

* 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)	(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



Safety precautions

Always read this section before starting use.

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

Hand Series

Design & Selection

1. COMMON

⚠ WARNING

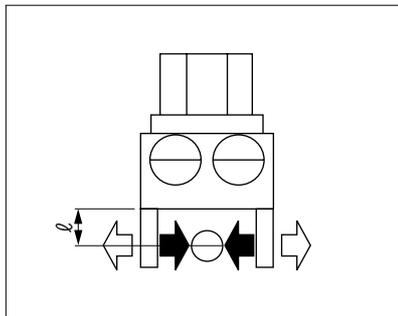
■ If the moving workpiece poses a possible risk to personnel or if fingers could be caught in the master key, etc., install a protective cover, etc.

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

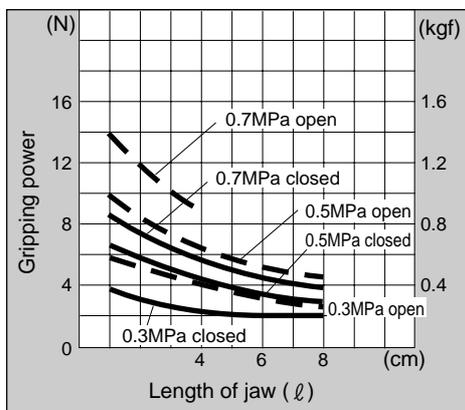
⚠ CAUTION

■ Cautions on gripping power

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



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



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

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

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

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 .

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

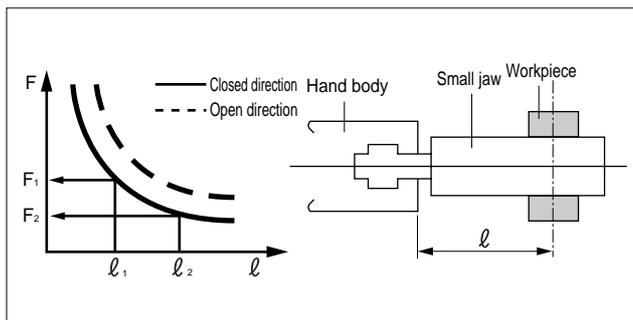
$$W \times 9.8 : (F \times N) = 1:10 \text{ (normal transfer)}$$

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

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

F : Gripping power (N)

N : Number of jaws



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

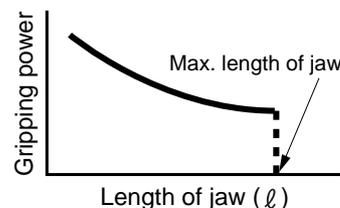
If the small jaw is long and heavy, inertia increases when opening and closing. This may cause play in the master key, and may adversely affect life.

- 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.

