Doc. no. MH*-OMG0048

Operation Manual

PRODUCT NAME

Angular Type Air Gripper

MODEL / Series / Product Number

MHC2-6*
MHCA2-6*
MHCM2-7S

SMC Corporation

Contents

Safety Instructions

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

*1) ISO 4414: Pneumatic fluid power -- General rules relating to systems.
ISO 4413: Hydraulic fluid power -- General rules relating to systems.
IEC 60204-1: Safety of machinery -- Electrical equipment of machines .(Part 1: General requirements)
ISO 10218: Manipulating industrial robots -Safety.
etc.

Caution	**Caution** indicates a hazard with a low level of risk which, if not avoided, could result in minor or moderate injury.
Warning	**Warning** indicates a hazard with a medium level of risk which, if not avoided, could result in death or serious injury.
Danger	**Danger** indicates a hazard with a high level of risk which, if not avoided, will result in death or serious injury.

⚠Warning

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

Since the product specified here is used under various operating conditions, its compatibility with specific equipment must be decided by the person who designs the equipment or decides its specifications based on necessary analysis and test results.

The expected performance and safety assurance of the equipment will be the responsibility of the person who has determined its compatibility with the product.

This person should also continuously review all specifications of the product referring to its latest catalog information, with a view to giving due consideration to any possibility of equipment failure when configuring the equipment.

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

The product specified here may become unsafe if handled incorrectly.

The assembly, operation and maintenance of machines or equipment including our products must be performed by an operator who is appropriately trained and experienced.

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

1.The inspection and maintenance of machinery/equipment should only be performed after measures to prevent falling or runaway of the driven objects have been confirmed.

2.When the product is to be removed, confirm that the safety measures as mentioned above are implemented and the power from any appropriate source is cut, and read and understand the specific product precautions of all relevant products carefully.

3. Before machinery/equipment is restarted, take measures to prevent unexpected operation and malfunction.

4. Contact SMC beforehand and take special consideration of safety measures if the product is to be used in any of the following conditions.

1. Conditions and environments outside of the given specifications, or use outdoors or in a place exposed to direct sunlight.

2. Installation on equipment in conjunction with atomic energy, railways, air navigation, space, shipping, vehicles, military, medical treatment, combustion and recreation, or equipment in contact with food and beverages, emergency stop circuits, clutch and brake circuits in press applications, safety equipment or other applications unsuitable for the standard specifications described in the product catalog.

3. An application which could have negative effects on people, property, or animals requiring special safety analysis.

4.Use in an interlock circuit, which requires the provision of double interlock for possible failure by using a mechanical protective function, and periodical checks to confirm proper operation.

Safety Instructions

⚠ Caution

The product is provided for use in manufacturing industries.

The product herein described is basically provided for peaceful use in manufacturing industries.
If considering using the product in other industries, consult SMC beforehand and exchange specifications or a contract if necessary.
If anything is unclear, contact your nearest sales branch.

Limited warranty and Disclaimer/Compliance Requirements

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

Limited warranty and Disclaimer

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

∗2) Vacuum pads are excluded from this 1 year warranty.
A vacuum pad is a consumable part, so it is warranted for a year after it is delivered.
Also, even within the warranty period, the wear of a product due to the use of the vacuum pad or failure due to the deterioration of rubber material are not covered by the limited warranty.

Compliance Requirements

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

⚠ Caution

SMC products are not intended for use as instruments for legal metrology.

Measurement instruments that SMC manufactures or sells have not been qualified by type approval tests relevant to the metrology (measurement) laws of each country.

Therefore, SMC products cannot be used for business or certification ordained by the metrology (measurement) laws of each country.

1. Specifications

Specifications

Model		MHC2-6※	MHCA2-6※	MHCM2-7S
Bore size		6 mm		7 mm
Fluid		Air		
Operation pressure	Double acting	0.15 to 0.6 MPa		—
	Single acting	0.3 to 0.6 MPa		0.4 to 0.6 MPa
Ambient and fluid temperature		- 10 to 60 ℃		
Note 1) Holding moment (External holding)	Double acting	0.038 N·m		—
	Single acting	0.024 N·m		0.017 N·m
Opening stroke (Both side)		- 10° to +30°		- 7° to +20°
Repeatability		±0.02 mm		
Max. operating frequency		180 c.p.m.		
Lubrication		Not required		
Note 2) Weight		22 g	19 g	9.5 g

Note 1) Pressure: 0.5MPa.

Note 2) Not including auto switch.

2. Operation Guide for Air Gripper.

2－1 Precautions on design

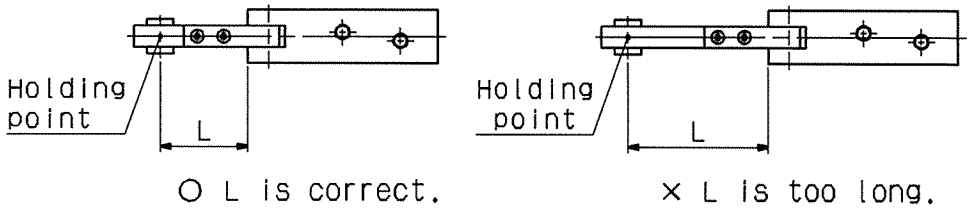
⚠ Warning

1. A protective cover is recommended to minimize the risk of personal injury due to accidental contact with moving parts of the gripper.
2. Measures should be taken to protect against unexpected drop of work due to loss of air pressure.
3. Contact SMC for other applications than work transfer. (i,e. Positioning, crimping)

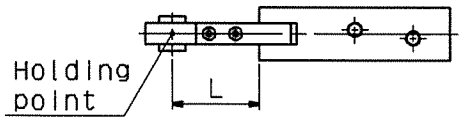
2－2 Selection

⚠ Warning

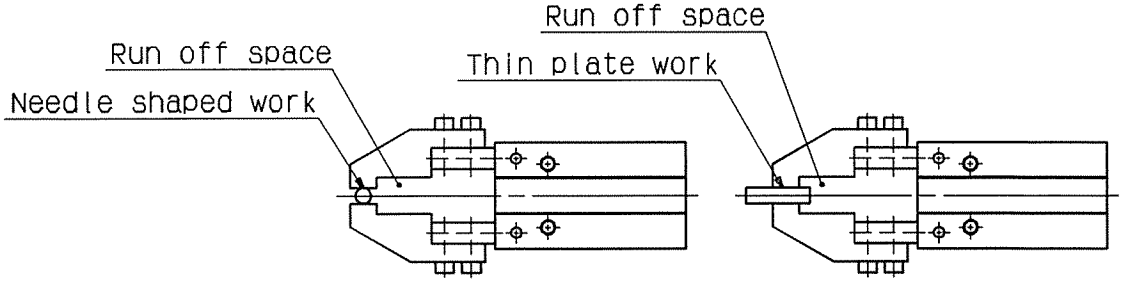
1. Keep the holding point within the specified range of the holding distance.
   When the holding point distance becomes large, the finger attachment applies an excessively large load to the cross roller section, causing excessive play of the fingers and possibly leading to premature failure. Refer to catalog for details.



2. Attachment should be designed as light and short as possible.
   1) Long and heavy attachment increases the inertia force to open or close the finger. It may cause unsteady movement of fingers and have an adverse effect on life.
   2) Even if holding point remains within the limited range, make the attachment as light and short as possible. Refer to catalog for details.



   3) Please use some pieces or larger size if long work or large work.
3. Please set roll on attachment if work is extra thin or extra fine.
   Product without roll off may cause incorrect positioning or incorrect holding, due to unstable holding.



4. Select the model whose holding force is sufficient against work weight.
   Incorrect selection may lead to release of work etc. Refer to "Effective holding force" and information to select the model by weight of work.
5. Do not use in applications where excessive external force or impact force may be applied to gripper. It may cause malfunction. Consult SMC with regard to any other application.
6. Select a model to have allowance in opening/closing width to work.
   <If no allowance is provided>
   1) Holding may be insecure due variations in air gripper opening/closing width or in work diameter.
   2) If auto-switch is used, detection failure may occur. Refer to hysteresis of auto-switch in each series to secure extra stroke for hysteresis. Especially when dual color advance waterproof auto-switch is used, stroke may be restricted depending on the setting of the lamp color at detection.
7. Please tell us when holding with spring force alone on single type.
   It may cause returning failure or unstable holding, due to operating failure.

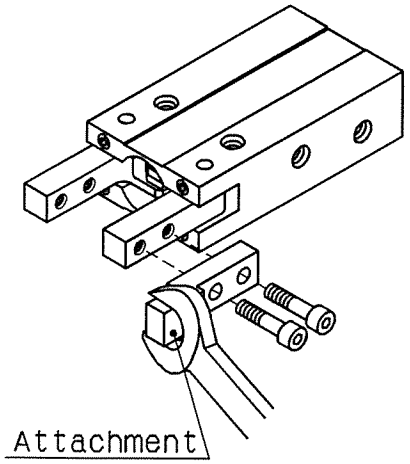
2−3 Mounting

⚠ Warning

1. Do not drop nor dent the gripper when mounting. Slight deformation can cause unaccuracy or malfunction.
2. Tighten the screw within the specified torque range to mount the attachment.
   The tightening with larger torque than specified range may cause malfunction, while the tightening with smaller torque may allow movement of holding position and dropping of work.

How to mount the attachment on fingers

To mount attachment, screw bolts in finger mounting female threads with the tightening torque in the table below.



Model	Mounting bolt	Max. tightening Torque N·m
MHC2-6	M2×0.4	0.15
MHCA2-6		
MHCM2-7S		

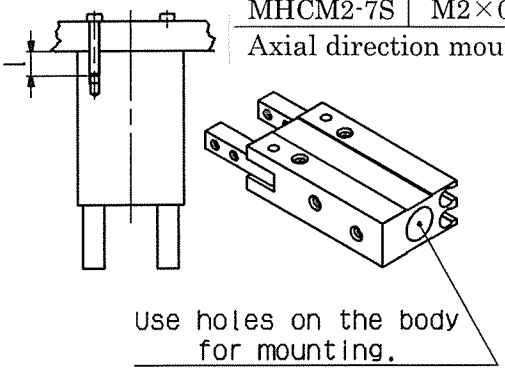
3. Adjust the holding point so that excessive force will not be applied on fingers when inserting the work.
   Confirm that the gripper can operate without receiving any shock by testing with manual operation or low-speed operation.

