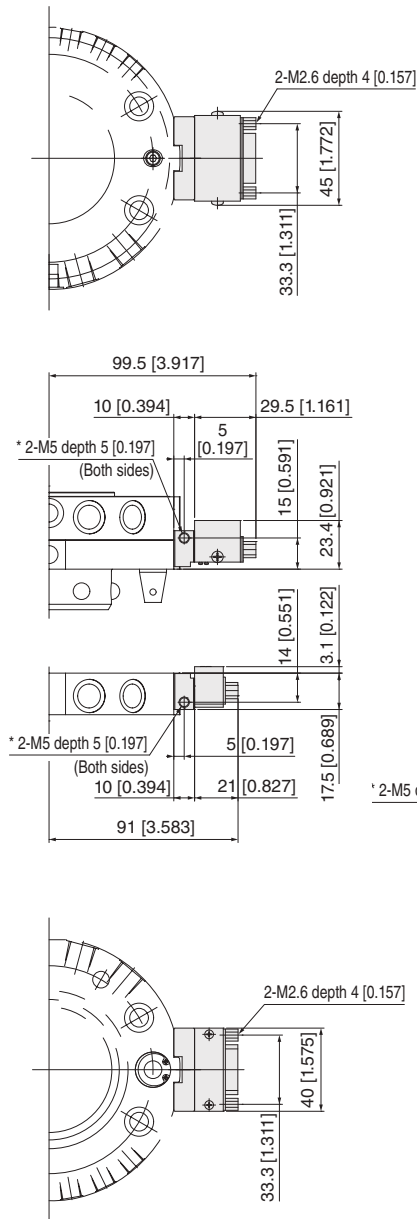
For -C1



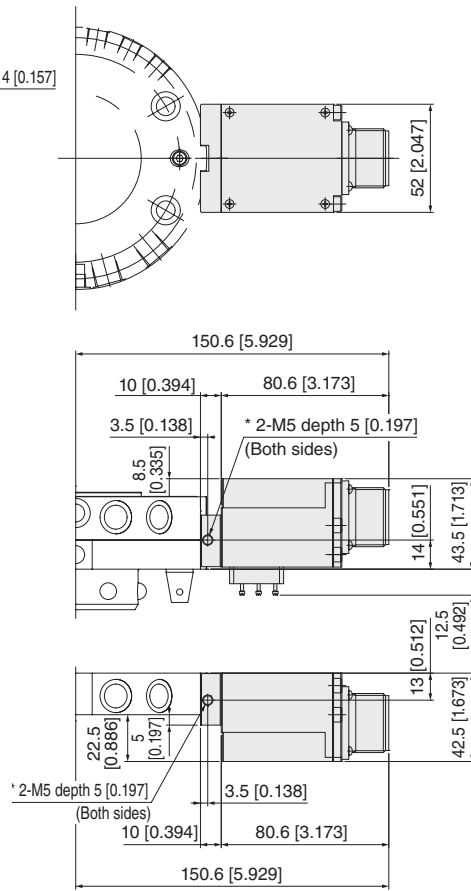
Note 1: For dimensions of the electrical interface 2 side (- □ 2), refer to the electrical interface 1 side (- □ 1).
 2: The * marks are parts (2-M5) for cable clips. Please purchase cable clips separately.

MJC100□

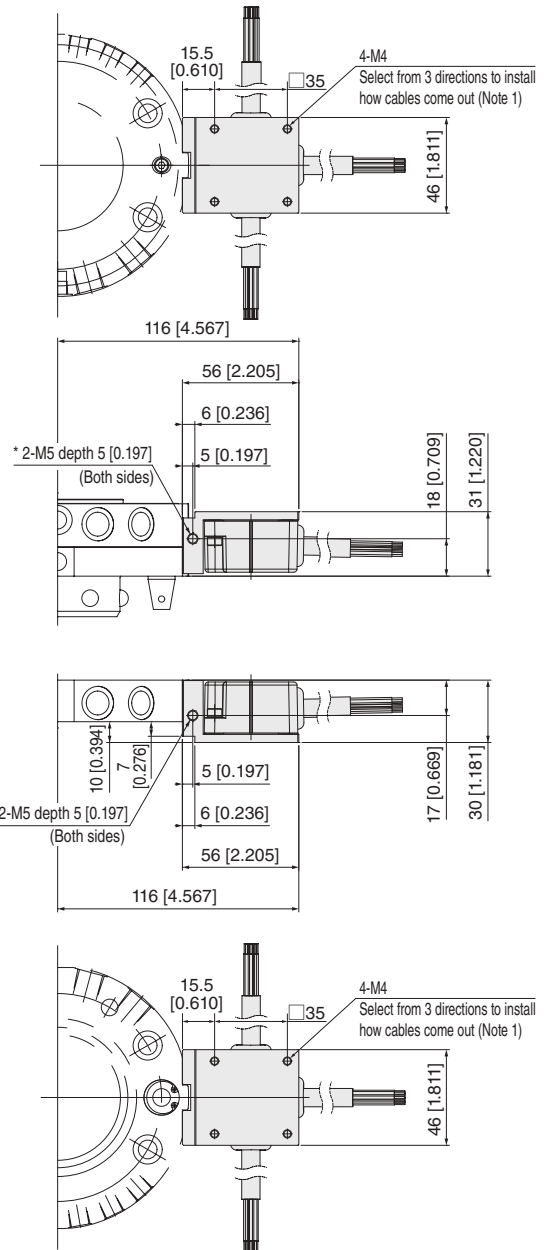
For -D1



For -Q1



For -R1

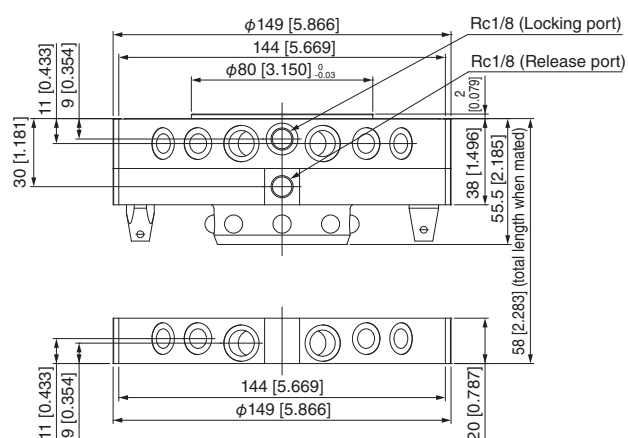
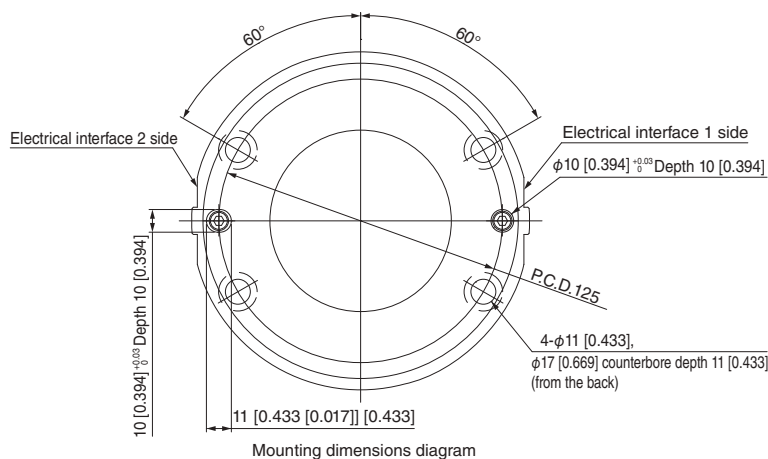
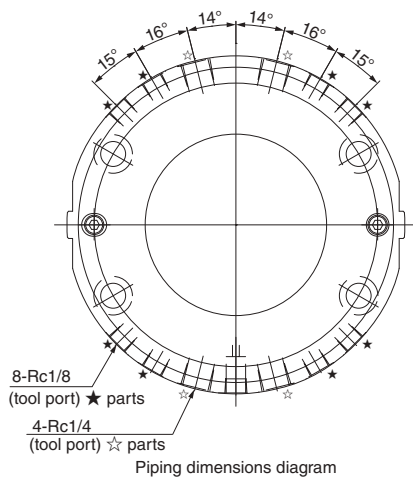


Note 1: Transmission is possible even when the cables come out in different directions on the master side and tool side.

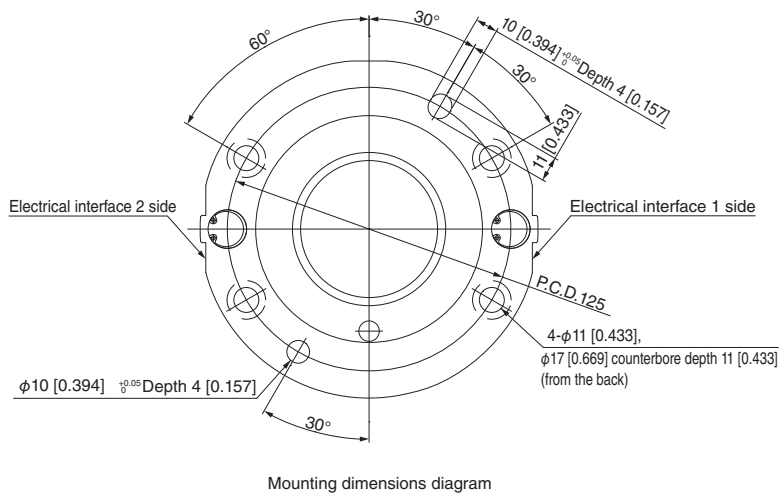
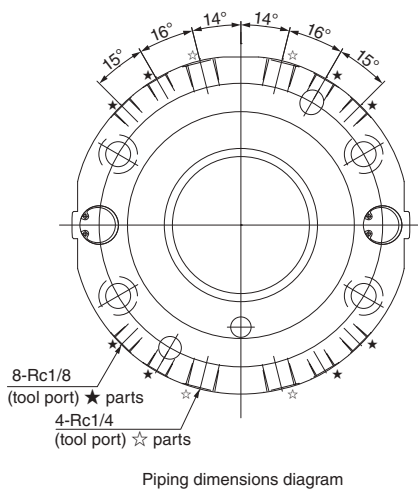
2: The * marks are parts (2-M5) for cable clips. Please purchase cable clips separately.

3: For dimensions of the electrical interface 2 side (- □ 2), refer to the electrical interface 1 side (- □ 1).

