MCHS2-OS series

PARALLEL GRIPPER (2-Finger)

mindman

Features
Standard
Model selection
Technical data
Caution for safety
(Read before installing)

Features

- Clamping safety device: Gripping force safety device for O.D. gripping even with a drop pressure.
  Self-locking gripper suitable for safe handling of square batteries and energy storage cells.
- Compact design to ensure minimum interference while operating; robust T rail design, ensure accurate gripping.
- Can reach maximum torque suitable for long jaws design.
- Oval piston-driven design ensure maximum gripping force.
- Hose-free direct connection: Air supply channel can connect directly without piping or through tread to assure the flexibility of supplying compressed air on any kind of automation system.
- Magnetic as standard.

Order example

MCHS2 — 100 — □ — OS

MODEL

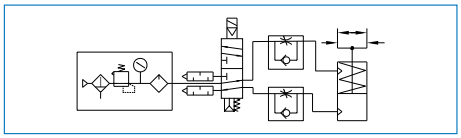
SIZE
80
100
125
160

GRIPPING FORCE		SIZE
Blank	Standard	80~125
F	High-strength	
Z	Enhanced spring force	100~160
FZ	High-strength + Enhanced spring force	

CLAMPING SAFETY DEVICE

Piping diagram

Double acting with spring



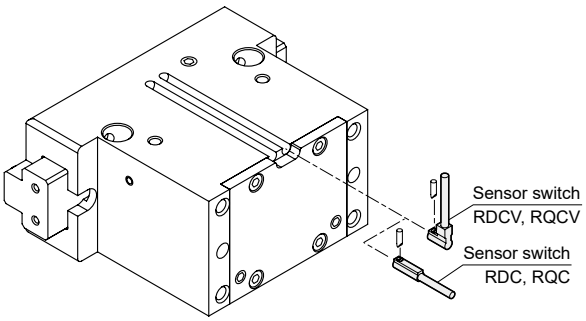
* To prevent the failure of the clamping safety device, the "Closed center (C), Pressure center (P)" type should not be used when employing a 3way solenoid valve.

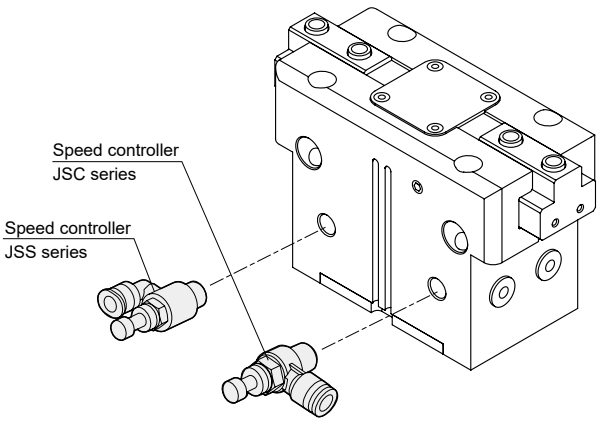
Specification

Model		MCHS2-OS			MCHS2-Z-OS		
Acting type		Double acting					
Size		80	100	125	100	125	160
Stroke per-jaw (mm)	Standaerd	8	10	12	10	12	16
	High	4	5	6	5	6	8
Effective external gripping force (N) (*)	Standaerd	830	928	1630	1082	1752	2632
	High	1558	1744	3060	2030	3288	4944
Close / Open time(s)	Open	0.05	0.09	0.12	0.09	0.12	0.25
	Close	0.03	0.06	0.08	0.06	0.08	0.15
Medium		Air					
Operating pressure range		0.4~0.6				0.45~0.6	0.4~0.6
Volume (cm^3)		50.2	89.9	145.9	89.9	145.9	250.5
Ambient temperature		+5~+80°C					
Lubrication		Not required					
Sensor switch		RDC(V), RQC(V)					
Accessories		Accessory kits					
Weight (kg)		0.57	1	1.74	1	1.74	3.5

* Under the condition of clamping length 0mm and operation pressure 0.6 MPa, at mid-stroke jaw position.

Installation of sensor switch & speed controller





* Each gripper needs at least two speed control valves to control speed.
* Speed controller specification .

Gripper selection

Depends on the coefficient of friction and the gripping conditions between soft fingers and work piece.

