

* Refer to pages 258 to 259 for the wide angle centering hand.

Range of gripping power at supply pressure 0.5MPa and general jaw length

(Note) Grip applies to one jaw.
The actual value is grip x 2.

Variation		Model no.	Action of jaw (J)	Gripping power (N)						Gripping power (N)				Switch model no.	Page
				5	10	50	50	100	500	1000	2000				
Parallel hand	Feather hand (Mini-parallel hand)	FH100		110 112 116	(8) (11) (14) (18) (20)									T2H/V T2H/V	264
	Parallel hand	HAP			1C 2CS 3CS 4CS	(8) (16) (26) (41)								T2H/V T3H/V	270
	Miniature cross roller parallel hand	BSA2		006C	(4)									F2H/V F2H/V	278
	Compact cross roller parallel hand	BHA/BHG			01CS1 03CS1 04CS1	(5) (9) (11)		05CS1	(15)					T2H/V T3H/V	282 288
	Linear guide hand	LHA			006CS 01CS	(4) (5)		03CS 04CS 05CS 06CS	(9) (11) (15) (20)					F2H/V, F3H/V T2H/V, T3H/V	294
	Linear guide hand with rubber cover	LHAG			01CS	(5)		03CS 04CS 05CS 06CS	(9) (11) (15) (20)					T2H/V T3H/V	302
	Cross roller parallel hand	HKP						32CS 40CS 50CS 63CS	(24) (30) (36) (40)					T2H/V T3H/V	310
	Thin parallel hand (bush type) (bearing type)	HLA/HLB			HLA 12CS HLA 15CS HLB 12CS HLB 15CS	(15) (20) (13) (18)		HLA 20CS HLB 20CS	(25) (23)					K2H/V, K3H/V K0H/V, K5H/V	316
	Rubber covered thin parallel hand (bush type) (bearing type)	HLAG/HLBG			HLAG 12CS HLAG 15CS HLBG 12CS HLBG 15CS	(15) (20) (13) (18)		HLAG 15CS HLBG 20CS	(25) (23)					K2H, K3H K0H, K5H	324
	Bearing parallel hand	HEP						3.5CS 4CS 5CS 6CS 7CS	(24) (36) (40) (50) (60)					T2H/V T3H/V	332
	Lateral parallel hand	HCP			2CS 3CS	(20) (30)		4CS	(40)					T2H/V T3H/V	338
	Compact wide parallel hand	HMF			12CS	(20)		16CS 20CS 25CS 32CS 40CS	(30) (40) (50) (70) (100)					T2H/V T3H/V	344
	LM guided large wide parallel hand	HMFB						25CS 32CS 40CS	(100) (120) (160)					T2H/V T3H/V	354
	Wide parallel hand	HFP			2CS	(20)		3CS 4CS 5CS	(30) (40) (60)					T2H/V T3H/V	360
	Thin type long stroke parallel hand	HLC						16CS 20CS 25CS 30CS	(40) (50) (60) (70)					T2H/V T3H/V	366
Long stroke parallel hand	HGP			3CS	(56)								T2H/V T3H/V	372	

(Example)
110 (8)
Model Gripping power Stroke length (mm)
or open and close degree

Series variation

Hand (wide angle/centering hand)







* Refer to pages 256 to 257 for parallel hand.

Hand (wide angle/centering hand)

Series variation

Range of gripping power at supply pressure 0.5MPa and general jaw length

(Note) Grip applies to one jaw.
The actual value is grip x 2.

Variation		Model no.	Action of jaw (J)	Gripping power (N)					Gripping power (N)					Switch model no.	Page	
				5	10	50	50	100	500	1000	2000					
Wide angle hand	Feather hand (Min-fulcrum hand)	FH500		510 512 516	(10° open -25° closed) (10° open -25° closed)	(10° open -25° closed)	(10° open -25° closed)					<div>(Example) 110 (8) Model Gripping power Stroke length (mm) or open and close degree</div>			T2H/V T3H/V	376
	Fulcrum hand	HBL		1C	(15) 2CS (20) 3CS	(25) 4CS	(40)								T2H/V T3H/V	382
	Wide angle hand	HDL		3CS	(25) 4CS	(40)									T2H/V T3H/V	388
	Thin wide angle hand	HMD				16C (184° open -4° closed) 25C (184° open -4° closed)									T2H/V T3H/V	392
Parallel hand	Toggle hand	HJL					32CS (28° open -3° closed) 40CS (28° open -3° closed) 50CS (28° open -3° closed) 63CS (28° open -3° closed)								T2H/V T3H/V	396
Centering hand	Centering hand	BHE			01CS (7) 03CS (10) 04CS (14) 05CS (16) 06CS (22)										T2H/V T3H/V	402



Pneumatic components

Safety precautions

Always read this section before starting use.

Refer to Intro 69 for general precautions of the cylinder, and to Intro 78 for general precautions of the cylinder switch.

Hand Series

Design & Selection

1. COMMON

⚠ WARNING

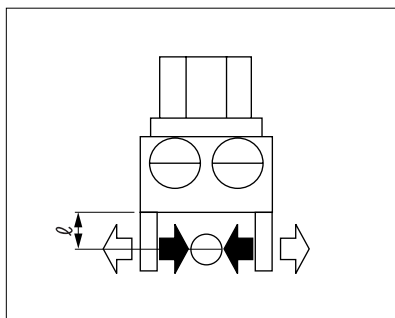
■ If the moving workpiece poses a possible risk to personnel or if fingers could be caught in the master key, etc., install a protective cover, etc.

■ If circuit pressure drops due to a service interruption or problems in the air source, gripping power drops and the workpiece could drop. Provide position locking measures, etc., so that personnel are not injured or machines damaged.

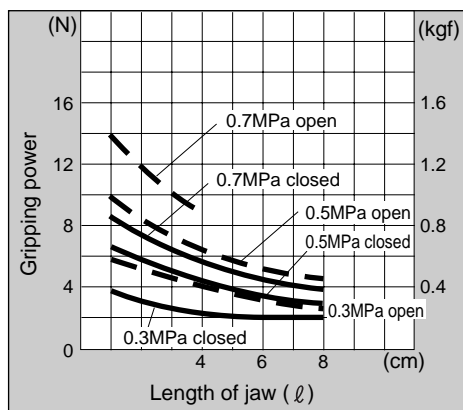
⚠ CAUTION

■ Cautions on gripping power

- The grip is for one master jaw when all master and small jaws contact the workpiece as shown below.



- Performance data indicates the gripping power at hand jaw length ℓ at a supply pressure of 0.15 to 0.7 MPa.



- To obtain gripping power from performance data, if the distance to the workpiece's center of gravity is ℓ when manufacturing the small jaw, gripping power F is expressed as follows

When $\ell = \ell_1$, then $F = F_1$

When $\ell = \ell_2$, then $F = F_2$

Refer to the drawing below.

- The jaw's working max. length can be used within performance data.

When N is used to express the number of jaws as reference for the coefficient for transferring workpiece weight W .

$WL \times 9.8: (F \times N) = 1:5$ (only gripping)

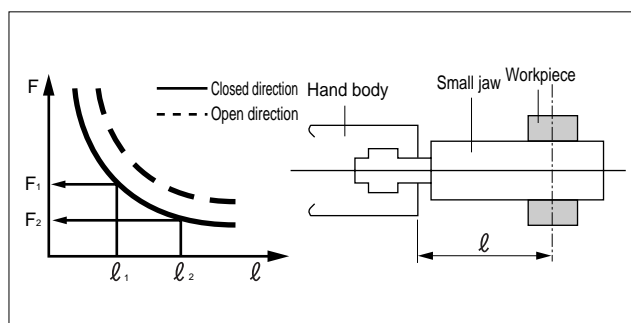
$WL \times 9.8: (F \times N) = 1:10$ (normal transfer)

$WL \times 9.8: (F \times N) = 1:20$ (sudden acceleration transfer)

$WL \times 9.8$: Workpiece weight (kg)

F : Gripping power (N)

N : Number of jaws



- Use as short and light a small jaw as possible.

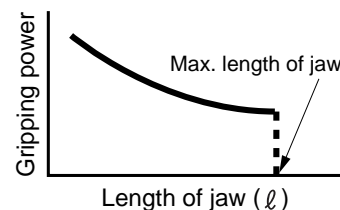
If the small jaw is long and heavy, inertia increases when opening and closing. This may cause play in the master key, and may adversely affect life.

- The small jaw's length must be within performance data.
- The weight of the small jaw affects life, so check that it is within the following value.

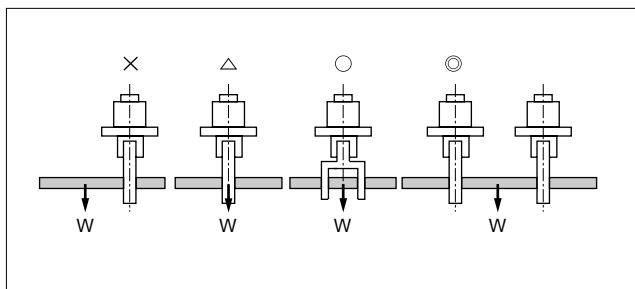
$W < 1/4H$ (1 pc.)

W : Weight of small jaw

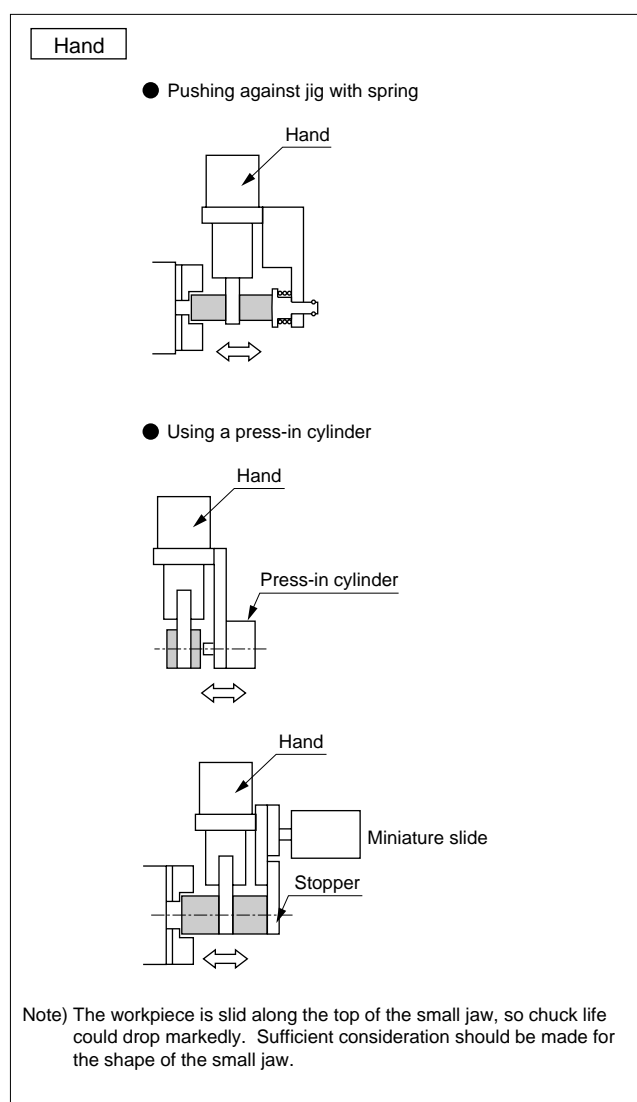
H : Product weight of hand



- When gripping a long object or large workpiece, the center of gravity must be gripped to provide stable prehension. It is also necessary to stabilize prehension by increasing the size or using multiple jaws.



- Select a model that has sufficient power to grip the workpiece weight.
- Select a model that has sufficient opening/closing width for the workpiece size.
- If directly inserting the workpiece into the jig with the hand, consider clearance during design to avoid damaging the hand.



- If the small jaw is not rigid enough, resulting deflection could cause the master jaw to twist or adversely affect operation.
- Adjust the chuck open/close speed with the speed control valve (optional).
Play may occur quickly when used at a high speed.

RRC
GRC
RV3*
NHS
HR
LN
FH100
HAP
BSA2
BHA/ BHG
LHA
LHAG
HKP
HLA/ HLB
HLAG/ HLBG
HEP
HCP
HMF
HMFB
HFP
HLC
HGP
FH500
HBL
HDL
HMD
HJL
BHE
CKG
CK
CKA
CKS
CKF
CKJ
CKL2
CKL2 -H-C
CKH2
CKLB2
NCK/ SCK/FCK
FJ
FK

Ending

Hand

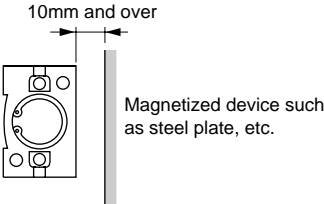
RRC
GRC
RV3*
NHS
HR
LN
FH100
HAP
BSA2
BHA/ BHG
LHA
LHAG
HKP
HLA/ HLB
HLAG/ HLBG
HEP
HCP
HMF
HMFB
HFP
HLC
HGP
FH500
HBL
HDL
HMD
HJL
BHE
CKG
CK
CKA
CKS
CKF
CKJ
CKL2
CKL2 -*.HC
CKH2
CKLB2
NCK/ SCK/FCK
FJ
FK
Ending

Installation & Adjustment

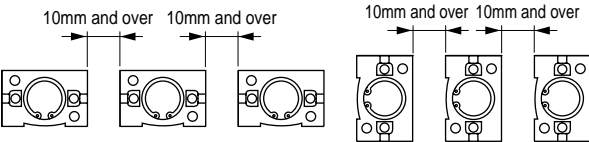
1. COMMON

CAUTION

- If a lateral load or load with a large impact is applied to the master key, play or damage could occur in the master key. Adjust and check that external force is not applied to the master key.
- The cylinder switch could malfunction if there is magnetic substance, such as a steel plate, near the cylinder switch. Keep magnetic substance at least 10mm from the cylinder.



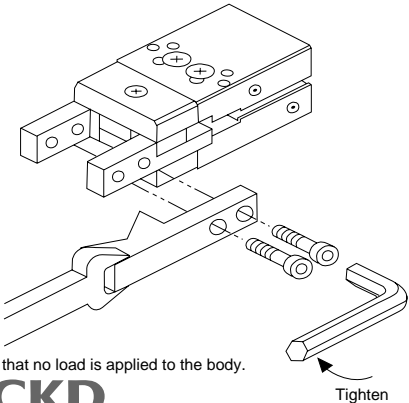
- The cylinder switch could malfunction if cylinders are installed adjacently. Check that the following distances are provided between cylinders.



- If the clamp is operated carefully and slowly as possible, accuracy increases. Repeatability also stabilizes.
- Regularly grease the sliding section of the master key. Periodic replenishment of grease will extend the life of the part.

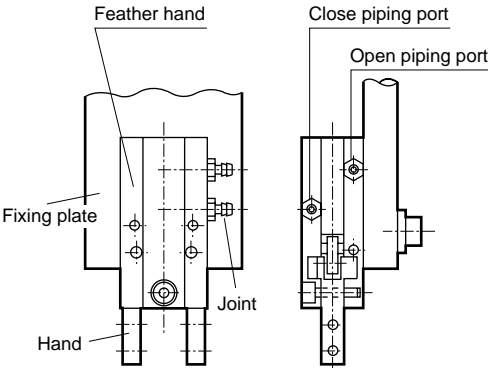
Installing the jaw


To prevent any effect onto the hand, support the master key with a wrench, etc., and tighten so that the master key is not twisted.



2. Installation

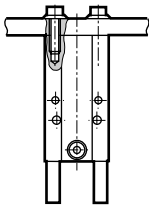
- Do not cause dents or scratches that may worsen flatness or perpendicularity on the fixing face or master key.
- If there is a limit to the thickness direction of the FH series body, the available piping joint will be limited. Refer to the following joints.



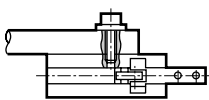
Model		FH*10		FH*12		FH*16		FH*20		FH*25			
Port size		M3				M5							
Joint		Model no.		Applicable O.D. (mm)		Effective sectional area (mm ²)		Model no.		Applicable O.D. (mm)		Effective sectional area (mm ²)	
Barbed joint		Straight FTS											
		FTS4-M3		φ3.2·φ4		0.4		FTS4-M5		φ3.2·φ4		2.1	
		-		-		-		FTS6-M5		φ6		4.1	

- Refer to the section below for details on installing the FH series.

