MCHC series

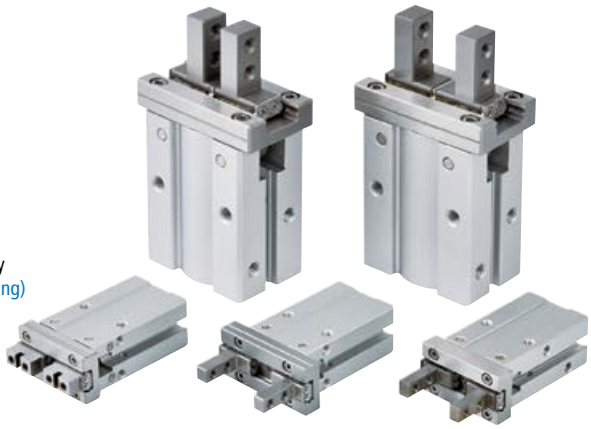
PARALLEL GRIPPER (2-Finger)

mindman

Model selection

Technical data

Caution for safety
(Read before installing)



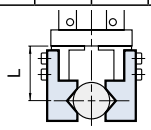
Features

- Integral linear guide used for high rigidity and high precision.
- The material of finger is martensitic stainless steel.
- Body thickness tolerance ±0.05mm.
- Bottom pin holes for accurate re-locating.
- Grooves on the body for sensor switch to be inserted into.
- The gripping stroke of long-stroke type is approximately double compare with standard type.
- Magnetic as standard.

Specification

Model			MCHC						
Acting type			Double acting / Single acting						
Tube I.D. (mm)			6	10	16	20	25	32	40
Opening / Closing stroke (mm)			4	4(8)	6(12)	10(18)	14(22)	22	30
Port size			M3×0.5		M5×0.8				
Medium			Air						
Operating pressure range (MPa)	Double acting		0.15~0.7	0.2~0.7	0.1~0.7				
	Single acting		–	0.35~0.7	0.25~0.7			–	
Ambient temperature			-10~+60°C (No freezing)						
Repeatability (mm)			± 0.01					± 0.02	
Max. operating frequency (c.p.m)			180 (120)					60	
Lubricator			Not required						
Volume (cm^3)	Double acting	A port inlet	0.2	0.6 (0.6)	1.4 (1.8)	2.9 (3.6)	4.5 (6.5)	11.6	28.3
		B port inlet	0.1	0.3 (0.5)	1.1 (1.9)	1.9 (2.7)	3 (4.9)	9.2	19
	S: Single acting	A port inlet	–	0.5	1.3	3.2	5	–	–
		B port inlet	–	0.4	1.2	2.1	3.8	–	–
	C: Single acting	A port inlet	–	0.5	1.3	3.4	5.2	–	–
		B port inlet	–	0.3	1.1	1.7	3.4	–	–
Sensor switch		ø6,32,40	RDC(V), RQC(V), RDFE(V)						
		ø10~40	RDE, RDE-D: Non-contact						
Weight (g)	Double acting	Standard	27	55	124	250	461	732	1298
		Long stroke	–	56	125	252	463	–	–
		Flat type	–	53	124	244	450	760	1344
	Single acting		–	70	145	270	490	–	–

* ( ) value for long stroke.

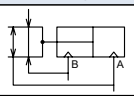
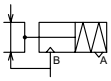
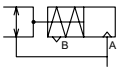


Order example

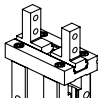
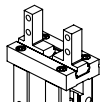
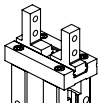
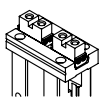
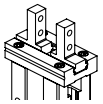
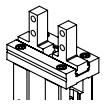
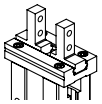
MCHC □ — 20 — □ N

Model	Tube ID.	Style (*1)	Type (*2)
MCHC (Standard stroke)	**6**	Blank: Double acting	Blank: Standard **1**: Standard (Side tapped) **2**: Standard (Through hole)
	10 **16** **20** **25**	Blank: Double acting **S**: Single acting / Normally open **C**: Single acting / Normally closed	Blank: Standard **1**: Standard (Side tapped) **2**: Standard (Through hole) **3**: Flat **N**: Narrow **N1**: Narrow (Side tapped) **N2**: Narrow (Through hole)
	32 **40**	Blank: Double acting	Blank: Standard **1**: Standard (Side tapped) **2**: Standard (Through hole) **3**: Flat
MCHCL (Long stroke)	**10** **16** **20** **25**	Blank: Double acting	Blank: Standard **1**: Standard (Side tapped) **2**: Standard (Through hole)

*1. STYLE

Blank: Double acting	**S**: Single acting / Normally open	**C**: Single acting / Normally closed
		

*2. TYPE

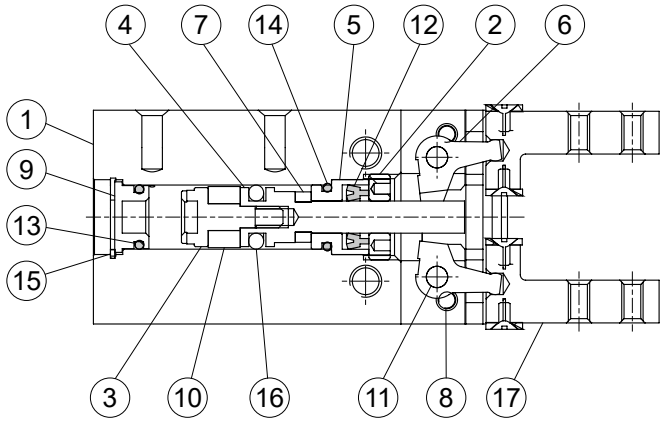
Blank: Standard	**1**: Standard (Side tapped)	**2**: Standard (Through hole)	**3**: Flat
			
N: Narrow	**N1**: Narrow (Side tapped)	**N2**: Narrow (Through hole)	
			

Gripping force

Tube I.D.		6	10	16	20	25	32	40
Double acting	External	3.3 (0.3)	11 (1.1)	34 (3.5)	42 (4.3)	65 (6.6)	158 (15.8)	254 (25.4)
	Internal	6.1 (0.6)	17 (1.7)	45 (4.6)	66 (6.7)	104 (10.6)	193 (19.3)	318 (31.8)
S: Single acting / Normally open	External	–	7.1 (0.7)	27 (2.8)	33 (3.4)	45 (4.6)	–	–
C: Single acting / Normally closed	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



Material

No.	Part name	Material	Q'y	Repair kits (inclusion)
1	Body	Aluminum alloy	1	
2	Front cap	Stainless steel	1	
3	Magnet holder	Stainless steel	1	
4	Piston rod	Stainless steel	1	
5	Rod cover	Stainless steel	1	
6	Lever	Stainless steel	2	
7	Cushion pad	PU	1	●
8	Screw	Stainless steel	4	
9	End cover	Aluminum alloy	1	
10	Magnet ring	Magnet material	1	
11	Pin	Bearing steel	2	
12	Rod packing	NBR	1	●
13	O-ring	NBR	1	●
14	O-ring	NBR	1	●
15	Snap ring	Carbon steel	1	
16	Piston packing	NBR	1	●
17	Gripping set	Stainless steel (*)	1	

* Bearing steel balls as standard.