MJC150M



MJC150T

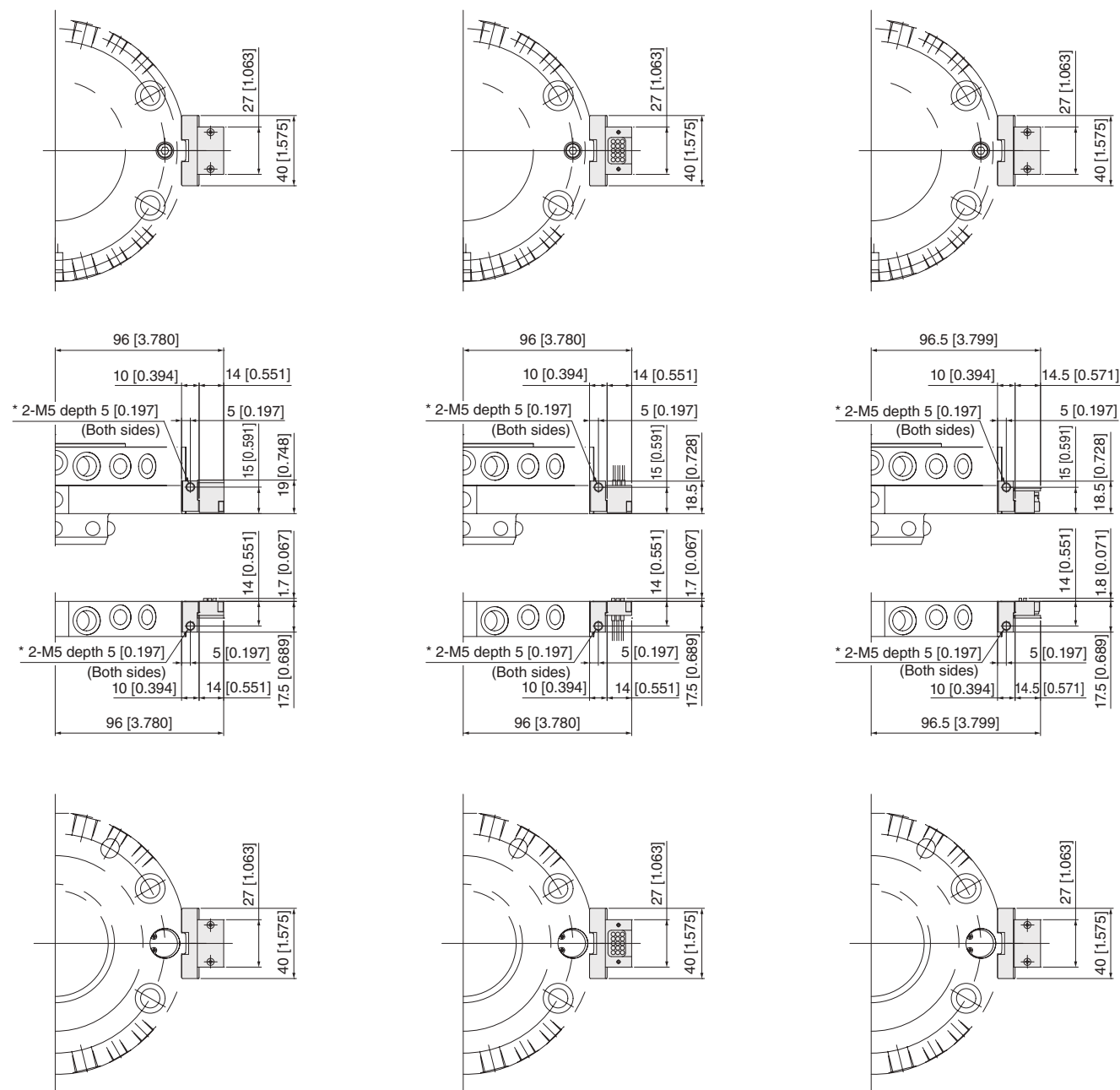


MJC150□

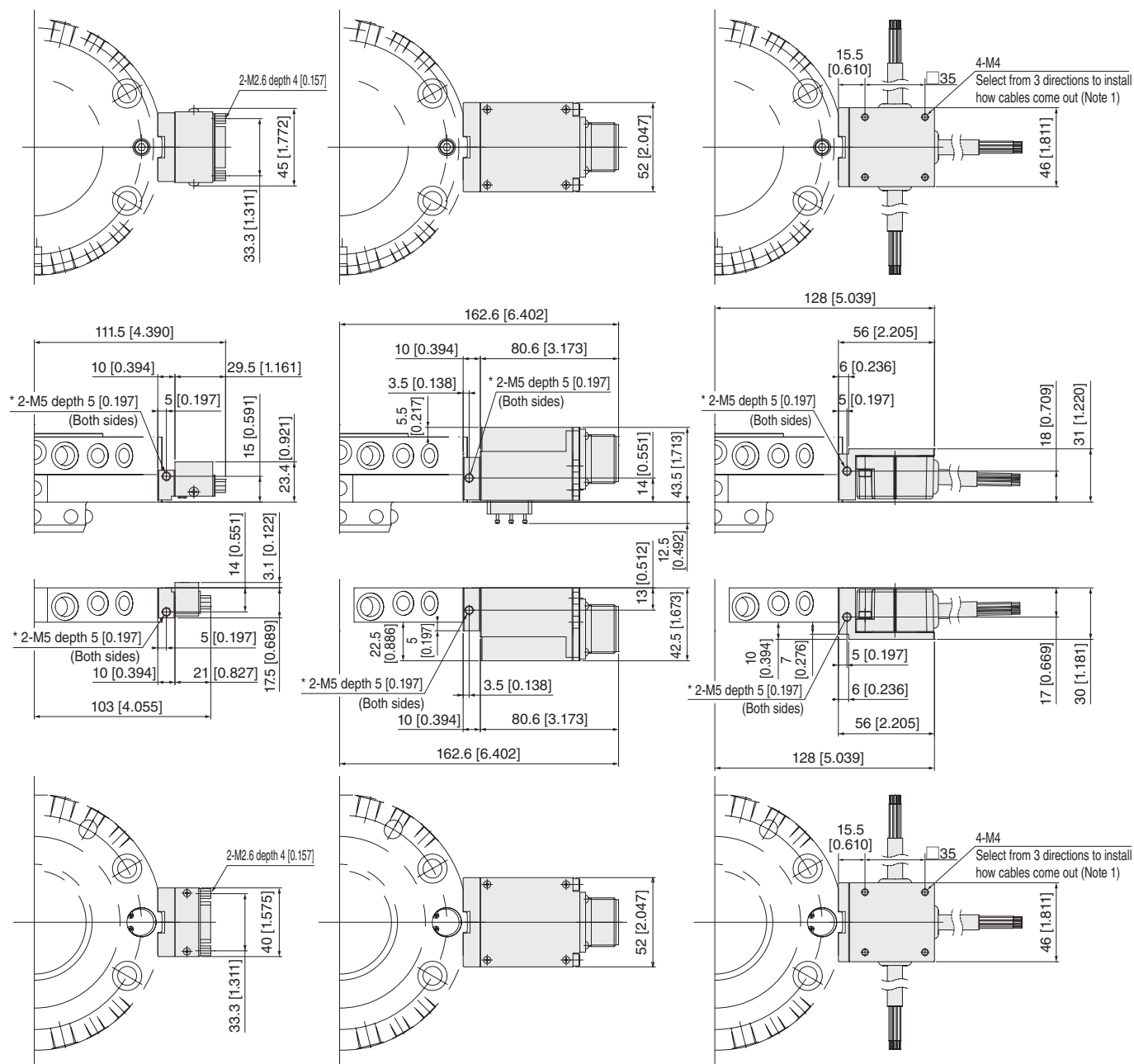
For -P1

For -PA1, -PB1

For -C1



For -R1



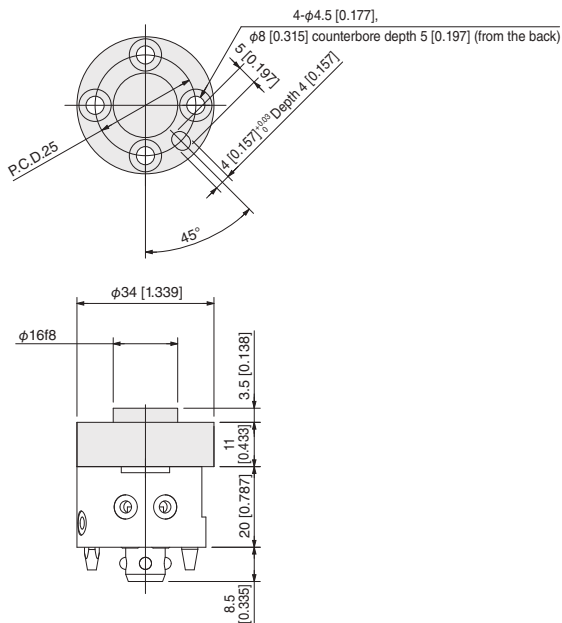
3: For dimensions of the electrical interface 2 side (- □ 2), refer to the electrical interface 1 side (- □ 1).

Robot adapter

For MJC3M

● External dimensions of assembled auto hand changer and robot adapter

MJC3M + RA-MJC3-A



Attached parts

Parallel pin: B type 2×5 1 pc

Parallel pin: B type 4×8 1 pc

Hexagon socket head bolt: M3×0.5, length under head 20 [0.787] 4 pc

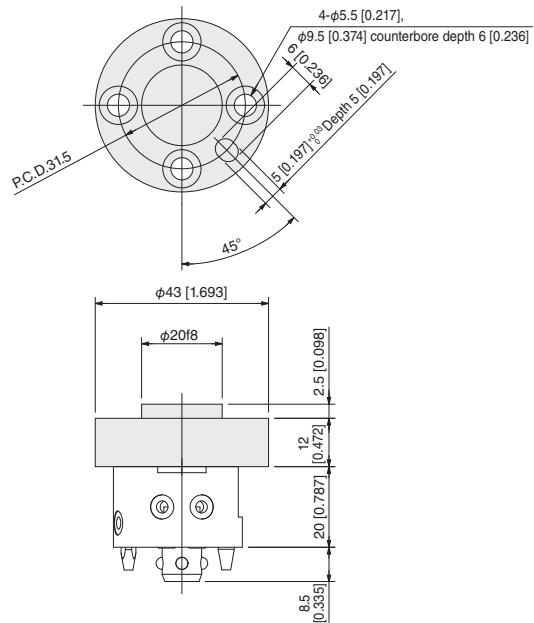
Hexagon socket head bolt: M4×0.7, length under head 12 [0.472] 4 pc

Note: Materials are as follows.

Robot adapter: Aluminum alloy (anodized)

Attached parts mentioned above: Stainless steel

MJC3M + RA-MJC3-B



Attached parts

Parallel pin: B type 2×5 1 pc

Parallel pin: B type 5×10 1 pc

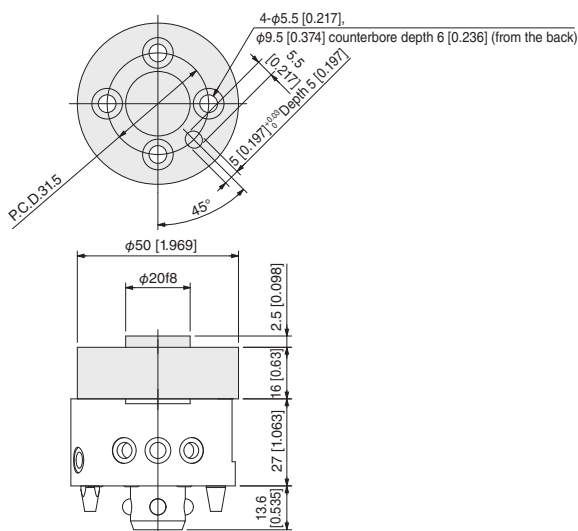
Hexagon socket head bolt: M3×0.5, length under head 20 [0.787] 4 pc

Hexagon socket head bolt: M5×0.8, length under head 12 [0.472] 4 pc

For MJC10M

● External dimensions of assembled auto hand changer and robot adapter

MJC10M + RA-MJC10-B



Attached parts

Parallel pin: B type 4×8 1 pc

Parallel pin: B type 5×10 1 pc

Hexagon socket head bolt: M5×0.8, length under head 16 [0.630] 4 pc

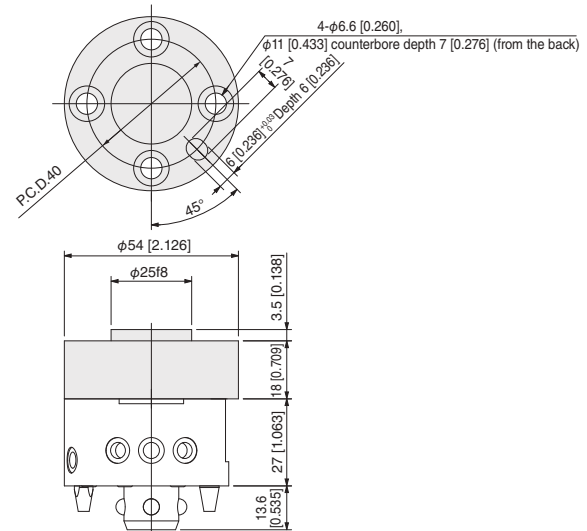
Hexagon socket head bolt: M5×0.8, length under head 30 [1.181] 4 pc

Note: Materials are as follows.