Mounting of gripper

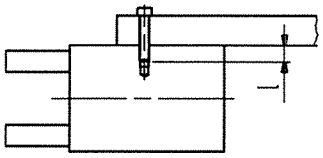
Axial mounting type (Body tapped)

Model	Mounting bolt	Max. tightening torque N·m	Max. screw-in depth (l) mm	Hole dia. mm	Hole depth mm
MHCA2-6	M2×0.4	0.15	6	ϕ 7H8$^{+0.022}_{0}$	1.5
MHCM2-7S	M2×0.4	0.15	4	—	—

Axial direction mounting can't be applied to MHC2-6



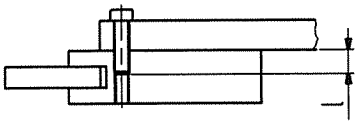
Length side mounting (Body tapped)



Model	Mounting bolt	Max. tightening torque N·m	Max. screw-in Depth (l) mm
MHCA2-6	M2×0.4	0.15	4

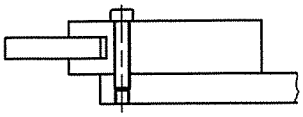
Length side mounting can't be applied to MHC2-6, MHCM2-7S.

Lateral side mounting (Body tapped)



Model	Mounting bolt	Max. tightening torque N·m	Max. screw-in depth (l) mm
MHC2-6	M3×0.5	0.88	10
MHCA2-6			
MHCM2-7S	M2×0.4	0.15	

Lateral side mounting (Through-hole mounting)



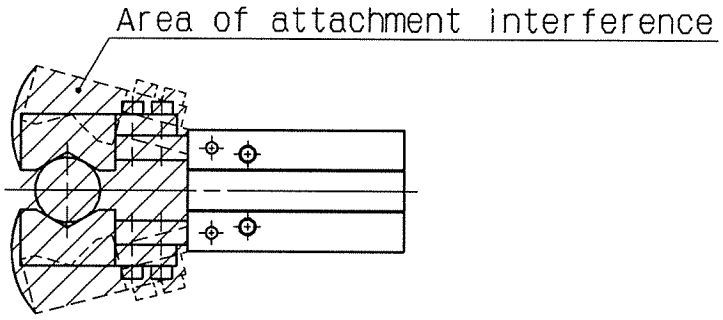
Model	Mounting bolt	Max. tightening torque N·m
MHC2-6	M2.5×0.45	0.49
MHCA2-6		

Lateral side mounting can't be applied to MHCM2-7S.

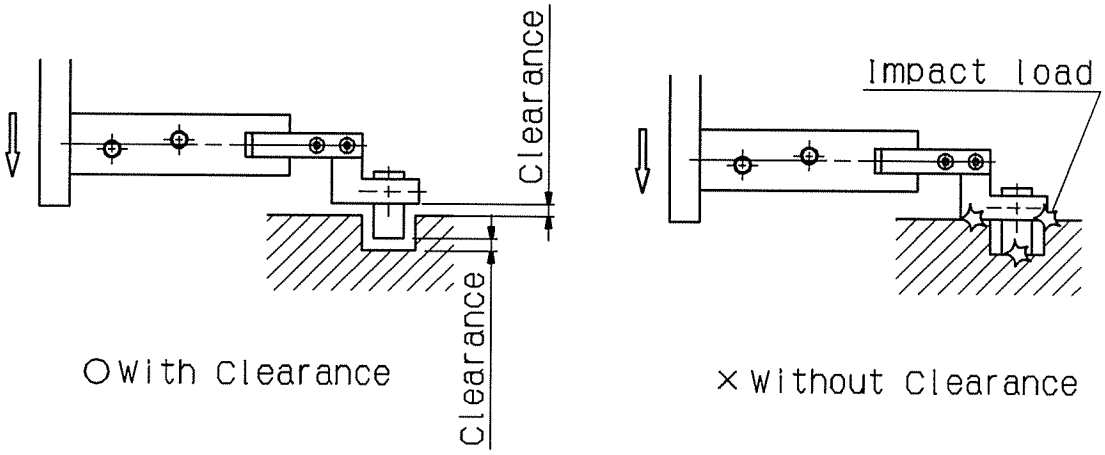
⚠ Caution

1. Avoid the excessive force on fingers when mounting the attachment.
   Any change of fingers may cause the malfunction and deteriorate the accuracy.
2. Avoid external force to fingers. Fingers may be damaged by continual lateral or the impact load.
   Provide clearance to prevent the work or the attachment from striking against any object at the stroke end.

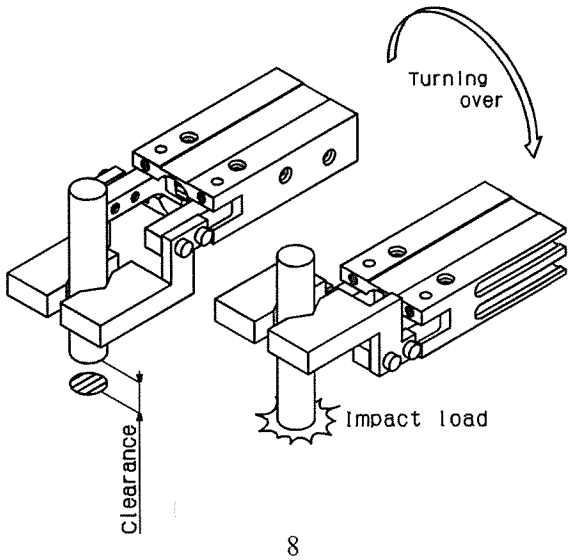
1. Stroke end in finger opening condition



2. Air gripper traveling stroke end

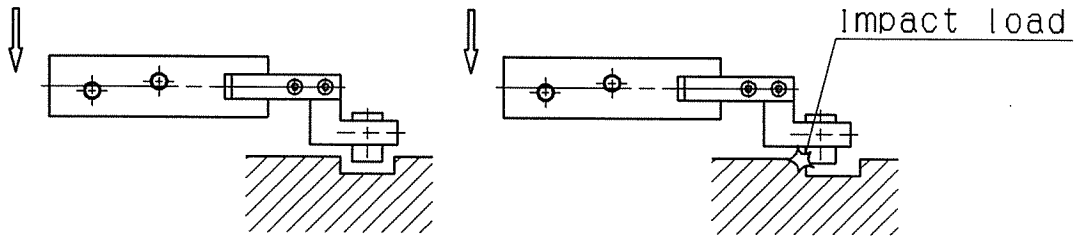


3. At opposite movement



3. Adjust the holding point so that excessive force will not be applied on fingers when inserting the work.

Confirm that the gripper can operate without receiving any shock by testing with manual operation or low-speed operation.



○ Aligned × Not aligned

4. If the finger opens and closes at an excessive speed, the work piece may not be gripped precisely. Also, rattles or damage may be caused by inertia of the fingers or attachments. damage. Therefore, it is definitely necessary to install speed controller and control the Install a speed controller to prevent shocks. Use a meter-in type speed controller.

Air gripper mounted type ····· AS1211F-M3

5. High frequency operation or long piping may cause condensation inside the air gripper or piping. For this reason, use a quick exhaust valve.

1) Air gripper mounted type ····· Speed exhaust controller : ASV□0F-M3
2) In-Line type ····· Quick exhaust valve : AQ240F-04

2—4 Air source

⚠Warning

1. Use clean air.

Do not use compressed air contains chemicals, salinity, corrosive gas or synthetic oil with organic solvent. Using it may cause malfunction or damage of air gripper.

⚠ Caution

1. Mount air filter.

Mount air filter near valve and before air gripper. Select filtration rating of 5 μm or less.

2. Install after-cooler, air dryer and drain catch.

Compressed air contains a large amount of drain may cause malfunction of valve and other pneumatic equipment.

3. Use air gripper within the specified fluid and ambient temperature range.

If air gripper is used below 5℃, moisture inside the circuit is frozen and may cause damage of packings or malfunction. Take preventative measures for freezing.

Refer to SMC "Compressed Air Cleaning System" for the details of compressed air quality described above.

2－5 Piping

⚠ Caution

1. Preparation before piping.

   Thoroughly flush the fittings to prevent dust or chips from entering the gripper.

2－6 Environment

⚠ Warning

1. Do not use in environment of corrosive grass, salt water, water, nor vapor.
2. Do not use in direct sun light.
3. Do not subject to excessive vibration.
4. Do not use close to flame.
5. Use a cover when gripper must be used in an environment where dust or cutting oil will come in contact with gripper.
6. Consult SMC for the use in any other special environment.

2－7 Lubrication

⚠ Caution

1. Non-lube type is lubricated already. Therefore, it is not necessary to lubricate before using. When lubricating the gripper, use the turbine oil class 1 (ISO VG32) and refuel continually. When lubrication has been started, it must be continued throughout the life of the gripper or malfunction may result.