Order example of repair kits

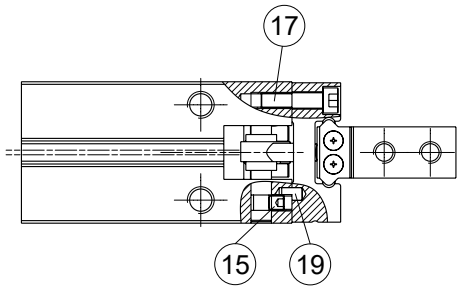
Tube I.D.	Repair kits
ø6	**PS-MCHC-6**

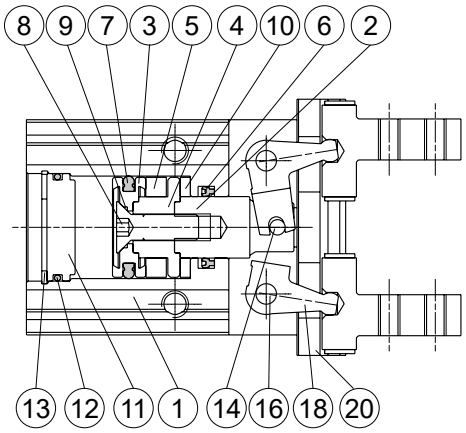
MCHC Inside structure & Parts list ø10~ø40

PARALLEL GRIPPER (2-Finger)

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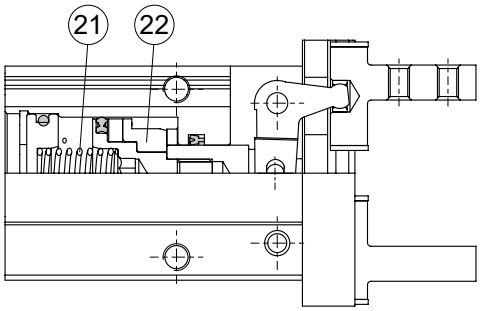
Double acting





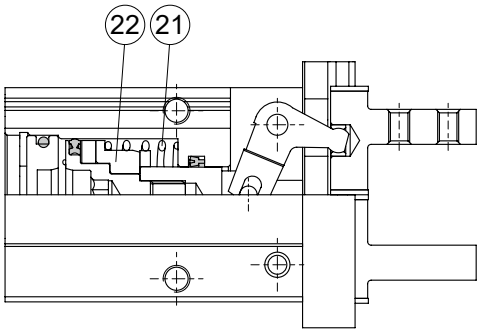
Single acting

Normally open



Single acting

Normally closed



Material

No.	Tube I.D. / Part name	10	16	20	25	32	40	Q'y	Repair kits (inclusion) Double	Single
1	Body	Aluminum alloy						1		
2	Piston rod	Stainless steel						1		
3	Piston	Aluminum alloy *1						1		
4	Magnet holder	*2	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	O-ring	—	NBR					1	●	
10	Cushion pad	PU						1	●	●
11	End cover	Aluminum alloy						1		
12	Cover ring	NBR						1	●	●
13	Snap ring	*3	Stainless steel					1		
14	Spindle river	Carbon steel						1		
15	Screw	*2	Alloy steel					4		
16	Grip rivet	Bearing steel						2		
17	Bolt	Stainless steel						4		
18	Lever	Stainless steel						2		

No.	Tube I.D. / Part name	10	16	20	25	32	40	Q'y	Repair kits (inclusion) Double	Single
19	Pin	Bearing steel						2		
20	Gripping set	Stainless steel *4						1		
21	Spring	Stainless steel						1		
22	Spring holder	Stainless steel						1		

*1. Single acting: Stainless steel
*2. Stainless steel
*3. Carbon steel
*4. Bearing steel balls as standard.

Order example of repair kits

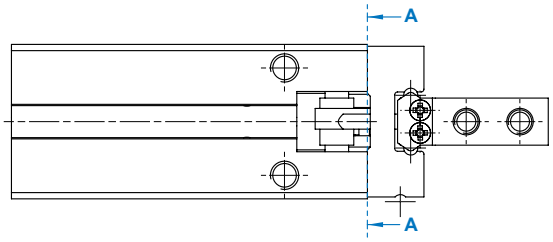
Tube I.D.	Repair kits	
	Double acting	Single acting N.O. / N.C.
ø10	**PS-MCHC-10**	**PS-MCHC-10-S**
ø16	**PS-MCHC-16**	**PS-MCHC-16-S**
ø20	**PS-MCHC-20**	**PS-MCHC-20-S**
ø25	**PS-MCHC-25**	**PS-MCHC-25-S**
ø32	**PS-MCHC-32**	–
ø40	**PS-MCHC-40**	–

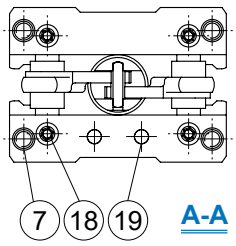
MCHCL Inside structure & Parts list ø10~ø25

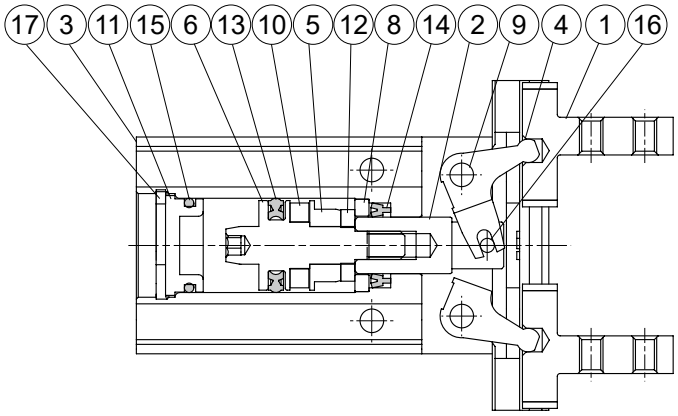
PARALLEL GRIPPER

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Double acting







Material

No.	Tube I.D. / Part name	10	16	20	25	Q'y	Repair kits (inclusion)
1	Gripping set	Stainless steel *1				1	
2	Piston rod	Stainless steel				1	
3	Body	Aluminum alloy				1	
4	Lever	Stainless steel				2	
5	Spring holder	Stainless steel				1	
6	Piston	Stainless steel				1	
7	Bolt	Stainless steel				4	
8	Stop ring	*2	–			1	
9	Grip rivet	Carbon steel				2	
10	Magnet ring	Magnet material				1	
11	End cover	Aluminum alloy				1	
12	Gasket	NBR				1	●
13	Piston packing	NBR				1	●
14	Rod packing	NBR				1	●
15	O-ring	NBR				1	●
16	Spindle river	Carbon steel				1	
17	Snap ring	*3	Stainless steel			1	
18	Hexagon screw	*2		Alloy steel		4	
19	Pin	Carbon steel				2	

*1. Bearing steel balls as standard.
2. Stainless steel 3.Carbon steel

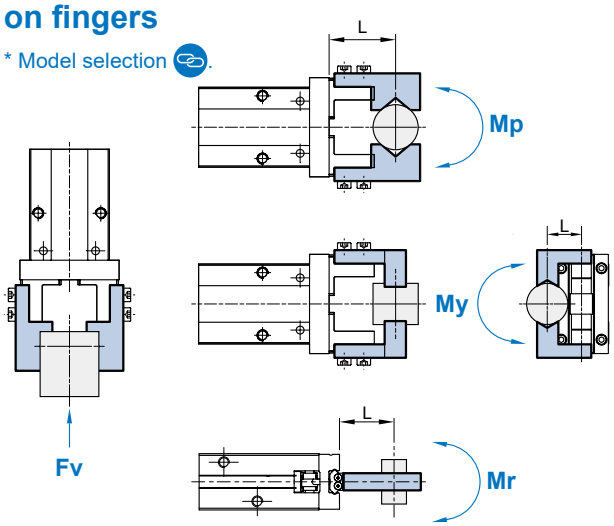
Order example of repair kits

* ø10 use the same repair kits with standard stroke single acting type.

