



Fulcrum hand Double acting/single acting

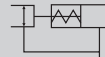
HBL Series

● Open/close angle: -5° to 20°

Double acting

Single acting (normally open)

Single acting (normally closed)



Specifications

Item	HBL			
	1C	2CS	3CS	4CS
Size	1C	2CS	3CS	4CS
Bore size mm	$\varnothing 15$	$\varnothing 20$	$\varnothing 25$	$\varnothing 40$
Actuation	Double acting/single acting			
Working fluid	Compressed air			
Max. working pressure MPa	0.7 (≈ 100 psi, 7 bar)			
Min. working pressure MPa	0.3 (≈ 44 psi, 3 bar)			
Ambient temperature $^{\circ}\text{C}$	5 (41°F) to 60 (140°F)			
Port size	M5			Rc1/8
Open and close angle $^{\circ}$	-5 to 20			
Rod diameter mm	$\varnothing 8$	$\varnothing 10$	$\varnothing 12$	$\varnothing 14$
Volumetric capacity (reciprocating) cm^3	0.5	2.2	4.3	14.2
Repeatability mm	± 0.03			
Weight kg	0.09	0.22	0.39	0.82
Lubrication	Not required (use turbine oil class 1 ISO VG32 if necessary for lubrication)			

Switch specifications

Item	Proximity 2-wire	Proximity 3-wire
	T2H/V	T3H/V
Applications	Dedicated for programmable controller	For programmable controller, relay
Output method	-	NPN output
Power supply voltage	-	10 to 28 VDC
Load voltage/current	10 to 30 VDC, 5 to 20 mA (*1)	30 VDC or less, 100 mA or less
Indicator	LED (Lit when ON)	
Leakage current	1 mA or less	10 μA or less
Weight	1 m:18 g 3 m:49 g 5 m:80 g *3	

*1 : The above max. load current is 20 mA at 25°C .

The current is lower than 20 mA if the operating ambient temperature around the switch is higher than 25°C . (5 to 10 mA at 60°C)

*2 : Refer to Ending Page 1 for detailed switch specifications and dimensions.

*3 : The weight of switch mounting bracket is 1.5 g.

LCM
LCR
LCG
LCW
LCX
STM
STG
STS/STL
STR2
UCA2
ULK*
JSK/M2
JSG
JSC3/JSC4
USSD
UFGD
USC
UB
JSB3
LMB
LML
HCM
HCA
LBC
CAC4
UCAC2
CAC-N
UCAC-N
RCS2
RCC2
PCC
SHC
MCP
GLC
MFC
BBS
RRC
GRC
RV3*
NHS
HRL
LN
Hand
Chuk
MecHnd/Chuk
ShkAbs
FJ
FK
SpdContr
Ending
LSH-HP
LSH
FH100
BSA2
BHA/BHG
LHA
LHAG
HAP
HKP
HCP
HGP
HLF2
HLA/HLB
HLAG/HLBG
HLC
HLD
HMF
HMF-G
HMF-B
HFP
FH500
HBL
HJL
HMD
HDL
HJD
BHE

How to order

Without switch (built-in magnet for switch)

HBL - 2CS - O

With switch (built-in magnet for switch)

HBL - 2CS - O - T2H - R

A Size

B Option
*1

C Switch model No.

D Switch quantity
*2

Code	Description					
A Size						
1C						
2CS						
3CS						
4CS						
B Option						
Blank	Standard (double acting)					
O	Single acting (normally open)					
C	Single acting (normally closed)					
Y1	With attachment (S50C)					
Y2	With attachment (MC nylon)					
C Switch model No.						
Lead wire	Lead wire	Contact	Voltage		Lead wire	
Straight type	L-shaped type		AC	DC		
T2H*	T2V*	Proximity		●	1-color	2-wire
T3H*	T3V*		●	LED	3-wire	
* Lead wire length						
Blank	1 m (standard)					
3	3 m (option)					
5	5 m (option)					
D Switch quantity						
R	1 on open side					
H	1 on closed side					
D	2					

⚠ Precautions for model No. selection

*1 : Refer to pages 1762 and 1763 for the dimensions and compatible model of the attachment.
When ordered as an option, two are attached at shipment.

*2 : If **A** Size is "1C", switch mounting cannot be selected.

[Example of model No.]