Robot adapter: Aluminum alloy (anodized)

Attached parts mentioned above: Stainless steel

MJC10M + RA-MJC10-C



Attached parts

Parallel pin: B type 4×8 1 pc

Parallel pin: B type 6×12 1 pc

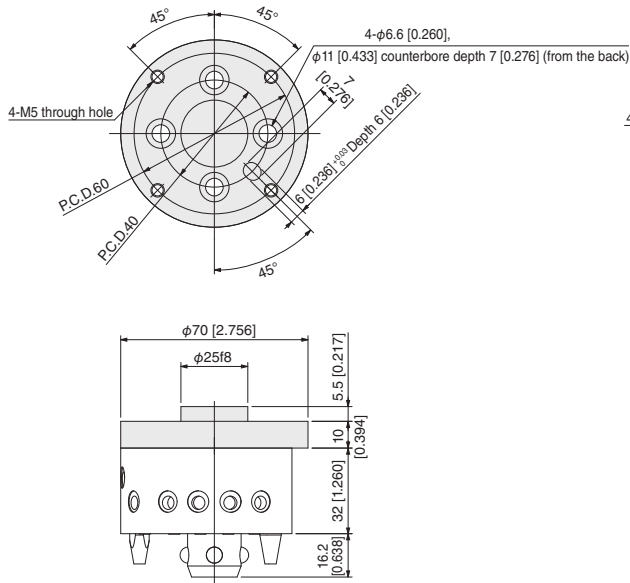
Hexagon socket head bolt: M5×0.8, length under head 30 [1.181] 4 pc

Hexagon socket head bolt: M6×1, length under head 20 [0.787] 4 pc

For MJC20M

● External dimensions of assembled auto hand changer and robot adapter

MJC20M + RA-MJC20-C



Attached parts

Parallel pin: B type 5×10 2 pc

Parallel pin: B type 6×12 1 pc

Hexagon socket head bolt: M5×0.8, length under head 35 [1.378] 4 pc

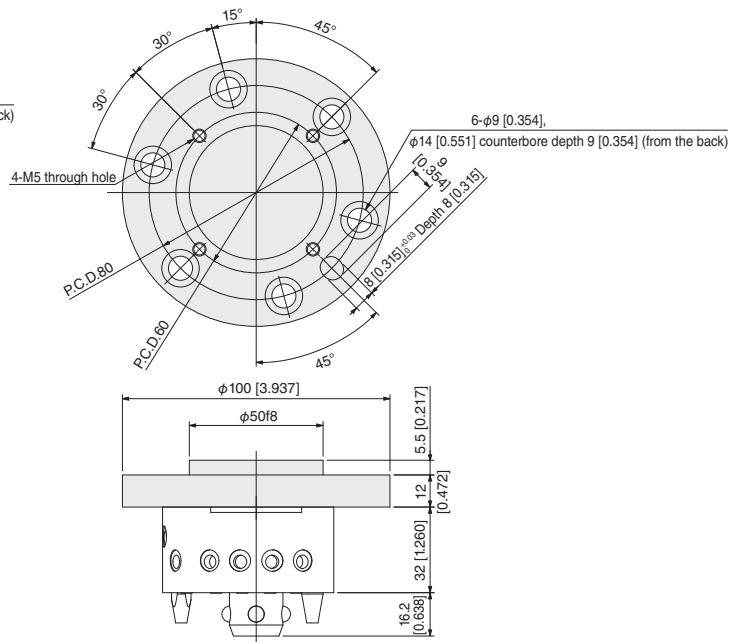
Hexagon socket head bolt: M6×1, length under head 12 [0.472] 4 pc

Note: Materials are as follows.

Robot adapter: Aluminum alloy (anodized)

Attached parts mentioned above: Stainless steel

MJC20M + RA-MJC20-D



Attached parts

Parallel pin: B type 5×10 1 pc

Parallel pin: B type 8×16 1 pc

Hexagon socket head bolt: M5×0.8, length under head 35 [1.378] 4 pc

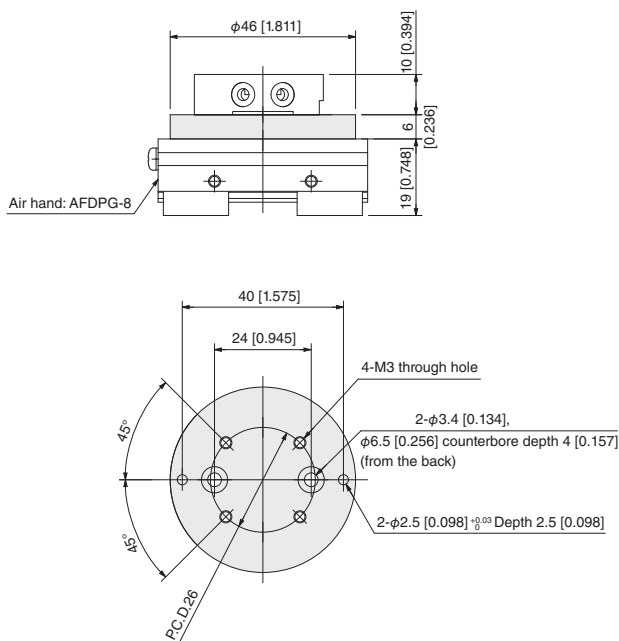
Hexagon socket head bolt: M8×1.25, length under head 14 [0.551] 6 pc

Adapter for air hand

For MJC3T

● External dimensions of assembled auto hand changer and adapter for air hand

MJC3T + HA-MJC3-A



Attached parts

Parallel pin: B type 2.5×5 2 pc

Parallel pin: B type 3×6 1 pc

Hexagon socket head bolt: M3×0.5, length under head 6 [0.236] 2 pc

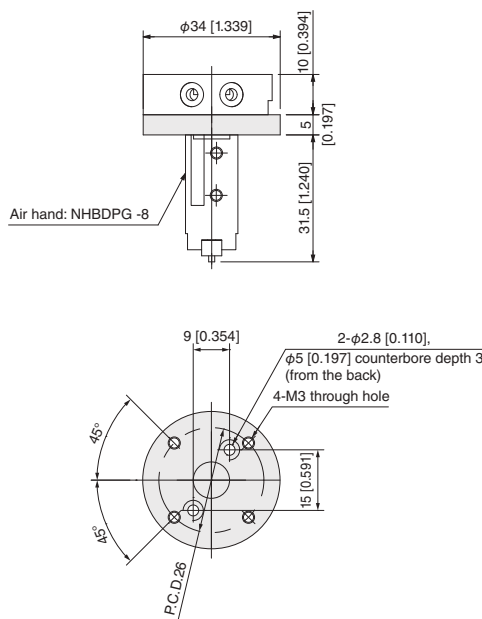
Hexagon socket head bolt: M3×0.5, length under head 10 [0.394] 4 pc

Note: Materials are as follows.

Adapter for air hand: Aluminum alloy (anodized)

Attached parts mentioned above: Stainless steel

MJC3T + HA-MJC3-N



Attached parts

Parallel pin: B type 3×6 2 pc

Hexagon socket head bolt: M2.5×0.45, length under head 5 [0.197] 2 pc

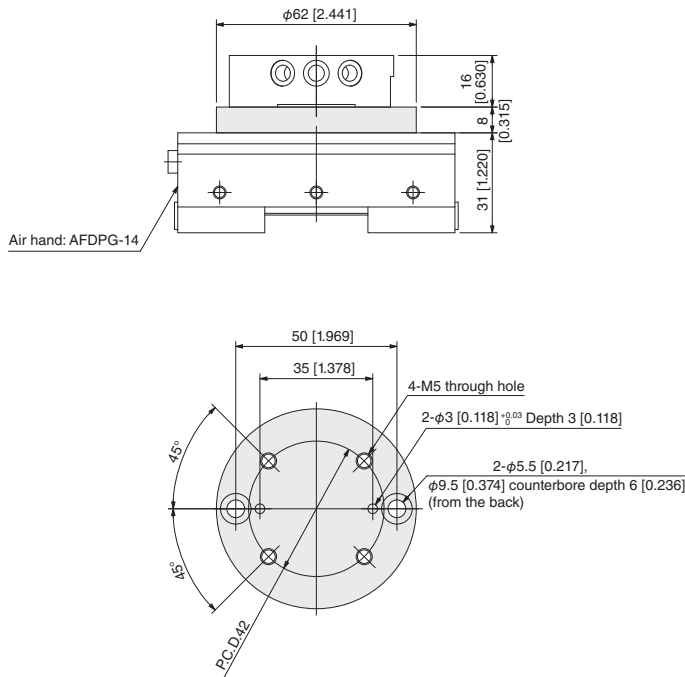
Hexagon socket head bolt: M3×0.5, length under head 10 [0.394] 4 pc

Adapter for air hand

For MJC10T

● External dimensions of assembled auto hand changer and adapter for air hand

MJC10T + HA-MJC10-A



Attached parts

Parallel pin: B type 3×6 2 pc

Parallel pin: B type 4×8 1 pc

Hexagon socket head bolt: M5×0.8, length under head 8 [0.315] 2 pc

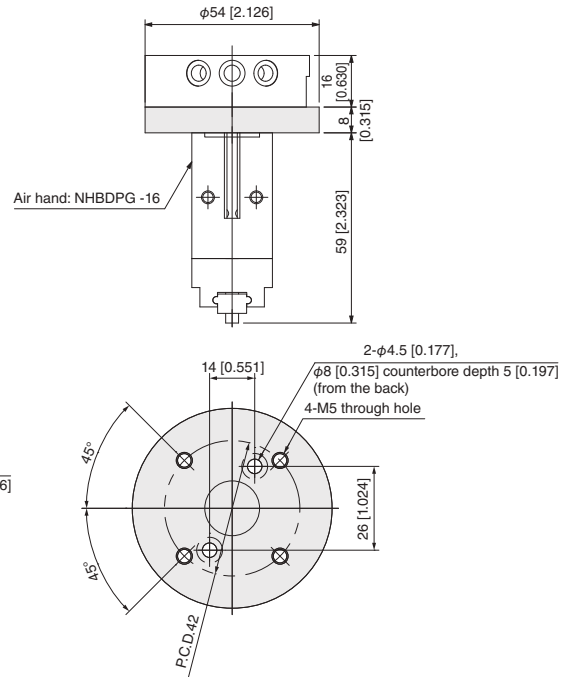
Hexagon socket head bolt: M5×0.8, length under head 16 [0.630] 4 pc

Note: Materials are as follows.