When gripping a workpiece as in the figure as shown above:

F: Gripping force of single finger (N)

μ: Coefficient of friction between the attachments and the workpiece

m: Workpiece mass (kg)

g : Gravitational acceleration (=9.8m/s^2)

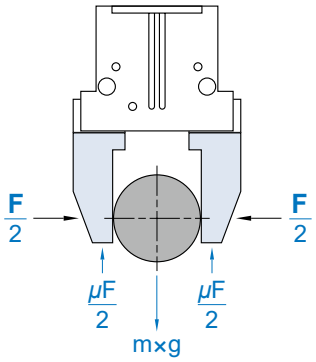
a : Safe factor

the conditions under which the workpiece will not drop are, $\mu F > m \times g$

Therefore, $$F \geq \frac{m \times g}{\mu}$$

With "a" representing the extra margin, "F" is determined by the following formula:

$$F \geq \frac{m \times g}{\mu} \times a$$

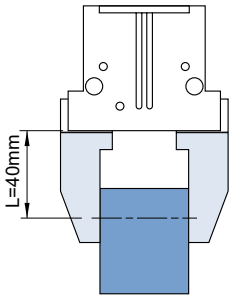


Model selection suggestions

1. For normal gripping and carrying usage, the recommended safe factor (a) is 4.
2. The value of gripping force of 2-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.

Model selection example

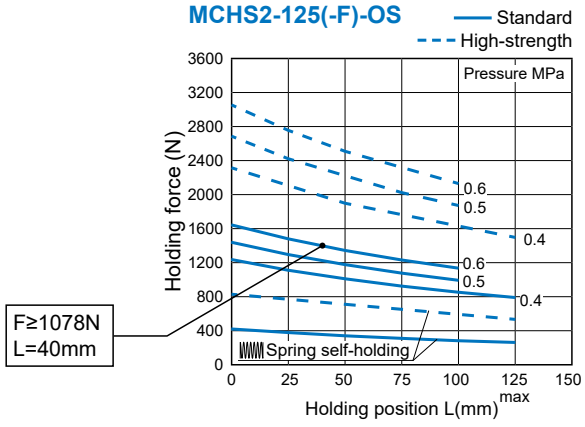
To use the **MCHS2-OS** gripper to hold a square battery weighing 5.5 kg by external gripping, operating air pressure of 0.6 MPa, gripping point distance L = 40 mm, no overhang, and soft jaws equipped with anti-slip PU pads (friction coefficient with the workpiece μ = 0.2). During handling, there is no high acceleration or impact. Which model would be suitable?



1. Based on the above formula, the required gripping force can be derived:

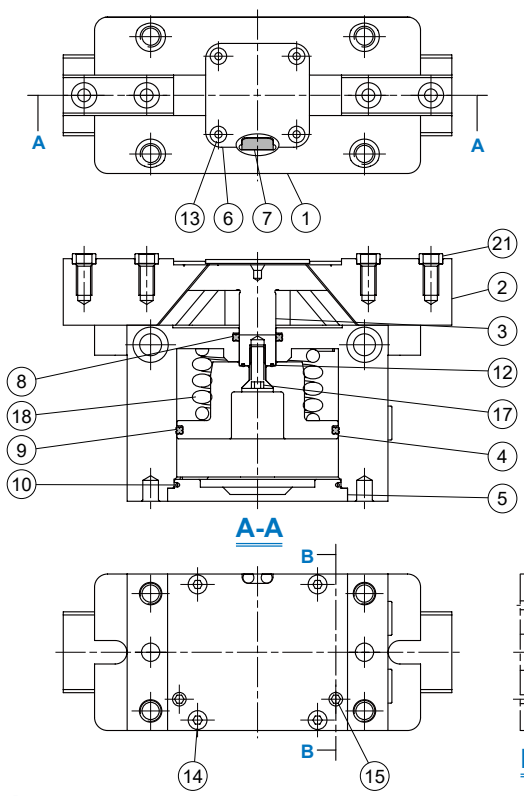
$$F \geq \frac{5.5 \times 9.8}{0.2} \times 4$$
$$\geq 1078(N)$$

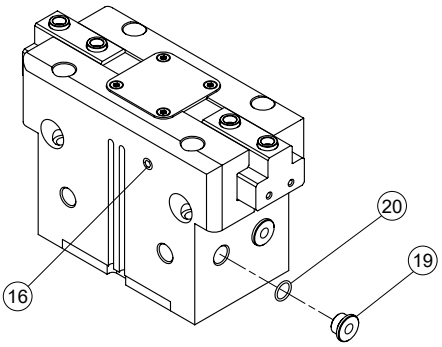
2. From effective gripping force fig,
   Operating pressure: 0.6 MPa; Holding position: 40 mm;
   Effective gripping force is greater than 1078 (N)
   So selected **MCHS2-125-OS** grippers.