Top installation

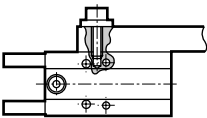


Front installation



Note) When a switch is provided, screw the bolt into as shown below so the switch is not pressed by the end of the bolt.

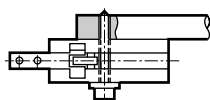
Side installation



Note) Check that the fixed plate does not overlap the master jaw support.

Model	Applicable bolt size	Max. screw depth (mm)	Recommended tightening torque (N·cm)
FH*10	M3×0.5	4.5	70
FH*12	M3×0.5	4.5	70
FH*16	M4×0.7	6	160
FH*20	M5×0.8	7.5	330
FH*25	M5×0.8	12	330

- Use of through hall

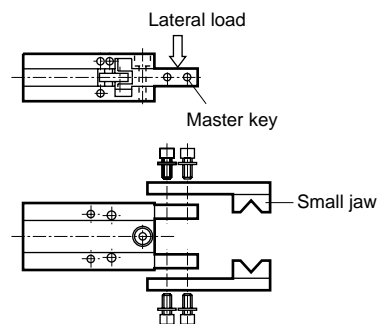


Note) A through hall cannot be used when a switch is provided.

Note) Check that the fixed plate does not overlap the master jaw support.

Model	Applicable bolt size	Recommended tightening torque (N·cm)
FH*10	M3×0.5	32
FH*12	M2.5×0.45	32
FH*16	M3×0.5	90
FH*20	M4×0.7	210
FH*25	M4×0.7	210

- When installing the small jaw, check that a lateral load is not applied to the master key.



- Tighten with the following tightening torque.

Screw nominal	M3	M4	M5	M6	M8
Recommended tightening torque (N·m)	0.59	1.4	2.8	4.8	12.0

During Use & Maintenance

⚠ CAUTION

- Do not disassemble or modify the body.

RRC
GRC
RV3*
NHS
HR
LN
FH100
HAP
BSA2
BHA/BHG
LHA
LHAG
HKP
HLA/HLB
HLAG/HLBG
HEP
HCP
HMF
HMFb
HFP
HLC
HGP
FH500
HBL
HDL
HMD
HJL
BHE
CKG
CK
CKA
CKS
CKF
CKJ
CKL2
CKL2*-HC
CKH2
CKLB2
NCK/SCK/FCK
FJ
FK
Ending

Hand



Feather hand (min-fulcrum hand) Double acting/single acting

FH500 Series

● Open and close angle: 20° at open, -5° at closed



Specifications

Descriptions	FH500							
	FH510-D	FH512-D	FH516-D	FH520-D	FH510-O	FH512-O	FH516-O	FH520-O
Actuation	Double acting				Single acting			
Working fluid	Compressed air							
Max. working pressure MPa	0.7							
Min. working pressure MPa	0.15				0.25			
Withstanding pressure MPa	1.05							
Ambient temperature °C	5 to 60							
Port size	M3		M5		M3		M5	
Open and close angle Degree	20° at open -5° at closed							
Product weight g	43	53	92	135	43	53	92	136
Repeatability (default) mm	±0.03							
Max. cycle rate cycle/sec.	3							
Cushion	Open side rubber cushion							
Option	Proximity switch (2 wire/3 wire) * Closed side speed control valve, end mount							

* Integrated speed control valve is available only for double acting type.

Switch specifications

Descriptions	Proximity 2 wire	Proximity 3 wire
	T2H/V	T3H/V
Applications	Programmable controller	Programmable controller, relay
Output method	-	NPN output
Power voltage	-	10 to 28 VDC
Load voltage/current	10 to 30 VDC, 5 to 20 mA (Note 1)	30 VDC or less, 100mA or less
Light	LED (ON lighting)	
Leakage current	1mA or less	10μA or less

Note 1: Max. load current above: 20 mA at 25°C. The current will be lower than 20mA if ambient temperature around switch is higher than 25°C. (5 to 10mA with 60°C)

How to order

Without switch

FH5 **10** - **D** **Y1** ————— **B**

With switch

FH5 **10** - **D** **Y1** - **T2V** - **R** - **B**

A Bore size

B Option

C Small jaw
Note 1

D Switch model no.
Note 2
* Indicates lead wire length.

E Switch quantity

F End mount
Note 3

⚠ Note on model no. selection

Note 1: Refer to pages 412 to 413 for the dimensions and applicable model of the small jaw. When ordered as an option, two are included on delivery.

Note 2: Switches other than (D) switch model no. are available. (Custom order) Refer to Ending 1 for details.

Note 3: When with end mount (model no. B), select switch with radial lead wire (model no. T*V).
The end mount is attached at delivery.

Symbol		Descriptions		
A Bore size				
10	φ10			
12	φ12			
16	φ16			
20	φ20			
B Option				
D	Double acting			
O	Single acting (normally open)			
Z	Double acting integrated flow control valve			
C Small jaw				
Blank	Without small jaw			
Y1	With small jaw material (S50C)			
Y2	With small jaw material (MC nylon)			
D Switch model no.				
Axial lead wire	Radial lead wire	Contact	Indicator	Lead wire
T2H*	T2V*	Proximity	1 color	2-wire
T3H*	T3V*		indicator type	3-wire
*Lead wire length				
Blank	1m (standard)			
3	3m (option)			
5	5m (option)			
E Switch quantity				
R	One on open side			
H	One on closed side			
D	Two			
F End mount				
Blank	Without end mount			
B	With end mount			

<Example of model number>

FH512-DY1-T2V-R-B

Model: Feather hand (min-fulcrum hand)

- A** Bore size : φ12
- B** Option : Double acting
- C** Small jaw : Small jaw material (S50C)
- D** Switch model no. : Proximity T2V switch, lead wire 1m
- E** Switch quantity : One on right (port) side open position
- F** End mount : With end mount

How to order end mount

FH - **B** - **10**

Symbol	Descriptions
A Bore size	
10	φ10
12	φ12
16	φ16
20	φ20

How to order switch

SW - **T2H**

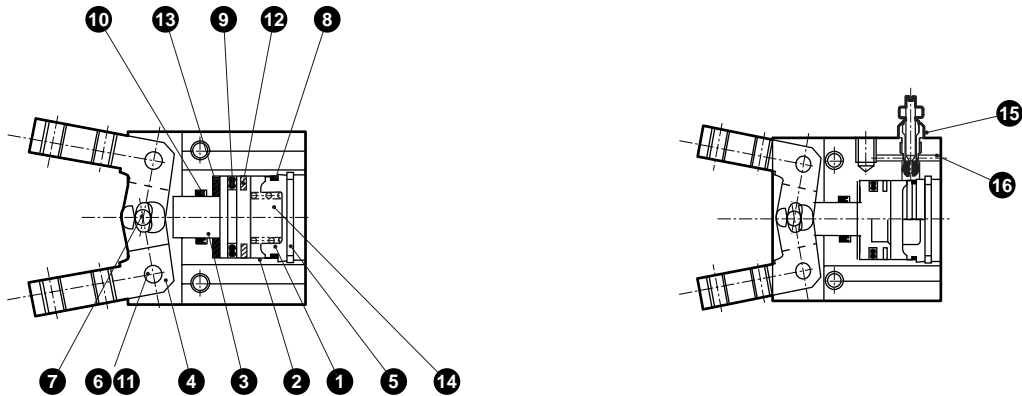
Switch model no.
(Item above **D**)

RRC
GRC
RV3*
NHS
HR
LN
FH100
HAP
BSA2
BHA/
BHG
LHA
LHAG
HKP
HLA/
HLB
HLAG/
HLBG
HEP
HCP
HMF
HMFB
HFP
HLC
HGP
FH500
HBL
HDL
HMD
HJL
BHE
CKG
CK
CKA
CKS
CKF
CKJ
CKL2
CKL2
*-HC
CKH2
CKLB2
NCK/
SCK/FCK
FJ
FK
Ending
Feather hand (min-fulcrum hand)
Hand

RRC
GRC
RV3*
NHS
HR
LN
FH100
HAP
BSA2
BHA/
BHG
LHA
LHAG
HKP
HLA/
HLB
HLAG/
HLBG
HEP
HCP
HMF
HMFb
HFP
HLC
HGP
FH500
HBL
HDL
HMD
HJL
BHE
CKG
CK
CKA
CKS
CKF
CKJ
CKL2
CKL2
-*.HC
CKH2
CKLB2
NCK/
SCK/FCK
FJ
FK
Ending

Internal structure and parts list

- Standard (double acting)/O (normally open) type
- Speed control valve



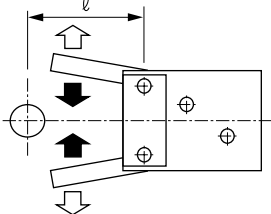
Spring of 14 is not contained in standard (double acting) type.

No.	Parts name	Material	Remarks	No.	Parts name	Material	Remarks
1	Cylinder guard	Acetar resin		9	Piston packing seal	Nitrile rubber	
2	Body	Aluminum alloy	Lubrication alumite treatment	10	Rod packing seal	Nitrile rubber	
3	Piston	Stainless steel		11	Hexagon socket head set screw	Stainless steel	
4	Master key	Alloy steel	Heat treatment	12	Magnet		Nickeling
5	Snap ring	Stainless steel		13	Cushion	Urethane rubber	
6	Fulcrum axis	Alloy steel	Heat treatment	14	Spring	Stainless steel	
7	Operation axis	Alloy steel	Heat treatment	15	Steel ball	Stainless steel	
8	Cylinder gasket	Nitrile rubber		16	Speed control valve assembly		

Gripping power performance data

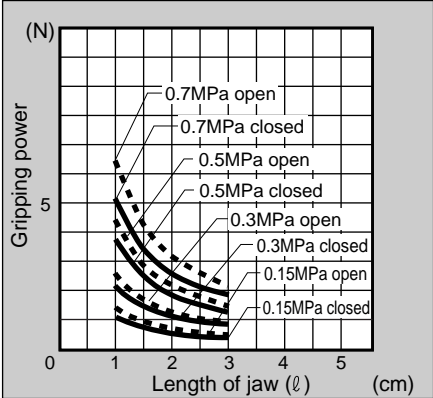
Gripping power that functions to open and closed directions with jaw length ℓ of hand at supply pressure 0.15 to 0.7 MPa is shown.

- Open direction (↵) - - - - (shown with broken line)
- Closed direction (➡) ——— (shown with continuous line)

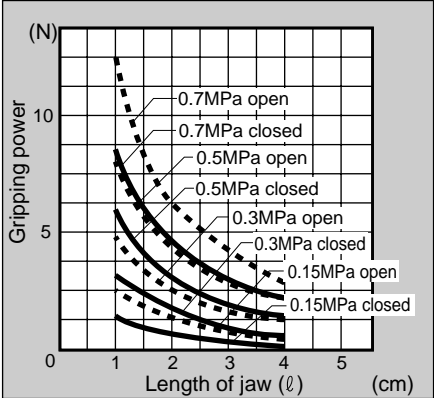


(Note) Closed side gripping power of single acting type decreases 25 to 30 % comparing to double acting type.
Grip performance data indicates the grip for one jaw. Since two jaws are used, double the grip in the graph when making a selection.

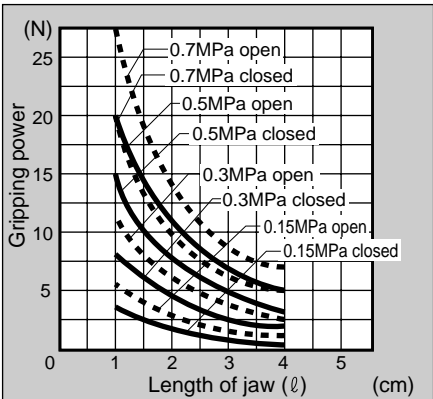
● FH510



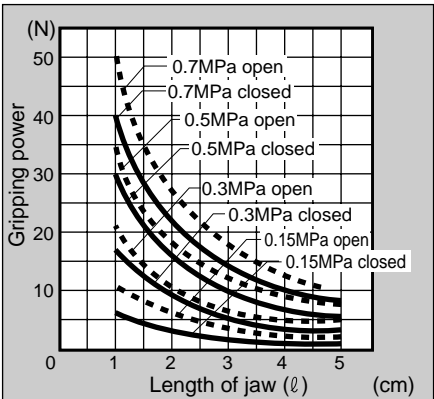
● FH512



● FH516



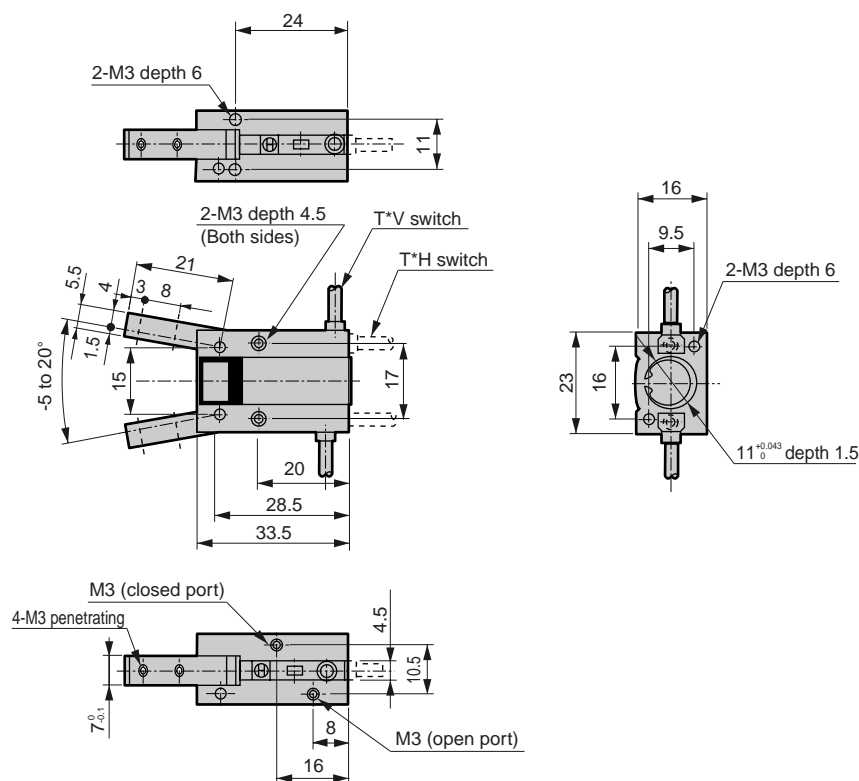
● FH520



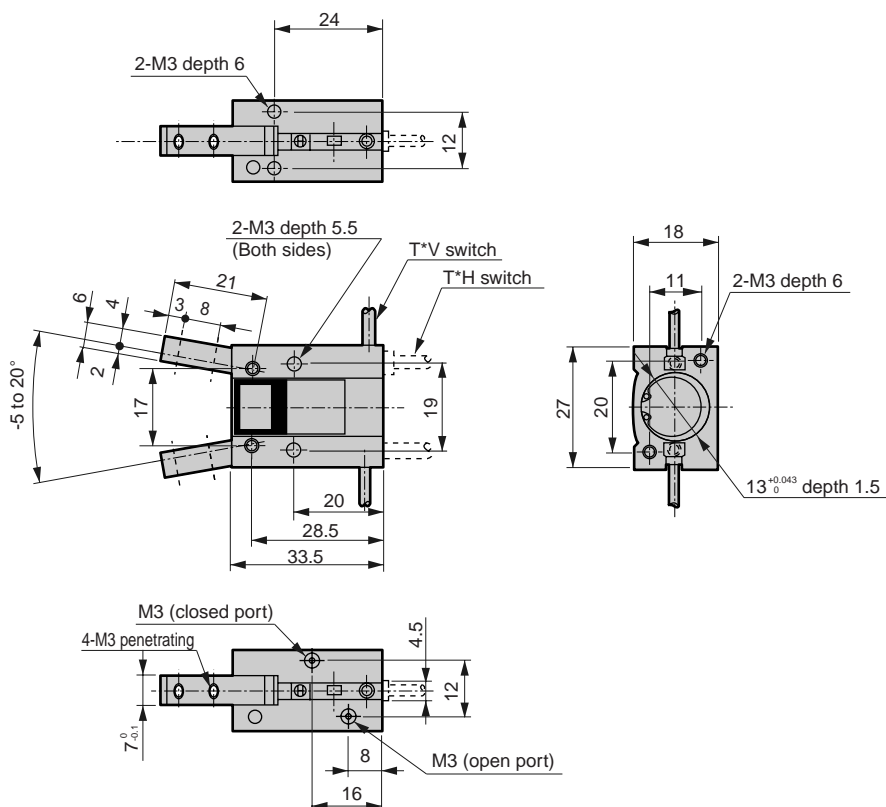
Dimensions



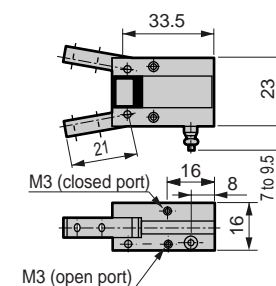
● FH510-D/FH510-O



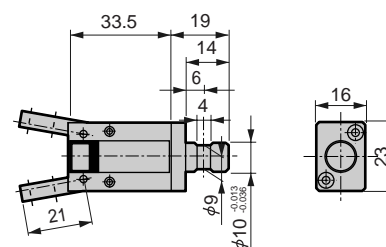
● FH512-D/FH512-O



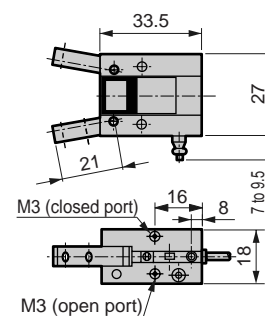
● Speed control valve (FH510-Z)



