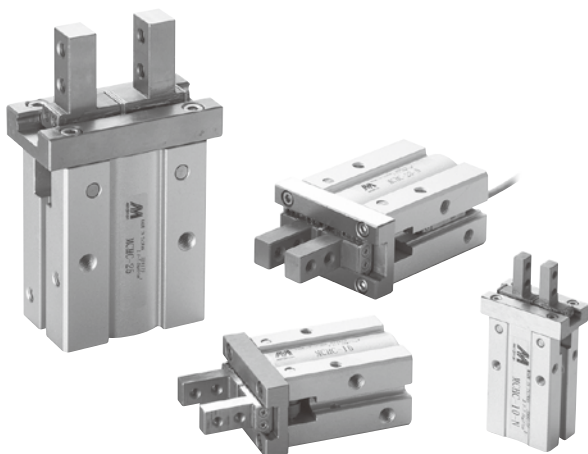




Order example

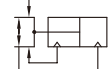
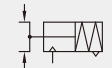
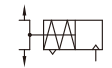
MCHC — 20 — □ N

MODEL

TUBE I.D.
10, 16, 20, 25

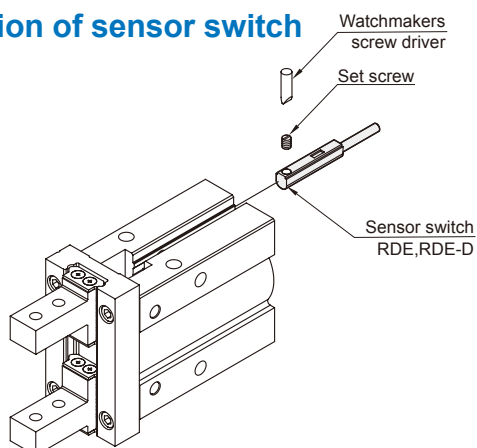
TYPE

STYLE

Code	Symbol	Description
Blank		Double acting
S		Single acting / Normally open
C		Single acting / Normally closed

Blank: Standard	N: Narrow
	
1: Side tapped mounting	N1: Narrow type side tapped mounting
	
2: Standard (Through hole)	N2: Narrow (Through hole)
	

Installation of sensor switch



Features

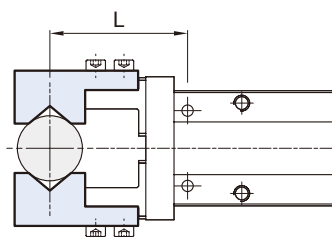
- Integral linear guide used for high rigidity and high precision.
- The material of finger is martensitic stainless steel.
- Body thickness tolerance $\pm 0.05\text{mm}$.
- Bottom pin holes for accurate re-locating.
- Grooves on the body for sensor switch to be inserted into.
- Standard with magnet.

Specification

Model		MCHC			
Acting type		Double acting / Single acting			
Tube I.D. (mm)		10	16	20	25
Opening / Closing stroke (mm)		4	6	10	14
Port size		M3×0.5	M5×0.8		
Medium		Air			
Operating pressure range	Double acting	0.2~0.7	0.1~0.7 MPa		
	Single acting	0.35~0.7	0.25~0.7 MPa		
Ambient temperature		-10~+60℃ (No freezing)			
Repeatability		± 0.01 mm			
Max. frequency		180 cycles / min			
Lubricator		Not required			
Sensor switch (☞)		RDE, RDE-D			
Weight (g)	Double acting	55	125	250	460
	Single acting	70	145	270	490

* RDE, RDE-D specification, please refer to page 5-6.

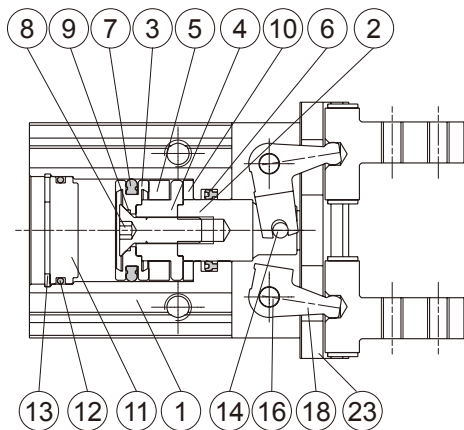
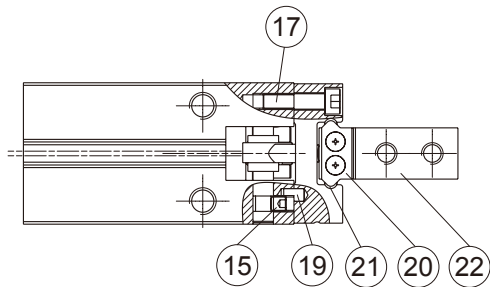
Gripping force



Tube I.D. (mm)		10	16	20	25
Double acting	External	11(1.1)	34(3.5)	42(4.3)	65(6.6)
	Internal	17(1.7)	45(4.6)	66(6.7)	104(10.6)
Single acting / Normally open	External	7.1(0.7)	27(2.8)	33(3.4)	45(4.6)
	Internal	13(1.3)	38(3.9)	57(5.8)	83(8.5)

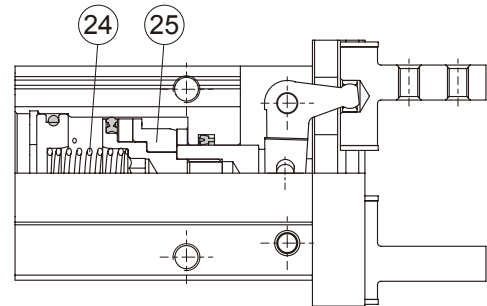
* Operation pressure 0.5 MPa, gripping length 20mm, the effective gripping force for each finger is *** N(kgf).