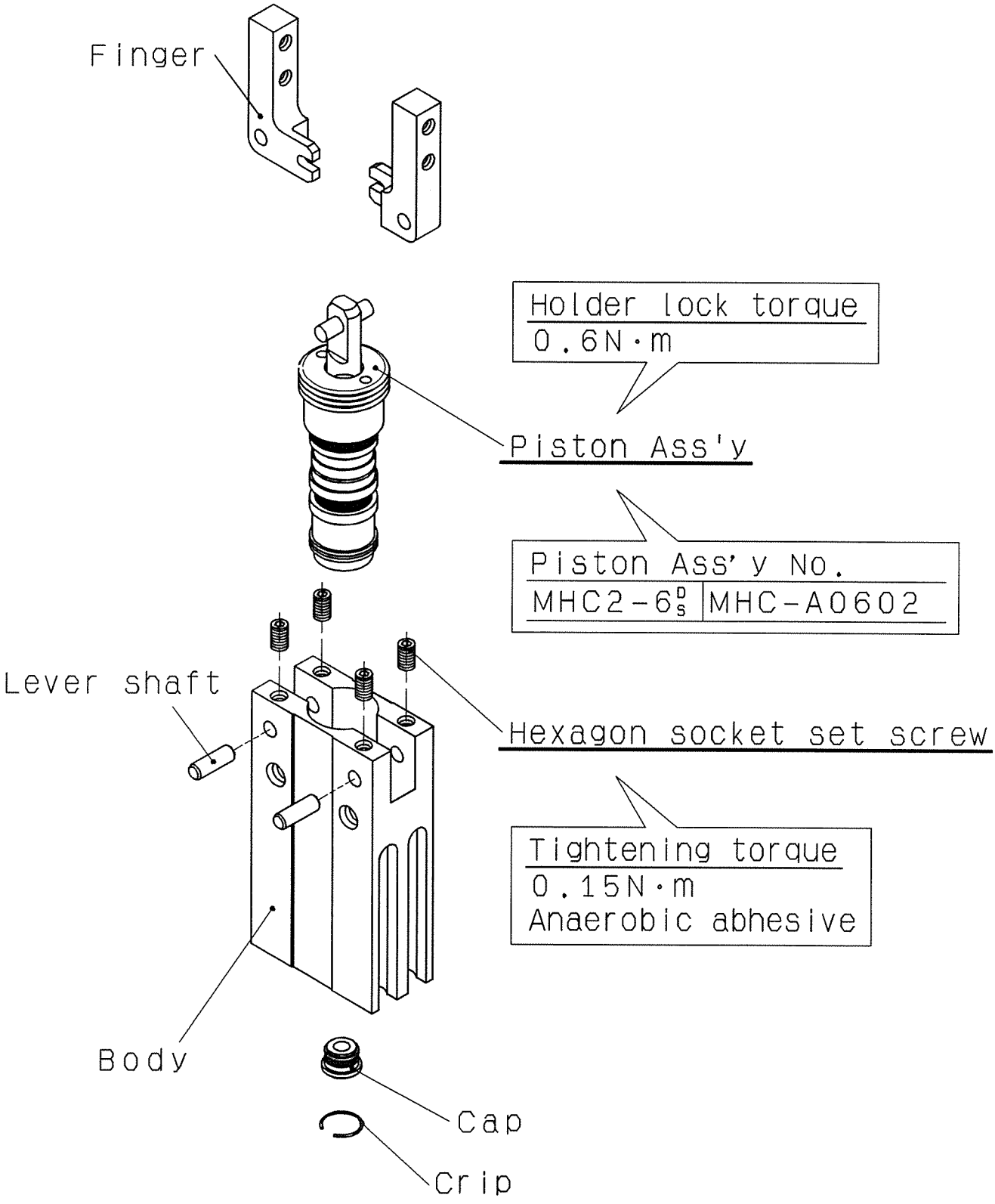
3. Maintenance

3－1 Notes

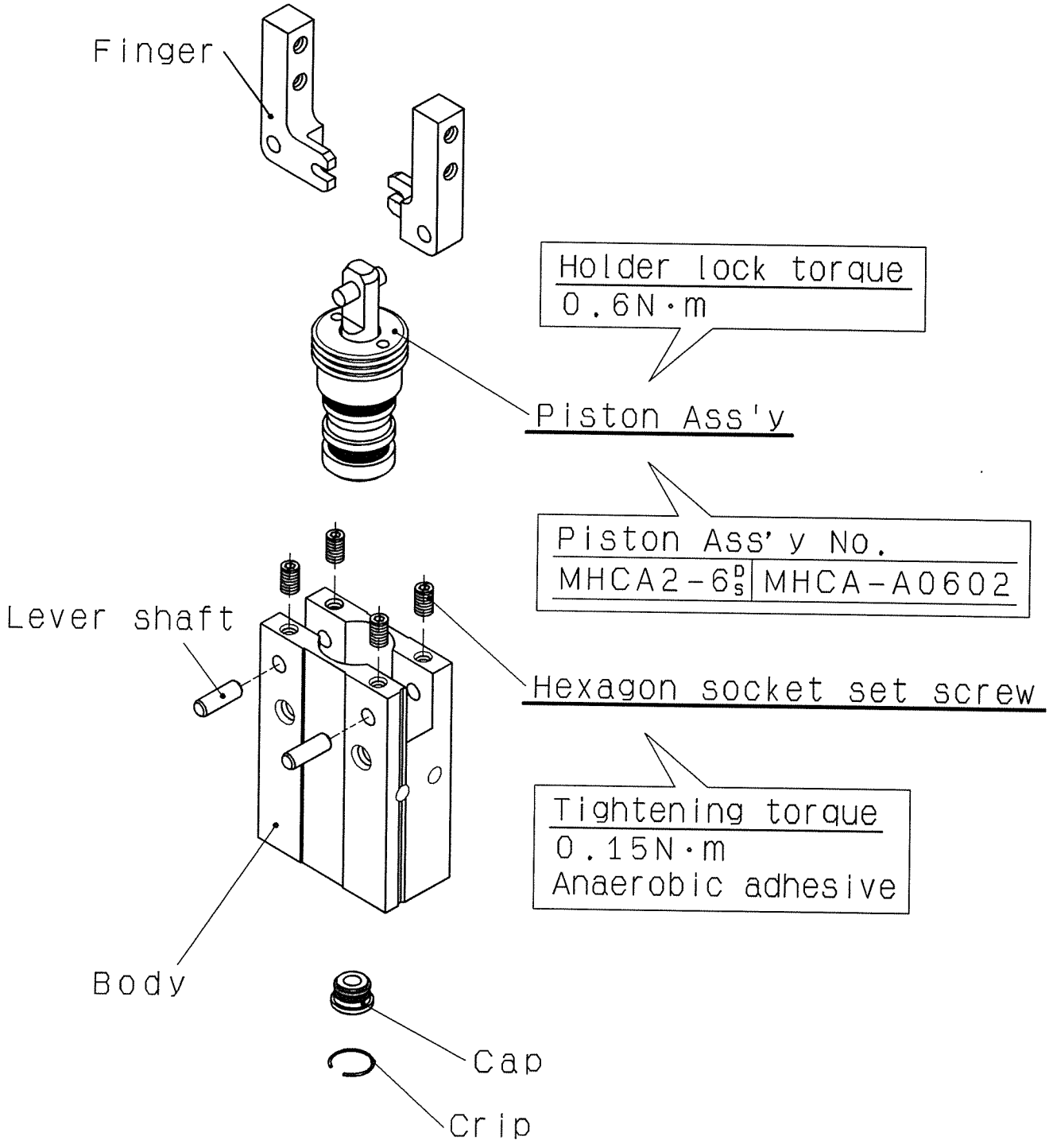
⚠ Warning

1. Do not enter the transfer line nor put the object. It may cause unexpected accidents.
2. Do not enter your hands between finger and attachment. It may cause unexpected accidents.
3. Confirm that no work is held by fingers before releasing the compressed air to remove the gripper from the line. Dropping of work can be dangerous.