HBL-2CS-O-T2H-R

Model: Fulcrum hand

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

How to order switch

● For switch T*H*

- Switch body + mounting bracket set

HBL - T2H

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

- Switch body

SW - T2H

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

- Mounting bracket set

HBL - T

● For switch T*V*

- Switch body + mounting bracket set

HBL - T2V - *

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

- Switch body

SW - T2V

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

- Mounting bracket set

HBL - TV - *

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

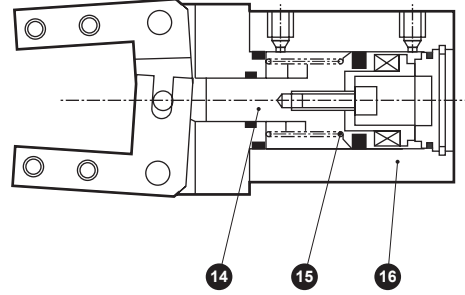
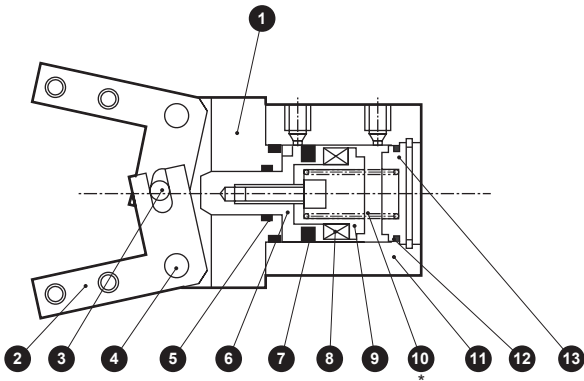
However, for Size 2CS, specify H (closed side) regardless of the switch mounting position.

LCM
LCR
LCG
LCW
LCX
STM
STG
STS/STL
STR2
UCA2
ULK*
JSK/M2
JSG
JSC3/JSC4
USSD
UFCD
USC
UB
JSB3
LMB
LML
HCM
HCA
LBC
CAC4
UCAC2
CAC-N
UCAC-N
RCS2
RCC2
PCC
SHC
MCP
GLC
MFC
BBS
RRC
GRC
RV3*
NHS
HRL
LN
Hand
Chuk
MechHnd/Chuk
ShkAbs
FJ
FK
SpdContr
Ending
LSH-HP
LSH
FH100
BSA2
BHA/BHG
LHA
LHAG
HAP
HKP
HCP
HGP
HLF2
HLA/HLB
HLAG/HLBG
HLC
HLD
HMF
HMF-G
HMFB
HFP
FH500
HBL
HJL
HMD
HDL
HJD
BHE

Internal structure and parts list

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

● C (normally closed)



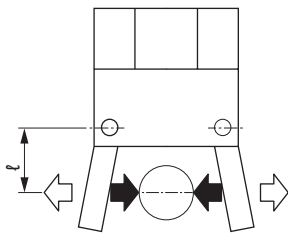
* Standard (double acting) does not contain ● spring.

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

Gripping force performance data

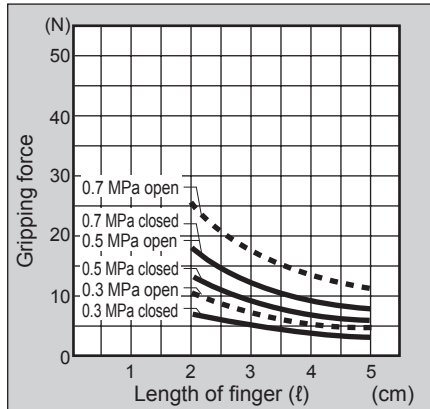
- Gripping force represents the thrust (per finger) in the arrow direction shown in the figure.
- The gripping force in the opening/closing directions with finger length L of hand with a supply pressure of 0.3, 0.5 and 0.7 MPa is shown.

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

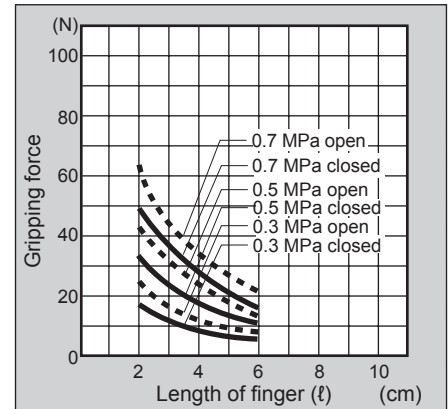


(Note) O type gripping force decreases approximately 20 to 30% in the closed direction compared to double acting. C type gripping force decreases approximately 10 to 20% in the open direction compared to the double acting. When making a selection, read the precautions for design and selection on page 1764.