Double acting



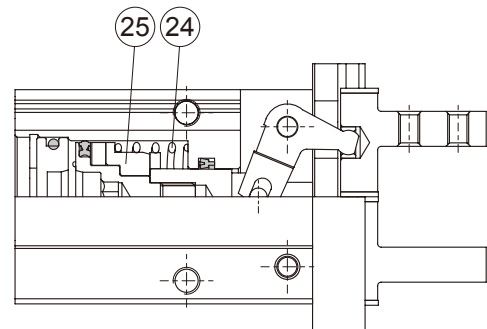
Single acting

Normally open



Single acting

Normally closed



Material

No.	Tube I.D. Part name	10	16	20	25	Q'y	Repair kits (inclusion)
1	Body	Aluminum alloy				1	
2	Piston rod	Stainless steel				1	
3	Piston	Aluminum alloy				1	
4	Piston R	*1	Aluminum alloy			1	
5	Magnet ring	Magnet material				1	
6	Rod packing	NBR				1	●
7	Piston packing	NBR				1	●
8	Screw	—	Stainless steel			1	
9	Gasket	—	NBR			1	●
10	Cushion pad	PU				1	●
11	Head cover	Aluminum alloy				1	
12	Cover ring	NBR				1	●
13	Stop ring	*2	Stainless steel			1	
14	Spindle river	Carbon steel				1	
15	Screw	Carbon steel				4	
16	Grip rivet	Carbon steel				2	
17	Bolt	Stainless steel				4	
18	Lever	Stainless steel				2	

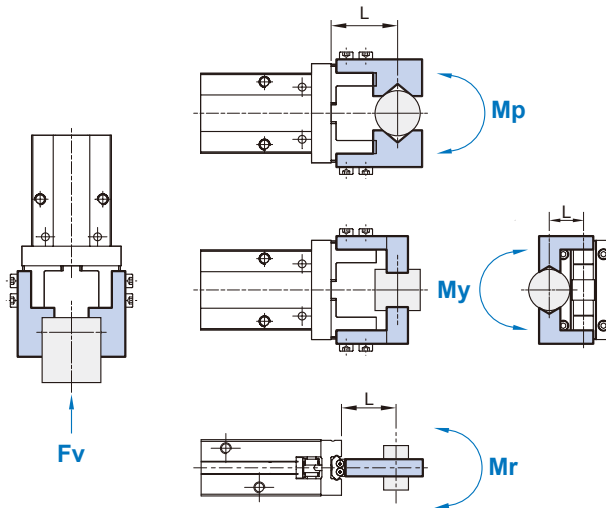
No.	Tube I.D. Part name	10	16	20	25	Q'y	Repair kits (inclusion)
19	Pin	Carbon steel				2	
20	Roller stopper	Stainless steel				4	
21	Steel balls	Bearing steel				24	
22	Finger	Stainless steel				2	
23	Guide	Stainless steel				1	
24	Magnet holder	Stainless steel				1	
25	Stop ring	Stainless steel				1	

*1. Stainless steel *2. Carbon steel

Order example of repair kits

Tube I.D.	Repair kits
ø10	PS-MCHC-10
ø16	PS-MCHC-16
ø20	PS-MCHC-20
ø25	PS-MCHC-25

Confirmation of external force on fingers



L: distance to the point at which the load is applied (mm)

Tube I.D. (mm)	Allowable vertical load Fv (N)	Maximum allowable moment		
		Pitch moment Mp (N-m)	Yaw moment My (N-m)	Roll moment Mr (N-m)
10	58	0.26	0.26	0.53
16	98	0.68	0.68	1.36
20	147	1.32	1.32	2.65
25	255	1.94	1.94	3.88

* Values for load and moment in the table indicate static values.

Allowable load calculation

$$\text{Allowable load } F(N) = \frac{M(\text{maximum allowable moment})(N \cdot m)}{L(m)}$$

Example

When a static load of $f=20N$ is operating, which applies pitch moment to point $L=25mm$ from the **MCHC-16** guide.

$$\begin{aligned} \text{Allowable load } F(N) &= \frac{0.68 (N \cdot m)}{25 \times 10^{-3} (m)} \\ &= 27.2 (N) \end{aligned}$$

Load $f=20 (N) < 27.2 (N)$, so can be used.