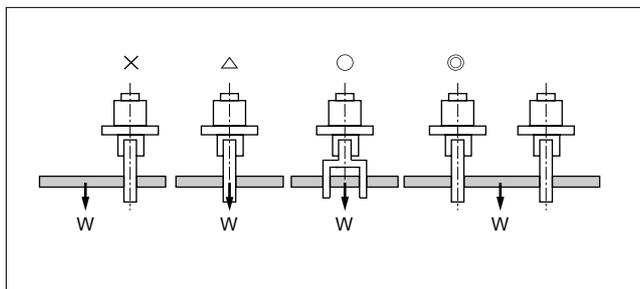
$$W < 1/4H \text{ (1 pc.)}$$

W : Weight of small jaw

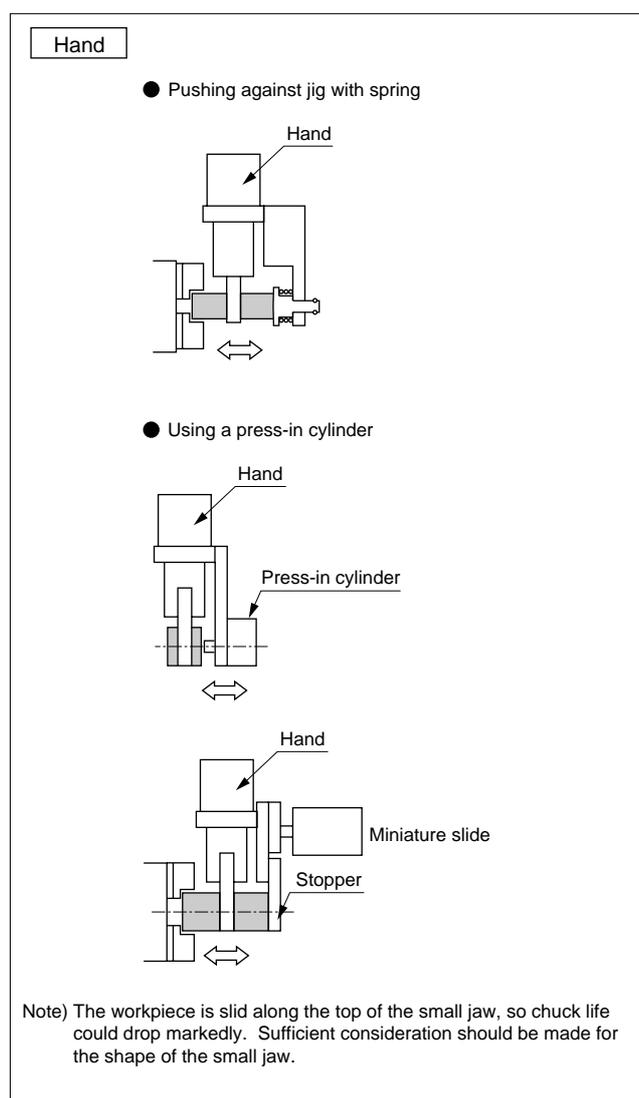
H : Product weight of hand



- 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
HBL
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

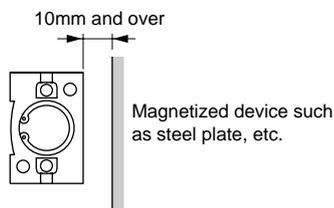
Installation & Adjustment

1. COMMON

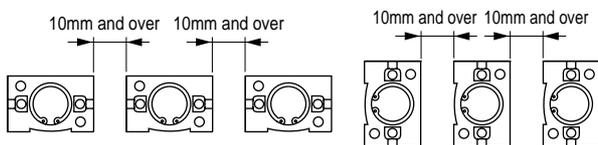
CAUTION

■ 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.

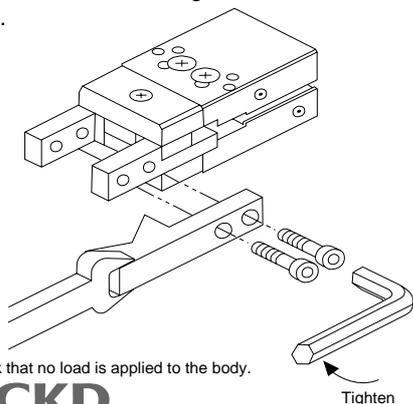


■ If the clamp is operated carefully and slowly as possible, accuracy increases. Repeatability also stabilizes.

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

Installing the jaw

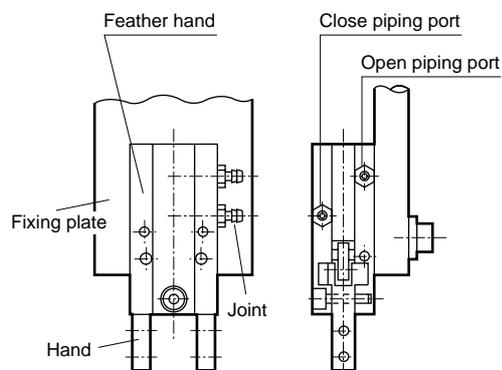
To prevent any effect onto the hand, support the master key with a wrench, etc., and tighten so that the master key is not twisted.