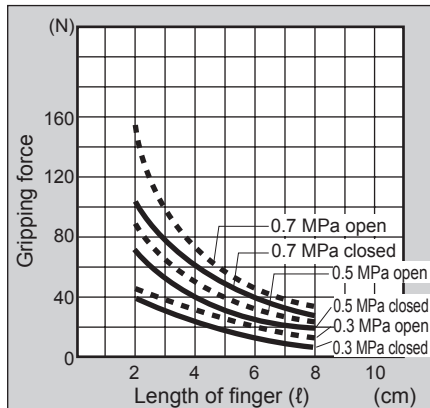
● HBL-1C



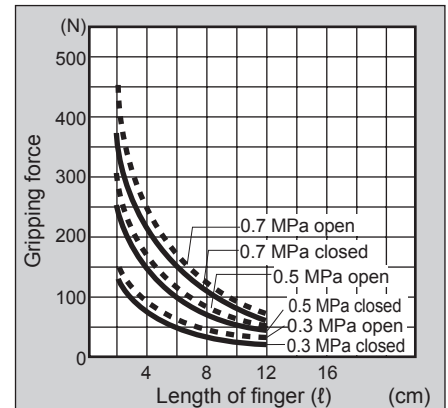
● HBL-2CS



● HBL-3CS

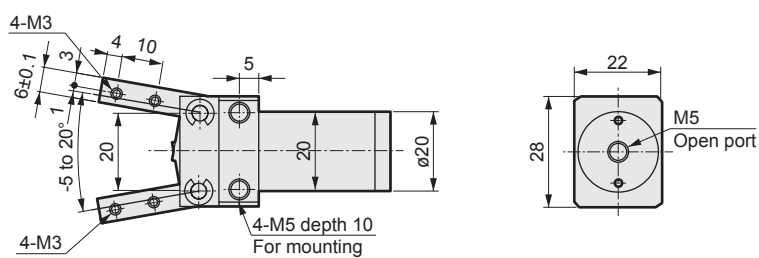
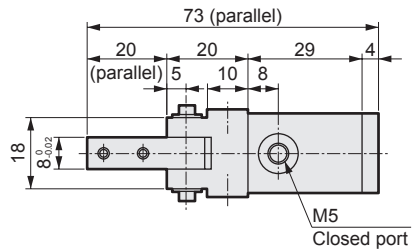


● HBL-4CS



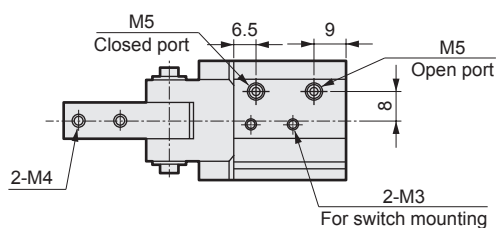
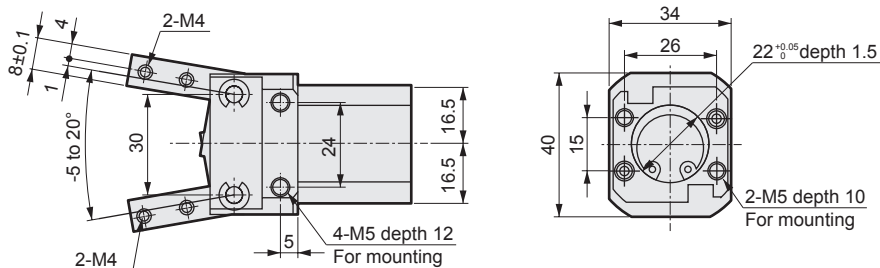
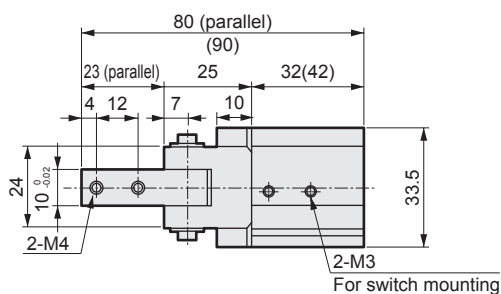
Dimensions

