

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

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

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

Variation	Model no.	Action of jaw (J)	Gripping power (N)			Gripping power (N)			Switch model no.	Page	
			5	10	50	50	100	500			1000
Feather hand (Mini-parallel hand)	FH100		110 (8) 112 116	(11) 120 (14) 125 (18)	(20)					T2H/V T2H/V	264
Parallel hand	HAP			1C (8) 2CS (16) 3CS (26)	4CS (26)					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 (5) 03CS1 (9) 04CS1 (11)		05CS1 (15)				T2H/V T3H/V	282 288
Linear guide hand	LHA			006CS (4) 01CS (5)		03CS (9) 04CS (11) 05CS (15) 06CS (20)				F2H/V, F3H/V T2H/V, T3H/V	294
Linear guide hand with rubber cover	LHAG			01CS (5)		03CS (9) 04CS (11) 05CS (15) 06CS (20)				T2H/V T3H/V	302
Cross roller parallel hand	HKP					32CS (24) 40CS (30) 50CS (36) 63CS (40)				T2H/V T3H/V	310
Thin parallel hand (bush type) (bearing type)	HLA/HLB			HLA 12CS (15) HLA 15CS (20) HLB 12CS (13) HLB 15CS (18)		HLA 20CS (25) HLB 20CS (23)				K2H/V, K3H/V K0H/V, K5H/V	316
Rubber covered thin parallel hand (bush type) (bearing type)	HLAG/HLBG			HLAG 12CS (15) HLAG 15CS (20) HLBG 12CS (13) HLBG 15CS (18)		HLAG 15CS (25) HLBG 20CS (23)				K2H, K3H K0H, K5H	324
Bearing parallel hand	HEP					3.5CS (24) 4CS (36) 5CS (40) 6CS (50) 7CS (60)				T2H/V T3H/V	332
Lateral parallel hand	HCP			2CS (20) 3CS (30)		4CS (40)				T2H/V T3H/V	338
Compact wide parallel hand	HMF			12CS (20)		16CS (30) 20CS (40) 25CS (50) 32CS (70) 40CS (100)				T2H/V T3H/V	344
LM guided large wide parallel hand	HMFB					25CS (100) 32CS (120) 40CS (160)				T2H/V T3H/V	354
Wide parallel hand	HFP			2CS (20)		3CS (30) 4CS (40) 5CS (60)				T2H/V T3H/V	360
Thin type long stroke parallel hand	HLC					16CS (40) 20CS (50) 25CS (60) 30CS (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

Parallel 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

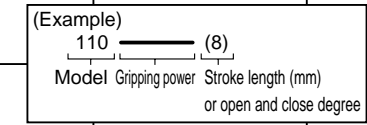
RRC  
GRC  
RV3\*  
NHS  
HR  
LN  
FH100  
HAP  
BSA2  
BHA/BHG  
LHA  
LHAG  
HKP  
HLA/HLB  
HLAG/HLBG  
HEP  
HCP  
HMF  
HMFB  
HFP  
HLC  
HGP  
FH500  
HBL  
HDL  
HMD  
HJL  
BHE  
CKG  
CK  
CKA  
CKS  
CKF  
CKJ  
CKL2  
CKL2 --HC  
CKH2  
CKLB2  
NCK/SCK/FCK  
FJ  
FK  
Ending

\* Refer to pages 256 to 257 for parallel 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
Wide angle hand	Feather hand (Min-fulcrum hand)	FH500	510 512	516	520					T2H/V T3H/V	376
	Fulcrum hand	HBL	1C	2CS (15) 3CS	4CS					T2H/V T3H/V	382
	Wide angle hand	HDL	3CS	4CS (25)						T2H/V T3H/V	388
	Thin wide angle hand	HMD			16C	25C				T2H/V T3H/V	392
Parallel hand	Toggle hand	HJL					32CS 40CS	50CS 63CS		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



- 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

- 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



# 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

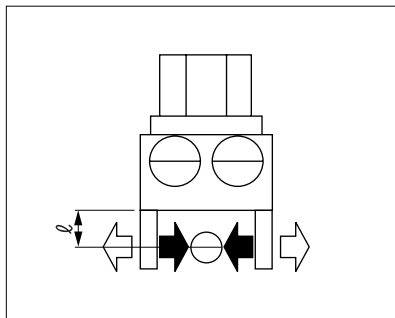
■ If the moving workpiece poses a possible risk to personnel or if fingers could be caught in the master key, etc., install a protective cover, etc.

■ 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.

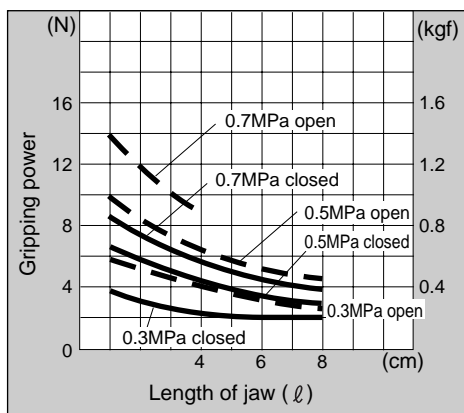
#### ⚠ CAUTION

■ 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  $\ell$  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  $\ell$  when manufacturing the small jaw, gripping power  $F$  is expressed as follows

$$\text{When } \ell = \ell_1, \text{ then } F = F_1$$

$$\text{When } \ell = \ell_2, \text{ then } F = F_2$$

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  $W$ .

$$W \times 9.8 : (F \times N) = 1:5 \text{ (only gripping)}$$

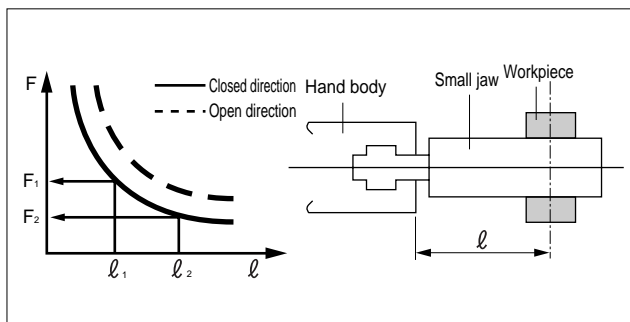
$$W \times 9.8 : (F \times N) = 1:10 \text{ (normal transfer)}$$

$$W \times 9.8 : (F \times N) = 1:20 \text{ (sudden acceleration transfer)}$$

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

$F$ : Gripping power (N)

$N$ : Number of jaws



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

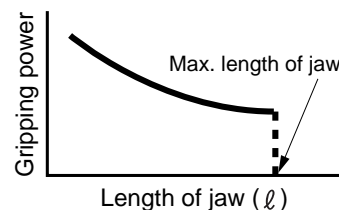
If the small jaw is long and heavy, inertia increases when opening and closing. This may cause play in the master key, and may adversely affect life.

- 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.

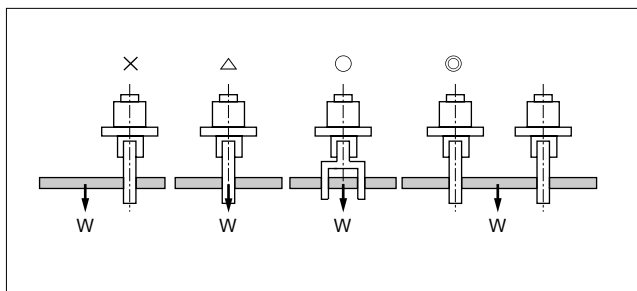
$$W < 1/4H \text{ (1 pc.)}$$

$W$ : Weight of small jaw

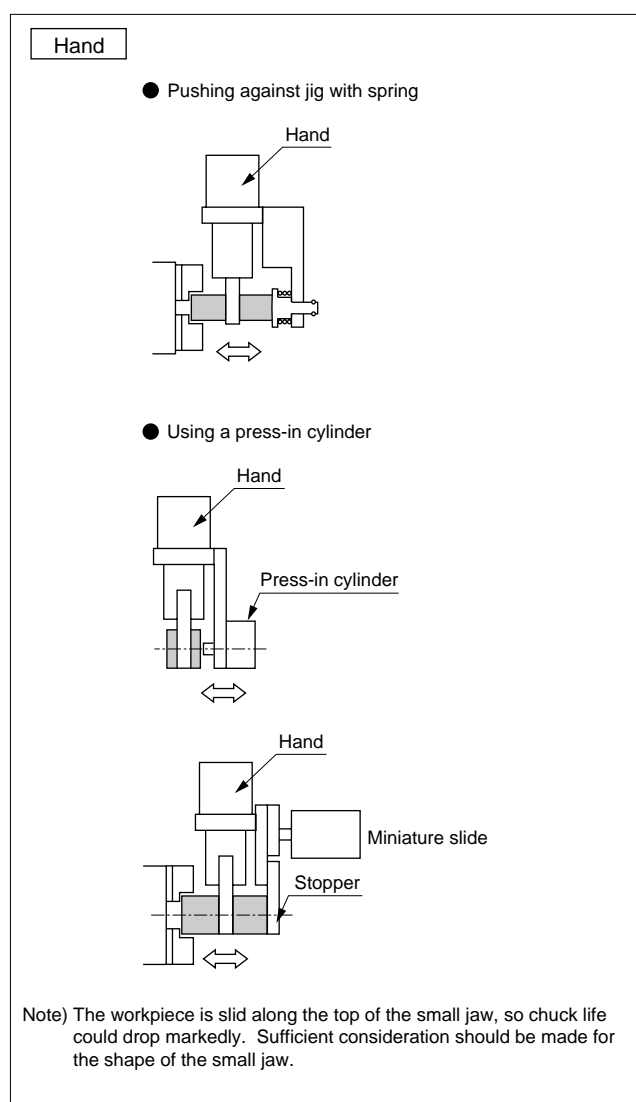
$H$ : Product weight of hand



- 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
HL
HDL
HMD
HJL
BHE
CKG
CK
CKA
CKS
CKF
CKJ
CKL2
CKL2 *-HC
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

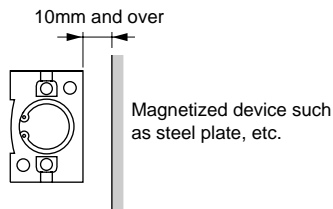
## Installation & Adjustment

### 1. COMMON

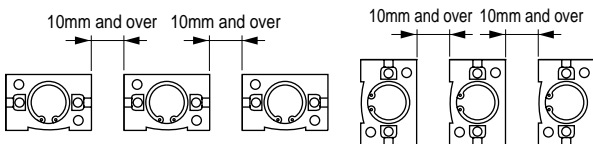
#### CAUTION

■ 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.

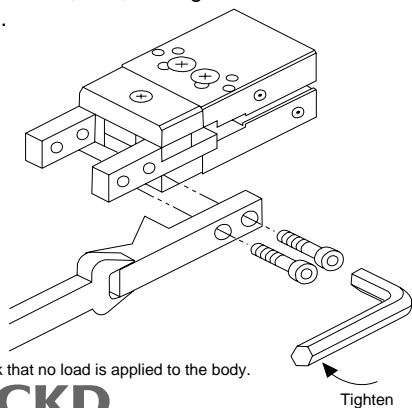


■ If the clamp is operated carefully and slowly as possible, accuracy increases. Repeatability also stabilizes.

■ Regularly grease the sliding section of the master key. Periodic replenishment of grease will extend the life of the part.

#### Installing the jaw

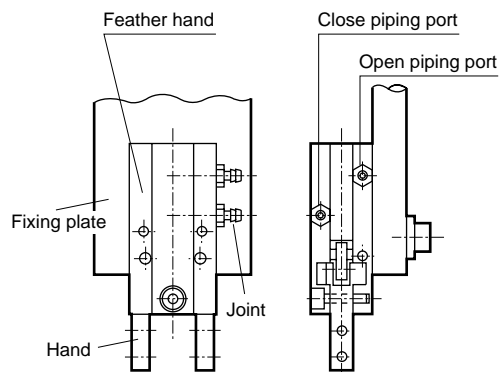
To prevent any effect onto the hand, support the master key with a wrench, etc., and tighten so that the master key is not twisted.



### 2. Installation

■ Do not cause dents or scratches that may worsen flatness or perpendicularity on the fixing face or master key.

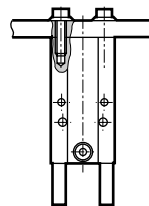
■ If there is a limit to the thickness direction of the FH series body, the available piping joint will be limited. Refer to the following joints.



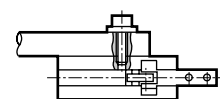
Model	FH*10	FH*12	FH*16	FH*20	FH*25	
Port size	M3			M5		
Joint	Model no.	Applicable O.D. (mm)	Effective sectional area (mm <sup>2</sup> )	Model no.	Applicable O.D. (mm)	Effective sectional area (mm <sup>2</sup> )
Barbed joint	Straight FTS					
	FTS4-M3	φ3.2·φ4	0.4	FTS4-M5	φ3.2·φ4	2.1
	-	-	-	FTS6-M5	φ6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

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

#### ● Top installation



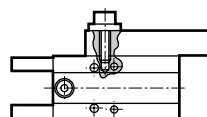
#### ● Front installation



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.

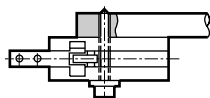
Note) Check that the fixed plate does not overlap the master jaw support.

#### ● Side installation



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

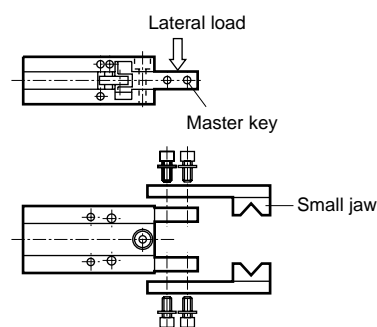


Note) A through hall cannot be used when a switch is provided.

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
HMFB
HMF
HMPFB
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 (mini-parallel hand) Double acting/single acting

# FH100 Series

● Operational stroke length: 8, 11, 14, 18, 20mm



RRC  
GRC  
RV3\*  
NHS  
HR  
LN

## FH100 Specifications

Descriptions	FH100									
	FH110-D	FH112-D	FH116-D	FH120-D	FH125-D	FH110-0	FH112-0	FH116-0	FH120-0	FH125-0
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	M3×0.5		M5×0.8			M3×0.5		M5×0.8		
Open and closed stroke length mm	8	11	14	18	20	8	11	14	18	20
Product weight g	51	71	124	176	284	51	71	124	177	286
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									

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

## 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	10 μA 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)

FH500  
HBL  
HDL  
HMD  
HJL  
BHE  
CKG  
CK  
CKA  
CKS  
CKF  
CKJ  
CKL2  
CKL2  
\*-HC  
CKH2  
CKLB2  
NCK/  
SCK/FCK  
FJ  
FK

Ending

### How to order

Without switch



With switch



**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

Symbol	Descriptions			
<b>A Bore size</b>				
10	φ10			
12	φ12			
16	φ16			
20	φ20			
25	φ25			
<b>B Option</b>				
D	Standard (double acting)			
O	Single acting (normally open)			
Z	Double acting integrated speed control valve			
<b>C Small jaw</b>				
Blank	Without small jaw			
Y1	With small jaw material (S50C)			
Y2	With small jaw material (MC nylon)			
<b>D Switch model no.</b>				
Axial lead wire	Radial lead wire	Contact	Indicator	Lead wire
T2H*	T2V*	Proximity	1 color indicator type	2-wire
T3H*	T3V*			3-wire
<b>*Lead wire length</b>				
Blank	1m (standard)			
3	3m (option)			
5	5m (option)			
<b>E Switch quantity</b>				
R	One on right (port) side open position			
D	Two			
<b>F End mount</b>				
Blank	Without end mount			
B	With end mount			

### ⚠ 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.

<Example of model number>

### FH112-ZY1-T2V-D-B

Model: Feather hand (mini-parallel hand)

- A** Bore size : φ12
- B** Option : Double acting integrated speed control valve
- C** Small jaw : Small jaw material (S50C)
- D** Switch model no.: Proximity T2V switch, lead wire 1m
- E** Switch quantity : 2
- F** End mount : With end mount

How to order end mount



Symbol	Descriptions	
<b>A Bore size</b>		
10	φ10	
12	φ12	
16	φ16	
20	φ20	
25	φ25	

How to order switch



Switch model no.  
(Item above (D))

RRC
GRC
RV3*
NHS
HR
LN
<b>FH100</b>
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

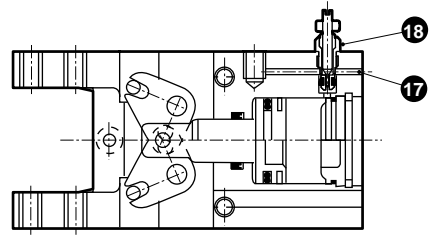
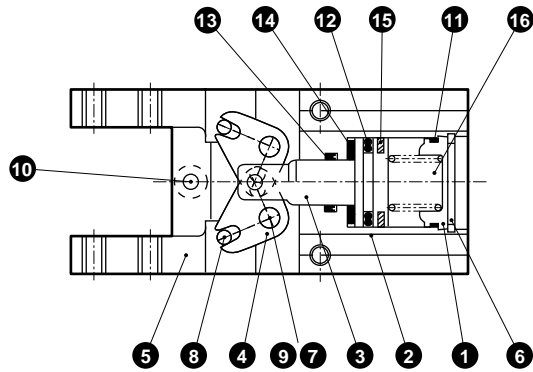
Feather hand (mini-parallel hand)  
Hand



## Internal structure and parts list

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

● Speed control valve



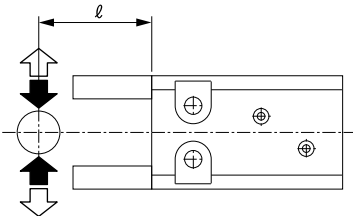
Spring of 16 is not contained in standard (double acting) type.

No.	Parts name	Material	Remarks	No.	Parts name	Material	Remarks
1	Cylinder guard	Acetar resin		10	Hexagon socket head cap bolt	Alloy steel	
2	Body	Aluminum alloy	Lubrication alumite treatment	11	Cylinder gasket	Nitrile rubber	
3	Piston	Stainless steel		12	Piston packing seal	Nitrile rubber	
4	Arm	Stainless steel	Heat treatment	13	Rod packing seal	Nitrile rubber	
5	Master key	Alloy steel	Heat treatment	14	Cushion	Urethane rubber	
6	Snap ring	Stainless steel		15	Magnet		Nickeling
7	Fulcrum axis	Alloy steel	Heat treatment	16	Spring	Stainless steel	
8	Operation axis	Alloy steel	Heat treatment	17	Steel ball	Stainless steel	
9	Hexagon socket head set screw	Stainless steel		18	Flow control valve assembly		

## Gripping power performance data

Gripping power that functions to open and closed directions with jaw length  $\ell$  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)

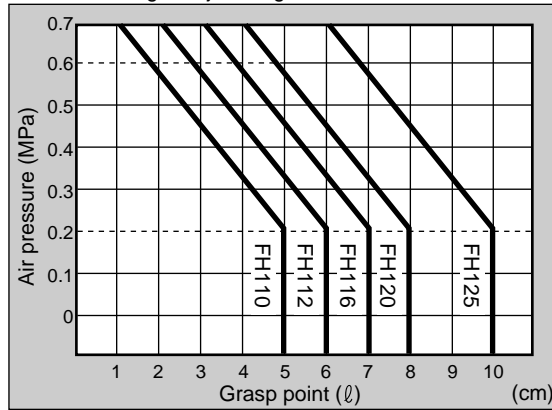


(Note) Single acting type closed side gripping power is decreased by 25 to 30% comparing to double acting type.

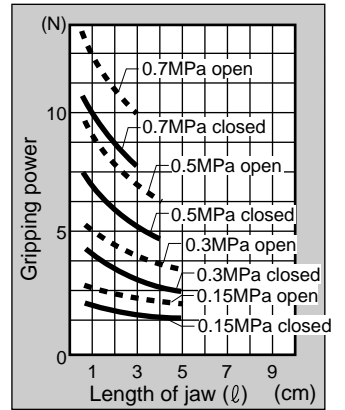
Grip performance data indicates the grip for one jaw.

Since two jaws are used, double the grip in the graph when making a selection.

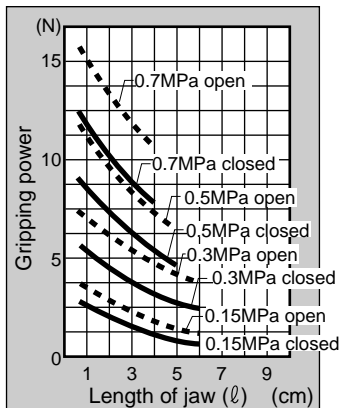
Restriction range for jaw length  $\ell$



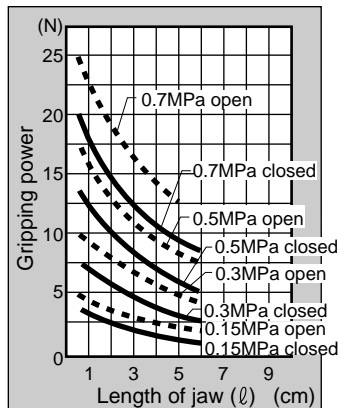
● FH110



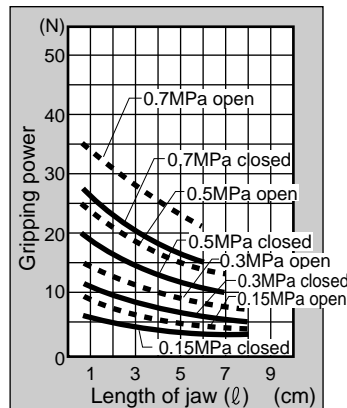
● FH112



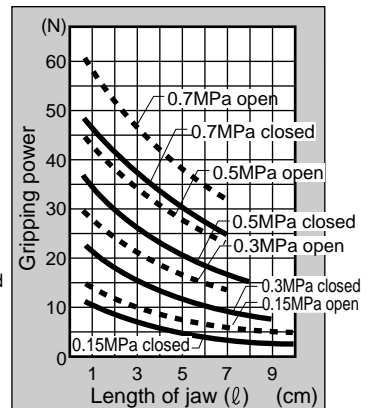
● FH116



● FH120



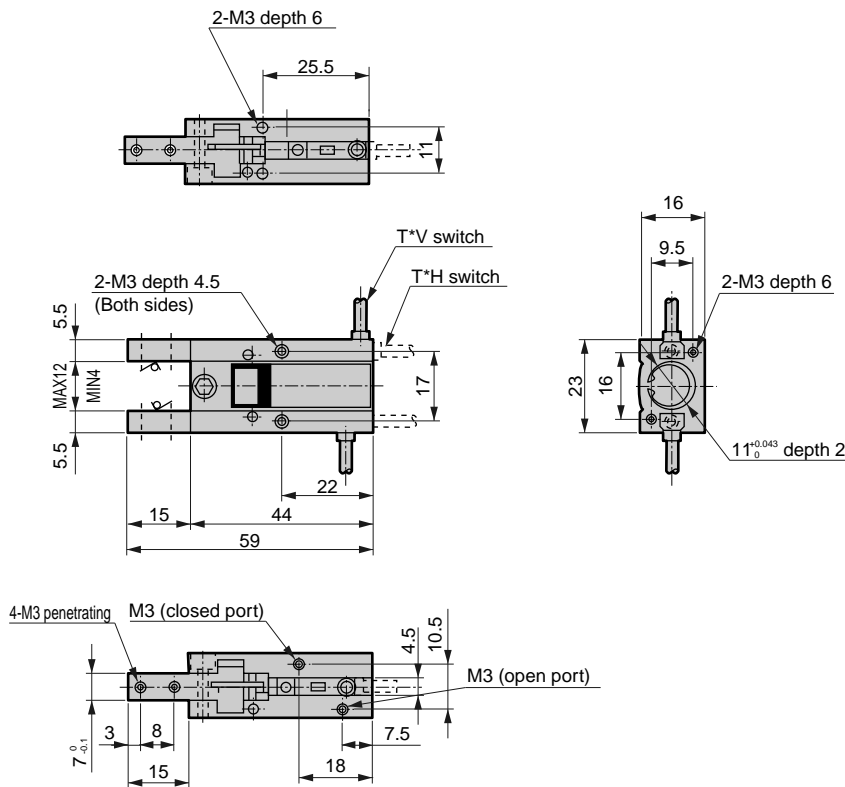
● FH125



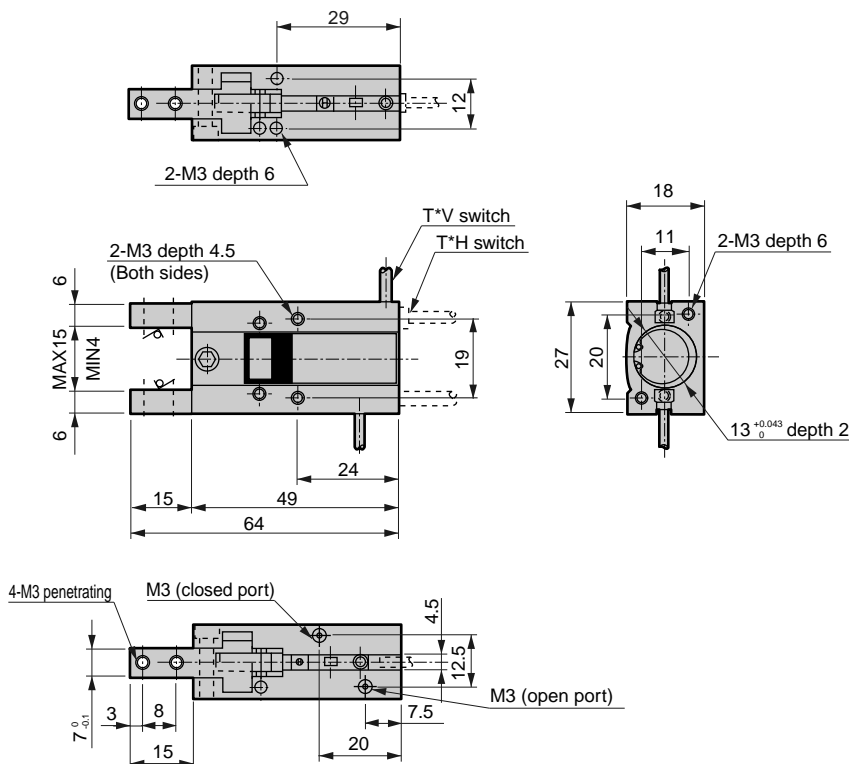
### Dimensions



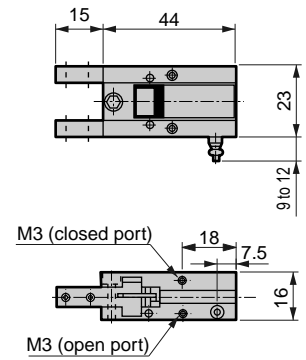
#### ● FH110-D/FH110-O



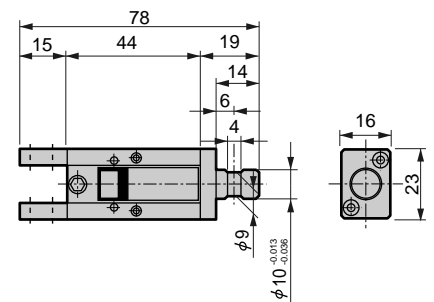
#### ● FH112-D/FH112-O



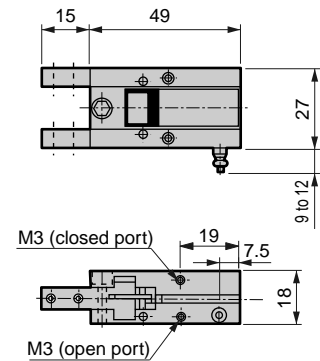
#### ● Speed control valve (FH110-Z)



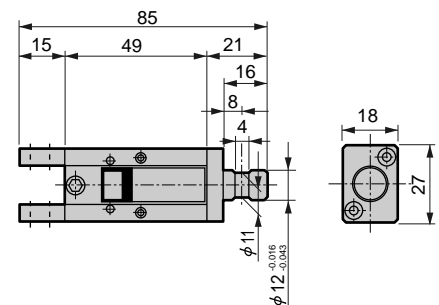
#### ● With end mount



#### ● Speed control valve (FH112-Z)



#### ● With end mount



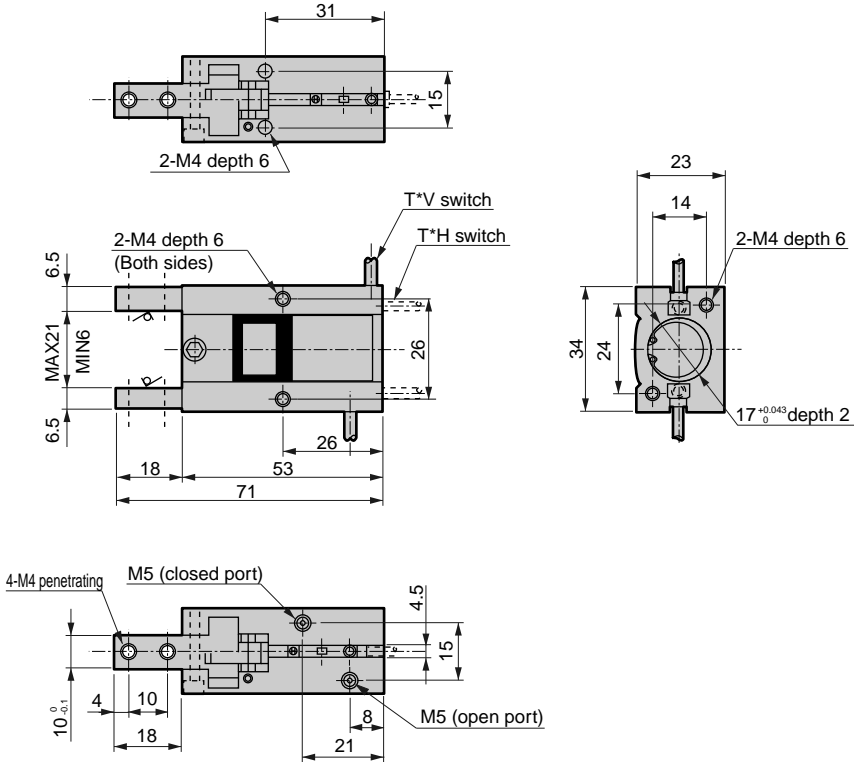
RRC
GRC
RV3*
NHS
HR
LN
<b>FH100</b>
HAP
BSA2
BHA/BHG
LHA
LHAG
HKP
HLA/HLB
HLAG/HLBG
HEP
HCP
HMF
HMFb
HFP
HLC
HGP
FH500
HL
HDL
HMD
HJL
BHE
CKG
CK
CKA
CKS
CKF
CKJ
CKL2
CKL2 *-HC
CKH2
CKLB2
NCK/SCK/FCK
FJ
FK
Ending

Feather hand (mini-parallel hand)  
Hand

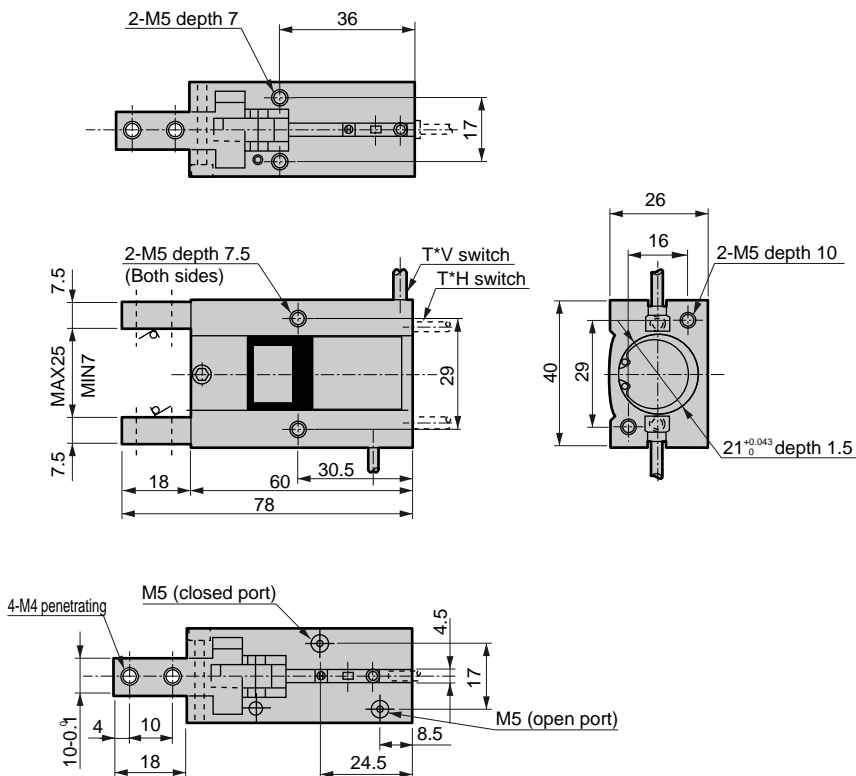


## Dimensions

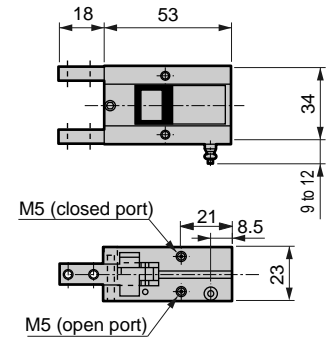
### ● FH116-D/FH116-O



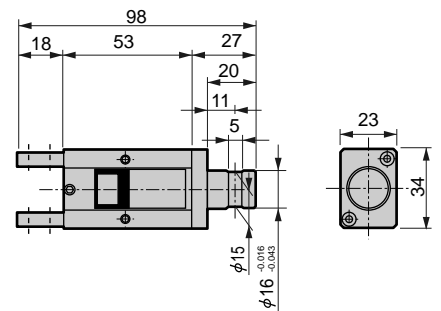
### ● FH120-D/FH120-O



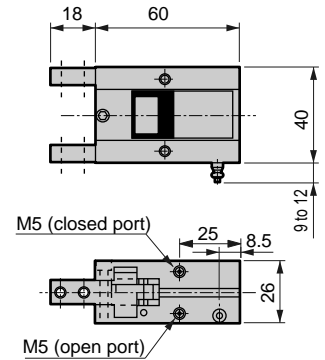
### ● Speed control valve (FH116-Z)



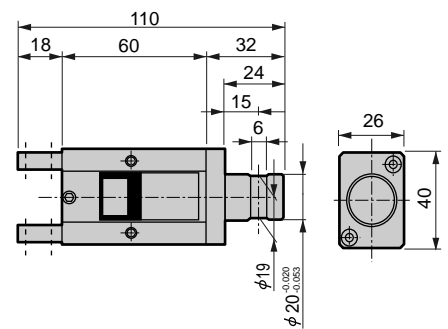
### ● With end mount



### ● Speed control valve (FH120-Z)



### ● With end mount

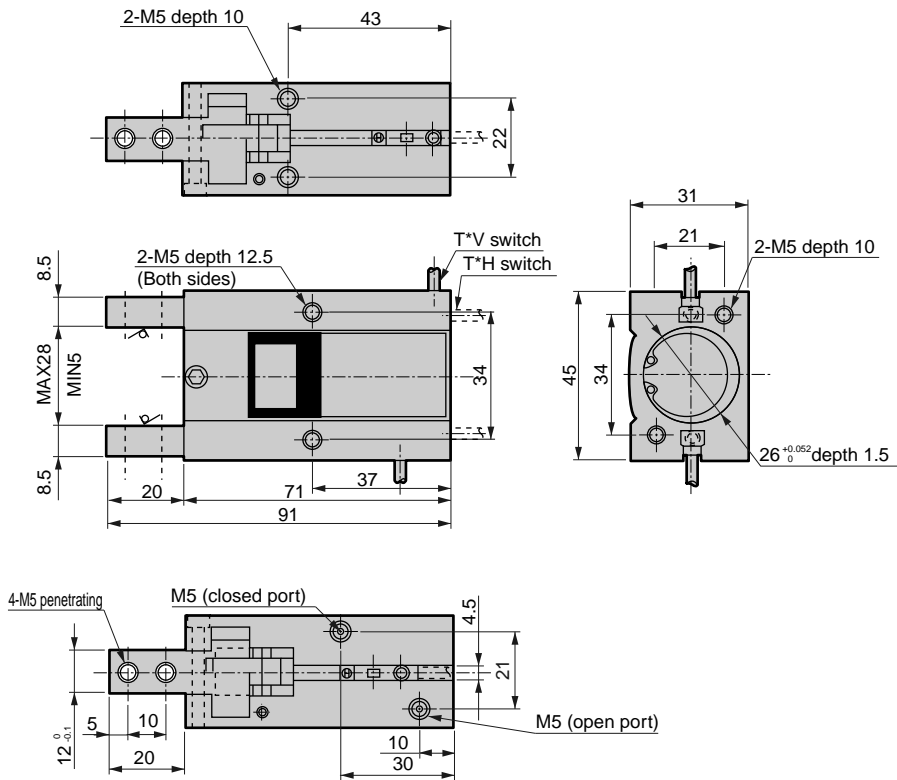


RRC
GRC
RV3*
NHS
HR
LN
<b>FH100</b>
HAP
BSA2
BHA/BHG
LHA
LHAG
HKP
HLA/HLB
HLAG/HLBG
HEP
HCP
HMF
HMFB
HFP
HLC
HGP
FH500
HBL
HDL
HMD
HJL
BHE
CKG
CK
CKA
CKS
CKF
CKJ
CKL2
CKL2 *-HC
CKH2
CKLB2
NCK/SCK/FCK
FJ
FK
Ending

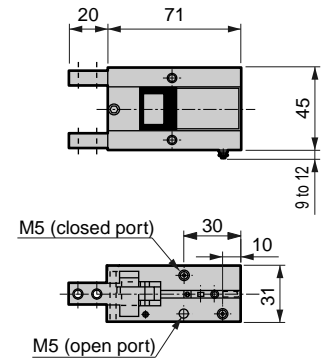
### Dimensions



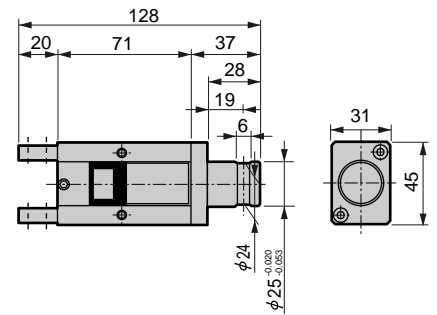
#### ● FH125-D/FH125-O



#### ● Speed control valve (FH125-Z)



#### ● With end mount



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

Feather hand (mini-parallel hand)  
Hand



Parallel hand Double acting/single acting

# HAP-1C Series

● Operational stroke length: 8mm

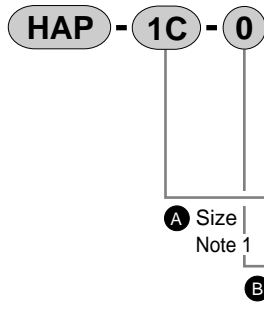


RRC  
GRC  
RV3\*  
NHS  
HR  
LN  
FH100  
HAP  
BSA2  
BHA/BHG  
LHA  
LHAG  
HKP  
HLA/HLB  
HLAG/HLBG  
HEP  
HCP  
HMF  
HMFB  
HFP  
HLC  
HGP  
FH500  
HBL  
HDL  
HMD  
HJL  
BHE  
CKG  
CK  
CKA  
CKS  
CKF  
CKJ  
CKL2  
CKL2  
-\*-HC  
CKH2  
CKLB2  
NCK/  
SCK/FCK  
FJ  
FK  
Ending

## Specifications

Descriptions		HAP
Size		1C
Cylinder bore size	mm	φ15
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
Operational stroke length		mm
Rod diameter		mm
Capacity of reciprocating		cm <sup>3</sup>
Repeatability		mm
Product weight		kg
Lubrication		Not required (when lubricating, use turbine oil Class 1 ISO VG32)

## How to order



Symbol	Descriptions
<b>A Size</b>	
1C	
<b>B Option</b>	
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)

## ⚠ Note on model no. selection

Note 1: Switch can not be installed onto HAP-1C.  
 Note 2: 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>

## HAP-1C-O

Model: Parallel hand

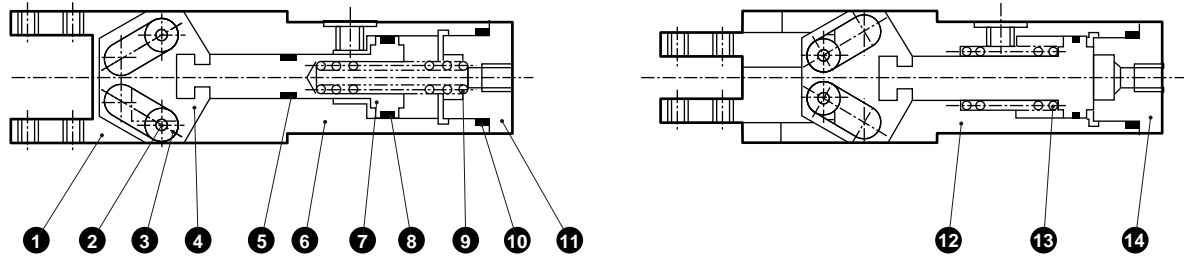
● Size : 1C

● Option: Single acting, normally open type

### Internal structure and parts list

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

● C (normally closed) type



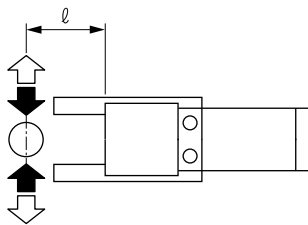
\* Spring of 9 is not contained in standard (double acting) type.

No	Parts name	Material	Remarks	No	Parts name	Material	Remarks
1	Master key	Alloy steel		8	Piston packing seal	Nitrile rubber	
2	Fulcrum axis	Alloy steel		9	Spring	Steel	Only O type
3	Bearing	Alloy steel		10	Cylinder gasket	Nitrile rubber	
4	Cam	Stainless steel		11	Head cover	Aluminum alloy	
5	Rod packing seal	Nitrile rubber		12	Body	Aluminum alloy	
6	Body	Aluminum alloy		13	Spring	Steel	
7	Piston	Stainless steel		14	Head cover	Aluminum alloy	

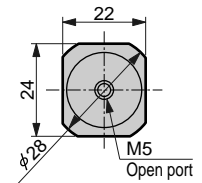
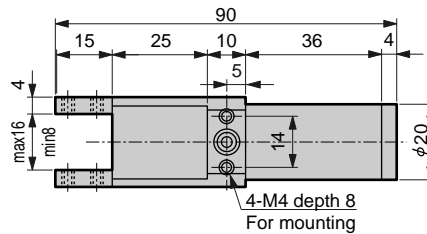
### Gripping power performance data

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.

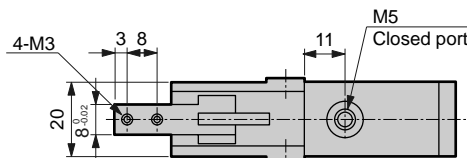
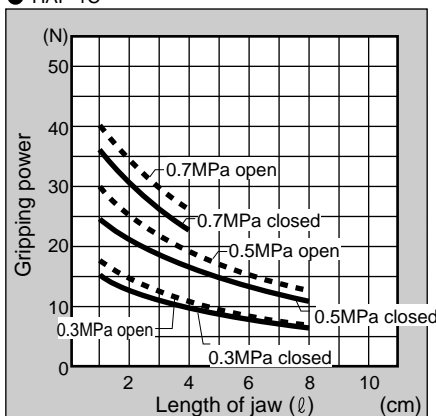
- Open direction (⇔) ..... (shown with broken line)
- Closed direction (→) ——— (shown with continuous line)



### Dimensions



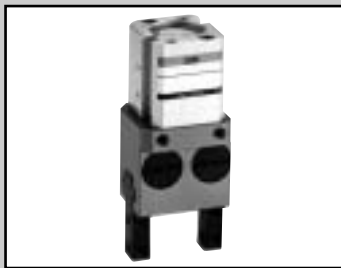
● HAP-1C



(Note) · O type gripping power decreases approximate 20 to 30 % comparing to double acting type to closed 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.