2. Installation

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

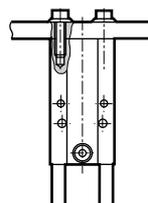
■ If there is a limit to the thickness direction of the FH series body, the available piping joint will be limited. Refer to the following joints.



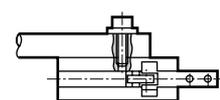
Model	FH*10	FH*12	FH*16	FH*20	FH*25	
Port size	M3			M5		
Joint	Model no.	Applicable O.D. (mm)	Effective sectional area (mm ²)	Model no.	Applicable O.D. (mm)	Effective sectional area (mm ²)
Barbed joint	Straight FTS			-		
	FTS4-M3	φ3.2·φ4	0.4	FTS4-M5	φ3.2·φ4	2.1
	-	-	-	FTS6-M5	φ6	4.1

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

● Top installation



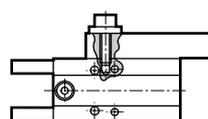
● Front installation



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

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



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	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			0.1		
Ambient temperature °C	5 to 60					
Port size	M5					
Operational stroke length mm	15	20	25	13	18	23
Capacity of reciprocating cm ³	1.69	3.53	7.85	1.47	3.18	7.22
Repeatability mm	±0.03			±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 μA or less
Maximum shock resistance	980m/s ²	

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 ²	

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

How to order

Without switch

HLA - 12CS

With switch

HLA - 12CS - K2H - R

A Model no.

B Size

C Switch model no.
Note 1

D Switch quantity

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

⚠ Note on model no. selection

Note 1: 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**)

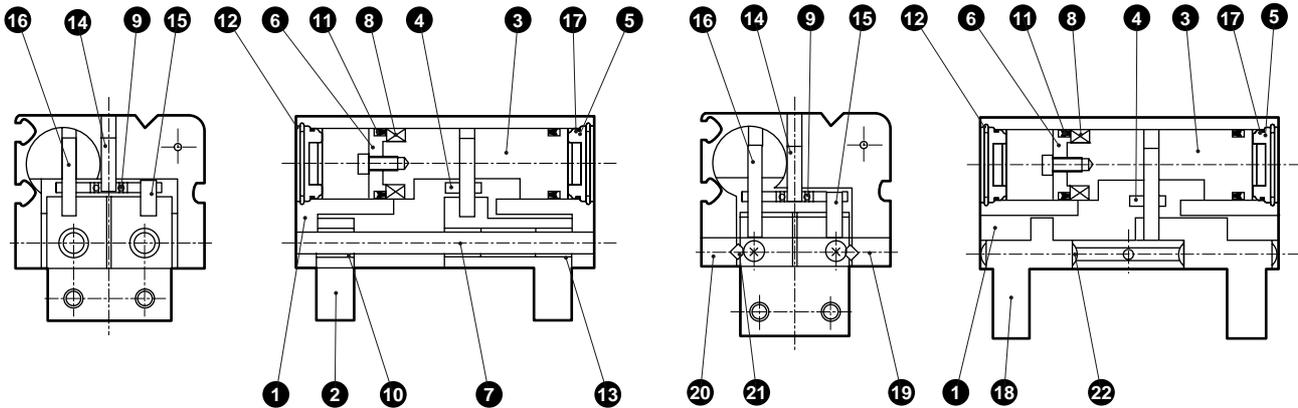
RRC
GRC
RV3*
NHS
HR
LN
FH100
HAP
BSA2
BHA/BHG
LHA
LHAG
HKP
HLA/HLB
HLAG/HLBG
HEP
HCP
HMF
HMFB
HFP
HLC
HGP
FH500
HLB
HDL
HMD
HJL
BHE
CKG
CK
CKA
CKS
CKF
CKJ
CKL2
CKL2*-HC
CKH2
CKLB2
NCK/SCK/FCK
FJ
FK
Ending