MCHS2-OS Inside structure & Parts list

PARALLEL GRIPPER (2-Finger)





Material

No.	Part name	Material	Size & Q'y				Repair kits (inclusion)	Accessory kits (inclusion)
			80	100	125	160		
1	Body	Aluminum alloy	1					
2	Finger	Carbon steel	2					
3	Rod	Carbon steel	1					
4	Piston	Aluminum alloy	1					
5	End cover	Aluminum alloy	1					
6	Plate cover	Stainless steel	1					
7	Magnet	Magnet material	2	4		6		
8	Rod packing	NBR	1				●	
9	Piston packing	NBR	1				●	
10	O-ring	NBR	1				●	
11	O-ring	NBR	4		2		●	
12	O-ring	NBR	1				●	
13	Screw	Alloy steel	4					
14	Hex bolt	Alloy steel	4					
15	Screw	Alloy steel	2					
16	Screw	Alloy steel	2					
17	Hex bolt	Alloy steel	1					
18	Sprin (*1)	Spring steel	1		1 or 2	1		
19	Iron plug	Stainless steel	2					
20	O-ring	NBR	2					
21	O-ring	NBR	–		2		●	
22	Centering sleeve	Stainless steel	4					●
23	Pin	Bearing steel	2					●
24	Iron plug	Stainless steel	2					●
25	O-ring	NBR	2					●
26	O-ring	NBR	2					●

* MCHS-125(-F)Z-OS Q'y: 2

Order example of repair & accessory kits

Size	Repair kits	Accessory kits
80	**PS-MCHS-80**	**AK-MCHS-80-OS**
100	**PS-MCHS-100**	**AK-MCHS-100-OS**
125	**PS-MCHS-125**	**AK-MCHS-125-OS**
160	**PS-MCHS-160**	**AK-MCHS-160-OS**

* Use the same kits with MCHS(-OS) series.

Accessory kits

	
O-ring (×2) No.25	Iron plug (×2) No.24, 26
	
Pin (×2)* No.23	Centering sleeve (×4) No.22

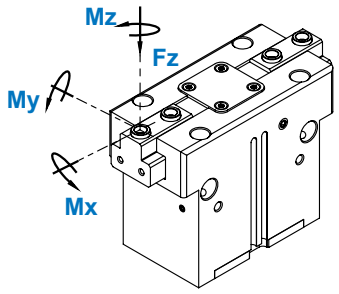
* Refer to the table below.

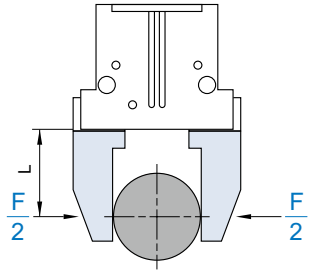
Pin size

Size	Pin
80	ø4×10.8L
100	ø5×14.8L
125	ø6×17.8L
160	ø6×17.8L

MCHS2-OS Capacity 80~160

PARALLEL GRIPPER (2-Finger)

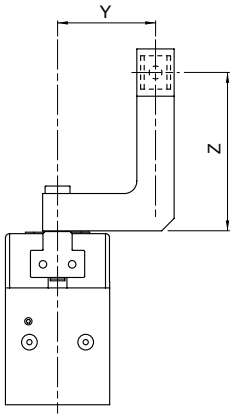




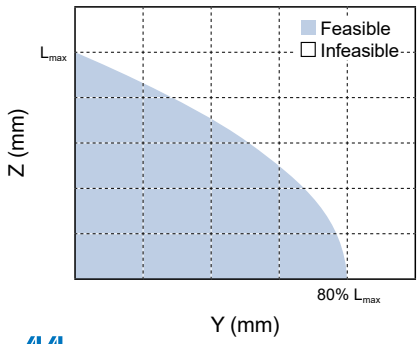
Total gripping force =
pneumatic gripping force + spring holding force

Code / Size	**Mx** max. (Nm)	**My** max. (Nm)	**Mz** max. (Nm)	**Fz** max. (N)
80	80	60	50	1800
100	100	90	75	2500
125	120	120	100	3200
160	160	180	140	5000

Max. feasible centrifugal degree

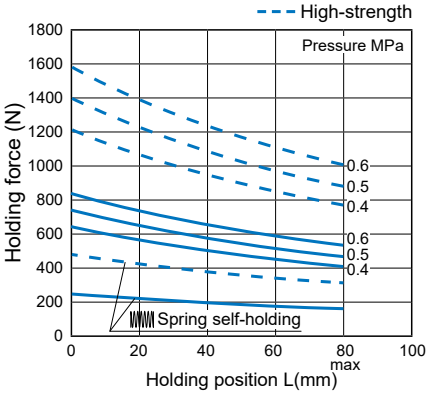


L_{max}: Maximum allowable gripping length:
please refer to the performance chart.