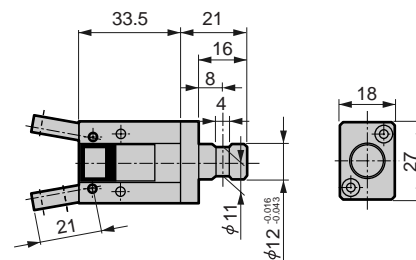
● With end mount



● Flow control valve (FH512-Z)



● With end mount



RRC
GRC
RV3*
NHS
HR
LN
FH100
HAP
BSA2
BHA/ BHG
LHA
LHAG
HKP
HLA/ HLB
HLAG/ HLBG
HEP
HCP
HMF
HMFB
HFP
HLC
HGP
FH500
HLB
HDL
HMD
HJL
BHE
CKG
CK
CKA
CKS
CKF
CKJ
CKL2
CKL2 -HC
CKH2
CKLB2
NCK/ SCK/FCK
FJ
FK
Ending

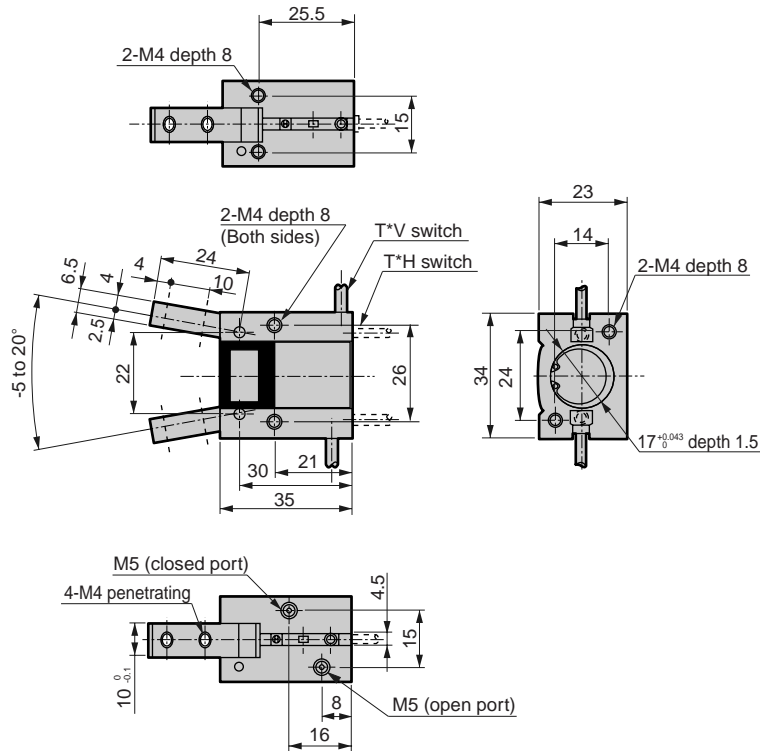
Feather hand (min-fulcrum hand)
Hand



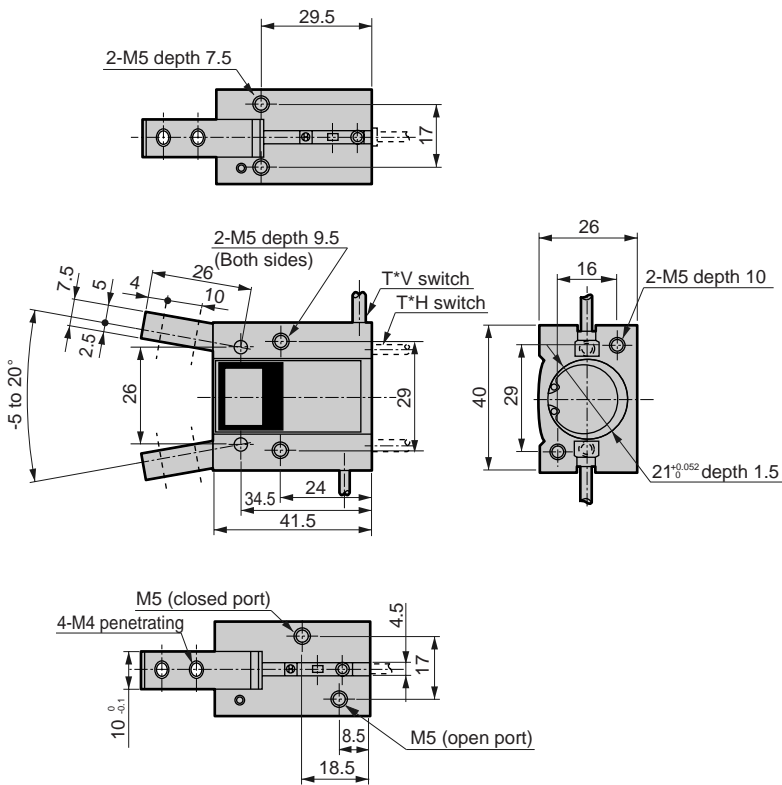
Dimensions

RRC
GRC
RV3*
NHS
HR
LN
FH100
HAP
BSA2
BHA/ BHG
LHA
LHAG
HKP
HLA/ HLB
HLAG/ HLBG
HEP
HCP
HMF
HMFB
HFP
HLC
HGP
FH500
HBL
HDL
HMD
HJL
BHE
CKG
CK
CKA
CKS
CKF
CKJ
CKL2
CKL2 -*.HC
CKH2
CKLB2
NCK/ SCK/FCK
FJ
FK
Ending

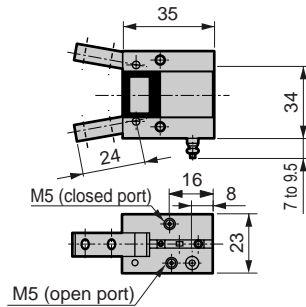
● FH516-D/FH516-O



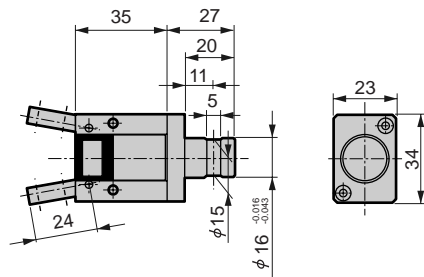
● FH520-D/FH520-O



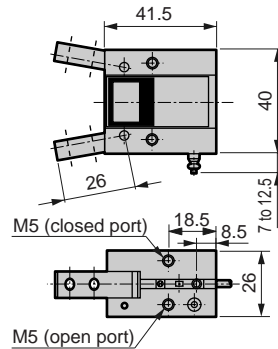
● Flow control valve (FH516-Z)



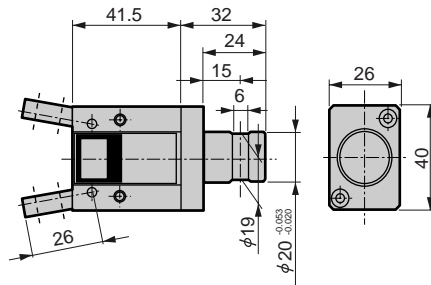
● With end mount



● Flow control valve (FH520-Z)



● With end mount



RRC
 GRC
 RV3*
 NHS
 HR
 LN
 FH100
 HAP
 BSA2
 BHA/
 BHG
 LHA
 LHAG
 HKP
 HLA/
 HLB
 HLAG/
 HLBG
 HEP
 HCP
 HMF
 HMFB
 HFP
 HLC
 HGP
 FH500
 HBL
 HDL
 HMD
 HJL
 BHE
 CKG
 CK
 CKA
 CKS
 CKF
 CKJ
 CKL2
 CKL2
 -*.HC
 CKH2
 CKLB2
 NCK/
 SCK/FCK
 FJ
 FK
 Ending



Fulcrum hand Double acting/single acting

HBL Series

● Open and close angle: -5° to 20°



Specifications

Descriptions		HBL			
Size		1C	2CS	3CS	4CS
Cylinder bore size	mm	φ15	φ20	φ25	φ40
Actuation		Double acting/single acting			
Working fluid		Compressed air			
Max. working pressure	MPa	0.7			
Min. working pressure	MPa	0.3			
Ambient temperature	°C	5 to 60			
Port size		M5			Rc1/8
Open angle	Degree	-5 to 20			
Rod diameter	mm	φ8	φ10	φ12	φ14
Capacity of reciprocating	cm³	0.5	2.2	4.3	14.2
Repeatability	mm	±0.03			
Product weight	kg	0.09	0.22	0.39	0.82
Lubrication		Not required (when lubricating, use turbine oil Class 1 ISO VG32)			

Switch specifications

Descriptions	Proximity 2 wire	Proximity 3 wire
	T2H/T2V	T3H/T3V
Applications	Programmable controller	Programmable controller, relay
Output method	-	NPN output
Power voltage	-	10 to 28 VDC
Load voltage/current	10 to 30 VDC, 5 to 20 mA (Note 1)	30 VDC or less, 100mA or less
Light	LED (ON lighting)	
Leakage current	1mA or less	10μA or less
Maximum shock resistance	980m/s ₂	
Lead wire	Standard 1m	Standard 1m
	(oil resistant vinyl cabtire cable 2-conductor 0.2mm ²)	(oil resistant vinyl cabtire cable 2-conductor 0.2mm ²)

Note 1: Max. load current above: 20 mA at 25°C.
 The current will be lower than 20mA if ambient temperature around switch is higher than 25°C. (5 to 10mA with 60°C)

How to order

Without switch

HBL - **2CS** - **O**

With switch

HBL - **2CS** - **O** - **T2H** - **R**

A Size

B Option
Note 1

C Switch model no.

D Switch quantity

Symbol	Descriptions			
A Size				
1C				
2CS				
3CS				
4CS				
B Option				
Blank	Standard (double acting)			
O	Single acting (normally open)			
C	Single acting (normally closed)			
Y1	With small jaw material (S50C)			
Y2	With small jaw material (MC nylon)			
C Switch model no.				
Axial lead wire	Radial lead wire	Contact	Indicator	Lead wire
T2H*	T2V*	Proximity	1 color	2-wire
T3H*	T3V*		indicator type	3-wire
*Lead wire length				
Blank	1m (standard)			
3	3m (option)			
5	5m (option)			
D Switch quantity				
R	One on open side			
H	One on closed side			
D	Two			

⚠ Note on model no. selection

Note 1: Refer to pages 412 to 413 for the dimensions and applicable model of the small jaw.
When ordered as an option, two are included on delivery.

<Example of model number>

HBL-2CS-O-T2H-R

Model: Fulcrum hand

- A** Size : 2CS
- B** Option : Single acting, normally open type
- C** Switch model no.: Proximity T2H switch, lead wire 1m
- D** Switch quantity : One on open side

How to order switch

● For switch T*H*

· Switch body + mounting bracket

HBL - **T2H**

Switch model no.
(Item above **C**)

· Switch body

SW - **T2H**

Switch model no.
(Item above **C**)

· Mounting bracket

HBL - **T**

● For switch T*V*

· Switch body + mounting bracket

HBL - **T2V** - *

Switch model no.
(Item above **C**)

· Switch body

SW - **T2V**

Switch model no.
(Item above **C**)

· Mounting bracket

HBL - **TV** - *

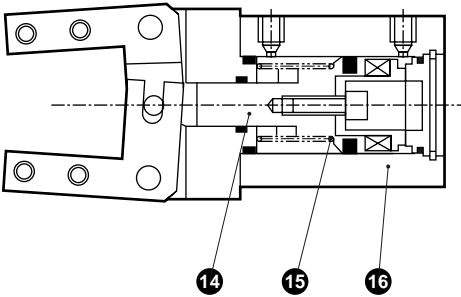
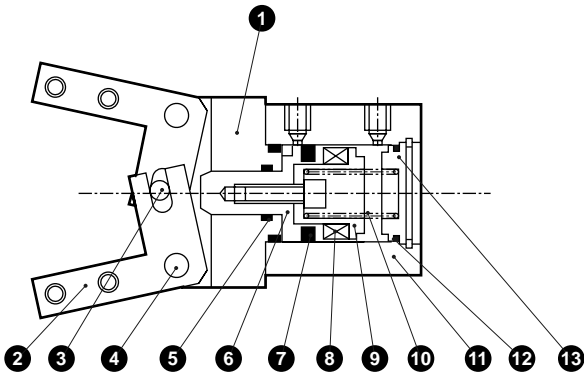
(Select either R (open) or H (closed) for sections marked with an asterisk (*).)

RRC
GRC
RV3*
NHS
HR
LN
FH100
HAP
BSA2
BHA/ BHG
LHA
LHAG
HKP
HLA/ HLB
HLAG/ HLBG
HEP
HCP
HMF
HMFB
HFP
HLC
HGP
FH500
HBL
HDL
HMD
HJL
BHE
CKG
CK
CKA
CKS
CKF
CKJ
CKL2
CKL2 *-HC
CKH2
CKLB2
NCK/ SCK/FCK
FJ
FK
Ending

Fulcrum hand
Hand

Internal structure and parts list

● Standard (double acting)/O (normally open) type ● C (normally closed) type



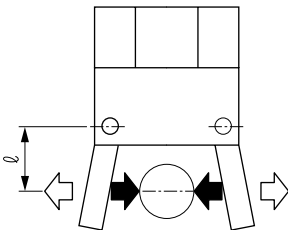
* Spring of 10 is not contained in standard (double acting) type.

No.	Parts name	Material	Remarks	No.	Parts name	Material	Remarks
1	Body	Aluminum alloy		9	Piston B	Stainless steel (1CS) Acetar resin (2 to 4CS)	
2	Master key	Steel		10	Spring	Stainless steel	Only O type
3	Operation axis	Steel		11	Cylinder	Aluminum alloy	
4	Fulcrum axis	Steel		12	Cylinder gasket	Nitrile rubber	
5	Rod packing seal	Nitrile rubber		13	Cylinder guard	Aluminum alloy (1CS) Acetar resin (2 to 4CS)	
6	Piston A	Stainless steel		14	Piston	Stainless steel	
7	Piston packing seal	Nitrile rubber		15	Spring	Stainless steel	
8	Magnet			16	Cylinder	Aluminum alloy	

Gripping power performance data

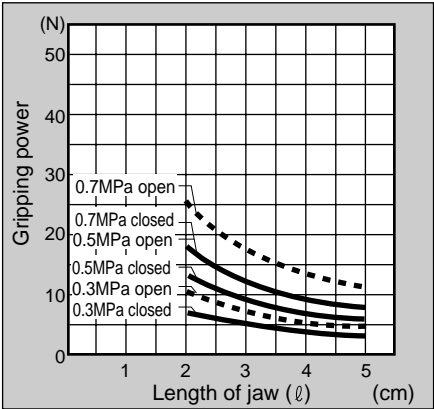
Gripping power that functions to open and closed directions with jaw length ℓ of hand at supply pressure 0.3, 0.5 and 0.7 MPa is shown.