Thin parallel hand
Hand

Internal structure and parts list

● HLA-12CS to 20CS

● HLB-12CS to 20CS

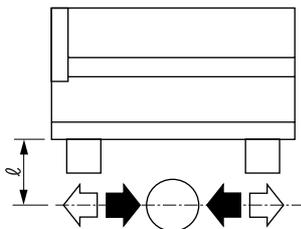


No.	Parts name	Material	Remarks	No.	Parts name	Material	Remarks
1	Body	Aluminum alloy		12	Snap ring	Stainless steel	
2	Master key	Aluminum alloy		13	Bush	Sintering oil impregnated alloy	
3	Piston	Stainless steel		14	Parallel pin	Steel	
4	Cam	Stainless steel		15	Needle roller A	Alloy steel	
5	Cylinder 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

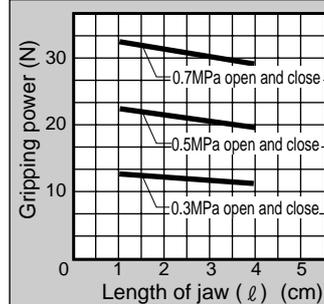
Gripping power that functions to open and closed directions with jaw length ℓ of hand at supply pressure 0.3, 0.5 and 0.7 MPa is shown.

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

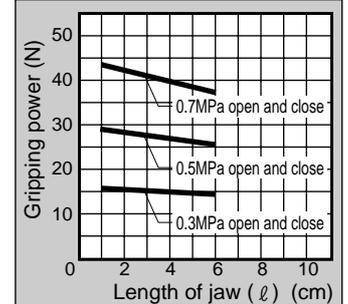


(Note) Grip performance data indicates the grip for one jaw. Since two jaws are used, double the grip in the graph when making a selection.

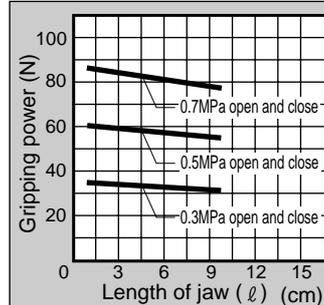
● HLA-12CS



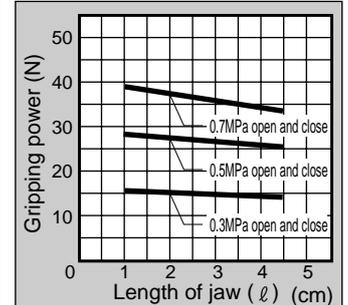
● HLA-15CS



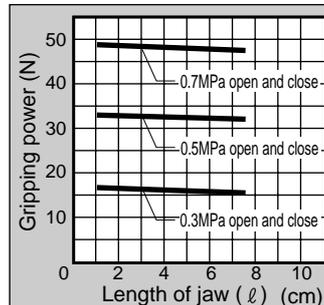
● HLA-20CS



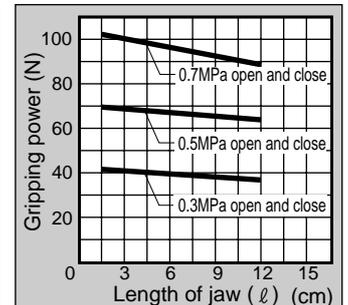
● HLB-12CS



● HLB-15CS



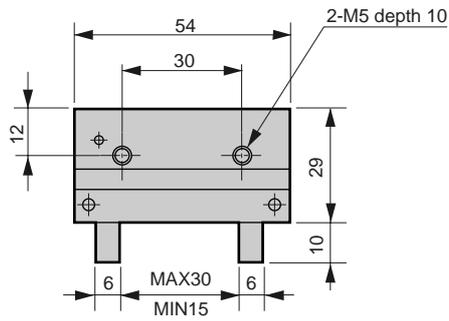
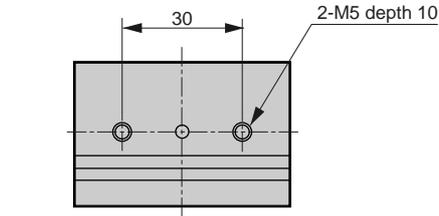
● HLB-20CS