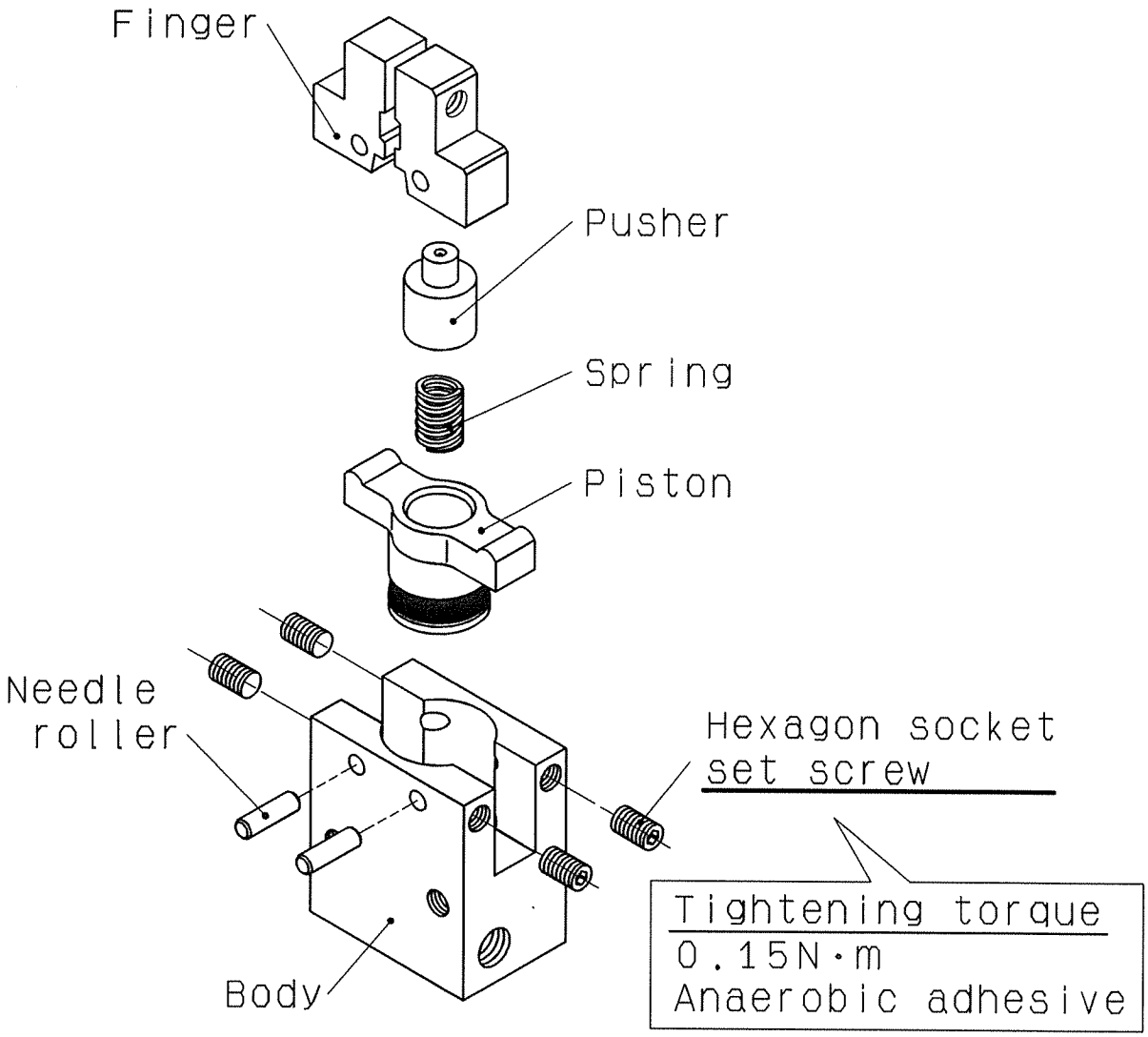
3−2 Exploded view 1 MHC2−6*



3−3 Exploded view 2 MHCA2−6*

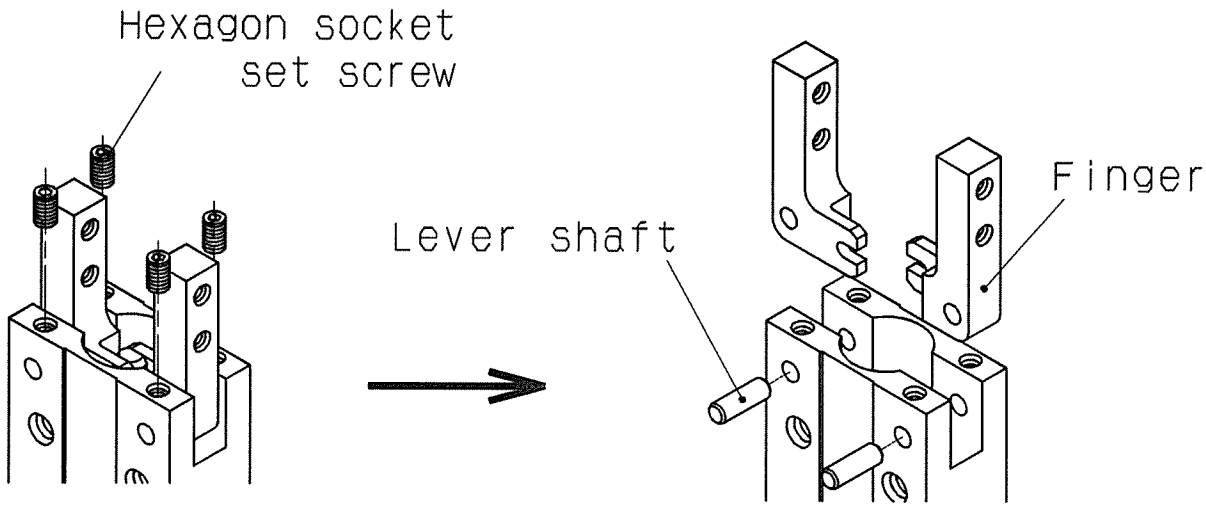


3－4 Exploded view 3 MHCM2－7S

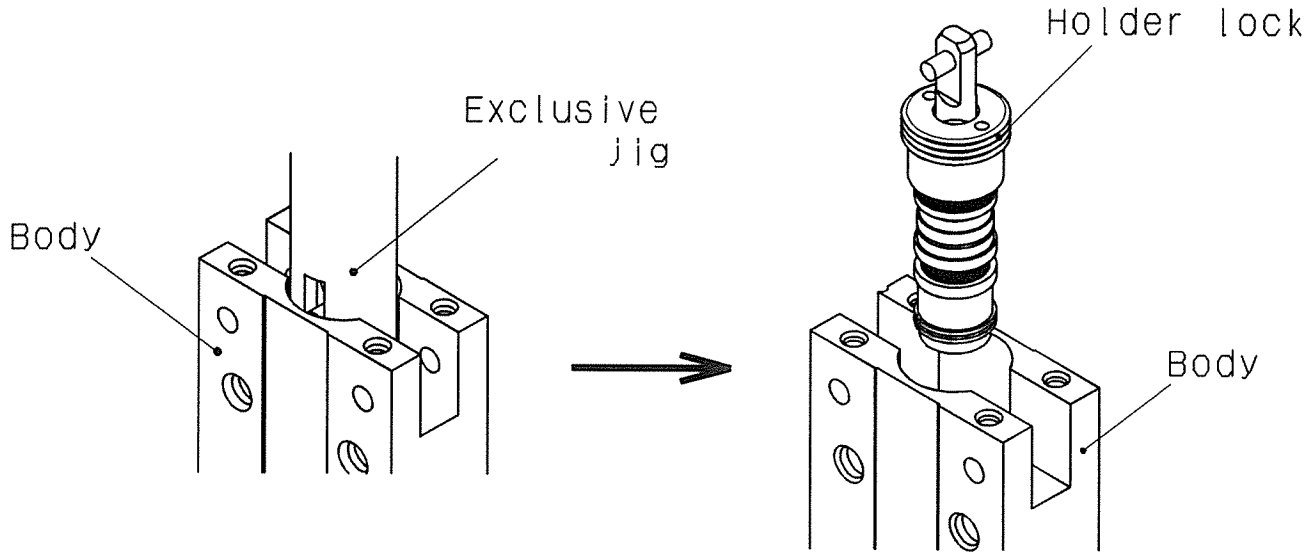


3−5 Replacing Procedure of Packing MHC2−6*／MHCA2−6

1. Loosen hexagon socket set screw, pull out lever shaft and remove finger.



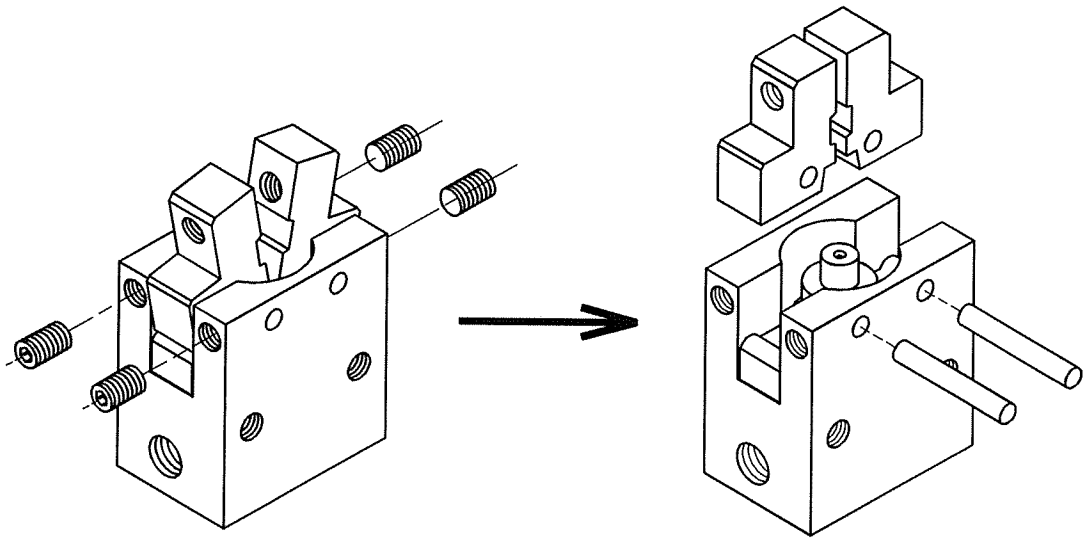
2. Loosen Holder lock with an Exclusive jig, and take Piston Ass'y out and replace Packing.



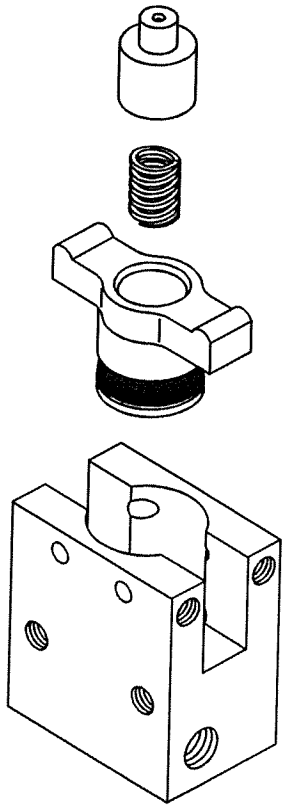
- Use No. MHC6−T1 for ordering an Exclusive jig.
- Reverse the order of this procedure for assemble.
- About tightening torque for Holder lock and Hexagon socket set screws, see each disassemble drawing.
- About grease, please contact to us. We'll give you an exclusive one.

3−6 Replacing Procedure of Packing MHCM2−7S

1. Loosen hexagon socket set screw, pull out Needle roller and remove finger.
   Be careful for jumping of pusher by built-in spring.



2. Take off pusher, spring and piston and replace packing.

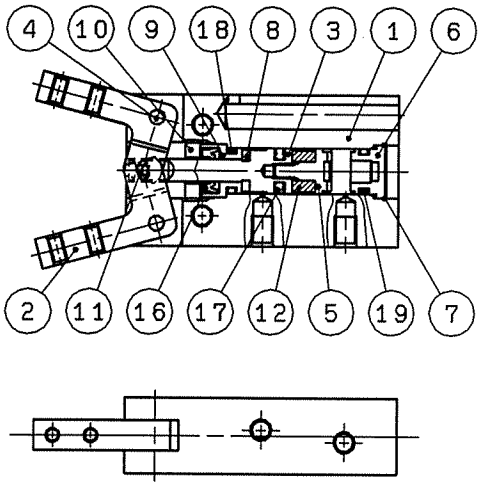


- Reverse the order of this procedure for assemble.
- About tightening torque for Hexagon socket set screws, see each disassemble drawing.
- About grease, please contact to us. We'll give you an exclusive one.