- 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

Parallel hand  
Hand



Parallel hand Double acting/single acting

# HAP-<sup>2</sup>/<sub>4</sub> to CS Series

● Operational stroke length: 16, 26, 41mm



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

## Specifications

Descriptions		HAP		
Size		2CS	3CS	4CS
Cylinder bore size	mm	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
Operational stroke length	mm	16	26	41
Rod diameter	mm	φ10	φ14	φ16
Capacity of reciprocating	cm <sup>3</sup>	4.4	10.8	47.4
Repeatability	mm	±0.03		
Product weight	kg	0.28	0.58	1.52
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 <sup>2</sup>	
Lead wire	Standard 1m (oil resistant vinyl cabtire cable 2-conductor 0.2mm <sup>2</sup> )	Standard 1m (oil resistant vinyl cabtire cable 2-conductor 0.2mm <sup>2</sup> )

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

**HAP** - **2CS** - **O**

With switch

**HAP** - **2CS** - **O** - **T2H** - **R**

**A** Size

**B** Option  
Note 1

**C** Switch model no.  
\* indicates lead wire length.

**D** Switch quantity

Symbol	Descriptions			
<b>A Size</b>				
2CS				
3CS				
4CS				
<b>B Option</b>				
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)			
<b>C Switch model no.</b>				
Axial lead wire	Radial lead wire	Contact	Indicator	Lead wire
T2H*	T2V*	Proximity	1 color indicator type	2-wire
T3H*	T3V*			3-wire
<b>*Lead wire length</b>				
Blank	1m (standard)			
3	3m (option)			
5	5m (option)			
<b>D Switch quantity</b>				
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>

**HAP-2CS-O-T2H-R**

Model: Parallel 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

**HAP** - **T2H**

Switch model no.  
(Item above ©)

· Switch body

**SW** - **T2H**

Switch model no.  
(Item above ©)

· Mounting bracket

**HAP** - **T**

● For switch T\*V\*

· Switch body + mounting bracket

**HAP** - **T2V** - \*

Switch model no.  
(Item above ©)

· Switch body

**SW** - **T2V**

Switch model no.  
(Item above ©)

· Mounting bracket

**HAP** - **TV** - \*

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

RRC
GRC
RV3*
NHS
HR
LN
FH100
<b>HAP</b>
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

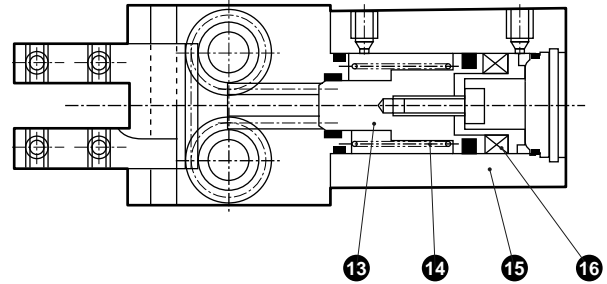
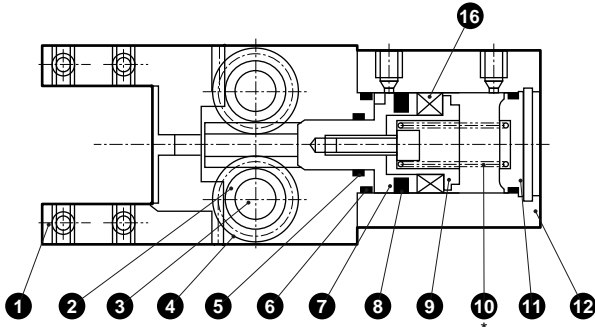
Parallel hand  
Hand



## Internal structure and parts list

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

● C (normally closed) type



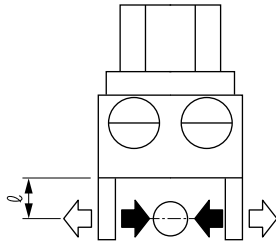
\* Spring of 10 is not contained in standard (double acting) type.

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

## Gripping power performance data

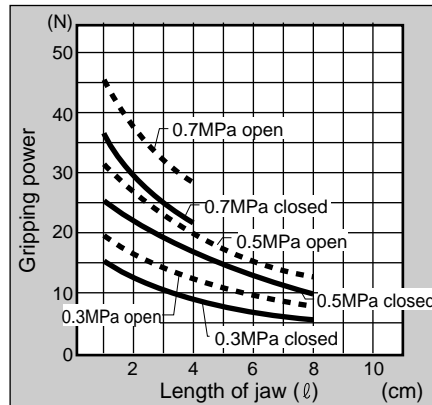
Gripping power that functions to open and closed directions with jaw length  $\ell$  of hand at supply pressure 0.3, 0.5 and 0.7 MPa is shown.

- Open direction (←) --- (shown with broken line)
- Closed direction (→) — (shown with continuous line)

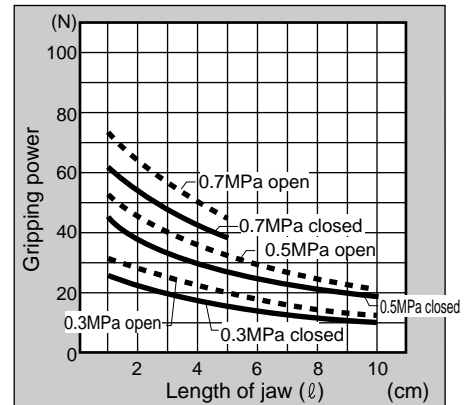


(Note) O type gripping power decreases approximate 20 to 30 % comparing to double acting type to closed direction.  
 C type gripping power decreases approximate 10 to 20 % comparing to double acting type to open direction.  
 Grip performance data indicates the grip for one jaw. Since two jaws are used,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

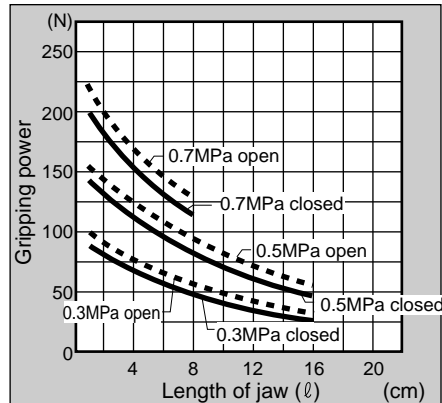
### ● HAP-2CS



### ● HAP-3CS



### ● HAP-4CS

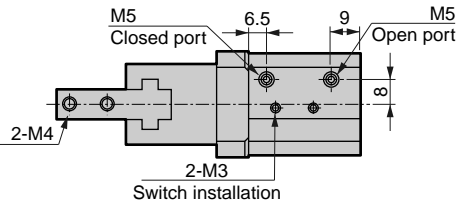
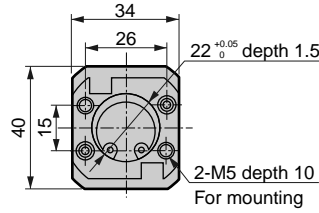
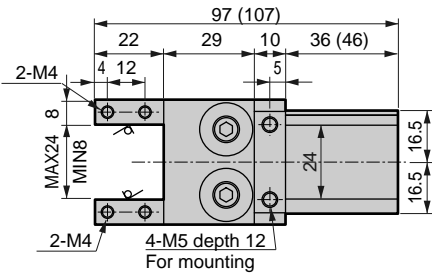
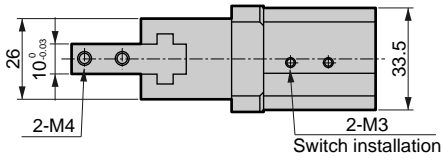


### Dimensions

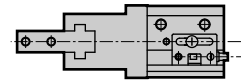
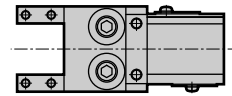
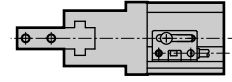


#### ● HAP-2CS standard/O/C

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

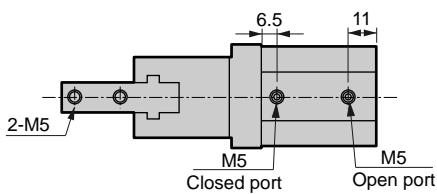
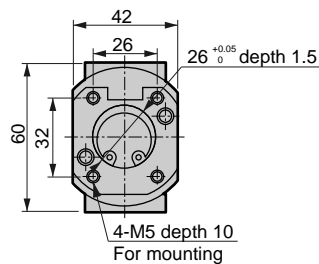
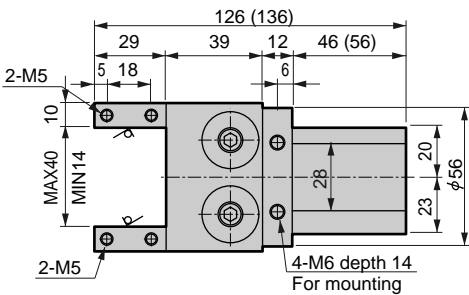
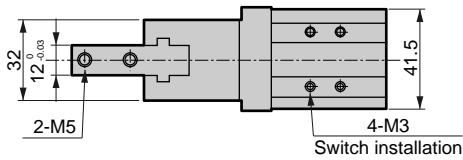


#### ● With switch

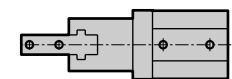
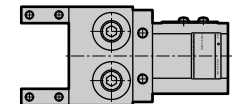
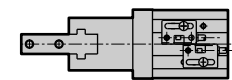


#### ● HAP-3CS standard/O/C

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



#### ● With switch



RRC
GRC
RV3*
NHS
HR
LN
FH100
<b>HAP</b>
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

Parallel hand  
Hand

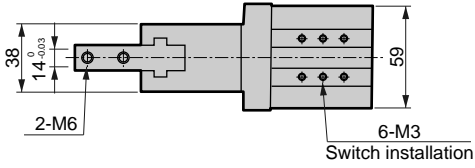
# HAP-4CS Series

## Dimensions

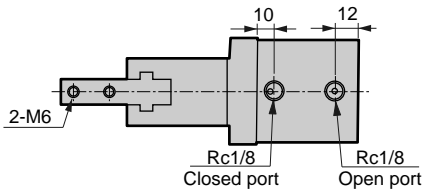
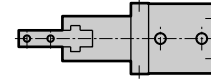
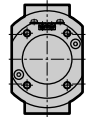
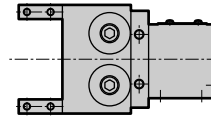
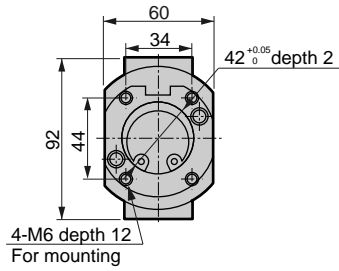
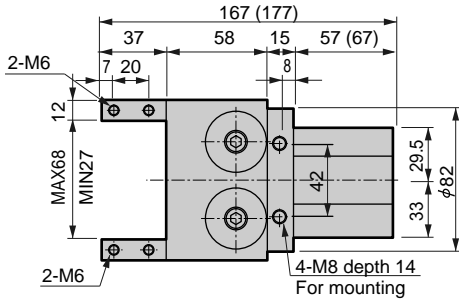
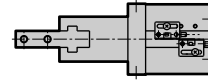


● HAP-4CS standard/O/C

● 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



Miniature cross roller parallel hand Double acting/single acting

# BSA2 Series

- Operational stroke length: 4mm



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

## Specifications

Descriptions	BSA2	
Size	006C	
Cylinder bore size	mm	φ6
Actuation	Double acting/single acting	
Working fluid	Compressed air	
Max. working pressure	MPa	0.7
Min. working pressure MPa	Double acting	0.15
	Normally open	0.25
	Normally closed	
Ambient temperature	°C	5 to 60
Port size	M3	
Operational stroke length	mm	4
Rod diameter	mm	φ3
Capacity of reciprocating	cm <sup>3</sup>	0.1
Repeatability	mm	±0.01
Product weight	kg	0.034
Lubrication	Not required (when lubricating, use turbine oil Class 1 ISO VG32)	

## Switch specifications

Descriptions	Proximity 2 wire	Proximity 3 wire
	F2H/F2V	F3H/F3V
Applications	Programmable controller	Programmable controller, relay
Output method	-	NPN output
Power voltage	-	10 to 28 VDC
Load voltage/current	10V to 30 VDC, 5 to 20mA (Note 1)	30 VDC, 50mA or less
Light	Yellow LED (ON lighting)	
Maximum shock resistance	980m/s <sup>2</sup>	
Lead wire	Standard 1m (oil resistant vinyl cable 2-conductor 0.15mm <sup>2</sup> )	Standard 1m (oil resistant vinyl cable 3-conductor 0.15mm <sup>2</sup> )
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

**BSA2** - **006C** - **O**

With switch

**BSA2** - **006C** - **O** - **F2V** - **D**

Model no.

Size

**A** Option

**B** Switch model no.

**C** Switch quantity

Symbol	Descriptions			
<b>A Option</b>				
Blank	Standard (double acting)			
O	Single acting (normally open)			
C	Single acting (normally closed)			
<b>B Switch model no.</b>				
Axial lead wire	Radial lead wire	Contact	Indicator	Lead wire
F2H*	F2V*	Proximity	1 color	2-wire
F3H*	F3V*		indicator type	3-wire
<b>*Lead wire length</b>				
Blank	1m (standard)			
3	3m (option)			
<b>C Switch quantity</b>				
R	One on open side			
H	One on closed side			
D	Two			

<Example of model number>

**BSA2-006C-O-F2V-D**

Model: Miniature cross roller parallel hand

Size: 006C

**A** Option : Single acting, normally open type

**B** Switch model no. : Proximity F2V switch, lead wire 1m

**C** Switch quantity : 2

### How to order switch

**SW** - **F2H**

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

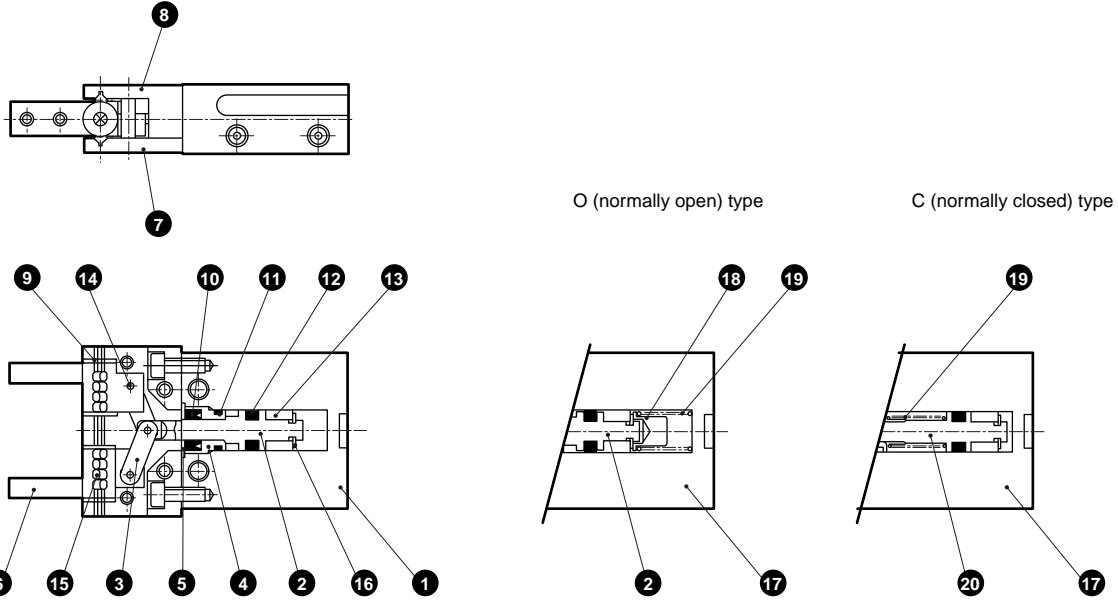
Note) When two switches are selected, the open/close stroke will be short. Depending on workpiece size, both switches may turn on.

RRC
GRC
RV3*
NHS
HR
LN
FH100
HAP
<b>BSA2</b>
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

Miniature cross roller parallel hand  
Hand

## Internal structure and parts list

- 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



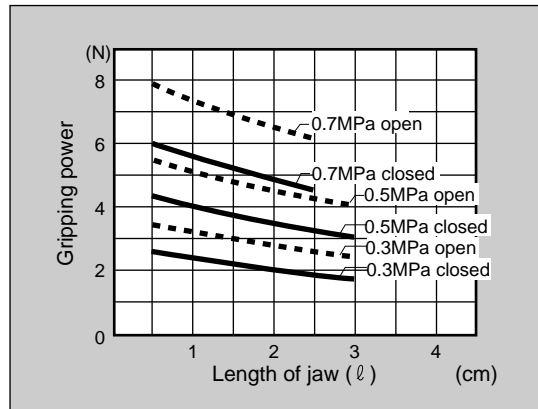
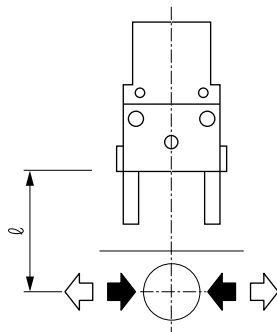
No.	Parts name	Material	No.	Parts name	Material
1	Body	Aluminum alloy	11	Cylinder gasket	Nitrile rubber
2	Piston	Stainless steel	12	Piston packing seal	Nitrile rubber
3	Arm	Stainless steel	13	Magnet	
4	Piston guide	Stainless steel	14	Operation axis	Stainless steel
5	Piston guide holder	Stainless steel	15	Cross roller	Alloy steel
6	Master key	Steel	16	Snap ring	Stainless steel
7	Bearing guide A	Steel	17	O, C body	Aluminum alloy
8	Bearing guide B	Steel	18	Spring guide	Stainless steel
9	Bearing holder	Stainless steel	19	O, C spring	Stainless steel
10	Rod packing seal	Nitrile rubber	20	C piston	Stainless steel

## Gripping power performance data

Gripping power that functions to open and closed directions with jaw length  $\ell$  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)

● BSA2-006C

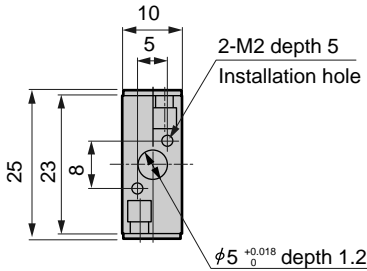
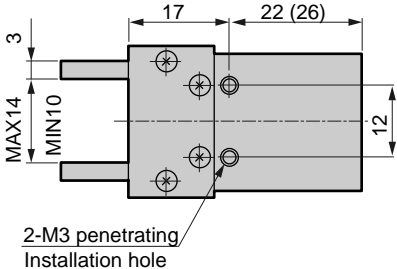
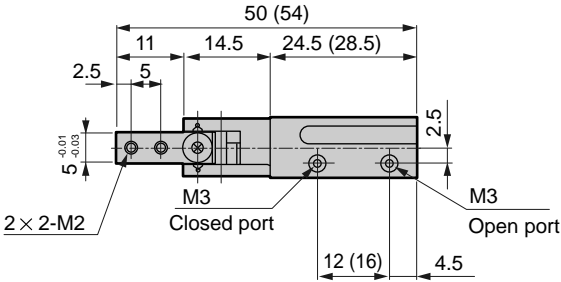


Note: O type gripping power decreases approximate 20 to 30 % comparing to double acting type to closed direction.  
 C type gripping power decreases approximate 10 to 20 % comparing to double acting type to open direction.  
 Grip performance data indicates the grip for one jaw. Since two jaws are used,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

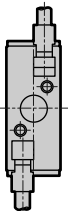
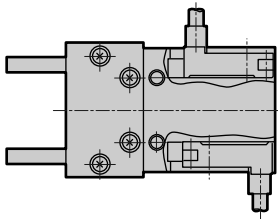
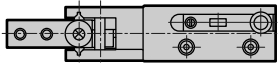
Dimensions



● Dimension in ( ) for O (normally open), C (normally closed) specifications.



● With switch



RRC
GRC
RV3*
NHS
HR
LN
FH100
HAP
<b>BSA2</b>
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

Miniature cross roller parallel hand  
Hand



Compact cross roller parallel hand Double acting/single acting

# BHA Series

- Operational stroke length: 5, 9, 11, 15mm



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

## Specifications

Descriptions		BHA			
Size		01CS1	03CS1	04CS1	05CS1
Cylinder bore size	mm	φ12	φ16	φ20	φ25
Actuation		Double acting/single acting			
Working fluid		Compressed air			
Max. working pressure	MPa	0.7			
Min. working pressure	MPa	0.1			
	Normally open	0.3			
	Normally closed	0.3			
Ambient temperature	°C	5 to 60			
Port size		M3	M5		
Operational stroke length	mm	5	9	11	15
Rod diameter	mm	φ6	φ8	φ10	φ12
Capacity of reciprocating	cm <sup>3</sup>	0.32	1.58	2.89	6.32
Repeatability	mm	±0.01			
Product weight	Kg	0.100	0.145	0.253	0.420
Lubrication		Not required (when lubricating, use turbine oil Class 1 ISO VG32)			

## 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	10 μA 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)

\* The BHA-LN Series with a length measurement sensor is also available.  
Refer to page 211 for details.



### How to order

Without switch

**BHA** - **01CS1** - **O**

With switch

**BHA** - **01CS1** - **O** - **T2H** - **R**

**A** Size

**B** Option  
Note 1

**C** Switch model no.  
\* indicates lead wire length.

**D** Switch quantity

Symbol	Descriptions			
<b>A Size</b>				
	<b>01CS1</b>			
	<b>03CS1</b>			
	<b>04CS1</b>			
	<b>05CS1</b>			
<b>B Option</b>				
<b>Blank</b>	Standard (double acting)			
<b>O</b>	Single acting (normally open)			
<b>C</b>	Single acting (normally closed)			
<b>Y1</b>	With small jaw material (S50C)			
<b>Y2</b>	With small jaw material (MC nylon)			
<b>C Switch model no.</b>				
Axial lead wire	Radial lead wire	Proximity Contact	Indicator	Lead wire
<b>T2H*</b>	<b>T2V*</b>	1 color indicator type		2-wire
<b>T3H*</b>	<b>T3V*</b>			3-wire
<b>*Lead wire length</b>				
<b>Blank</b>	1m (standard)			
<b>3</b>	3m (option)			
<b>5</b>	5m (option)			
<b>D Switch quantity</b>				
<b>R</b>	One on open side			
<b>H</b>	One on closed side			
<b>D</b>	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>

**BHA-01CS1-O-T3H-R**

Model : Compact cross roller parallel hand

**A** Size : 01CS1

**B** Option : Single acting, normally open type

**C** Switch model no.: Proximity T3H switch, lead wire 1m

**D** Switch quantity : One on open side

### How to order switch

**SW** - **T2H**

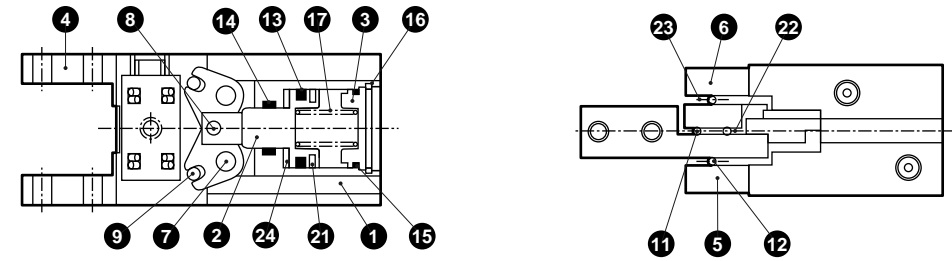
Switch model no.  
(Item above (C))

RRC  
GRC  
RV3\*  
NHS  
HR  
LN  
FH100  
HAP  
BSA2  
BHA/  
BHG  
LHA  
LHAG  
HKL  
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

Compact cross roller parallel hand  
Hand

## Internal structure and parts list

Standard (double acting) / O (normally open) type



C (normally closed) type

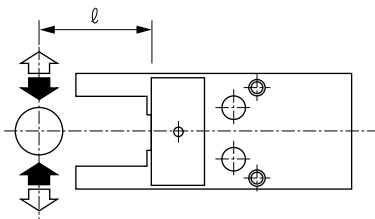
\* Spring of 17 is not contained in standard (double acting) type.

No.	Parts name	Material	Remarks	No.	Parts name	Material	Remarks
1	Body	Aluminum alloy		13	Piston packing seal	Nitrile rubber	
2	Piston	Stainless steel		14	Rod packing seal	Nitrile rubber	
3	Cylinder guard	Acetar resin		15	Cylinder gasket	Nitrile rubber	
4	Master key	Steel		16	Snap ring		
5	Bearing guide A	Steel		17	Spring	Stainless steel	Only O type
6	Bearing guide B	Steel		18	Body	Aluminum alloy	
7	Fulcrum axis	Steel		19	Piston	Stainless steel	
8	Operation axis A	Steel		20	Spring	Stainless steel	
9	Operation axis B	Steel		21	Magnet		
10	Arm	Steel		22	Retainer A	Stainless steel	
11	Cross roller A	Alloy steel		23	Retainer B	Stainless steel	
12	Cross roller B	Alloy steel		24	Cushion	Urethane rubber	

## Gripping power performance data

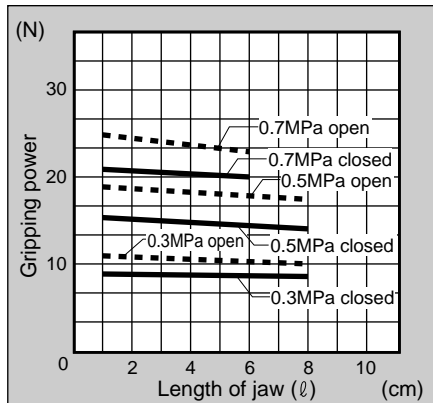
Gripping power that functions to open and closed directions with jaw length  $\ell$  of hand at supply pressure 0.3, 0.5 and 0.7 MPa is shown.

- Open direction (↔) - (shown with broken line)
- Closed direction (→) - (shown with continuous line)

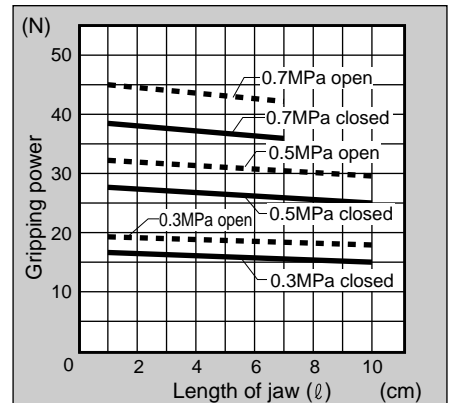


(Note) O type gripping power decreases approximate 20 to 30 % comparing to double acting type to closed direction. C type gripping power decreases approximate 10 to 20 % comparing to double acting type to open direction. Grip performance data indicates the grip for one jaw. Since two jaws are used, double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

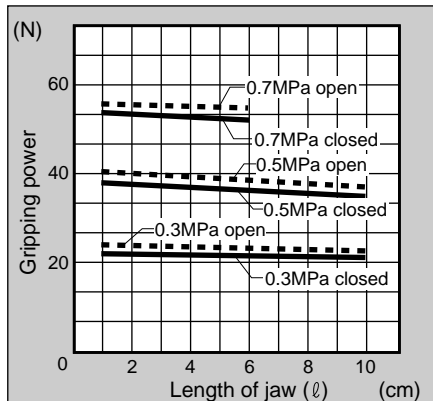
● BHA-01CS1



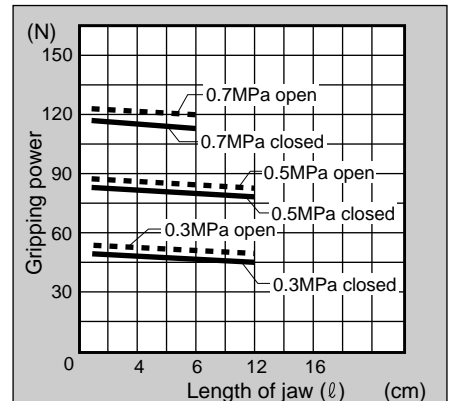
● BHA-03CS1



● BHA-04CS1



● BHA-05CS1

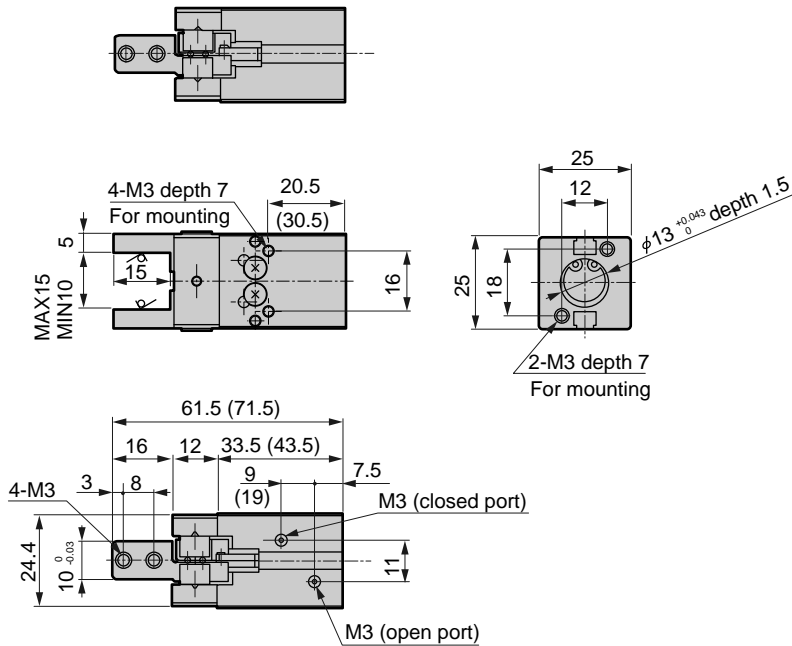


### Dimensions

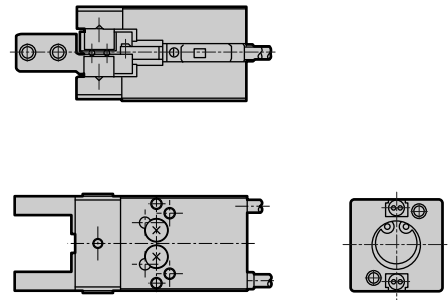


● BHA-01CS1 standard/O/C

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

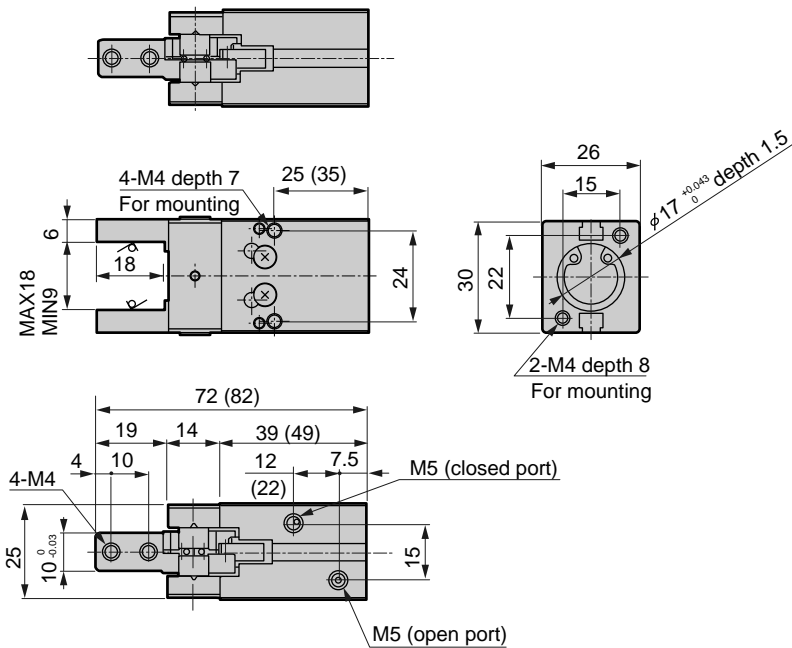


● With switch

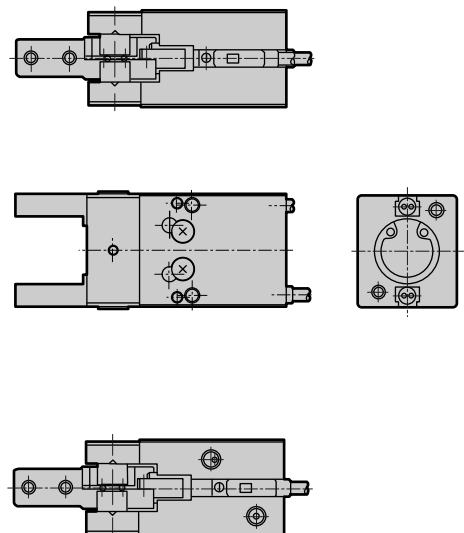


● BHA-03CS1 standard/O/C

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



● With switch



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

Compact cross roller parallel hand  
Hand

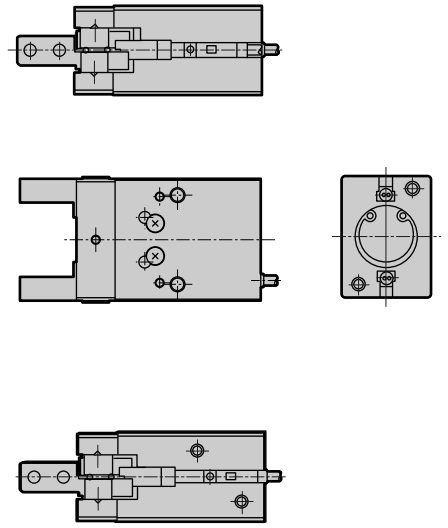
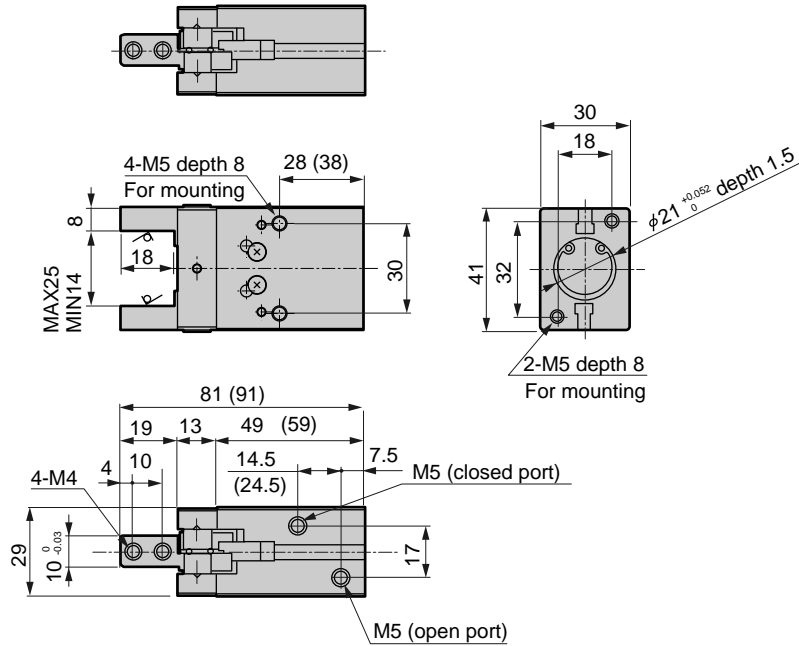


## Dimensions

### ● BHA-04CS1 standard/O/C

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

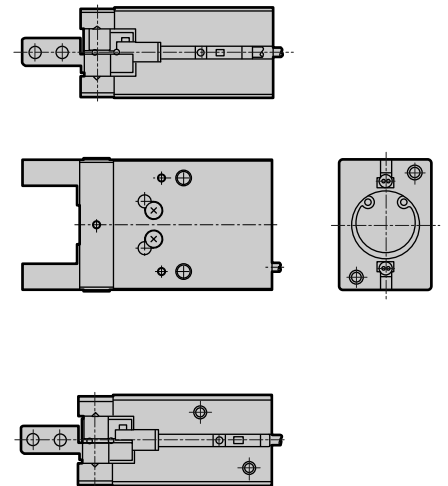
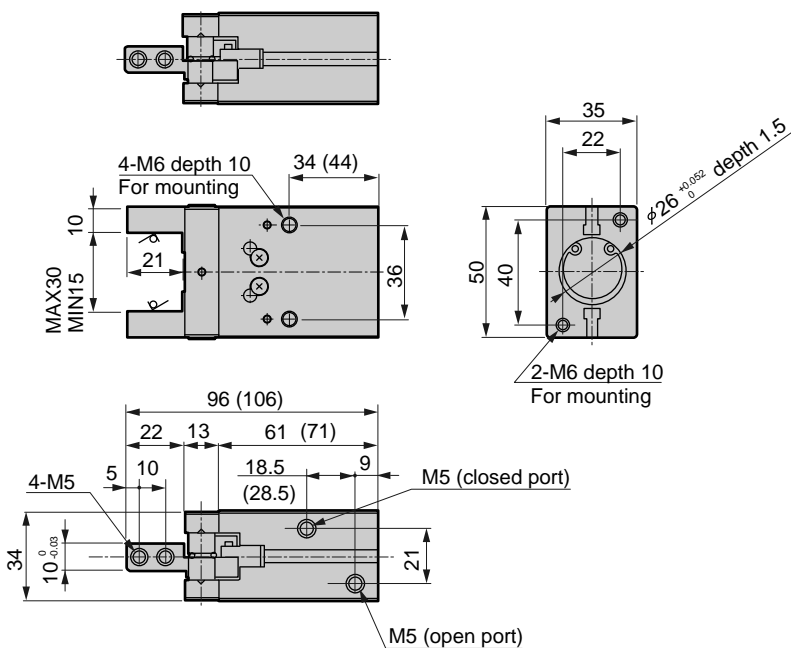
● With switch



### ● BHA-05CS1 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



Compact cross roller parallel hand with rubber cover Double acting/single acting

# BHG Series

- Operational stroke length: 5, 9, 11, 15mm



## Specifications

Descriptions		BHG			
Size		01CS	03CS	04CS	05CS
Cylinder bore size	mm	φ12	φ16	φ20	φ25
Actuation		Double acting/single acting			
Working fluid		Compressed air			
Max. working pressure	MPa	0.7			
Min. working pressure MPa	Double acting	0.15			
	Normally open	0.3			
	Normally closed				
Ambient temperature	°C	5 to 60			
Port size		M3	M5		
Operational stroke length	mm	5	9	11	15
Rod diameter	mm	φ6	φ8	φ10	φ12
Capacity of reciprocating	cm <sup>3</sup>	0.32	1.58	2.89	6.32
Repeatability	mm	±0.01			
Product weight	kg	0.118	0.165	0.238	0.455
Lubrication		Not required (when lubricating, use turbine oil Class 1 ISO VG32)			

## Switch specifications and variations

Descriptions	Proximity 2 wire	Proximity 3 wire
	T2H/V	T3H/V
Applications	Programmable controller	Programmable controller, relay
Output method	-	Output method
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	10 μA 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)

\* The BHG-LN Series with a length measurement sensor is also available. Refer to page 211 for details.

### How to order

Without switch

**BHG** - **01CS** - **O**

With switch

**BHG** - **01CS** - **O** - **T2H** - **R**

**A** Size

**B** Option  
Note 1

**C** Switch model no.

**D** Switch quantity

Symbol	Descriptions			
<b>A Size</b>				
01CS				
03CS				
04CS				
05CS				
<b>B Option</b>				
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)			
<b>C Switch model no.</b>				
Axial lead wire	Radial lead wire	Proximity Contact	Indicator	Lead wire
T2H*	T2V*			
T3H*	T3V*	3-wire		
<b>*Lead wire length</b>				
Blank	1m (standard)			
3	3m (option)			
5	5m (option)			
<b>D Switch quantity</b>				
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>

**BHG-01CS-O-T3H-R**

Model: Compact cross roller parallel hand with rubber cover

- A** Size : 01CS
- B** Option : Single acting, normally open type
- C** Switch model no. : Proximity T3H switch, lead wire 1m
- D** Switch quantity : One on open side

### How to order switch

**SW** - **T2H**

Switch model no.  
(Item above C)

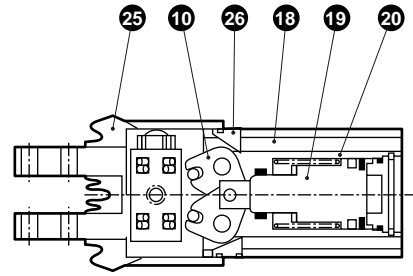
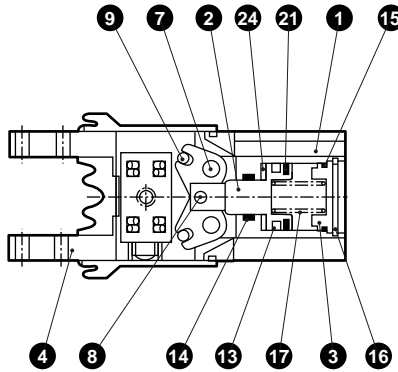
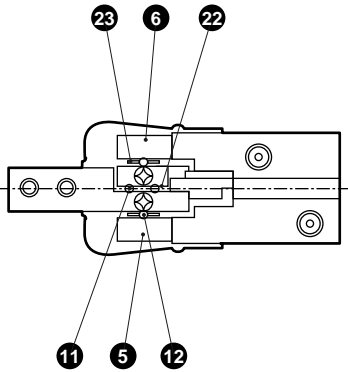
RRC
GRC
RV3*
NHS
HR
LN
FH100
HAP
BSA2
BHA/ BHG
LHA
LHAG
HKP
HLA/ HLB
HLAG/ HLBG
HEP
HCP
HMF
HMFb
HFP
HLC
HGP
FH500
HBL
HDL
HMD
HJL
BHE
CKG
CK
CKA
CKS
CKF
CKJ
CKL2
CKL2 *-HC
CKH2
CKLB2
NCK/ SCK/FCK
FJ
FK
Ending

Compact cross roller parallel hand with rubber cover  
Hand

## Internal structure and parts list

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

● C (normally closed) type



\* Spring of 17 is not contained in standard (double acting) type.

No.	Parts name	Material	Remarks	No.	Parts name	Material	Remarks
1	Body	Aluminum alloy		14	Rod packing seal	Nitrile rubber	
2	Piston	Stainless steel		15	Cylinder gasket	Nitrile rubber	
3	Cylinder guard	Acetar resin		16	Snap ring	Stainless steel	
4	Master key	Steel		17	Spring	Stainless steel	Only O type
5	Bearing guide A	Steel		18	Body	Aluminum alloy	
6	Bearing guide B	Steel		19	Piston	Stainless steel	
7	Fulcrum axis	Steel		20	Spring	Stainless steel	
8	Operation axis A	Steel		21	Magnet		
9	Operation axis B	Steel		22	Retainer A	Stainless steel	
10	Arm	Steel		23	Retainer B	Stainless steel	
11	Cross roller A	Alloy steel		24	Cushion	Urethane rubber	
12	Cross roller B	Alloy steel		25	Rubber cover	Nitrile rubber	
13	Piston packing seal	Nitrile rubber		26	Bracket	Aluminum alloy	

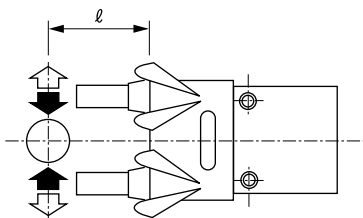
### Rubber cover part model no.