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

Confirmation of external force on fingers

* Model selection .



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)
6	10	0.04	0.04	0.08
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
32	343	3	3	6
40	490	4.5	4.5	9

* 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.

$$\text{Allowable load } F(N) = \frac{0.68\ (N\cdot m)}{25\times10^{-3}(m)}$$

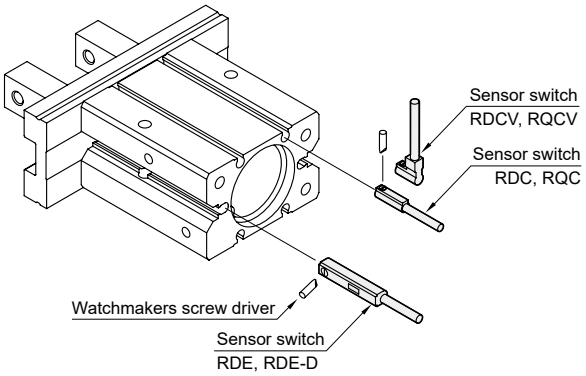
$$= 27.2\ (N)$$

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.

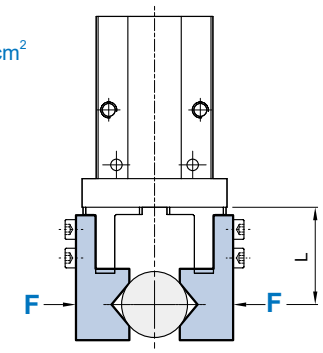
Installation of sensor switch



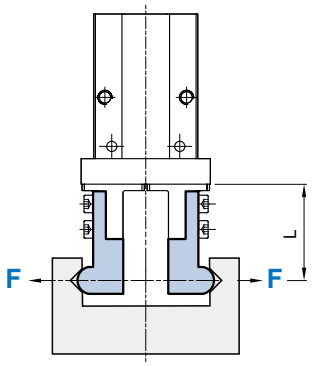
Effective gripping force (Double acting)

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.

1N=0.102 kgf
1MPa=10.2 kgf/cm^2

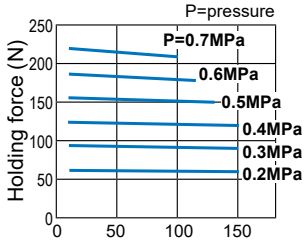


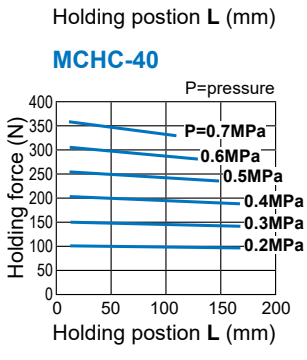
External grip



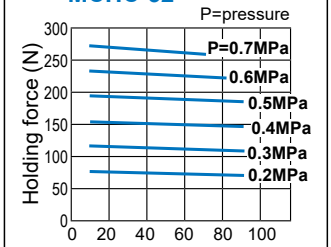
Internal grip

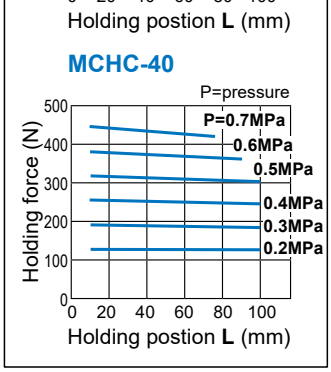
External gripping force



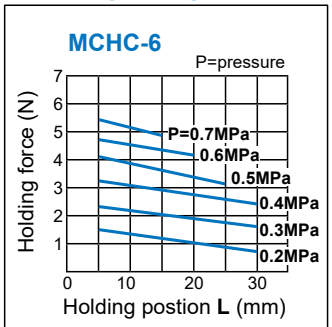


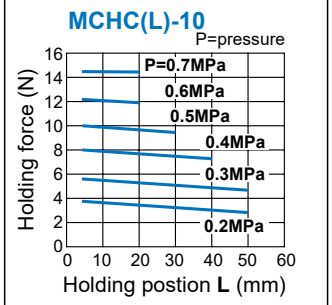
Internal gripping force

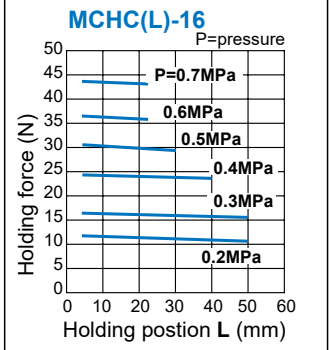


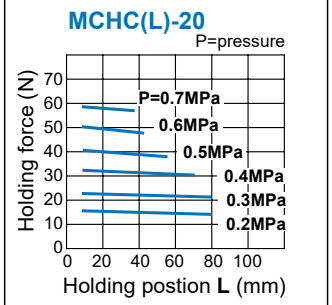


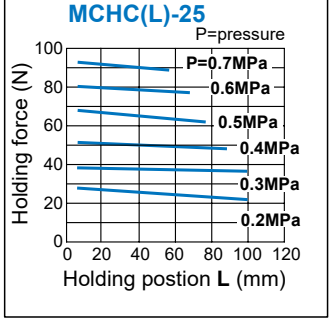
External gripping force



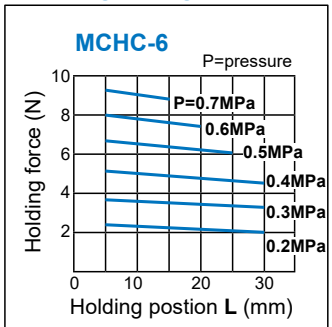


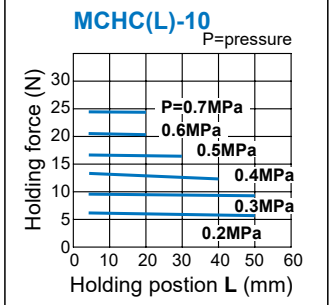


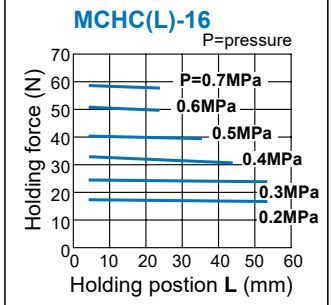


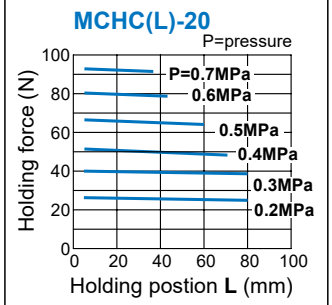


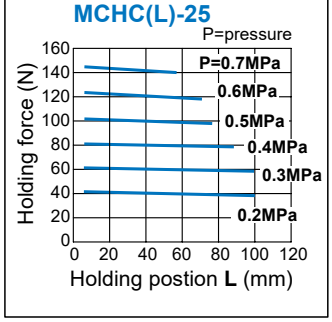
Internal gripping force







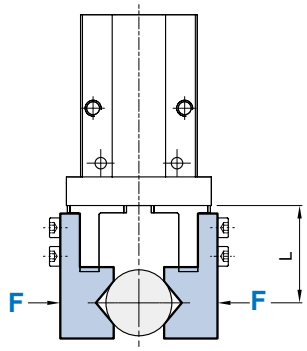




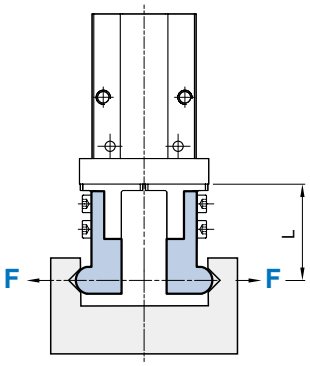
Effective gripping force (Single acting)