● HBL-1C Standard/O/C

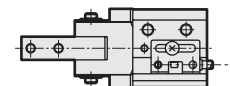
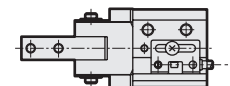
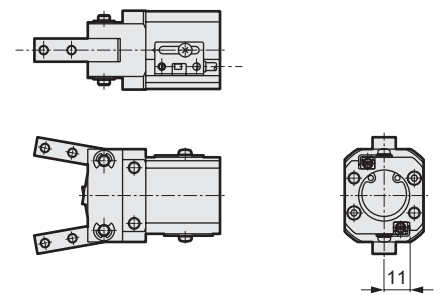


● HBL-2CS Standard/O/C

● Dimensions in () are for C [normally closed] specifications.



● With switch



LCM
LCR
LCG
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STM
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STS/STL
STR2
UCA2
ULK*
JSK/M2
JSG
JSC3/JSC4
USSD
UFCD
USC
UB
JSB3
LMB
LML
HCM
HCA
LBC
CAC4
UCAC2
CAC-N
UCAC-N
RCS2
RCC2
PCC
SHC
MCP
GLC
MFC
BBS
RRC
GRC
RV3*
NHS
HRL
LN

Hand

Chuk
MechHnd/Chuk
ShkAbs
FJ
FK
SpdContr

Ending

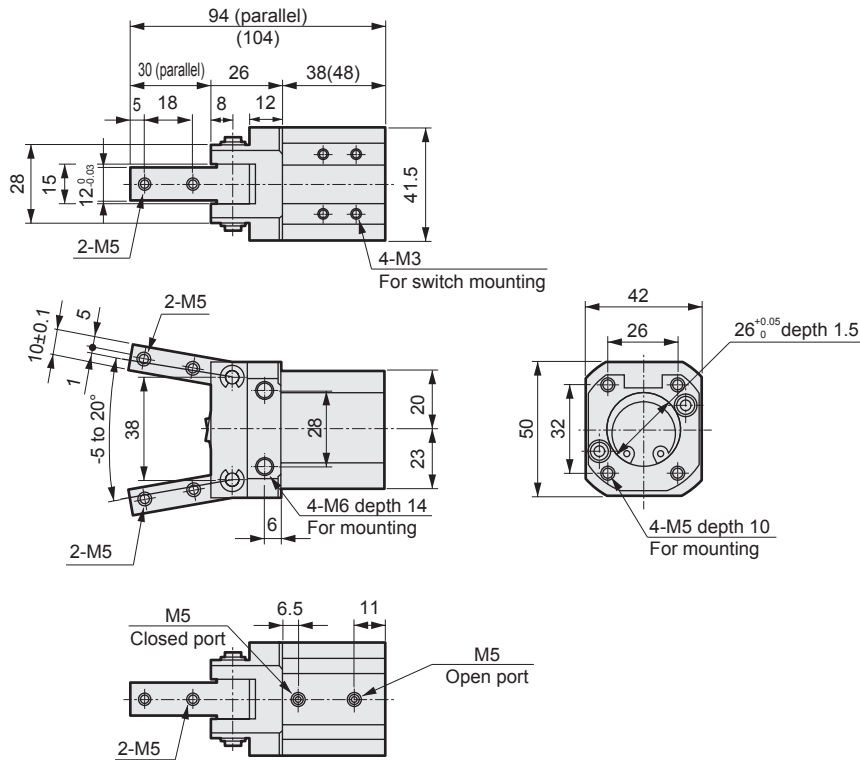
LSH-HP
LSH
FH100
BSA2
BHA/BHG
LHA
LHAG
HAP
HKP
HCP
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HLAG/HLBG
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HMFB
HFP
FH500
HBL
HJL
HMD
HDL
HJD
BHE

Dimensions

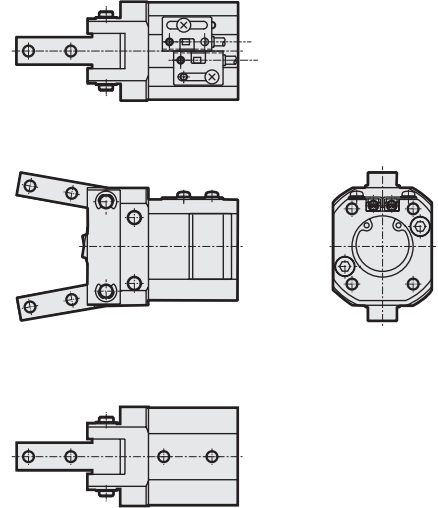


● HBL-3CS Standard/O/C

● Dimensions in () are for C [normally closed] specifications.