Size	Part model no.	Part number
01CS	BHG-01K	25
03CS	BHG-03K	
04CS	BHG-04K	
05CS	BHG-05K	

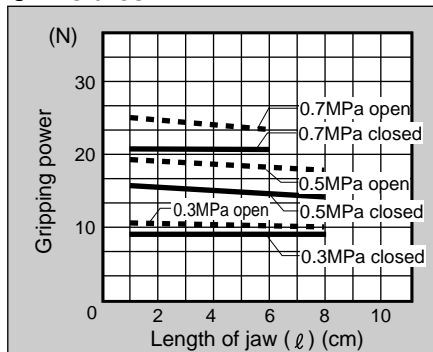
### Gripping power performance data

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

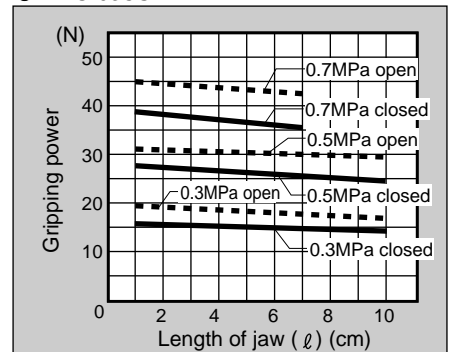
- Open direction (←) (shown with broken line)
- Closed direction (→) (shown with continuous line)



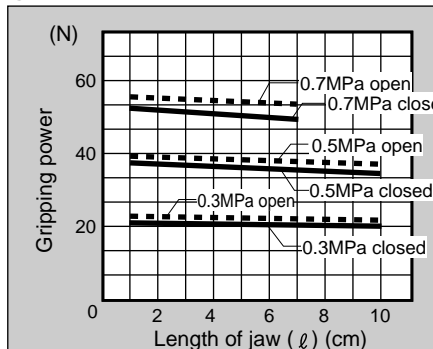
● BHG-01CS



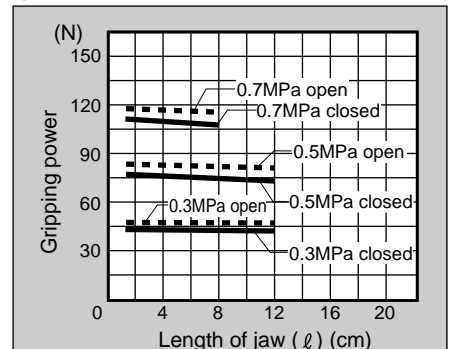
● BHG-03CS



● BHG-04CS



● BHG-05CS



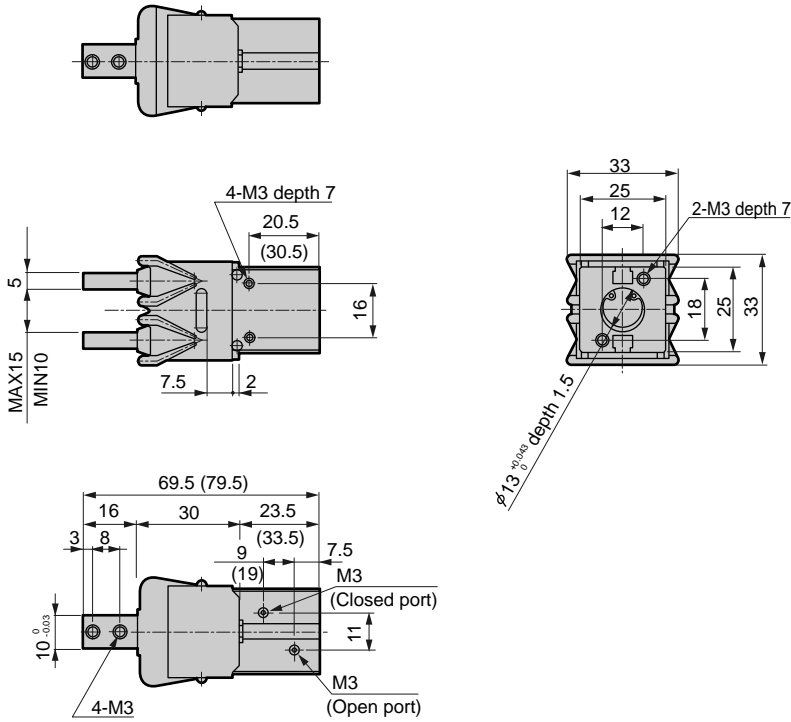
(Note) O type gripping power decreases approximate 20 to 30 % comparing to double acting type to closed direction. C type gripping power decreases approximate 10 to 20 % comparing to double acting type to open direction. Grip performance data indicates the grip for one jaw. Since two jaws are used, double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

### Dimensions

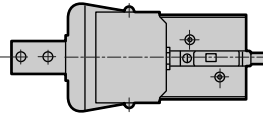
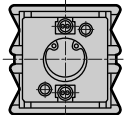
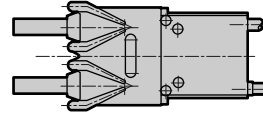
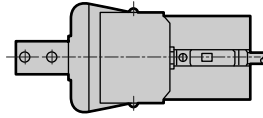


#### ● BHG-01CS standard/O/C

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

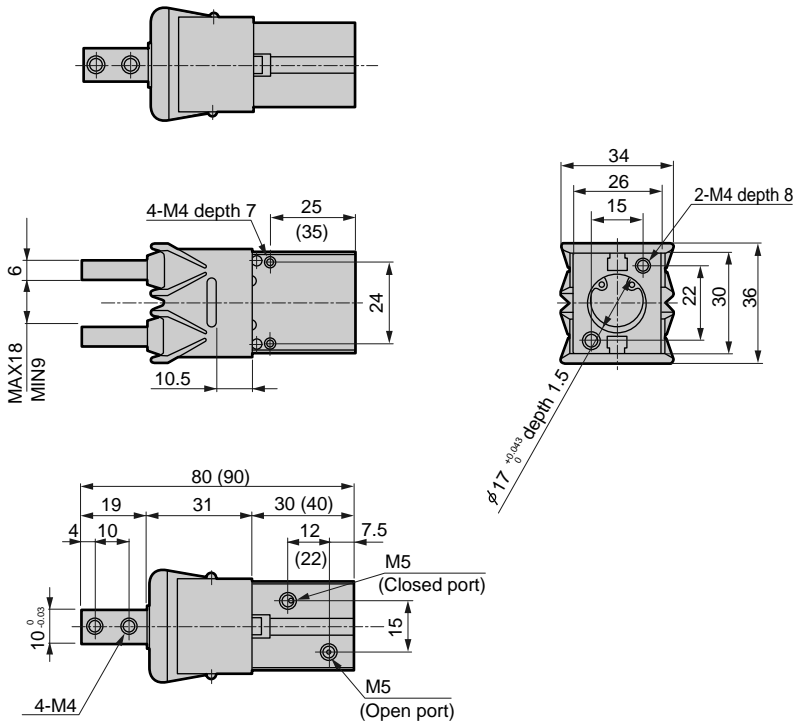


● With switch

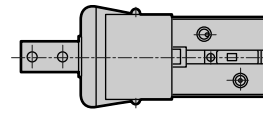
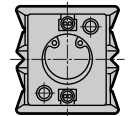
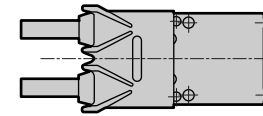
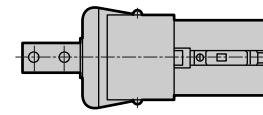


#### ● BHG-03CS standard/O/C

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



● With switch



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

Compact cross roller parallel hand with rubber cover  
Hand

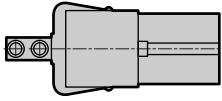




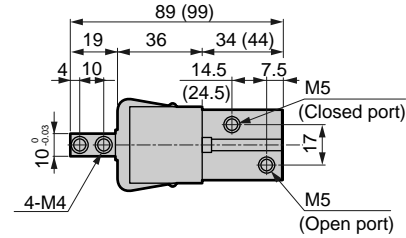
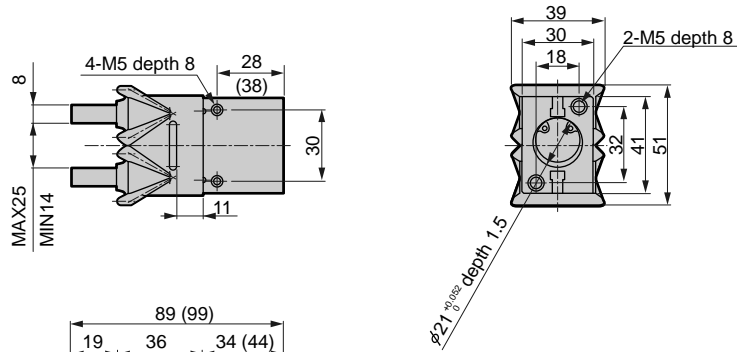
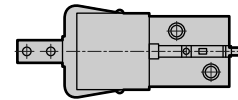
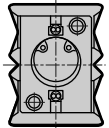
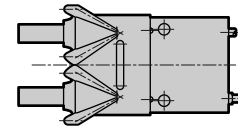
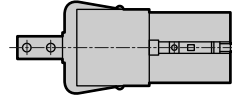
## Dimensions

### ● BHG-04CS standard/O/C

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

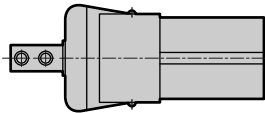


● With switch

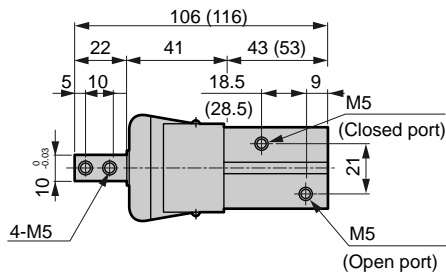
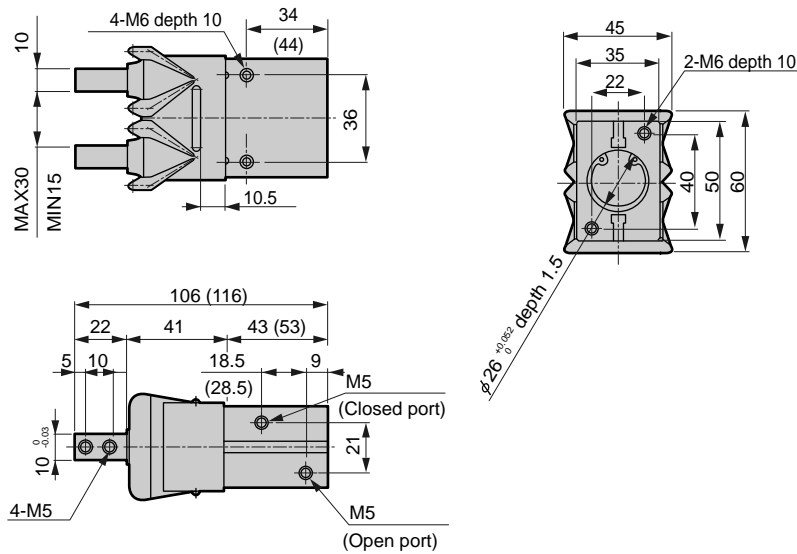
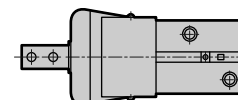
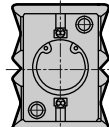
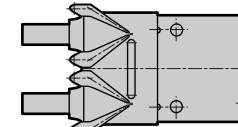
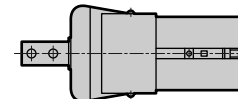


### ● BHG-05CS standard/O/C

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



● With switch





Linear guide hand Double acting/single acting

# LHA Series

- Operational stroke length: 4, 5, 9, 11, 15, 20mm



## Specifications

Descriptions	LHA					
Size	006CS	01CS	03CS	04CS	05CS	06CS
Cylinder bore size mm	φ6	φ12	φ16	φ20	φ25	φ32
Actuation	Double acting/single acting					
Working fluid	Compressed air					
Max. working pressure MPa	0.7					
Min. working pressure MPa	Double acting	0.1				
	Single acting	0.3				
Ambient temperature °C	5 to 60					
Port size	M3			M5		
Operational stroke length mm	4	5	9	11	15	20
Rod diameter mm	φ3	φ6	φ8	φ10	φ12	φ16
Capacity of reciprocating cm <sup>3</sup>	0.10	0.32	1.58	2.89	6.32	14.07
Repeatability mm	±0.01					
Product weight kg	0.04	0.085	0.15	0.36	0.52	0.82
Lubrication	Not required (when lubricating, use turbine oil Class 1 ISO VG32)					

## Switch specifications

Descriptions	Proximity 2 wire	Proximity 3 wire	Proximity 2 wire	Proximity 3 wire
	T2H/T2V	T3H/T3V	F2H/F2V	F3H/F3V
Applications	Programmable controller	Programmable controller, relay	Programmable controller	Programmable controller, relay
Output method	-	NPN output	-	NPN output
Power voltage	-	10 to 28 VDC	-	10 to 28 VDC
Load voltage/current	10 to 30 VDC, 5 to 20mA (Note 1)	30 VDC or less, 100mA or less	10 to 30 VDC, 5 to 20mA	30 VDC, 50mA or less
Light	LED (ON lighting)			
Leakage current	1mA or less	10 μA or less	1mA or less	10 μA or less
Maximum shock resistance	980m/s <sup>2</sup>			
Lead wire	Standard 1m (oil resistant vinyl cabtire cable 2-conductor 0.2mm <sup>2</sup> )	Standard 1m (oil resistant vinyl cabtire cable 3-conductor 0.2mm <sup>2</sup> )	Standard 1m (oil resistant vinyl cabtire cable 2-conductor 0.15mm <sup>2</sup> )	Standard 1m (oil resistant vinyl cabtire cable 3-conductor 0.15mm <sup>2</sup> )

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

**LHA** - **03CS** - **O**

With switch

**LHA** - **03CS** - **O** - **T2H** - **R**

**A** Size

**B** Option

**C** Switch model no.  
\* indicates lead wire length.

Note 1  
Note 2

**D** Switch quantity

Symbol	Descriptions			
<b>A Size</b>				
<b>006CS</b>				
<b>01CS</b>				
<b>03CS</b>				
<b>04CS</b>				
<b>05CS</b>				
<b>06CS</b>				
<b>B Option</b>				
<b>Blank</b>	Standard (double acting)			
<b>O</b>	Single acting (normally open)			
<b>C</b>	Single acting (normally closed)			
<b>C Switch model no.</b>				
Axial lead wire	Radial lead wire	Contact	Indicator	Lead wire
<b>F2H*</b>	<b>F2V*</b>	Proximity	1 color indicator type	2-wire
<b>F3H*</b>	<b>F3V*</b>			3-wire
<b>T2H*</b>	<b>T2V*</b>			2-wire
<b>T3H*</b>	<b>T3V*</b>			3-wire
<b>*Lead wire length</b>				
<b>Blank</b>	1m (standard)			
<b>3</b>	3m (option)			
<b>5</b>	5m (option)			
<b>D Switch quantity</b>				
<b>R</b>	One on open side			
<b>H</b>	One on closed side			
<b>D</b>	Two			

### **⚠** Note on model no. selection

Note 1: Only the LHA-006CS is provided with the F switch.  
Note 2: The 5 m lead cannot be selected for the F switch.

<Example of model number>

**LHA-03CS-O-T2H-R**

Model: Linear guide hand

- A** Size: 03CS
- 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

**SW** - **F2H\***

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

RRC
GRC
RV3*
NHS
HR
LN
FH100
HAP
BSA2
BHA/BHG
<b>LHA</b>
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

Linear guide hand  
Hand

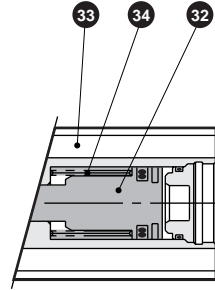
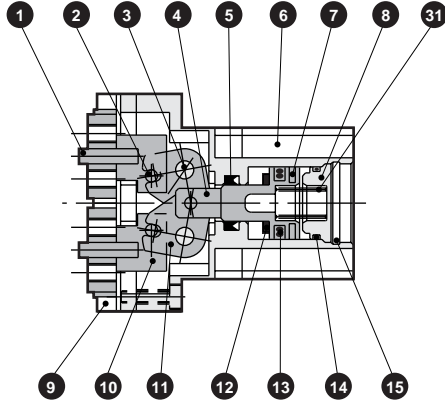
## Internal structure

RRC
GRC
RV3*
NHS
HR
LN
FH100
HAP
BSA2
BHA/BHG
<b>LHA</b>
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

● LHA-01CS to 05CS

Standard (double acting) O (normally open) type

C (normally closed) type

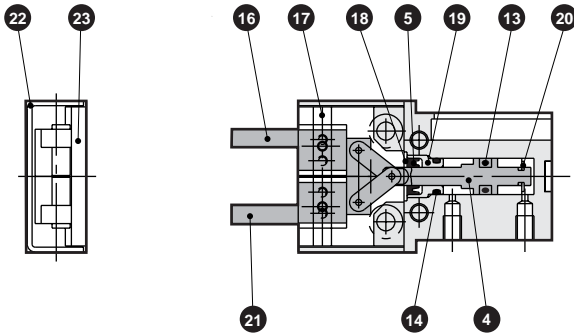


● LHA-006CS

Standard (double acting)

O (normally open) type

C (normally closed) type

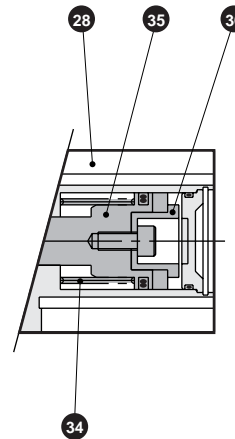
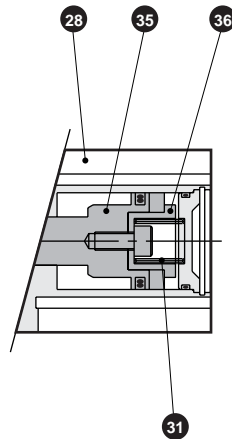
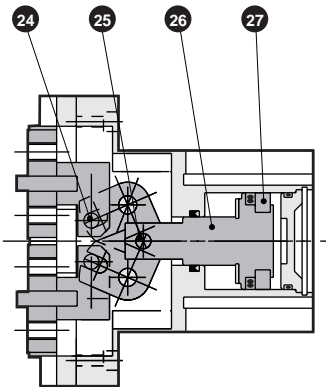


● LHA-06CS

Standard (double acting)

C (normally open) type

C (normally closed) type



### Parts list

No.	Parts name	Material	Remarks	No.	Parts name	Material	Remarks
1	Dowel pin	Alloy steel		19	Piston guide	Stainless steel	
2	Operation axis	Alloy steel		20	E type snap ring	Stainless steel	
3	Fulcrum axis	Alloy steel		21	Master key A	Stainless steel	
4	Piston	Stainless steel		22	Guard	Stainless steel	
5	Rod sealant	Nitrile rubber		23	Guide plate	Stainless steel	
6	Body	Aluminum alloy		24	Operation axis B	Alloy steel	
7	Semicircle magnet			25	Operation axis A	Steel	
8	Cylinder guard	Acetar resin		26	Piston	Stainless steel	
9	Linear guide			27	Magnet		
10	Master plate	Stainless steel		28	NO, NC body	Aluminum alloy	
11	Arm	Stainless steel	06CS: Steel	29	Spring guide	Stainless steel	
12	Cushion	Urethane seat		30	NO, NC spring	Stainless steel	
13	Piston seal	Nitrile rubber		31	NO spring	Stainless steel	
14	Cylinder sealant	Nitrile rubber		32	NC piston	Stainless steel	
15	C type snap ring	Stainless steel		33	NC body	Aluminum alloy	
16	Master key B	Stainless steel		34	NC spring	Stainless steel	
17	Linear guide			35	NO, NC piston A	Stainless steel	
18	Piston guide holder	Stainless steel		36	Piston B	Acetar resin	

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

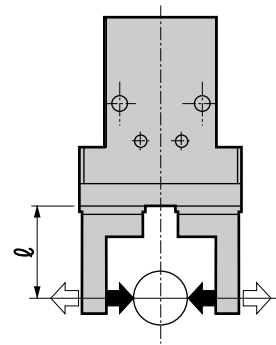
Linear guide hand  
 Hand

## Gripping power performance data

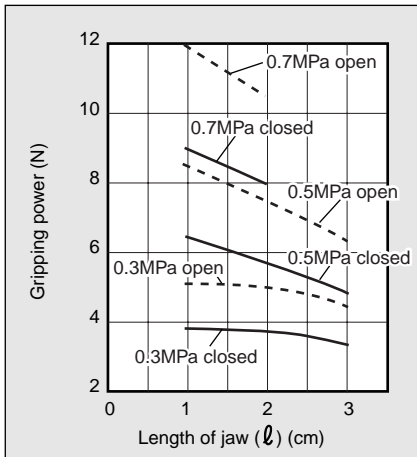
Gripping power that functions to open and closed directions with jaw length  $\ell$  of hand at supply pressure 0.3, 0.5 and 0.7 MPa is shown.

- Open direction (⇐⇒)----- (shown with broken line)
- Closed direction (⇒)————— (shown with continuous line)

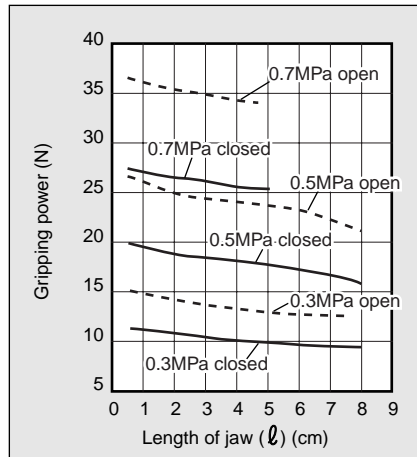
(Note) O type gripping power decreases approximate 20 to 30 % comparing to double acting type to closed direction.  
 C type gripping power decreases approximate 10 to 20 % comparing to double acting type to open direction.  
 Grip performance data indicates the grip for one jaw. Since two jaws are used,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



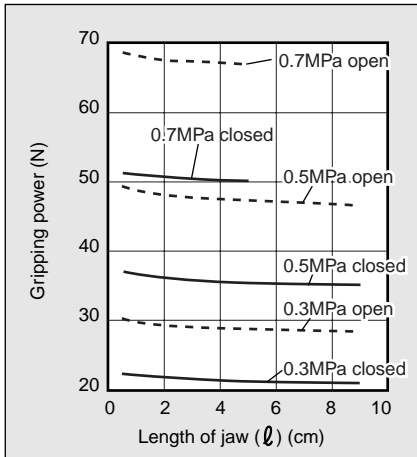
● LHA-006CS



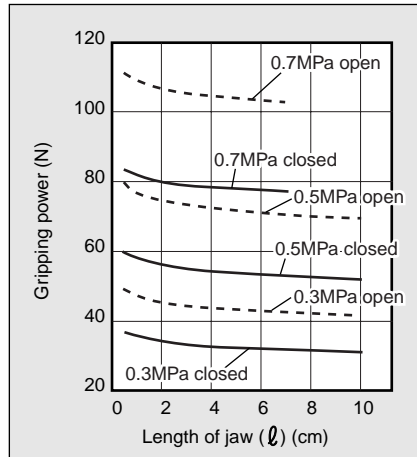
● LHA-01CS



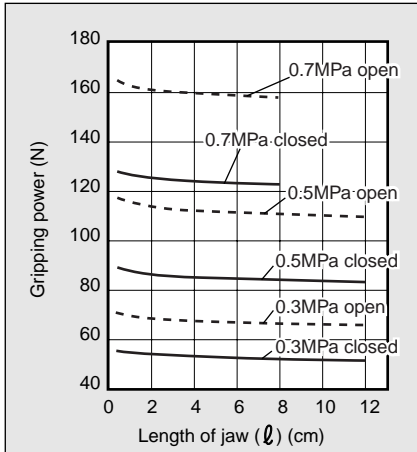
● LHA-03CS



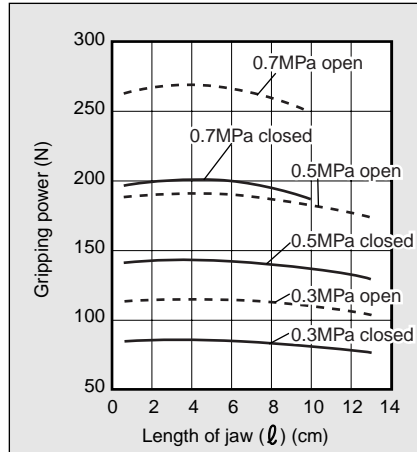
● LHA-04CS



● LHA-05CS



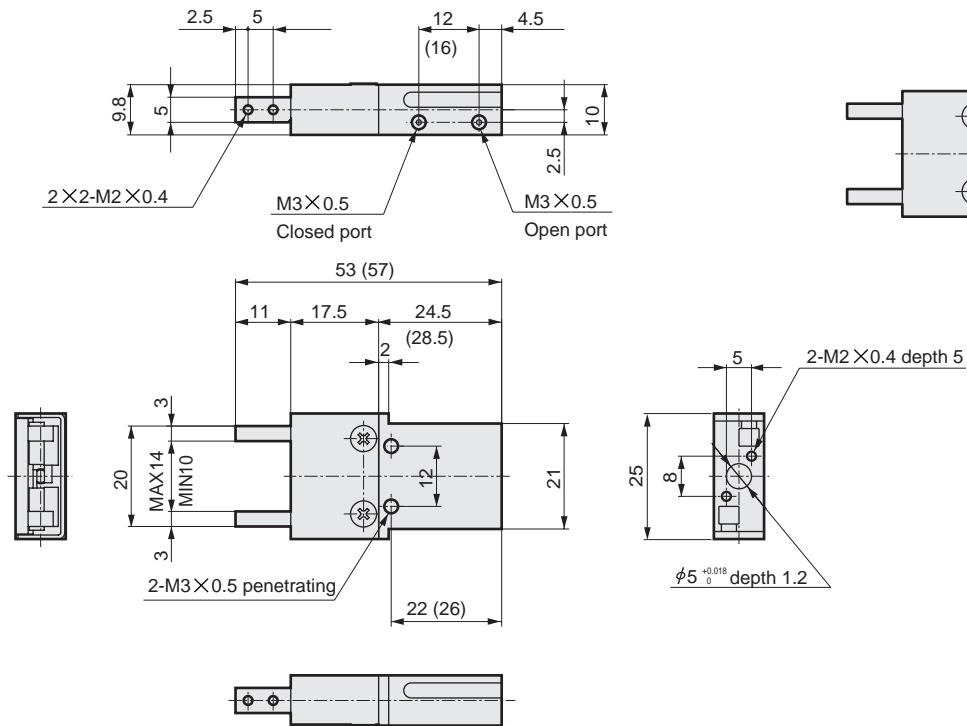
● LHA-06CS



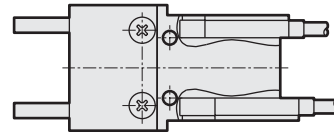
### Dimensions

● LHA-006CS standard/O/C

· Dimension in ( ) for C (normally closed) specifications

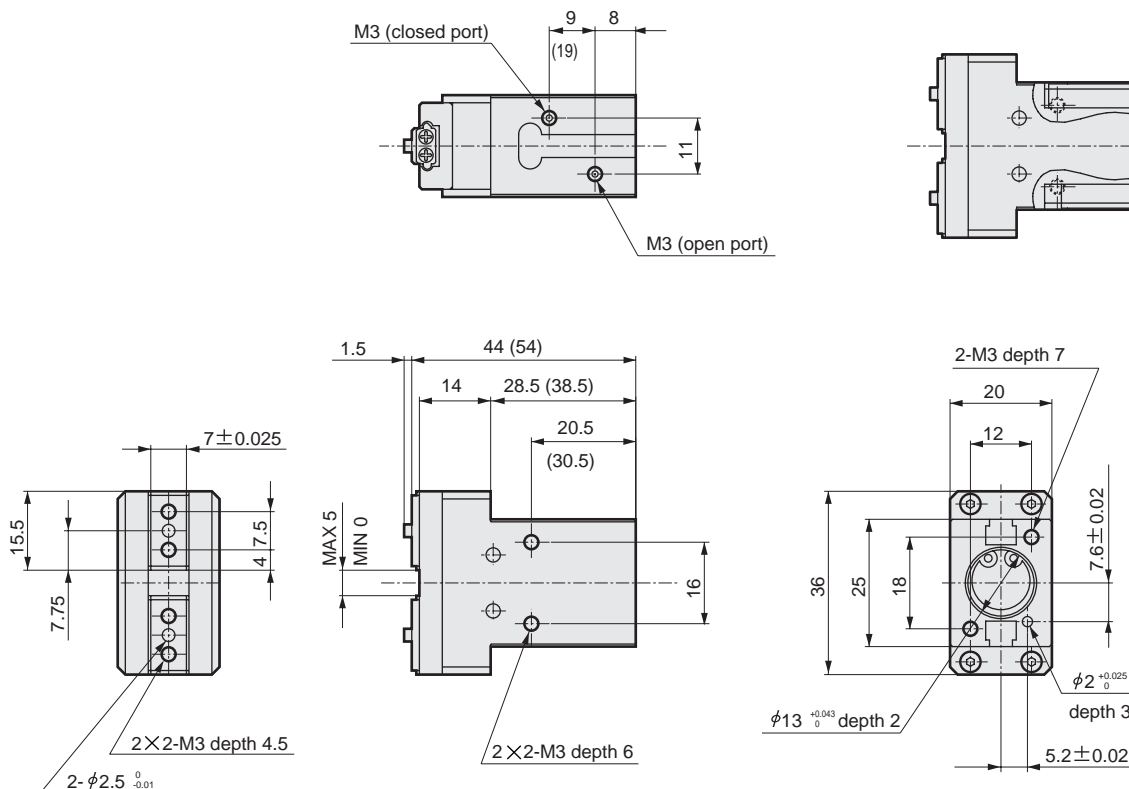


● With switch

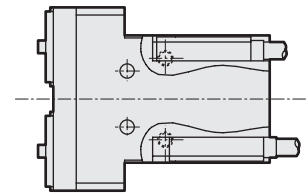


● LHA-01CS standard/O/C

· Dimension in ( ) for C (normally closed) specifications



● With switch



RRC
GRC
RV3*
NHS
HR
LN
FH100
HAP
BSA2
BHA/BHG
<b>LHA</b>
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

Linear guide hand  
Hand

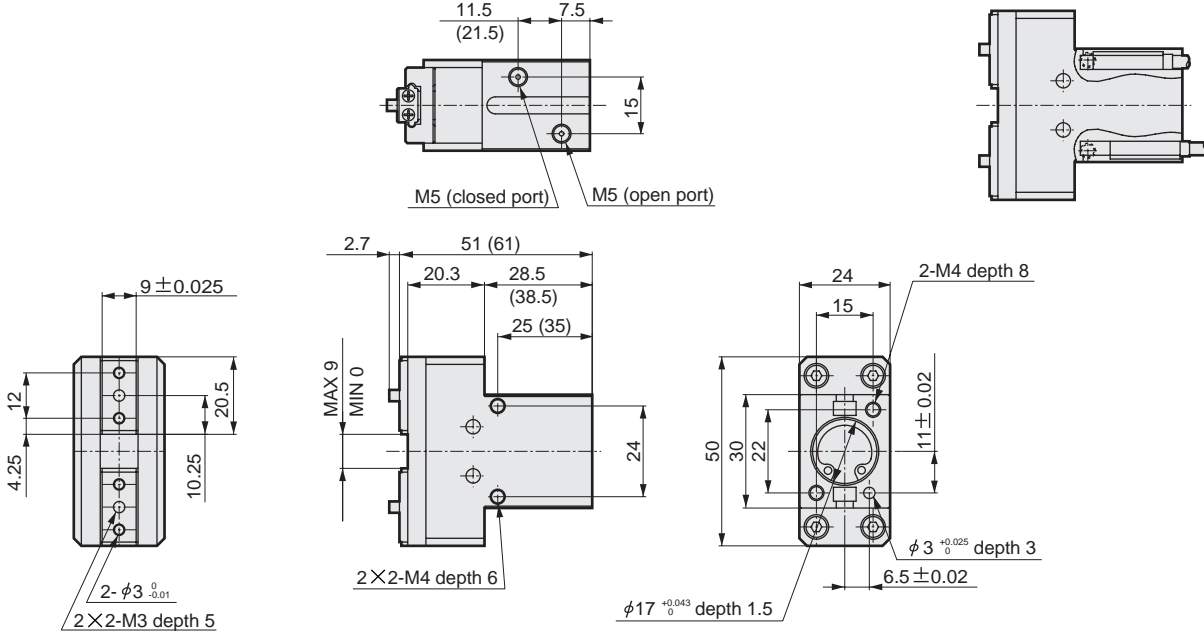
## Dimensions



### ● LHA-03CS standard/O/C

· Dimension in ( ) for C (normally closed) specifications

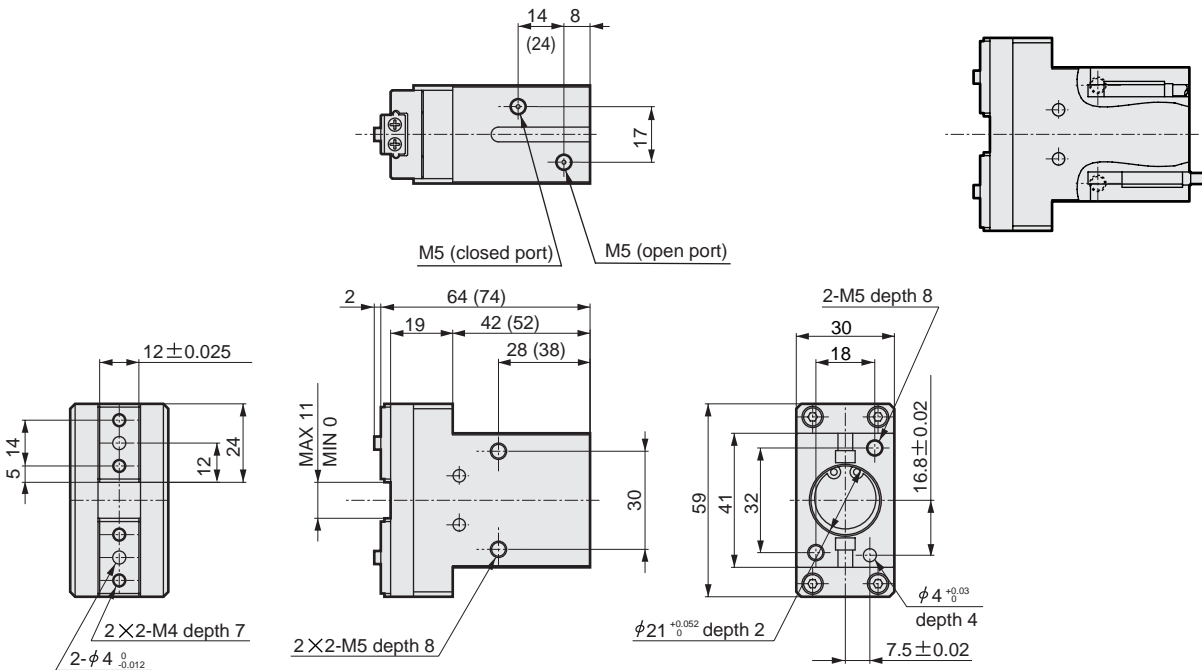
### ● With switch



### ● LHA-04CS standard/O/C

· Dimension in ( ) for C (normally closed) specifications

### ● With switch

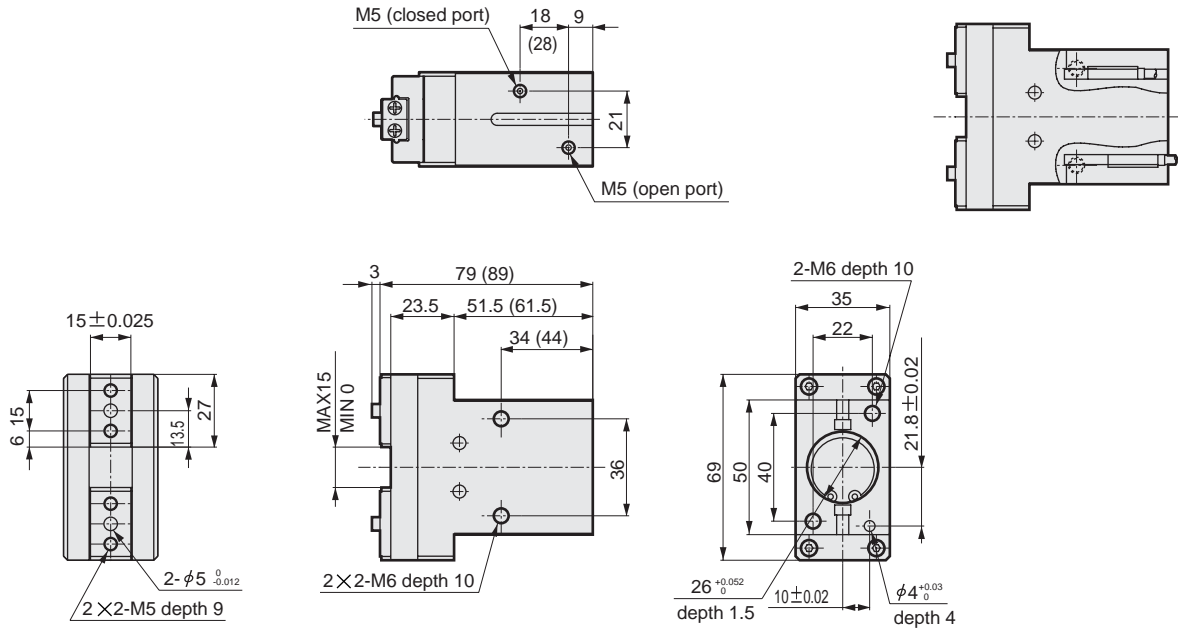




### Dimensions

● LHA-05CS standard/O/C

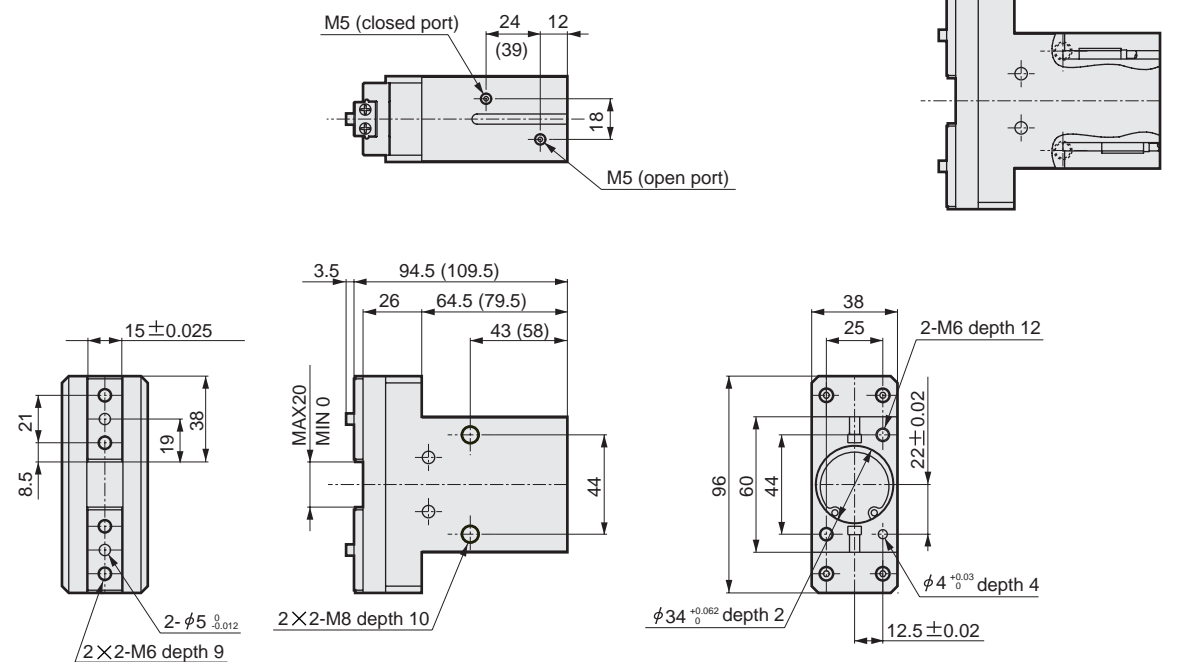
· Dimension in ( ) for C (normally closed) specifications



● With switch

● LHA-06CS standard/O/C

· Dimension in ( ) for C (normally closed) specifications



● With switch

RRC
GRC
RV3*
NHS
HR
LN
FH100
HAP
BSA2
BHA/BHG
<b>LHA</b>
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

Linear guide hand  
Hand



Linear guide hand with rubber cover Double acting/single acting

# LHAG Series

- Operational stroke length: 5, 9, 11, 15, 20mm



## Specifications

Descriptions	LHAG				
	01CS	03CS	04CS	05CS	06CS
Size					
Cylinder bore size mm	φ12	φ16	φ20	φ25	φ32
Actuation	Double acting/single acting				
Working fluid	Compressed air				
Max. working pressure MPa	0.7				
Min. working pressure MPa	Double acting	0.2			
	Single acting	0.3			
Ambient temperature °C	5 to 60				
Port size	M3		M5		
Operational stroke length mm	5	9	11	15	20
Rod diameter mm	φ6	φ8	φ10	φ12	φ16
Capacity of reciprocating cm <sup>3</sup>	0.32	1.58	2.89	6.32	14.07
Repeatability mm	±0.01				
Product weight kg	0.09	0.17	0.37	0.57	0.9
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	10 μA or less
Maximum shock resistance	980m/s <sub>2</sub>	
Lead wire	Standard 1m	Standard 1m
	(oil resistant vinyl cabtire cable 2-conductor 0.2mm <sup>2</sup> )	(oil resistant vinyl cabtire cable 2-conductor 0.2mm <sup>2</sup> )

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

**LHAG** - **03CS** - **O**

With switch

**LHAG** - **03CS** - **O** - **T2H** - **R**

Model no.

**A** Size

**B** Option

**C** Switch model no.  
\* indicates lead wire length.

**D** Switch quantity

Symbol	Descriptions			
<b>A Size</b>				
<b>01CS</b>				
<b>03CS</b>				
<b>04CS</b>				
<b>05CS</b>				
<b>06CS</b>				
<b>B Option</b>				
<b>Blank</b>	Standard (double acting with nitrile rubber guard)			
<b>O</b>	Single acting (normally open)			
<b>C</b>	Single acting (normally closed)			
<b>F</b>	Fluoro rubber guard			
<b>T</b>	Silicon rubber guard			
<b>C Switch model no.</b>				
Axial lead wire	Radial lead wire	Contact	Indicator	Lead wire
<b>T2H*</b>	<b>T2V*</b>	Proximity	1 color indicator type	2-wire
<b>T3H*</b>	<b>T3V*</b>			3-wire
<b>*Lead wire length</b>				
<b>Blank</b>	1m (standard)			
<b>3</b>	3m (option)			
<b>5</b>	5m (option)			
<b>D Switch quantity</b>				
<b>R</b>	One on open side			
<b>H</b>	One on closed side			
<b>D</b>	Two			

RRC
GRC
RV3*
NHS
HR
LN
FH100
HAP
BSA2
BHA/BHG
LHA
<b>LHAG</b>
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

<Example of model number>

**LHAG-03CS-O-T2H-R**

Model: Linear guide hand with rubber cover

- A** Size: 03CS
- 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

**SW** - **T2H\***

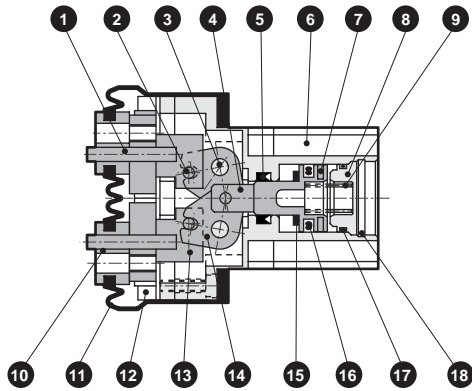
Switch model no.  
(Item above **C**)

Linear guide hand with rubber cover  
Hand

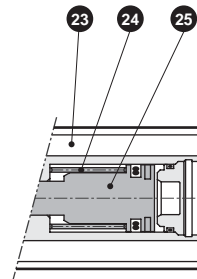
## Internal structure and parts list

### ● LHAG-01CS to 05CS

Standard (double acting) / O (normally open) type

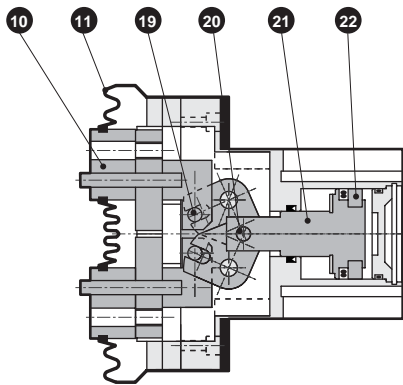


C (normally closed) type

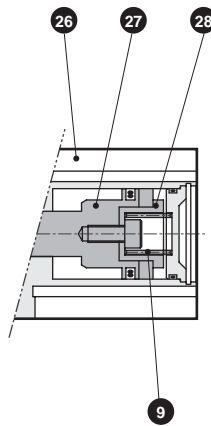


### ● LHAG-06CS

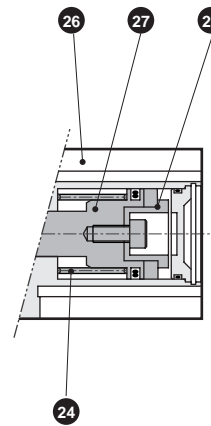
Standard (double acting)



O (normally open) type



C (normally closed) type



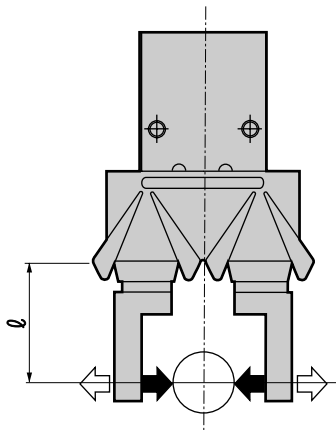
No.	Parts name	Material	Remarks	No.	Parts name	Material	Remarks
1	Dowel pin	Alloy steel		15	Cushion	Urethane seat	
2	Operation axis	Alloy steel		16	Piston seal	Nitrile rubber	
3	Fulcrum axis	Alloy steel		17	Cylinder sealant	Nitrile rubber	
4	Piston	Stainless steel		18	C type snap ring	Stainless steel	
5	Rod sealant	Nitrile rubber		19	Operation axis B	Alloy steel	
6	Body	Aluminum alloy		20	Operation axis A	Steel	
7	Semicircle magnet			21	Piston	Stainless steel, aluminum alloy	
8	Cylinder guard	Acetar resin		22	Magnet		
9	NO spring	Stainless steel		23	NC body	Aluminum alloy	
10	Main jaw for rubber covers	Stainless steel		24	NC spring	Stainless steel	
11	Rubber cover	Nitrile rubber		25	NC piston	Stainless steel	
12	Linear guide			26	NO, NC body	Aluminum alloy	
13	Master plate	Stainless steel		27	NO, NC piston A	Stainless steel	
14	Arm	Stainless steel	06CS: Steel	28	Piston B	Acetar resin	

### Gripping power performance data

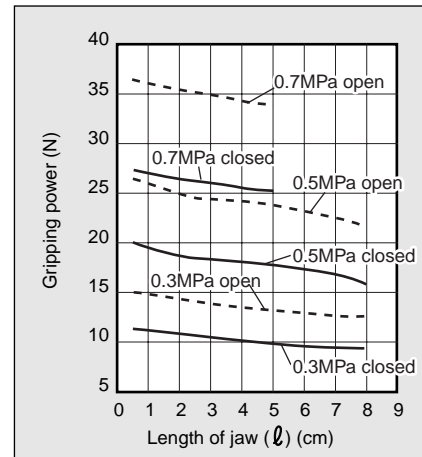
Gripping power that functions to open and closed directions with jaw length  $\ell$  of hand at supply pressure 0.3, 0.5 and 0.7 MPa is shown.