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 kgf
1MPa=10.2 kgf/cm^2

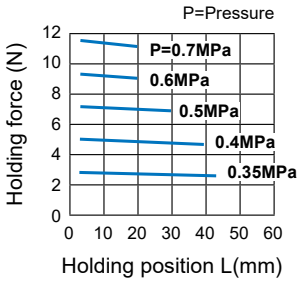


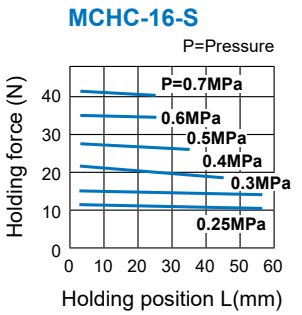
External grip
(Single acting / Normally open)

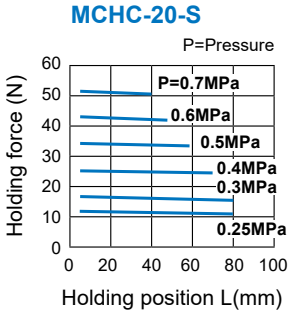


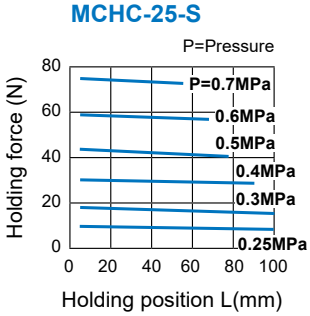
Internal grip
(Single acting / Normally closed)

External gripping force
Single acting / N.O.

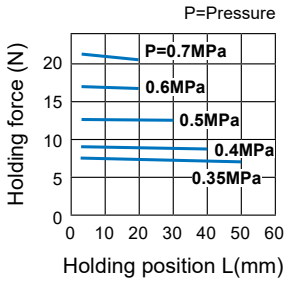


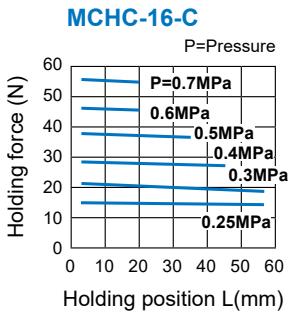


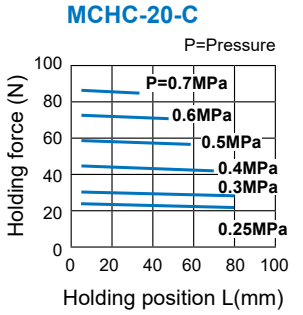


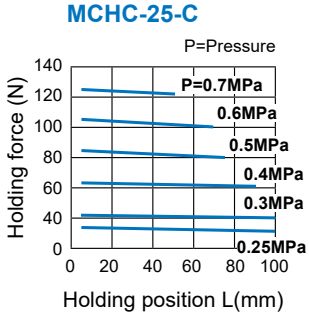


Internal gripping force
Single acting / N.C.



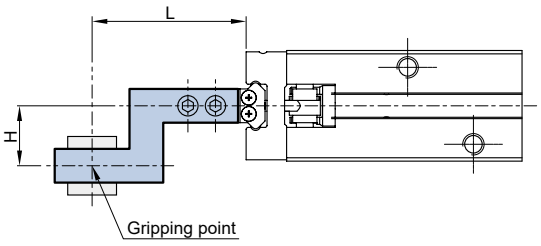




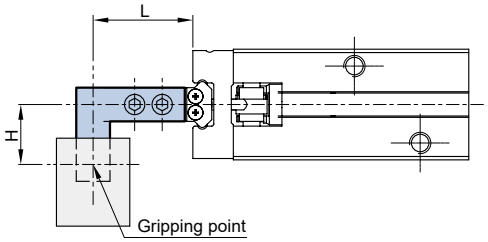


Confirmation of gripping point

- 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.