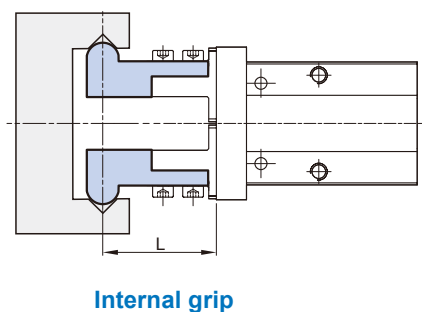
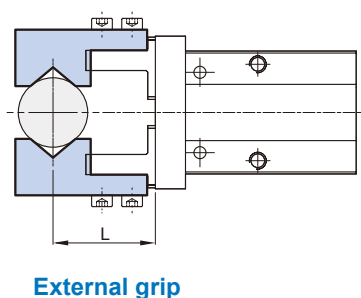
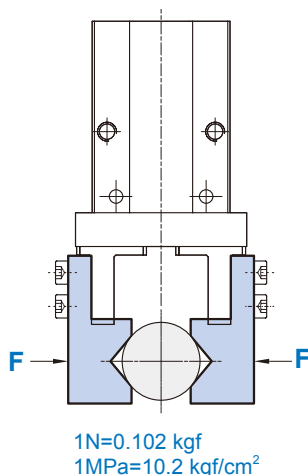
Model selection suggestions

1. For normal gripping and carrying usage, the recommended safe factor (a) is 4.
2. The value of gripping force of single finger can be found at the gripping force table.
3. The safe factor (a) have to be higher if the gripper is using with a great accelerated velocity or impaction condition.

Effective gripping force (Double acting)

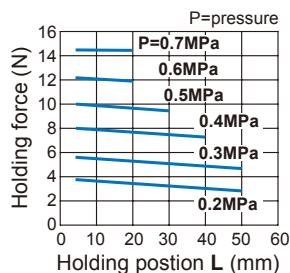
Indication of effective force.

The effective gripping force shown in the graphs to the right is expressed as F, which is the thrust of one finger, when both fingers and attachments are in full contact with the workpiece as shown in the figure below.

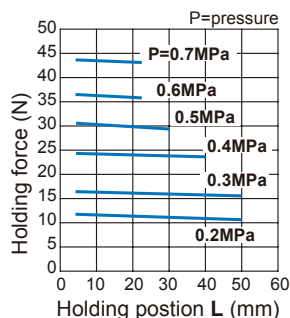


External gripping force

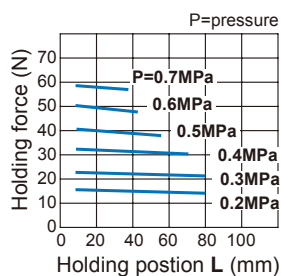
MCHC-10



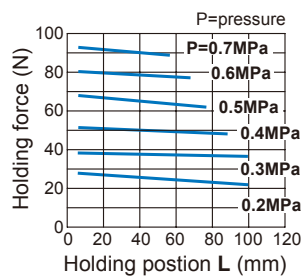
MCHC-16



MCHC-20

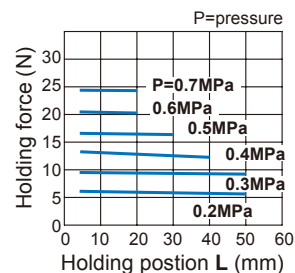


MCHC-25

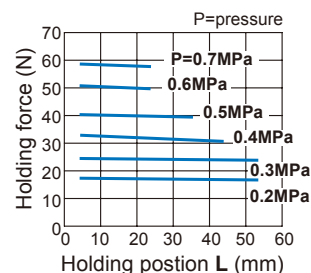


Internal gripping force

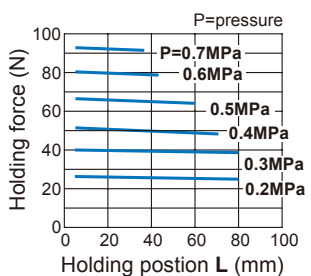
MCHC-10



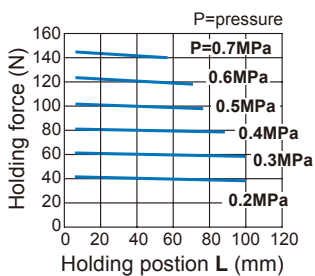
MCHC-16



MCHC-20



MCHC-25



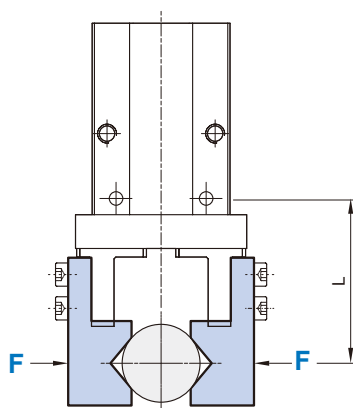
Effective gripping force (Single acting)

Indication of effective force.