- Open direction (←)----- (shown with broken line)
- Closed direction (→)————— (shown with continuous line)

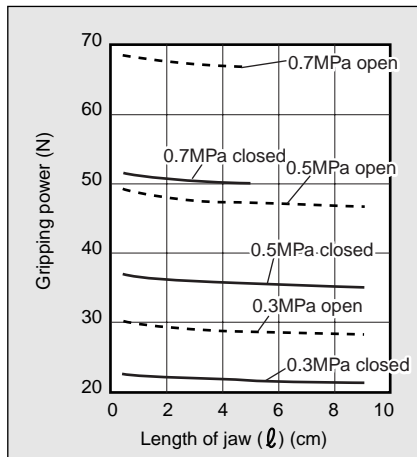
(Note) O type gripping power decreases approximate 20 to 30 % comparing to double acting type to closed direction.  
 C type gripping power decreases approximate 10 to 20 % comparing to double acting type to open direction.  
 Grip performance data indicates the grip for one jaw. Since two jaws are used,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



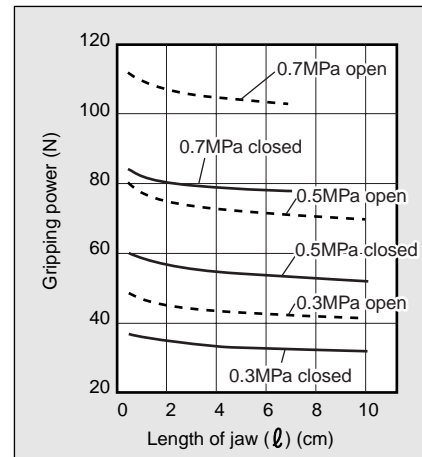
● LHAG-01CS



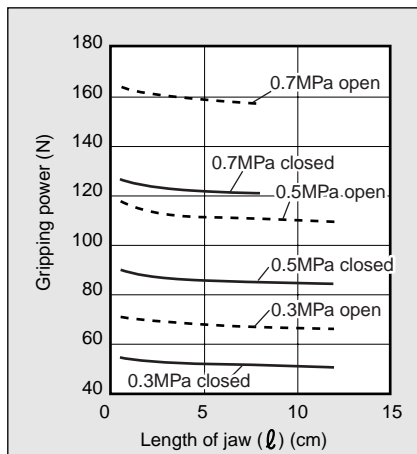
● LHAG-03CS



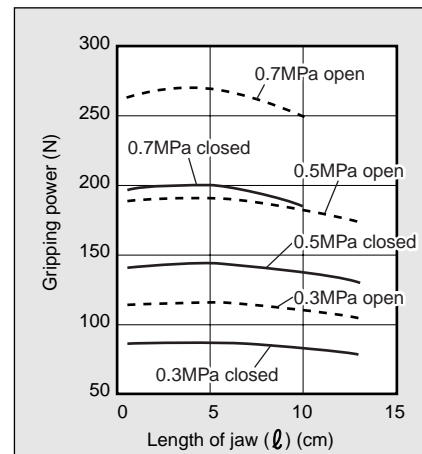
● LHAG-04CS



● LHAG-05CS



● LHAG-06CS



RRC
GRC
RV3*
NHS
HR
LN
FH100
HAP
BSA2
BHA/BHG
LHA
<b>LHAG</b>
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

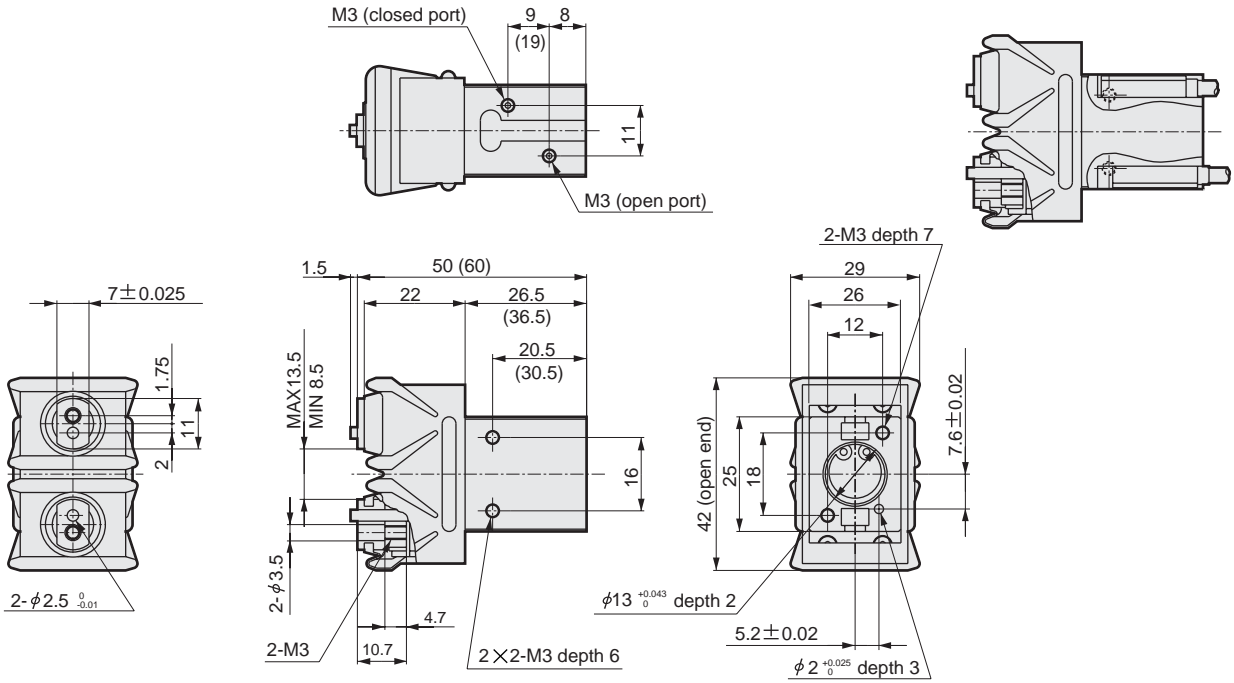
Linear guide hand with rubber cover  
Hand

## Dimensions

RRC
GRC
RV3*
NHS
HR
LN
FH100
HAP
BSA2
BHA/BHG
LHA
<b>LHAG</b>
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

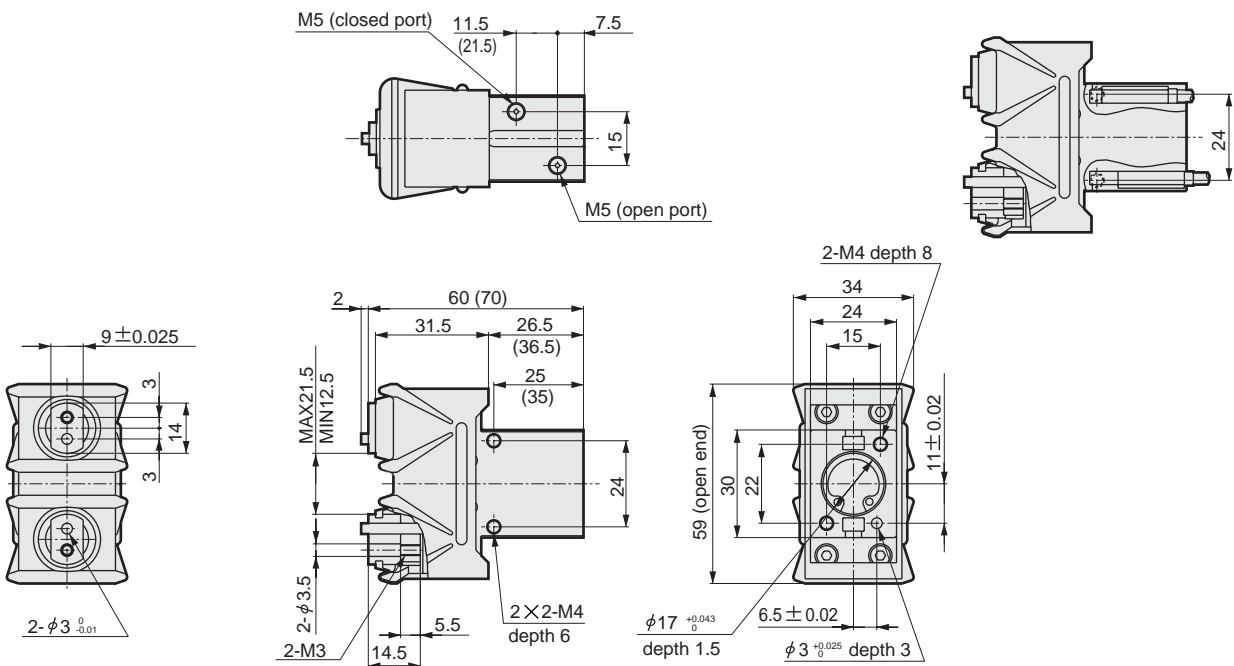
- LHAG-01CS standard/O/C
  - Dimension in ( ) for C (normally closed) specifications

- With switch



- LHAG-03CS standard/O/C
  - Dimension in ( ) for C (normally closed) specifications

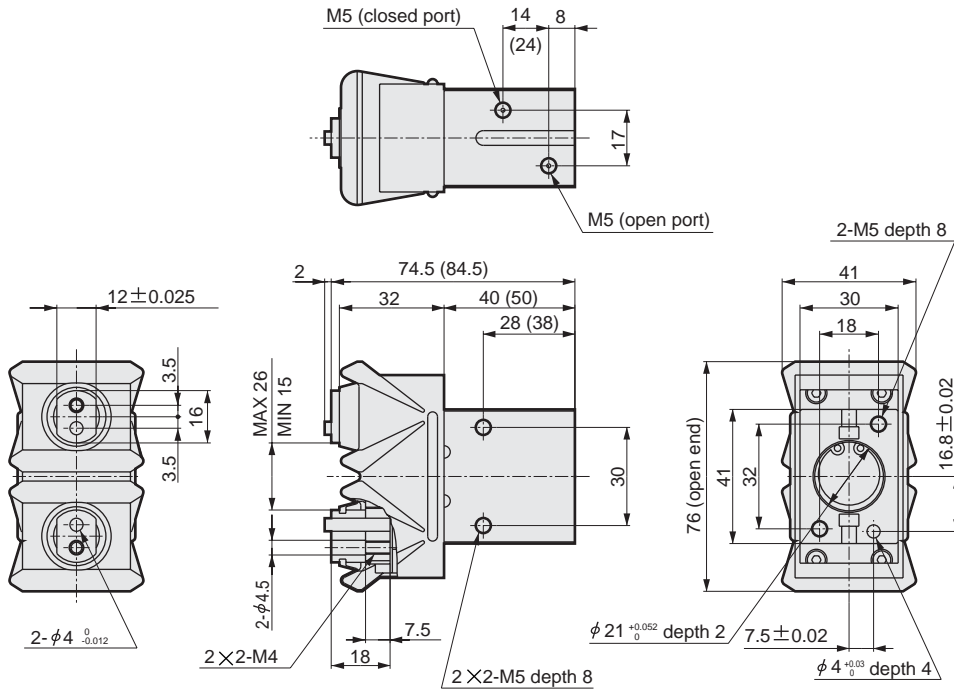
- With switch



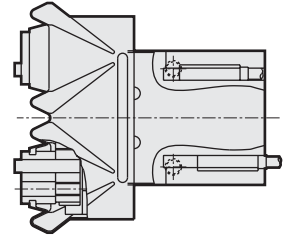
### Dimensions

● LHAG-04CS standard/O/C

· Dimension in ( ) for C (normally closed) specifications

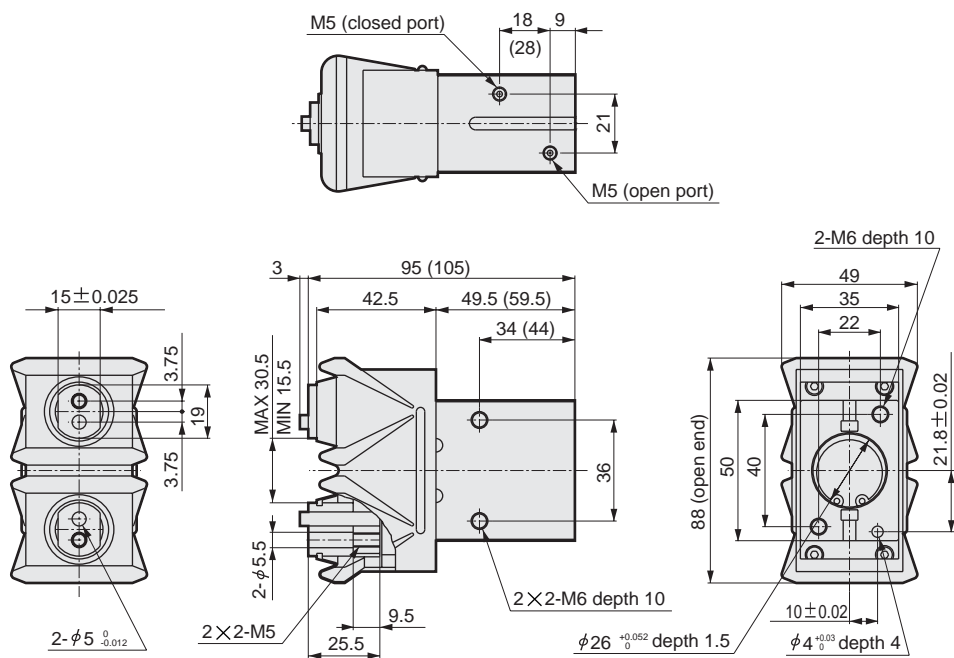


● With switch

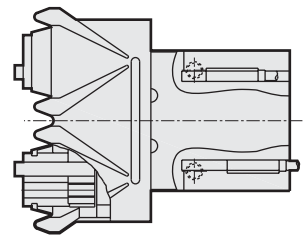


● LHAG-05CS standard/O/C

· Dimension in ( ) for C (normally closed) specifications



● With switch



RRC
GRC
RV3*
NHS
HR
LN
FH100
HAP
BSA2
BHA/BHG
LHA
<b>LHAG</b>
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

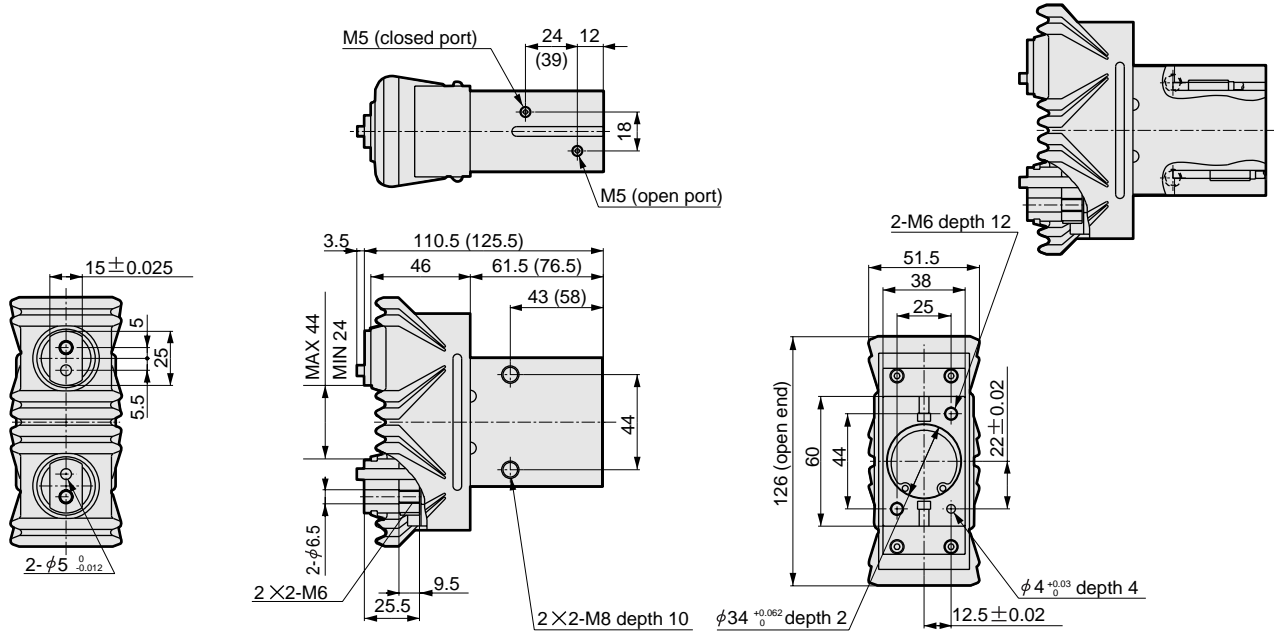
Linear guide hand with rubber cover  
Hand

## Dimensions

● LHAG-06CS standard/O/C

● With switch

· Dimension in ( ) for C (normally closed) specifications



RRC
GRC
RV3*
NHS
HR
LN
FH100
HAP
BSA2
BHA/BHG
LHA
<b>LHAG</b>
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





Cross roller parallel hand Double acting/single acting

# HKP Series

● Operational stroke length: 24, 30, 36, 40mm



RRC  
GRC  
RV3\*  
NHS  
HR  
LN

FH100

## Specifications

HAP

Descriptions		HKP				
Size		32CS	40CS	50CS	63CS	
Cylinder bore size	mm	φ32	φ40	φ50	φ63	
LHA	Actuation	Double acting/single acting				
LHAG	Working fluid	Compressed air				
HKP	Max. working pressure	MPa				
		0.7				
HLA/ HLB	Min. working pressure <sup>note</sup> MPa	Double acting	0.1			
HLAG/ HLBG		Normally open	0.3			
HEP		Normally closed				
HCP	Ambient temperature	°C				
		5 to 60				
HMF	Port size	M5	Rc1/8			
HMFB	Operational stroke length	mm	24	30	36	40
HFP	Rod diameter	mm	φ16	φ20	φ28	φ32
HLC	Capacity of reciprocating	cm <sup>3</sup>	25.3	49.5	89.4	162.9
HGP	Repeatability	mm	± 0.01			
FH500	Product weight	kg	1.36	1.95	4.2	5.4
HBL	Lubrication	Not required (when lubricating, use turbine oil Class 1 ISO VG32)				

HBL

Note: If rubber cover (option) is installed, min. working pressure for double acting is to be 0.15MPa.

HDL

HMD

## Switch specifications

HJL

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	
CKF	Light	LED (ON lighting)	
CKJ	Leakage current	1mA or less	10 μA or less
CKL2	Maximum shock resistance	980m/s <sup>2</sup>	
CKL2 -*.HC	Lead wire	Standard 1m (oil resistant vinyl cabtire cable 2-conductor 0.2mm <sup>2</sup> )	Standard 1m (oil resistant vinyl cabtire cable 2-conductor 0.2mm <sup>2</sup> )

CKLB2

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)

NCK/  
SCK/FCK

Note 2: If rubber cover (option) is installed, minimum working pressure is to be 0.35MPa.

FJ

FK

Ending

### How to order

Without switch

HKP - 32CS - O

With switch

HKP - 32CS - O - T2H - R

Ⓐ Size

Ⓑ Option

Ⓒ Switch model no.

Ⓓ Switch quantity

Symbol	Descriptions			
<b>Ⓐ Size</b>				
32CS				
40CS				
50CS				
63CS				
<b>Ⓑ Option</b>				
Blank	Standard (double acting)			
O	Single acting (normally open)			
C	Single acting (normally closed)			
G	With rubber cover (nitrile rubber)			
<b>Ⓒ Switch model no.</b>				
Axial lead wire	Radial lead wire	Contact	Indicator	Lead wire
T2H*	T2V*	Proximity	1 color indicator type	2-wire 3-wire
T3H*	T3V*			
<b>*Lead wire length</b>				
Blank	1m (standard)			
3	3m (option)			
5	5m (option)			
<b>Ⓓ Switch quantity</b>				
R	One on open side			
H	One on closed side			
D	Two			

<Example of model number>

**HKP-32CS-O-T2H-R**

Model: Cross roller parallel hand

- Ⓐ Size : 32CS
- Ⓑ Option : Single acting, normally open type
- Ⓒ 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

HKP - T2H

Switch model no.  
(Item above Ⓒ)

SW - T2H

Switch model no.  
(Item above Ⓒ)

HKP - T

- For switch T\*V\*
- Switch body + mounting bracket

HKP - T2V - \*

Switch model no.  
(Item above Ⓒ)

SW - T2V

Switch model no.  
(Item above Ⓒ)

HKP - TV - \*

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

### Rubber cover part model no.

Size	Part model no.
32CS	HKP-32K
40CS	HKP-40K
50CS	HKP-50K
63CS	HKP-63K

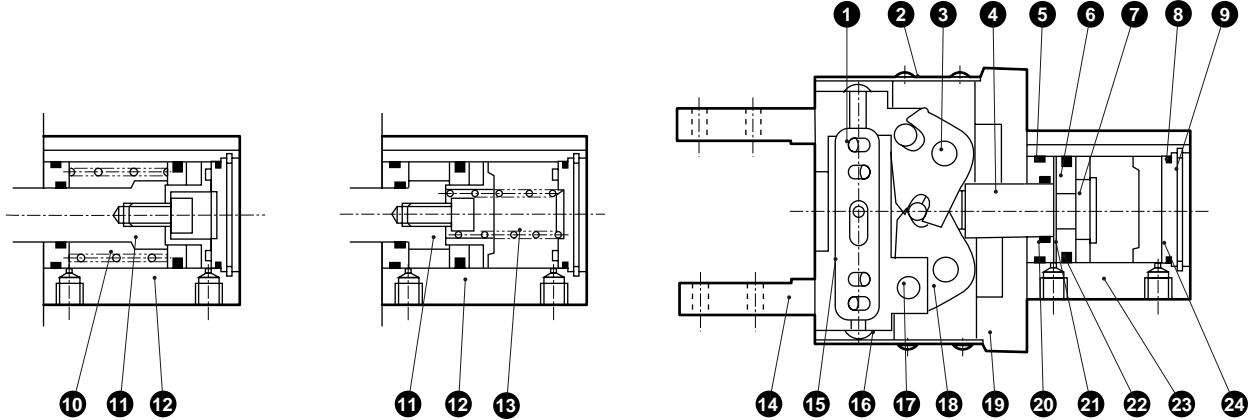
RRC  
GRC  
RV3\*  
NHS  
HR  
LN  
FH100  
HAP  
BSA2  
BHA/  
BHG  
LHA  
LHAG  
HKP  
HLA/  
HLB  
HLAG/  
HLBG  
HEP  
HCP  
HMF  
HMFB  
HFP  
HLC  
HGP  
FH500  
HBL  
HDL  
HMD  
HJL  
BHE  
CKG  
CK  
CKA  
CKS  
CKF  
CKJ  
CKL2  
CKL2  
\*-HC  
CKH2  
CKLB2  
NCK/  
SCK/FCK  
FJ  
FK  
Ending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

## Internal structure and parts list

● C (normally closed) type

● O (normally open) type

● Standard (double acting)

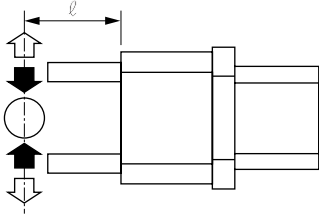


No.	Parts name	Material	Remarks	No.	Parts name	Material	Remarks
1	Cross roller	Alloy steel		13	Spring	Stainless steel	Only O type
2	Side cover	Stainless steel		14	Master key	Steel	
3	Fulcrum axis	Steel		15	Retainer	Stainless steel	
4	Piston rod	Stainless steel		16	Bearing guide	Steel	
5	Cylinder gasket A	Nitrile rubber		17	Operation axis	Steel	
6	Piston A	Aluminum alloy		18	Arm	Steel	
7	Piston B	Stainless steel (40 to 63CS) Acetar resin (32CS)		19	Body	Aluminum alloy	
8	Cylinder gasket B	Nitrile rubber		20	Rod packing seal	Nitrile rubber	
9	Snap ring	Stainless steel		21	Cushion	Resin	
10	Spring	Stainless steel	Only C type	22	Piston packing seal	Nitrile rubber	
11	Piston	Stainless steel		23	Cylinder	Aluminum alloy	
12	Cylinder	Aluminum alloy		24	Cylinder guard	Aluminum alloy (32CS, 50 to 63CS) Acetar resin (40CS)	

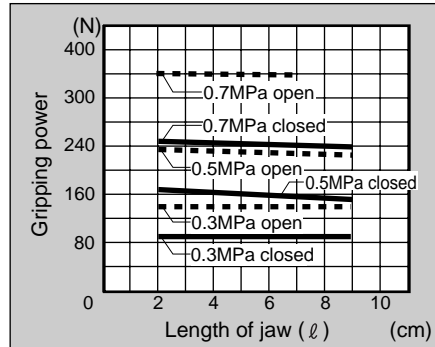
## Gripping power performance data

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

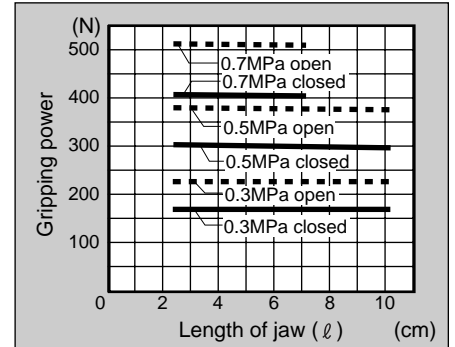
- Open direction (←) ..... (shown with broken line)
- Closed direction (→) ——— (shown with continuous line)



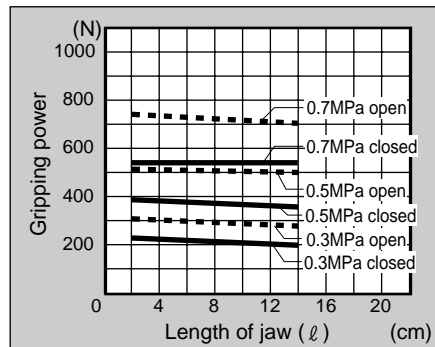
● HKP-32CS



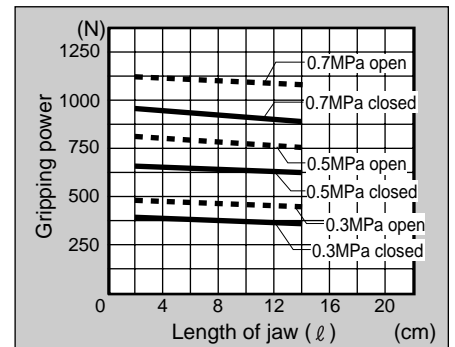
● HKP-40CS



● HKP-50CS



● HKP-63CS



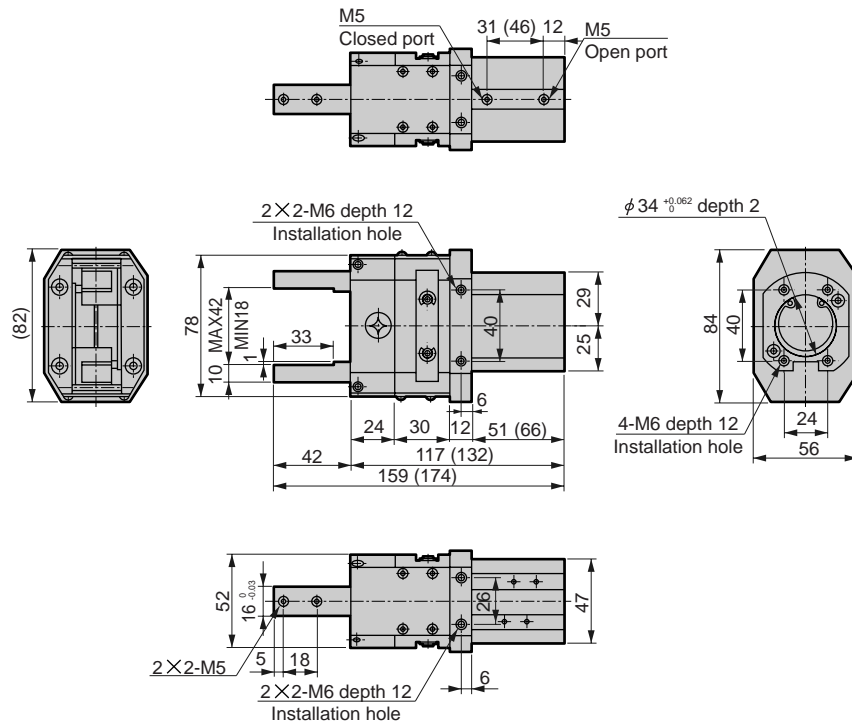
(Note) O type gripping power decreases approximate 20 to 30 % comparing to double acting type to closed direction. C type gripping power decreases approximate 10 to 20 % comparing to double acting type to open direction. Grip performance data indicates the grip for one jaw. Since two jaws are used, double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

### Dimensions

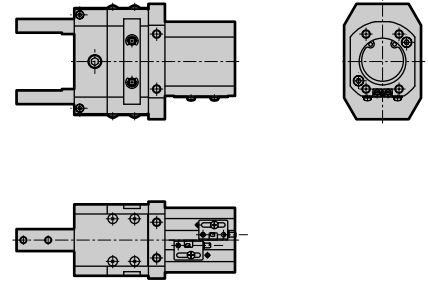


#### ● HKP-32CS standard/O/C

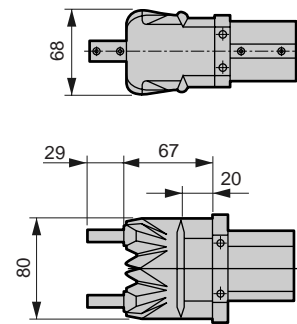
· Dimension in ( ) for O (normally open), C (normally closed) specifications



#### ● With switch

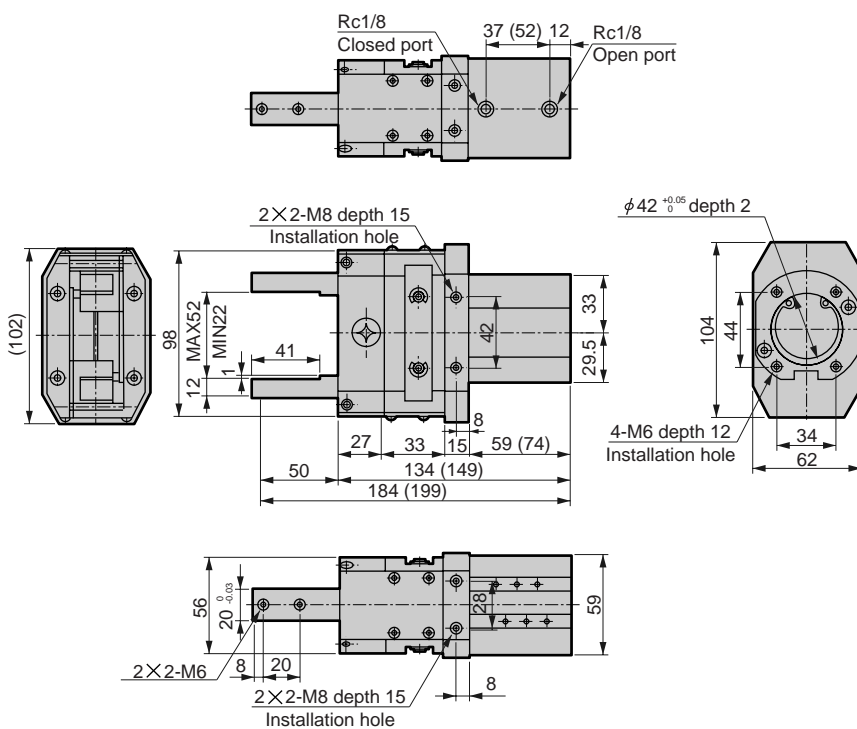


#### ● With rubber cover

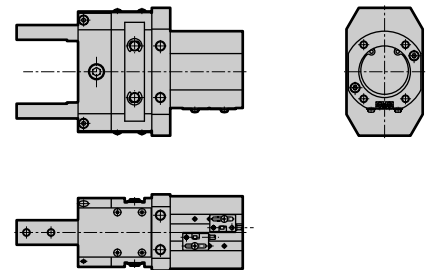


#### ● HKP-40CS standard/O/C

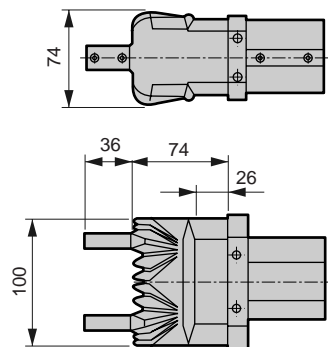
· Dimension in ( ) for O (normally open), C (normally closed) specifications



#### ● With switch



#### ● With rubber cover



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

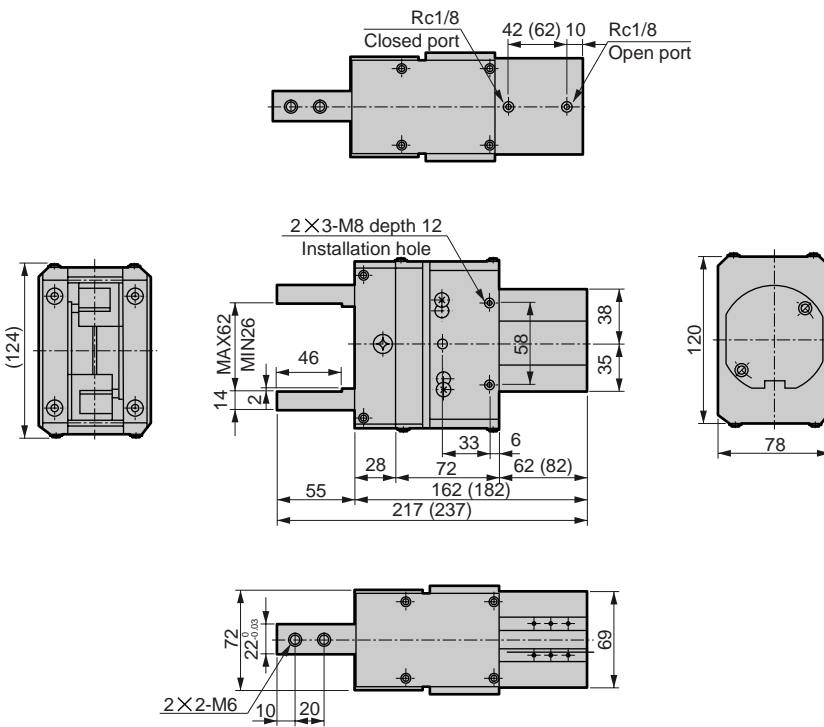
Cross roller parallel hand  
Hand



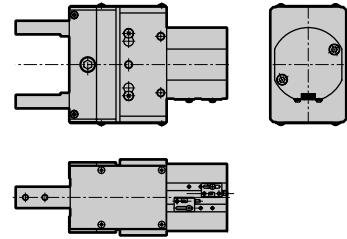
## Dimensions

### ● HKP-50CS standard/O/C

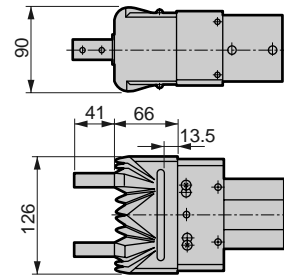
· Dimension in ( ) for O (normally open), C (normally closed) specifications



### ● With switch

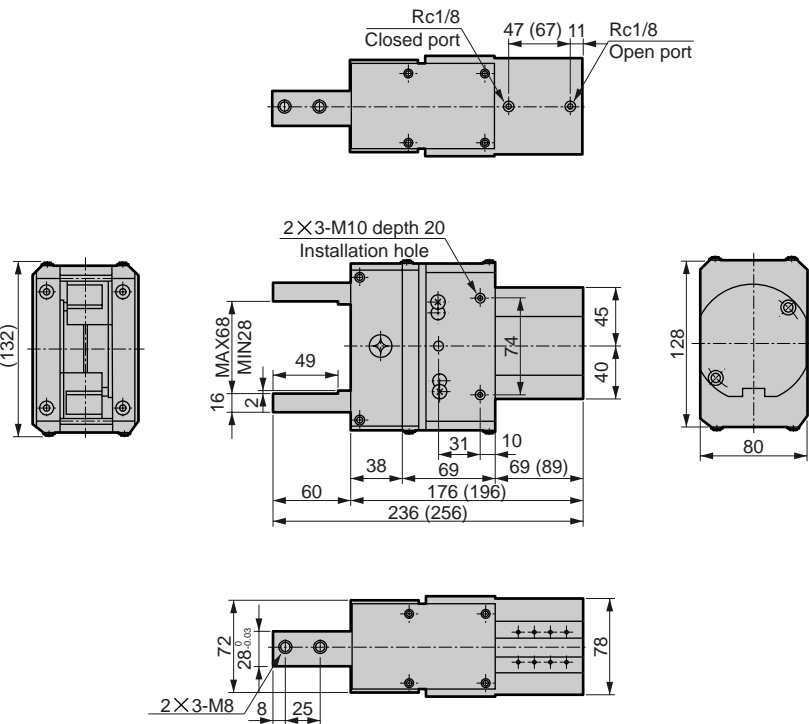


### ● With rubber cover

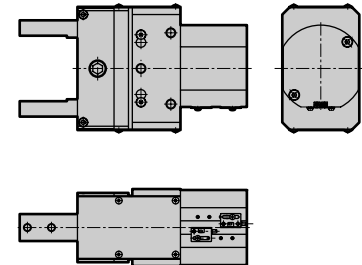


### ● HKP-63CS standard/O/C

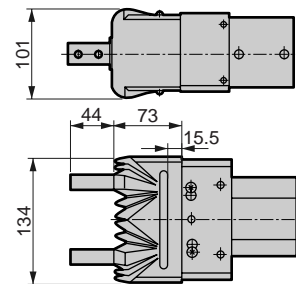
· Dimension in ( ) for O (normally open), C (normally closed) specifications



### ● With switch



### ● With rubber cover





Thin parallel hand (bush/bearing guide) Double acting

# HLA/HLB Series

- Operational stroke length: HLA 15, 20, 25mm  
HLB 13, 18, 23mm



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

## Specifications

Descriptions	HLA			HLB		
	12CS	15CS	20CS	12CS	15CS	20CS
Size	12CS	15CS	20CS	12CS	15CS	20CS
Cylinder bore size mm	$\phi 12$	$\phi 15$	$\phi 20$	$\phi 12$	$\phi 15$	$\phi 20$
Actuation	Double acting					
Working fluid	Compressed air					
Max. working pressure MPa	0.7					
Min. working pressure MPa	0.3			0.1		
Ambient temperature °C	5 to 60					
Port size	M5					
Operational stroke length mm	15	20	25	13	18	23
Capacity of reciprocating cm <sup>3</sup>	1.69	3.53	7.85	1.47	3.18	7.22
Repeatability mm	$\pm 0.03$			$\pm 0.01$		
Product weight kg	0.152	0.276	0.504	0.214	0.402	0.678
Lubrication	Not required (when lubricating, use turbine oil Class 1 ISO VG32)					

## Switch specifications and variations

Descriptions	Proximity 2 wire	Proximity 3 wire
	K2H/K2V	K3H/K3V
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, 50mA or less
Light	LED (ON lighting)	
Leakage current	1mA or less	10 $\mu$ A or less
Maximum shock resistance	980m/s <sup>2</sup>	

Descriptions	Reed 2 wire	
	K0H/K0V	K5H/K5V
Applications	Programmable controller, relay	Programmable controller, relay, IC circuit (w/o light), serial connection
Power voltage	-	
Load voltage/current	12/24 VDC, 5 to 50 mA 110 VAC, 7 to 20 mA	5/12/24 VDC, 50mA or less 110 VAC, 20mA or less
Light	LED (ON lighting)	None
Leakage current	0mA	
Maximum shock resistance	294m/s <sup>2</sup>	

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

**HLA** - **12CS**

With switch

**HLA** - **12CS** - **K2H** - **R**

**A** Model no.

**B** Size

**C** Switch model no.  
Note 1

**D** Switch quantity

Symbol	Descriptions			
<b>A Model no.</b>				
<b>HLA</b>	Bush guide			
<b>HLB</b>	Bearing guide			
<b>B Size</b>				
<b>12CS</b>				
<b>15CS</b>				
<b>20CS</b>				
<b>C Switch model no.</b>				
Axial lead wire	Radial lead wire	Contact	Indicator	Lead wire
<b>K0H*</b>	<b>K0V*</b>	Reed	1 color indicator type	2-wire
<b>K5H*</b>	<b>K5V*</b>		Without indicator light	
<b>K2H*</b>	<b>K2V*</b>	Proximity	1 color indicator type	2-wire
<b>K3H*</b>	<b>K3V*</b>		3-wire	
<b>*Lead wire length</b>				
<b>Blank</b>	1m (standard)			
<b>3</b>	3m (option)			
<b>5</b>	5m (option)			
<b>D Switch quantity</b>				
<b>R</b>	One on open side			
<b>H</b>	One on closed side			
<b>D</b>	Two			

### ⚠ Note on model no. selection

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

<Example of model number>

**HLB-12CS-K2H-R**

Model: Thin parallel hand

- A** Model no. : Bearing guide HLB
- B** Size : 12CS
- C** Switch model no. : Proximity K2H switch, lead wire 1m
- D** Switch quantity : One on open side

### How to order switch

**SW** - **K2H**

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

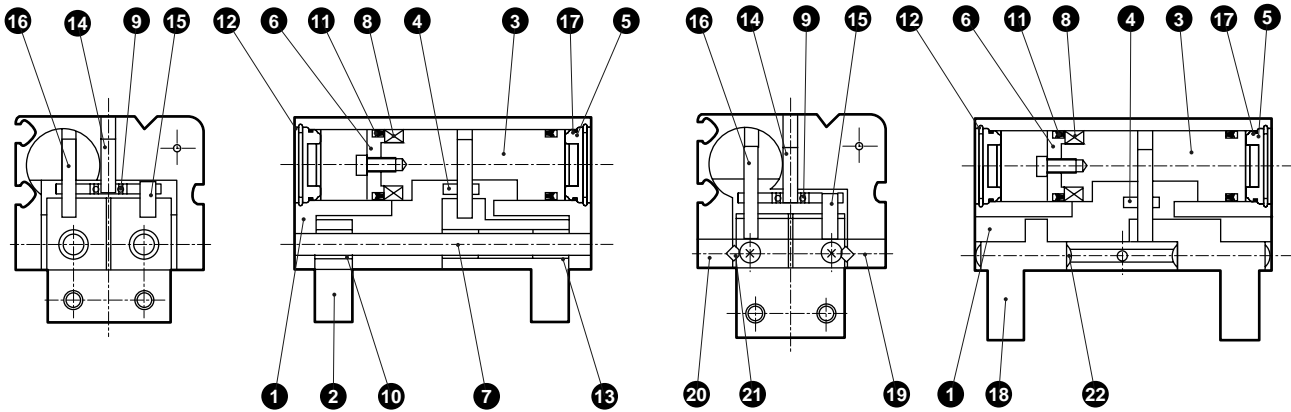
RRC
GRC
RV3*
NHS
HR
LN
FH100
HAP
BSA2
BHA/BHG
LHA
LHAG
HKP
HLA/HLB
HLAG/HLBG
HEP
HCP
HMF
HMFB
HFP
HLC
HGP
FH500
HLB
HDL
HMD
HJL
BHE
CKG
CK
CKA
CKS
CKF
CKJ
CKL2
CKL2*-HC
CKH2
CKLB2
NCK/SCK/FCK
FJ
FK
Ending

Thin parallel hand  
Hand

## Internal structure and parts list

● HLA-12CS to 20CS

● HLB-12CS to 20CS

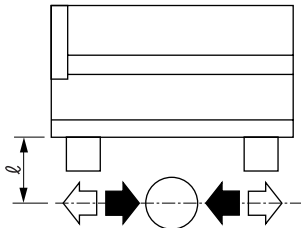


No.	Parts name	Material	Remarks	No.	Parts name	Material	Remarks
1	Body	Aluminum alloy		12	Snap ring	Stainless steel	
2	Master key	Aluminum alloy		13	Bush	Sintering oil impregnated alloy	
3	Piston	Stainless steel		14	Parallel pin	Steel	
4	Cam	Stainless steel		15	Needle roller A	Alloy steel	
5	Cylinder guard	Acetar resin		16	Needle roller B	Alloy steel	
6	Magnet holder	Aluminum alloy		17	Cylinder gasket	Nitrile rubber	
7	Guide rod	Alloy steel		18	Master key	Steel	
8	Magnet			19	Bearing guide A	Steel	
9	Small diameter sphere bearing	Alloy steel		20	Bearing guide B	Steel	
10	Bush	Sintering oil impregnated alloy		21	Cross roller	Alloy steel	
11	Piston packing seal	Nitrile rubber		22	Truss machine screw	Stainless steel	

## Gripping power performance data

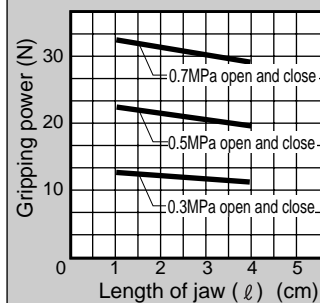
Gripping power that functions to open and closed directions with jaw length  $\ell$  of hand at supply pressure 0.3, 0.5 and 0.7 MPa is shown.

- Both open direction (⇐) closed direction (⇒)
- (shown with continuous line)

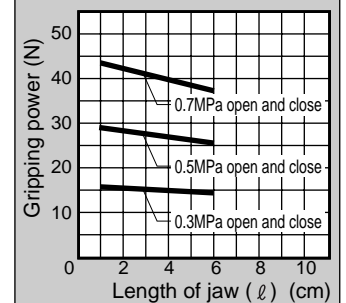


(Note) Grip performance data indicates the grip for one jaw. Since two jaws are used, double the grip in the graph when making a selection.