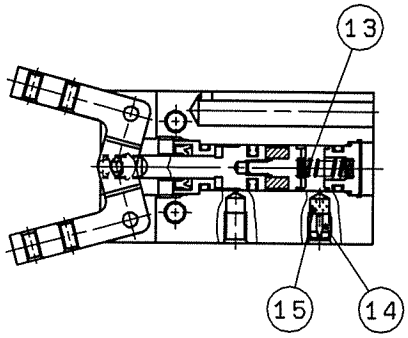
3−7 Structural drawing ／ Parts List · Seal Kits 1

[MHC2−6＊]

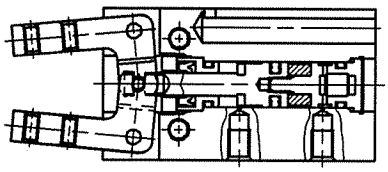
Double acting / Finger open condition



Single acting / Normally open



Double acting / Finger closed condition



Component Parts

No.	Description	Material	Note
1	Body	Aluminum alloy	Hard anodized
2	Finger	Stainless steel	Heat treatment
3	Piston	Stainless steel	
4	Lever shaft	Stainless steel	Nitrided
5	Magnet holder	Stainless steel	
6	Cap	Aluminum alloy	Hard anodized
7	Clip	Stainless steel	
8	Dumper	Urethane rubber	
9	Holder	Brass	Electroless nickel plated
10	Holder lock	Stainless steel	

Component Parts

No.	Description	Material	Note
11	Needle roller	Steel	
12	Magnet	Rare earth magnet	Nickel plated
13	N.O. spring	Piano wire	Zinc chrome
14	Exhaust plug	Brass	Electroless nickel plated
15	Exhaust filter	Polyvinyl formal	
16	Rod packing	NBR	
17	Piston packing	NBR	
18	Gasket	NBR	
19	Gasket	NBR	

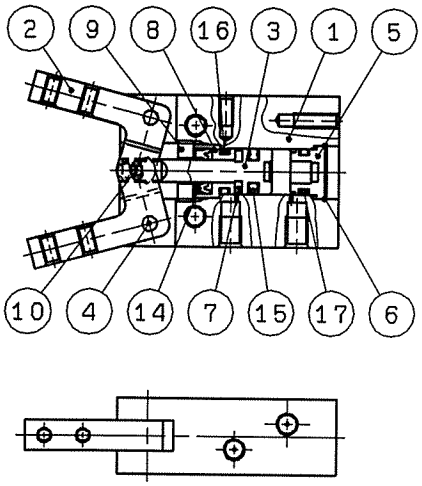
Replaceable parts list : Seal kits

Part No.	Description
MHC6-PS	Kits include items 16,17,18 and 19 from the table above

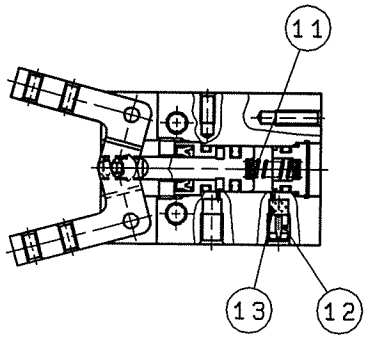
3−8 Structural drawing ／ Parts List・Seal Kits 2

[MHCA2−6＊]

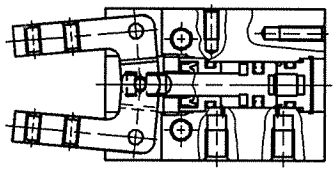
Double acting / Finger open condition



Single acting / Normally open



Double acting / Finger closed condition



Component Parts

No.	Description	Material	Note
1	Body	Aluminum alloy	Hard anodized
2	Finger	Stainless steel	Heat treatment
3	Piston	Stainless steel	
4	Lever shaft	Stainless steel	Nitrided
5	Cap	Aluminum alloy	Hard anodized
6	Clip	Stainless steel	
7	Dumper	Urethane rubber	
8	Holder	Brass	Electroless nickel plated
9	Holder lock	Stainless steel	

Component Parts

No.	Description	Material	Note
10	Needle roller	Steel	
11	N.O. spring	Piano wire	Zinc chrome
12	Exhaust plug	Brass	Electroless nickel plated
13	Exhaust filter	Polyvinyl formal	
14	Rod packing	NBR	
15	Piston packing	NBR	
16	Gasket	NBR	
17	Gasket	NBR	

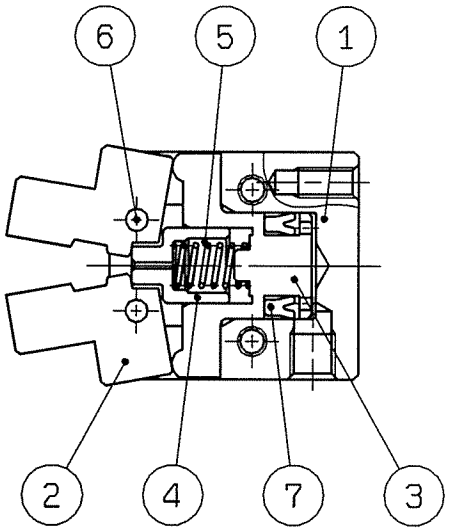
Replaceable parts list : Seal kits

Part No.	Description
MHCA6-PS	Kits include items 14,15,16 and 17 from the table above

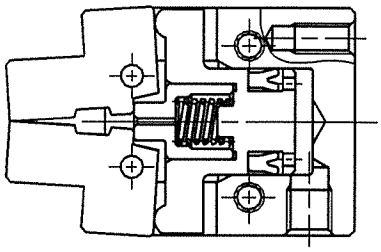
3－9 Structural drawing ／ Parts List・Seal Kits 2

[MHCM2－7S]

Double acting / Finger open condition



Finger closed condition



Component Parts

No.	Description	Material	Note
1	Body	Aluminum alloy	Hard anodized
2	Finger	Stainless steel	Heat treatment
3	Piston	Stainless steel	Heat treatment
4	Pusher	Stainless steel	
5	Spring	Piano wire	Zinc chrome
6	Needle roller	Steel	
7	Piston packing	NBR	

Replaceable parts list

Part name	Order No.	Description
Piston packing	MYN-4	Above No. 7

Revision history

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SMC

対応文書 No. MH*-OMG0120

PNEUMATIC GRIPPER "AIR CHUCK"
MH SERIES
INSTRUCTION MANUAL

HOW TO ORDER

MH | P | 20 | D | — | Y59A | | |

●Types of open-close

P	Parallel type
C	Angular type

●Cylinder diameter

10	φ10
16	φ16
20	φ20
25	φ25

●Operating type

D	Double acting
S	Single acting

●Auto-switch

Nil	No auto-switch
Y59A	Solid state type 3 wire;Parallel to axis
Y59B	Solid state type 2 wire;Parallel to axis
Y69A	Solid state type 3 wire;Right angle to axis
Y69B	Solid state type 2 wire;Right angle to axis

●Lead wire length

Nil	0.5 m
L	3 m

●Symbol for auto-switch

Nil	2 pcs.
S	1 pce.

= INDEX =

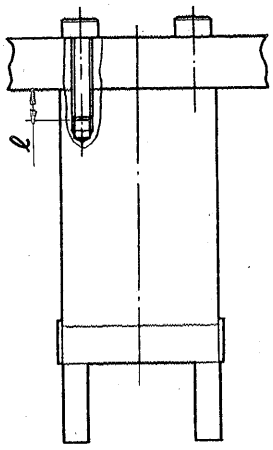
SMC CORPORATION

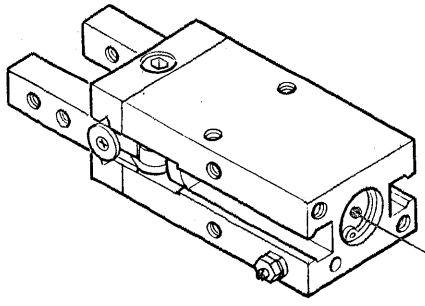
1. Mounting style of Air Chuck.

MH series Air Chuck can be mounted from 3 directions.

Appropriate direction can be selected to suit intended machinery or workpiece.

①To mount direct axis type (body tap)





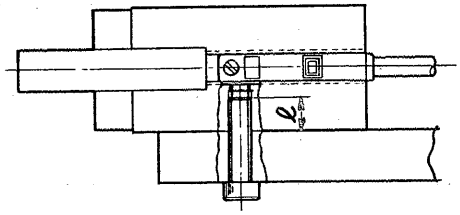
Model	using bolt	MAX. tightening torque kgf·cm	MAX. length of engagement; ℓ mm
MHP10, MHC10	M3x0.5	9	6
MHP16, MHC16	M4x0.7	21	8
MHP20, MHC20	M5x0.8	44	10
MHP25, MHC25	M6x 1	74	12

●Holes at end of body can be used for positioning.

Model	Hole dia.	Hole depth
MHP10, MHC10	$\phi 11H9\ ^{+0.043}_{0}$	1.5
MHP16, MHC16	$\phi 17H9\ ^{+0.043}_{0}$	1.5
MHP20, MHC20	$\phi 21H9\ ^{+0.052}_{0}$	1.5
MHP25, MHC25	$\phi 26H9\ ^{+0.052}_{0}$	1.5

②Side mounting type (body tap, body through hole)

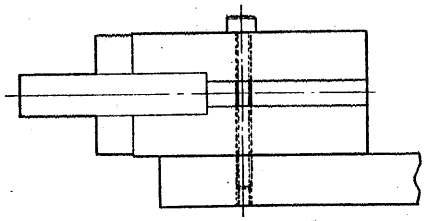
Body tap use



•In case, body tap is used.