Adapter for air hand: Aluminum alloy (anodized)

Attached parts mentioned above: Stainless steel

MJC10T + HA-MJC10-N



Attached parts

Parallel pin: B type 4×8 1 pc

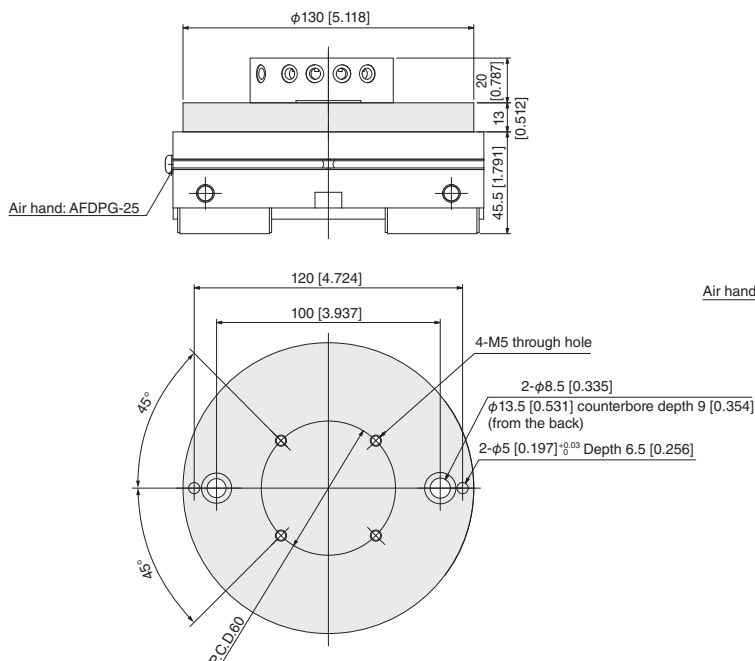
Hexagon socket head bolt: M4×0.7, length under head 8 [0.315] 2 pc

Hexagon socket head bolt: M5×0.8, length under head 16 [0.630] 4 pc

For MJC20T

● External dimensions of assembled auto hand changer and adapter for air hand

MJC20T + HA-MJC20-A



Attached parts

Parallel pin: B type 5×10 3 pc

Hexagon socket head bolt: M5×0.8, length under head 20 [0.787] 4 pc

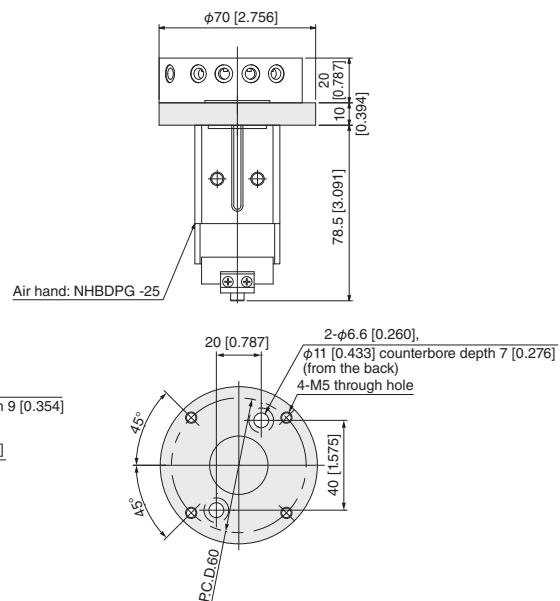
Hexagon socket head bolt: M8×1.25, length under head 10 [0.394] 2 pc

Note: Materials are as follows.

Adapter for air hand: Aluminum alloy (anodized)

Attached parts mentioned above: Stainless steel

MJC20T + HA-MJC20-N



Attached parts

Parallel pin: B type 5×10 1 pc

Hexagon socket head bolt: M5×0.8, length under head 20 [0.787] 4 pc

Hexagon socket head bolt: M6×1, length under head 12 [0.472] 2 pc

Compliance light

Direct piping specifications Parallel type



Specifications

Basic type		CPLHB34F	CPLHB34F-N	CPLHB54F	CPLHB54F-N	CPLHB70F	CPLHB70F-N
Item							
Cylinder bore	mm [in.]	16 [0.630]		25 [0.984]		40 [1.575]	
External dimensions	mm [in.]	φ34 [1.339]		φ54 [2.126]		φ70 [2.756]	
Height	mm [in.]	25 [0.984]		31 [1.220]		36 [1.417]	
Weight	g [oz]	60 [2.12]		180 [6.35]		360 [12.70]	
Operating type		Single acting type					
Medium		Air					
Operating pressure range	MPa [psi]	0.2 to 0.7 [29 to 102]					
Proof pressure	MPa [psi]	1.05 [152]					
Operating temperature range	°C [°F]	0 to 60 [32 to 140]					
Connection port size	mm [in.]	φ1.5 [0.059]		φ2 [0.079]			
Lubrication	Cylinder parts	Not required					
	Sliding part	Not required					
Maximum payload	kg [lb]	1 [2.205]		2 [4.410]		4 [8.820]	
Movement range	X-Y mm [in.]	±0.5 [0.020]		±1 [0.039]		±1.5 [0.059]	
	θ (twisting) °	±3				±4	
Centripetal force (when movement is 5 mm [0.197 in.]) ^{Note 1} N [lbf]		3 [0.674]	0	5 [1.124]	0	5 [1.124]	0
Repeatability ^{Note 2} (in the direction of X and Y)	P=0.5 MPa [73 psi] mm [in.]	±0.05 [0.002]					
Angle repeatability ^{Note 3} (in the direction of θ)	P=0.5 MPa [73 psi] °	±0.1 (Bidirectional repeatability)		±0.05 (Bidirectional repeatability)			
Withstand load ^{Note 5}	Pushing direction N [lbf]	1580 [355.2]		2840 [638.4]		5150 [1158]	
	Pulling direction N [lbf]	840 [188.8]		1480 [332.7]		2980 [669.9]	

Note 1: Centripetal force: Indicates the force generated by the restraining ring to maintain a center position, when no load or pressure is applied.

2: Repeatability: Maximum error of positions at which the plate stops when air pressure is applied after the plate is moved in a random direction with no load and no air pressure applied. See page 12 for details.

3: Angle repeatability: Bidirectional repeatability

Maximum error of angles at which the plate stops when air pressure is applied after the plate is rotated left and right with no load and no air pressure applied. See page 12 for details.

4: The center position when pressure is applied to the plate and the center position when pressure is not applied may be misaligned.

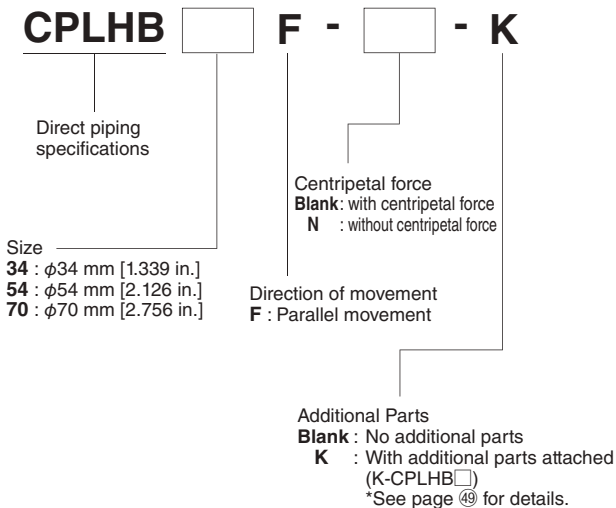
5: When applying pressure, use a load that is 1/10 or less of the withstand load. See page 12 for details.

6: Avoid overhanging operation conditions by keeping the installed center of gravity positioned within the outer diameter of the plate.

7: See page 12 for handling instructions and precautions.

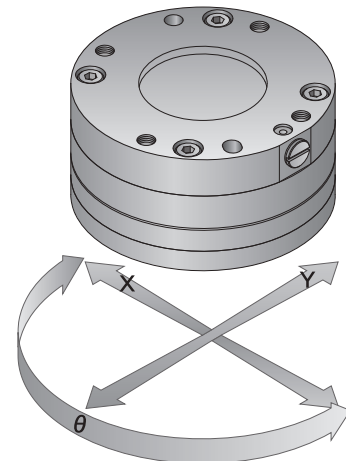
Order Codes

● Direct piping specifications, parallel type

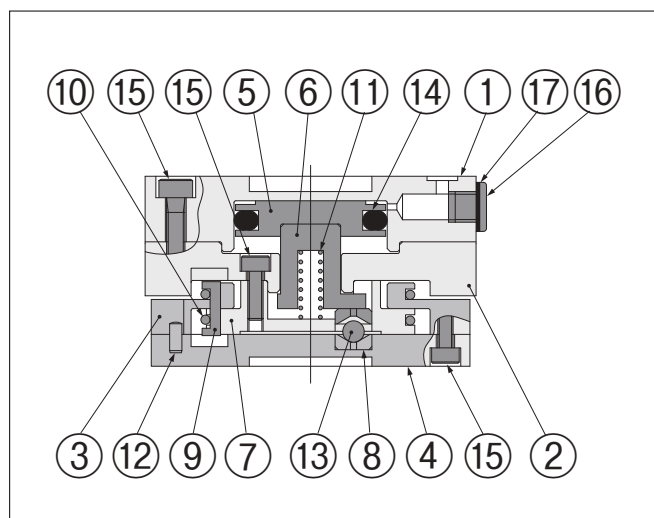


Direction of movement

● X, Y, and θ axes



Inner construction



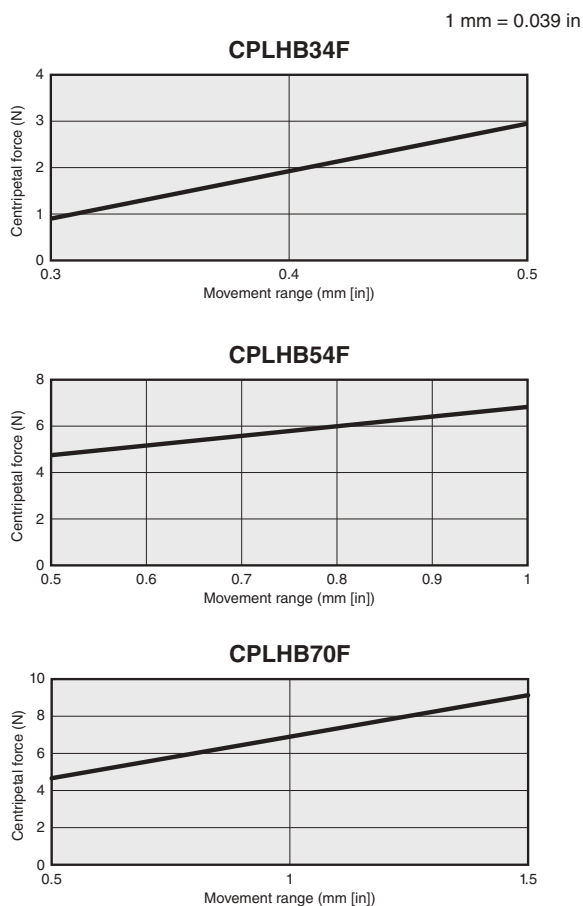
Major parts and materials

No.	Model Name	CPLHB34F	CPLHB54F	CPLHB70F
①	Main unit	Aluminum alloy (electroless nickel plated)		
②	Mated unit	Aluminum alloy (electroless nickel plated)		
③	Frame	Aluminum alloy (electroless nickel plated)		
④	Plate	Aluminum alloy (electroless nickel plated)		
⑤	Piston	Aluminum alloy (anodized)		
⑥	Lock piston	Steel (electroless nickel plated)		
⑦	Disk	Aluminum alloy (special anti-abrasion treatment)		
⑧	Spacer	Stainless steel (heat-treated)		
⑨	Alignment pin	Stainless steel (heat-treated)		
⑩	Restraining ring	Stainless steel		
⑪	Spring	Piano wire		
⑫	Parallel pin	Stainless steel		
⑬	Steel ball	Hard steel		
⑭	Seal	Synthetic rubber (NBR)		
⑮	Bolt	Stainless steel		
⑯	Plug	Stainless steel	Carbon steel (nickel plated)	
⑰	Gasket	Stainless steel coated with synthetic rubber (NBR)		