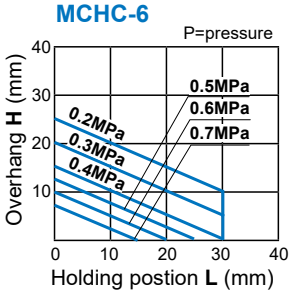
External grip



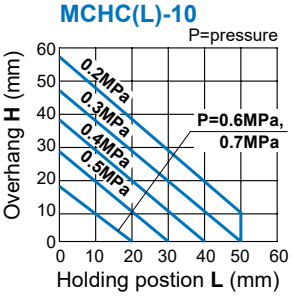
Internal grip

External gripping

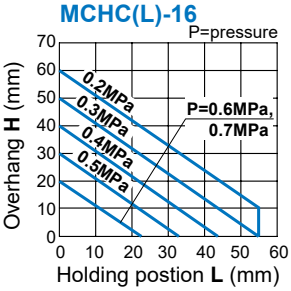
MCHC-6



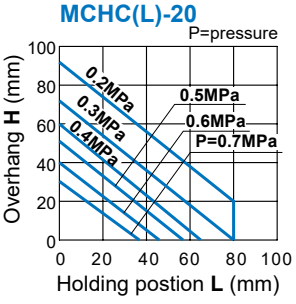
MCHC(L)-10



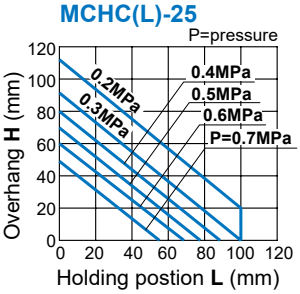
MCHC(L)-16



MCHC(L)-20

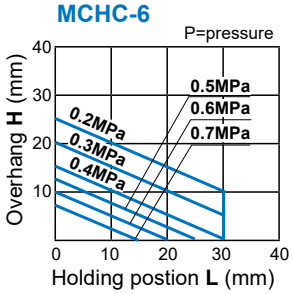


MCHC(L)-25

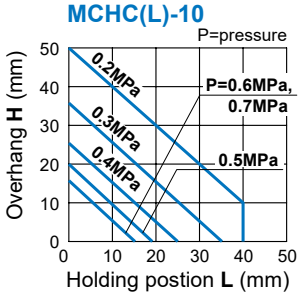


Internal gripping

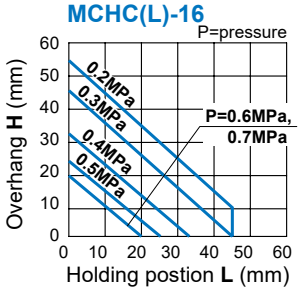
MCHC-6



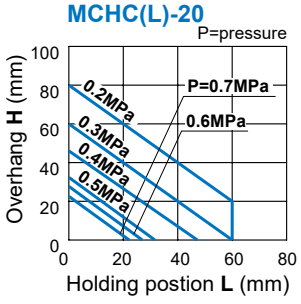
MCHC(L)-10



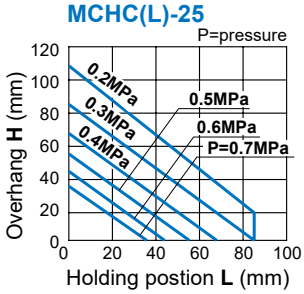
MCHC(L)-16



MCHC(L)-20

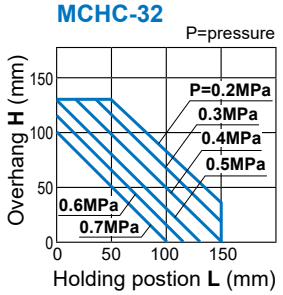


MCHC(L)-25

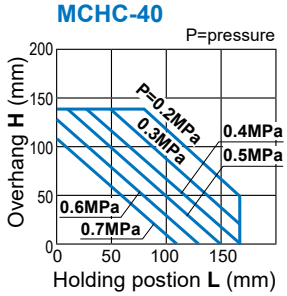


External gripping

MCHC-32

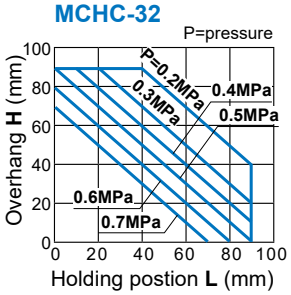


MCHC-40

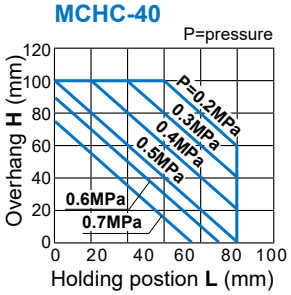


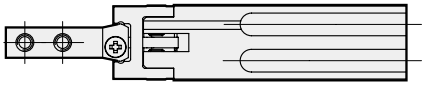
Internal gripping

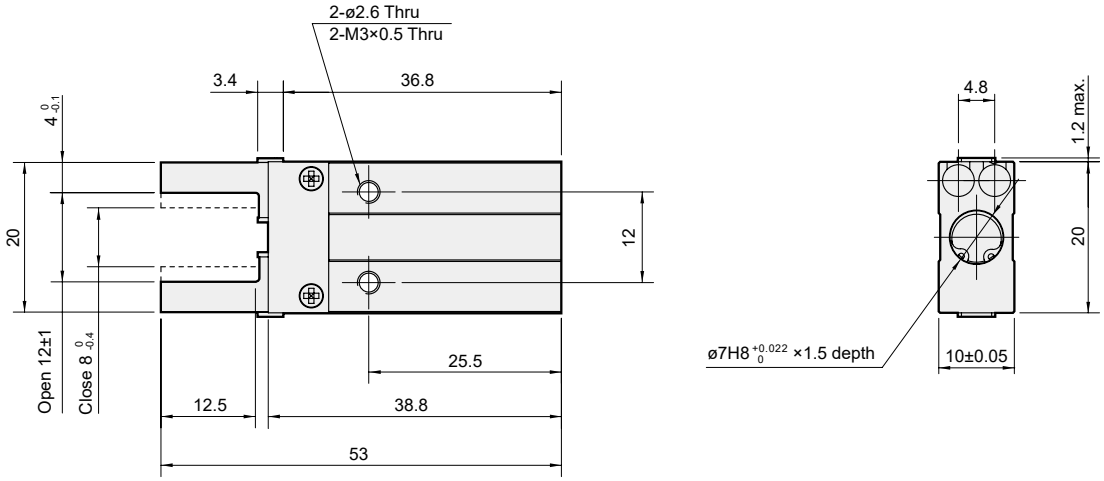
MCHC-32

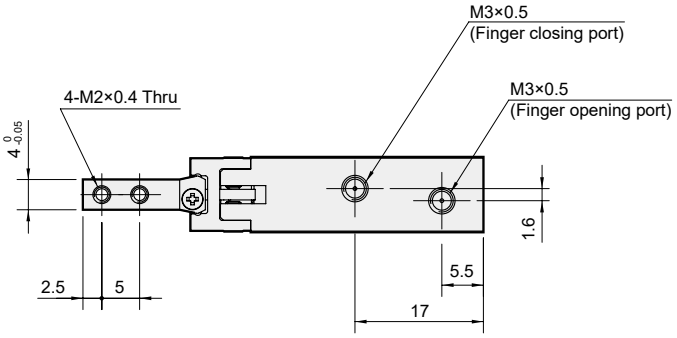


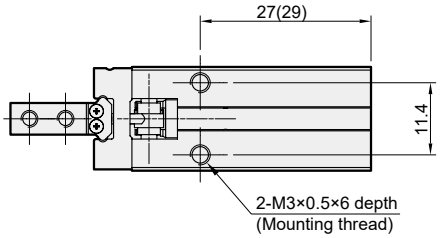
MCHC-40

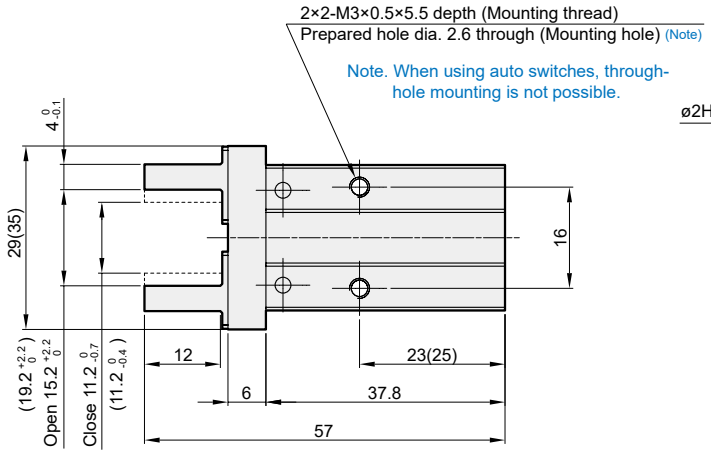


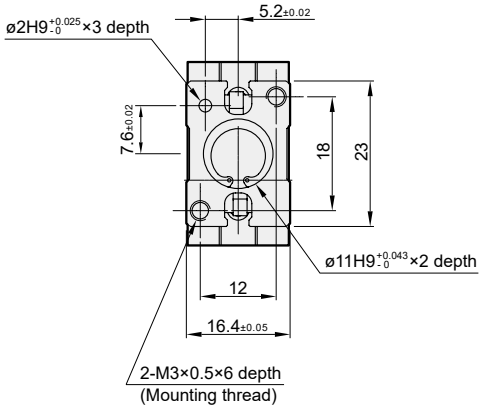


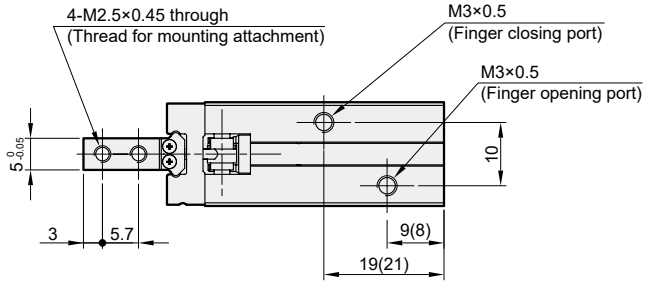

2-ø2.6 Thru
2-M3×0.5 Thru
3.4
36.8
4 0 -0.1
20
12
Open 12±1
Close 8 0 -0.4
25.5
12.5
38.8
53
4.8
1.2 max.
20
ø7H8 +0.022 0 ×1.5 depth
10±0.05


M3×0.5
(Finger closing port)
M3×0.5
(Finger opening port)
4-M2×0.4 Thru
4 0 -0.05
1.6
5.5
17
2.5
5





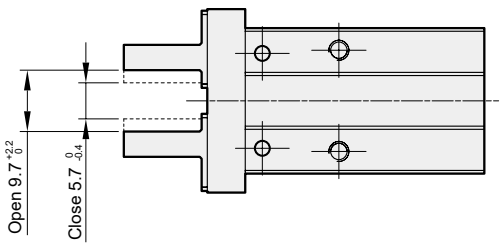


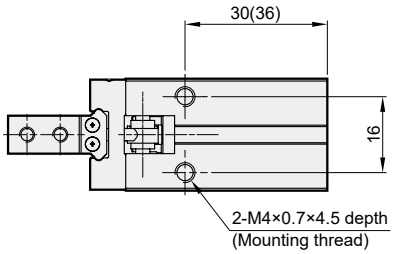


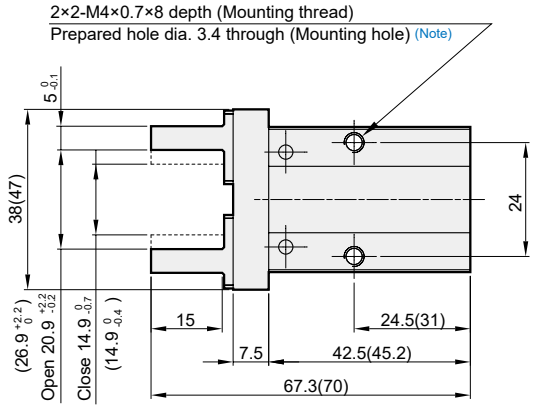
*( ) for long stroke value.