Model	using bolt	MAX. tightening torque kgf·cm	MAX. length of engagement; ℓ mm
MHP10, MHC10	M3x0.5	7	5
MHP16, MHC16	M4x0.7	21	8
MHP20, MHC20	M5x0.8	44	10
MHP25, MHC25	M6x 1	74	12

Body through hole use



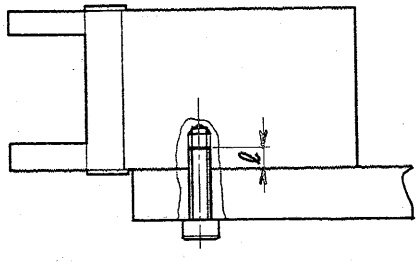
•In case, body through hole is used.

Model	using bolt	MAX. tightening torque kgf·cm
MHP10, MHC10	M2.5x0.45	5
MHP16, MHC16	M 3 x0.5	9
MHP20, MHC20	M 4 x0.7	21
MHP25, MHC25	M 5 x0.8	44

Note) When auto-switch is desired, only body tap type can be used. Care should be taken not to push main body of the switch by end of bolt, length of engagement; ℓ should be no more than figures stated in table as shown.

Model	MAX. length of engagement; ℓ mm
MHP10, MHC10	5
MHP16, MHC16	8
MHP20, MHC20	10
MHP25, MHC25	12

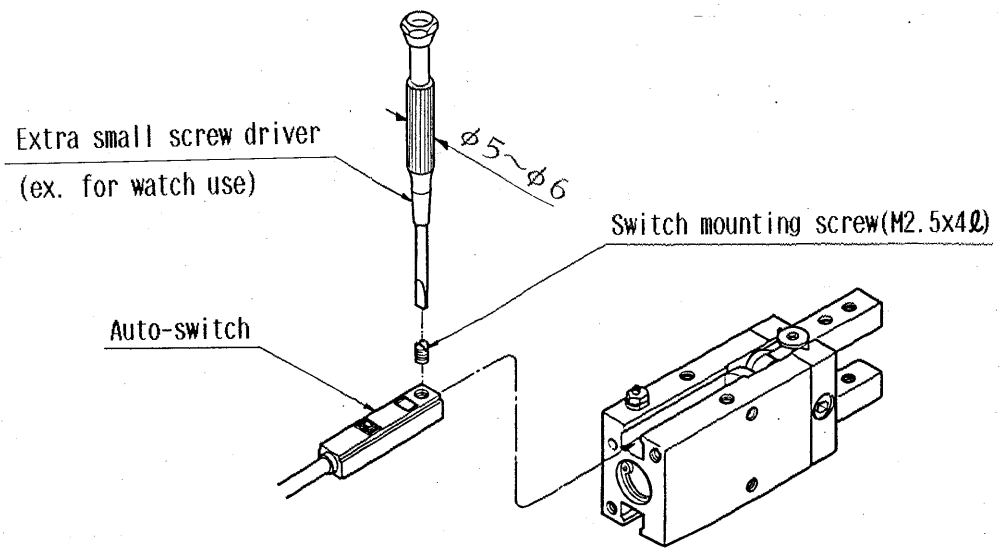
③Vertical mounting type (body tap)



Model	using bolt	MAX. tightening torque kgf·cm	MAX. length of engagement; ℓ mm
MHP10, MHC10	M3x0.5	9	6
MHP16, MHC16	M4x0.7	16	6.5
MHP20, MHC20	M5x0.8	34	8
MHP25, MHC25	M6x 1	60	10

2. Mounting procedure of auto-switch.

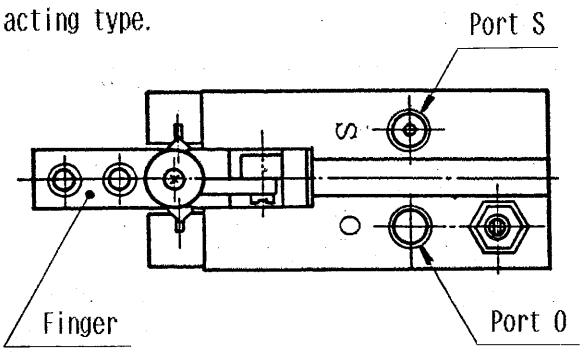
To mount auto-switch, insert auto-switch into mounting groove of Air Chuck as shown in lower illustration. After mounting position is determined, secure by tightening fitting screw provided.



Note) To tighten auto-switch fitting screw, use extra small screw driver of grip dia. approx. 5—6mm. Advised tightening torque is approx. 0.5 — 1kgf · cm. When touch feeling is obtained, rotate 90° to reach the required torque.

3. Piping.

Double acting type.



· Piping port

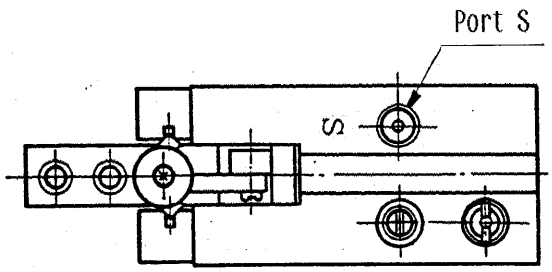
Port S;Port to close finger

Port O;Port to open finger

· Piping port size

Model	Piping port size
MHP10D, MHC10D	M3x0.5
MHP16D, MHC16D	M5x0.8
MHP20D, MHC20D	
MHP25D, MHC25D	

Single acting type.



· Piping port

Port S;Port to close finger

· Piping port size

Model	Piping port size
MHP10S, MHC10S	M3x0.5
MHP16S, MHC16S	M5x0.8
MHP20S, MHC20S	
MHP25S, MHC25S	

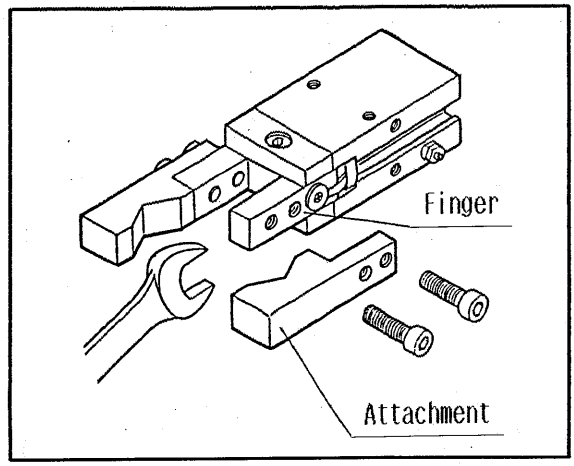
· Pipe fittings.-use SMC miniature pipe fittings (M3,M5 series) or one-touch fittings (M5 size).

· Pipes to be connected should be air-flushed thoroughly and care should be taken to ensure dirt or cutting-chips do not enter into Air Chuck assembly.

4. Installation adjustment of Air Chuck.

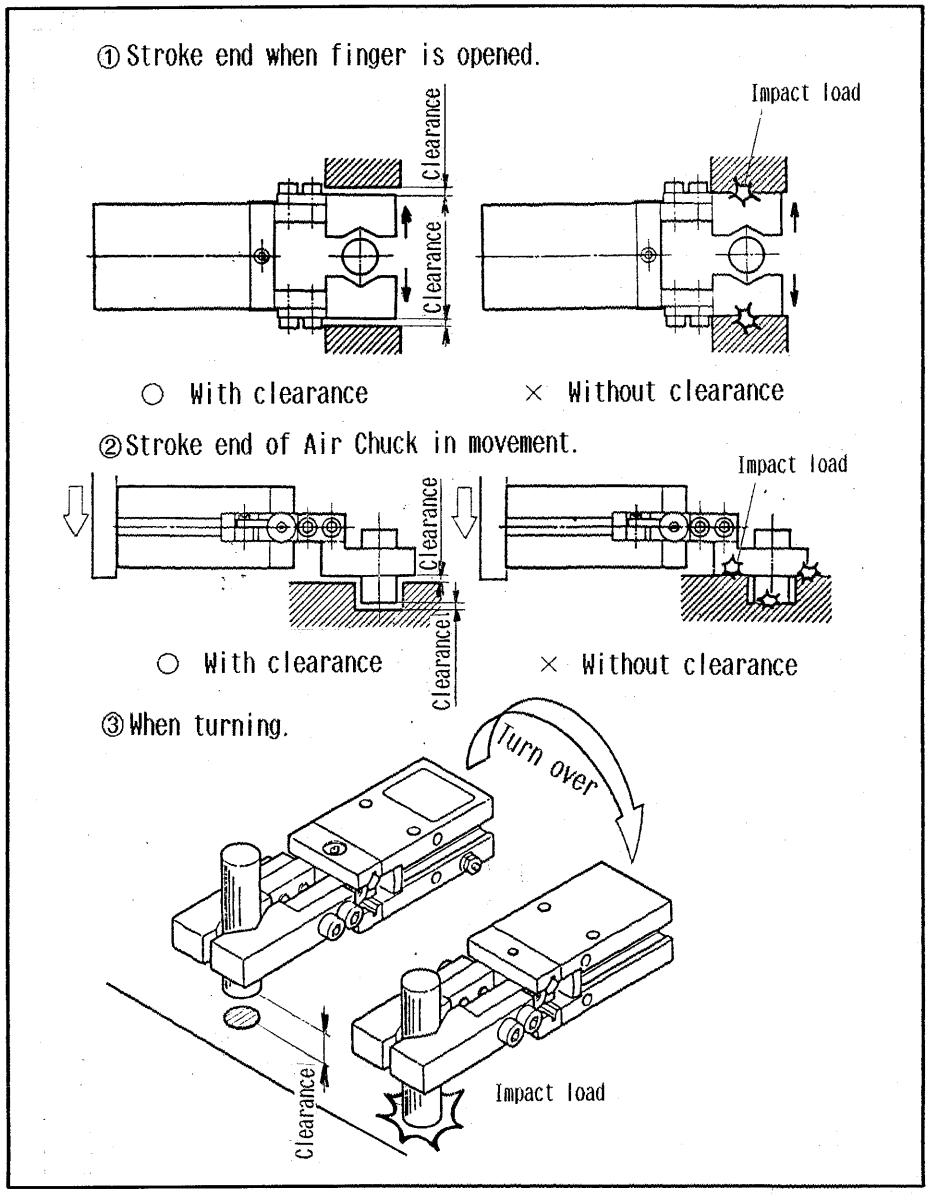
1)Precautions to fit attachment.