Graph (reference values)

● Centripetal force

* Centripetal force: The force generated by the restraining ring to maintain a center position, when no load or pressure is applied

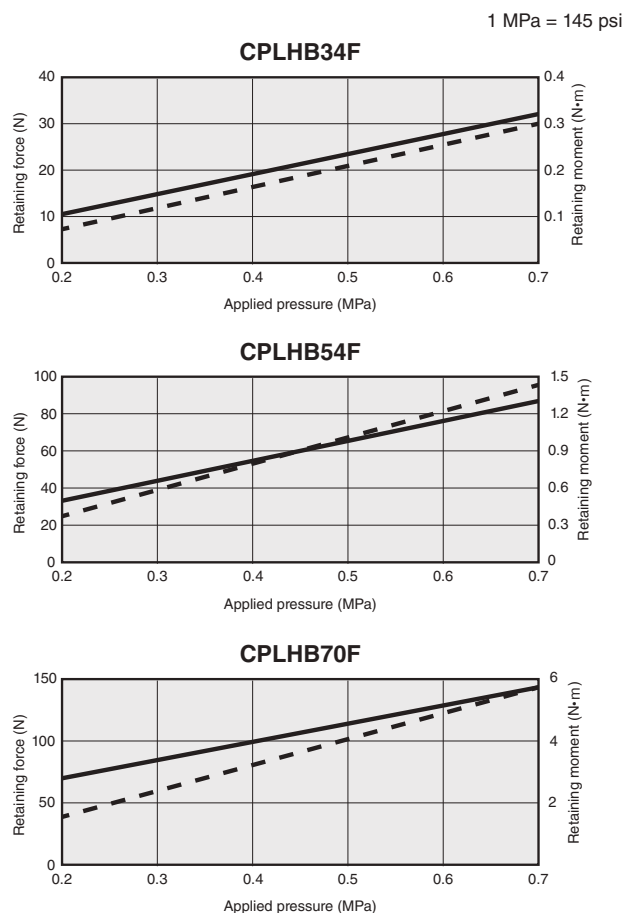


● Retaining force, retaining moment

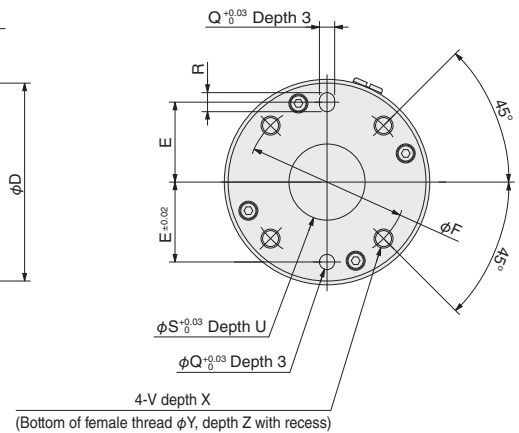
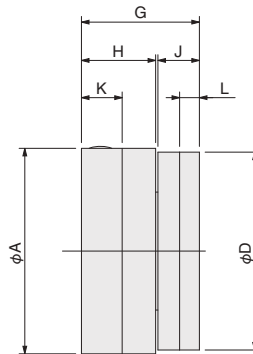
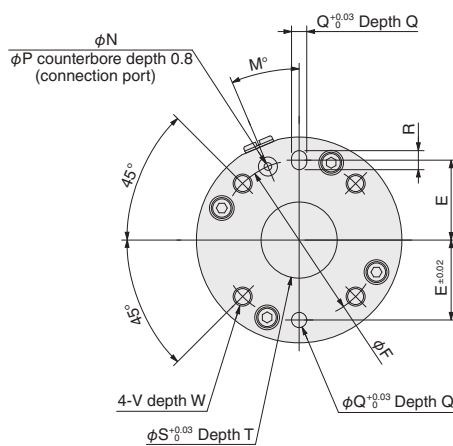
—— Retaining force
- - - Retaining moment

* Retaining force: Force to hold the center position in the X-Y direction while air pressure is applied

* Retaining moment: Force to hold the center position in the θ direction while air pressure is applied



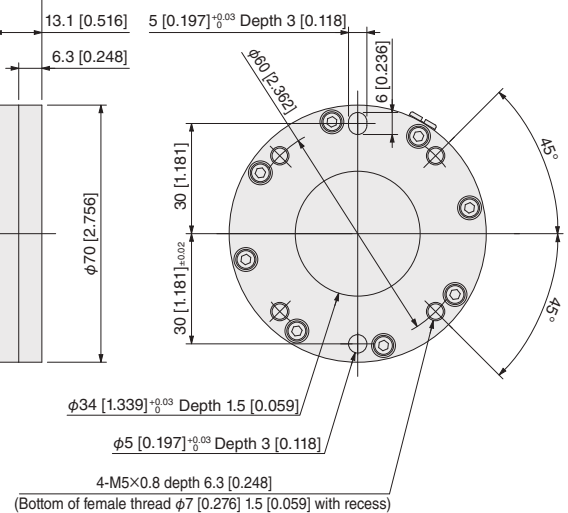
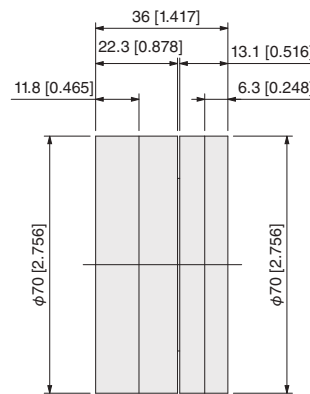
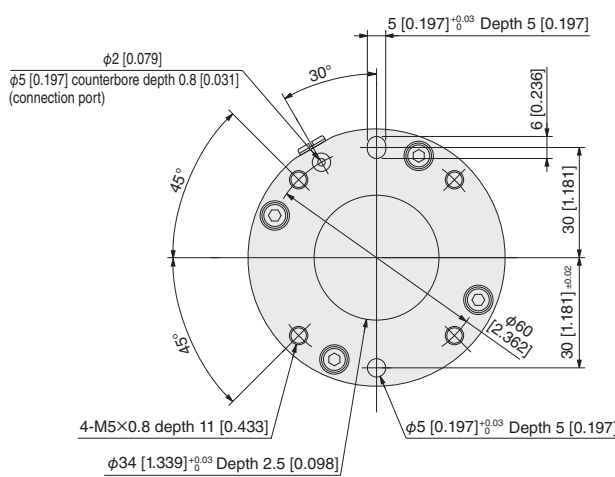
CPLHB34F CPLHB54F



Model \ Code	A	D	E	F	G	H	J	K	L	M	N	P	Q	R
CPLHB34F	34 [1.339]	32 [1.260]	13 [0.512]	26 [1.024]	25 [0.984]	15.9 [0.626]	8.7 [0.343]	8.7 [0.343]	4.3 [0.169]	17 [0.669]	1.5 [0.059]	4 [0.157]	3 [0.118]	4 [0.157]
CPLHB54F	54 [2.126]	52 [2.047]	21 [0.827]	42 [1.654]	31 [1.220]	19.5 [0.768]	10.9 [0.429]	10.7 [0.421]	5.2 [0.205]	23 [0.906]	2 [0.079]	5 [0.197]	4 [0.157]	5 [0.197]

Model \ Code	S	T	U	V	W	X	Y	Z
CPLHB34F	12 [0.472]	2 [0.079]	1.5 [0.059]	M3 × 0.5	6 [0.236]	4.3 [0.169]	4 [0.157]	1 [0.039]
CPLHB54F	20 [0.787]	2.5 [0.098]	1.5 [0.059]	M5 × 0.8	10 [0.394]	5.2 [0.205]	6 [0.236]	1.5 [0.059]

CPLHB70F



Compliance light

Direct piping specifications Swing type



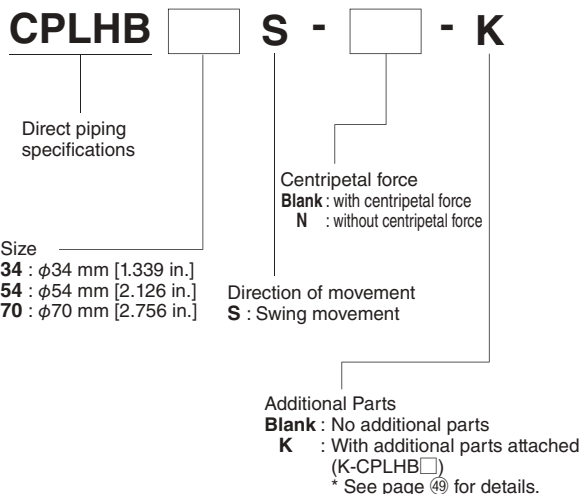
Specifications

Basic type		CPLHB34S	CPLHB34S-N	CPLHB54S	CPLHB54S-N	CPLHB70S	CPLHB70S-N
Item							
Cylinder bore	mm [in.]	16 [0.630]		25 [0.984]		40 [1.575]	
External dimensions	mm [in.]	φ34 [1.339]		φ54 [2.126]		φ70 [2.756]	
Height	mm [in.]	26 [1.024]		33 [1.299]		39 [1.535]	
Weight	g [oz]	60 [2.12]		190 [6.70]		370 [13.05]	
Operating type		Single acting type					
Medium		Air					
Operating pressure range	MPa [psi]	0.2 to 0.7 [29 to 102]					
Proof pressure	MPa [psi]	1.05 [152]					
Operating temperature range	°C [°F]	0 to 60 [32 to 8700]					
Connection port size	mm [in.]	φ1.5 [0.059]		φ2 [0.079]			
Lubrication	Cylinder parts	Not required					
	Sliding part	No					
Maximum payload	kg [lb]	1 [2.205]		2 [4.410]		4 [8.820]	
Movement range	X-Y	mm [in.]	±0.5 [0.020]	±1 [0.039]		±1.5 [0.059]	
	Z	mm [in.]	-0.5 [-0.020]	-0.5 [-0.020]		-0.7 [-0.028]	
	θ (twisting)	°	±3			±4	
	α (tilting)	Swing angle	±0.5			±1	
		Incline angle	±1.4			±0.7	
Centripetal force (when movement is 5 mm [0.197 in.]) ^{Note 1}	N [lbf]	3 [0.674]	0	5 [1.124]	0	5 [1.124]	0
Repeatability ^{Note 2} (in the direction of X and Y)	P=0.5 MPa [73 psi] mm [in.]	±0.05 [0.002]					
Angle repeatability ^{Note 3} (in the direction of θ)	P=0.5 MPa [73 psi] °	±0.2 (Bidirectional repeatability)		±0.1 (Bidirectional repeatability)			
Withstand load ^{Note 5}	Pushing direction	N [lbf]	1,580 [355.2]	2,840 [638.4]		5,150 [1158]	
	Pulling direction	N [lbf]	840 [188.8]	1,480 [332.7]		2,980 [669.9]	

- Note 1: Centripetal force: Indicates the force generated by the restraining ring to maintain a center position, when no load or pressure is applied.
 2: Repeatability: Maximum error of positions at which the plate stops when air pressure is applied after the plate is moved in a random direction with no load and no air pressure applied. See page 12 for details.
 3: Angle repeatability: Bidirectional repeatability
 Maximum error of angles at which the plate stops when air pressure is applied after the plate is rotated left and right with no load and no air pressure applied. See page 12 for details.
 4: The center position when pressure is applied to the plate and the center position when pressure is not applied may be misaligned.
 5: When applying pressure, use a load that is 1/10 or less of the withstand load. See page 12 for details.
 6: Avoid overhanging operation conditions by keeping the installed center of gravity positioned within the outer diameter of the plate.
 7: See page 12 for handling instructions and precautions.