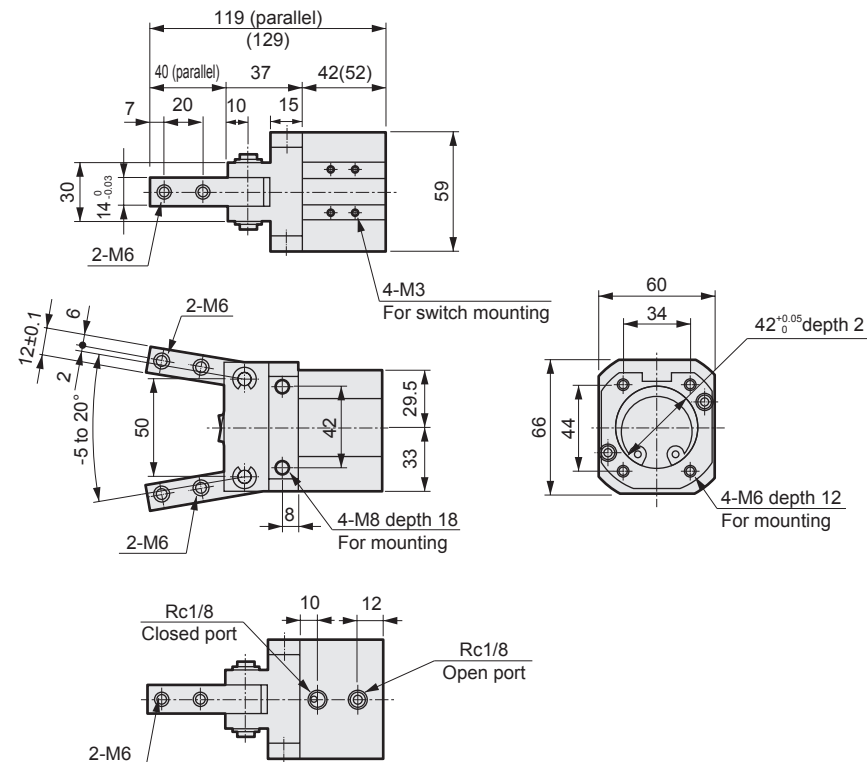


● With switch

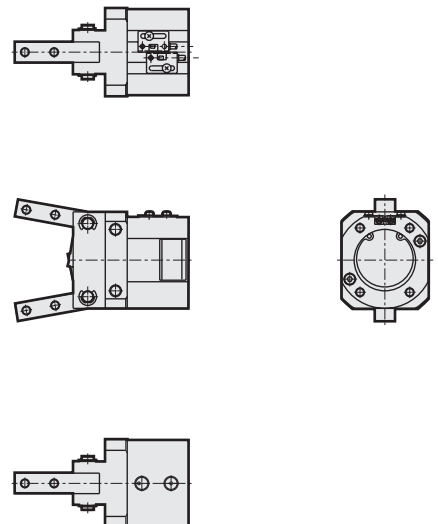


● HBL-4CS Standard/O/C

● Dimensions in () are for C [normally closed] specifications.



● With switch



LCM
LCR
LCG
LCW
LCX
STM
STG
STS/STL
STR2
UCA2
ULK*
JSK/M2
JSG
JSC3/JSC4
USSD
UFCD
USC
UB
JSB3
LMB
LML
HCM
HCA
LBC
CAC4
UCAC2
CAC-N
UCAC-N
RCS2
RCC2
PCC
SHC
MCP
GLC
MFC
BBS
RRC
GRC
RV3*
NHS
HRL
LN
Hand
Chuk
MecHnd/Chuk
ShkAbs
FJ
FK
SpdContr
Ending
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