When mounting attachment to finger, it should be carried out holding finger by spanner or other means so that the tightening force is not transmitted to the finger guide mechanism. For tightening torque of bolts, refer to the following table.



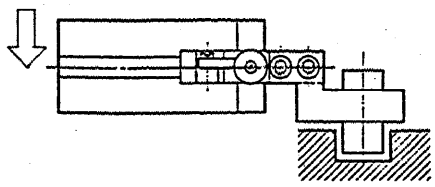
Model	Fixing bolt	Max. tightening torque kgf·cm
MHP10, MHC10	M2.5x0.45	3.2
MHP16, MHC16	M3x0.5	6
MHP20, MHC20	M4x0.7	14
MHP25, MHC25	M5x0.8	29

2) Adjust the device not to receive external force on its finger and some clearance should be kept at stroke end of the finger between finger and the other object.

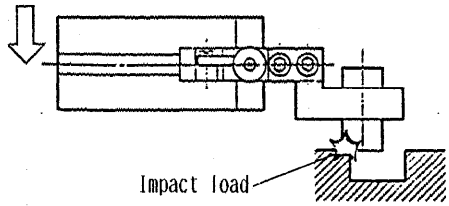


Appropriate clearance should be kept at finger not to receive force except gripping workpiece, particularly when workpiece is gripped, not to crash to other object at stroke end of Air Chuck movement. Lateral load comes on to finger repeatedly or impact load comes on may cause finger to loosening or damage. It is often happens when Air Chuck is turned little variation of length of workpiece may cause to crash at downward stroke end of turning movement. It should be cared.

Before inserting workpiece, centering should be carried out thoroughly not to add unnecessary force to finger. Particularly in test run, keep manual force or air cylinder pressure low to operate and make sure no existence of shock and safety.



○ Correct centering



× Incorrect centering

3) Adjustment of open-close speed of the finger.

Adjust open-close finger speed not to unnecessarily fast.

· How to adjust open-close finger speed.

Double acting type	Speed can be adjusted by built-in needle. Table below can be referred as a guide.
Single acting type	Connect speed controller *1 to close side port of the finger and use it as meter-in style.

*1 SMC's speed controller AS1000F or equivalent.

Model	Back turns from the needle fully closed. (*2)
MHP10D, MHC10D	1/4 – 1/2
MHP16D, MHC16D	1/2 – 1
MHP20D, MHC20D	1 – 1 1/2
MHP25D, MHC25D	1 1/2 – 2

*2 When needle is tightened to slightly touch bottom

· In case angular type, in order to avoid impact to the portion of finger base due to inertia moment, adjustment may be needed for making operating speed slower according to the length of attachment.

· If open-close speed is unnecessarily fast, impact force on finger becomes too great and will shorten its life.

◎Adjusting procedure for needle.

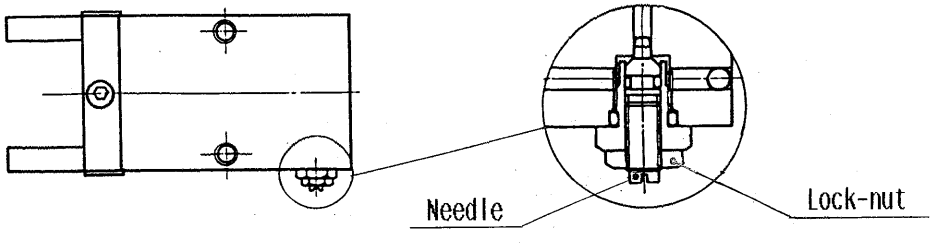
· Rotate needle valve clockwise to close and anti-clockwise to open.

Rotate needle valve clockwise to decrease finger closing speed and anti-clockwise to increase.

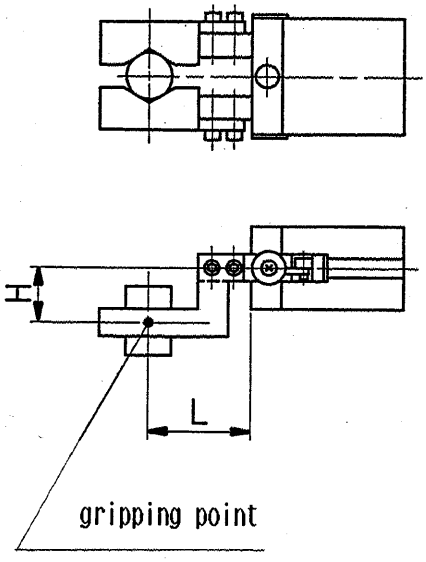
· Rotate needle anti-clockwise, drop-preventing function to stop it.

Do not attempt to rotate further.

· Upon completing adjustment, ensure lock-nut is tightened correctly.



5. Gripping point.

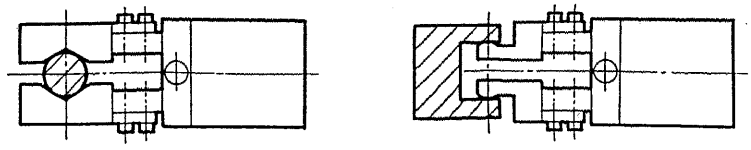


L ; length of gripping point

H ; length of overhang

- Holding point of workpiece is recommended to follow conditions stated in graphs right hand side for L;holding distance subject to working pressure, and H;over-hang quantity.
- Used Chuck outside of recommended area stated in graphs for holding point of workpiece, load coming on finger and guide part becomes excessively great and so may cause to malfunction of the finger or shorten its life.

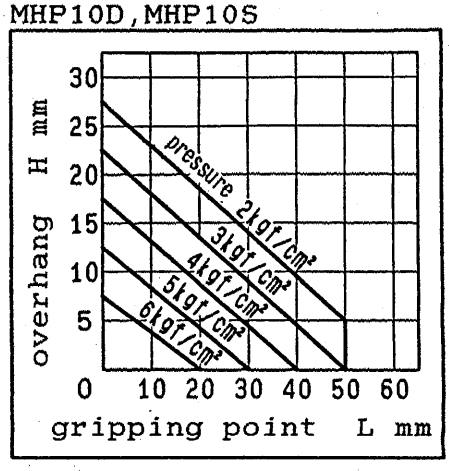
The products are designed for external work holding. For internal work holding applications please contact us.



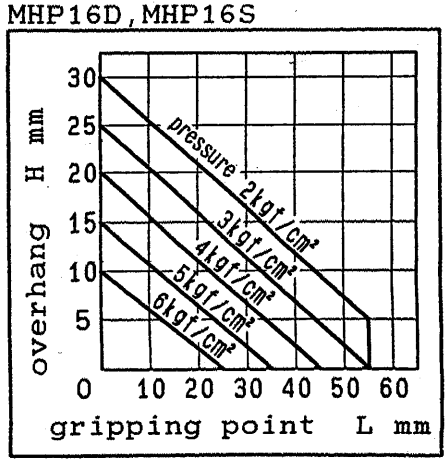
○ external work holding × internal working holding

Limitting range of gripping point.

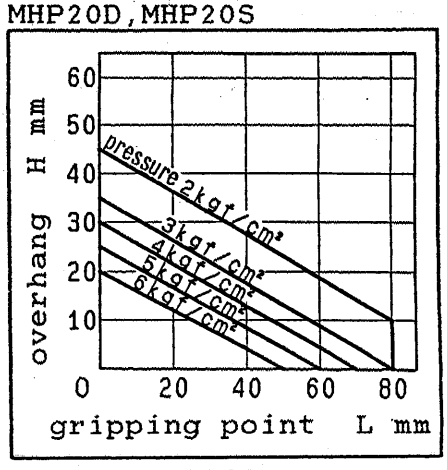
MHP10D, MHP10S



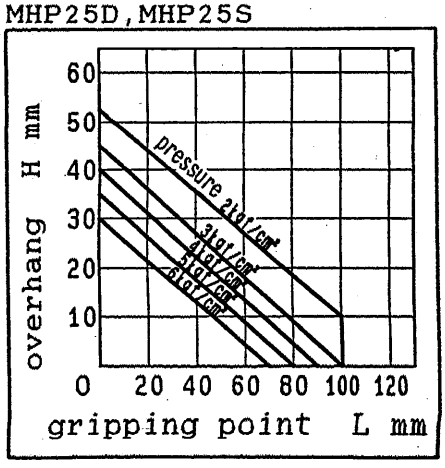
MHP16D, MHP16S



MHP20D, MHP20S

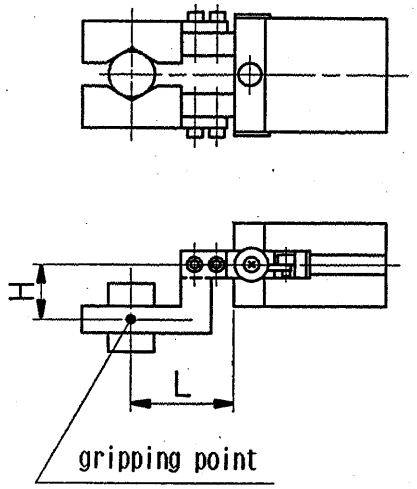


MHP25D, MHP25S



7. Effective gripping force for parallel type gripper.

Gripping Point



Gripping point ; The length of L and length of H should be used within the limits described on P5.