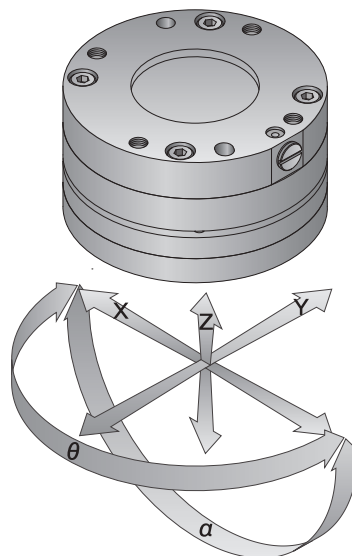
Order Codes

● Direct piping specifications, swing type

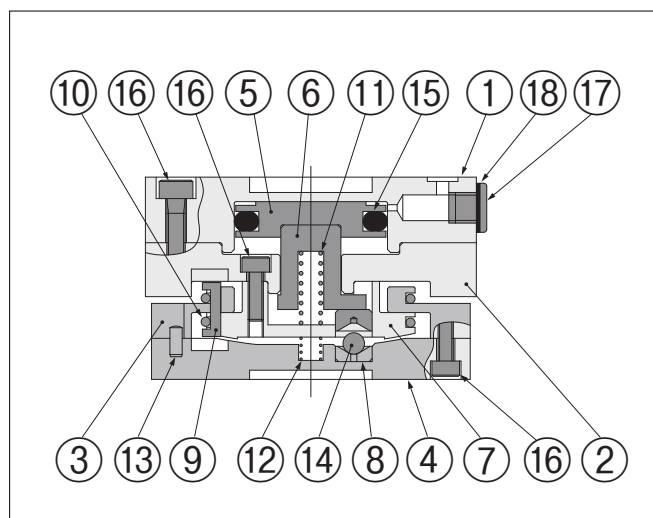


Direction of movement

● X, Y, Z, θ, and α axes



Inner construction



Major parts and materials

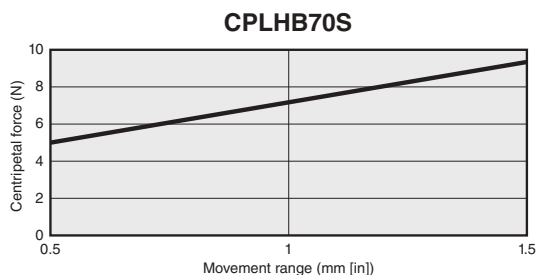
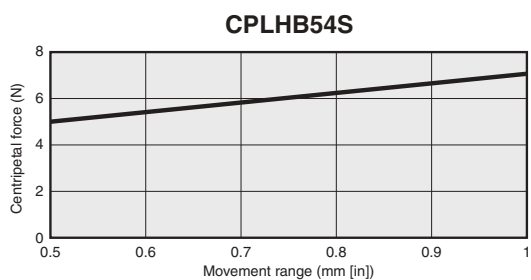
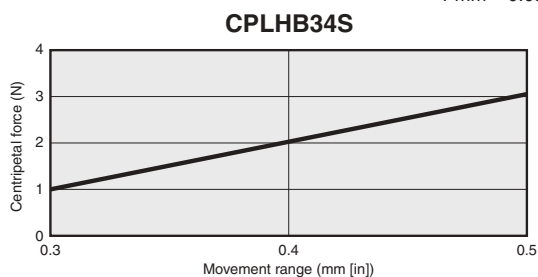
No.	Model Name	CPLHB34S	CPLHB54S	CPLHB70S
①	Main unit	Aluminum alloy (electroless nickel plated)		
②	Mated unit	Aluminum alloy (electroless nickel plated)		
③	Frame	Aluminum alloy (electroless nickel plated)		
④	Plate	Aluminum alloy (electroless nickel plated)		
⑤	Piston	Aluminum alloy (anodized)		
⑥	Lock piston	Steel (electroless nickel plated)		
⑦	Disk	Aluminum alloy (special anti-abrasion treatment)		
⑧	Spacer	Stainless steel (heat-treated)		
⑨	Alignment pin	Stainless steel (heat-treated)		
⑩	Restraining ring	Stainless steel		
⑪	Spring	Piano wire		
⑫	Spring	Stainless steel		
⑬	Parallel pin	Stainless steel		
⑭	Steel ball	Hard steel		
⑮	Seal	Synthetic rubber (NBR)		
⑯	Bolt	Stainless steel		
⑰	Plug	Stainless steel	Carbon steel (nickel plated)	
⑱	Gasket	Stainless steel coated with synthetic rubber (NBR)		

Graph (reference values)

● Centripetal force

* Centripetal force: The force generated by the restraining ring to maintain a center position, when no load or pressure is applied.

1 mm = 0.039 in

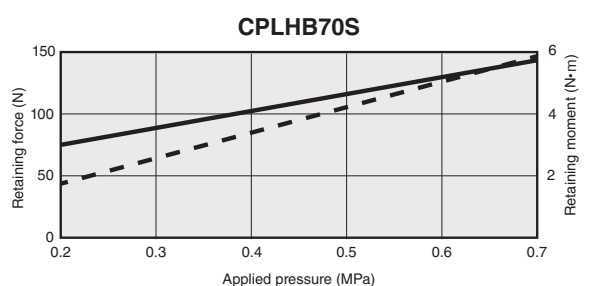
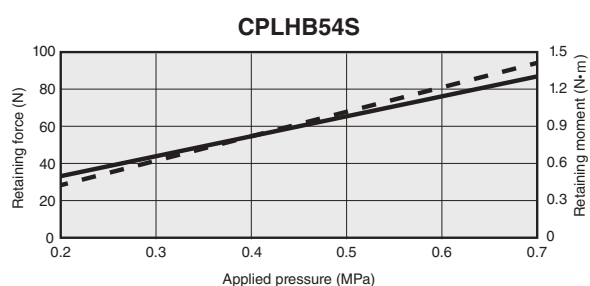
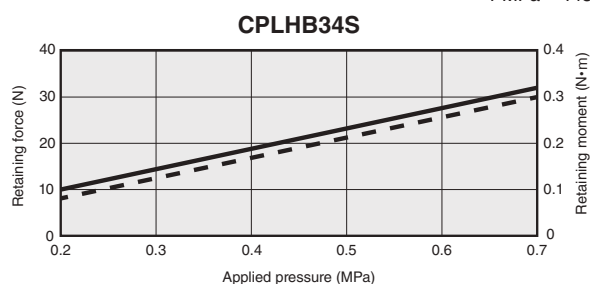


● Retaining force, retaining moment

* Retaining force: Force to hold the center position in the X-Y direction while air pressure is applied.

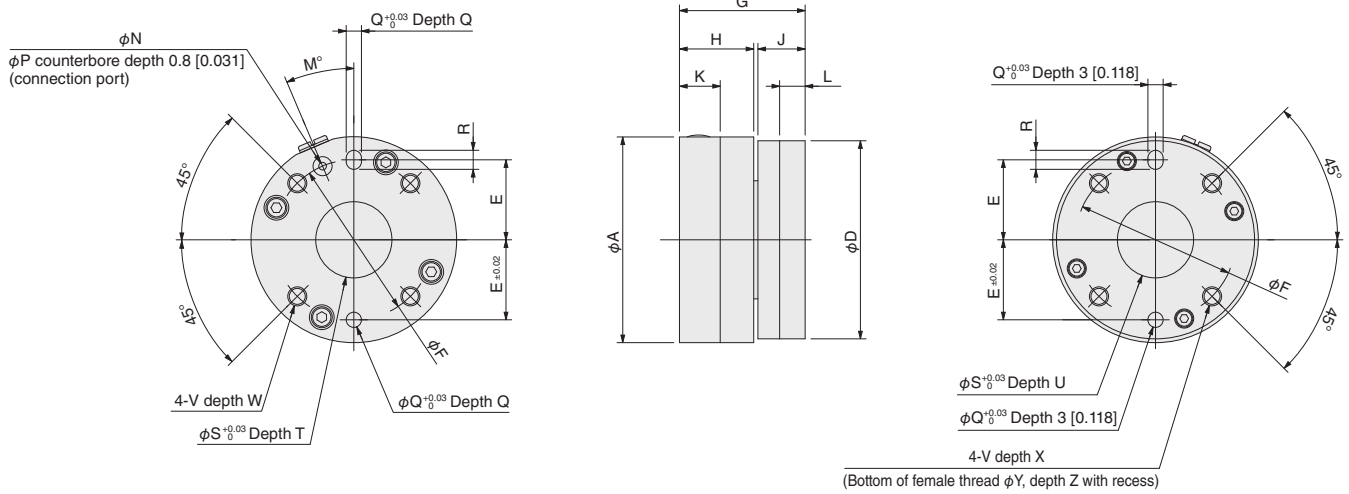
* Retaining moment: Force to hold the center position in the θ direction while air pressure is applied.

1 MPa = 145 psi



CPLHB34S

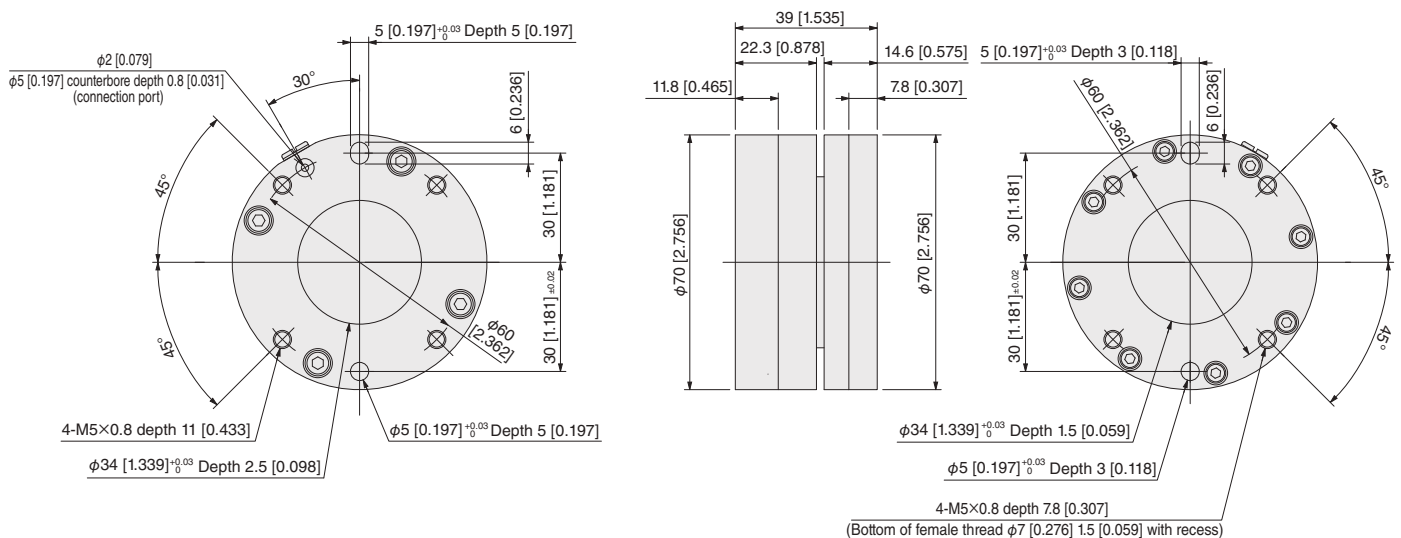
CPLHB54S



Model	Code	A	D	E	F	G	H	J	K	L	M	N	P	Q	R
CPLHB34S		34 [1.339]	32 [1.260]	13 [0.512]	26 [1.024]	26 [1.024]	15.9 [0.626]	9.2 [0.362]	8.7 [0.343]	4.8 [0.189]	17 [0.669]	1.5 [0.059]	4 [0.157]	3 [0.118]	4 [0.157]
CPLHB54S		54 [2.126]	52 [2.047]	21 [0.827]	42 [1.654]	33 [1.299]	19.5 [0.768]	12.4 [0.488]	10.7 [0.421]	6.7 [0.264]	23 [0.906]	2 [0.079]	5 [0.197]	4 [0.157]	5 [0.197]