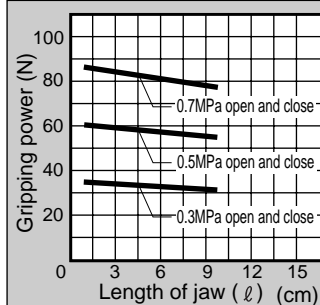
● HLA-12CS



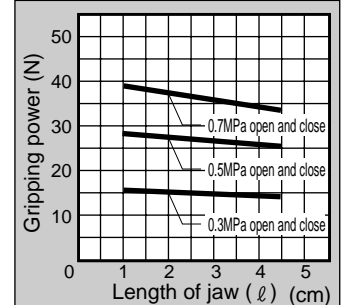
● HLA-15CS



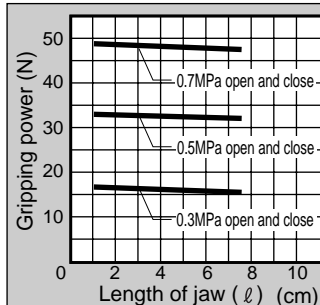
● HLA-20CS



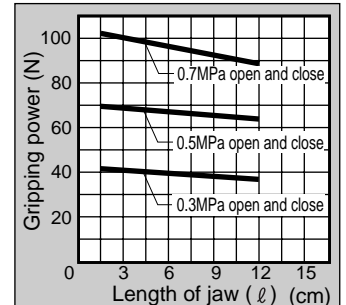
● HLB-12CS



● HLB-15CS



● HLB-20CS

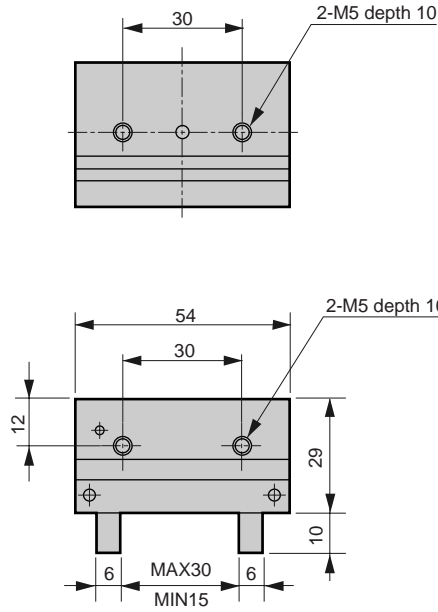




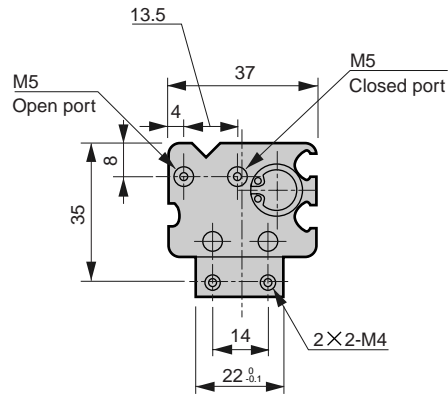
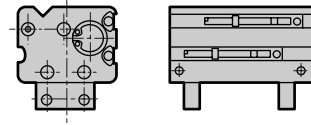
### Dimensions



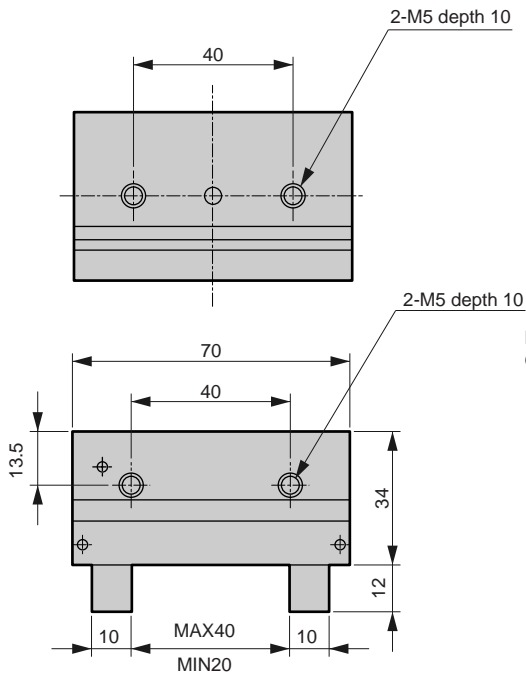
● HLA-12CS standard



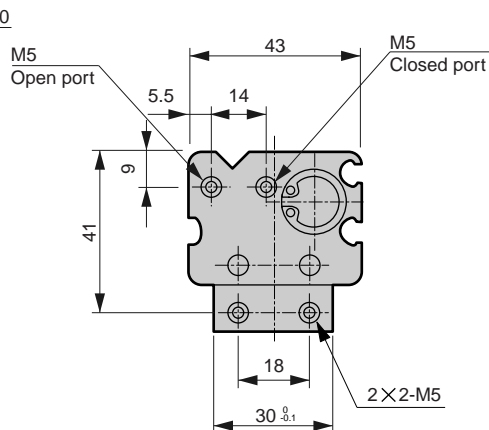
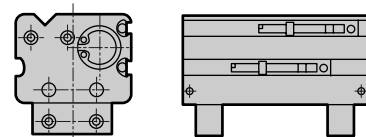
● With switch



● HLA-15CS standard



● 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

Thin parallel hand  
Hand

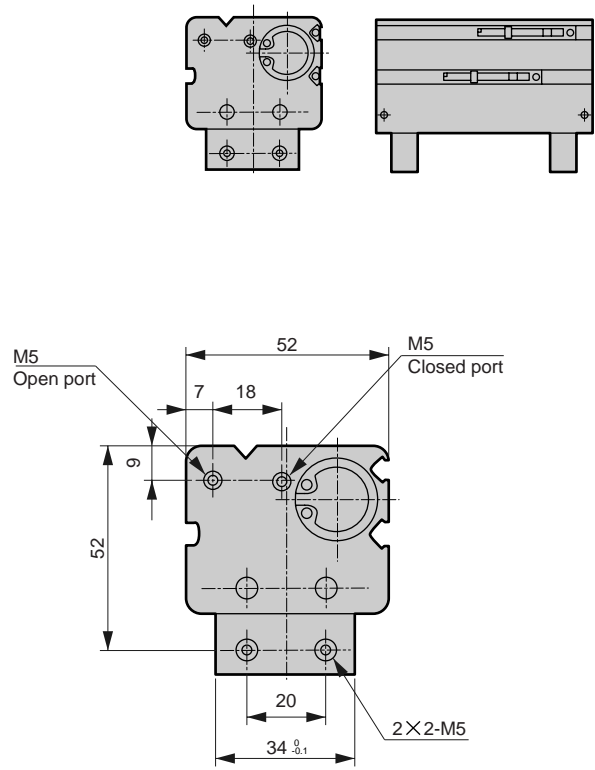
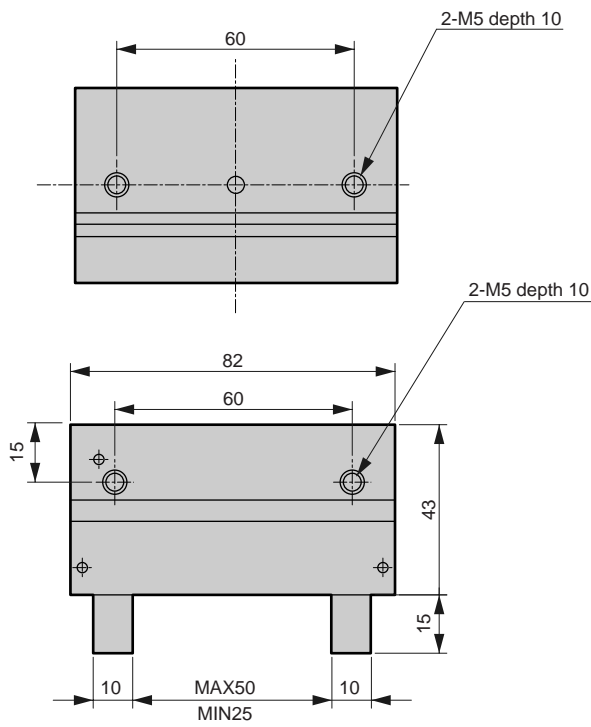
## Dimensions



● HLA-20CS standard

● With switch

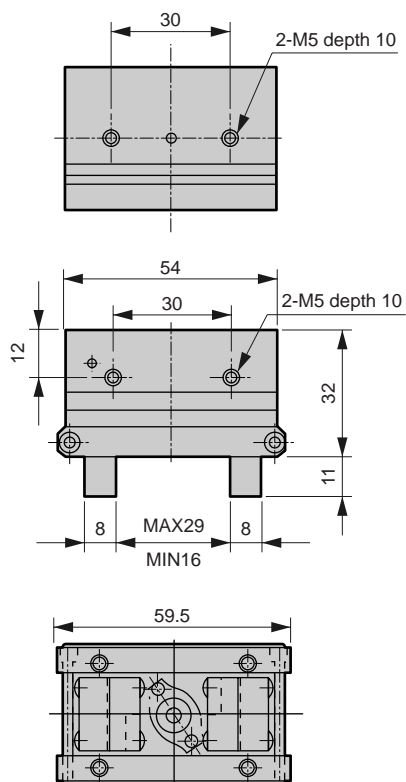
- RRC
- GRC
- RV3\*
- NHS
- HR
- LN
- FH100
- HAP
- BSA2
- BHA/  
BHG
- LHA
- LHAG
- HKP
- HLA/  
HLB
- HLAG/  
HLBG
- HEP
- HCP
- HMF
- HMFB
- HFP
- HLC
- HGP
- FH500
- HBL
- HDL
- HMD
- HJL
- BHE
- CKG
- CK
- CKA
- CKS
- CKF
- CKJ
- CKL2
- CKL2  
-\*HC
- CKH2
- CKLB2
- NCK/  
SCK/FCK
- FJ
- FK
- Ending



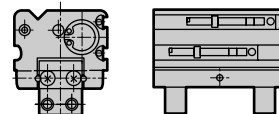
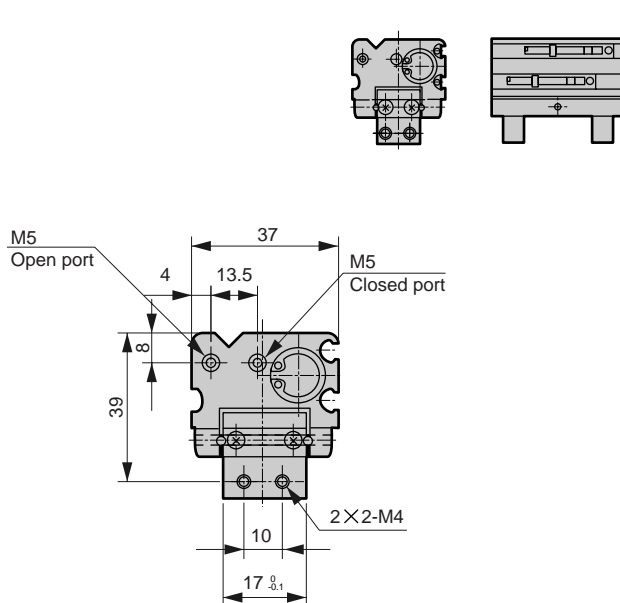
### Dimensions



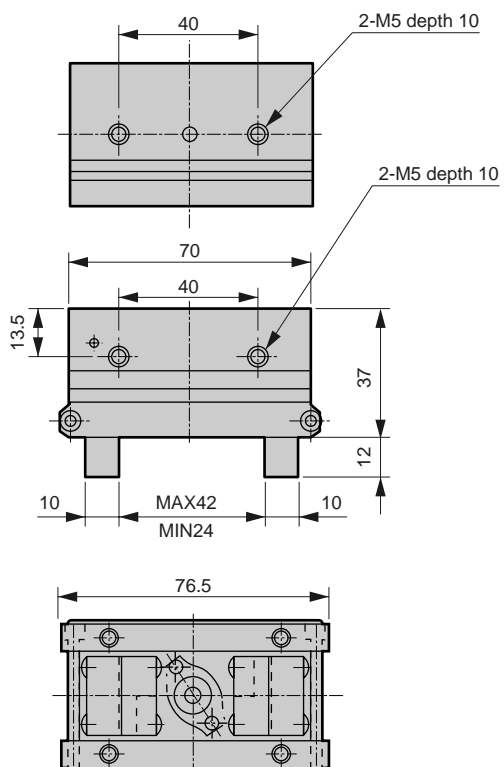
● HLB-12CS standard



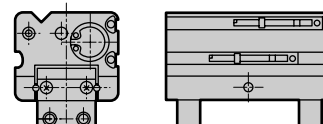
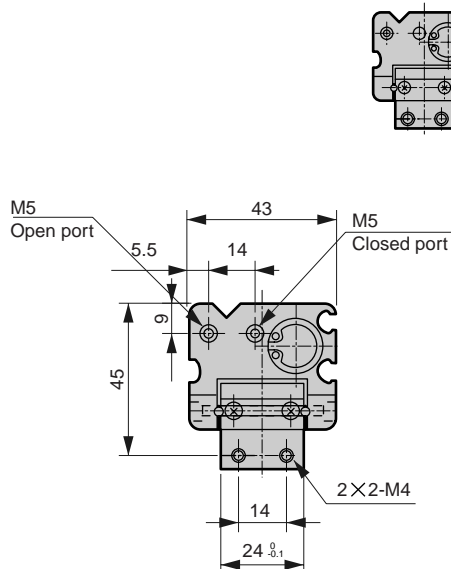
● With switch



● HLB-15CS standard



● With switch



RRR
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 parallel hand  
Hand

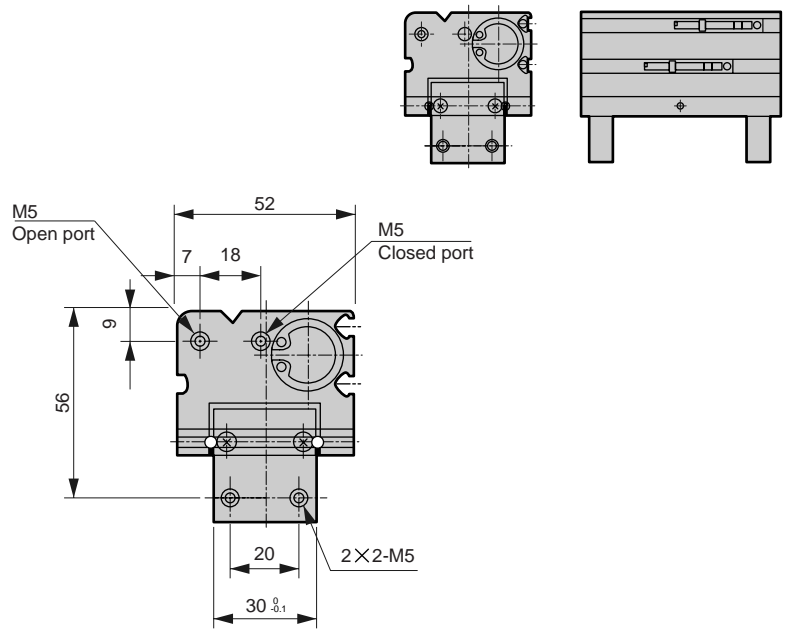
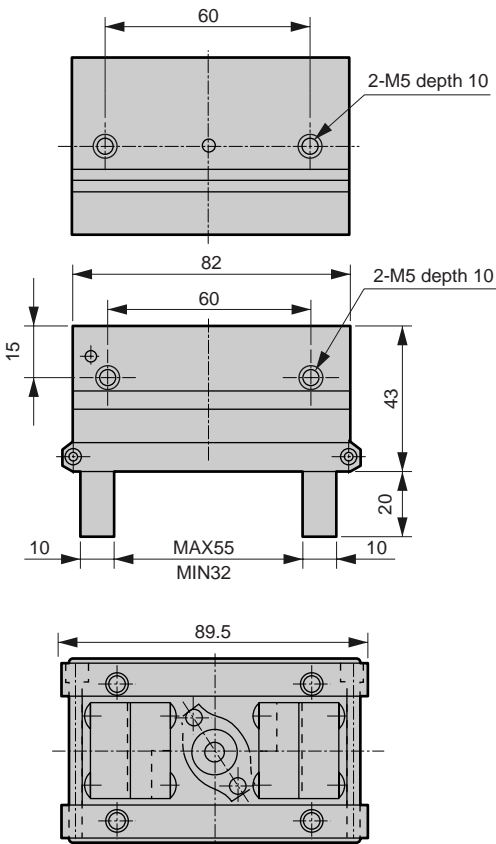
## Dimensions



● HLB-20CS standard

● 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 parallel hand with rubber cover (bush type/bearing type) Double acting

# HLAG/HLBG Series

- Operational stroke length: HLAG 15, 20, 25mm  
HLBG 13, 18, 23mm



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

## Specifications

Descriptions	HLAG-12CS	HLAG-15CS	HLAG-20CS	HLBG-12CS	HLBG-15CS	HLBG-20CS
Cylinder bore size mm	φ12	φ15	φ20	φ12	φ15	φ20
Actuation	Double acting					
Working fluid	Compressed air					
Max. working pressure MPa	0.7					
Min. working pressure MPa	0.3			0.2		
Ambient temperature °C	5 to 60					
Port size	M5					
Operational stroke length mm	15	20	25	13	18	23
Capacity of reciprocating cm <sup>3</sup>	1.69	3.53	7.85	1.47	3.18	7.22
Repeatability mm	±0.03			±0.01		
Product weight kg	0.175	0.305	0.545	0.24	0.42	0.75
Lubrication	Not required (when lubricating, use turbine oil Class 1 ISO VG32)					

## Switch specifications

Descriptions	Proximity 2 wire	Proximity 3 wire
	K2H	K3H
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, 50mA or less
Light	LED (ON lighting)	
Leakage current	1mA or less	10 μA or less

Descriptions	Reed 2 wire	
	K0H	K5H
Applications	Programmable controller, relay	Programmable controller, relay IC circuit (without indicator light), serial connection
Power voltage	-	
Load voltage/current	12/24 VDC, 5 to 50 mA 110 VAC, 7 to 20mA	5/12/24 VDC, 50mA or less 110 VAC, 20mA or less
Light	LED (ON lighting)	None
Leakage current	0mA	

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)

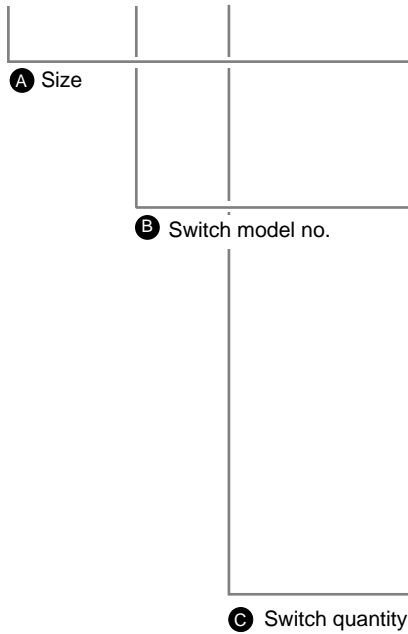
### How to order

Bush guide

**HLAG** - **12CS** - **K2H** - **R**

Bearing guide

**HLBG** - **12CS** - **K2H** - **R**



Symbol	Descriptions		
<b>A Size</b>			
	<b>12CS</b>		
	<b>15CS</b>		
	<b>20CS</b>		
<b>B Switch model no.</b>			
Axial lead wire	Contact	Indicator	Lead wire
<b>K0H*</b>	Reed	1 color indicator type	2-wire
<b>K5H*</b>		Without indicator light	
<b>K2H*</b>	Proximity	1 color indicator type	2-wire
<b>K3H*</b>			3-wire
<b>*Lead wire length</b>			
<b>Blank</b>	1m (standard)		
<b>3</b>	3m (option)		
<b>5</b>	5m (option)		
<b>C Switch quantity</b>			
<b>R</b>	One on open side		
<b>H</b>	One on closed side		
<b>D</b>	Two		

<Example of model number>

**HLAG-12CS-K2H-R**

- A** Size : 12CS
- B** Switch model no. : Proximity K2H, lead wire 1m
- C** Switch quantity : One on open side

### How to order switch

**SW** - **K2H**

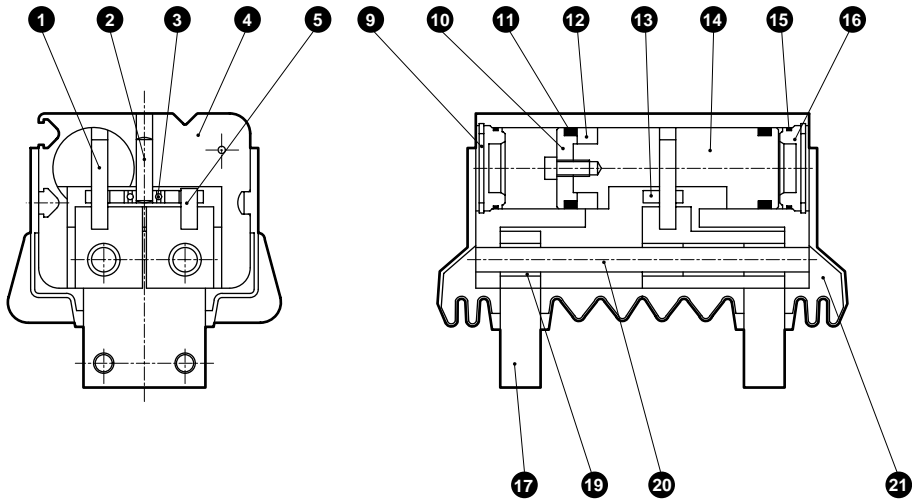
↓  
Switch model no.  
(Item above **B**)

RRC
GRC
RV3*
NHS
HR
LN
FH100
HAP
BSA2
BHA/ BHG
LHA
HLAG
HKP
HLA/ HLB
<b>HLAG/ HLBG</b>
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

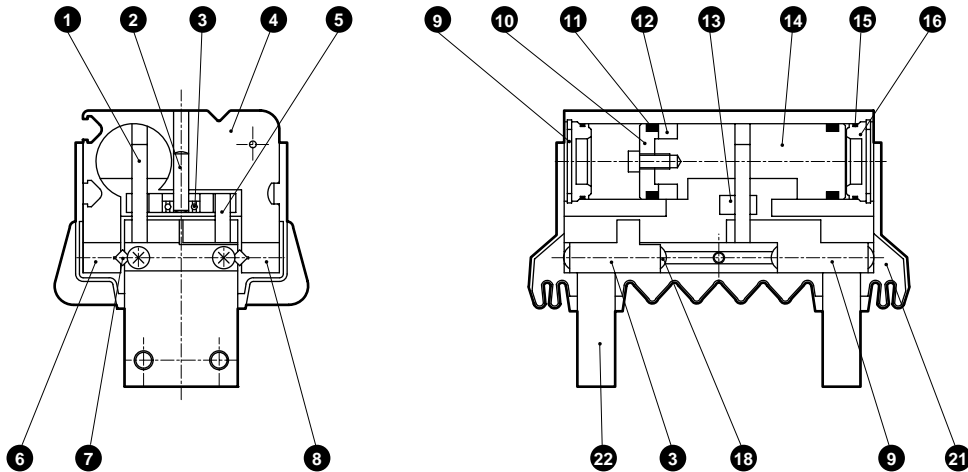
Thin parallel hand with rubber cover  
Hand

## Internal structure and parts list

### ● HLAG-12CS to 20CS



### ● HLBG-12CS to 20CS



## Parts list

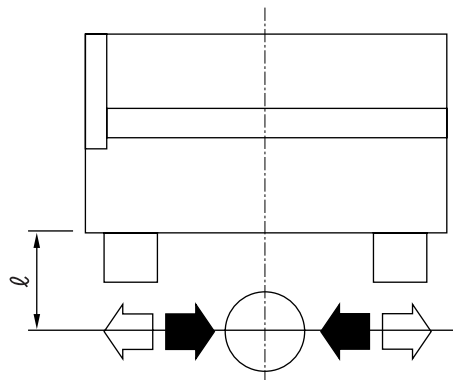
No.	Parts name	Material	Remarks	No.	Parts name	Material	Remarks
1	Needle roller B	High carbon chrome bearing steel		12	Magnet		
2	Parallel pin	Steel		13	Cam	Stainless steel	
3	Small diameter sphere bearing	Alloy steel		14	Piston	Stainless steel	
4	Body	Aluminum alloy		15	Cylinder gasket	Nitrile rubber	
5	Needle roller A	High carbon chrome bearing steel		16	Cylinder guard	Resin	
6	Bearing guide B	Steel		17	Master key	Aluminum alloy	
7	Cross roller	High carbon chrome bearing steel		18	Truss machine screw	Stainless steel	
8	Bearing guide A	Steel		19	Bush	Sintering oil impregnated alloy	
9	Snap ring	Stainless steel		20	Guide lot	High carbon chrome bearing steel	
10	Magnet holder	Aluminum alloy		21	Rubber cover	Nitrile rubber	
11	Piston packing seal	Nitrile rubber		22	Master key	Steel	

### Gripping power performance data

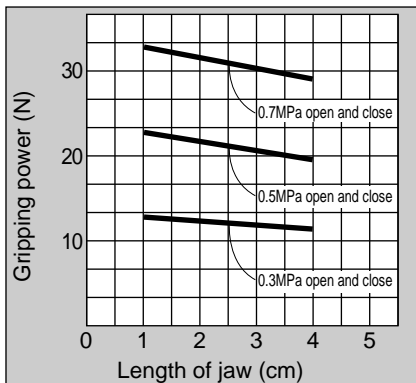
Gripping power that functions to open and closed directions with jaw length  $l$  of hand at supply pressure 0.3, 0.5 and 0.7 MPa is shown.

- Both open direction (◁) closed direction (▶)
- (Shown with continuous line)

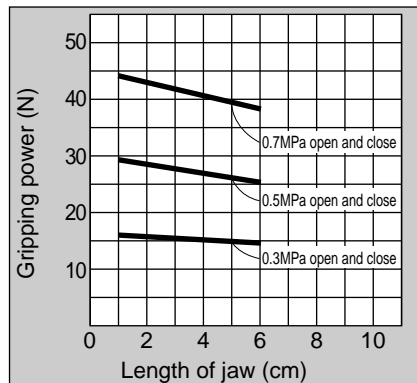
(Note) Grip performance data indicates the grip for one jaw. Since two jaws are used, double the grip in the graph when making a selection.



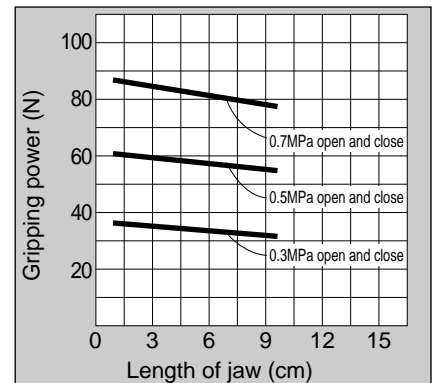
#### ● HLAG-12CS



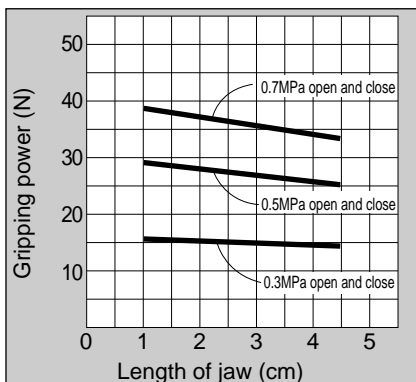
#### ● HLAG-15CS



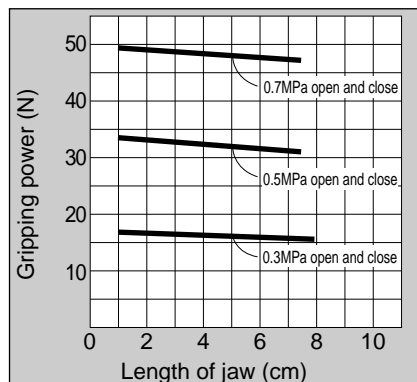
#### ● HLAG-20CS



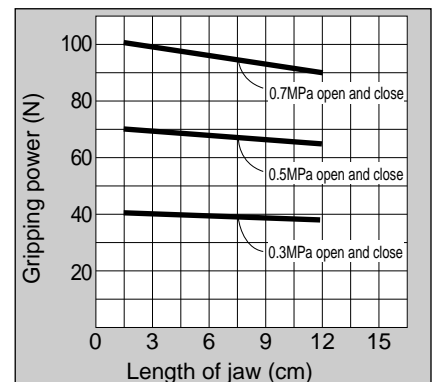
#### ● HLBG-12CS



#### ● HLBG-15CS



#### ● HLBG-20CS



RRC
GRC
RV3*
NHS
HR
LN
FH100
HAP
BSA2
BHA/BHG
LHA
LHAG
HKP
HLA/HLB
<b>HLAG/HLBG</b>
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 parallel hand with rubber cover  
Hand



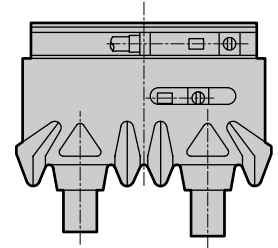
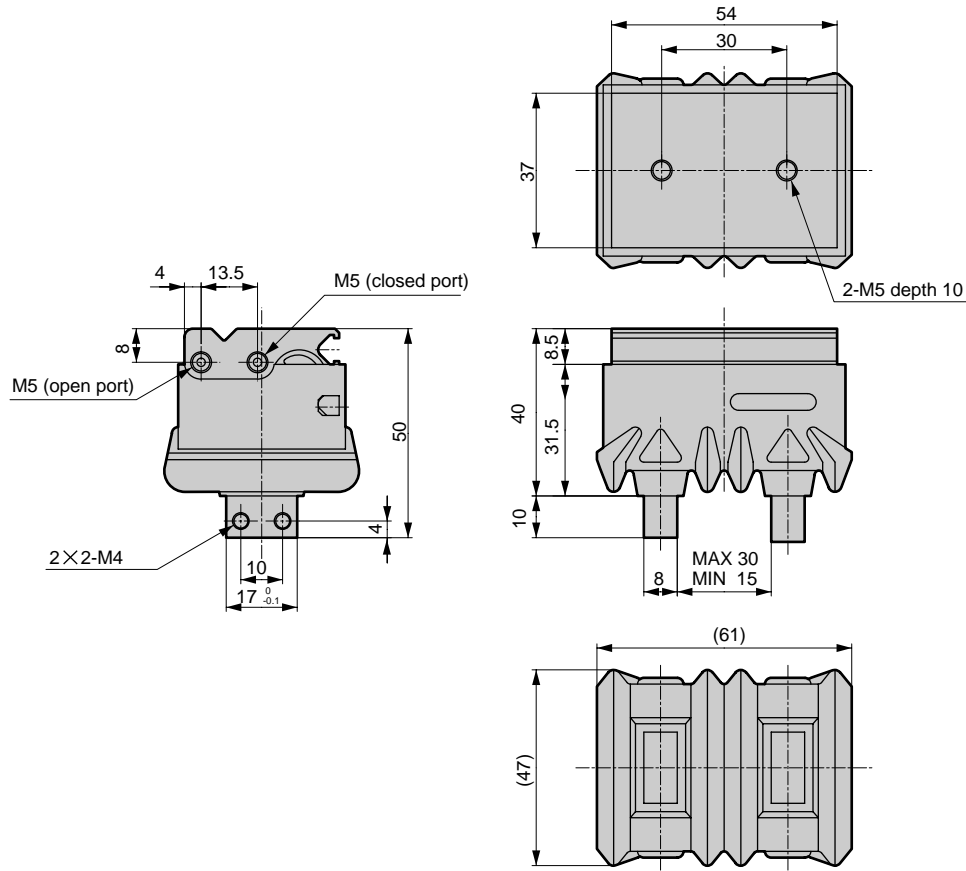
## Dimensions



RRC
GRC
RV3*
NHS
HR
LN
FH100
HAP
BSA2
BHA/BHG
LHA
LHAG
HKP
HLA/HLB
<b>HLAG/HLBG</b>
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

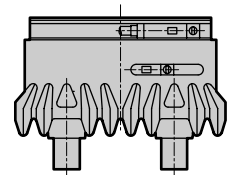
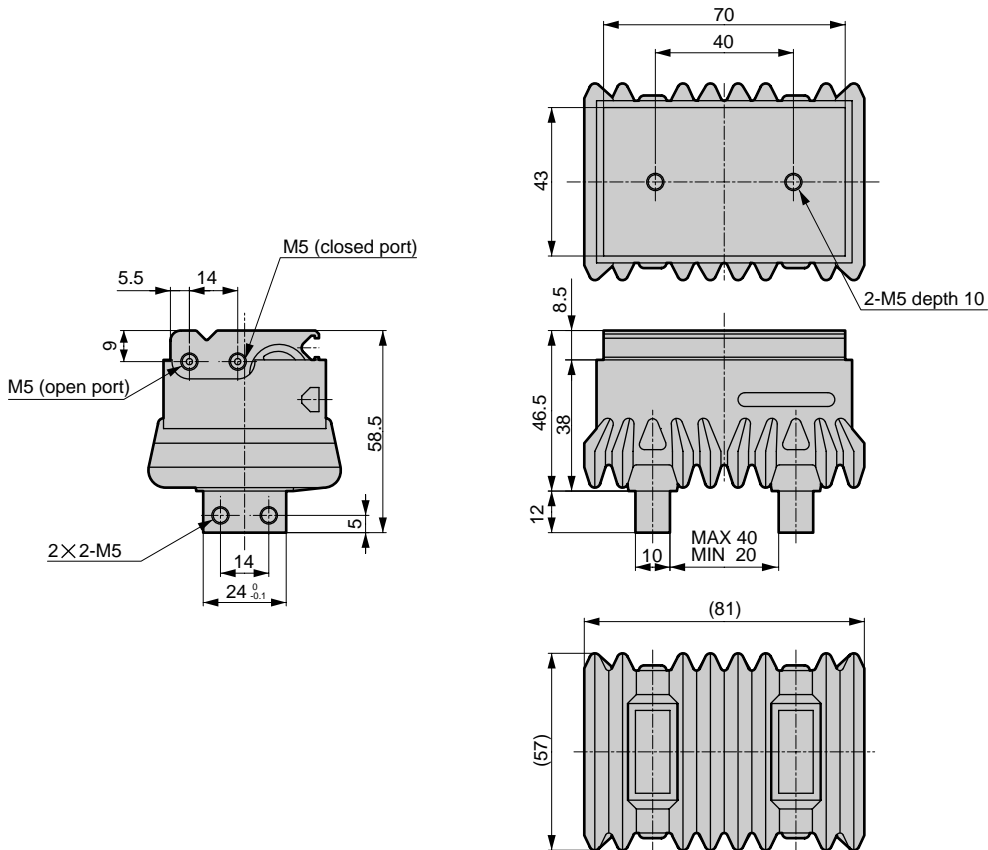
### ● HLAG-12CS standard

### ● With switch



### ● HLAG-15CS standard

### ● With switch

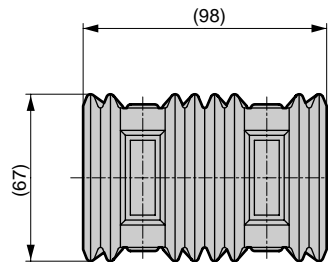
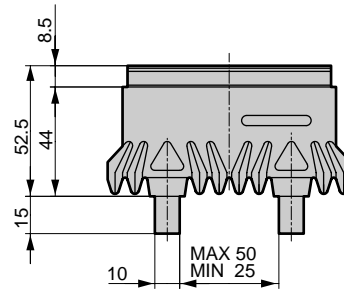
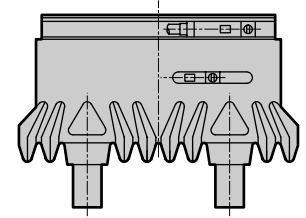
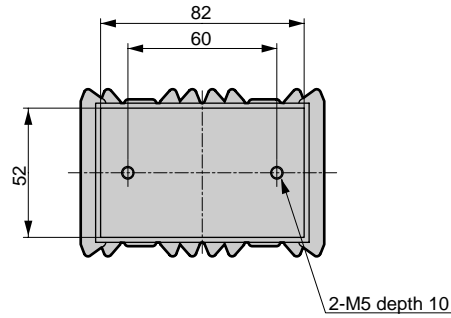
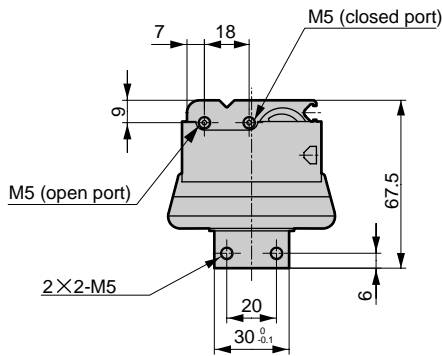


### Dimensions



● HLAG-20CS standard

● With switch



RRC
GRC
RV3*
NHS
HR
LN
FH100
HAP
BSA2
BHA/BHG
LHA
LHAG
HKP
HLA/HLB
<b>HLAG/HLBG</b>
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

Thin parallel hand with rubber cover  
Hand

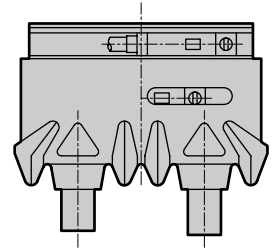
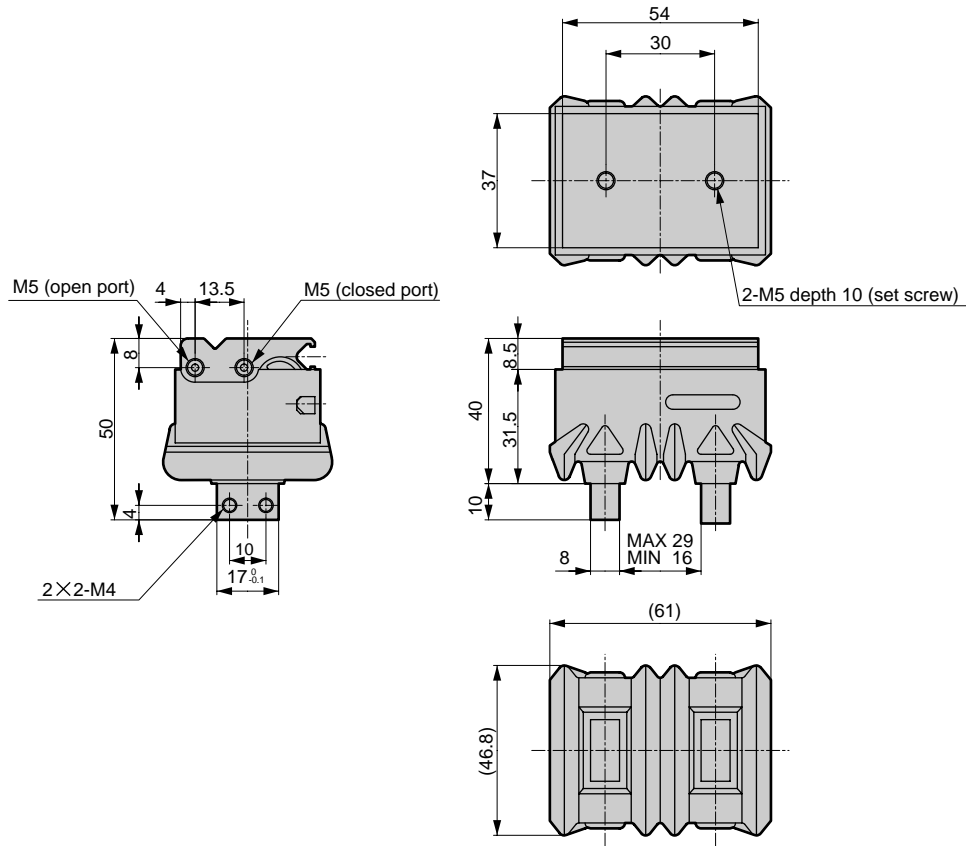
## Dimensions



RRC
GRC
RV3*
NHS
HR
LN
FH100
HAP
BSA2
BHA/BHG
LHA
LHAG
HKP
HLA/HLB
<b>HLAG/HLBG</b>
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

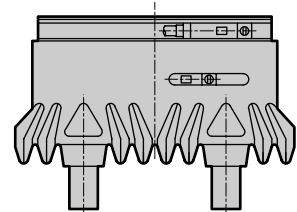
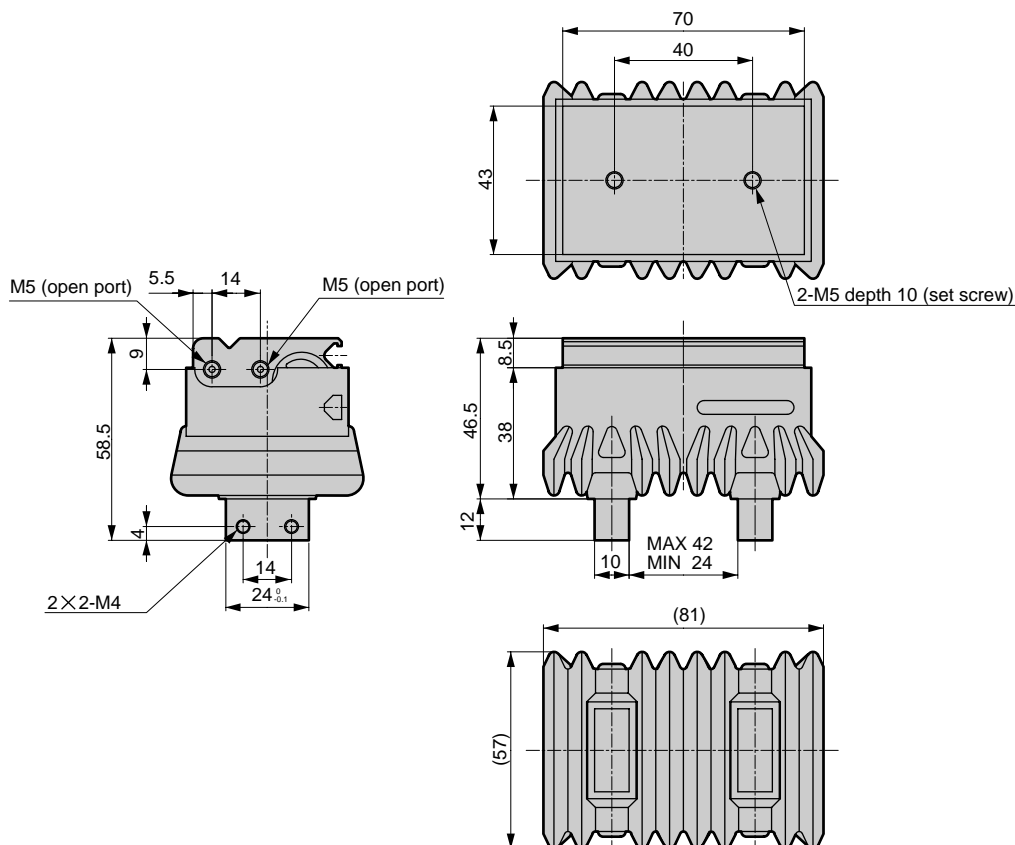
### ● HLBG-12CS standard

### ● With switch



### ● HLBG-15CS standard

### ● With switch

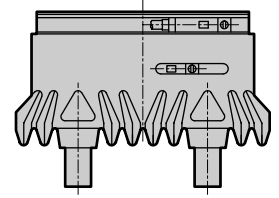
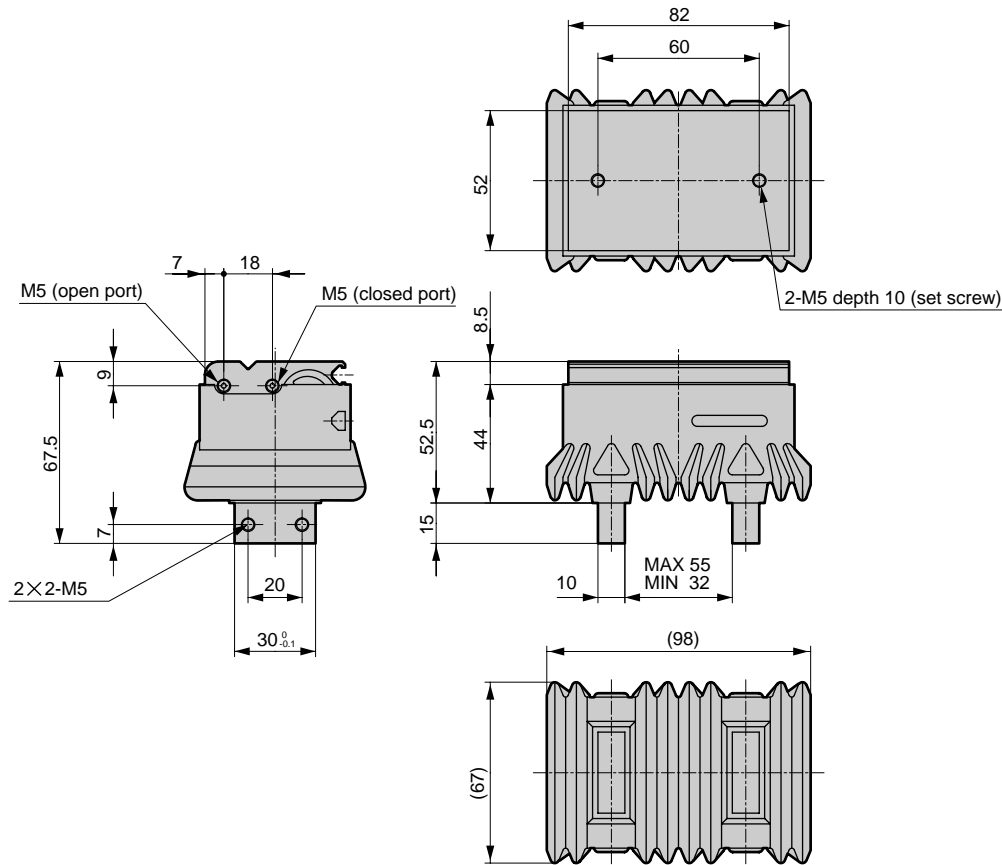


### Dimensions



● HLBG-20CS standard

● With switch



RRC
GRC
RV3*
NHS
HR
LN
FH100
HAP
BSA2
BHA/ BHG
LHA
LHAG
HKP
HLA/ HLB
<b>HLAG/ HLBG</b>
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 parallel hand with rubber cover  
Hand



Bearing parallel hand Double acting/single acting

# HEP Series

● Operational stroke length: 24, 36, 40, 50, 60mm



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

## Specifications

Descriptions	HEP				
Size	3.5CS	4CS	5CS	6CS	7CS
Cylinder bore size mm	$\phi 32$	$\phi 50$	$\phi 63$	$\phi 80$	$\phi 100$
Actuation	Double acting/single acting				
Working fluid	Compressed air				
Max. working pressure MPa	0.7		0.5		
Min. working pressure MPa	0.3				
Ambient temperature °C	5 to 60				
Port size	M5	Rc1/8		Rc1/4	
Operational stroke length mm	24	36	40	50	60
Rod diameter mm	$\phi 14$	$\phi 20$	$\phi 24$	$\phi 28$	$\phi 30$
Capacity of reciprocating cm <sup>3</sup>	17.5	65.0	115.6	236	450
Repeatability mm	$\pm 0.03$				
Product weight kg	1.2	3.2	4.7	7.8	11.7
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	10 $\mu$ A or less
Maximum shock resistance	980m/s <sup>2</sup>	
Lead wire	Standard 1m (oil resistant vinyl cabtire cable 2-conductor 0.2mm <sup>2</sup> )	Standard 1m (oil resistant vinyl cabtire cable 2-conductor 0.2mm <sup>2</sup> )

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

**HEP - 3.5CS - C**

With switch

**HEP - 3.5CS - C - T2H - R**

**A** Size

**B** Option  
Note 1  
Note 2

**C** Switch model no.

**D** Switch quantity

Symbol	Descriptions			
<b>A Size</b>				
3.5CS				
4CS				
5CS				
6CS				
7CS				
<b>B Option</b>				
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)			
<b>C Switch model no.</b>				
Axial lead wire	Radial lead wire	Contact	Indicator	Lead wire
T2H*	T2V*	Proximity	1 color indicator type	2-wire
T3H*	T3V*			3-wire
<b>*Lead wire length</b>				
Blank	1m (standard)			
3	3m (option)			
5	5m (option)			
<b>D Switch quantity</b>				
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. These are attached at shipment. (When ordered as an option, two are included)

Note 2: 6CS and 7CS have no small jaw.