- Open direction (↵) ----- (shown with broken line)
- Closed direction (➡) ————— (shown with continuous line)

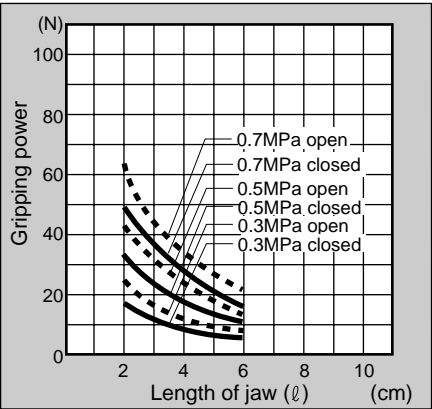


(Note) O type gripping power decreases approximate 20 to 30 % comparing to double acting type to closed direction.
C type gripping power decreases approximate 10 to 20 % comparing to double acting type to open direction.
Grip performance data indicates the grip for one jaw. Since two jaws are used, double the grip in the graph when making a selection.

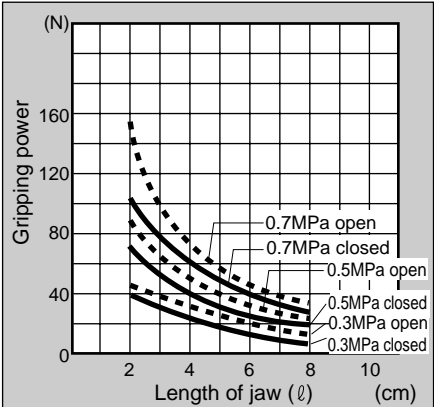
● HBL-1C



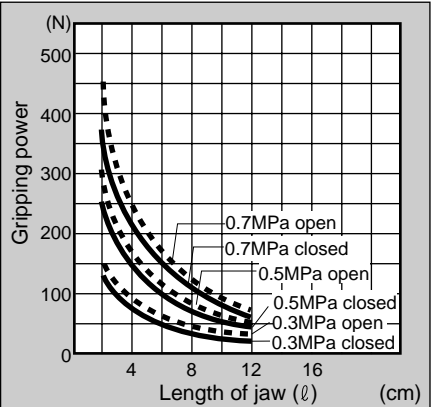
● HBL-2CS



● HBL-3CS



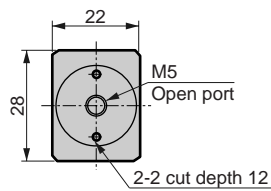
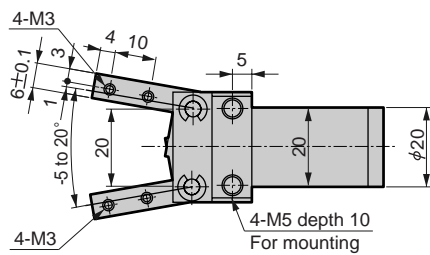
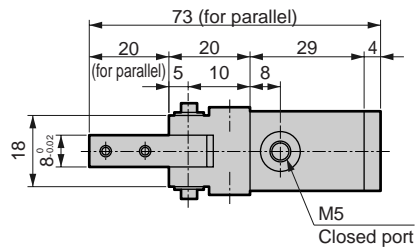
● HBL-4CS



Dimensions

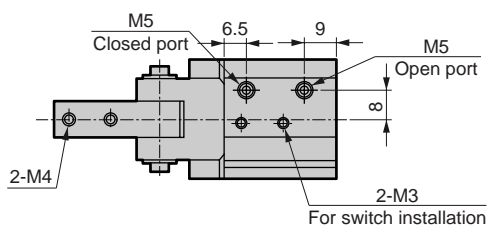
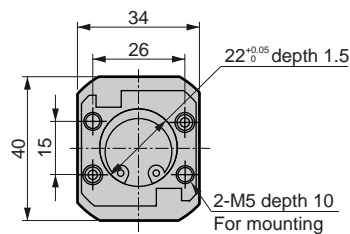
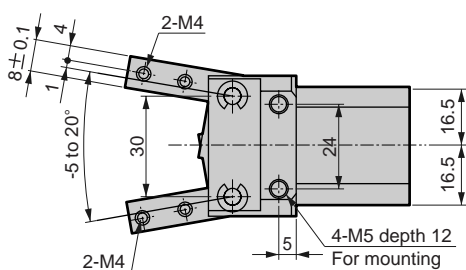
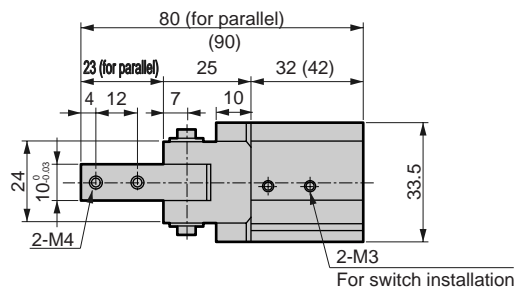


- HBL-1C standard/O/C

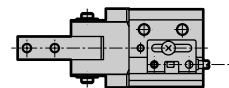
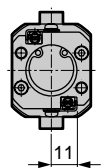
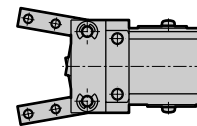
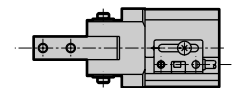


- HBL-2CS standard/O/C

- Dimension in () for C (normally closed) specifications.



- With switch



RRC
GRC
RV3*
NHS
HR
LN
FH100
HAP
BSA2
BHA/ BHG
LHA
LHAG
HKP
HLA/ HLB
HLAG/ HLBG
HEP
HCP
HMF
HMFB
HFP
HLC
HGP
FH500
HLB
HDL
HMD
HJL
BHE
CKG
CK
CKA
CKS
CKF
CKJ
CKL2
CKL2 -*HC
CKH2
CKLB2
NCK/ SCK/FCK
FJ
FK
Ending

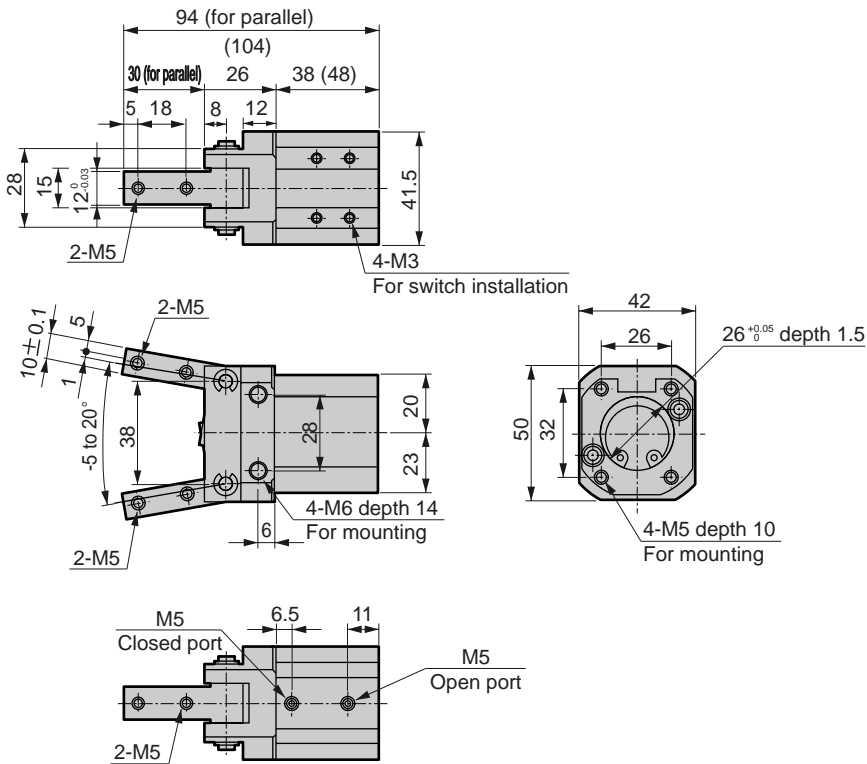
Fulcrum hand
Hand



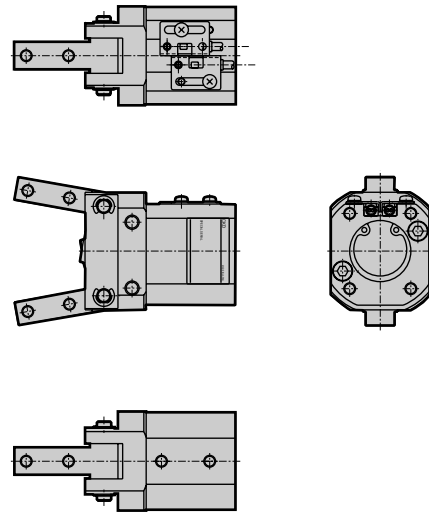
Dimensions

● HBL-3CS standard/O/C

● Dimension in () for C (normally closed) specifications.

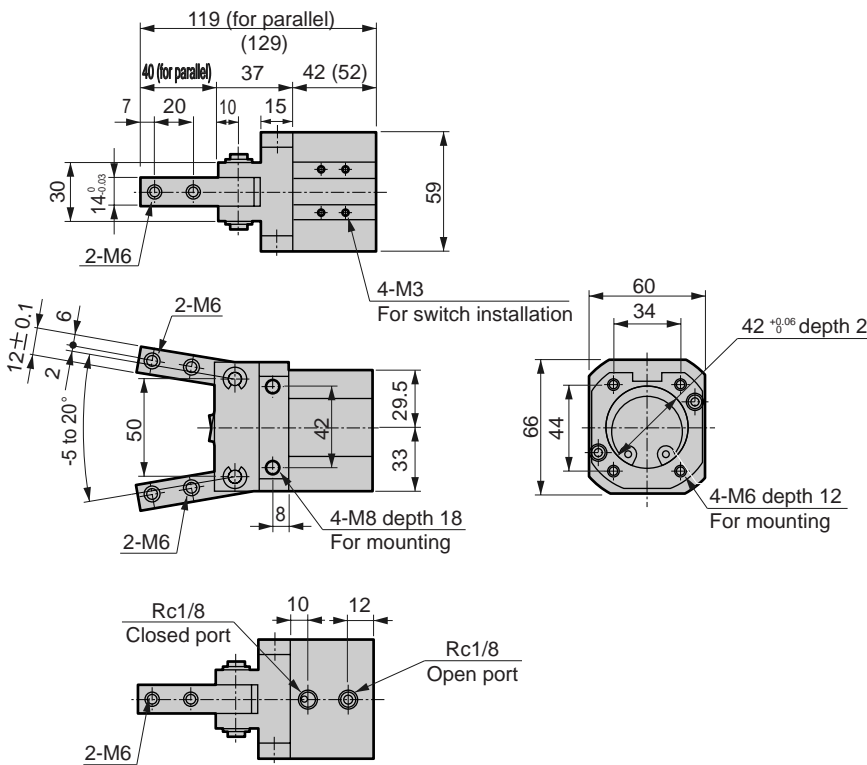


● With switch

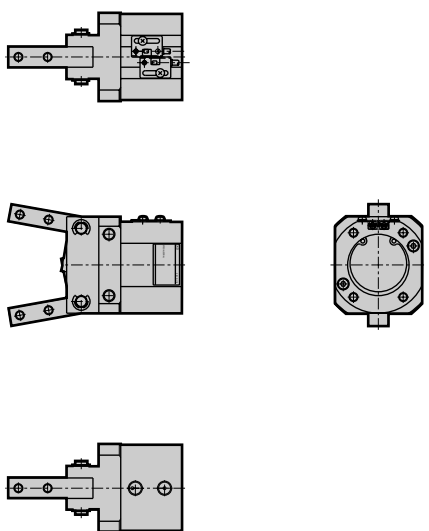


● HBL-4CS standard/O/C

● Dimension in () for C (normally closed) specifications.



● With switch





Wide angle hand Double acting/single acting

HDL Series

● Open and close angle: 0° to 180°



Specifications

Descriptions	HDL	
Size	3CS	4CS
Cylinder bore size mm	φ25	φ40
Actuation	Double acting/single acting	
Working fluid	Compressed air	
Max. working pressure MPa	0.7	
Min. working pressure MPa	0.3	
Ambient temperature °C	5 to 60	
Port size	M5	Rc1/8
Open angle Degree	0 to 180	
Rod diameter mm	φ14	φ16
Capacity of reciprocating cm ³	7.8	53.2
Repeatability mm	±0.2	±0.1
Product weight kg	0.6	2.40
Lubrication	Not required (when lubricating, use turbine oil Class 1 ISO VG32)	

Switch specifications

Descriptions	Proximity 2 wire	Proximity 3 wire
	T2H/T2V	T3H/T3V
Applications	Programmable controller	Programmable controller, relay
Output method	-	NPN output
Power voltage	-	10 to 28 VDC
Load voltage/current	10 to 30 VDC, 5 to 20 mA (Note 1)	30 VDC or less, 100mA or less
Light	LED (ON lighting)	
Leakage current	1mA or less	10μA or less
Maximum shock resistance	980m/s ²	
Lead wire	Standard 1m (oil resistant vinyl cabtire cable 2-conductor 0.2mm ²)	Standard 1m (oil resistant vinyl cabtire cable 2-conductor 0.2mm ²)

Note 1: Max. load current above: 20 mA at 25°C.

The current will be lower than 20mA if ambient temperature around switch is higher than 25°C. (5 to 10mA with 60°C)

How to order

Without switch

HDL - 3CS - O

With switch

HDL - 3CS - O - T2H - R

A Size

B Option

C Switch model no.
* indicates lead wire length.

D Switch quantity

Symbol	Descriptions			
A Size				
3CS				
4CS				
B Option				
Blank	Standard (double acting)			
O	Single acting (normally open)			
C	Single acting (normally closed)			
C Switch model no.				
Axial lead wire	Radial lead wire	Contact	Indicator	Lead wire
T2H*	T2V*	Proximity	1 color	2-wire
T3H*	T3V*		indicator type	3-wire
*Lead wire length				
Blank	1m (standard)			
3	3m (option)			
5	5m (option)			
D Switch quantity				
R	One on open side			
H	One on closed side			
D	Two			

<Example of model number>

HDL-3CS-O-T2H-R

Model: Wide angle hand

- A** Size : 3CS
- B** Option : Single acting, normally open type
- C** Switch model no.: Proximity T2H switch, lead wire 1m
- D** Switch quantity : One on open side

How to order switch

● For switch T*H*

· Switch body + mounting bracket

HDL - T2H

Switch model no.
(Item above **C**)

· Switch body

SW - T2H

Switch model no.
(Item above **C**)

· Mounting bracket

HDL - T

● For switch T*V*

· Switch body + mounting bracket

HDL - T2V - *

Switch model no.
(Item above **C**)

· Switch body

SW - T2V

Switch model no.
(Item above **C**)

· Mounting bracket

HDL - TV - *

(Select either R (open) or H (closed) for sections marked with an asterisk (*).)

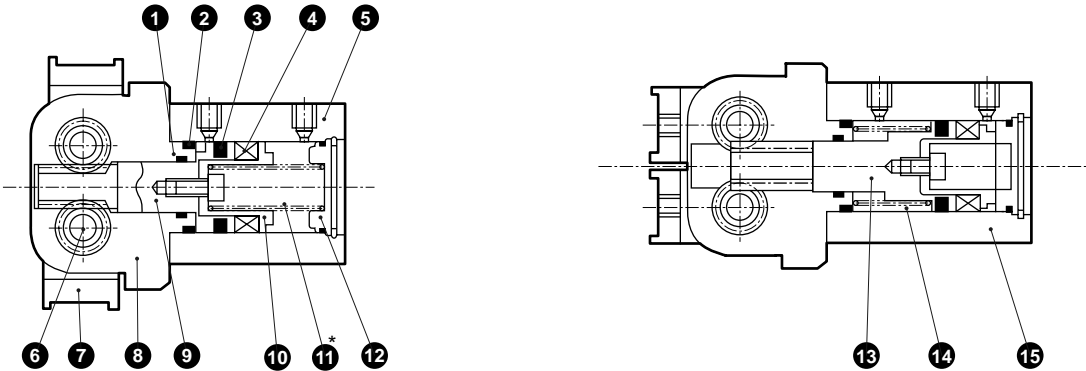
RRC
GRC
RV3*
NHS
HR
LN
FH100
HAP
BSA2
BHA/BHG
LHA
LHAG
HKP
HLA/HLB
HLAG/HLBG
HEP
HCP
HMF
HMFB
HFP
HLC
HGP
FH500
HLB
HDL
HMD
HJL
BHE
CKG
CK
CKA
CKS
CKF
CKJ
CKL2
CKL2 *-HC
CKH2
CKLB2
NCK/SCK/FCK
FJ
FK
Ending

Wide angle hand
Hand

RRC
GRC
RV3*
NHS
HR
LN
FH100
HAP
BSA2
BHA/
BHG
LHA
LHAG
HKP
HLA/
HLB
HLAG/
HLBG
HEP
HCP
HMF
HMFB
HFP
HLC
HGP
FH500
HBL
HDL
HMD
HJL
BHE
CKG
CK
CKA
CKS
CKF
CKJ
CKL2
CKL2
-*.HC
CKH2
CKLB2
NCK/
SCK/FCK
FJ
FK
Ending

Internal structure and parts list

● Standard (double acting)/O (normally open) type ● C (normally closed) type



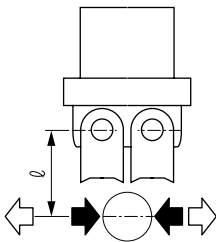
* Spring of 11 is not contained in standard (double acting) type.