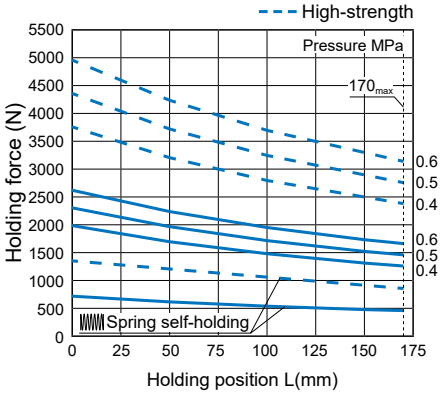


Total 2-finger gripping force (at mid-stroke position)

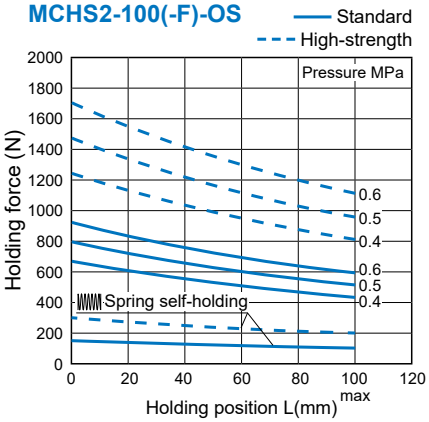
MCHS2-80(-F)-OS



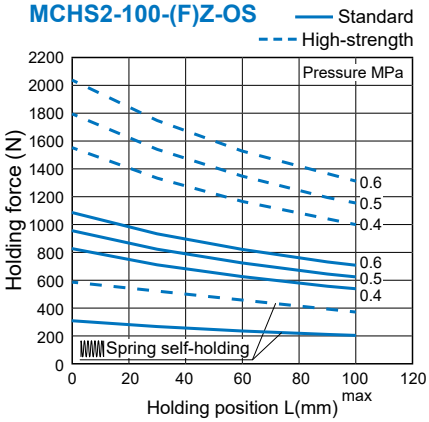
MCHS2-160-(F)Z-OS



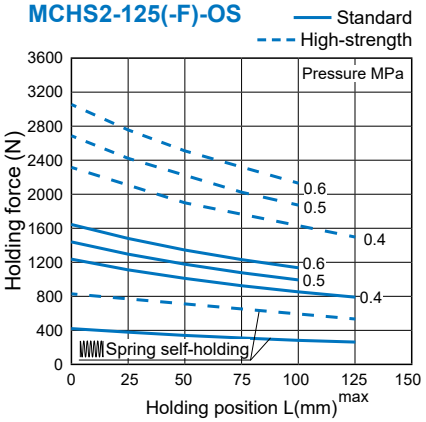
MCHS2-100(-F)-OS



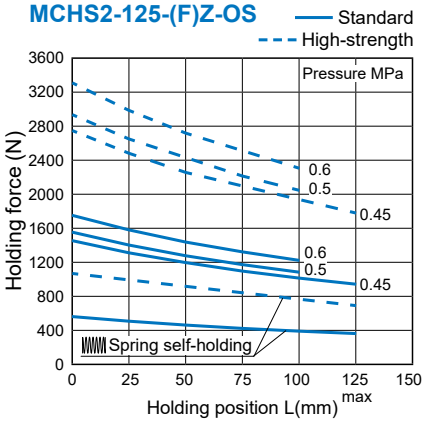
MCHS2-100-(F)Z-OS



MCHS2-125(-F)-OS



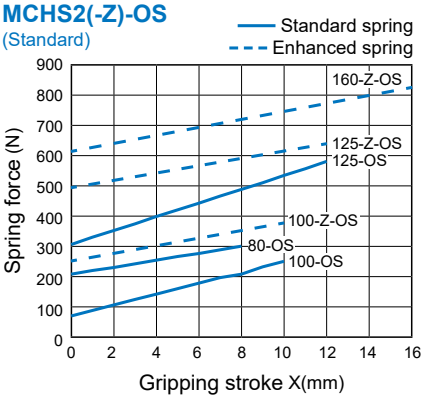
MCHS2-125-(F)Z-OS



Spring force & gripping stroke relationship

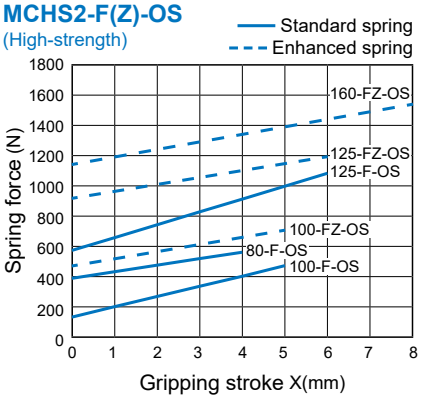
MCHS2(-Z)-OS

(Standard)