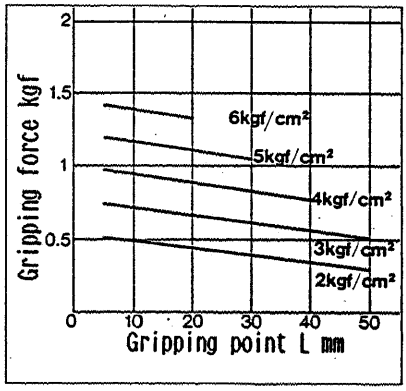
Guidelines for The Selection of Air Chuck Model with Respect to Component Weight

- ●Selection of the correct model depends upon the component weight, the coefficient of friction between the chuck attachment and the component, and their respective configurations. A model should be selected with a gripping force of 10 to 20 times of the component weight.
- ●If high accelleration, high decelleration or impact are encountered during component transportation then a further margin of safety should be considered.

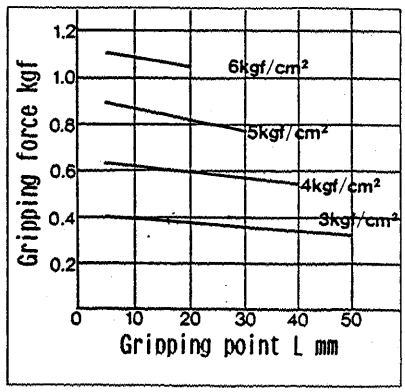
Effective Gripping Force

Double Acting Type	Single Acting Type

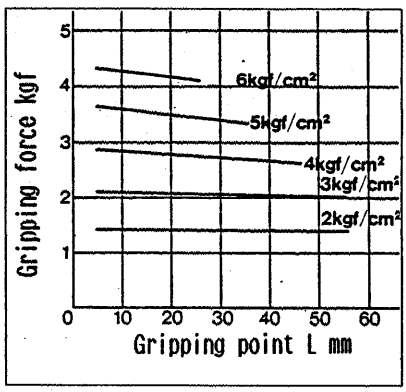
MHP10D



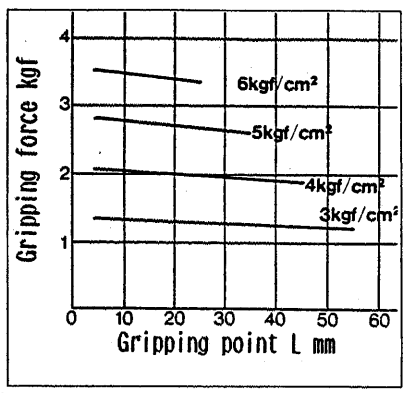
MHP10S



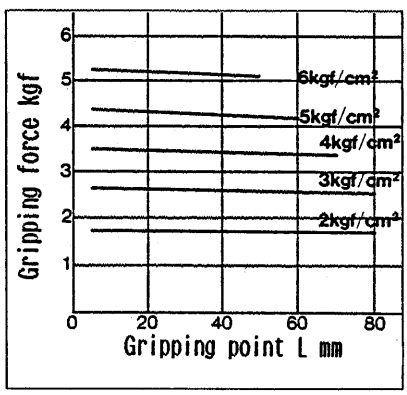
MHP16D



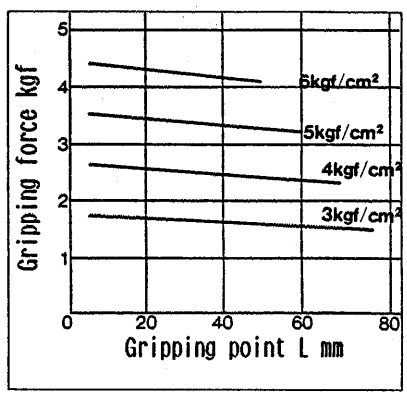
MHP16S



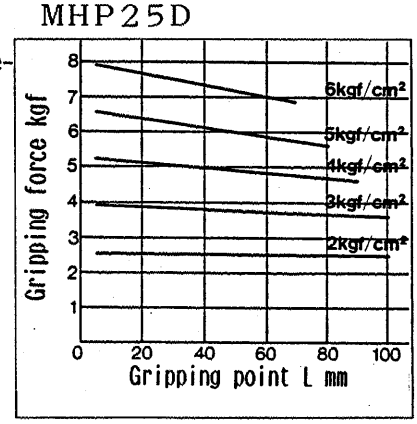
MHP20D



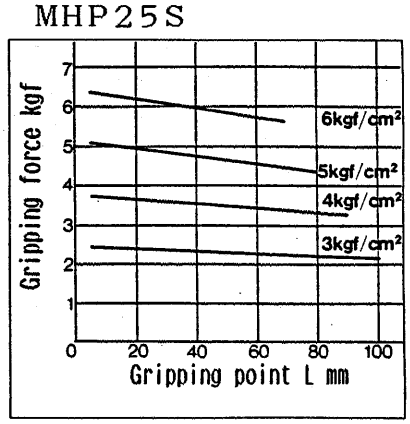
MHP20S



MHP25D

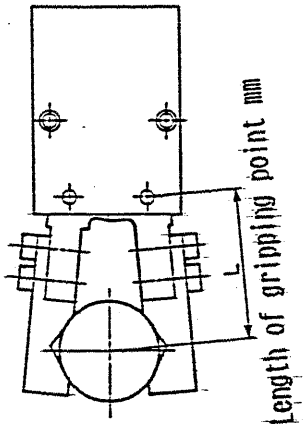


MHP25S



8. Effective gripping force for angular type gripper.

Gripping Point



Guidelines for The Selection of Air Chuck Model with Respect to Component Weight

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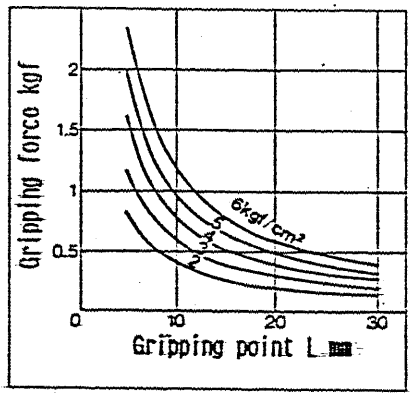
- If high accelleration, high decelleration or impact are encountered during component transportation then a further margin of safety should be considered.

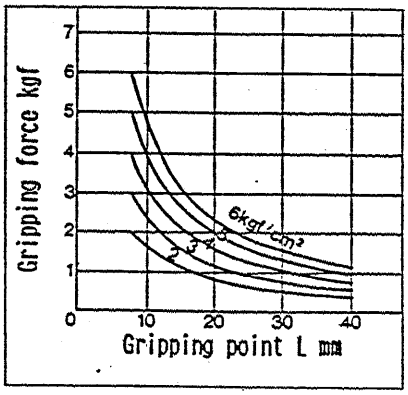
Effective Gripping Force

Double Acting Type

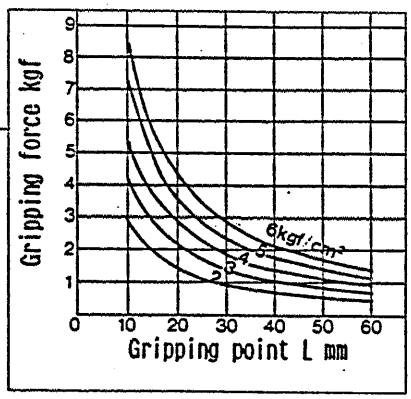
MHC10D



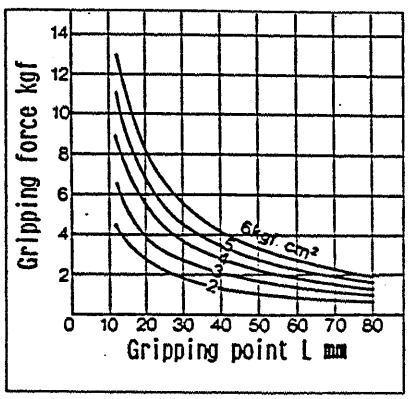
MHC16D



MHC20D

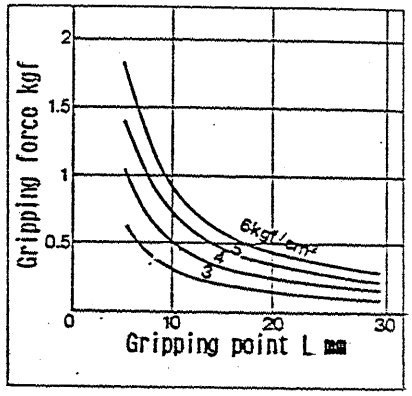


MHC25D

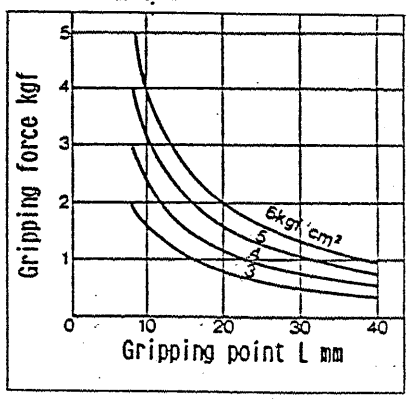


Single Acting Type

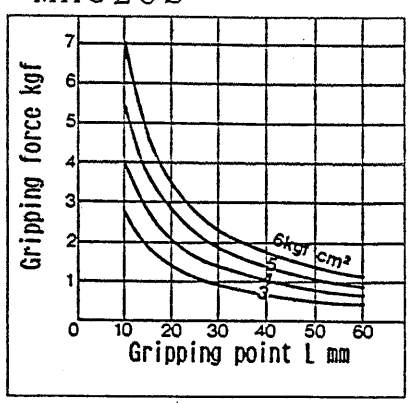
MHC10S



MHC16S



MHC20S



MHC25S