No.	Parts name	Material	Remarks	No.	Parts name	Material	Remarks
1	Rod packing seal	Nitrile rubber		9	Piston A	Stainless steel	
2	Cylinder gasket	Nitrile rubber		10	Piston B	Acetar resin	
3	Piston packing seal	Nitrile rubber		11	Spring	Stainless steel	Only O type
4	Magnet			12	Cylinder guard	Acetar resin	
5	Cylinder	Aluminum alloy		13	Piston	Stainless steel	
6	Pinion gear	Steel		14	Spring	Stainless steel	
7	Master key	Steel		15	Cylinder	Aluminum alloy	
8	Body	Aluminum alloy					

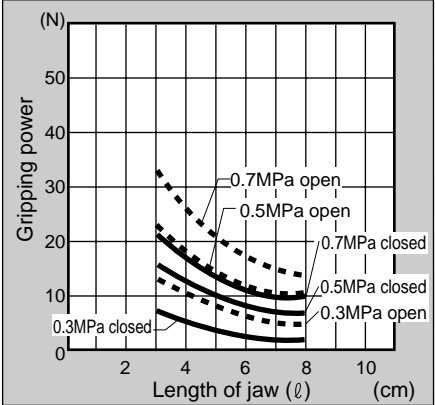
Gripping power performance data

Gripping power that functions to open and closed directions with jaw length ℓ of hand at supply pressure 0.3, 0.5 and 0.7 MPa is shown.

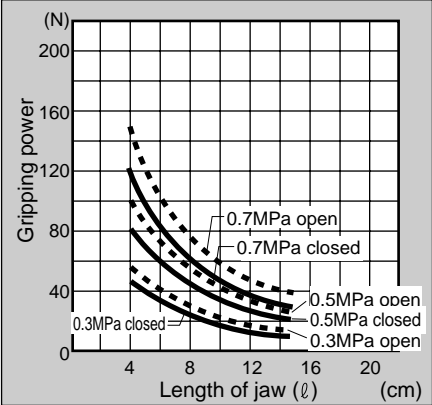
- Open direction (↺) - - - - (shown with broken line)
- Closed direction (↻) ——— (shown with continuous line)



● HDL-3CS



● HDL-4CS



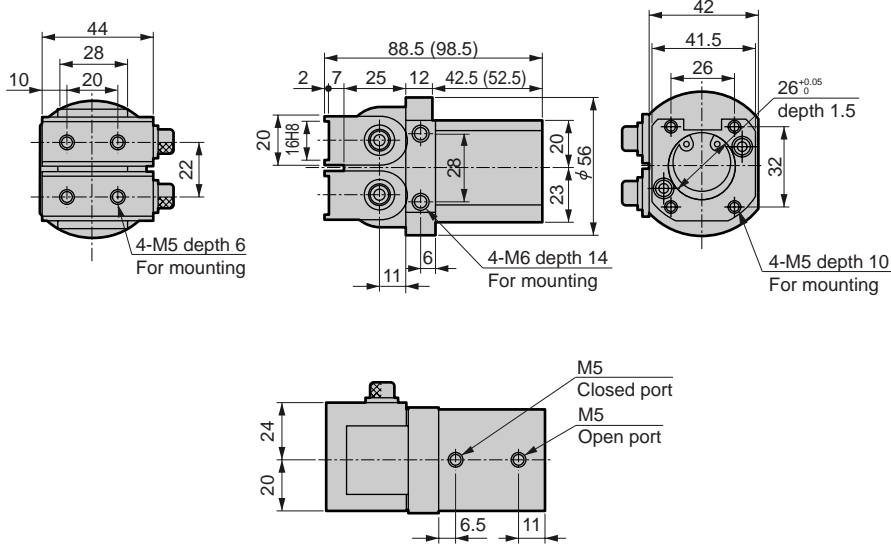
(Note) O type gripping power decreases approximate 20 to 30 % comparing to double acting type to closed direction.
C type gripping power decreases approximate 10 to 20 % comparing to double acting type to open direction.
Grip performance data indicates the grip for one jaw. Since two jaws are used, double the grip in the graph when making a selection.

Dimensions

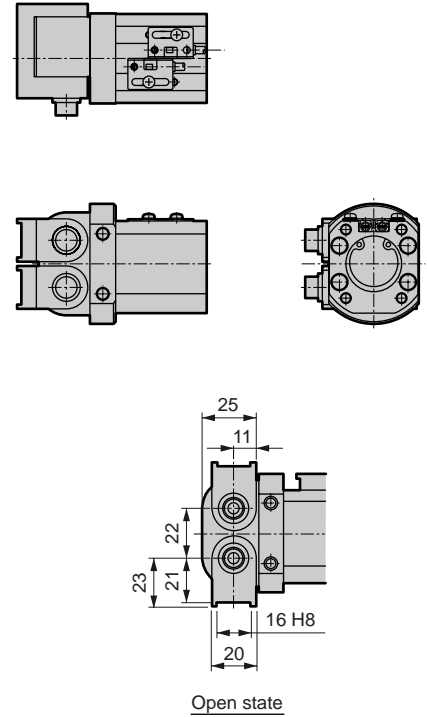


● HDL-3CS standard/O/C

● Dimension in () for C (normally closed) specifications.

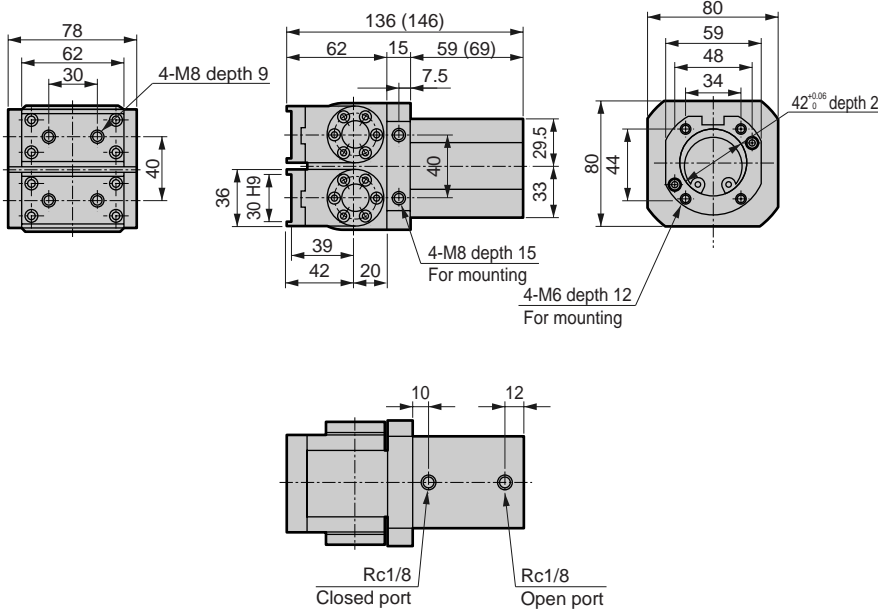


● With switch

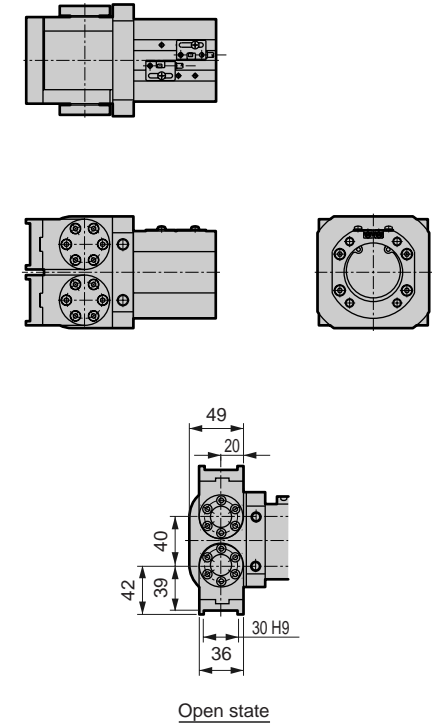


● HDL-4CS standard/O/C

● Dimension in () for C (normally closed) specifications.



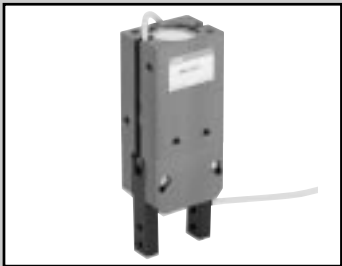
● With switch



RRC
GRC
RV3*
NHS
HR
LN
FH100
HAP
BSA2
BHA/
BHG
LHA
LHAG
HKP
HLA/
HLB
HLAG/
HLBG
HEP
HCP
HMF
HMFB
HFP
HLC
HGP
FH500
HBL
HDL
HMD
HJL
BHE
CKG
CK
CKA
CKS
CKF
CKJ
CKL2
CKL2
-HC
CKH2
CKLB2
NCK/
SCK/FCK
FJ
FK
Ending

Wide angle hand
Hand

RRC
 GRC
 RV3*
 NHS
 HR
 LN
 FH100
 HAP
 BSA2
 BHA/
 BHG
 LHA
 LHAG
 HKP
 HLA/
 HLB
 HLAG/
 HLBG
 HEP
 HCP
 HMF
 HMFB
 HFP
 HLC
 HGP
 FH500
 HBL
 HDL
 HMD
 HJL
 BHE
 CKG
 CK
 CKA
 CKS
 CKF
 CKJ
 CKL2
 CKL2
 -*.HC
 CKH2
 CKLB2
 NCK/
 SCK/FCK
 FJ
 FK
 Ending



Thin wide angle hand

HMD Series

● Open and close angle: - 4° to 184°



Specifications

Descriptions	HMD	
Size	16CS	25CS
Cylinder bore size mm	φ16	φ25
Actuation	Double acting	
Working fluid	Compressed air	
Max. working pressure MPa	0.7	
Min. working pressure MPa	0.3	
Ambient temperature °C	5 to 60	
Port size	M3	M5
Open angle Degree	-4 to 184	
Rod diameter mm	φ6	φ8
Capacity of reciprocating cm ³	5.8	19.4
Repeatability mm	±0.2	
Product weight kg	0.13	0.38
Lubrication	Not required (when lubricating, use turbine oil Class 1 ISO VG32)	

Switch specifications

Descriptions	Proximity 2 wire	Proximity 3 wire
	T2H/T2V	T3H/T3V
Applications	Programmable controller	Programmable controller, relay
Output method	-	NPN output
Power voltage	-	10 to 28 VDC
Load voltage/current	10 to 30 VDC, 5 to 20 mA (Note 1)	30 VDC or less, 100mA or less
Light	LED (ON lighting)	
Maximum shock resistance	980m/s ²	
Lead wire	Standard 1m	Standard 1m
	(oil resistant vinyl cabtire cable 2-conductor 0.2mm ²)	(oil resistant vinyl cabtire cable 3-conductor 0.2mm ²)
Leakage current	1mA or less	10μA or less

Note 1: Max. load current above: 20 mA at 25°C.
 The current will be lower than 20mA if ambient temperature around switch is higher than 25°C. (5 to 10mA with 60°C)

How to order

Without switch

HMD - **16CS**

With switch

HMD - **16CS** - **T2H** - **R**

Model no.

A Size

B Switch model no.

* indicates lead wire length.

C Switch quantity

Symbol	Descriptions			
A Size				
16CS				
25CS				
B Switch model no.				
Axial lead wire	Radial lead wire	Contact	Indicator	Lead wire
T2H*	T2V*	Proximity	1 color	2-wire
T3H*	T3V*		indicator type	3-wire
*Lead wire length				
Blank	1m (standard)			
3	3m (option)			
5	5m (option)			
C Switch quantity				
R	One on open side			
H	One on closed side			
D	Two			

<Example of model number>

HMD-16CS-T2H-R

Model: Thin wide angle hand

A Size: 16CS

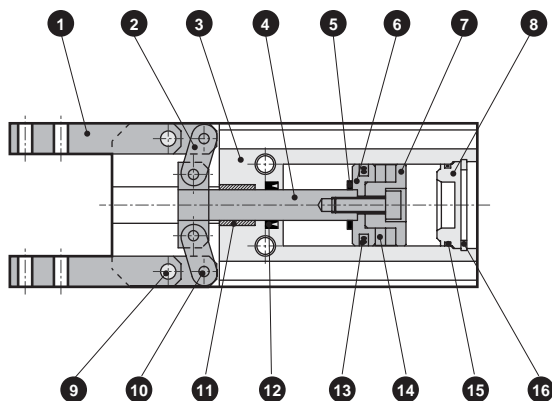
B Switch model no.: Proximity T2H switch, lead wire 1m

C Switch quantity: One on open side

How to order switch

SW - **T2H***Switch model no.
(Item B above)

Internal structure and parts list



No.	Parts name	Material	Remarks
1	Master key	Steel	
2	Link	Steel	
3	Body	Aluminum alloy	
4	Piston A	Stainless steel	
5	Cushion	Urethane rubber	
6	Piston B	Copper alloy	
7	Piston C	Copper alloy	
8	Cylinder guard	Acetar resin	
9	Fulcrum axis	Alloy steel	
10	Operation axis	Alloy steel	
11	Bush	Sintering oil impregnated alloy	
12	Rod sealant	Nitrile rubber	
13	Piston seal	Nitrile rubber	
14	Magnet		
15	Cylinder sealant	Nitrile rubber	
16	Snap ring	Stainless steel	

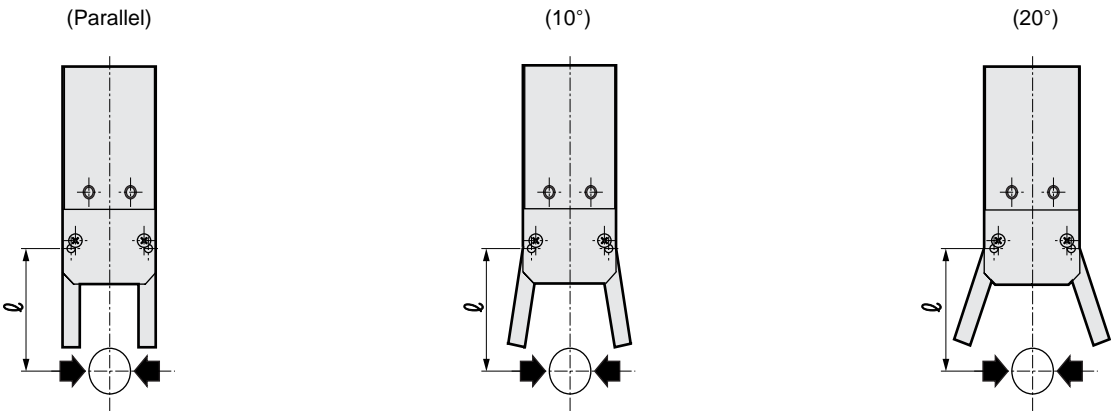
RRC
GRC
RV3*
NHS
HR
LN
FH100
HAP
BSA2
BHA/
BHG
LHA
LHAG
HKP
HLA/
HLB
HLAG/
HLBG
HEP
HCP
HMF
HMFB
HFP
HLC
HGP
FH500
HBL
HDL
HMD
HJL
BHE
CKG
CK
CKA
CKS
CKF
CKJ
CKL2
CKL2
*-HC
CKH2
CKLB2
NCK/
SCK/FCK
FJ
FK
Ending