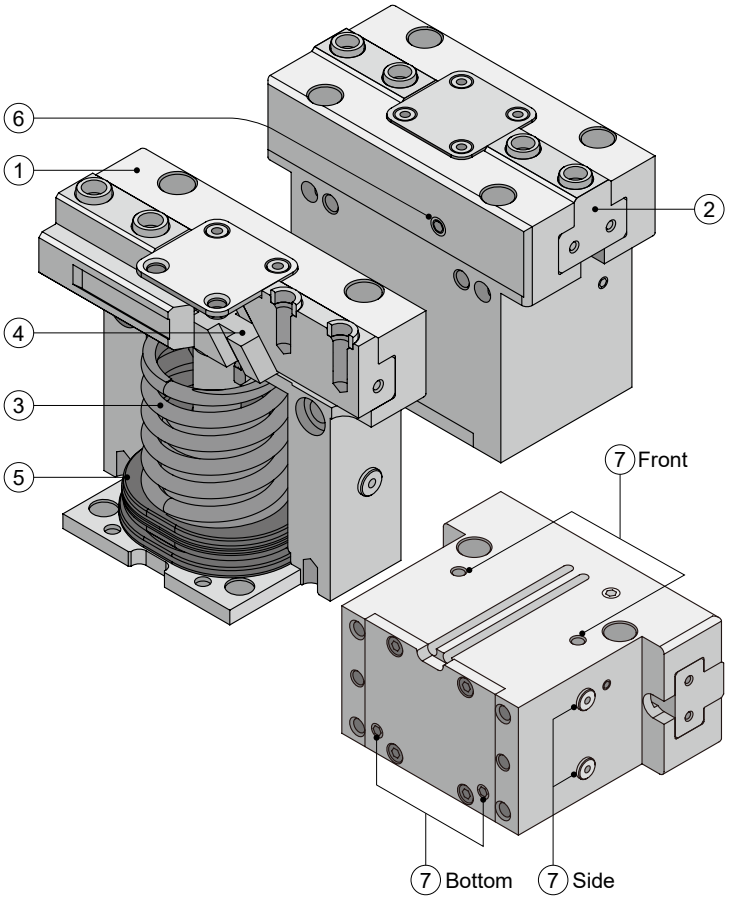
MCHS2-F(Z)-OS

(High-strength)



Internal structure & Movement description

Compressed air will push or press the oval piston.
By tilting the working surface, the wedge hook will transfer the movement to side movement, and initiate the action of the two base jaws simultaneously.



① Material
Anodized high rigid aluminum alloy to reduce weight.

② Rail & Base jaw
Bearing rails load the base jaw,which ensure the minimal vibration of long jaw.
Jaws connected to work piece.

③ Spring
Clamping safety device: Gripping force safety device for O.D. gripping even with a drop pressure (Refer to the performance chart for the spring self-holding force).

④ Wedge hook
High power transmission center jaws.

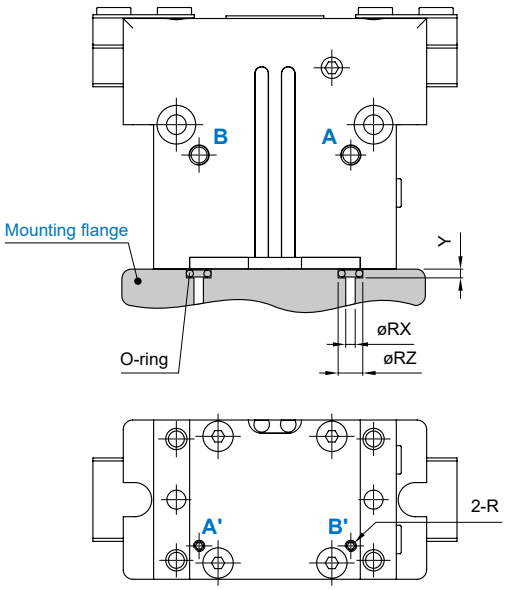
⑤ Large circular piston
Generate larger structural strength.

⑥ Air purge connection (External vents)
The air purge is used in order to make it more difficult for dirt and dust to penetrate into the product and the guiding areas.

* The air purge is effective only when the gripper is opened.
* Install a valve to control the air purge.

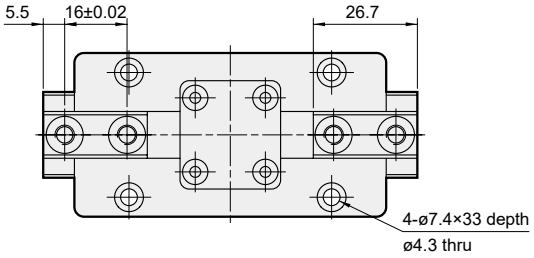
⑦ Air inlets (Multiple positions)
Front / Side / Bottom