<Example of model number>

### HEP-3.5CS-O-T2H-R

Model: Bearing parallel hand

- A** Size : 3.5CS
- 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

**HEP - T2H**

Switch model no.  
(Item above C)

· Switch body

**SW - T2H**

Switch model no.  
(Item above C)

· Mounting bracket

**HEP - T**

● For switch T\*V\*

· Switch body + mounting bracket

**HEP - T2V - \***

Switch model no.  
(Item above C)

· Switch body

**SW - T2V**

Switch model no.  
(Item above C)

· Mounting bracket

**HEP - TV - \***

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

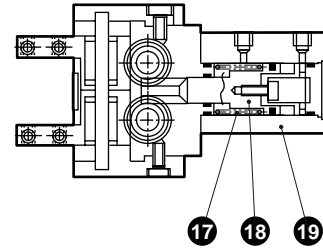
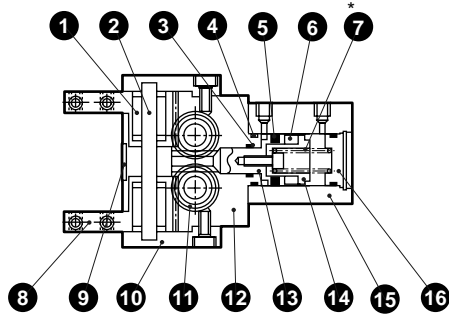
RRC
GRC
RV3*
NHS
HR
LN
FH100
HAP
BSA2
BHA/ BHG
LHA
LHAG
HKP
HLA/ HLB
HLAG/ HLBG
<b>HEP</b>
HCP
HMF
HMFB
HFP
HLC
HGP
FH500
HBL
HDL
HMD
HJL
BHE
CKG
CK
CKA
CKS
CKF
CKJ
CKL2
CKL2 *-HC
CKH2
CKLB2
NCK/ SCK/FCK
FJ
FK
Ending

Bearing parallel hand  
Hand

## Internal structure and parts list

Standard (double acting)/O (normally open) type

C (normally closed) type



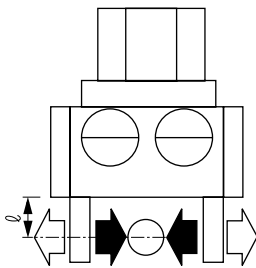
\* Spring of 7 is not contained in standard (double acting) type.

No.	Parts name	Material	Remarks	No.	Parts name	Material	Remarks
1	Bearing	Steel		11	Pinion gear	Steel	
2	Guide rod	Alloy steel		12	Body	Aluminum alloy	
3	Rod packing seal	Nitrile rubber		13	Piston A	Stainless steel	
4	Cylinder gasket	Nitrile rubber		14	Piston B	Stainless steel (4 to 7CS) Acetar resin (3.5CS)	
5	Piston packing seal	Nitrile rubber		15	Cylinder	Aluminum alloy	
6	Magnet			16	Cylinder guard	Aluminum alloy	
7	Spring	Steel	Only O type	17	Spring	Stainless steel	
8	Master key	Steel		18	Piston	Stainless steel	
9	Center guard	Steel		19	Cylinder	Aluminum alloy	
10	Side cover	Aluminum alloy					

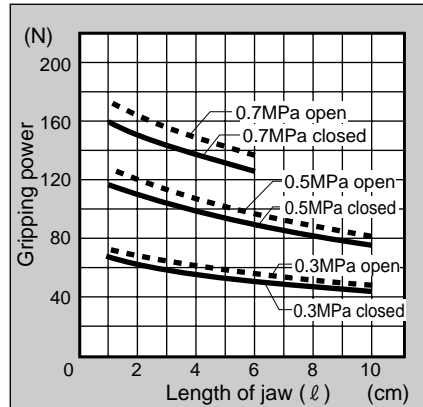
## Gripping power performance data

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

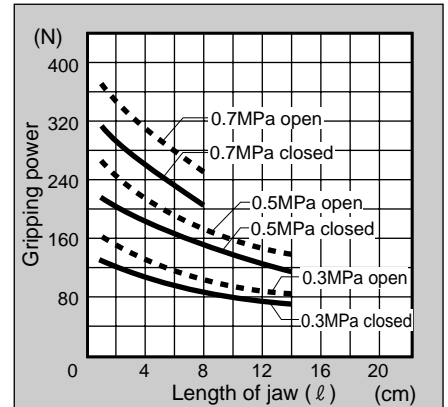
- Open direction (↔) - - - - (shown with broken line)
- Closed direction (→) ——— (shown with continuous line)



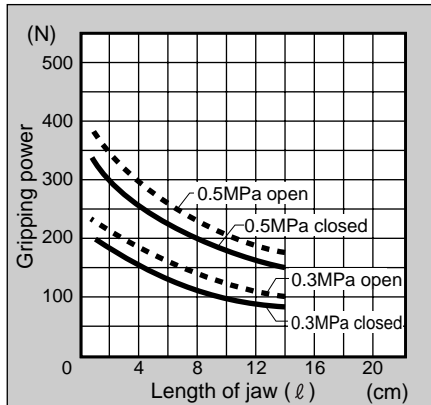
● HEP-3.5CS



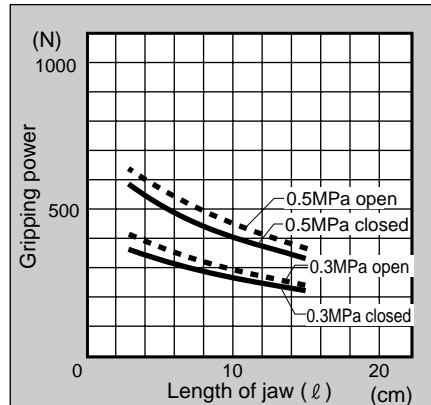
● HEP-4CS



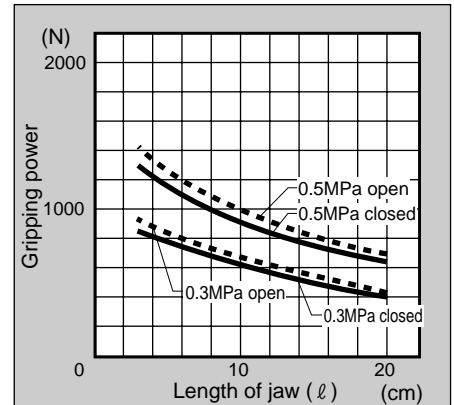
● HEP-5CS



● HEP-6CS



● HEP-7CS



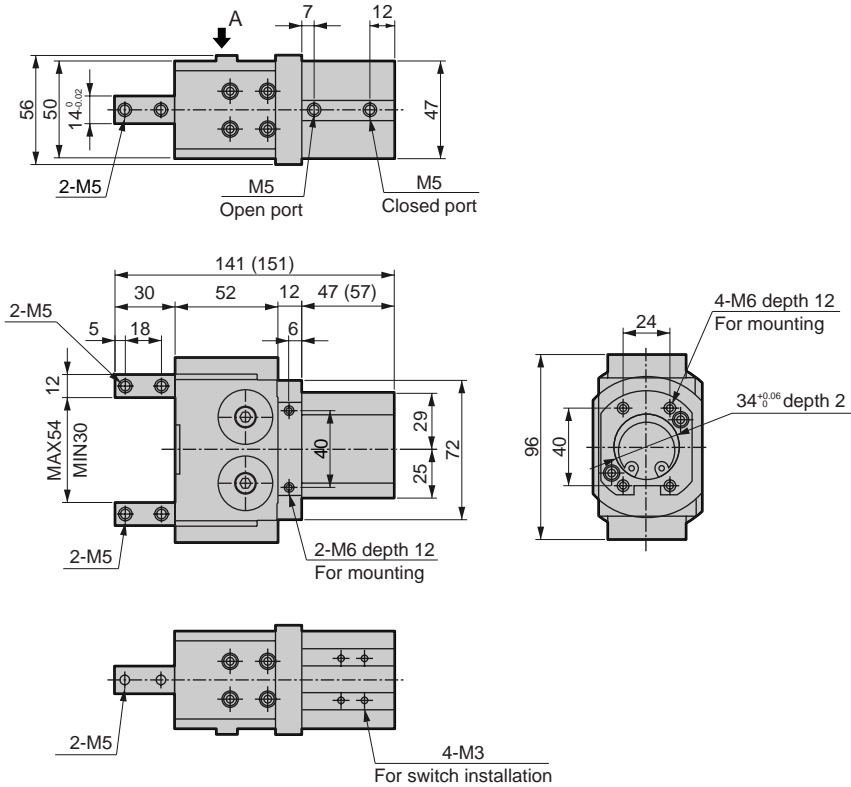
(Note) O type gripping power decreases approximate 20 to 30 % comparing to double acting type to closed direction.  
C type gripping power decreases approximate 10 to 20 % comparing to double acting type to open direction.  
Grip performance data indicates the grip for one jaw. Since two jaws are used,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

### Dimensions

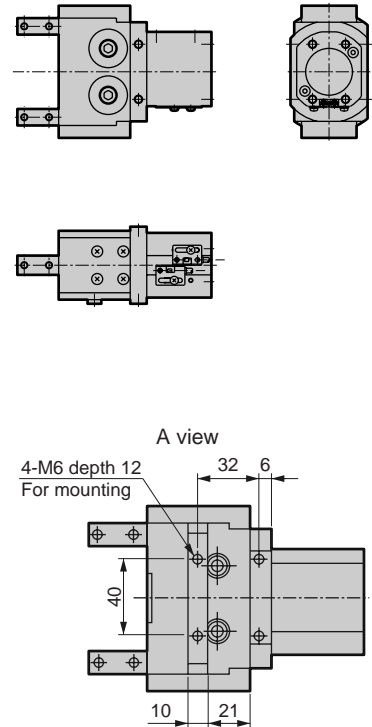


● HEP-3.5CS standard/O/C

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

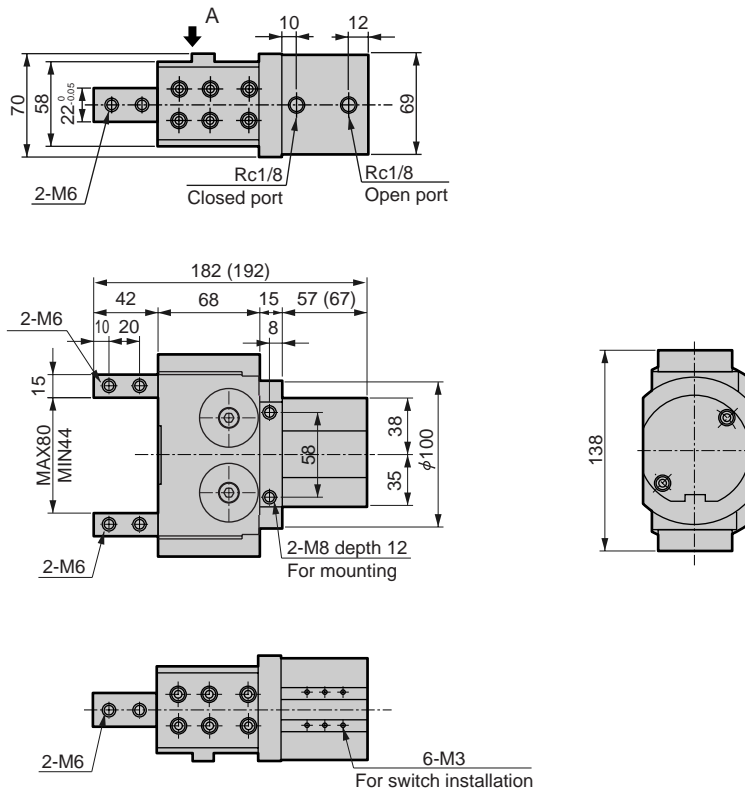


● With switch

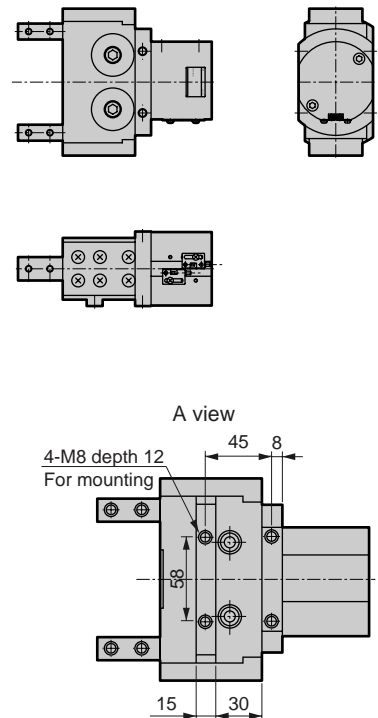


● HEP-4CS standard/O/C

● 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
<b>HEP</b>
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

Bearing parallel hand  
Hand



## Dimensions

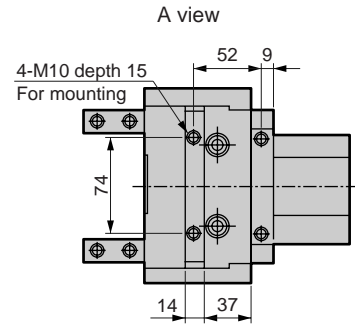
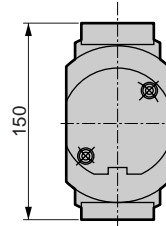
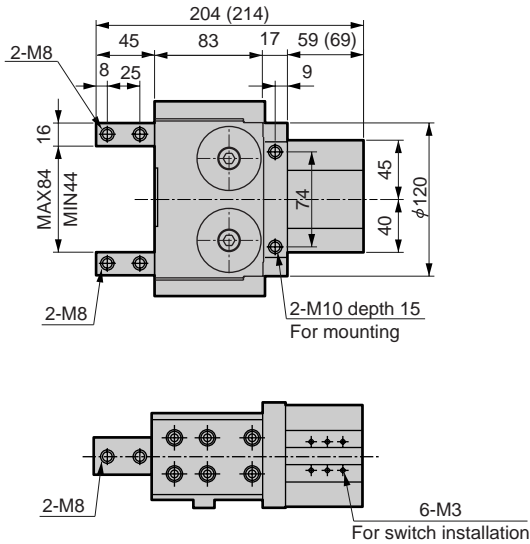
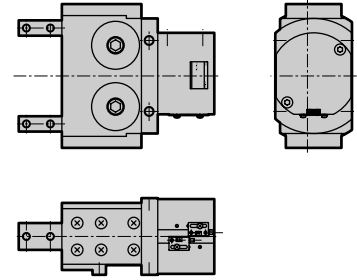
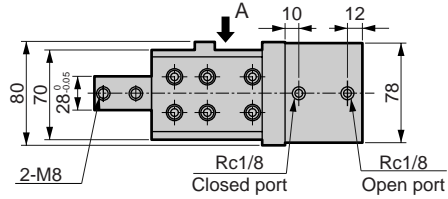


RRC
GRC
RV3*
NHS
HR
LN
FH100
HAP
BSA2
BHA/BHG
LHA
LHAG
HKP
HLA/HLB
HLAG/HLBG
<b>HEP</b>
HCP
HMF
HMFB
HFP
HLC
HGP
FH500
HBL
HDL
HMD
HJL
BHE
CKG
CK
CKA
CKS
CKF
CKJ
CKL2
CKL2 -*.HC
CKH2
CKLB2
NCK/ SCK/FCK
FJ
FK
Ending

● HEP-5CS standard/O/C

● With switch

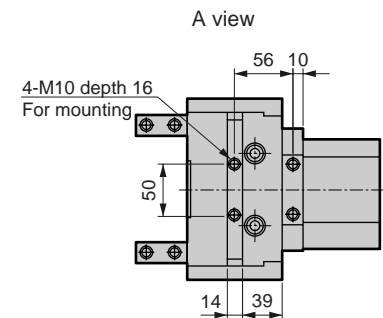
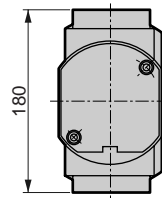
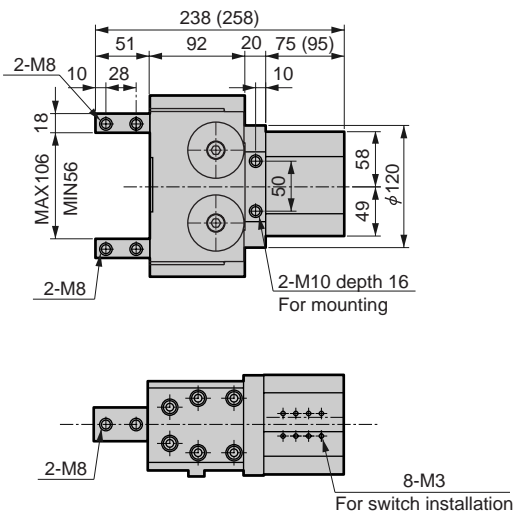
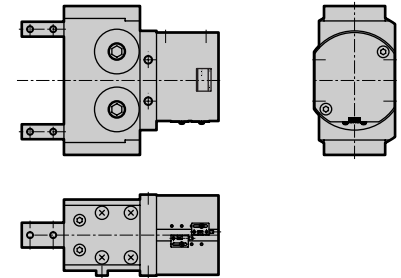
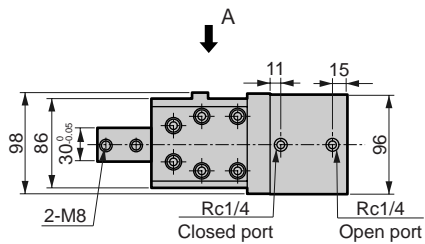
● Dimension in ( ) for C (normally closed) specifications.



● HEP-6CS standard/O/C

● With switch

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

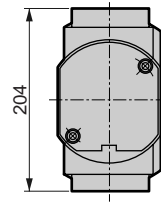
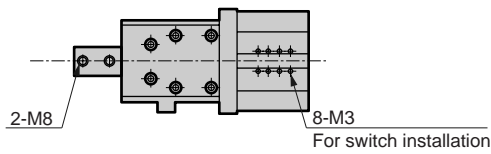
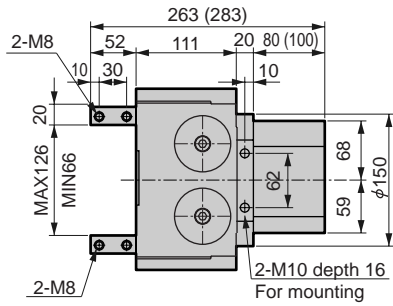
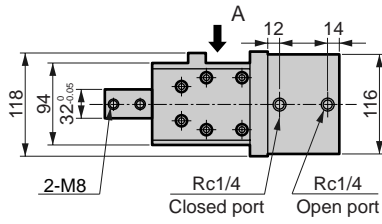


### Dimensions

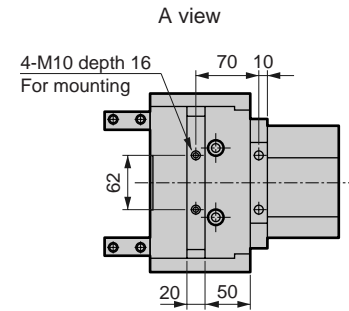
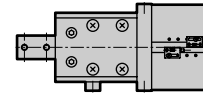
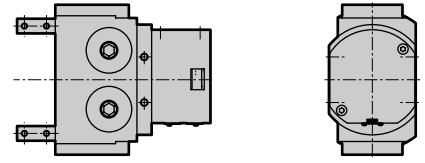


● HEP-7CS standard/O/C

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

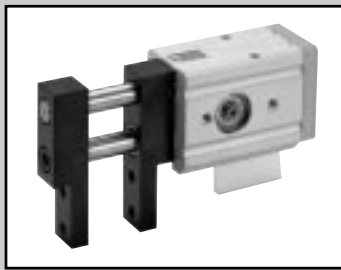


● With switch



RRC
GRC
RV3*
NHS
HR
LN
FH100
HAP
BSA2
BHA/ BHG
LHA
LHAG
HKP
HLA/ HLB
HLAG/ HLBG
<b>HEP</b>
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

Bearing parallel hand  
Hand



Lateral parallel hand Double acting

# HCP Series

- Operational stroke length: 20, 30, 40mm



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

## Specifications

Descriptions	HCP		
Size	2CS	3CS	4CS
Cylinder bore size mm	φ12	φ20	φ32
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	M5		Rc1/8
Operational stroke length mm	20	30	40
Rod diameter mm	φ10	φ12	φ16
Capacity of reciprocating cm <sup>3</sup>	2.3	9.4	32.1
Repeatability mm	±0.05		
Product weight kg	0.52	0.98	1.90
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	10 μA or less
Maximum shock resistance	980m/s <sub>2</sub>	
Lead wire	Standard 1m (oil resistant vinyl cabtire cable 2-conductor 0.2mm <sup>2</sup> )	Standard 1m (oil resistant vinyl cabtire cable 2-conductor 0.2mm <sup>2</sup> )

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

**HCP - 2CS - Y1**

With switch

**HCP - 2CS - Y1 - T2H - R**

**A** Size

**B** Option  
Note 1, Note 2

**C** Switch model no.

**D** Switch quantity

Symbol	Descriptions			
<b>A Size</b>				
2CS				
3CS				
4CS				
<b>B Option</b>				
Blank	Standard (double acting)			
Y1	With small jaw material (S50C)			
Y2	With small jaw material (MC nylon)			
<b>C Switch model no.</b>				
Axial lead wire	Radial lead wire	Contact	Indicator	Lead wire
T2H*	T2V*	Proximity	1 color indicator type	2-wire
T3H*	T3V*			
<b>*Lead wire length</b>				
Blank	1m (standard)			
3	3m (option)			
5	5m (option)			
<b>D Switch quantity</b>				
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>

**HCP-2CS-Y1-T2H-R**

Model: Lateral parallel hand

- A** Size : 2CS
- B** Option : With small jaw, material S50C
- 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

**HCP - T2H**

Switch model no.  
(Item above ©)

· Switch body

**SW - T2H**

Switch model no.  
(Item above ©)

· Mounting bracket

**HCP - T**

● For switch T\*V\*

· Switch body + mounting bracket

**HCP - T2V - \***

Switch model no.  
(Item above ©)

· Switch body

**SW - T2V**

Switch model no.  
(Item above ©)

· Mounting bracket

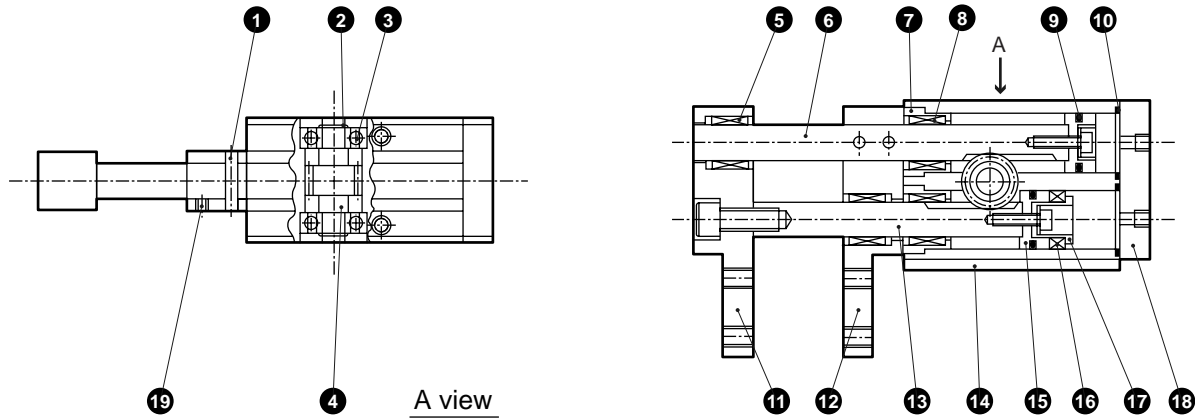
**HCP - TV - \***

(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

Lateral parallel hand  
Hand

## Internal structure and parts list

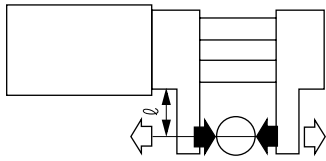


No.	Parts name	Material	Remarks	No.	Parts name	Material	Remarks
1	Spring pin	Steel		10	Cylinder gasket	Nitrile rubber	
2	Grip snap ring	Steel		11	Master key B	Steel	
3	Bearing	Steel		12	Master key A	Steel	
4	Pinion gear	Stainless steel		13	Piston rod B	Stainless steel	
5	Needle bearing	Steel		14	Body	Aluminum alloy	
6	Piston rod A	Stainless steel		15	Piston A	Aluminum alloy	
7	Rod cover	Aluminum alloy		16	Magnet		
8	Needle bearing	Steel		17	Piston B	Acetar resin	
9	Piston packing seal	Nitrile rubber		18	Head cover	Aluminum alloy	
				19	Hexagon socket head set screw	Alloy steel	

## Gripping power performance data

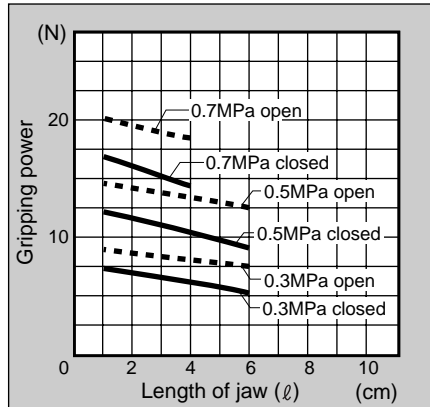
Gripping power that functions to open and closed directions with jaw length of  $\ell$  hand at supply pressure 0.3, 0.5 and 0.7 MPa is shown.

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

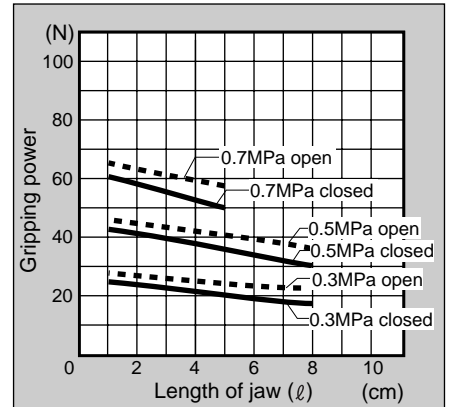


(Note) Grip performance data indicates the grip for one jaw. Since two jaws are used, double the grip in the graph when making a selection.

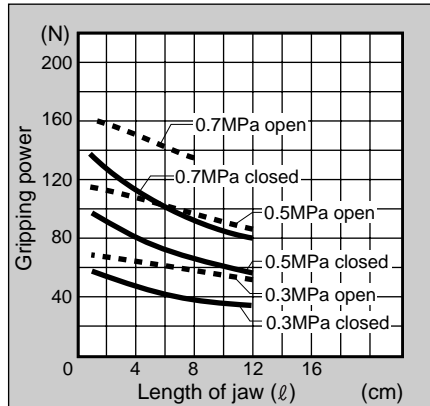
### ● HCP-2CS



### ● HCP-3CS



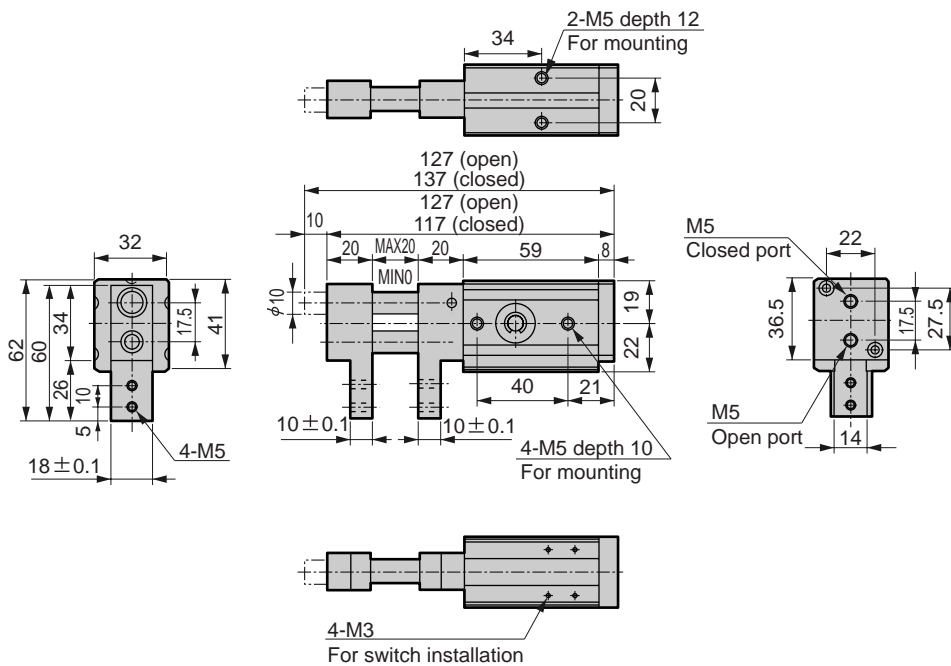
### ● HCP-4CS



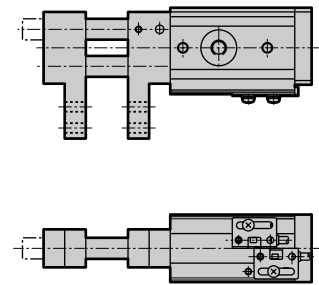
### Dimensions



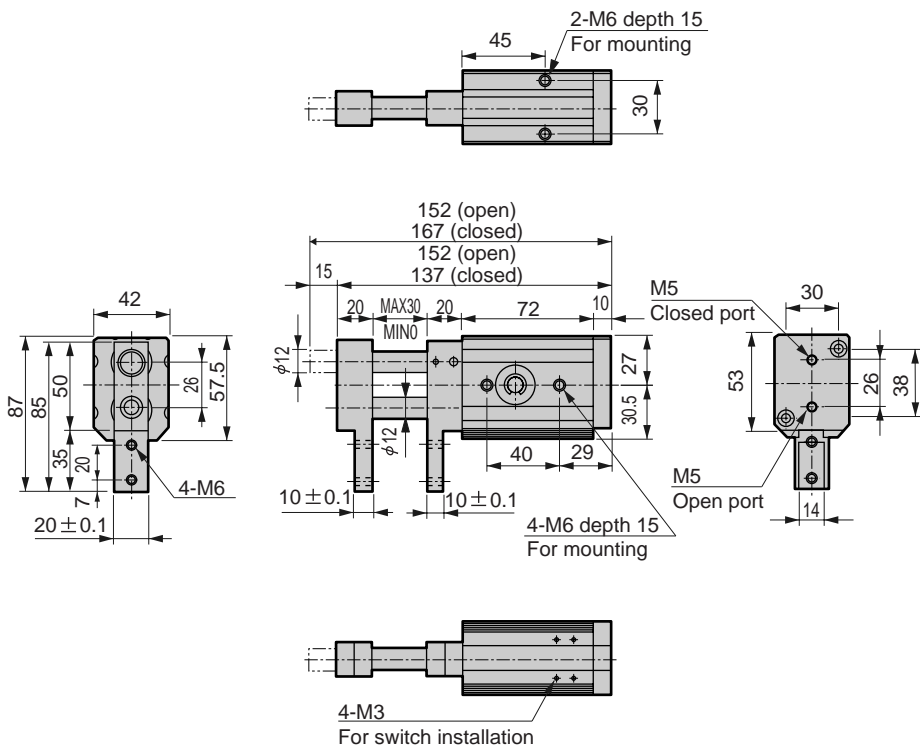
● HCP-2CS standard



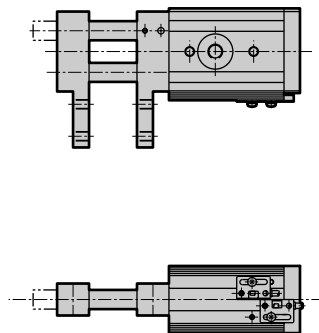
● With switch



● HCP-3CS standard



● With switch



RRC
GRC
RV3*
NHS
HR
LN
FH100
HAP
BSA2
BHA/BHG
LHA
LHAG
HKP
HLA/HLB
HLAG/HLBG
HEP
<b>HCP</b>
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

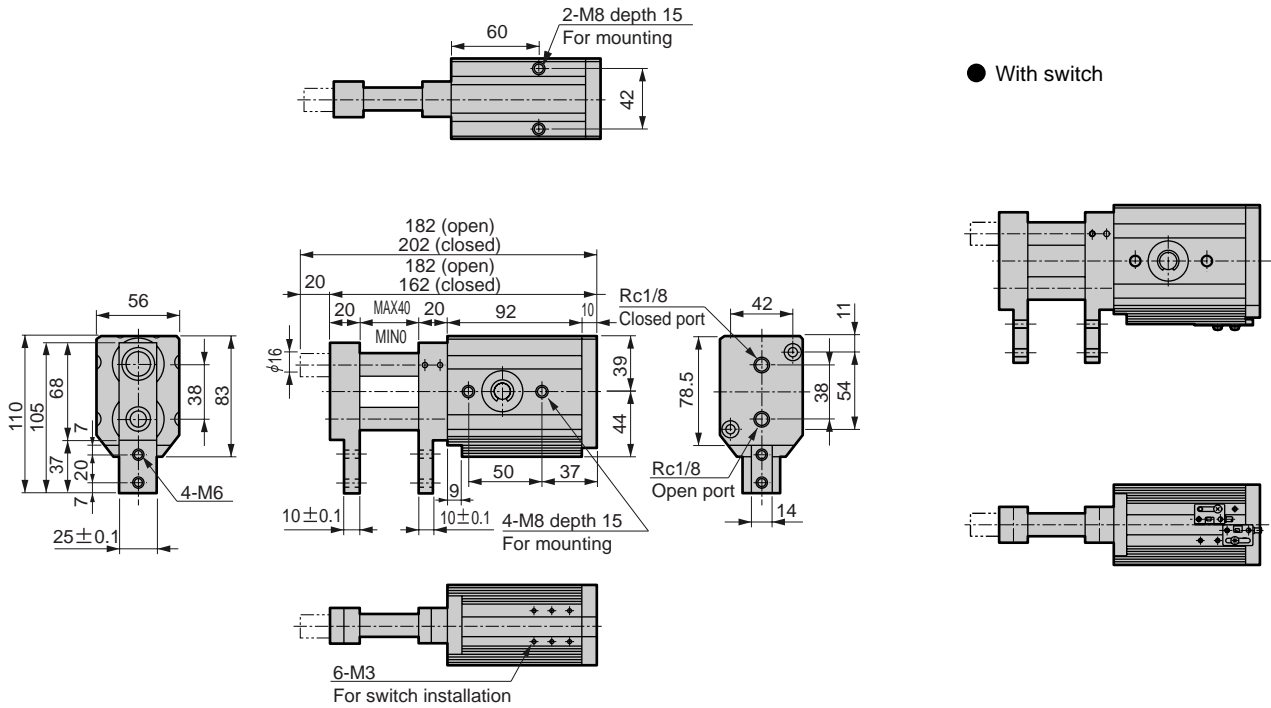
Lateral parallel hand  
Hand



## Dimensions

HCP-4CS standard

- 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



● With switch



Compact wide parallel hand (standard, long stroke)

# HMF Series

- Operational stroke length: Standard 30, 40, 50, 70, 100mm  
Long stroke 60, 80, 100, 120, 160, 200mm



RRC  
GRC  
RV3\*  
NHS  
HR  
LN  
FH100  
HAP  
BSA2  
BHA/  
BHG  
LHA  
LHAG  
HKP  
HLA/  
HLB  
HLAG/  
HLBG  
HEP  
HCP  
HMF  
HMF B  
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

## Specifications

Descriptions	HMF-12CS	HMF-16CS			HMF-20CS			HMF-25CS			HMF-32CS			HMF-40CS		
		Standard	L1	L2	Standard	L1	L2	Standard	L1	L2	Standard	L1	L2	Standard	L1	L2
Cylinder bore size mm	φ12×2	φ16×2			φ20×2			φ25×2			φ32×2			φ40×2		
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						
Operational stroke length mm	20	30	60	80	40	80	100	50	100	120	70	120	160	100	160	200
Rod diameter mm	φ6	φ8			φ10			φ12			φ16			φ20		
Capacity of reciprocating cm <sup>3</sup>	3.4	9.1	18.1	24.1	18.8	37.6	47.0	37.7	75.4	90.5	84.4	145	193	226	301	377
Repeatability mm	±0.1															
Product weight kg	0.31	0.54	0.95	1.12	0.90	1.58	1.77	1.7	2.16	2.3	2.8	3.8	4.8	5.7	7.8	8.8
Lubrication	Not required (when lubricating, use turbine oil Class 1 ISO VG32)															

## 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

**HMF - 32CS - L1 - T2H - R**

**A** Size

**B** Option  
Note 1

**C** Switch model no.

**D** Switch quantity

Symbol	Descriptions			
<b>A Size</b>				
12CS				
16CS				
20CS				
25CS				
32CS				
40CS				
<b>B Option</b>				
Blank	Standard			
L1	Long stroke 1			
L2	Long stroke 2			
<b>C Switch model no.</b>				
Axial lead wire	Radial lead wire	Contact	Indicator	Lead wire
T2H*	T2V*	Proximity	1 color indicator type	2-wire
T3H*	T3V*			3-wire
<b>*Lead wire length</b>				
Blank	1m (standard)			
3	3m (option)			
5	5m (option)			
<b>D Switch quantity</b>				
R	One on open side			
H	One on closed side			
D	Two			

### ⚠ Note on model no. selection

Note 1: 12CS is not available for long stroke "L1", "L2".

<Example of model number>

**HMF-32CS-L1-T2H-R**

- A** Size : 32CS
- B** Option : Long stroke 1
- C** Switch model no. : Proximity T2H, lead wire 1m
- D** Switch quantity : One on open side

### How to order switch

**SW - T2H**

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

RRC
GRC
RV3*
NHS
HR
LN
FH100
HAP
BSA2
BHA/ BHG
LHA
LHAG
HKP
HLA/ HLB
HLAG/ HLBG
HEP
HCP
<b>HMF</b>
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

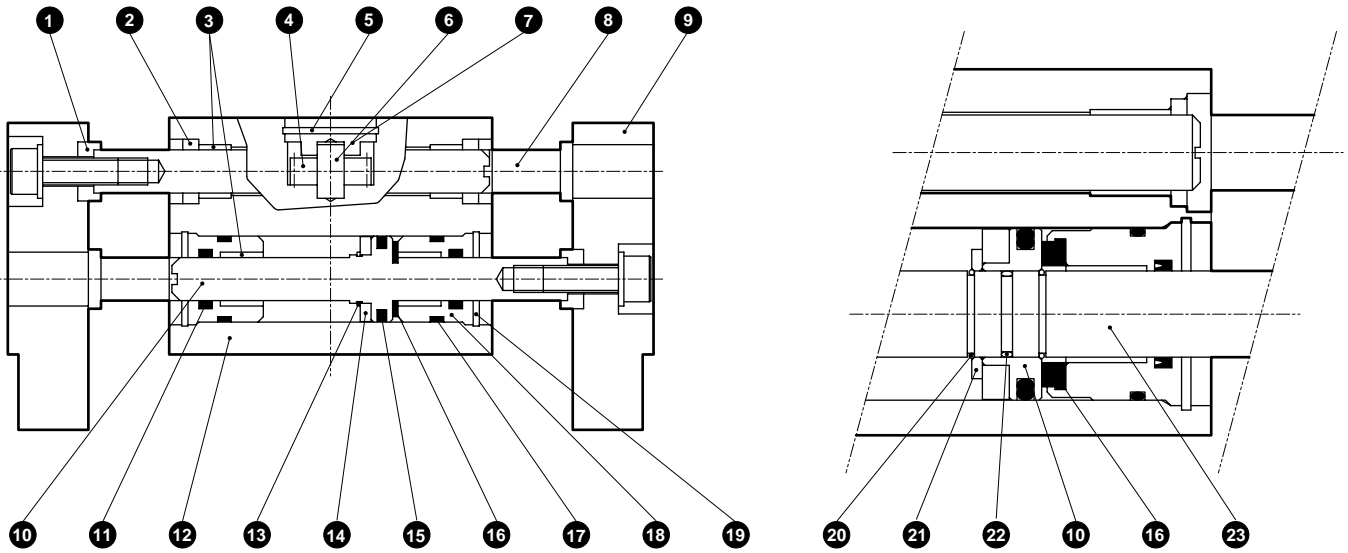
Compact wide parallel hand  
Hand

## Internal structure and parts list

● HMF-12CS to 25CS (standard stroke length)

● HMF-32CS, 40CS (standard)

● HMF-16CS to 40CS-L1, L2 (long stroke)



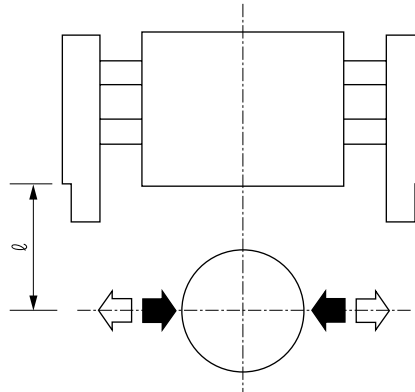
No.	Parts name	Material	Remarks	No.	Parts name	Material	Remarks
1	Washer	Carbon steel	12CS, 16CS only	13	Snap ring	Stainless steel	
2	Needle bearing sealant	Resin + steel		14	Magnet		
3	Bush	Sintering oil impregnated alloy		15	Piston packing seal	Nitrile rubber	
4	Pinion gear	Carbon steel		16	Cushion	Urethane rubber	
5	Snap ring	Stainless steel		17	Cylinder gasket	Nitrile rubber	
6	Pinion gear axis	Stainless steel		18	Cylinder guard	Aluminum alloy	
7	Pinion guard	Stainless steel		19	Snap ring	Stainless steel	
8	Guide rod	Stainless steel		20	Piston fixing spring	Stainless steel	
9	Master key	Aluminum alloy		21	Magnet holder	Stainless steel	
10	Piston	Stainless steel		22	O ring	Nitrile rubber	
11	Rod packing seal	Nitrile rubber		23	Piston rod	Stainless steel	
12	Body	Aluminum alloy					

### Gripping power performance data

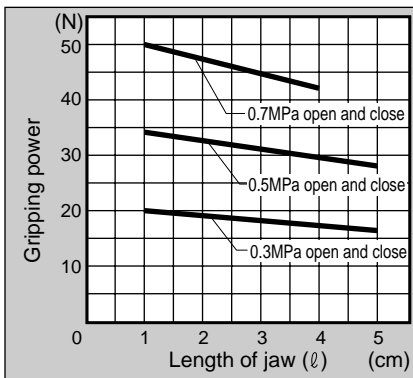
Gripping power is shown per length of  $\ell$  hand jaw at supply pressure 0.3, 0.5 and 0.7MPa.