Thin wide angle hand
Hand

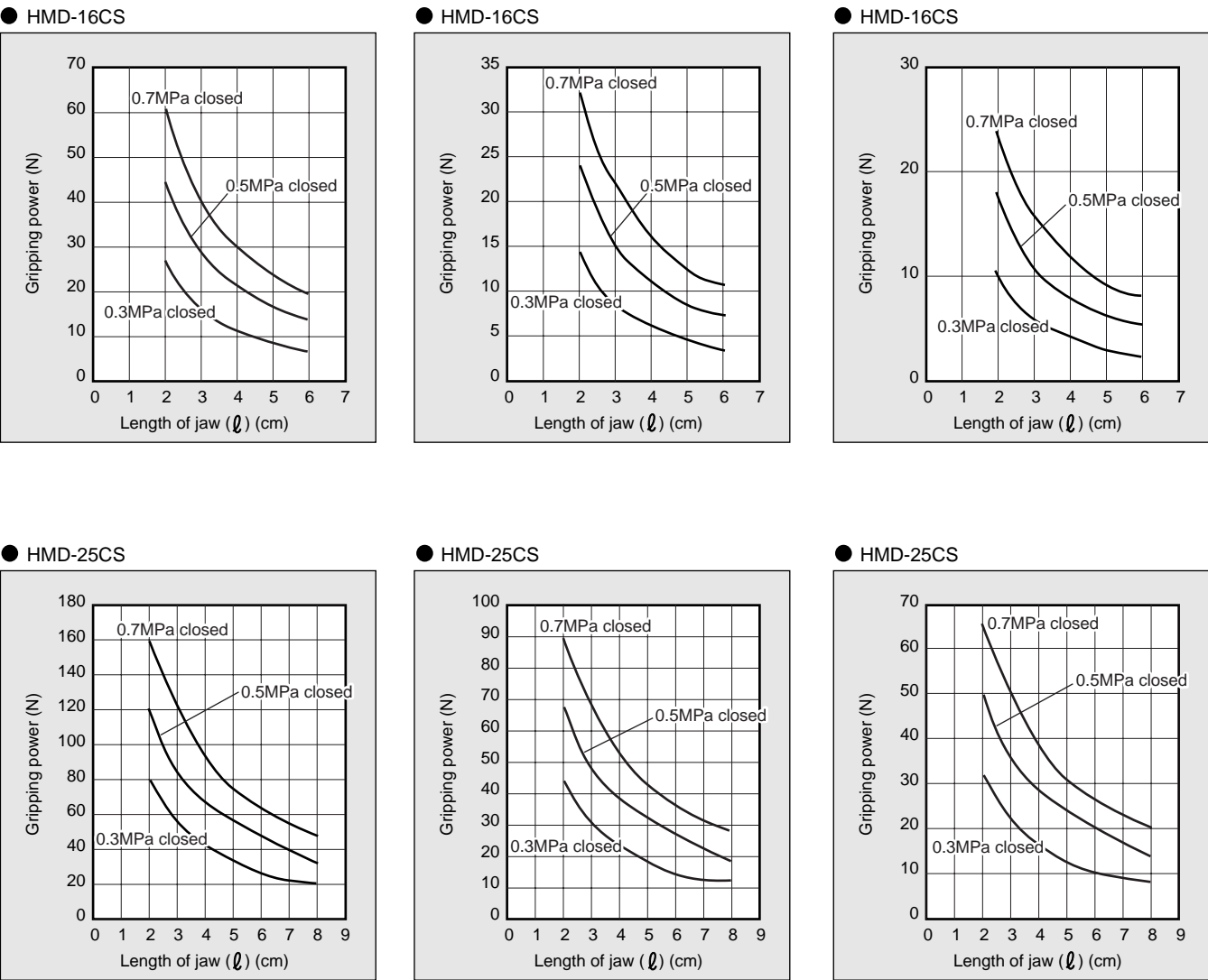
Gripping power performance data

Gripping power that functions to open and closed directions with jaw length ℓ of hand at supply pressure 0.3, 0.5 and 0.7 MPa is shown.

· Closed direction (➡) (shown with continuous line)



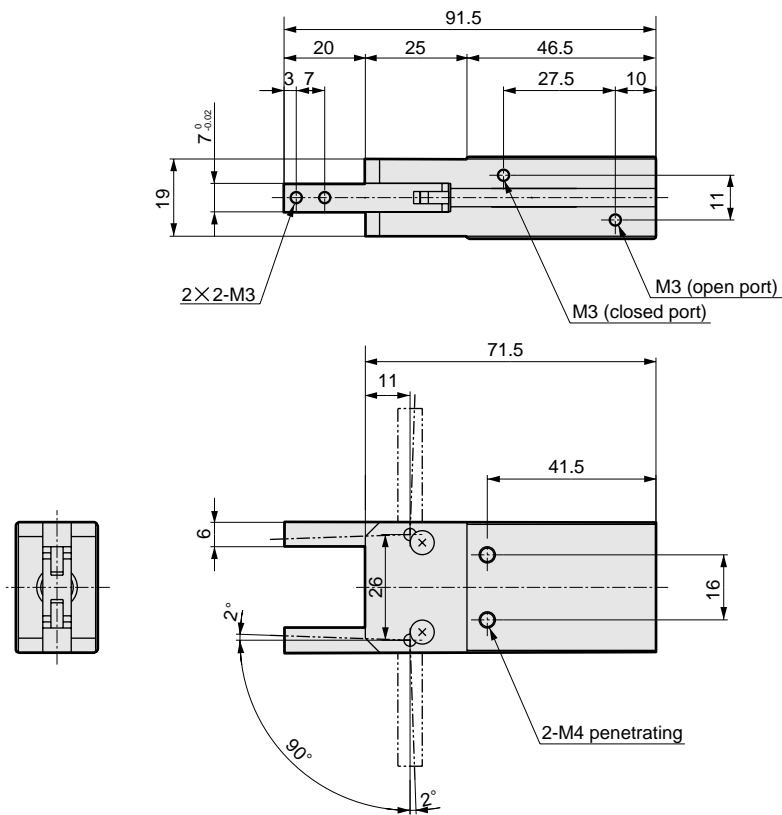
(Note) Grip performance data indicates the grip for one jaw.
Since two jaws are used, double the grip in the graph when making a selection.



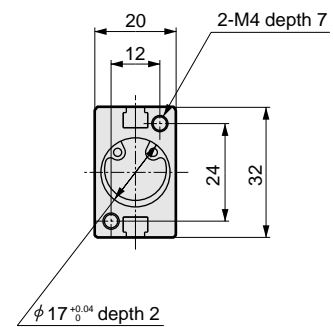
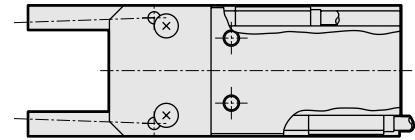
Dimensions



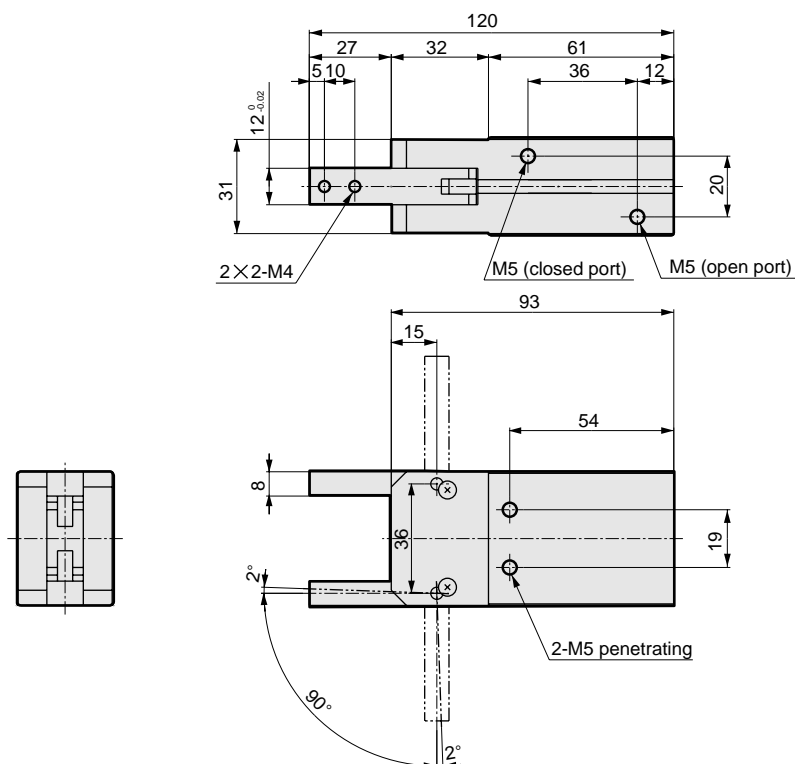
● HMD-16CS



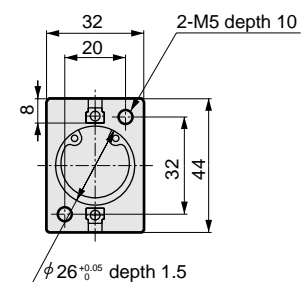
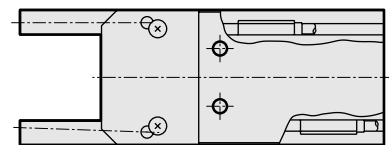
● With switch



● HMD-25CS



● With switch



RRC
GRC
RV3*
NHS
HR
LN
FH100
HAP
BSA2
BHA/BHG
LHA
LHAG
HKP
HLA/HLB
HLAG/HLBG
HEP
HCP
HMF
HMFB
HFP
HLC
HGP
FH500
HBL
HDL
HMD
HJL
BHE
CKG
CK
CKA
CKS
CKF
CKJ
CKL2
CKL2*-HC
CKH2
CKLB2
NCK/SCK/FCK
FJ
FK
Ending

Thin wide angle hand
Hand

RRC
 GRC
 RV3*
 NHS
 HR
 LN
 FH100
 HAP
 BSA2
 BHA/
 BHG
 LHA
 LHAG
 HKP
 HLA/
 HLB
 HLAG/
 HLBG
 HEP
 HCP
 HMF
 HMFB
 HFP
 HLC
 HGP
 FH500
 HBL
 HDL
 HMD
 HJL
 BHE
 CKG
 CK
 CKA
 CKS
 CKF
 CKJ
 CKL2
 CKL2
 -*.HC
 CKH2
 CKLB2
 NCK/
 SCK/FCK
 FJ
 FK
 Ending



Toggle hand

HJL Series



Specifications

Descriptions	HJL			
Size	32CS	40CS	50CS	63CS
Cylinder bore size mm	ϕ32	ϕ40	ϕ50	ϕ63
Working fluid	Compressed air			
Max. working pressure MPa	0.7			
Min. working pressure MPa	0.3			
Ambient temperature °C	5 to 60			
Port size	M5	Rc1/8		
Open angle Degree	-3 to 28			
Rod diameter mm	ϕ14	ϕ16	ϕ20	ϕ20
Capacity of reciprocating cm³	21.9	37.0	72.3	118.4
Repeatability mm	±0.1			
Product weight kg	0.88	1.24	2.11	3.00
Lubrication	Not required (when lubricating, use turbine oil Class 1 ISO VG32)			

Switch specifications

Descriptions	Proximity 2 wire	Proximity 3 wire
	T2H/T2V	T3H/T3V
Applications	Programmable controller	Programmable controller, relay
Output method	-	NPN output
Power voltage	-	10 to 28 VDC
Load voltage/current	10 to 30 VDC, 5 to 20 mA (Note 1)	30 VDC or less, 100mA or less
Light	LED (ON lighting)	
Leakage current	1mA or less	10μA or less
Maximum shock resistance	980m/s ²	
Lead wire	Standard 1m (oil resistant vinyl cabtire cable 2-conductor 0.2mm ²)	Standard 1m (oil resistant vinyl cabtire cable 2-conductor 0.2mm ²)

Note 1: Max. load current above: 20 mA at 25°C.
 The current will be lower than 20mA if ambient temperature around switch is higher than 25°C. (5 to 10mA with 60°C)

How to order

HJL - 40CS - T2H - R

Ⓐ Size

Ⓑ Switch model no.
* indicates lead wire length.

Ⓒ Switch quantity

Symbol	Descriptions			
A Size				
32CS				
40CS				
50CS				
63CS				
B Switch model no.				
Axial lead wire	Radial lead wire	Contact	Indicator	Lead wire
T2H*	T2V*	Proximity	1 color	2-wire
T3H*	T3V*		indicator type	3-wire
*Lead wire length				
Blank	1m (standard)			
3	3m (option)			
5	5m (option)			
C Switch quantity				
R	One on open side			
H	One on closed side			
D	Two			

<Example of model number>

HJL-40CS-T2H-R

Model: Toggle hand

- Ⓐ Size : 40CS
- Ⓑ Switch model no. : Proximity T2H switch, lead wire 1m
- Ⓒ Switch quantity : One on open side

How to order switch

● For switch T*H*

- Switch body + mounting bracket

HJL - T2H

↓

Switch model no.
(Item above Ⓑ)

- Only switch body

SW - T2H

↓

Switch model no.
(Item above Ⓑ)

- Mounting bracket

HJL - T

↓

Bracket

● For switch T*V*

- Switch body + mounting bracket

HJL - T2V - *

↓

Switch model no.
(Item above Ⓑ)

- Only switch body

SW - T2V

↓

Switch model no.
(Item above Ⓑ)

- Mounting bracket

HJL - TV - *

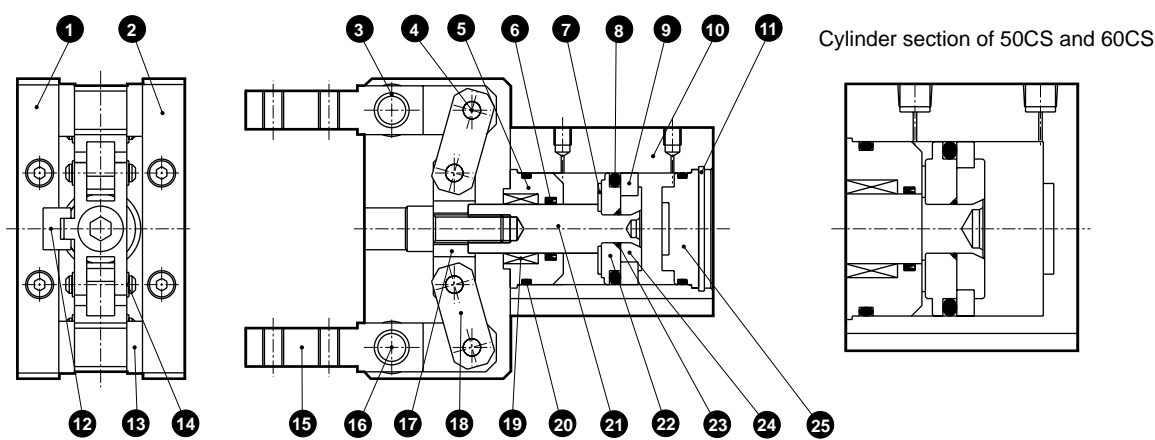
(Select either R (open) or H (closed) for sections marked with an asterisk (*).)