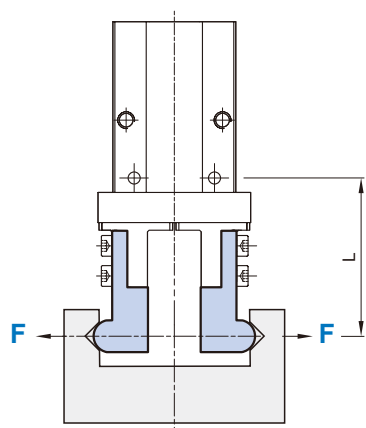
The effective gripping force shown in the graphs to the right is expressed as F, which is the thrust of one finger, when both fingers and attachments are in full contact with the workpiece as shown in the figure below.

$$1N = 0.102 \text{ kgf}$$

$$1\text{MPa} = 10.2 \text{ kgf/cm}^2$$

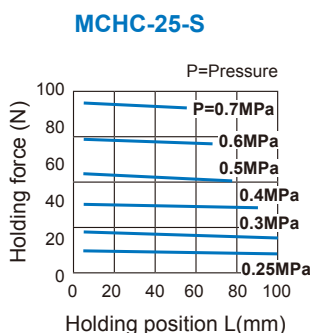
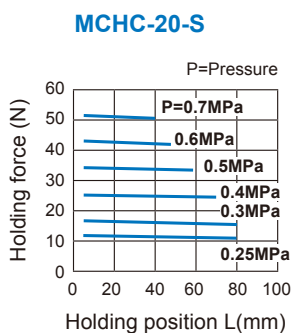
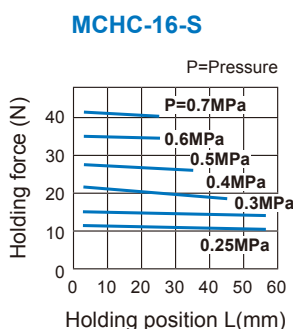
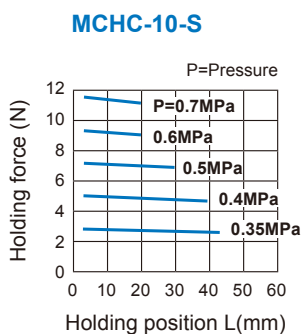


External grip
(Single acting / Normally open)

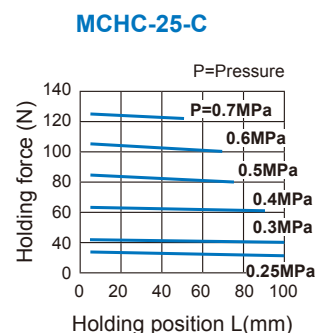
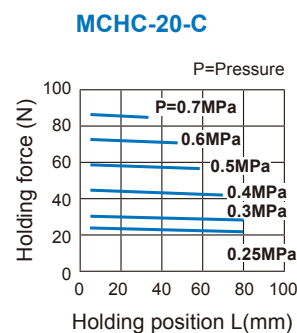
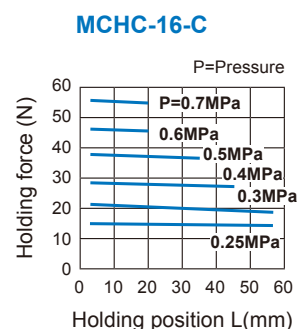
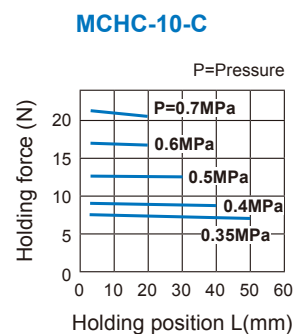


Internal grip
(Single acting / Normally closed)

External gripping force Single acting / N.O.

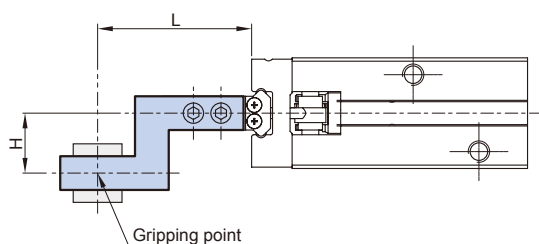


Internal gripping force Single acting / N.C.

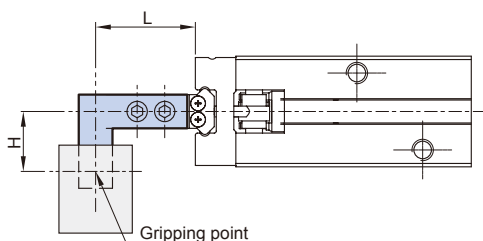


Confirmation of gripping point

- The air gripper should be operated so that the workpiece gripping point "L" and the amount of overhang "H" stay within the range shown for each operating pressure given in the graphs to the right.
- If the workpiece gripping point goes beyond the range limits, this will have an adverse effect on the life the air gripper.