Model	Code	S	T	U	V	W	X	Y	Z
CPLHB34S		12 [0.472]	2 [0.079]	1.5 [0.059]	M3 × 0.5	6 [0.236]	4.8 [0.189]	4 [0.157]	1 [0.039]
CPLHB54S		20 [0.787]	2.5 [0.098]	1.5 [0.059]	M5 × 0.8	10 [0.394]	6.7 [0.264]	6 [0.236]	1.5 [0.059]

CPLHB70S



● Additional parts

- Auto hand changer installation set

K-CPLHB 34

34 : For CPLHB34
54 : For CPLHB54
70 : For CPLHB70

[Set contents]

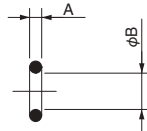
- SRK-CPLHB□
- P-CPLHB□
- AD-CPLHB□
- BLT-CPLHB□

Individual parts

- Packing to connect auto hand changer

SRK-CPLHB 34

34 : For CPLHB34 (1 pc)
54 : For CPLHB54 (1 pc)
70 : For CPLHB70 (1 pc)



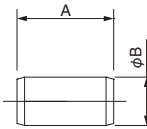
Model	A	B	Material
SRK-CPLHB34	1	2	NBR
SRK-CPLHB54	1	3	NBR
SRK-CPLHB70	1	3	NBR

- Positioning pin



P-CPLHB 34

34 : For CPLHB34 (2 pc)
54 : For CPLHB54 (2 pc)
70 : For CPLHB70 (2 pc)



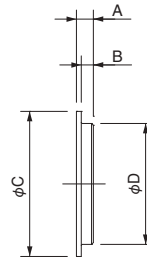
Model	A	B	Nominal	Material
P-CPLHB34	6	3h8 $\left(\begin{smallmatrix} 0 \\ -0.014 \end{smallmatrix}\right)$	JIS B 1354 B type 3×6	Stainless steel
P-CPLHB54	8	4h8 $\left(\begin{smallmatrix} 0 \\ -0.018 \end{smallmatrix}\right)$	JIS B 1354 B type 4×8	Stainless steel
P-CPLHB70	10	5h8 $\left(\begin{smallmatrix} 0 \\ -0.018 \end{smallmatrix}\right)$	JIS B 1354 B type 5×10	Stainless steel

- Positioning plate



AD-CPLHB 34

34 : For CPLHB34
54 : For CPLHB54
70 : For CPLHB70



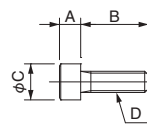
Model	A	B	C	D	Material
AD-CPLHB34	2.3	1.5	15g6 $\left(\begin{smallmatrix} -0.006 \\ -0.017 \end{smallmatrix}\right)$	12g6 $\left(\begin{smallmatrix} -0.006 \\ -0.017 \end{smallmatrix}\right)$	Aluminum alloy
AD-CPLHB54	2.8	2	24g6 $\left(\begin{smallmatrix} -0.007 \\ -0.020 \end{smallmatrix}\right)$	20g6 $\left(\begin{smallmatrix} -0.007 \\ -0.020 \end{smallmatrix}\right)$	Aluminum alloy
AD-CPLHB70	3.3	1	34g6 $\left(\begin{smallmatrix} -0.009 \\ -0.025 \end{smallmatrix}\right)$	29g6 $\left(\begin{smallmatrix} -0.007 \\ -0.020 \end{smallmatrix}\right)$	Aluminum alloy

- Mounting bolts



BLT-CPLHB 34

34 : For CPLHB34 (4 pc)
54 : For CPLHB54 (4 pc)
70 : For CPLHB70 (4 pc)



Model	A	B	C	D	Material
BLT-CPLHB34	3	10	5.5	M3×0.5	Stainless steel
BLT-CPLHB54	5	16	8.5	M5×0.8	Stainless steel
BLT-CPLHB70	5	20	8.5	M5×0.8	Stainless steel

● Adapter set for air hand

HA-CPLHB 34 - A

34 : For CPLHB34
54 : For CPLHB54
70 : For CPLHB70

A: For AFDPG
N: For NHBDPG

* The adapter set for air hands is the hand adapter A, hand adapter B, positioning pins, and mounting bolts. However, only the set for HA-CPLHB34-A has the hand adapter A, positioning pins, and mounting bolts.

The following table shows air hands for their intended adapter sets.

Size	Type	-A	-N
34		For AFDPG-6	For NHBDPG-10
54		For AFDPG-8	For NHBDPG-16
70		For AFDPG-14	For NHBDPG-20

Mass

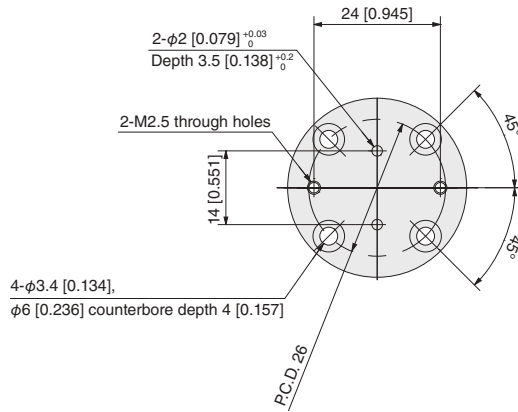
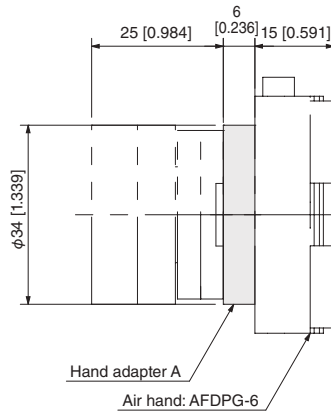
g [oz]

Basic type	HA-CPLHB34-A	HA-CPLHB34-N	HA-CPLHB54-A	HA-CPLHB54-N	HA-CPLHB70-A	HA-CPLHB70-N
Mass	18 [0.64]	33 [1.16]	118 [4.16]	113 [3.99]	183 [6.46]	184 [6.49]

Adapter for air hand For CPLHB34

● External dimensions of assembled compliance light and adapter for air hand

CPLHB34F(S) + HA-CPLHB34-A



Attached parts

Parallel pin: B type 2×5 2 pc

Parallel pin: B type 3×6 1 pc

Hexagon socket head bolt: M2.5×0.45, length under head 12 [0.472] 2 pc

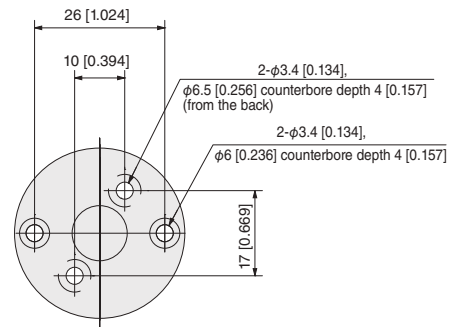
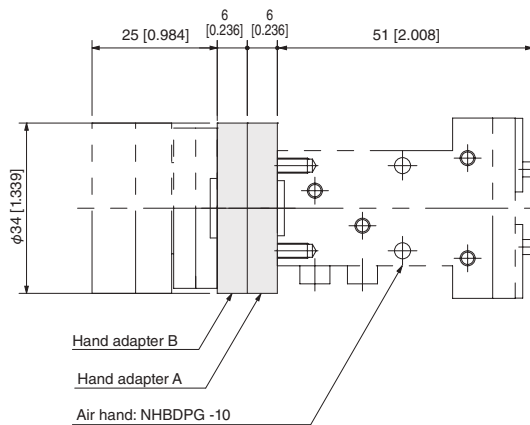
Hexagon socket head bolt: M3×0.5, length under head 6 [0.236] 4 pc

Note: Materials are as follows.

Hand adapter A: Aluminum alloy (anodized)

Attached parts mentioned above: Stainless steel

CPLHB34F(S) + HA-CPLHB34-N



Attached parts

Parallel pin: B type 3×6 2 pc

Hexagon socket head bolt: M3×0.5, length under head 6 [0.236] 8 pc

Note: Materials are as follows.

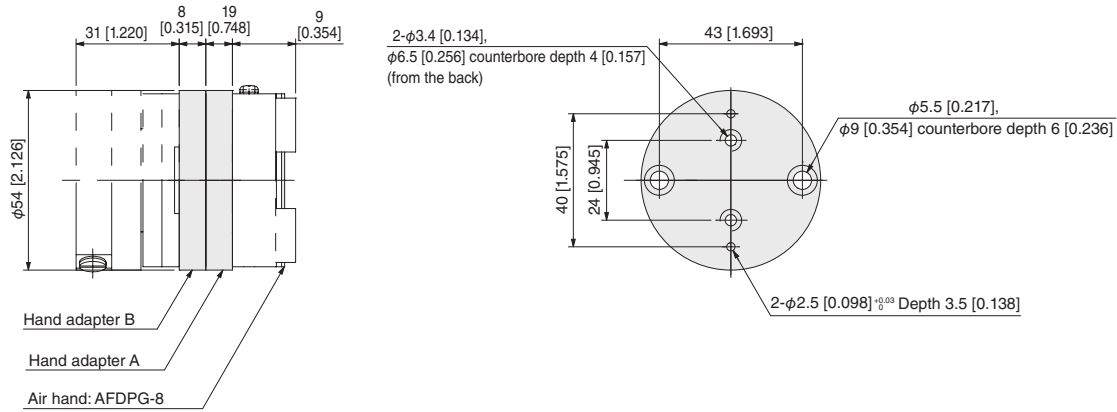
Hand adapter A, hand adapter B: Aluminum alloy (anodized)

Attached parts mentioned above: Stainless steel

Adapter for air hand For CPLHB54

● External dimensions of assembled compliance light and adapter for air hand

CPLHB54F(S) + HA-CPLHB54-A



Attached parts

Parallel pin: B type 2.5×6 2 pc

Parallel pin: B type 4×8 2 pc

Hexagon socket head bolt: M3×0.5, length under head 8 [0.315] 2 pc

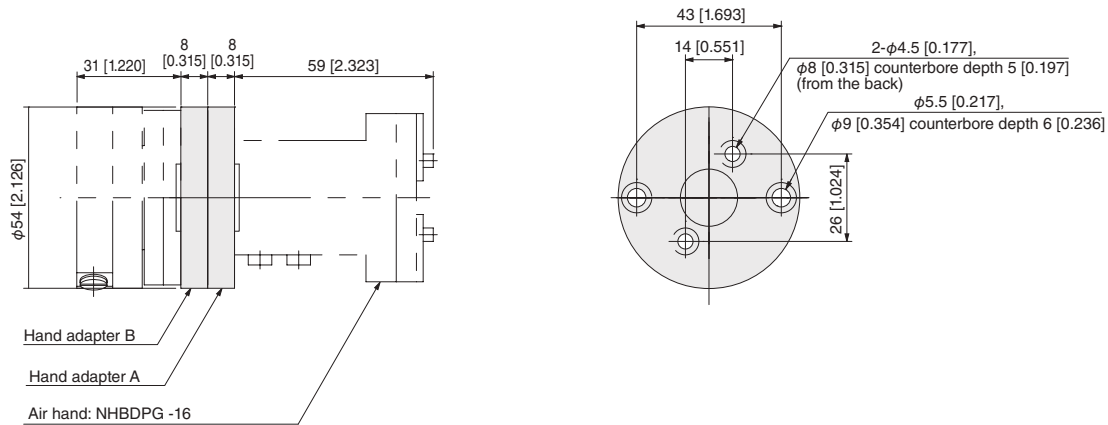
Hexagon socket head bolt: M5×0.8, length under head 8 [0.315] 6 pc

Note: Materials are as follows.