RRC
GRC
RV3*
NHS
HR
LN
FH100
HAP
BSA2
BHA/BHG
LHA
LHAG
HKP
HLA/HLB
HLAG/HLBG
HEP
HCP
HMF
HMFB
HFP
HLC
HGP
FH500
HLB
HDL
HMD
HJL
BHE
CKG
CK
CKA
CKS
CKF
CKJ
CKL2
CKL2 *-HC
CKH2
CKLB2
NCK/SCK/FCK
FJ
FK
Ending

Toggle hand
Hand

RRC
GRC
RV3*
NHS
HR
LN
FH100
HAP
BSA2
BHA/ BHG
LHA
LHAG
HKP
HLA/ HLB
HLAG/ HLBG
HEP
HCP
HMF
HMFB
HFP
HLC
HGP
FH500
HBL
HDL
HMD
HJL
BHE
CKG
CK
CKA
CKS
CKF
CKJ
CKL2
CKL2 -*.HC
CKH2
CKLB2
NCK/ SCK/FCK
FJ
FK
Ending

Internal structure and parts list




Parts list

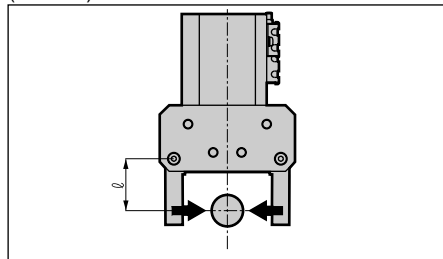
No.	Parts name	Material	Remarks	No.	Parts name	Material	Remarks
1	Body B	Aluminum alloy		14	E type snap ring	Carbon steel	
2	Body A	Aluminum alloy		15	Master key	Carbon steel	
3	DU dry bearing	Sintering oil impregnated alloy		16	Fulcrum axis	Carbon steel	
4	Operation axis	Carbon steel		17	Operation plate	Carbon steel	
5	Rod cover	Aluminum alloy		18	Link	Carbon steel	
6	Rod sealant	Nitrile rubber		19	Die slide bush	Copper alloy casting	
7	Cushion	Urethane rubber		20	Cylinder sealant	Nitrile rubber	
8	Piston seal	Nitrile rubber		21	Piston rod	Stainless steel	
9	Magnet			22	Piston A	Aluminum alloy	
10	Cylinder	Aluminum alloy		23	O ring	Nitrile rubber	
11	C type snap ring	Stainless steel	50CS, 60CS are not available	24	Piston B	Aluminum alloy	
12	Guide rail	Carbon steel		25	Cylinder guard	Aluminum alloy	50CS, 60CS are not available
13	Collar	Carbon steel					

Gripping power performance data

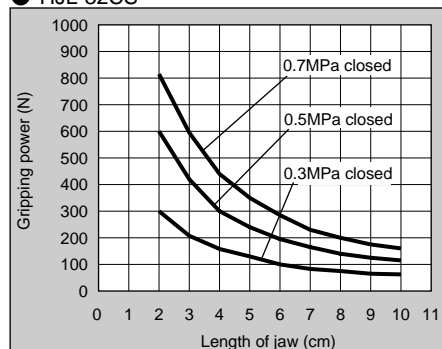
Gripping power that functions to open and closed directions with jaw length ℓ of hand at supply pressure 0.3, 0.5 and 0.7 MPa is shown.

· Closed direction () (shown with continuous line)

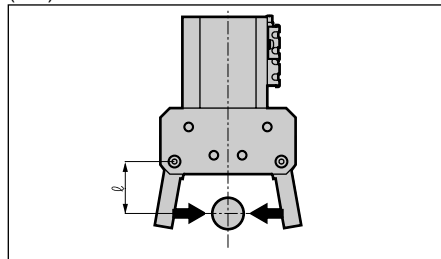
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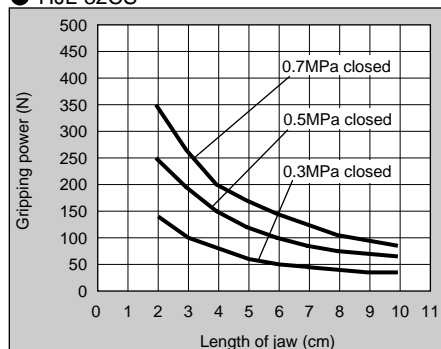
● HJL-32CS



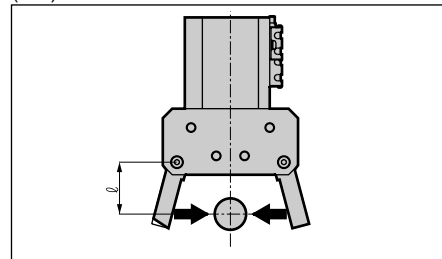
(10°)



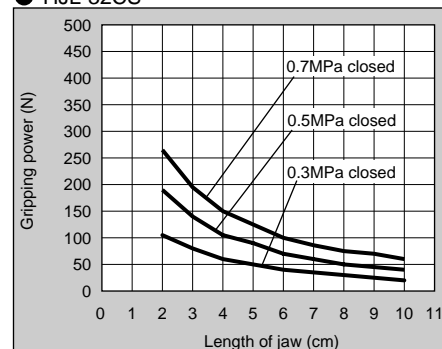
● HJL-32CS



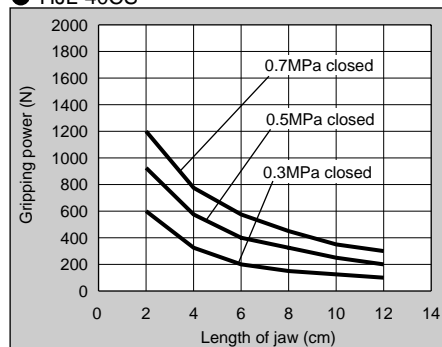
(20°)



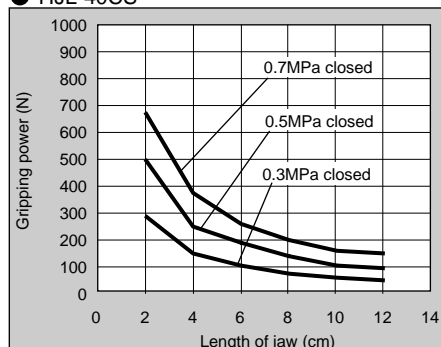
● HJL-32CS



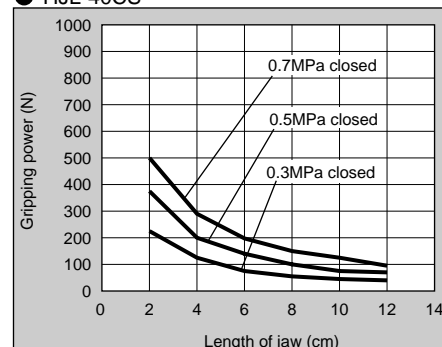
● HJL-40CS



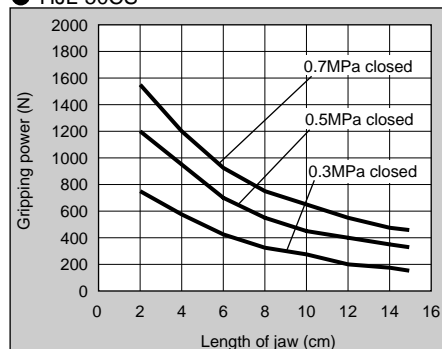
● HJL-40CS



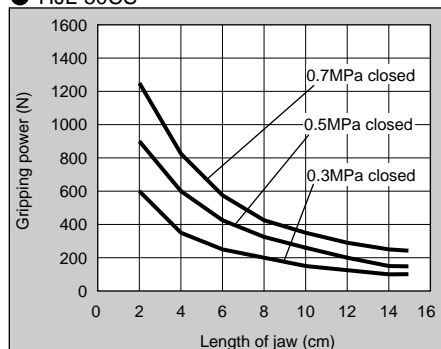
● HJL-40CS



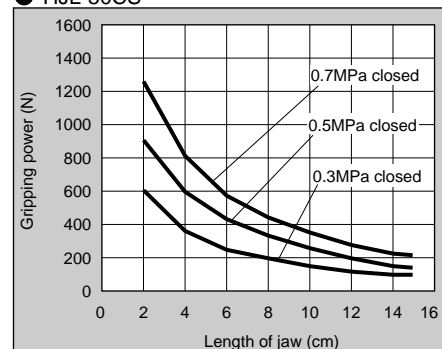
● HJL-50CS



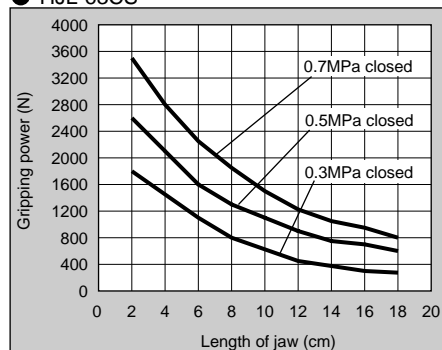
● HJL-50CS



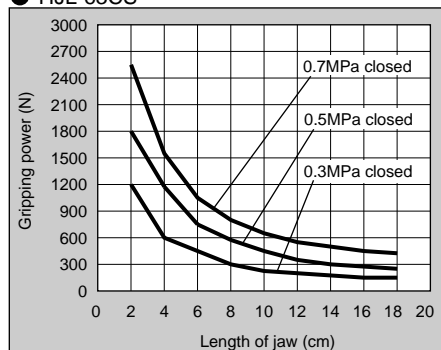
● HJL-50CS



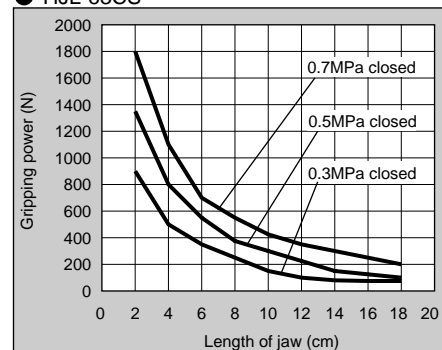
● HJL-63CS



● HJL-63CS



● HJL-63CS



(Note) Grip performance data indicates the grip for one jaw. Since two jaws are used, double the grip in the graph when making a selection.

RRC

GRC

RV3*

NHS

HR

LN

FH100

HAP

BSA2

BHA/
BHG

LHA

LHAG

HKP

HLA/
HLB

HLAG/
HLBG

HEP

HCP

HMF

HMFB

HFP

HLC

HGP

FH500

HLB

HDL

HMD

HJL

BHE

CKG

CK

CKA

CKS

CKF

CKJ

CKL2

CKL2
*-HC

CKH2

CKLB2

NCK/
SCK/FCK

FJ

FK

Ending

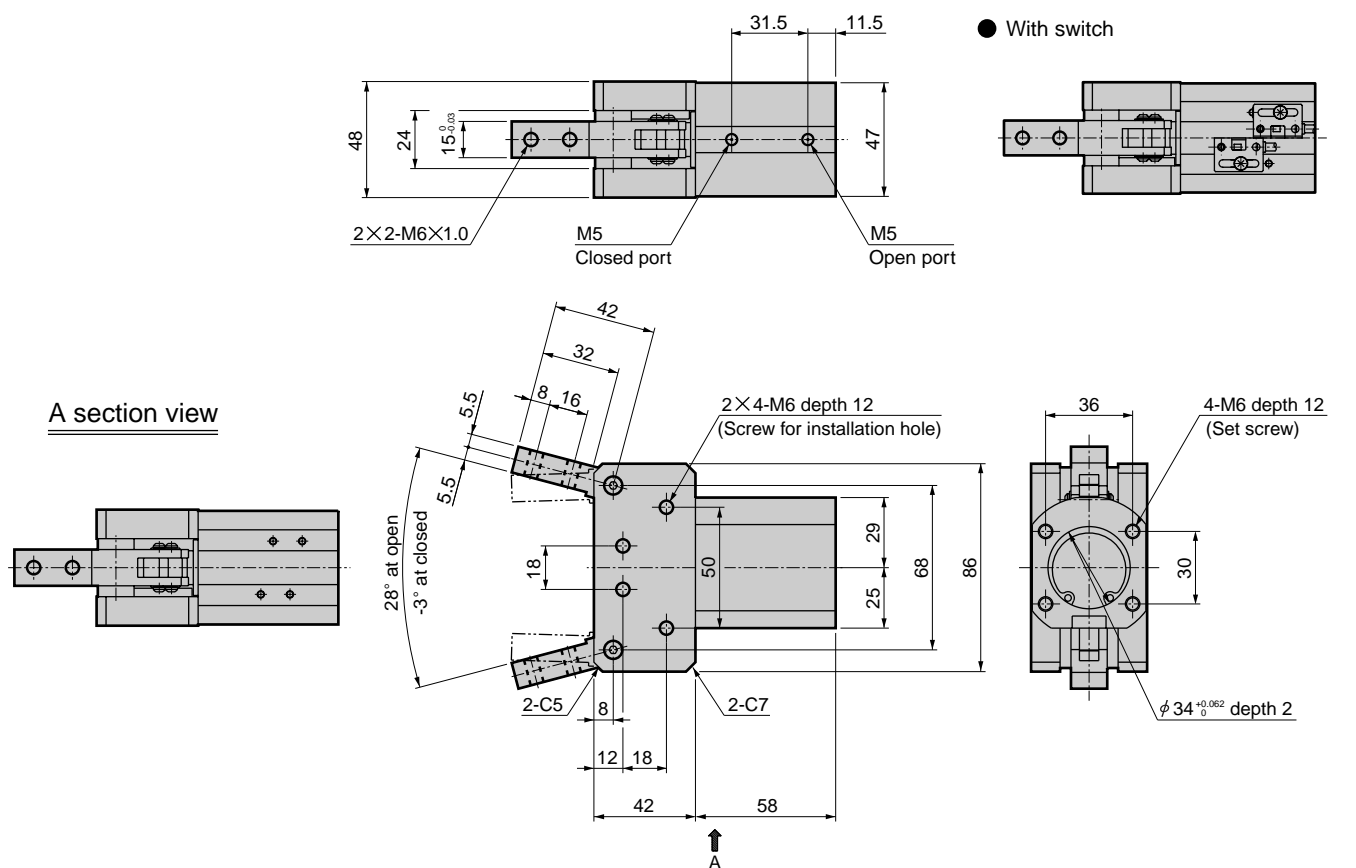
Toggle hand

Hand

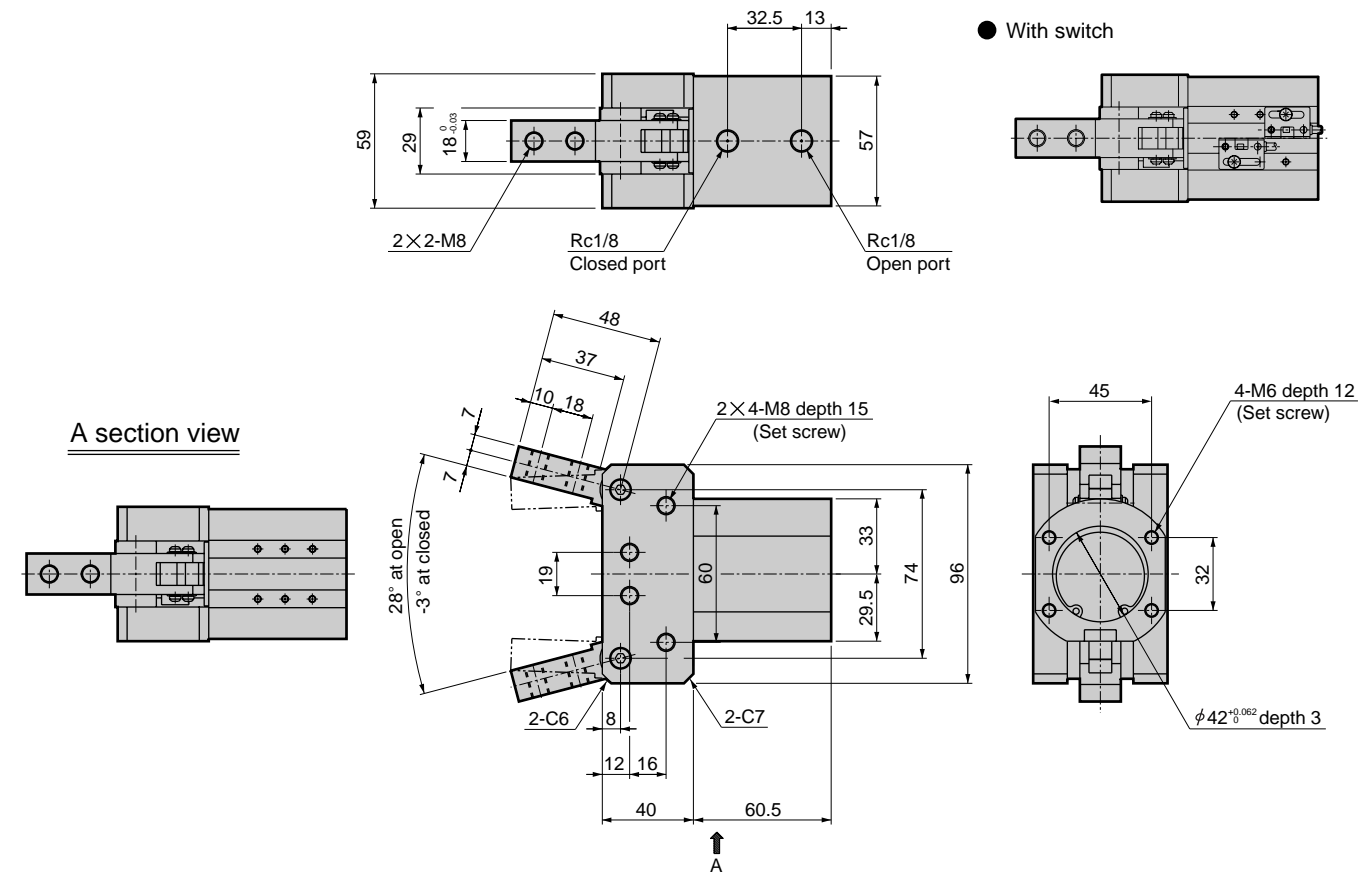
Dimensions



● HJL-32CS



● HJL-40CS

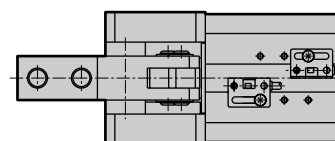
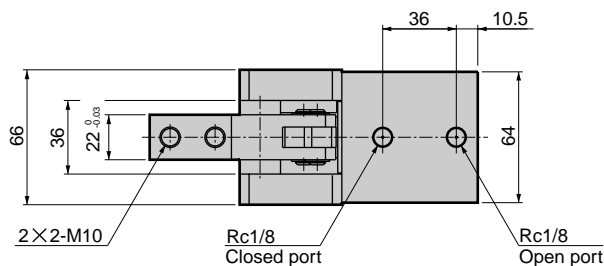


