

LCM
 LCR
 LCG
 LCW
 LCX
 STM
 STG
 STS/STL
 STR2
 UCA2
 ULK*
 JSK/M2
 JSG
 USC3/USC4
 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
 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



Compact cross roller parallel hand Double acting/single acting

BHA Series

● Operating stroke length: 5, 9, 11, 15 mm

Double acting



Single acting (normally open)



Single acting (normally closed)



Specifications

Item		BHA			
Size		01CS1	03CS1	04CS1	05CS1
Bore size	mm	ø12	ø16	ø20	ø25
Actuation		Double acting/single acting			
Working fluid		Compressed air			
Max. working pressure		0.7 (≈100 psi, 7 bar)			
Min. working pressure MPa	Double acting	0.1 (≈15 psi, 1 bar)			
	Normally open	0.3 (≈44 psi, 3 bar)			
	Normally closed				
Ambient temperature		5 (41°F) to 60 (140°F)			
Port size		M3	M5		
Operating stroke length	mm	5	9	11	15
Rod diameter	mm	ø6	ø8	ø10	ø12
Volumetric capacity (reciprocating)	cm ³	0.32	1.58	2.89	6.32
Repeatability	mm	±0.01			
Weight	kg	0.100	0.145	0.253	0.420
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 lamp	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	

*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.

* The BHA-LN Series with length measuring function (length measuring sensor) is also available. Refer to page 1465 for details.

How to order

Without switch (built-in magnet for switch)

BHA - 01CS1 - O

With switch (built-in magnet for switch)

BHA - 01CS1 - O - T2H - R

A Size

B Option
*1

C Switch model No.
* indicates the lead wire length.

D Switch quantity

⚠ Precautions for model No. selection

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

[Example of model No.]

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 1 m
- D** Switch quantity : 1 on open side

How to order switch

SW - T2H

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

Specifications for rechargeable battery (Catalog No. CC-1226A)

BHA - ... - P4* ● Design compatible with rechargeable battery manufacturing process.

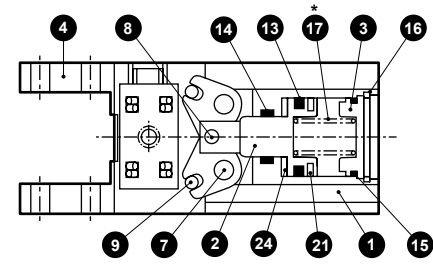
* Contact CKD for details.

Code	Description					
A Size						
01CS1						
03CS1						
04CS1						
05CS1						
B Option						
Blank	Standard (double acting)					
O	Single acting (normally open)					
C	Single acting (normally closed)					
Y1	With attachment (Material S50C)					
Y2	With attachment (Material MC nylon)					
C Switch model No.						
Axial lead wire	Radial lead wire	Contact Proximity	Voltage		Display	Lead wire
			AC	DC		
T2H*	T2V*				●	1-color display
T3H*	T3V*			●	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					

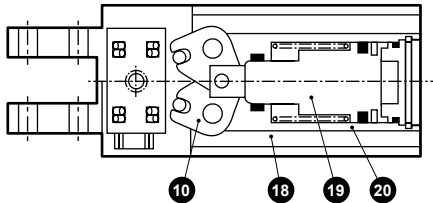
LCM
LCR
LCG
LCW
LCX
STM
STG
STS/STL
STR2
UCA2
ULK*
JSK/M2
JSG
JSC3/JSC4
USSD
UFCD
USC
UB
JSB3
LMB
LML
HCM
HCA
LBC
CAC4
UCAC2
CAC-N
UCAC-N
RCS2
RCC2
PCC
SHC
MCP
GLC
MFC
BBS
RRC
GRC
RV3*
NHS
HRL
LN
Hand
Chuk
MedHnd/Chuk
ShkAbs
FJ
FK
SpdContr
Ending
LSH-HP
LSH
FH100
BSA2
BHA/BHG
LHA
LHAG
HAP
HKP
HCP
HGP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

Internal structure and parts list

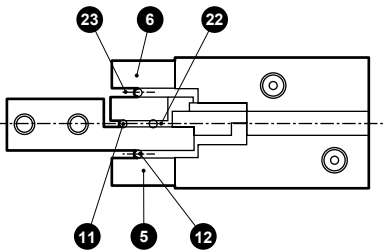
Standard (double acting)/
O (normally open)



C (normally closed)



* Standard (double acting) does not contain a 17 spring.