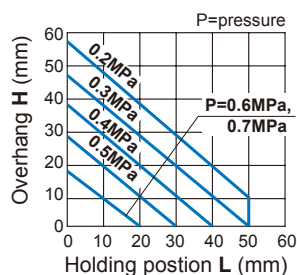
External grip



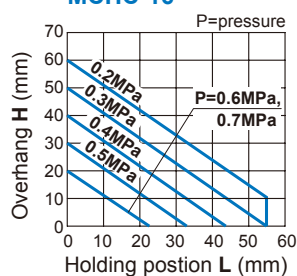
Internal grip

External gripping force

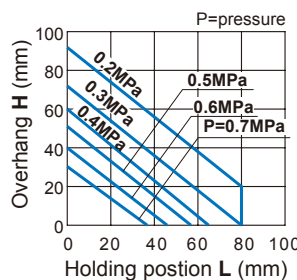
MCHC-10



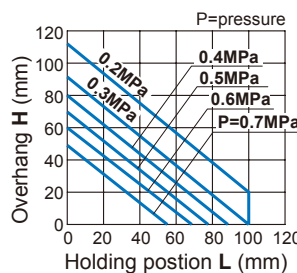
MCHC-16



MCHC-20

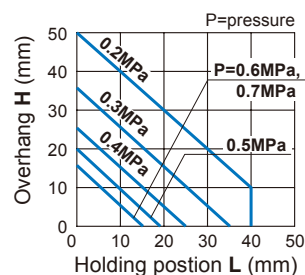


MCHC-25

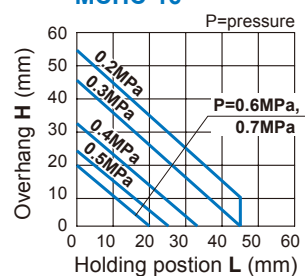


Internal gripping force

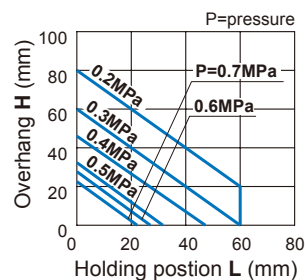
MCHC-10



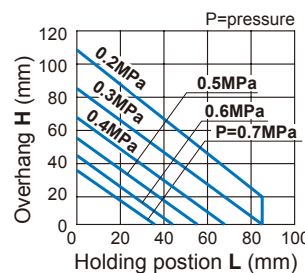
MCHC-16



MCHC-20

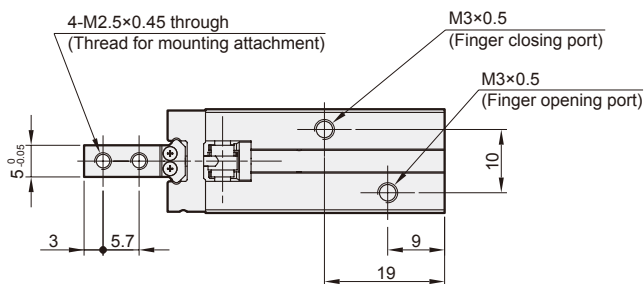
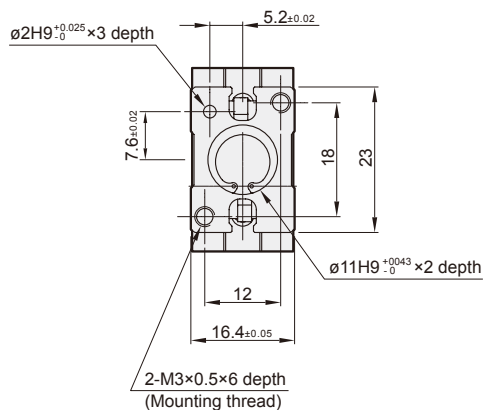
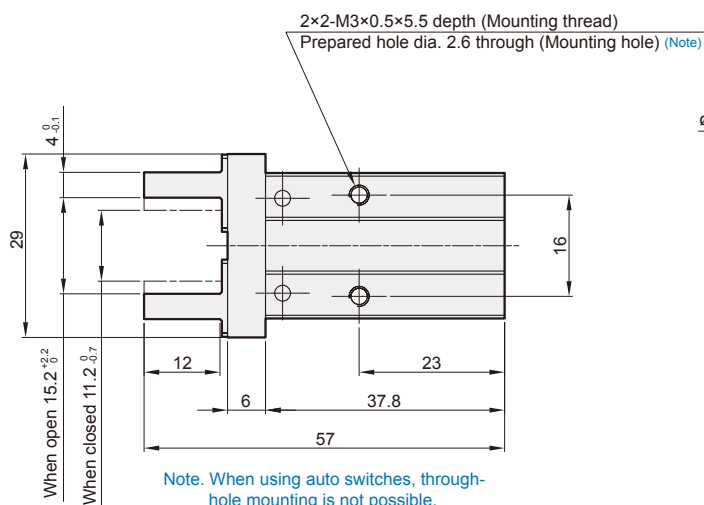
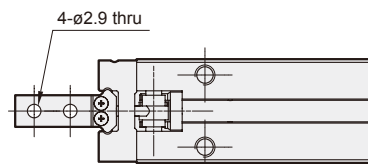
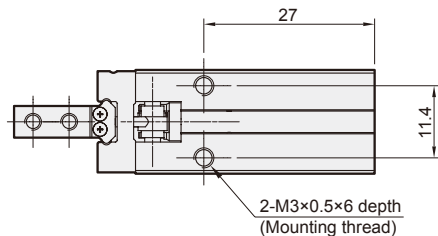