Finger position – Narrow

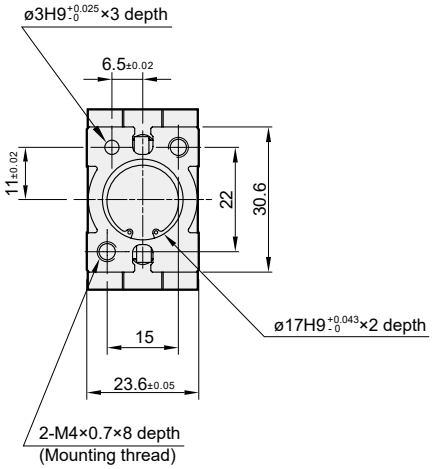
MCHC(L)-10-N

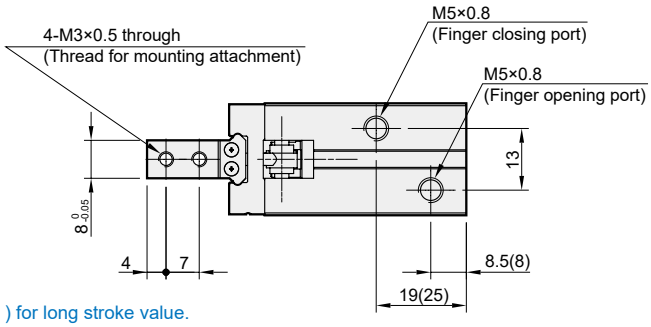






Note. Through-hole mounting is not possible when using the auto switch at the square groove.

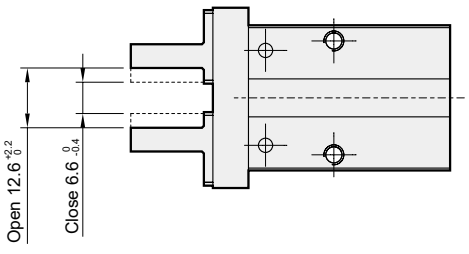


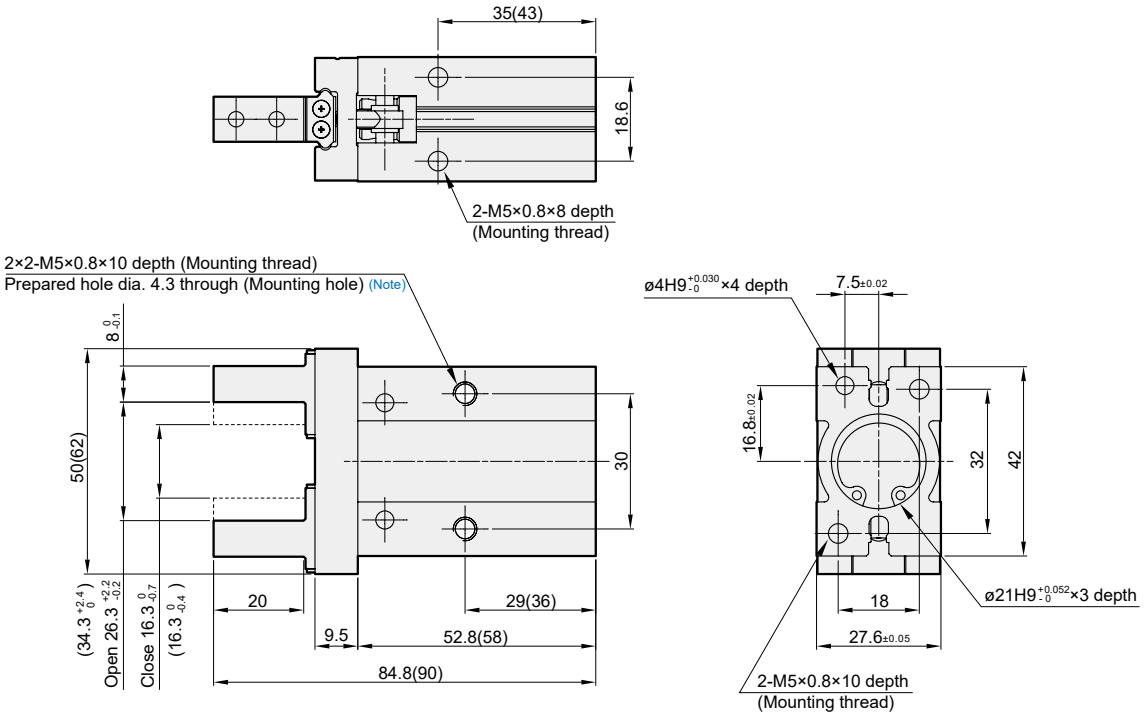


*( ) for long stroke value.

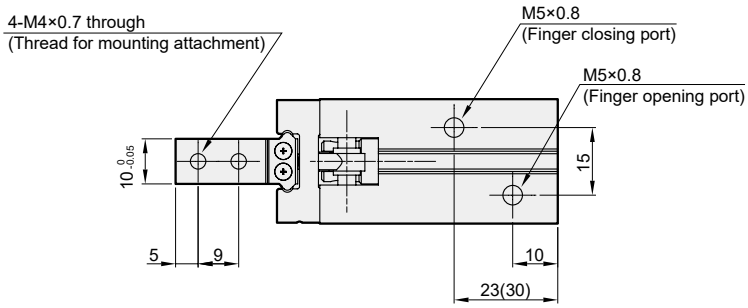
Finger position – Narrow

MCHC(L)-16-N





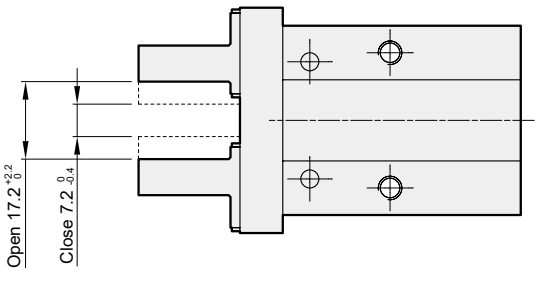
Note. Through-hole mounting is not possible when using the auto switch at the square groove.