Dimensions

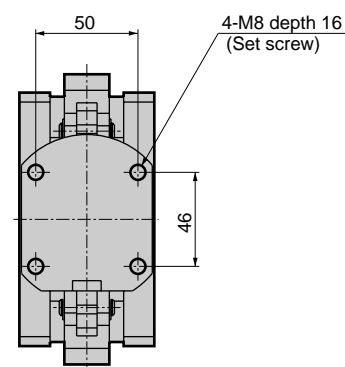
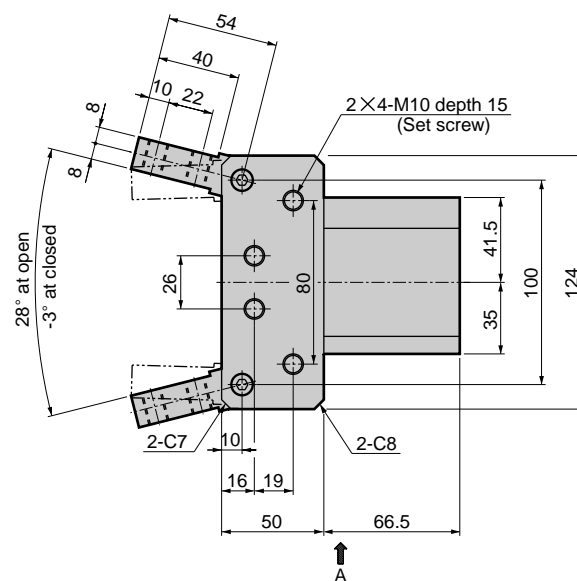
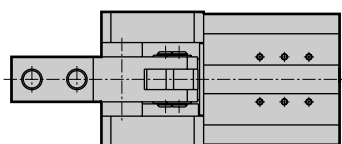


● HJL-50CS

● With switch

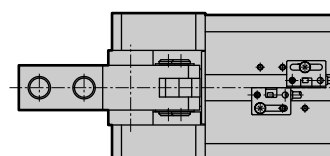
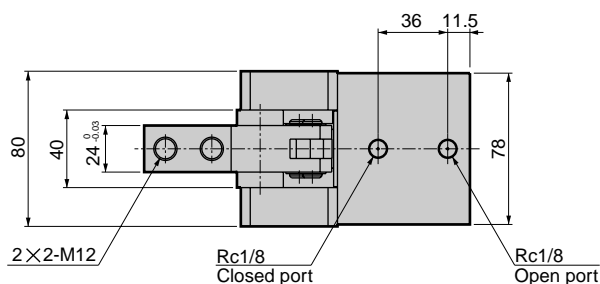


A section view

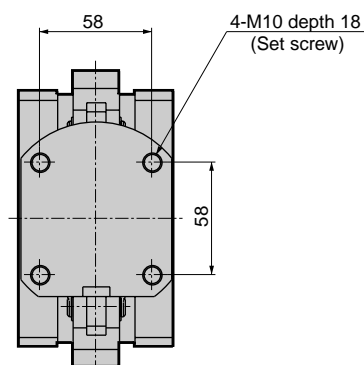
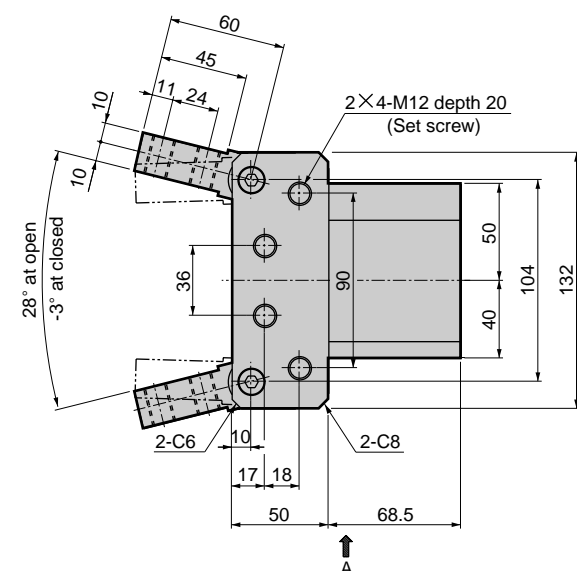
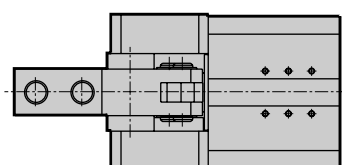


● HJL-63CS

● With switch



A section view



RRC
GRC
RV3*
NHS
HR
LN
FH100
HAP
BSA2
BHA/
BHG
LHA
LHAG
HKP
HLA/
HLB
HLAG/
HLBG
HEP
HCP
HMF
HMFB
HFP
HLC
HGP
FH500
HLB
HDL
HMD
HJL
BHE
CKG
CK
CKA
CKS
CKF
CKJ
CKL2
CKL2
-HC
CKH2
CKLB2
NCK/
SCK/FCK
FJ
FK
Ending

Toggle hand
Hand

RRC
GRC
RV3*
NHS
HR
LN
FH100
HAP
BSA2
BHA/BHG
LHA
LHAG
HKP
HLA/HLB
HLAG/HLBG
HEP
HCP
HMF
HMFb
HFP
HLC
HGP
FH500
HBL
HDL
HMD
HJL
BHE
CKG
CK
CKA
CKS
CKF
CKJ
CKL2
CKL2
-*.HC
CKH2
CKLB2
NCK/
SCK/FCK
FJ
FK
Ending



Small jaw

● Material: Iron, engineering plastic



Features

A variety of small jaws is available to match user machining needs.

● **Socket and spigot section machined**

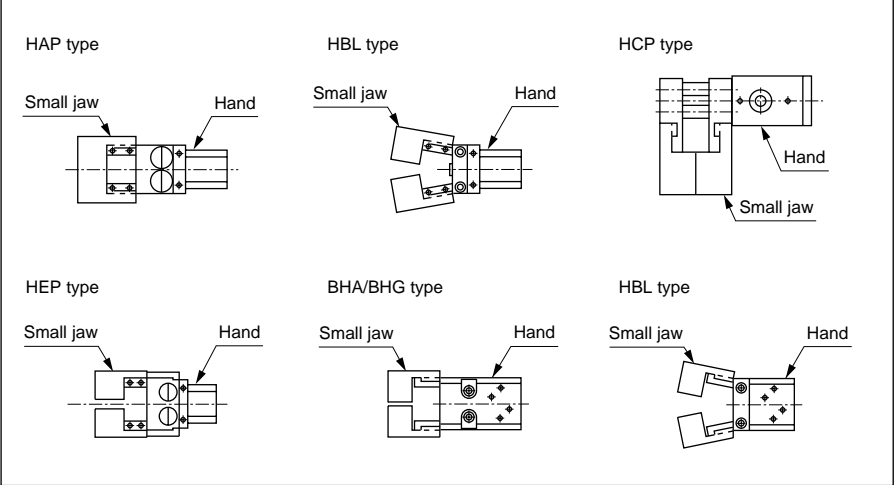
Standard section (socket and spigot section) machined.

Wide series variation to select according to workpiece shape and dimension.

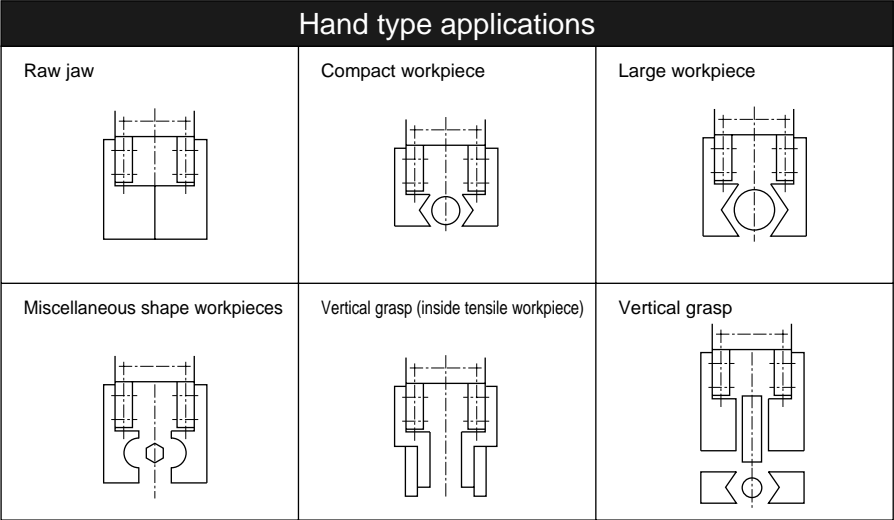
● **2 types of materials for small jaw**

Iron (S50C) and engineering plastic (MC nylon) are available according to material and working conditions of workpiece.

Applicable model for standard small jaw



Small jaw applications



How to order (Note: When ordering repair parts, 1 pc. is provided.)

BHA - **Y1** - **110**

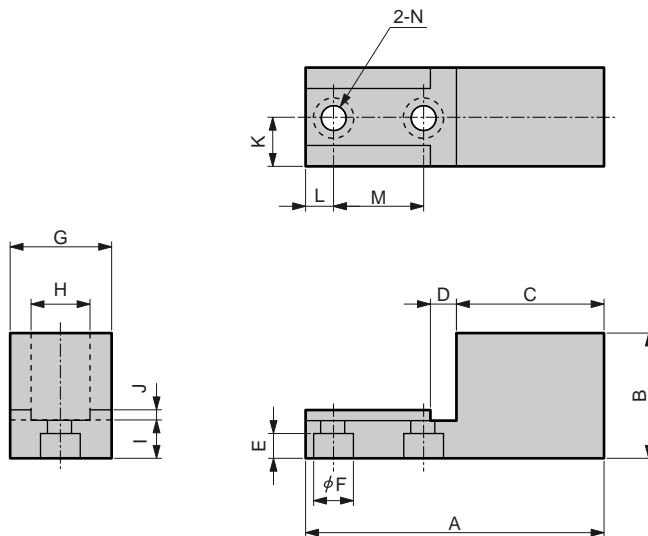
A Model **B** Material **C** Small jaw no.

A Model		B Material		C Small jaw no.			
Symbol	Descriptions	Symbol	Descriptions	Symbol	Applicable model	Symbol	Applicable model
FH	Feather hand (FH100/FH500)	Y1	Material S50C	110	HAP-1C	210	HEP-5CS
HAP	Parallel hand	Y2	Material MC nylon	120	HAP-2CS, HBL-2CS	310	FH110, FH510
BHA	Compact cross roller parallel hand			130	HAP-3CS, HBL-3CS	320	FH112, FH512
BHG	Compact cross roller parallel hand with rubber cover			140	HAP-4CS, HBL-4CS	330	FH116, FH516
HEP	Bearing parallel hand			150	HBL-1CS	340	FH120, FH520
HCP	Lateral parallel hand			160	HCP-2CS	350	FH125
HBL	Fulcrum hand			170	HCP-3CS	260	BHA-01CS1, BHG-01CS
				180	HCP-4CS	270	BHA-03CS1, BHG-03CS
				190	HEP-3.5CS	280	BHA-04CS1, BHG-04CS
				200	HEP-4CS	290	BHA-05CS1, BHG-05CS

Dimensions



● 110 to 350



*Material
Y1: S50C
Y2: MC nylon

Small jaw no.	Applicable model	*Material	Dimension (mm)															Weight (g)
			A	B	C	D	E	φF	G	H ₀ ^{+0.02} _{-0.1}	I	J	K	L	M	φN		
110	HAP-1C	Y1	40	17	24.5	4.5	3	6	10	8	5	1.5	5	3.5	8	3.5	39	
		Y2		21							9						8	
120	HAP-2CS HBL-2CS	Y1	50	26	28	5.5	4	8	20	10	6	2	10	5	12	4.5	135	
		Y2		30							10						25	
130	HAP-3CS HBL-3CS	Y1	60	33	30.5	6.5	5	9.5	20	12	8	2	10	5.5	18	5.5	194	
		Y2		43							10						29	
140	HAP-4CS HBL-4CS	Y1	80	43	44	7.5	6	11	20	14	10	2	10	8	20	6.5	352	
		Y2		50							17						53	
150	HBL-1C	Y1	40	19	19	4.5	3	6	12	8	5	1.5	6	4	10	3.5	44	
		Y2			21						7							
160	HCP-2CS	Y1	60	29	33	9.5	5	9.5	22	18 ^{+0.02} _{-0.1}	9	2	11	11	10	5.5	206	
		Y2									31							
170	HCP-3CS	Y1	70	35	34	11.5	6	11	25	20 ^{+0.02} _{-0.1}	10	2	12.5	8	20	6.5	303	
		Y2									45							
180	HCP-4CS	Y1	80	40	42	13	6	11	35	25 ^{+0.02} _{-0.1}	10	2	17.5	10	20	6.5	563	
		Y2	78	44						14	8			97				
190	HEP-3.5CS	Y1	80	41	50	7.5	5	9.5	20	14	10	2	10	6	18	5.5	360	
		Y2		49							18						70	
200	HEP-4CS	Y1	120	60	81	11.5	6	11	30	22	13	2	15	8	20	6.5	1245	
		Y2		77					32		30		16				270	
210	HEP-5CS	Y1	135	60	91	14.5	8	14	30	28	16	2	15	10	25	8.5	1443	
		Y2		79					38		35		19				382	
310	FH110 FH510	Y1	29.5	15	14	4.5	3	6	12	7	4	1.5	6	3.5	8	3.5	22	
		Y2									4						4	
320	FH112 FH512	Y1	29.5	16.5	14	4.5	3	6	12	7	4	1.5	6	3.5	8	3.5	23	
		Y2									4							
330	FH116 FH516	Y1	39	20	20.5	5.5	4	8	12	10	5	1.5	6	3.5	10	4.5	48	
		Y2									8							
340	FH120 FH520	Y1	39	22.5	20.5	5.5	4	8	12	10	5	1.5	6	3.5	10	4.5	53	
		Y2		25.5							8						10	
350	FH125	Y1	48.5	22.5	28.5	6.5	5	9.5	14	12	8	2	7	4.5	10	5.5	105	
		Y2		25.5							14						17	
260	BHA-01CS1 BHG-01CS	Y1	30	17.5	14.5	4.5	3	6	14	10	5	1.5	7	4	8	3.5	38	
		Y2									6							
270	BHA-03CS1 BHG-03CS	Y1	40	21	21	5.5	4	8	14	10	6	1.5	7	4.5	10	4.5	61	
		Y2		23							8						11	
280	BHA-04CS1 BHG-04CS	Y1	40	26.5	21	5.5	4	8	14	10	6	1.5	7	4.5	10	4.5	76	
		Y2		29.5							9						12	
290	BHA-05CS1 BHG-05CS	Y1	50	33	28.5	6.5	5	9.5	14	10	8	2	7	6	10	5.5	123	
		Y2		39							14						23	

RRC
GRC
RV3*
NHS
HR
LN
FH100
HAP
BSA2
BHA/
BHG
LHA
LHAG
HKP
HLA/
HLB
HLAG/
HLBG
HEP
HCP
HMF
HMFB
HFP
HLC
HGP
FH500
HBL
HDL
HMD
HJL
BHE
CKG
CK
CKA
CKS
CKF
CKJ
CKL2
CKL2
-HC
CKH2
CKLB2
NCK/
SCK/FCK
FJ
FK

Ending

Hand