MCHC-25



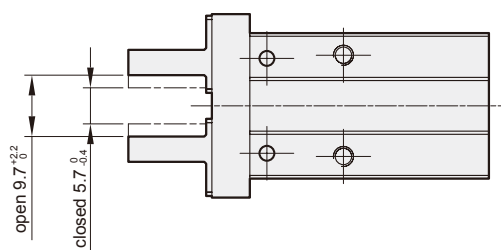
Through hole type

MCHC-10-2 / MCHC-10-N2



Finger position – Narrow type

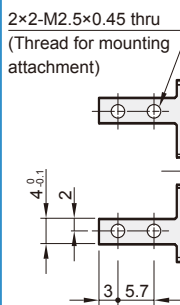
MCHC-10-N



Side tapped mounting

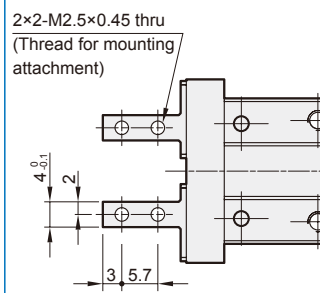
Standard

MCHC-10-1



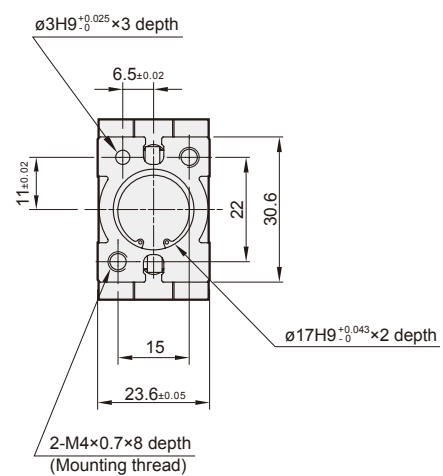
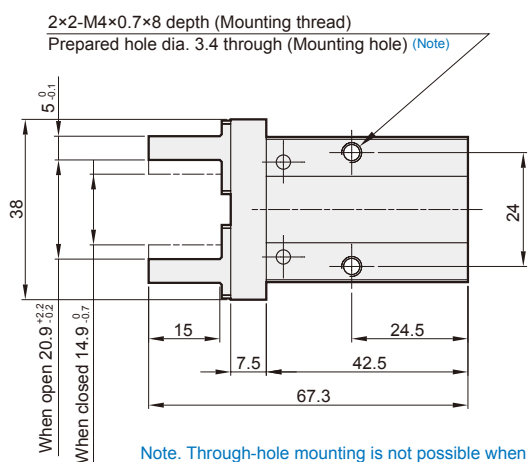
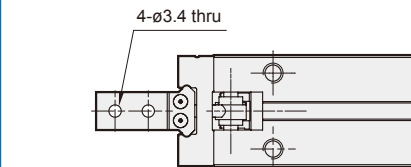
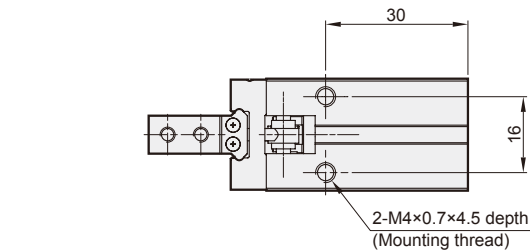
Narrow type

MCHC-10-N1

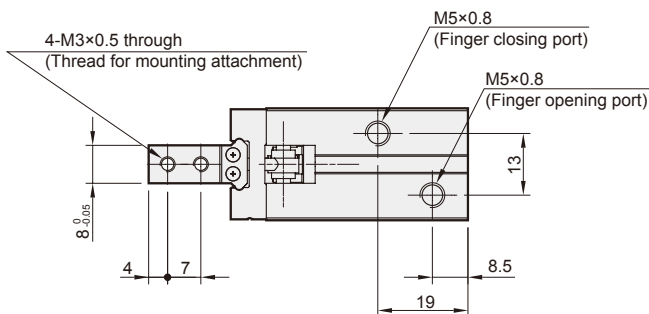


Through hole type

MCHC-16-2 / MCHC-16-N2

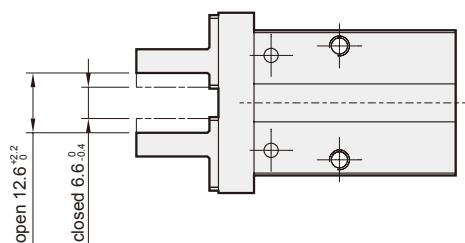


Note. Through-hole mounting is not possible when using the auto switch at the square groove.