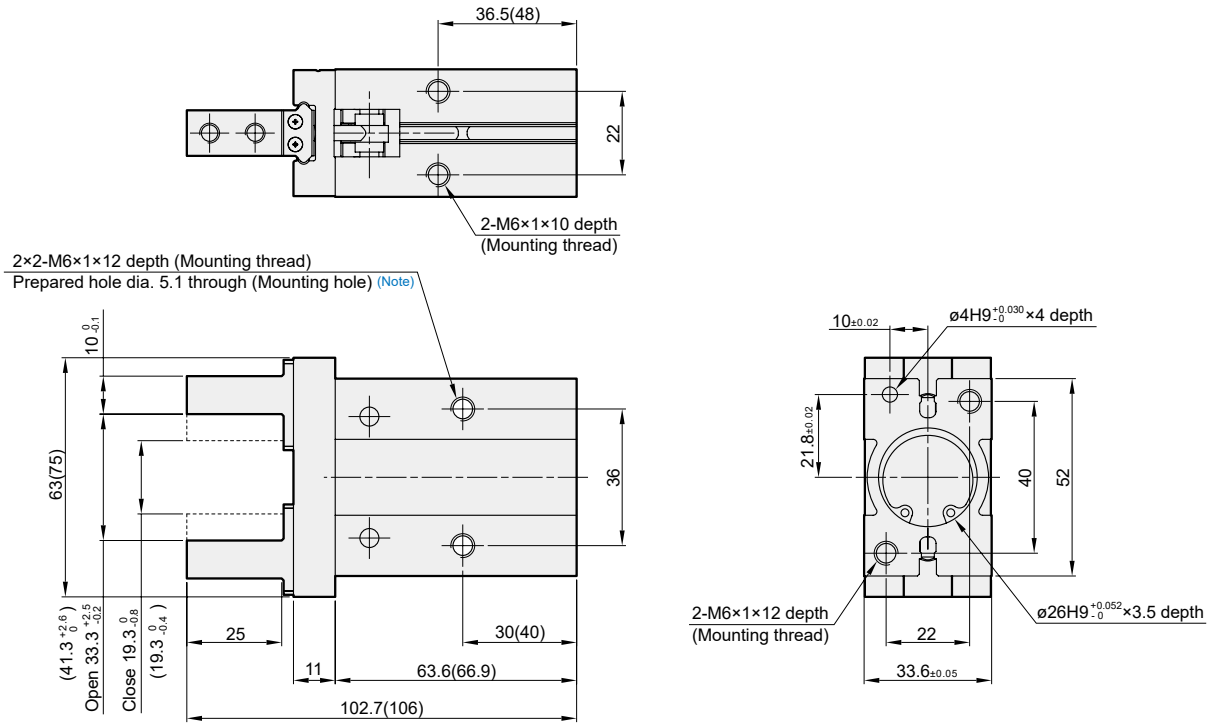


*( ) for long stroke value.

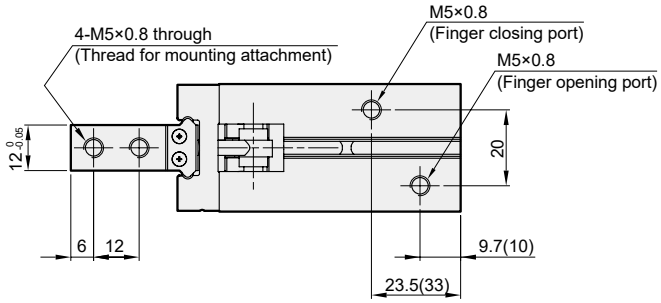
Finger position – Narrow

MCHC(L)-20-N





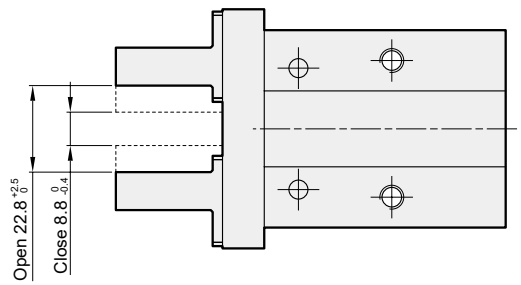
Note. Through-hole mounting is not possible when using the auto switch at the square groove.

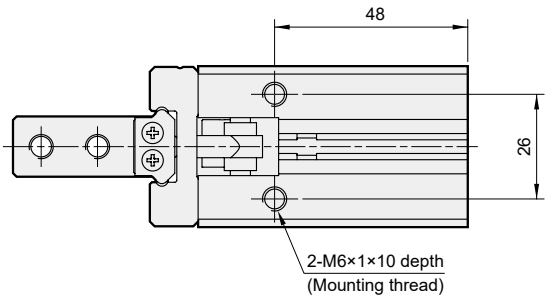


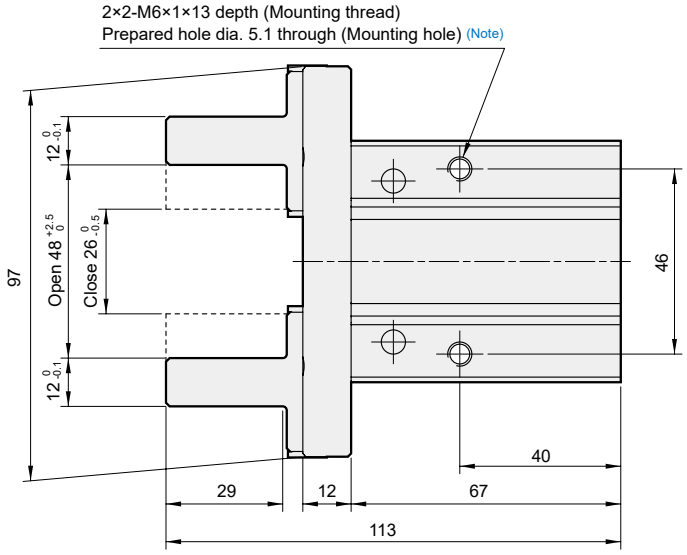
*( ) for long stroke value.