- Both open direction (◀) closed direction (▶)
- (Shown with continuous line)

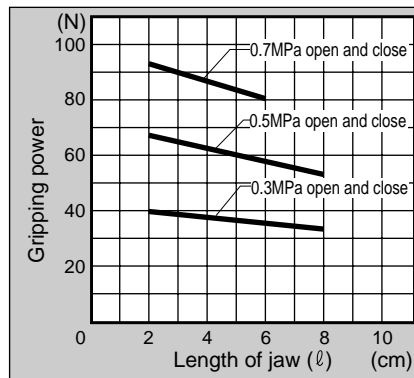
(Note) Grip performance data indicates the grip for one jaw. Since two jaws are used, double the grip in the graph when making a selection.



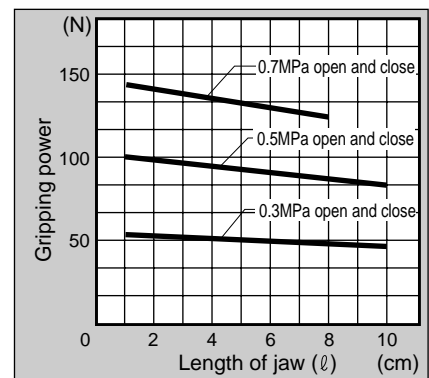
● HMF-12CS



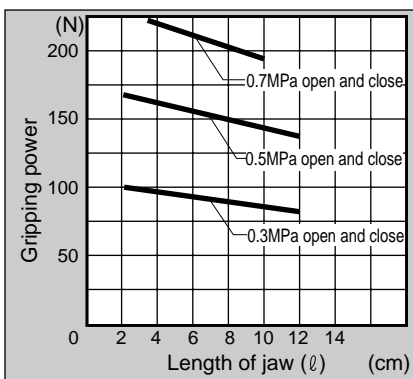
● HMF-16CS



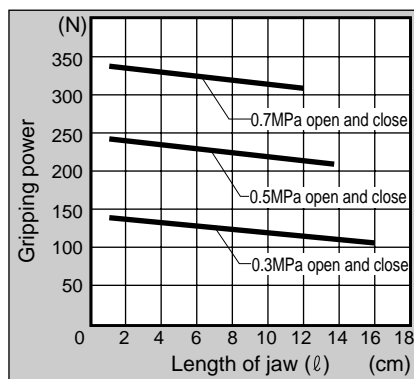
● HMF-20CS



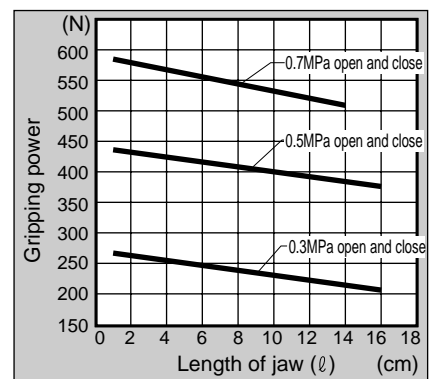
● HMF-25CS



● HMF-32CS



● HMF-40CS



RRC
GRC
RV3*
NHS
HR
LN
FH100
HAP
BSA2
BHA/BHG
LHA
LHAG
HKP
HLA/HLB
HLAG/HLBG
HEP
HCP
<b>HMF</b>
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

Compact wide parallel hand  
Hand

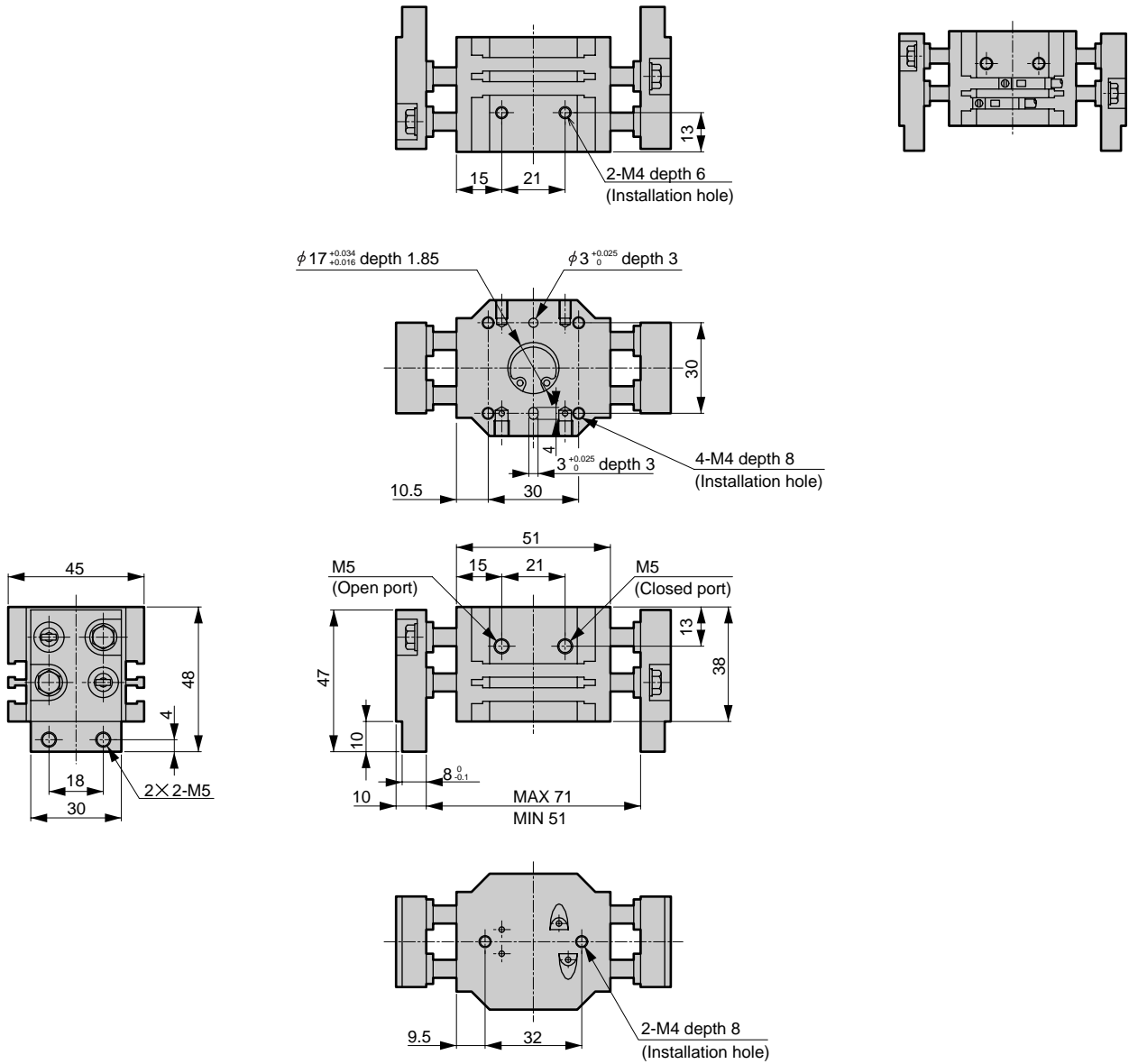
## Dimensions



- 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

● HMF-12CS standard

● With switch

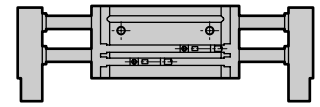
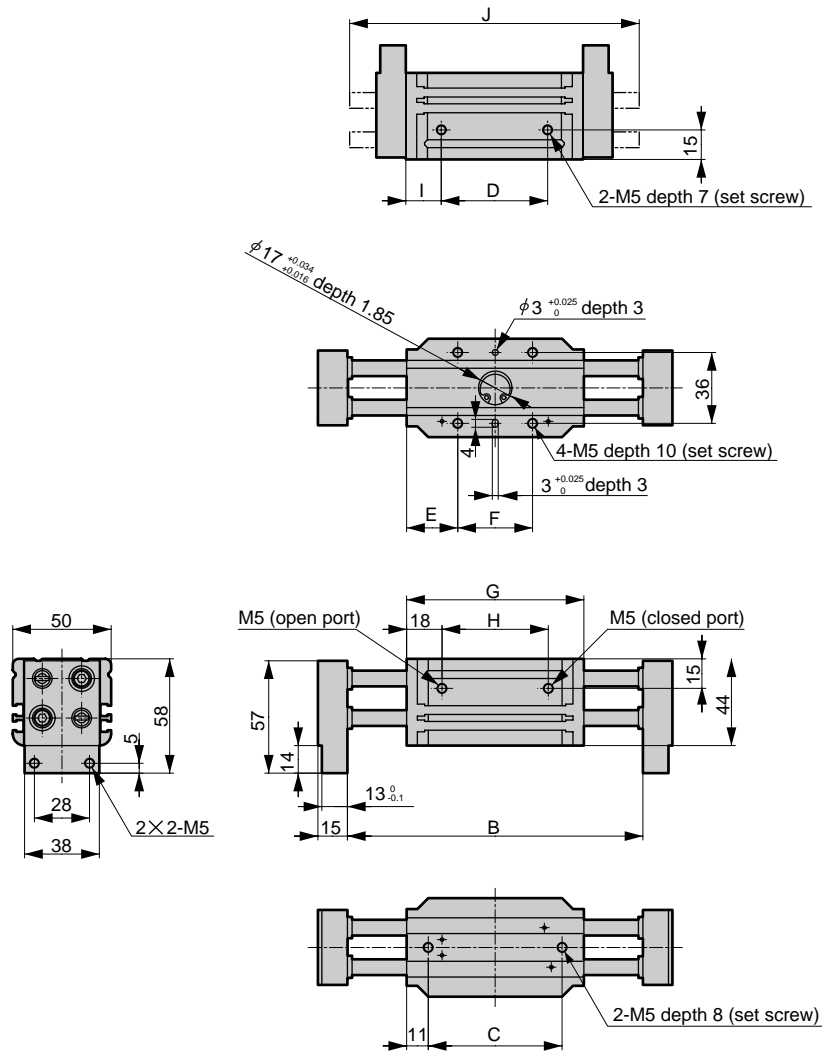


### Dimensions



● HMF-16CS standard/L1/L2

● With switch



Symbol	B		C	D	E	F	G	H	I	J
	MAX	MIN								
Standard (blank)	90	60	38	28	11	38	60	24	16	-
L1	150	90	68	54	26	38	90	54	18	147
L2	186	106	84	70	26	54	106	70	18	183

RRC
GRC
RV3*
NHS
HR
LN
FH100
HAP
BSA2
BHA/BHG
LHA
LHAG
HKP
HLA/HLB
HLAG/HLBG
HEP
HCP
<b>HMF</b>
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

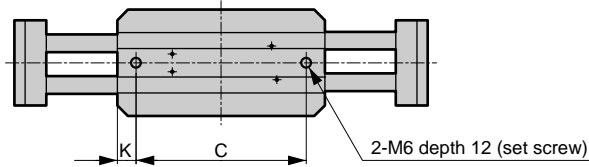
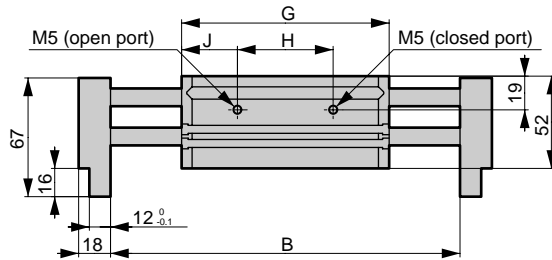
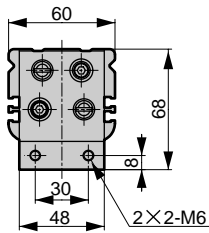
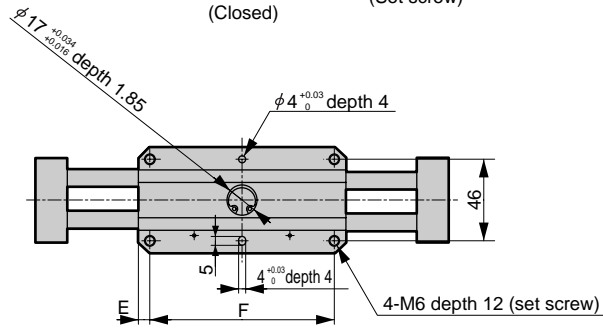
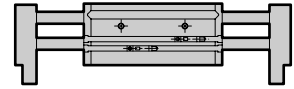
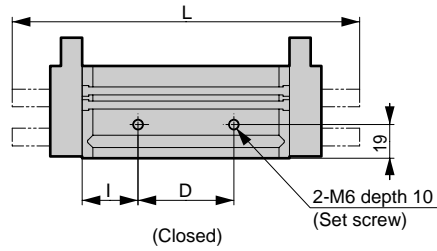
Compact wide parallel hand  
Hand

## Dimensions



● HMF-20CS standard/L1/L2

● With switch



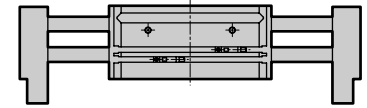
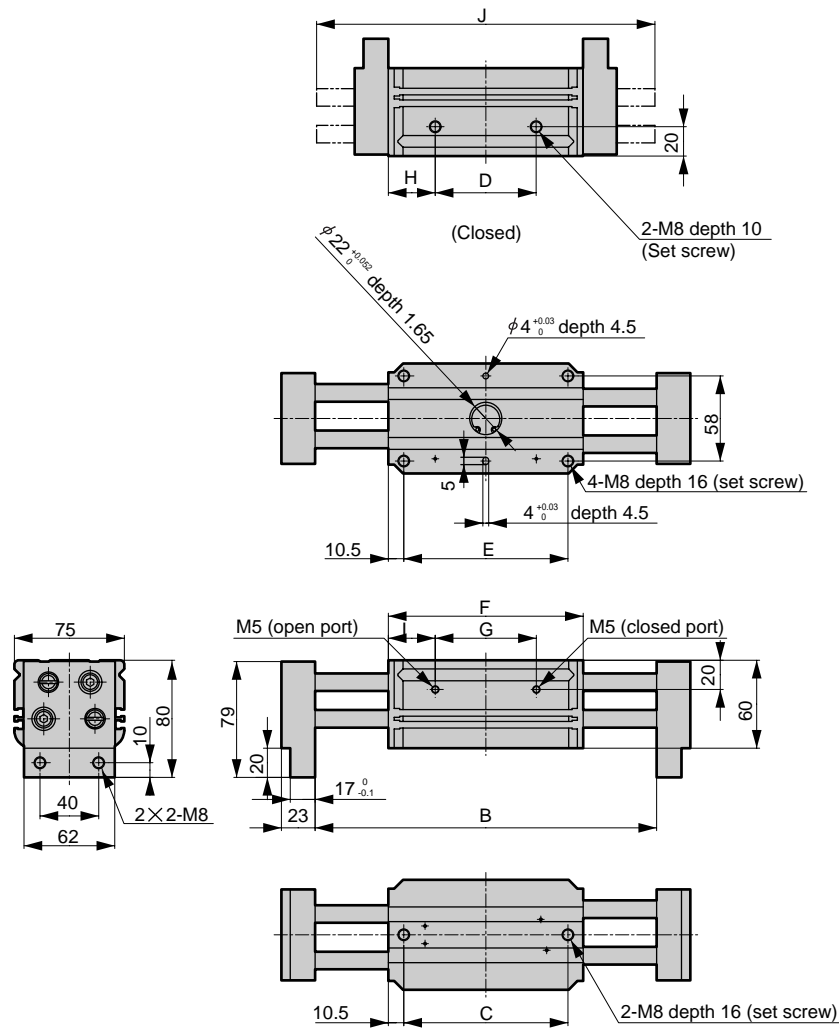
Symbol	B		C	D	E	F	G	H	I	J	K	L
	MAX	MIN										
Standard (blank)	114	74	56	38	9	56	74	34	18	20	9	-
L1	197	117	96	54	6.5	104	117	54	31.5	31.5	10.5	196
L2	233	133	112	70	6.5	120	133	70	31.5	31.5	10.5	232

### Dimensions



● HMF-25CS standard/L1/L2

● With switch



Symbol	B		C	D	E	F	G	H	I	J
	MAX	MIN								
Standard (blank)	141	91	70	48	70	91	41	21.5	25	-
L1	233	133	112	69	112	133	69	32	32	231
L2	271	151	130	87	130	151	87	32	32	269

RRC
GRC
RV3*
NHS
HR
LN
FH100
HAP
BSA2
BHA/BHG
LHA
LHAG
HKP
HLA/HLB
HLAG/HLBG
HEP
HCP
<b>HMF</b>
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

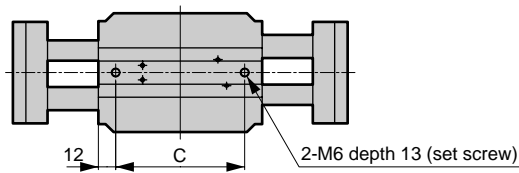
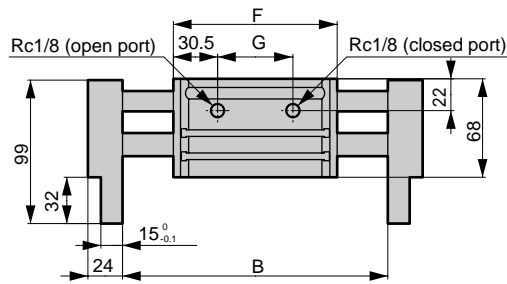
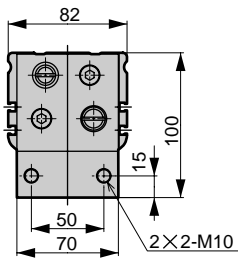
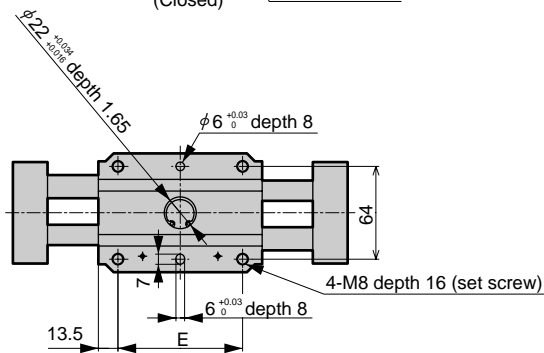
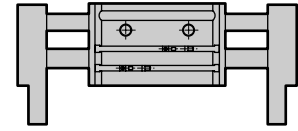
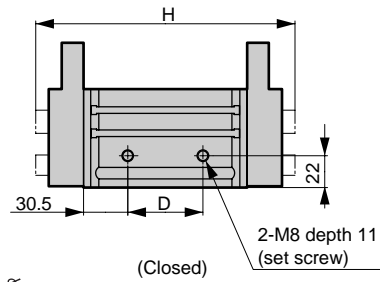
Compact wide parallel hand  
Hand

## Dimensions



● HMF-32CS standard/L1/L2

● With switch



Symbol	B		C	D	E	F	G	H
	MAX	MIN						
Standard (blank)	183	113	89	52	86	113	52	179
L1	274	154	130	93	127	154	93	270
L2	354	194	170	133	167	194	133	350

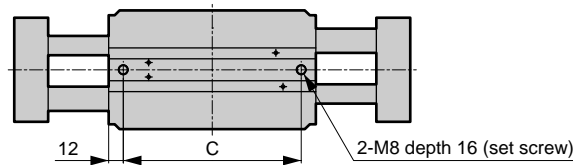
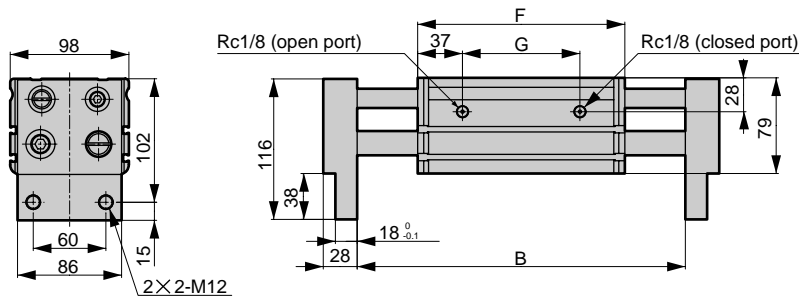
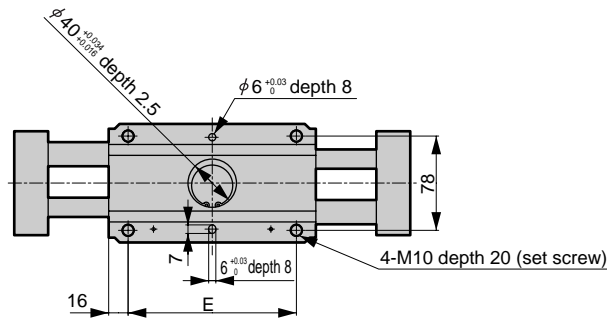
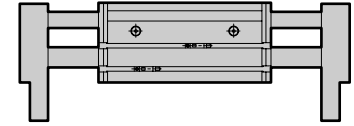
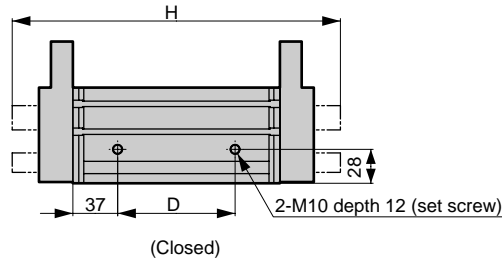


### Dimensions



● HMF-40CS standard/L1/L2

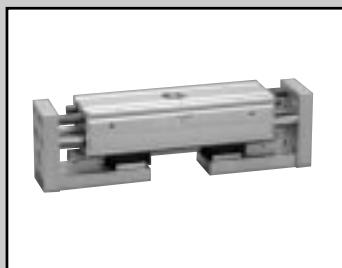
● With switch



Symbol	B		C	D	E	F	G	H
	MAX	MIN						
Standard (blank)	271	171	147	97	139	171	97	271
L1	361	201	177	127	169	201	127	361
L2	434	234	210	160	202	234	160	434

RRC
GRC
RV3*
NHS
HR
LN
FH100
HAP
BSA2
BHA/BHG
LHA
LHAG
HKP
HLA/HLB
HLAG/HLBG
HEP
HCP
<b>HMF</b>
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

Compact wide parallel hand  
Hand



LM guided large wide parallel hand  
(Long stroke 1, long stroke 2)

# HMFB Series

- Operational stroke length: Long stroke 1 100, 120, 160  
Long stroke 2 120, 160, 200



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

## Specifications

Descriptions	HMFB					
	25CS		32CS		40CS	
Size	L1	L2	L1	L2	L1	L2
Cylinder bore size mm	φ25×2		φ32×2		φ40×2	
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		
Operational stroke length mm	100	120	120	160	160	200
Rod diameter mm	φ12		φ16		φ20	
Capacity of reciprocating cm <sup>3</sup>	75.4	90.5	145	193	301	377
Repeatability mm	±0.1					
Product weight kg	4.06	4.13	5.97	7.2	10.05	11.8
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, 100mA or less
Light	LED (ON lighting)	
Maximum shock resistance	980m/s <sup>2</sup>	
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

**HMFB** - **25CS** - **L1** - **T2H** - **R**

**A** Size

**B** Stroke length

**C** Switch model no.  
\* indicates lead wire length.

**D** Switch quantity

Symbol	Descriptions			
<b>A Size</b>				
	<b>25CS</b>			
	<b>32CS</b>			
	<b>40CS</b>			
<b>B Option</b>				
	<b>L1</b>	Long stroke 1		
	<b>L2</b>	Long stroke 2		
<b>C Switch model no.</b>				
Axial lead wire	Radial lead wire	Contact	Indicator	Lead wire
<b>T2H*</b>	<b>T2V*</b>	Proximity	1 color indicator type	2-wire
<b>T3H*</b>	<b>T3V*</b>			3-wire
<b>*Lead wire length</b>				
	<b>Blank</b>	1m (standard)		
	<b>3</b>	3m (option)		
	<b>5</b>	5m (option)		
<b>D Switch quantity</b>				
	<b>R</b>	One on open side		
	<b>H</b>	One on closed side		
	<b>D</b>	Two		

<Example of model number>

**HMFB-25CS-L1-T2H-R**

Model: LM guided large wide parallel hand

- A** Size : 25CS
- B** Stroke length : Long stroke 1
- C** Switch model no. : Proximity T2H switch, lead wire 1m
- D** Switch quantity : One on open side

### How to order switch

**SW** - **T2H**

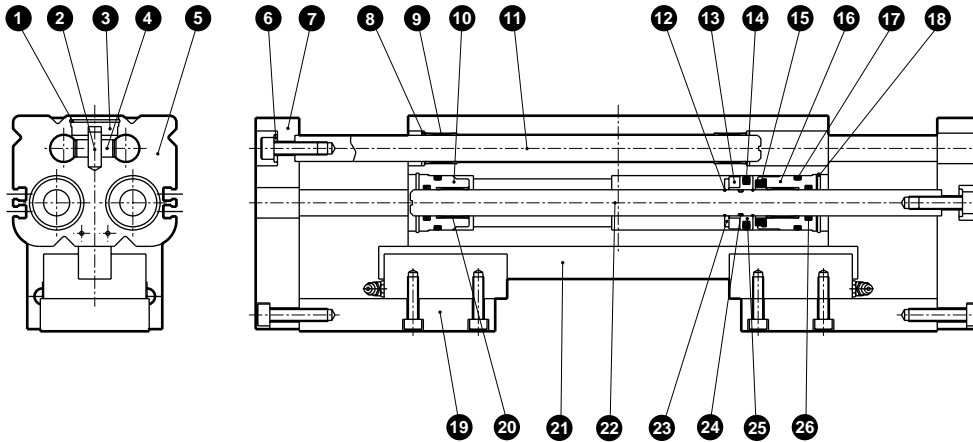
Switch model no.  
(Item above **C**)

RRC
GRC
RV3*
NHS
HR
LN
FH100
HAP
BSA2
BHA/BHG
LHA
LHAG
HKP
HLA/HLB
HLAG/HLBG
HEP
HCP
HMF
<b>HMFB</b>
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

LM guided large wide parallel hand  
Hand

## Internal structure and parts list

- HMFB-25CS to 40CS-L1
- HMFB-25CS to 40CS-L2



## Parts list

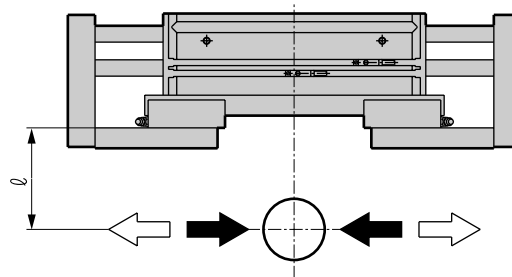
No.	Parts name	Material	Remarks	No.	Parts name	Material	Remarks
1	C type snap ring	Stainless steel		14	Packing seal	Nitrile rubber	
2	Pinion gear axis	Stainless steel		15	Cushion	Urethane rubber	
3	Pinion cover	Stainless steel		16	Cylinder guard A	Aluminum alloy	
4	Pinion gear	Carbon steel		17	O ring	Nitrile rubber	
5	Body	Aluminum alloy		18	C type snap ring	Stainless steel	
6	Plain washer	Stainless steel	32CS-L1, L2 are not available	19	Connection plate	Aluminum alloy	
7	Master key	Aluminum alloy		20	Bush	Sintering oil impregnated alloy	
8	Needle bearing sealant			21	LM guide		
9	Bush	Sintering oil impregnated alloy		22	Piston rod	Stainless steel	
10	Cylinder guard B	Aluminum alloy		23	Magnet holder	Stainless steel	
11	Guide rod	Stainless steel		24	O ring	Nitrile rubber	
12	Piston fixing spring	Stainless steel		25	Piston	Stainless steel	
13	Magnet			26	Packing seal	Nitrile rubber	

## 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.

- Both open direction (◀) closed direction (▶)
- (Shown with continuous line)

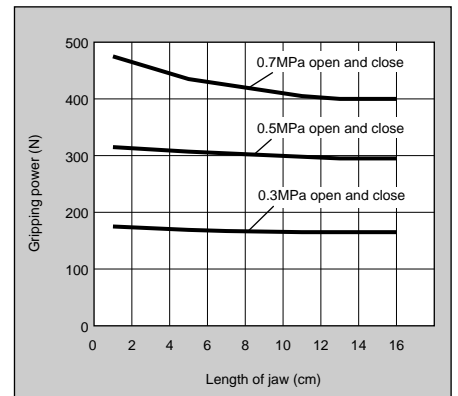
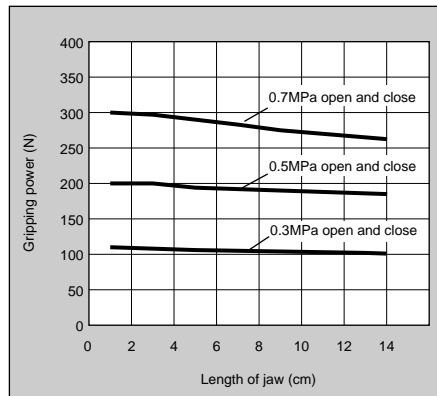
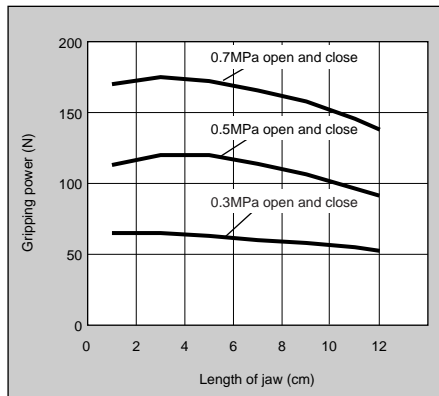
(Note) Grip performance data indicates the grip for one jaw. Since two jaws are used, double the grip in the graph when making a selection.



- HMFB-25CS

- HMFB-32CS

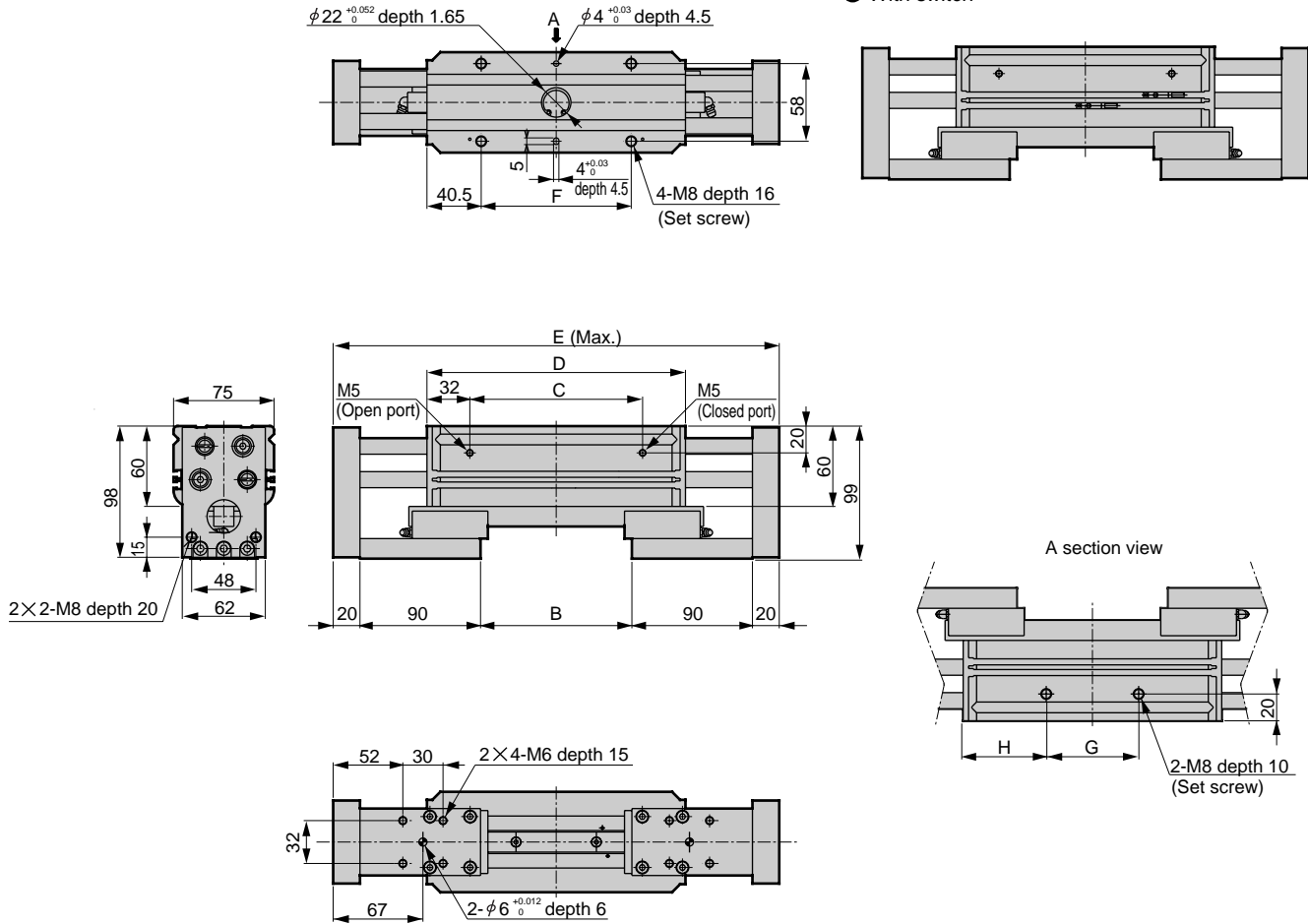
- HMFB-40CS



### Dimensions



● HMFB-25CS-L1/L2



Symbol	B		C	D	E	F	G	H
	MAX	MIN						
L1	113	13	129	193	333	112	69	62
L2	131	11	127	191	351	110	87	52

RRC
GRC
RV3*
NHS
HR
LN
FH100
HAP
BSA2
BHA/BHG
LHA
LHAG
HKP
HLA/HLB
HLAG/HLBG
HEP
HCP
HMF
<b>HMFB</b>
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

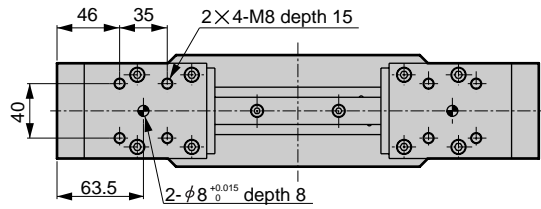
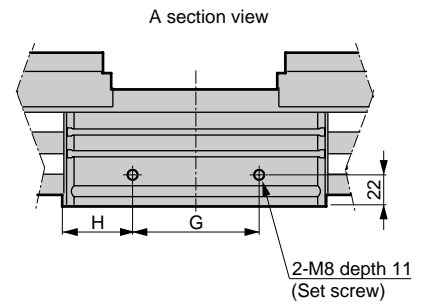
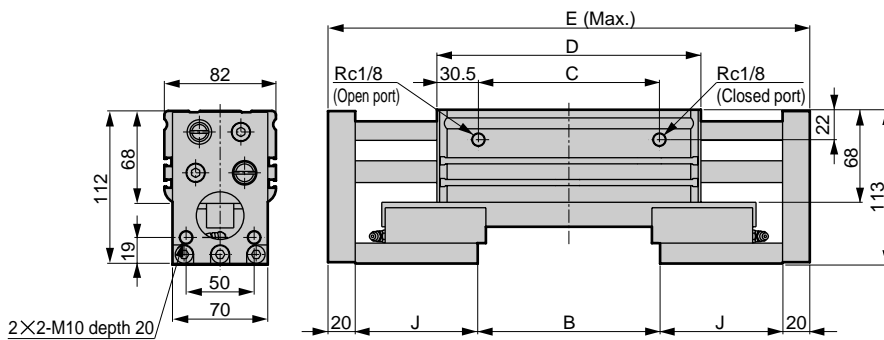
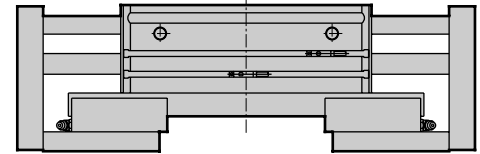
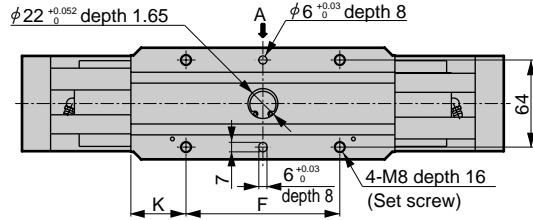
LM guided large wide parallel hand  
Hand

## Dimensions



● HMFB-32CS-L1/L2

● With switch



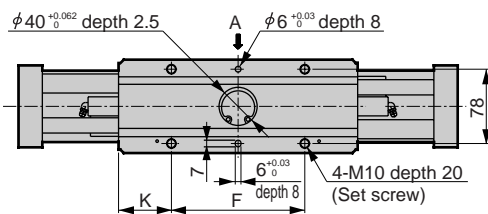
Symbol	B		C	D	E	F	G	H	J	K
	MAX	MIN								
L1	134	14	133	194	354	113	93	50.5	90	40.5
L2	174	14	193	254	454	167	133	60.5	120	43.5

- RRC
- GRC
- RV3\*
- NHS
- HR
- LN
- FH100
- HAP
- BSA2
- BHA/BHG
- LHA
- LHAG
- HKP
- HLA/HLB
- HLAG/HLBG
- HEP
- HCP
- 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

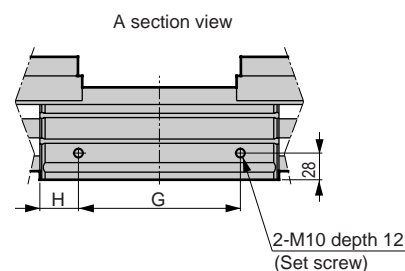
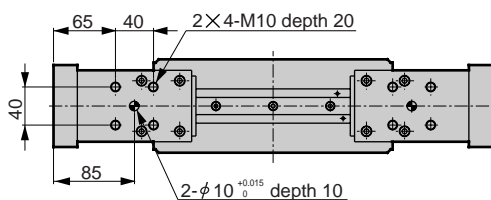
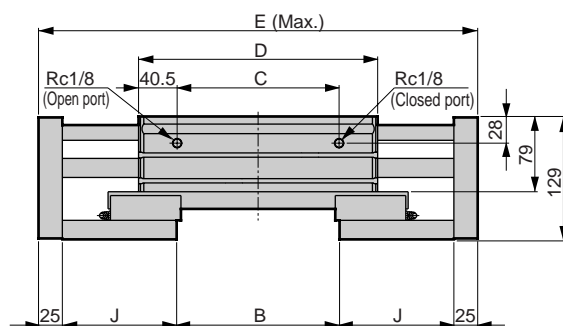
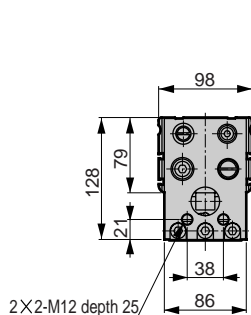
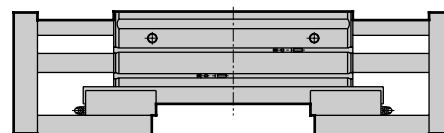
### Dimensions



● HMFB-40CS-L1/L2



● With switch



Symbol	B		C	D	E	F	G	H	J	K
	MAX	MIN								
L1	171	11	170	251	461	140	170	40.5	120	55.5
L2	214	14	233	314	564	202	160	77	150	56

RRC
GRC
RV3*
NHS
HR
LN
FH100
HAP
BSA2
BHA/ BHG
LHA
LHAG
HKP
HLA/ HLB
HLAG/ HLBG
HEP
HCP
HMF
<b>HMFB</b>
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

LM guided large wide parallel hand  
Hand

Wide parallel hand Double acting

# HFP Series

● Operational stroke length: 20, 30, 40, 60mm



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

## Specifications

Descriptions		HFP			
Size		2CS	3CS	4CS	5CS
Cylinder bore size	mm	φ16×2	φ25×2	φ32×2	φ40×2
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		M5			Rc1/8
Operational stroke length	mm	20	30	40	60
Rod diameter	mm	φ10	φ12	φ15	φ18
Capacity of reciprocating	cm <sup>3</sup>	4.90	22.70	50.2	120.3
Repeatability	mm	±0.03			
Product weight	kg	0.59	1.10	2.07	3.90
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 <sup>2</sup>	
Lead wire	Standard 1m (oil resistant vinyl cabtire cable 2-conductor 0.2mm <sup>2</sup> )	Standard 1m (oil resistant vinyl cabtire cable 2-conductor 0.2mm <sup>2</sup> )

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

**HFP - 2CS**

With switch

**HFP - 2CS - T2H - R**

**A** Size

**B** Switch model no.

**C** Switch quantity

<Example of model number>

**HFP-2CS-T2H-R**

Model: Wide parallel hand

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

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

## How to order switch

● For switch T\*H\*

· Switch body + mounting bracket

**HFP - T2H**

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

· Switch body

**SW - T2H**

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

· Mounting bracket

**HFP - T**

● For switch T\*V\*

· Switch body + mounting bracket

**HFP - T2V - \***

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

· Switch body

**SW - T2V**

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

· Mounting bracket

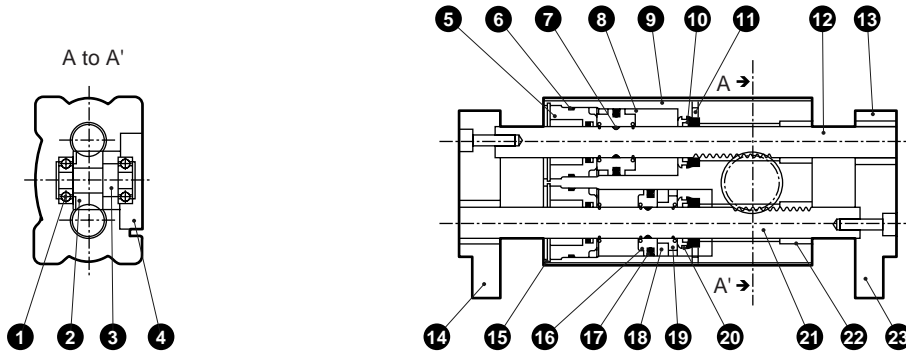
**HFP - TV - \***

(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
<b>HFP</b>
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 parallel hand  
Hand

## Internal structure and parts list

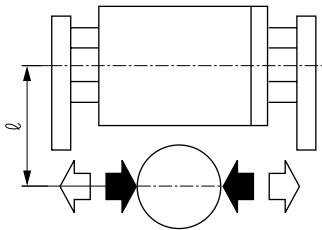


No.	Parts name	Material	Remarks	No.	Parts name	Material	Remarks
1	Bearing	Alloy steel		13	Bush	Copper alloy casting	
2	Pinion gear	Steel		14	Master key A	Aluminum alloy	
3	Pinion gear axis	Steel		15	Snap ring	Stainless steel	
4	Bearing guard	Aluminum alloy		16	Piston A	Aluminum alloy	
5	Packing seal housing A	Aluminum alloy		17	Piston packing seal	Nitrile rubber	
6	Gasket A	Nitrile rubber		18	Magnet	Plastic magnet	
7	Piston gasket	Nitrile rubber		19	Piston B	Aluminum alloy	
8	Piston fixing spring	Stainless steel		20	Gasket B	Nitrile rubber	
9	Body	Aluminum alloy		21	Piston rod B	Stainless steel	
10	Rod packing seal	Nitrile rubber		22	Bush	Copper alloy casting	
11	Packing seal housing B	Aluminum alloy		23	Master key B	Aluminum alloy	
12	Piston rod A	Stainless steel					

## Gripping power performance data

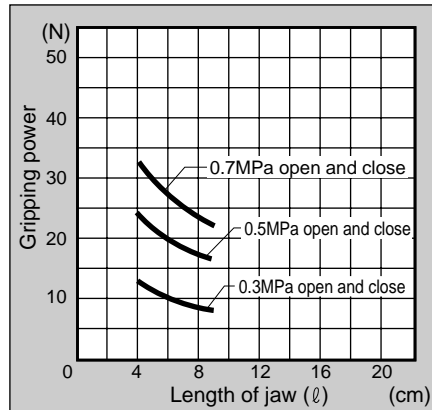
Gripping power that functions to open and closed directions with jaw length  $\ell$  of hand at supply pressure 0.3, 0.5 and 0.7 MPa is shown.