Hose-free direct connection

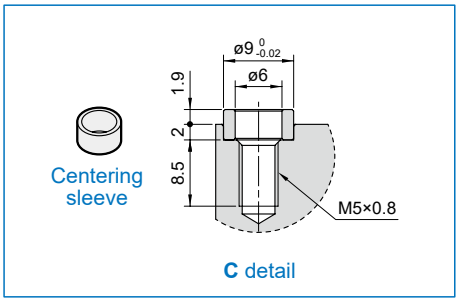


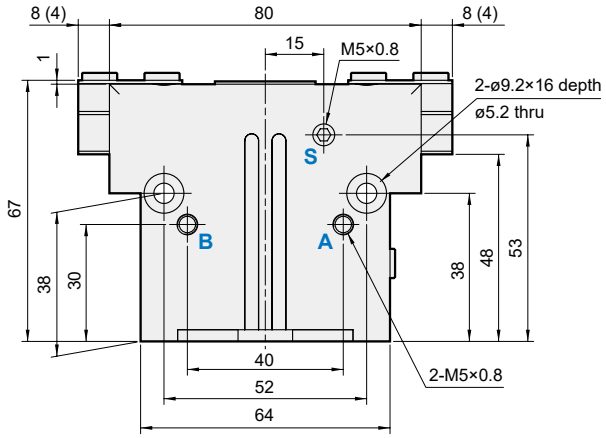
Code / Size	R	RX	RZ	Y
80	M3	3	5	0.7
100	M5	5	8	1.1
125	M5	5	8	1.1
160	M5	5	8	1.1

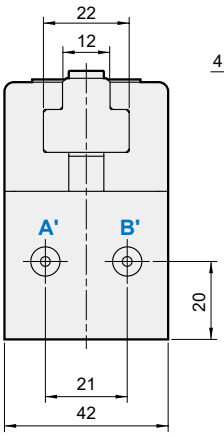
A/ A' : Gripper open
B/ B' : Gripper close

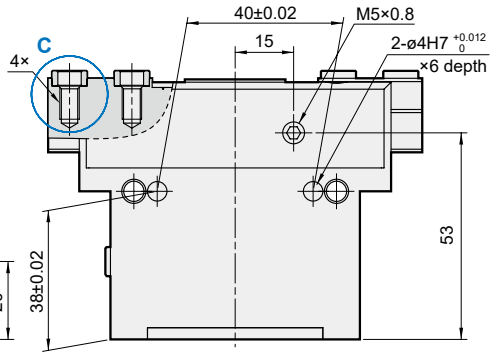


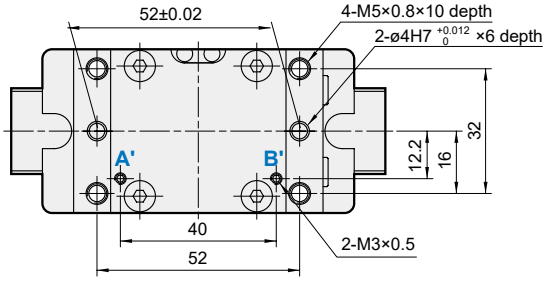
Centering sleeve



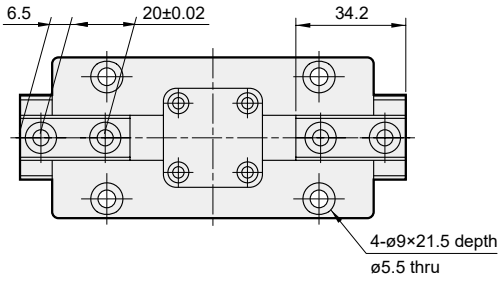




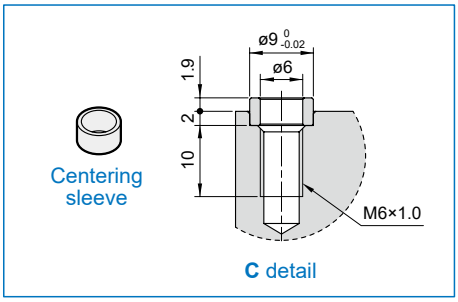


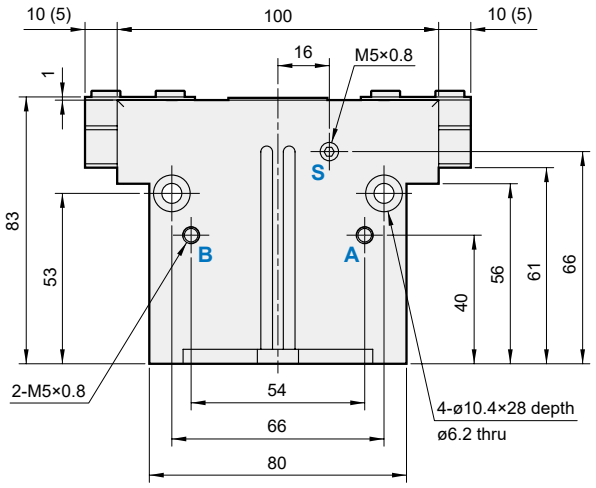


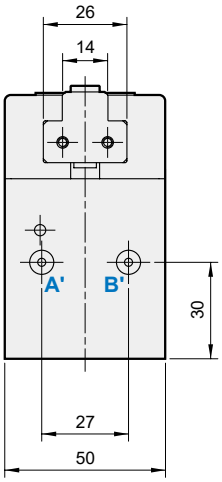
A/ **A'**: Gripper open
B/ **B'**: Gripper close
S: External vents
( ) for high-strength gripping force