Finger position – Narrow type

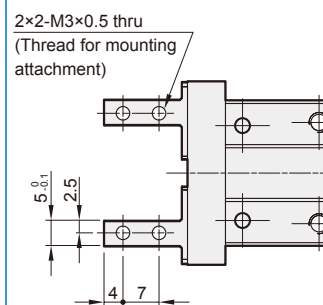
MCHC-16-N



Side tapped mounting

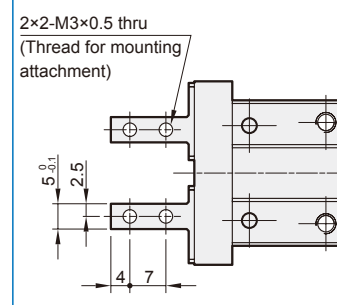
Standard

MCHC-16-1



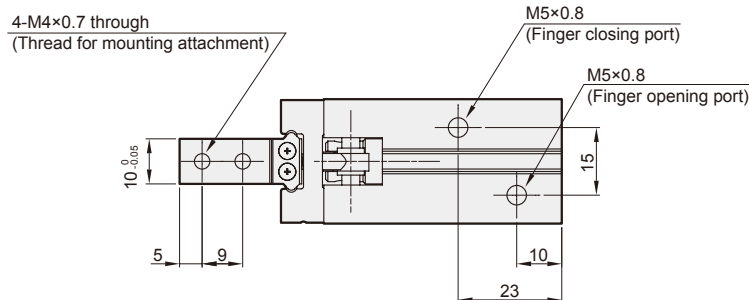
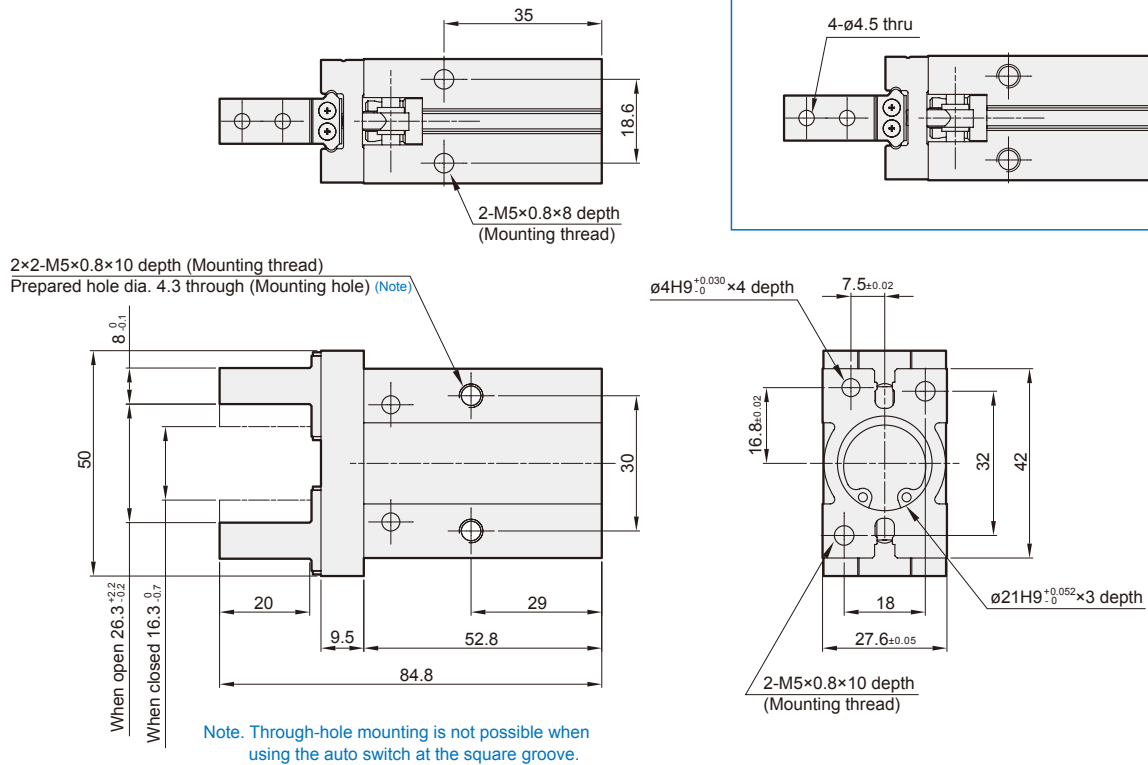
Narrow type