- Both open direction (◁) closed direction (▷)
- (Shown with continuous line)

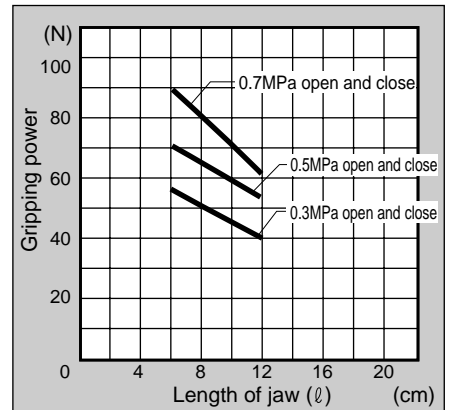


(Note) Grip performance data indicates the grip for one jaw. Since two jaws are used, double the grip in the graph when making a selection.

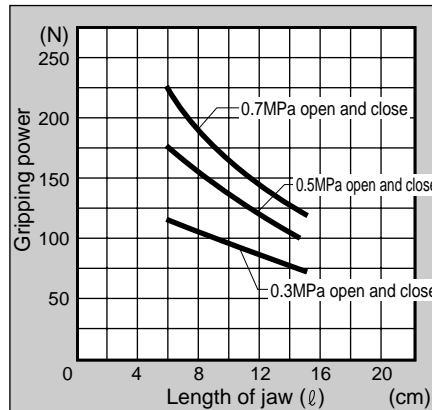
### ● HFP-2CS



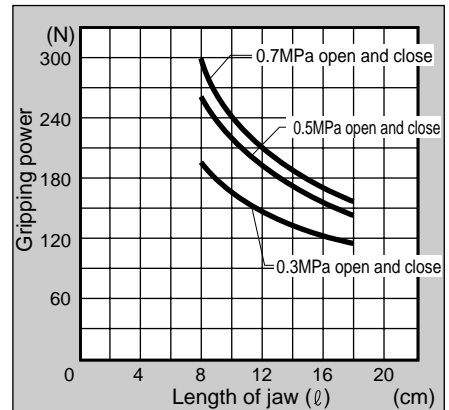
### ● HFP-3CS



### ● HFP-4CS



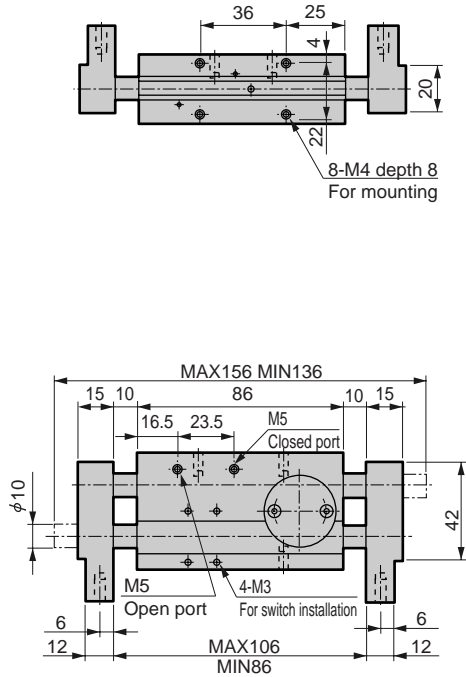
### ● HFP-5CS



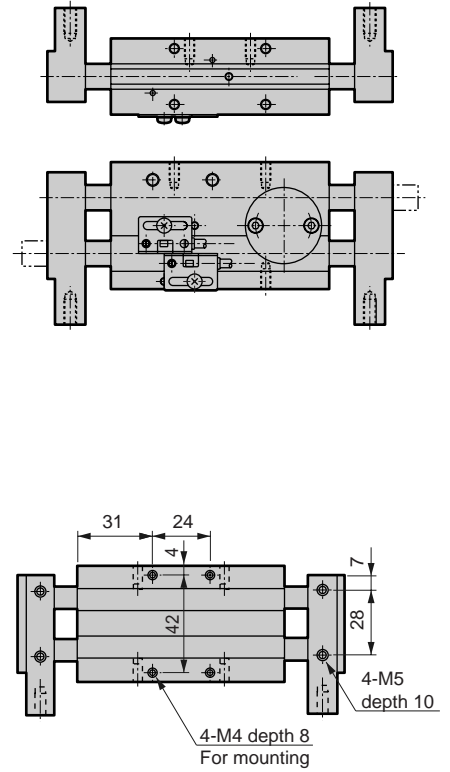
### Dimensions



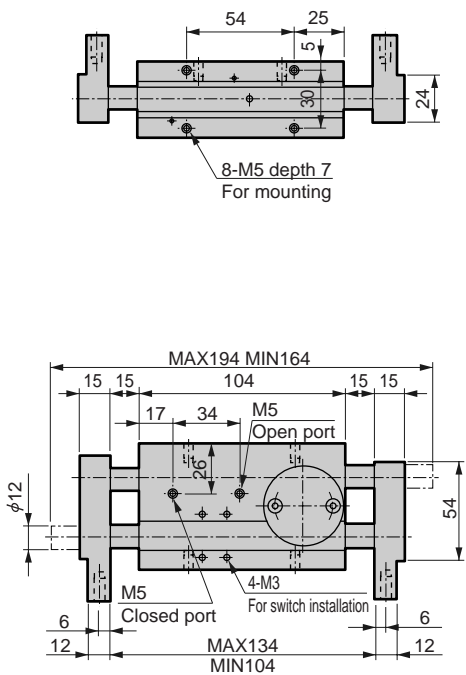
#### ● HFP-2CS standard



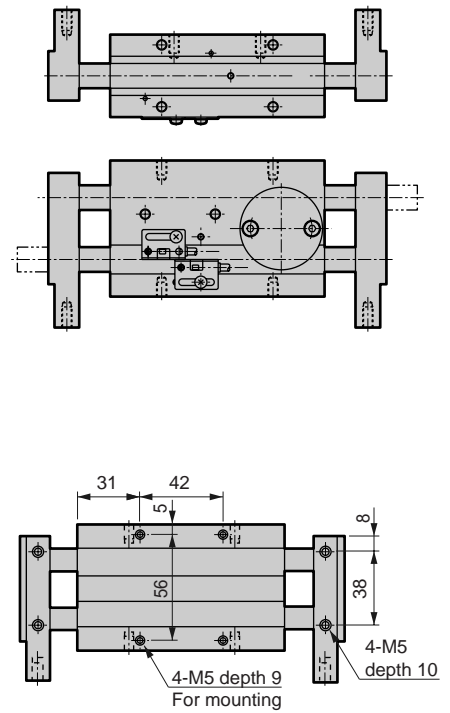
#### ● With switch



#### ● HFP-3CS standard



#### ● With switch



RRC
GRC
RV3*
NHS
HR
LN
FH100
HAP
BSA2
BHA/BHG
LHA
LHAG
HKP
HLA/HLB
HLAG/HLBG
HEP
HCP
HMF
HMFB
<b>HFP</b>
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

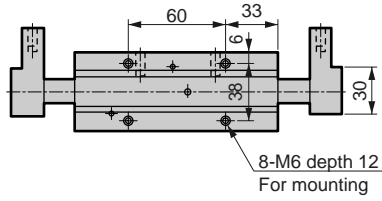
Wide parallel hand  
Hand

## Dimensions

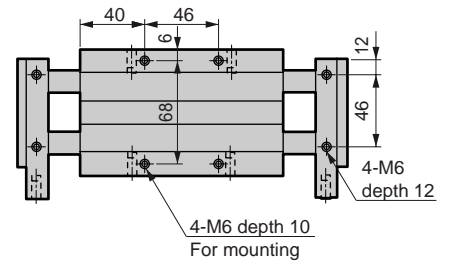
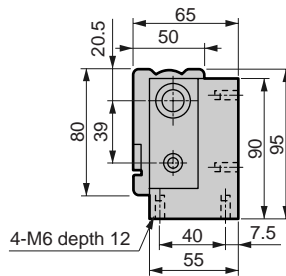
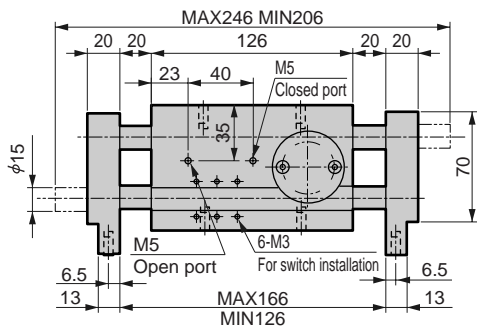
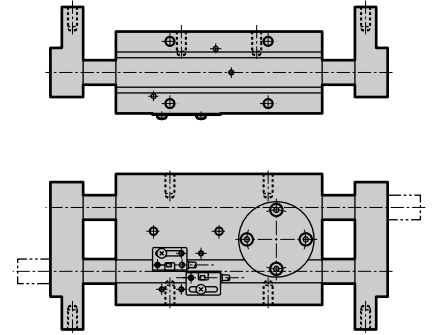


- RRC
- GRC
- RV3\*
- NHS
- HR
- LN
- FH100
- HAP
- BSA2
- BHA/BHG
- LHA
- LHAG
- HKP
- HLA/HLB
- HLAG/HLBG
- HEP
- HCP
- HMF
- HMFB
- HFP**
- HLC
- HGP
- FH500
- HBL
- HDL
- HMD
- HJL
- BHE
- CKG
- CK
- CKA
- CKS
- CKF
- CKJ
- CKL2
- CKL2 \*-HC
- CKH2
- CKLB2
- NCK/SCK/FCK
- FJ
- FK
- Ending

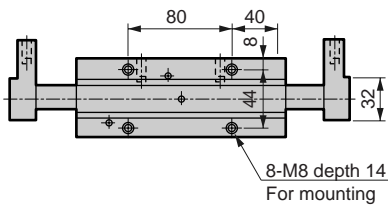
### ● HFP-4CS standard



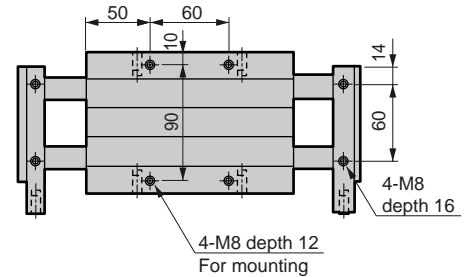
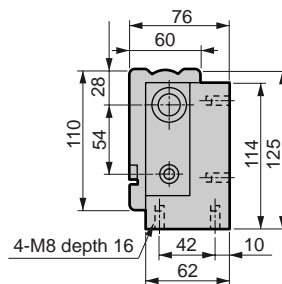
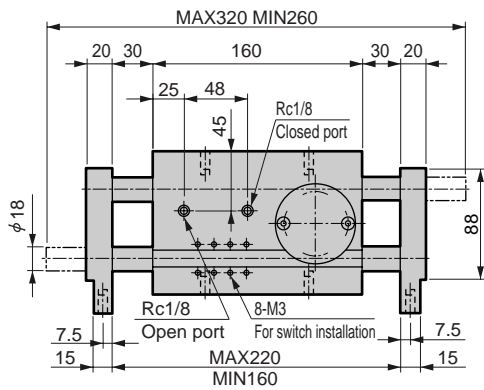
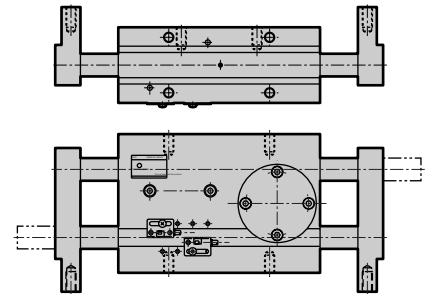
### ● With switch

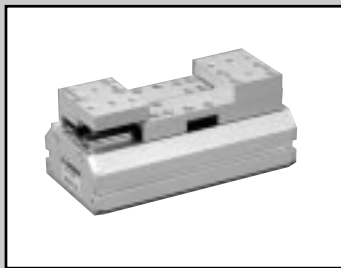


### ● HFP-5CS standard



### ● With switch





Thin type long stroke parallel hand Double acting  
(Standard, long stroke 1)

# HLC Series

- Operational stroke length: Standard 40, 50, 60, 70  
Long stroke 1 80, 100, 120, 140



## Specifications

Descriptions	HLC							
	16CS		20CS		25CS		30CS	
Size	Standard	L1	Standard	L1	Standard	L1	Standard	L1
Cylinder bore size mm	$\phi 16 \times 2$		$\phi 20 \times 2$		$\phi 25 \times 2$		$\phi 30 \times 2$	
Working fluid	Compressed air							
Max. working pressure MPa	0.7							
Min. working pressure MPa	0.2							
Ambient temperature °C	5 to 60							
Port size	M5							
Operational stroke length mm	40	80	50	100	60	120	70	140
Capacity of reciprocating cm <sup>3</sup>	16.1	32.2	31.4	62.8	58.9	117.8	99	198
Repeatability mm	$\pm 0.03$							
Product weight kg	0.71	0.85	1.03	1.4	1.62	2.23	2.74	3.69
Lubrication	Not required (when lubricating, use turbine oil Class 1 ISO VG32)							

## Switch specifications

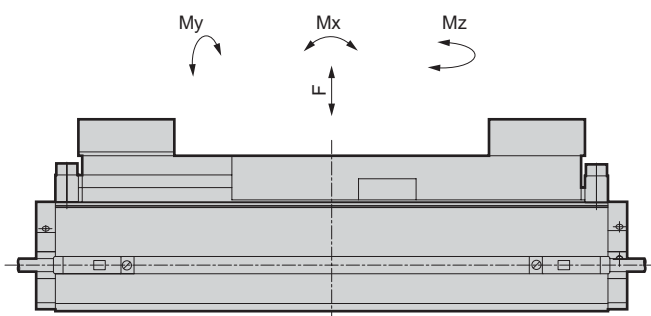
Descriptions	Proximity 2 wire	Proximity 3 wire
	T2H/T2V	T3H/T3V
Applications	Programmable controller	Programmable controller, relay
Output method	-	NPN output
Power voltage	-	10 to 28 VDC
Load voltage/current	10 to 30 VDC, 5 to 20 mA (Note 1)	30 VDC, 100mA or less
Light	LED (ON lighting)	
Maximum shock resistance	980m/s <sup>2</sup>	
Leakage current	1mA or less	10 $\mu$ A 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)

## Allowable load and allowable moment of HLC

Allowable load and allowable moment	F	Mx	Mz	My
Model no.	N	N·m	N·m	N·m
HLC-16CS	95	33.8	33.8	3.43
HLC-16CS-L1	95	49.5	49.5	3.43
HLC-20CS	95	50.0	50.0	3.43
HLC-20CS-L1	95	68.1	68.1	3.43
HLC-25CS	157	78.9	78.9	6.86
HLC-25CS-L1	157	120.0	120.0	6.86
HLC-30CS	281	152.0	152.0	13.72
HLC-30CS-L1	281	224.0	224.0	13.72



### How to order

**HLC** - **20CS** - **L1** - **T2H** - **R**

**A** Size

**B** Option

**C** Switch model no.  
\* indicates lead wire length.

**D** Switch quantity

Symbol	Descriptions			
<b>A Size</b>				
	16CS			
	20CS			
	25CS			
	30CS			
<b>B Option</b>				
<b>Blank</b>	Standard			
<b>L1</b>	Long stroke 1			
<b>C Switch model no.</b>				
Axial lead wire	Radial lead wire	Contact	Indicator	Lead wire
<b>T2H*</b>	<b>T2V*</b>	Proximity	1 color indicator type	2-wire
<b>T3H*</b>	<b>T3V*</b>			3-wire
<b>*Lead wire length</b>				
<b>Blank</b>	1m (standard)			
<b>3</b>	3m (option)			
<b>5</b>	5m (option)			
<b>D Switch quantity</b>				
<b>R</b>	One on open side			
<b>H</b>	One on closed side			
<b>D</b>	Two			

<Example of model number>

**HLC-20CS-L1-T2H-R**

Model: Thin long stroke parallel hand

- A** Size : 20CS
- B** Option : Long stroke 1
- C** Switch model no. : Proximity T2H switch, lead wire 1m
- D** Switch quantity : One on open side

### How to order switch

**SW** - **T2H**

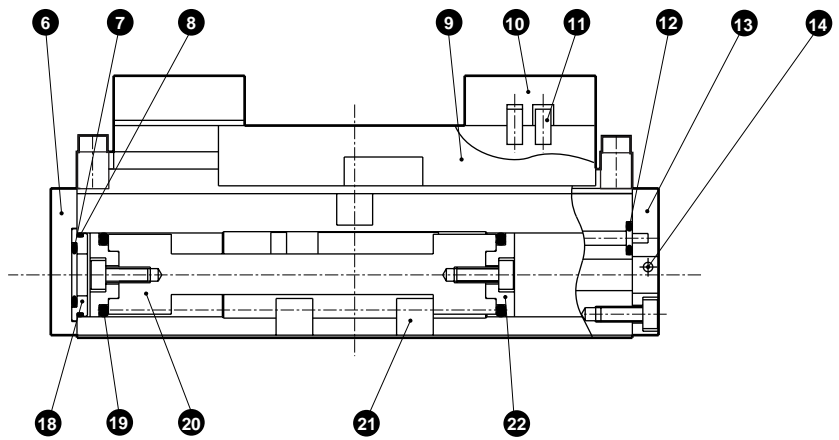
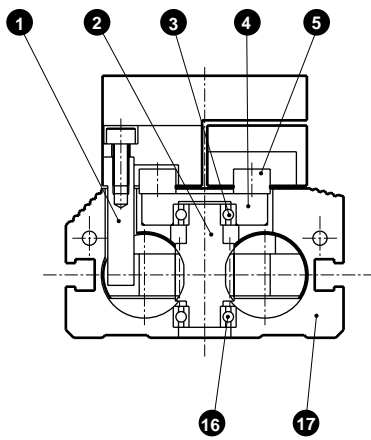
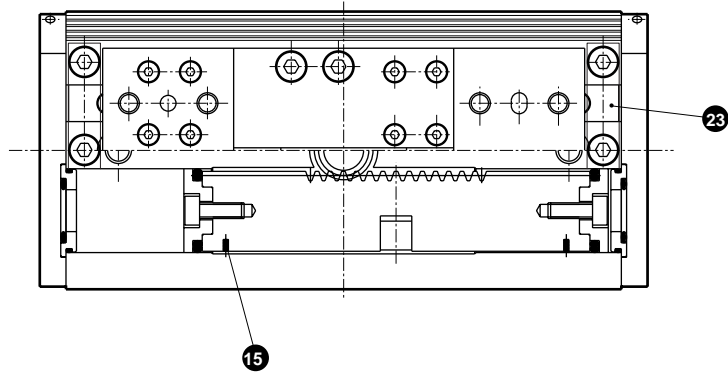
Switch model no.  
(Item above **C**)

RRC
GRC
RV3*
NHS
HR
LN
FH100
HAP
BSA2
BHA/BHG
LHA
LHAG
HKP
HLA/HLB
HLAG/HLBG
HEP
HCP
HMF
HMFB
HFP
<b>HLC</b>
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 long stroke parallel hand  
Hand

## Internal structure and parts list

- HLC-16CS to 30CS (standard)
- HLC-16CS to 30CS-L1



## Parts list

No.	Parts name	Material	Remarks	No.	Parts name	Material	Remarks
1	Rack joint	Carbon steel		13	Side plate 1	Aluminum alloy	
2	Pinion	Stainless steel		14	Steel ball	Stainless steel	
3	Single row deep groove ball bearing			15	Semicircle magnet		
4	Bearing holder	Aluminum alloy		16	Single row deep groove ball bearing		Only 20CS
5	LM guide			17	Body	Aluminum alloy	
6	Side plate 2	Aluminum alloy		18	Cylinder guard	Aluminum alloy	
7	Cylinder sealant 1	Nitrile rubber		19	Piston seal	Nitrile rubber	
8	Cylinder sealant 2	Nitrile rubber		20	Rack	Stainless steel	
9	LM plate	Aluminum alloy		21	Key	16CS to 25CS carbon steel 30CS stainless steel	
10	Master key	Aluminum alloy		22	Piston	Acetar resin	
11	Dowel pin			23	Stiffening plate	Stainless steel	Only 16, 20CS
12	Gasket	Nitrile rubber					

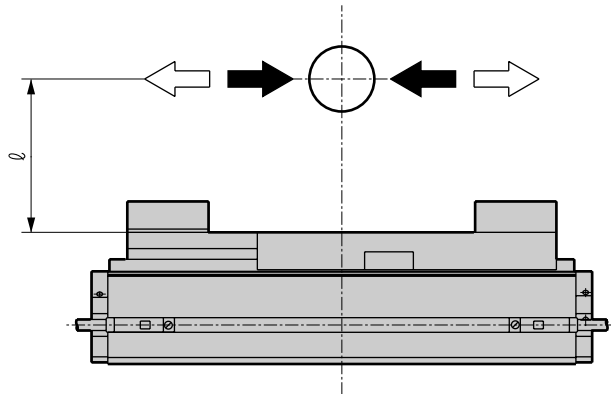
Ending

### Gripping power performance data

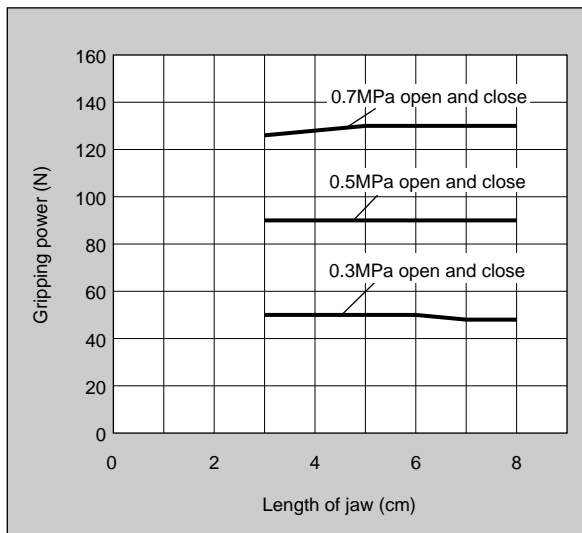
Gripping power that functions to open and closed directions with jaw length  $\ell$  of hand at supply pressure 0.3, 0.5 and 0.7 MPa is shown.

● Both open direction (◀) closed direction (▶)  
 — (Shown with continuous line)

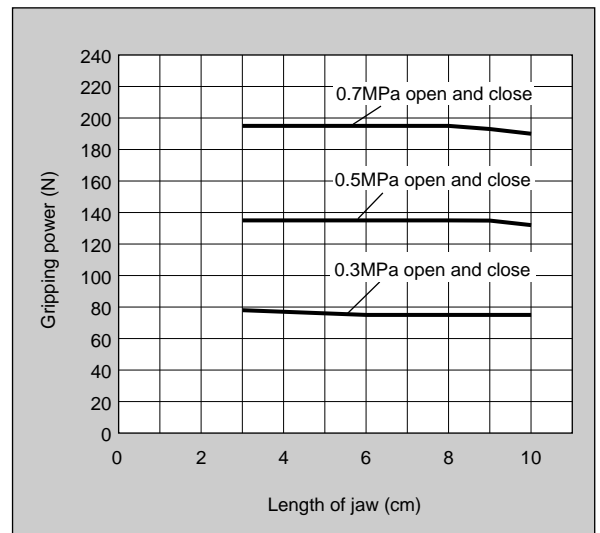
(Note) Grip performance data indicates the grip for one jaw. Since two jaws are used, double the grip in the graph when making a selection.



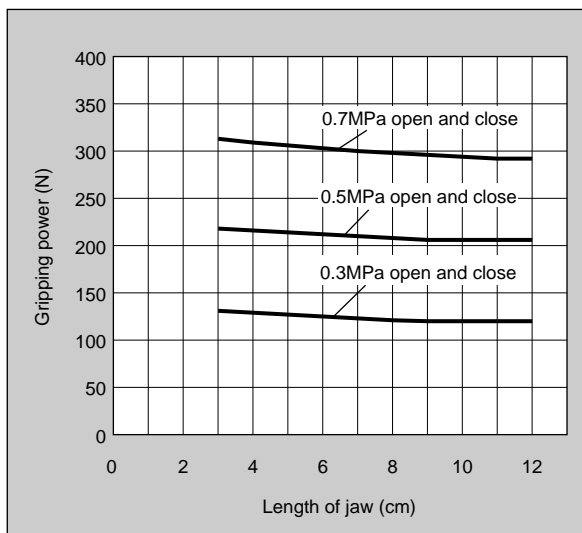
#### ● HLC-16CS



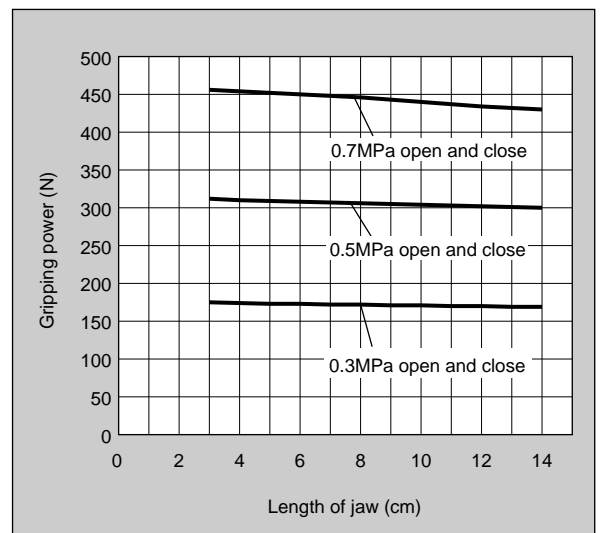
#### ● HLC-20CS



#### ● HLC-25CS



#### ● HLC-30CS



- 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

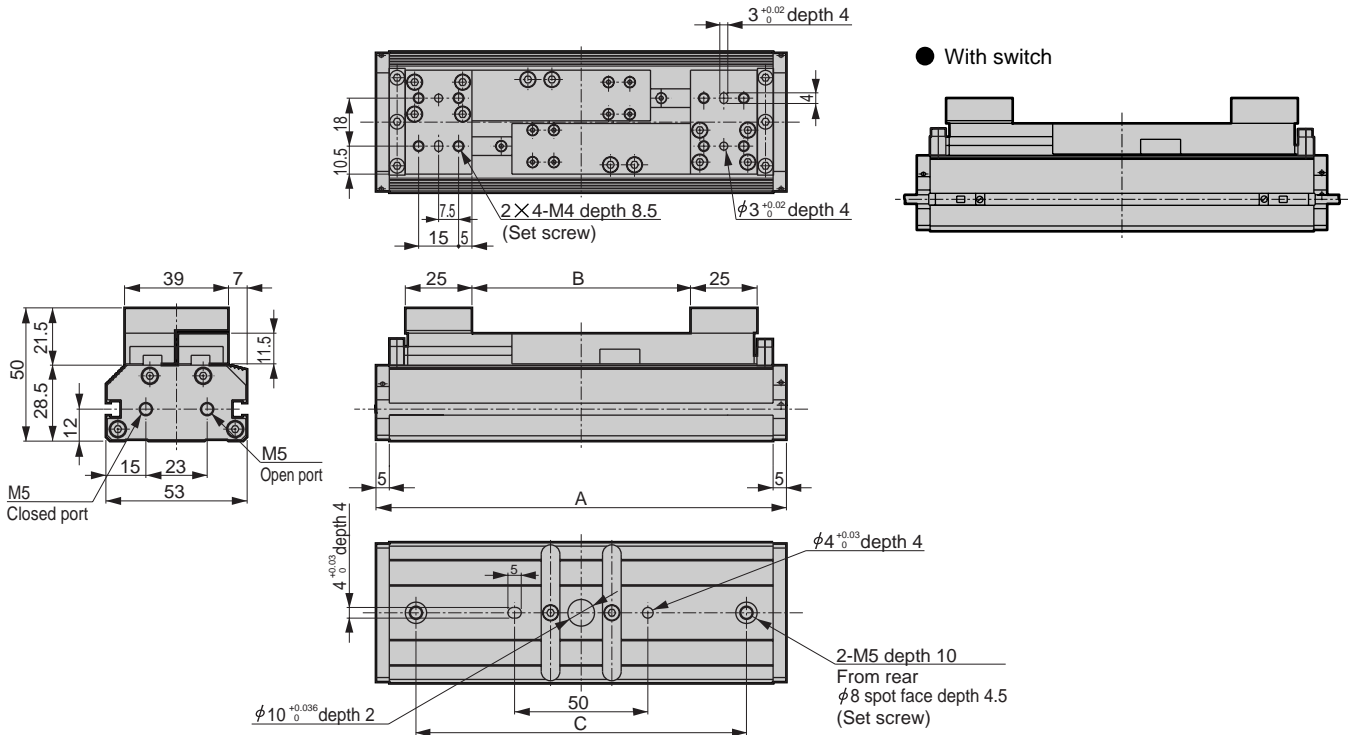
Ending  
 Thin long stroke parallel hand  
 Hand



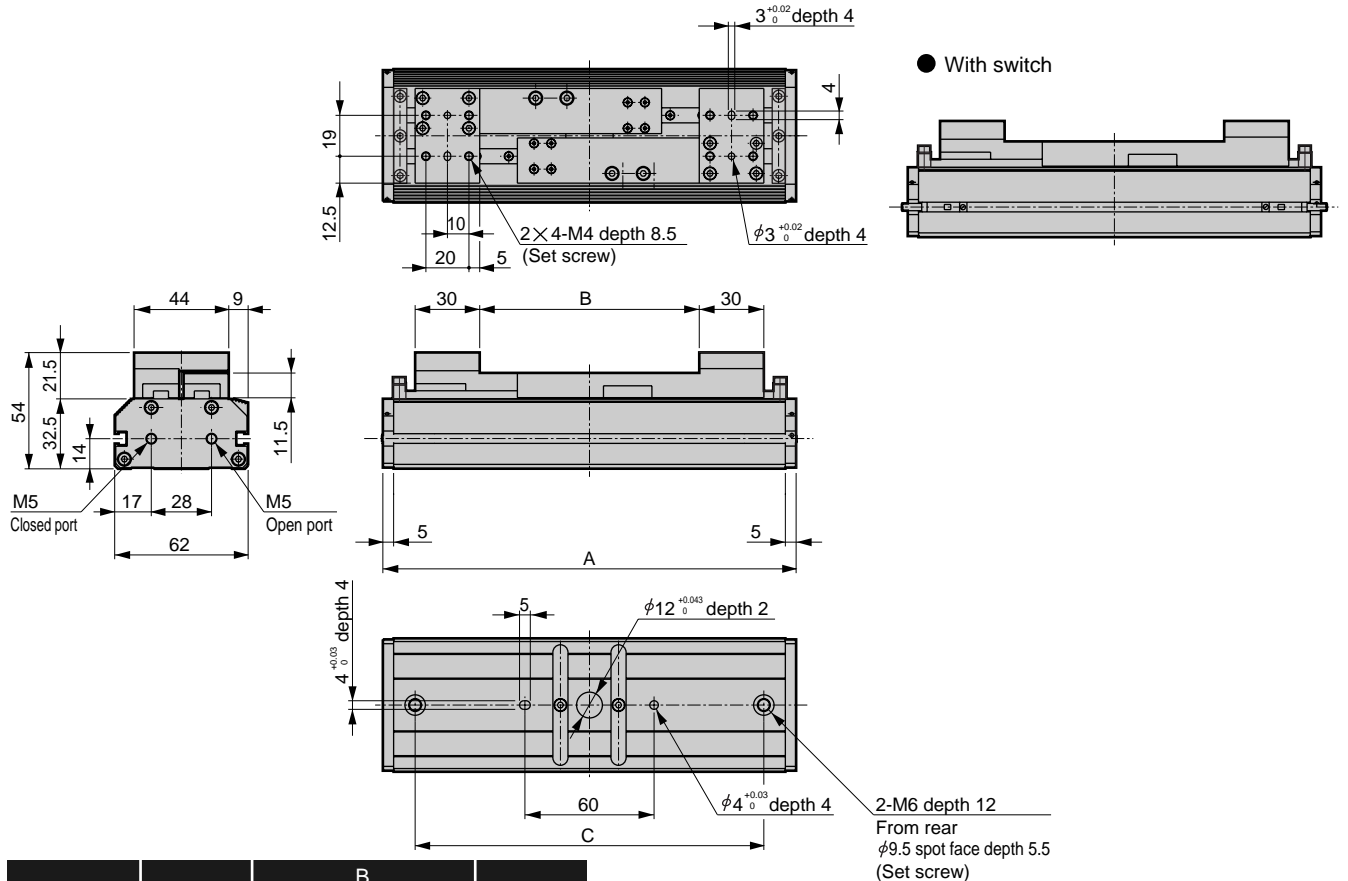
## Dimensions



### ● HLC-16CS standard/L1



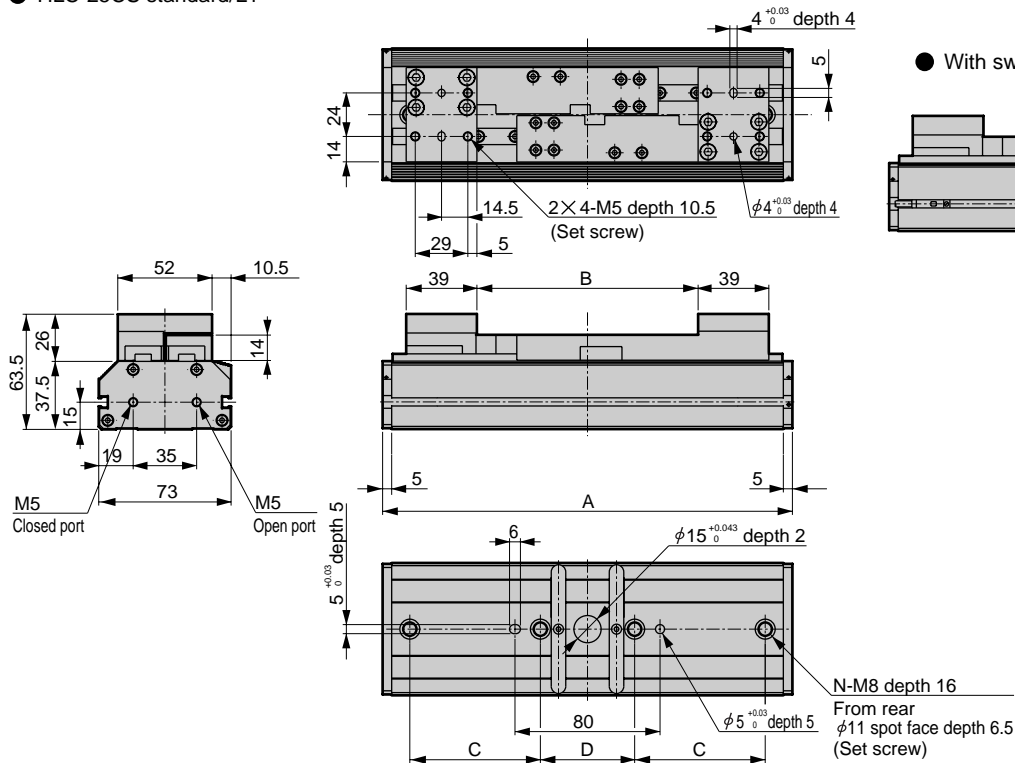
### ● HLC-20CS standard/L1



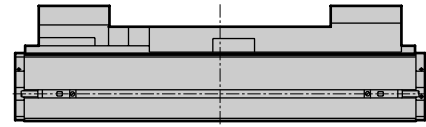
### Dimensions



#### ● HLC-25CS standard/L1

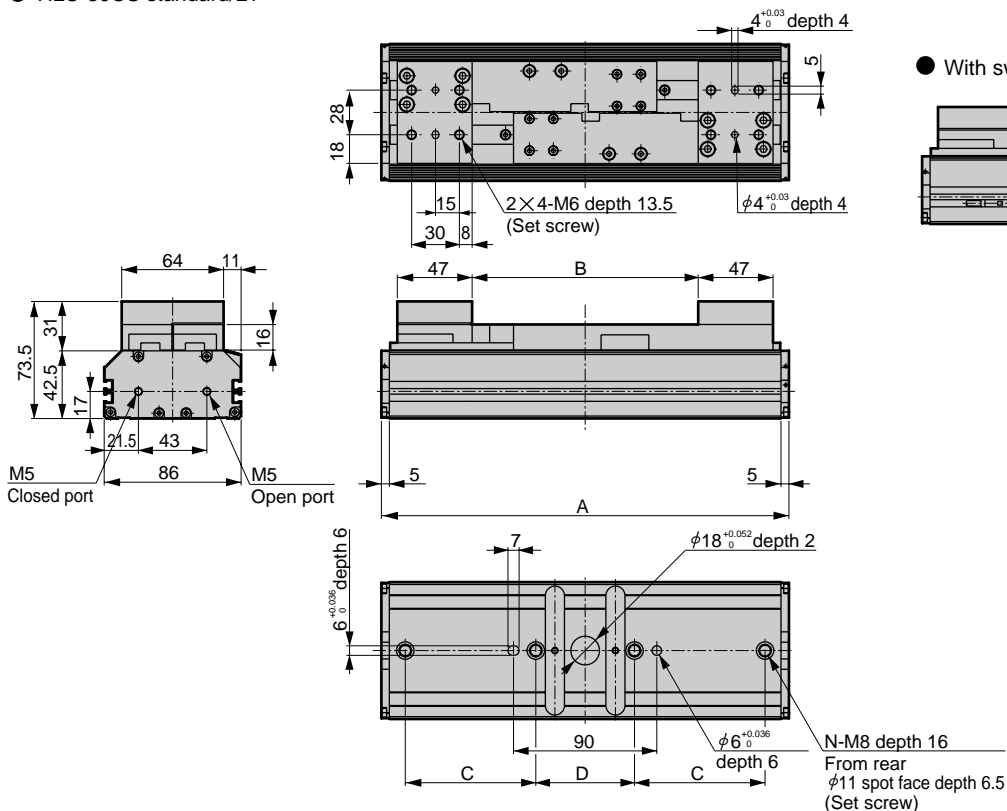


● With switch

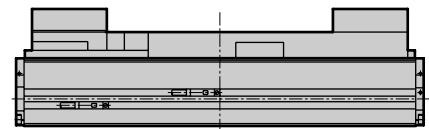


Symbol	A	B		C	D	N
		MAX	MIN			
Standard	152	62	2	0	122	2
L1	226	122	2	72	52	4

#### ● HLC-30CS standard/L1



● With switch



Symbol	A	B		C	D	N
		MAX	MIN			
Standard	174	72	2	0	144	2
L1	256	142	2	82	62	4

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- 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 long stroke parallel hand  
Hand



Long stroke parallel hand Double acting/single acting

# HGP Series

● Operational stroke length: 56mm



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

## Specifications

Descriptions	HGP
Size	3CS
Cylinder bore size mm	φ25
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
Operational stroke length mm	56
Rod diameter mm	φ10
Capacity of reciprocating cm <sup>3</sup>	11.8
Repeatability mm	±0.03
Product weight kg	0.85
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 <sup>2</sup>	
Lead wire	Standard 1m (oil resistant vinyl cable 2-conductor 0.2mm <sup>2</sup> )	Standard 1m (oil resistant vinyl cable 2-conductor 0.2mm <sup>2</sup> )

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)

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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**

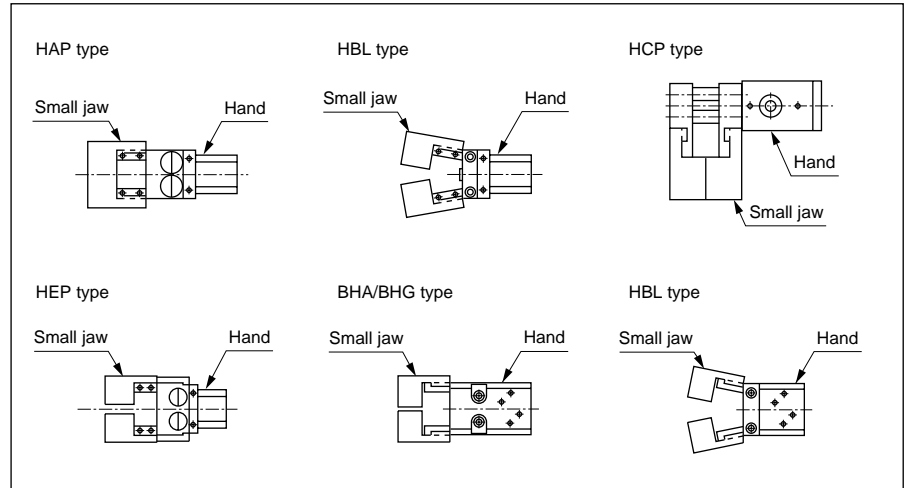
Standard section (socket and spigot section) machined.

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

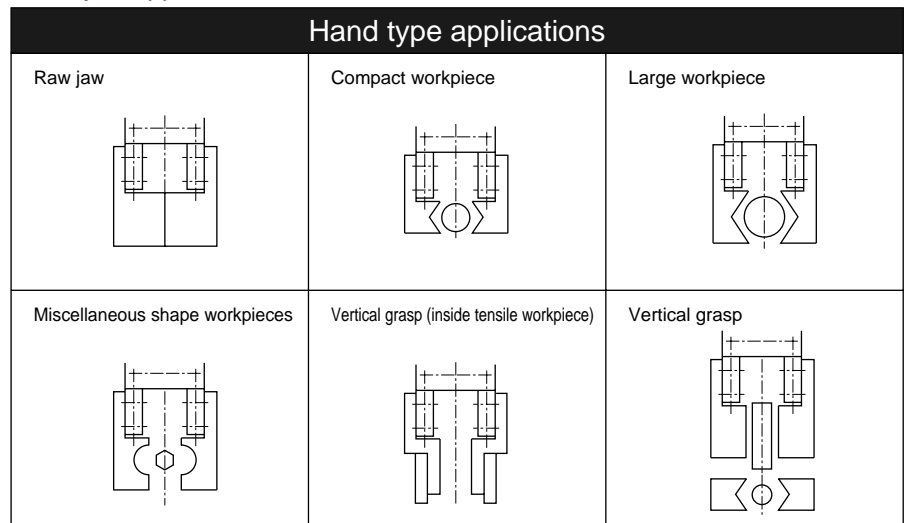
● **2 types of materials for small jaw**

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**

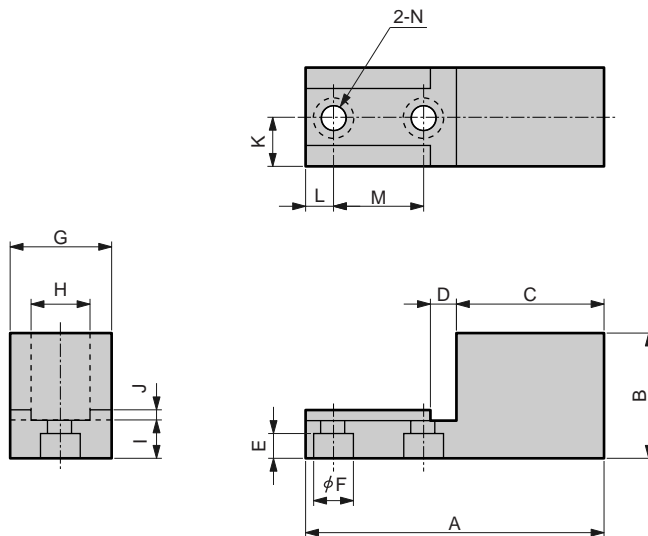
**A** Model      **B** Material      **C** Small jaw no.

A Model		B Material		C Small jaw no.			
Symbol	Descriptions	Symbol	Descriptions	Symbol	Applicable model	Symbol	Applicable model
<b>FH</b>	Feather hand (FH100/FH500)	<b>Y1</b>	Material S50C	<b>110</b>	HAP-1C	<b>210</b>	HEP-5CS
<b>HAP</b>	Parallel hand	<b>Y2</b>	Material MC nylon	<b>120</b>	HAP-2CS, HBL-2CS	<b>310</b>	FH110, FH510
<b>BHA</b>	Compact cross roller parallel hand			<b>130</b>	HAP-3CS, HBL-3CS	<b>320</b>	FH112, FH512
<b>BHG</b>	Compact cross roller parallel hand with rubber cover			<b>140</b>	HAP-4CS, HBL-4CS	<b>330</b>	FH116, FH516
<b>HEP</b>	Bearing parallel hand			<b>150</b>	HBL-1CS	<b>340</b>	FH120, FH520
<b>HCP</b>	Lateral parallel hand			<b>160</b>	HCP-2CS	<b>350</b>	FH125
<b>HBL</b>	Fulcrum hand			<b>170</b>	HCP-3CS	<b>260</b>	BHA-01CS1, BHG-01CS
				<b>180</b>	HCP-4CS	<b>270</b>	BHA-03CS1, BHG-03CS
				<b>190</b>	HEP-3.5CS	<b>280</b>	BHA-04CS1, BHG-04CS
				<b>200</b>	HEP-4CS	<b>290</b>	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 <sub>0</sub> <sup>+0.02</sup>	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															
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 <sup>+0.02</sup> <sub>-0.01</sub>	9	2	11	11	10	5.5	206
		Y2															
170	HCP-3CS	Y1	70	35	34	11.5	6	11	25	20 <sup>+0.02</sup> <sub>-0.01</sub>	10	2	12.5	8	20	6.5	303
		Y2															
180	HCP-4CS	Y1	80	40	42	13	6	11	35	25 <sup>+0.02</sup> <sub>-0.01</sub>	10	2	17.5	10	20	6.5	563
		Y2	78	44										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							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		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															
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															
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															
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															
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

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- FK

Ending

Hand