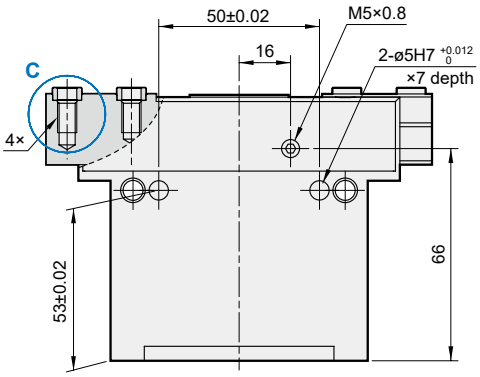


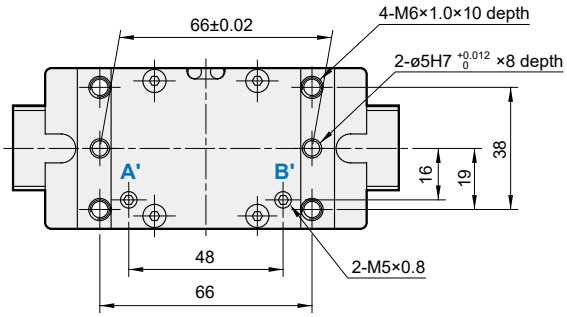
Centering sleeve



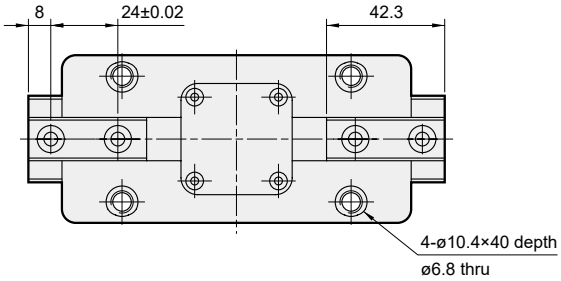




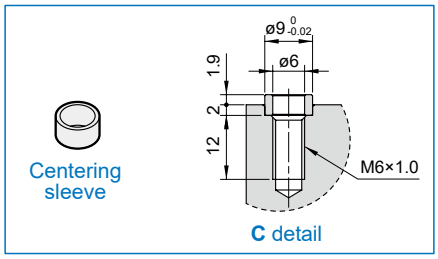


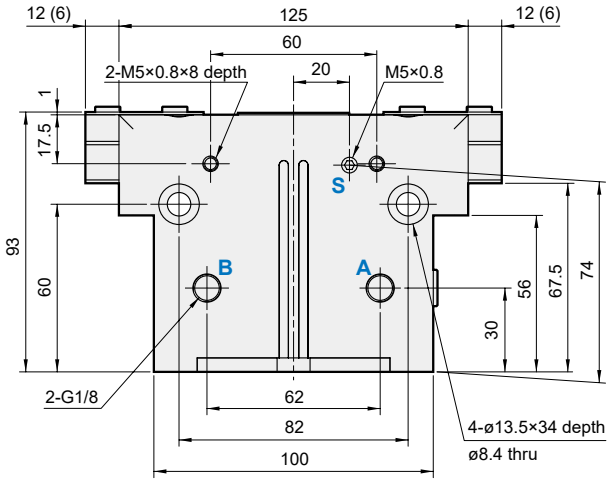


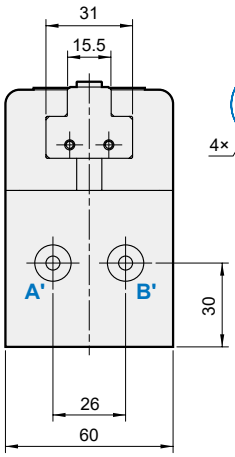
A/ A': Gripper open
B/ B': Gripper close
S: External vents
( ) for high-strength gripping force