MCHC-16-N1



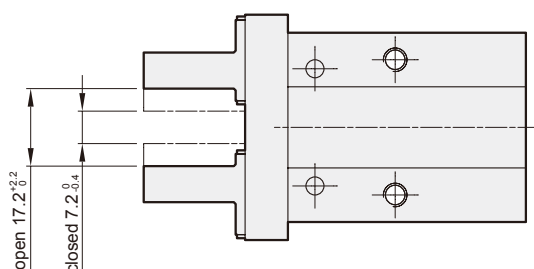
Through hole type

MCHC-20-2 / MCHC-20-N2



Finger position – Narrow type

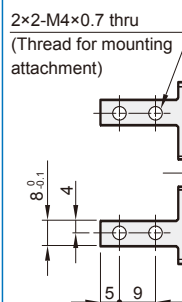
MCHC-20-N



Side tapped mounting

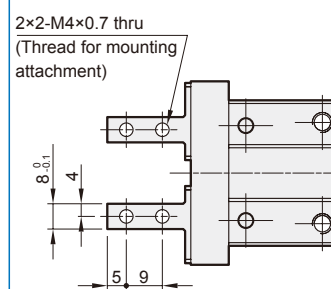
Standard

MCHC-20-1



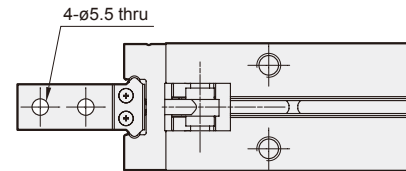
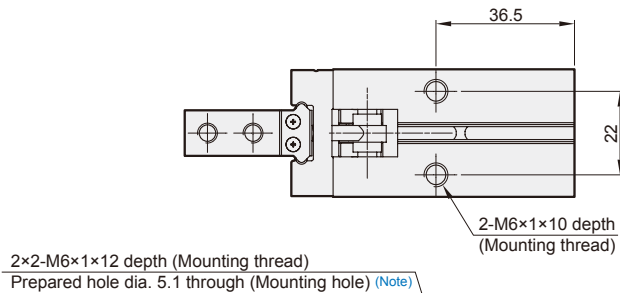
Narrow type

MCHC-20-N1

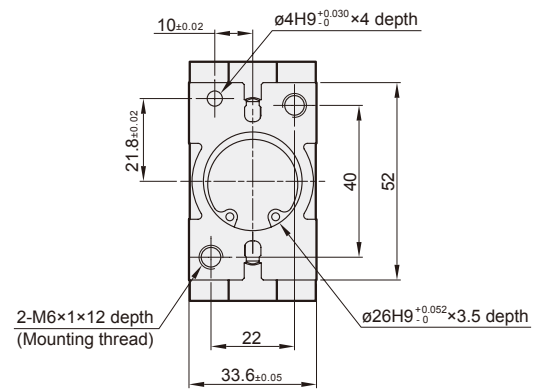
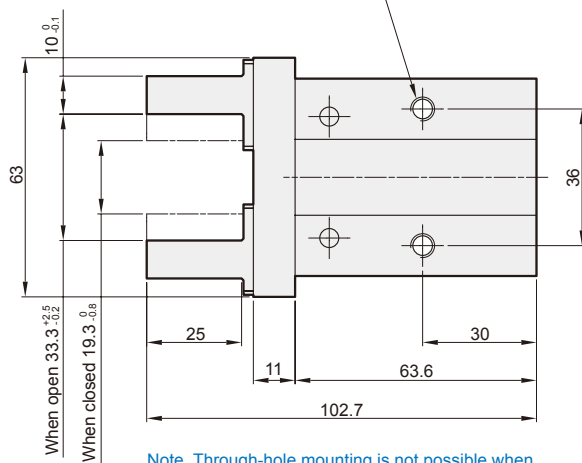


Through hole type

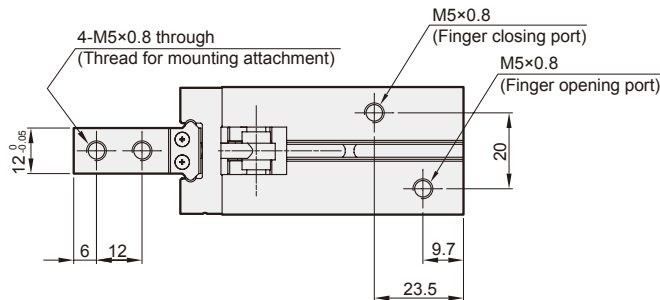
MCHC-25-2 / MCHC-25-N2



2x2-M6x1x12 depth (Mounting thread)
Prepared hole dia. 5.1 through (Mounting hole) (Note)



Note. Through-hole mounting is not possible when using the auto switch at the square groove.



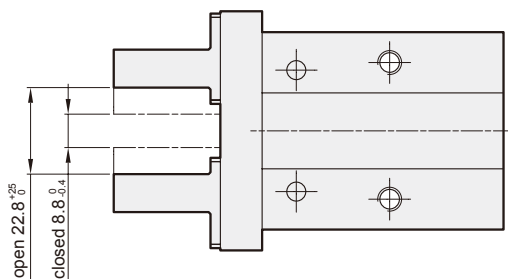
Side tapped mounting

Standard

Narrow type

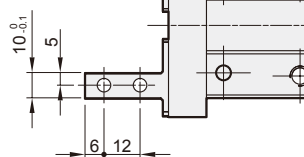
Finger position – Narrow type

MCHC-25-N



MCHC-25-1

2x2-M5x0.8 thru (Thread for mounting attachment)



MCHC-25-N1

2x2-M5x0.8 thru (Thread for mounting attachment)