Hand adapter A, hand adapter B: Aluminum alloy (anodized)

Attached parts mentioned above: Stainless steel

CPLHB54F(S) + HA-CPLHB54-N



Attached parts

Parallel pin: B type 4×8 2 pc

Hexagon socket head bolt: M4×0.7, length under head 8 [0.315] 2 pc

Hexagon socket head bolt: M5×0.8, length under head 8 [0.315] 6 pc

Note: Materials are as follows.

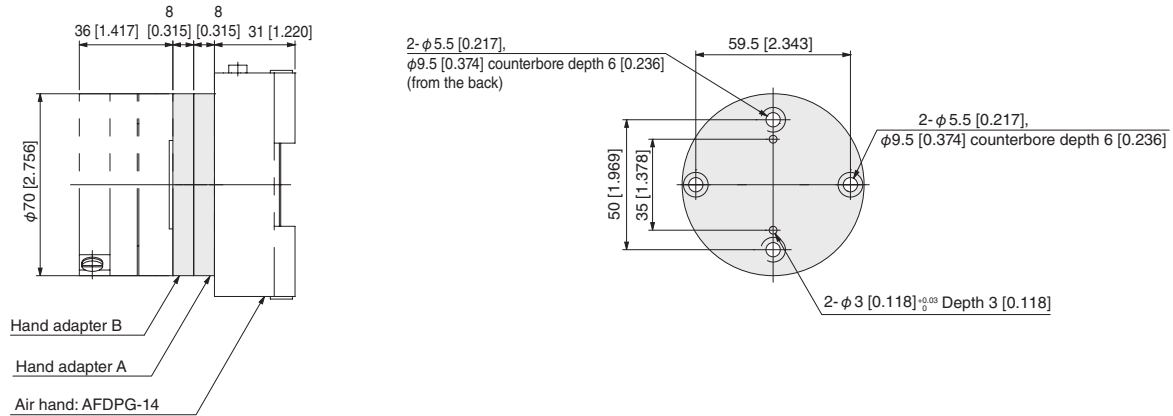
Hand adapter A, hand adapter B: Aluminum alloy (anodized)

Attached parts mentioned above: Stainless steel

Adapter for air hand For CPLHB70

● External dimensions of assembled compliance light and adapter for air hand

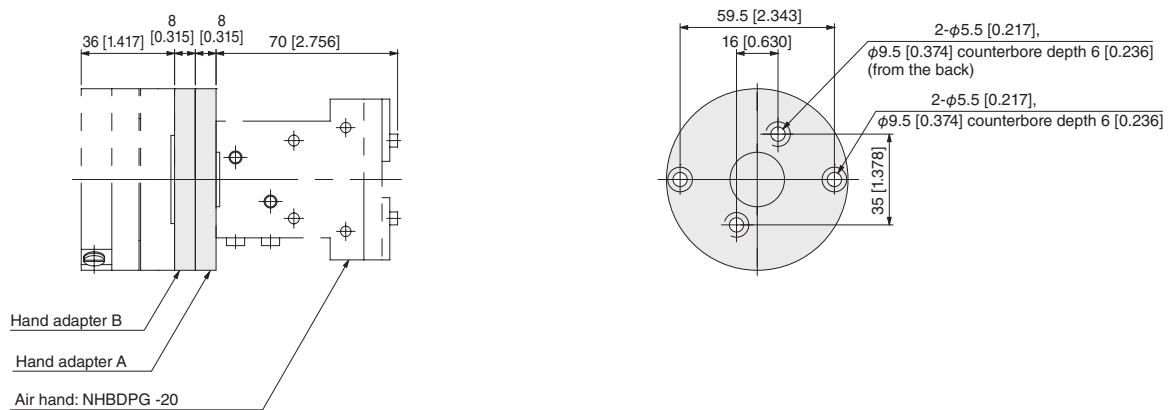
CPLHB70F(S) + HA-CPLHB70-A



Attached parts
Parallel pin: B type 3×6 2 pc
Parallel pin: B type 5×10 2 pc
Hexagon socket head bolt: M5×0.8, length under head 8 [0.315] 8 pc

Note: Materials are as follows.
Hand adapter A, hand adapter B: Aluminum alloy (anodized)
Attached parts mentioned above: Stainless steel

CPLHB70F(S) + HA-CPLHB70-N



Attached parts
Parallel pin: B type 5×10 2 pc
Hexagon socket head bolt: M5×0.8, length under head 8 [0.315] 8 pc

Note: Materials are as follows.
Hand adapter A, hand adapter B: Aluminum alloy (anodized)
Attached parts mentioned above: Stainless steel

Example of unit dimensions

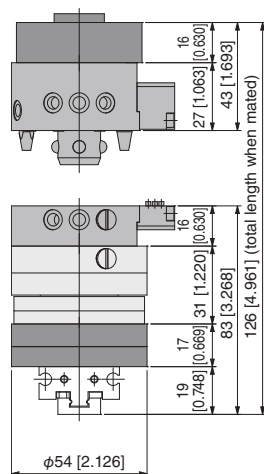
● Robot adapter (RA-MJC10-B)

Auto hand changer (MJC10M-P, MJC10TC-P)

Compliance light (CPLHB54F)

Adapter for air hand (HA-CPLHB54-A)

Air hand (AFDPG-8)



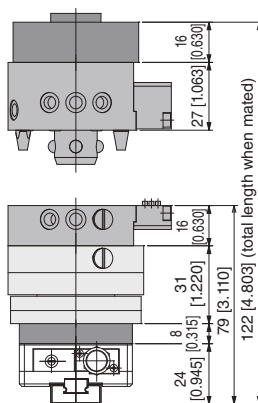
● Robot adapter (RA-MJC10-B)

Auto hand changer (MJC10M-P, MJC10TC-P)

Compliance light (CPLHB54F)

Adapter for electric hand (EW2A-H18)

Flat type electric hand (EW2H18)

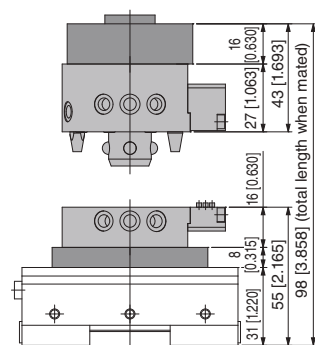


● Robot adapter (RA-MJC10-B)

Auto hand changer (MJC10M-P, MJC10T-P)

Adapter for air hand (HA-MJC10-A)

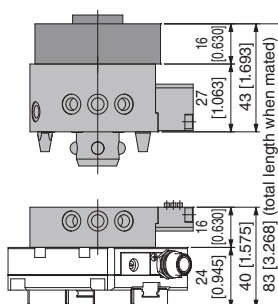
Air hand (AFDPG-14)



● Robot adapter (RA-MJC10-B)

Auto hand changer (MJC10M-P, MJC10T-P)

Flat type electric hand (EW2H18)



Comparison table of new and previous MJB

* The previous "MJB series auto hand changer series" models were changed to the "MJC series", as of October 2019.
We apologize for inconveniencing our customers using these products. Please refer to the following compatibility table.

Master side		Compatibility
Previous model	New model	
MJB34M	MJC3M	◎
MJB34M-P	MJC3M-P	
MJB34M-C	MJC3M-C	
MJB54M	MJC10M	
MJB54M-P	MJC10M-P	
MJB54M-C	MJC10M-C	
MJB54M-D	MJC10M-D	
MJB70M	MJC20M	
MJB70M-P	MJC20M-P	
MJB70M-C	MJC20M-C	
MJB70M-D	MJC20M-D	

Tool side		Compatibility
Previous model	New model	
MJB34T	MJC3T	◎
MJB34T-P	MJC3T-P	
MJB34T-C	MJC3T-C	
MJB34TC	MJC3TC	
MJB34TC-P	MJC3TC-P	
MJB34TC-C	MJC3TC-C	
MJB54T	MJC10T	
MJB54T-P	MJC10T-P	
MJB54T-C	MJC10T-C	
MJB54T-D	MJC10T-D	
MJB54TC	MJC10TC	
MJB54TC-P	MJC10TC-P	
MJB54TC-C	MJC10TC-C	
MJB54TC-D	MJC10TC-D	
MJB70T	MJC20T	
MJB70T-P	MJC20T-P	
MJB70T-C	MJC20T-C	
MJB70T-D	MJC20T-D	
MJB70TC	MJC20TC	
MJB70TC-P	MJC20TC-P	
MJB70TC-C	MJC20TC-C	
MJB70TC-D	MJC20TC-D	

Additional Parts		Compatibility
Previous model	New model	
MJBE-PM-34	MJCE-PM-3	◎
MJBE-PT-34	MJCE-PT-3	
MJBE-CM-34	MJCE-CM-3	
MJBE-CT-34	MJCE-CT-3	
MJBE-DM-54	MJCE-DM-10	
MJBE-DT-54	MJCE-DT-10	
MJBE-PM	MJCE-PM	
MJBE-PT	MJCE-PT	
MJBE-CM	MJCE-CM	
MJBE-CT	MJCE-CT	
MJBE-DM	MJCE-DM	
MJBE-DT	MJCE-DT	
RA-MJB34-A	RA-MJC3-A	
RA-MJB34-B	RA-MJC3-B	
RA-MJB54-B	RA-MJC10-B	
RA-MJB54-C	RA-MJC10-C	
RA-MJB70-C	RA-MJC20-C	
RA-MJB70-D	RA-MJC20-D	
HA-MJB34-A	HA-MJC3-A	
HA-MJB34-N	HA-MJC3-N	
HA-MJB54-A	HA-MJC10-A	
HA-MJB54-N	HA-MJC10-N	
HA-MJB70-A	HA-MJC20-A	
HA-MJB70-N	HA-MJC20-N	
MJBZ-PK	MJCZ-PK	
MJBZ-PR	MJCZ-PR	

Limited Warranty

KOGANEI CORP. warrants its products to be free from defects in material and workmanship subject to the following provisions.

Warranty Period The warranty period is 180 days from the date of delivery.

Koganei Responsibility If a defect in material or workmanship is found during the warranty period, KOGANEI CORP. will replace any part proved defective under normal use free of charge and will provide the service necessary to replace such a part.

Limitations

- This warranty is in lieu of all other warranties, expressed or implied, and is limited to the original cost of the product and shall not include any transportation fee, the cost of installation or any liability for direct, indirect or consequential damage or delay resulting from the defects.

- KOGANEI CORP. shall in no way be liable or responsible for injuries or damage to persons or property arising out of the use or operation of the manufacturer's product.

- This warranty shall be void if the engineered safety devices are removed, made inoperative or not periodically checked for proper functioning.

- Any operation beyond the rated capacity, any improper use or application, or any improper installation of the product, or any substitution upon it with parts not furnished or approved by KOGANEI CORP., shall void this warranty.

- This warranty covers only such items supplied by KOGANEI CORP. The products of other manufacturers are covered only by such warranties made by those original manufacturers, even though such items may have been included as the components.

The specifications are subject to change without notice.

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