Finger position – Narrow

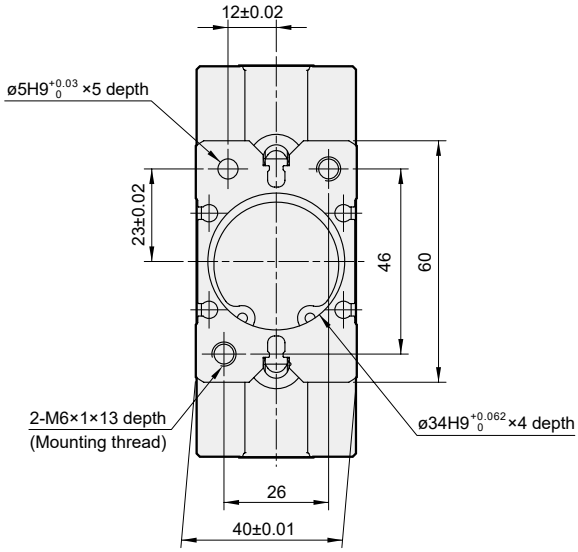
MCHC(L)-25-N

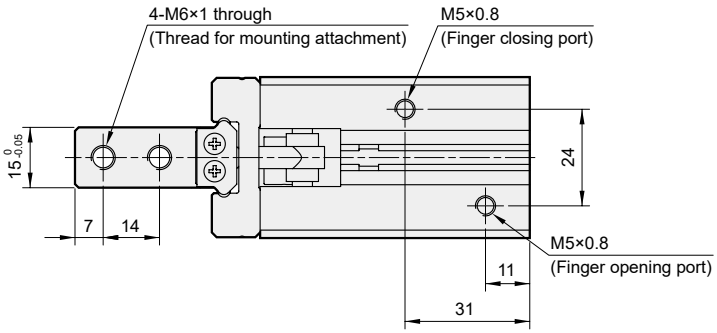


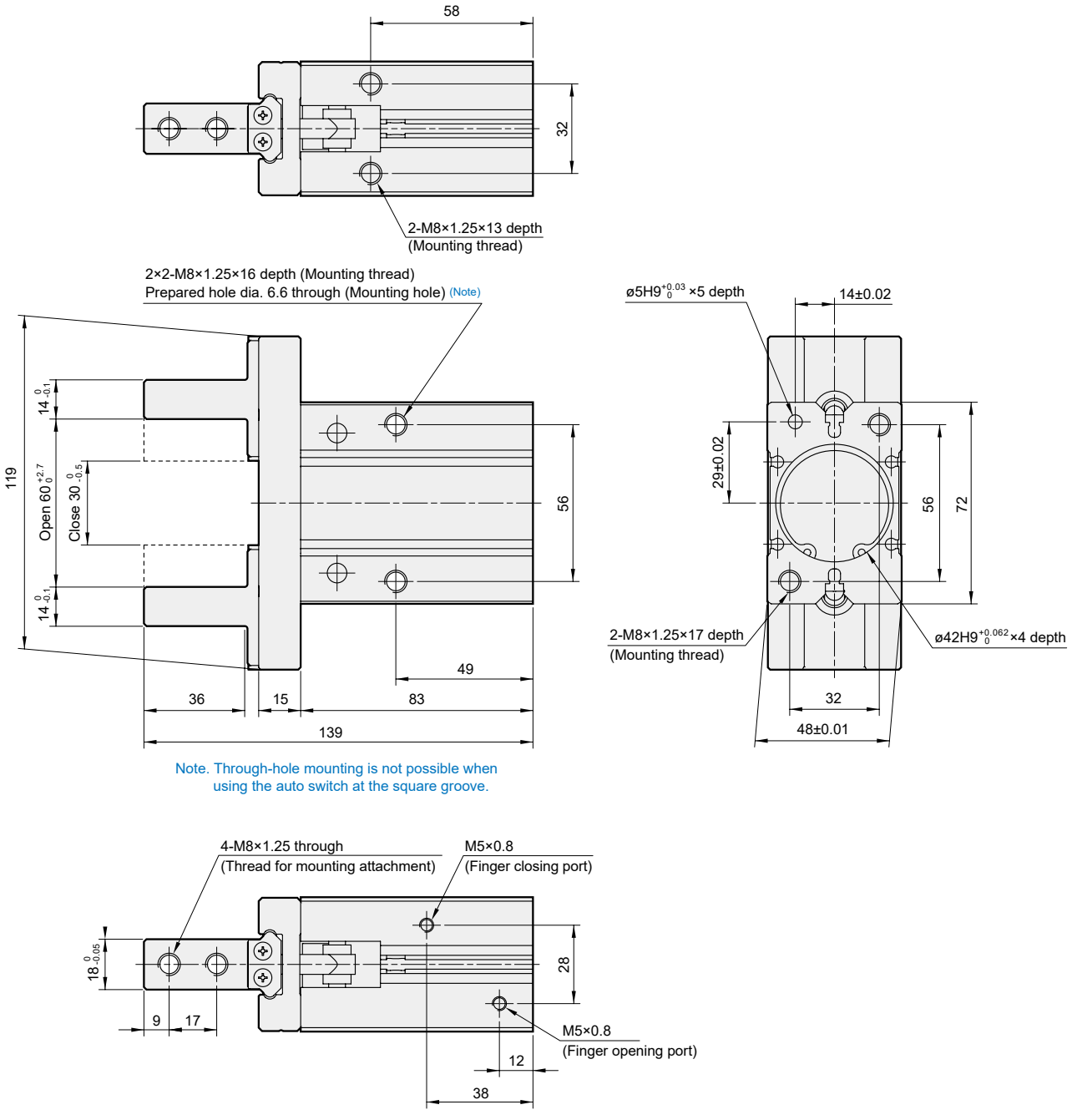




Note. Through-hole mounting is not possible when using the auto switch at the square groove.

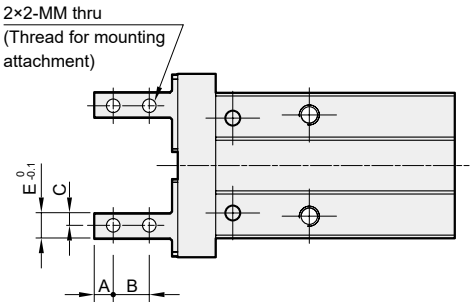






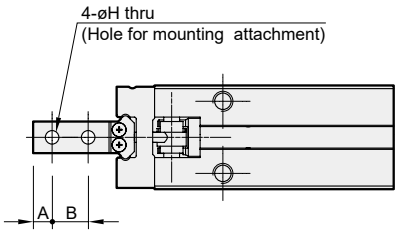
Note. Through-hole mounting is not possible when using the auto switch at the square groove.

MCHC*-1, N1 Side tapped



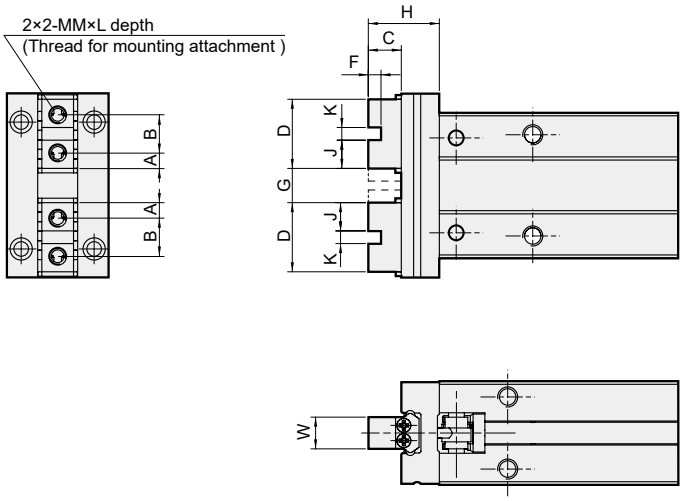
Code / Tube I.D.	A	B	C	E	MM
6	2.5	5	2	4	M2×0.4
10	3	5.7	2	4	M2.5×0.45
16	4	7	2.5	5	M3×0.5
20	5	9	4	8	M4×0.7
25	6	12	5	10	M5×0.8
32	7	14	6	12	M6×1.0
40	9	17	7	14	M8×1.25

MCHC*-2, N2 Through hole



Code / Tube I.D.	A	B	H
6	2.5	5	ø2.4
10	3	5.7	ø2.9
16	4	7	ø3.4
20	5	9	ø4.5
25	6	12	ø5.5
32	7	14	ø6.6
40	9	17	ø9

MCHC*-3 Flat



Code / Tube I.D.	A	B	C	D	F	G Open	G Closed	H	J	K	MM	L	W
10	2.45	6	5.2	10.9	2	5.4 +2.2 0	1.4 0 -0.2	11.2	4.45	2H9 +0.025 0	M2.5×0.45	5	5 0 -0.05
16	3.05	8	8.3	14.1	2.5	7.4 +2.2 0	1.4 0 -0.2	15.8	5.8	2.5H9 +0.025 0	M3×0.5	6	8 0 -0.05
20	3.95	10	10.5	17.9	3	11.6 +2.3 0	1.6 0 -0.2	20	7.45	3H9 +0.025 0	M4×0.7	8	10 0 -0.05
25	4.90	12	13.1	21.8	4	16 +2.5 0	2 0 -0.2	24.1	8.9	4H9 +0.03 0	M5×0.8	10	12 0 -0.05
32	7.30	20	18	34.6	5	25 +2.7 0	3 0 -0.2	30	14.8	5H9 +0.03 0	M6×1.0	12	15 0 -0.05
40	8.70	24	22	41.4	6	33 +2.9 0	3 0 -0.2	37	17.7	6H9 +0.03 0	M8×1.25	16	18 0 -0.05