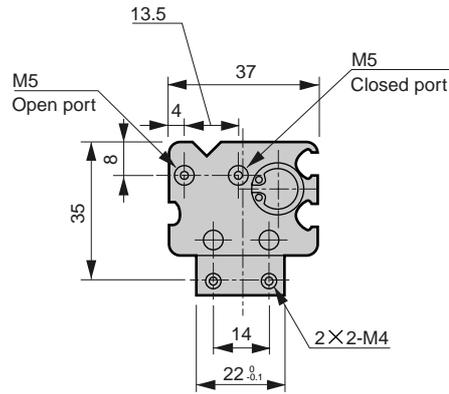
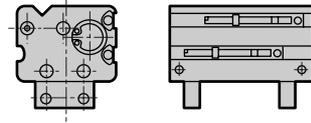
Dimensions



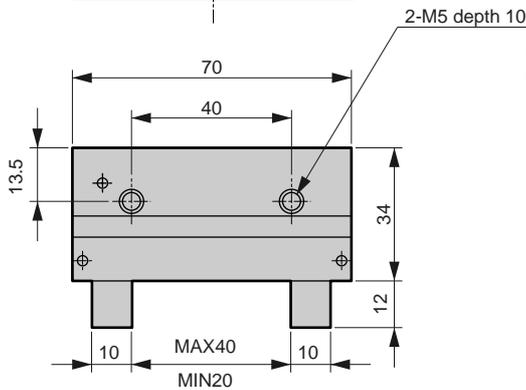
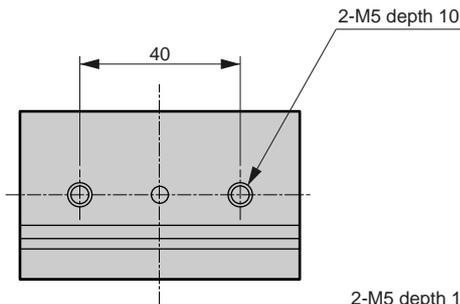
● HLA-12CS standard



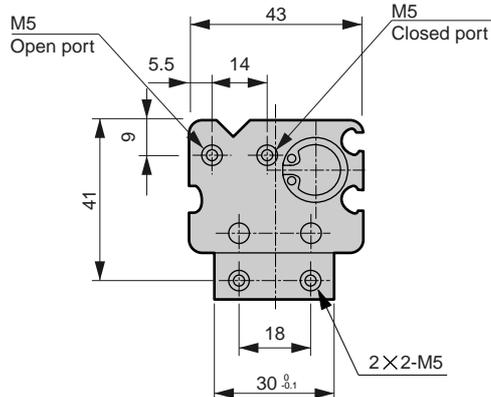
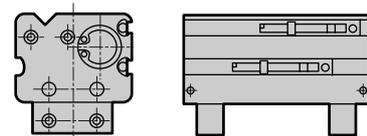
● With switch