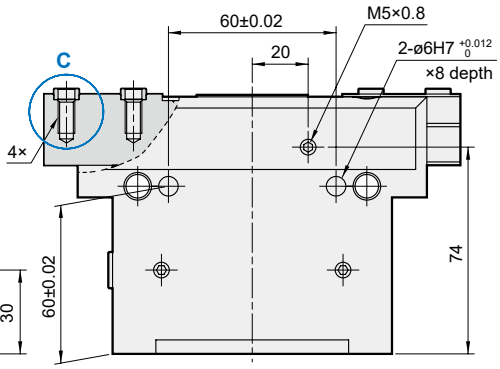


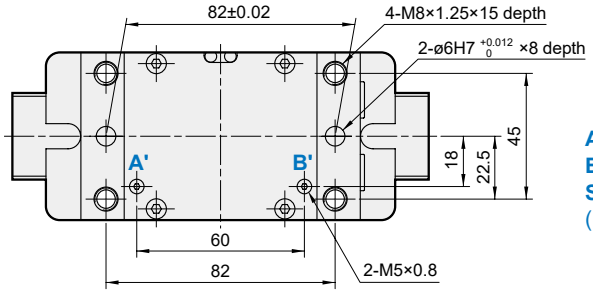
Centering sleeve



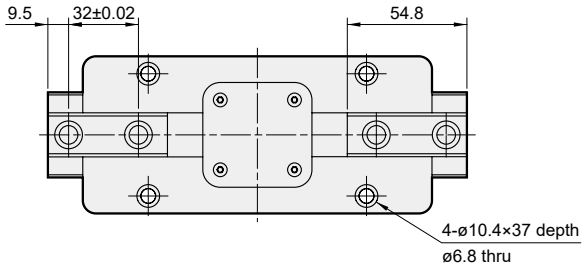




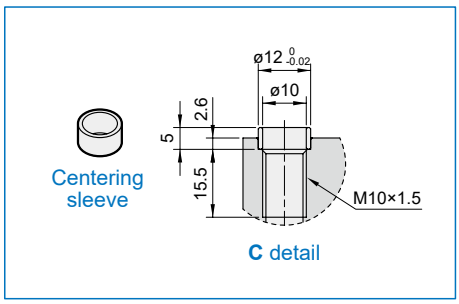


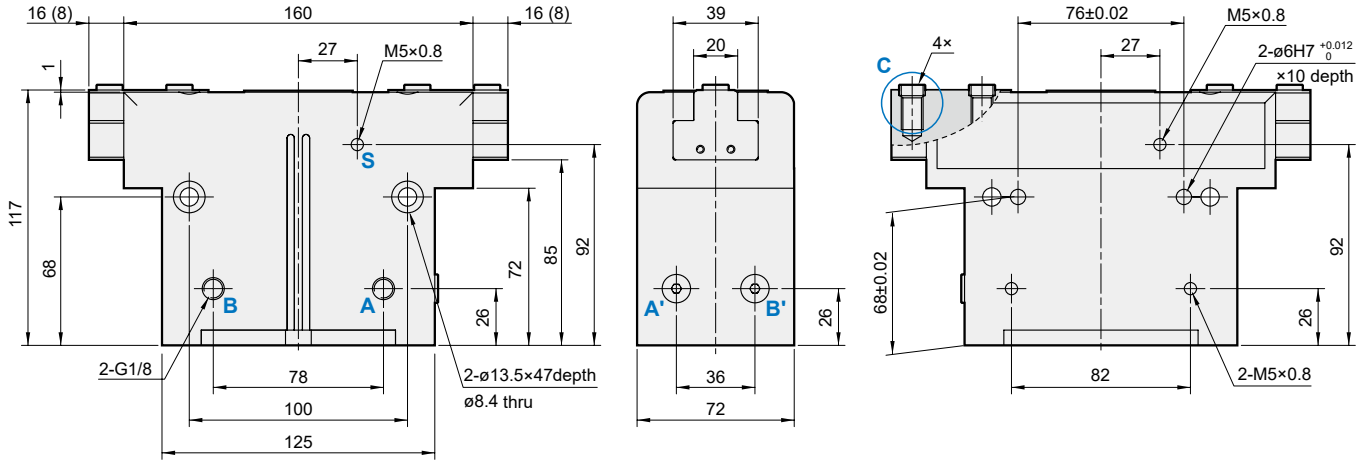


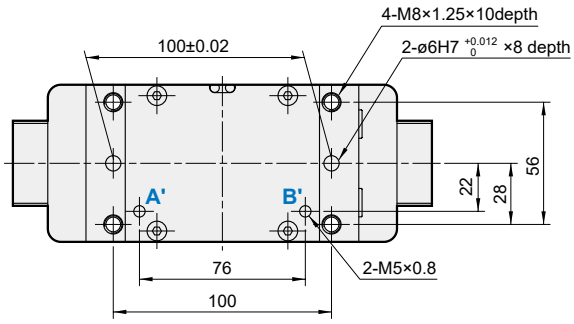
A/ **A'**: Gripper open
B/ **B'**: Gripper close
S: External vents
( ) for high-strength gripping force



Centering sleeve







A/ **A'**: Gripper open
B/ **B'**: Gripper close
S: External vents
( ) for high-strength gripping force