● 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

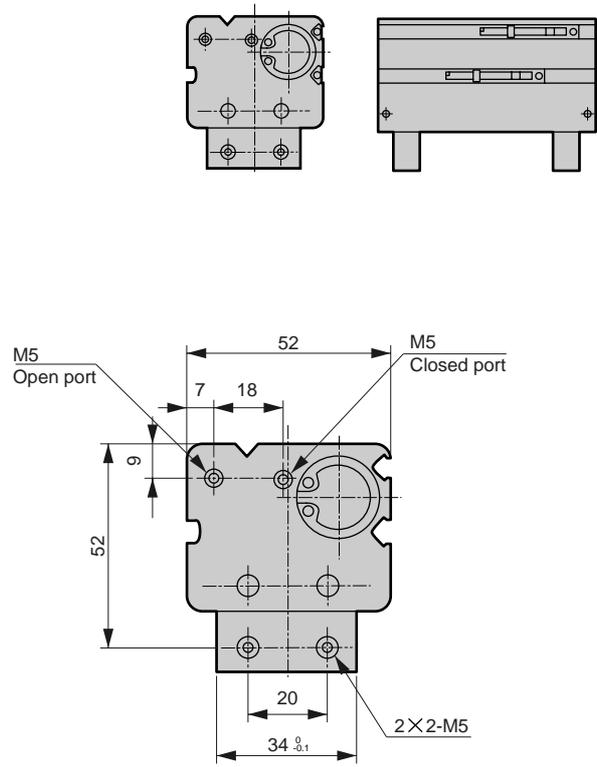
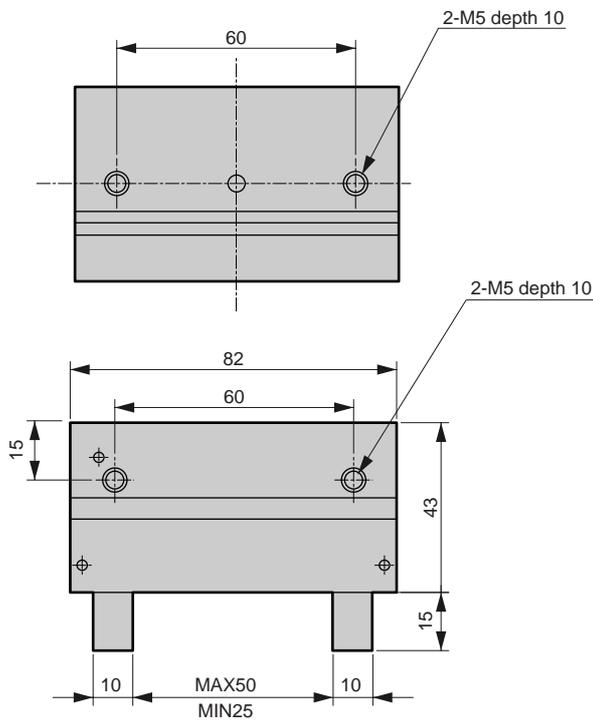
Dimensions



● HLA-20CS standard

● With switch

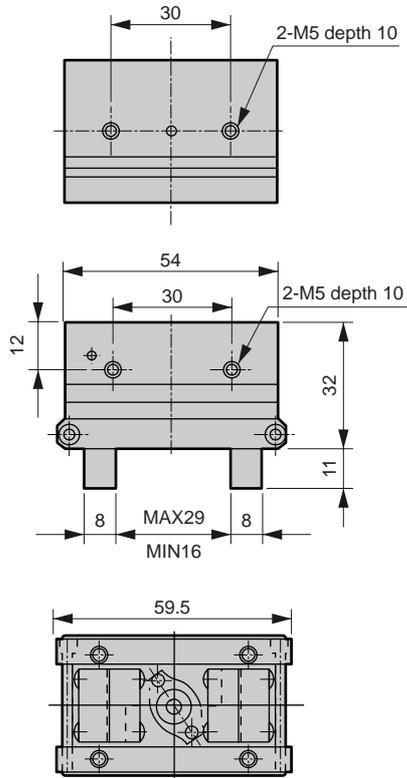
- RRC
- GRC
- RV3*
- NHS
- HR
- LN
- FH100
- HAP
- BSA2
- BHA/
BHG
- LHA
- LHAG
- HKP
- HLA/
HLB
- HLAG/
HLBG
- HEP
- HCP
- HMF
- HMFB
- HFP
- HLC
- HGP
- FH500
- HBL
- HDL
- HMD
- HJL
- BHE
- CKG
- CK
- CKA
- CKS
- CKF
- CKJ
- CKL2
- CKL2
-*HC
- CKH2
- CKLB2
- NCK/
SCK/FCK
- FJ
- FK
- Ending



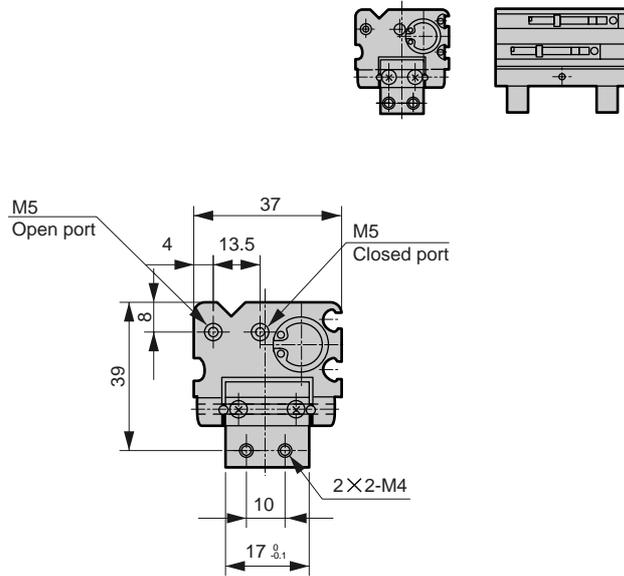
Dimensions



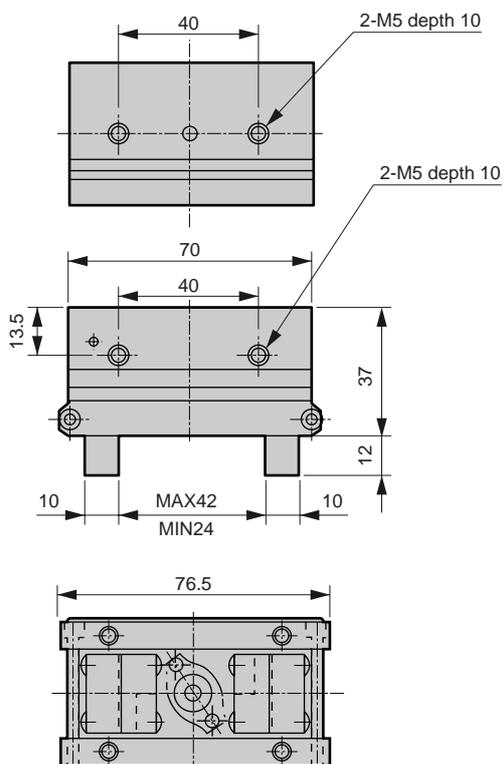
● HLB-12CS standard



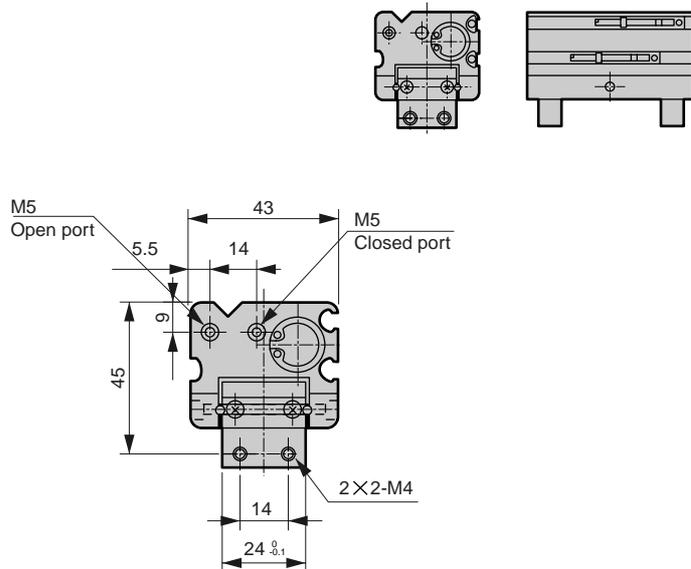
● With switch



● HLB-15CS standard



● With switch



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
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