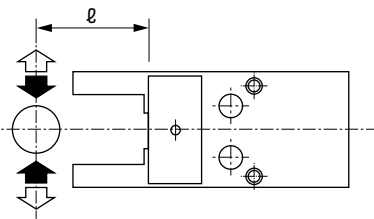
Cannot be disassembled

No.	Part name	Material	Remarks	No.	Part name	Material	Remarks
1	Body	Aluminum alloy		13	Piston packing	Nitrile rubber	
2	Piston	Stainless steel		14	Rod packing	Nitrile rubber	
3	Cylinder guard	Acetal resin		15	Cylinder gasket	Nitrile rubber	
4	Finger	Steel		16	Snap ring		
5	Bearing guide A	Steel		17	Spring	Stainless steel	O type only
6	Bearing guide B	Steel		18	Body	Aluminum alloy	
7	Fulcrum axis	Steel		19	Piston	Stainless steel	
8	Operation shaft A	Steel		20	Spring	Stainless steel	
9	Operation shaft 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

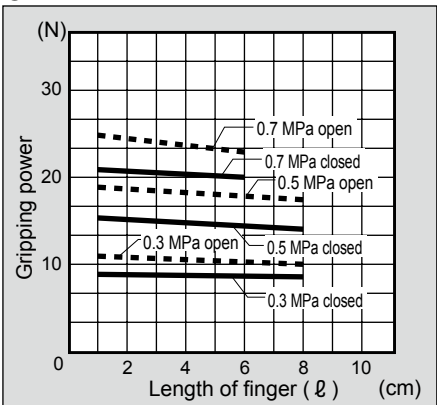
- Gripping power represents the thrust (per one finger) in the arrow direction shown in the figure.
- The gripping power in the opening/closing directions with finger length L of hand with a supply pressure of 0.3, 0.5 and 0.7 MPa is shown.

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

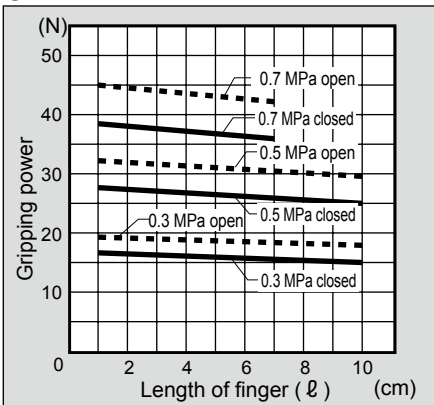


(Note) O type gripping power decreases approximately 20 to 30% in the closed direction compared to double acting. C type gripping power decreases approximately 10 to 20% in the open direction compared to the double acting. When making a selection, read the precautions for design and selection on page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

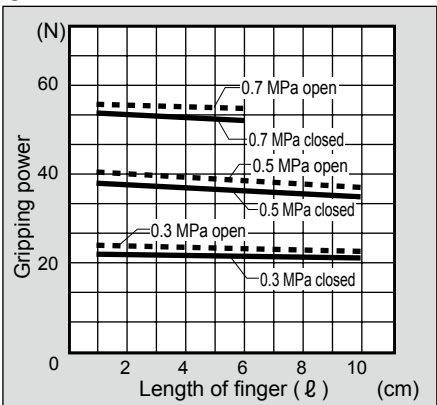
● BHA-01CS1



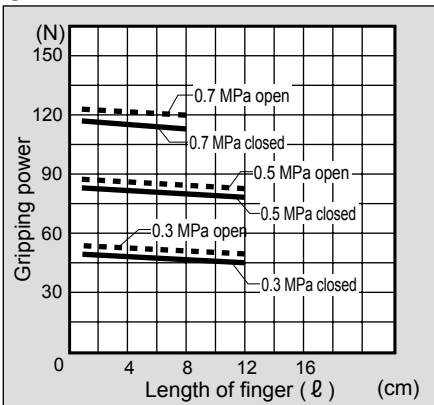
● BHA-03CS1



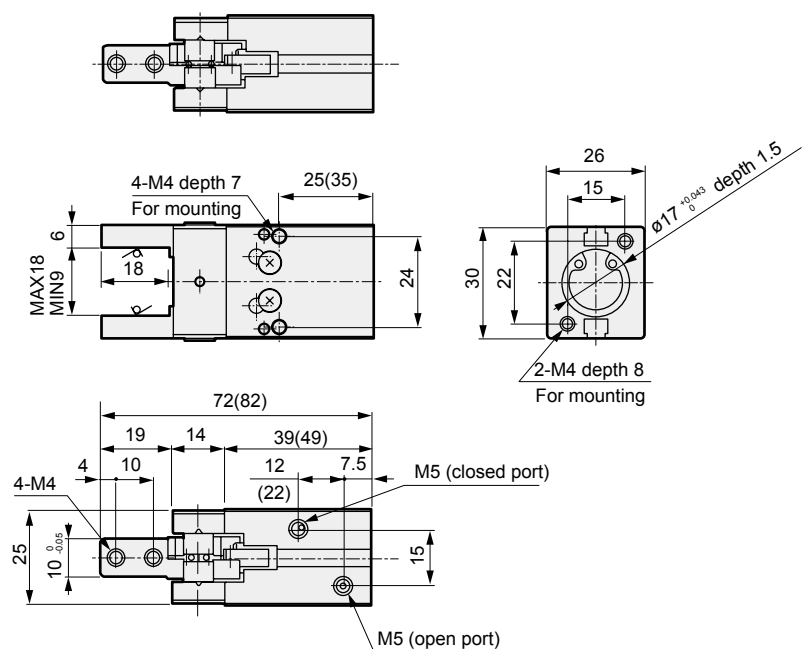
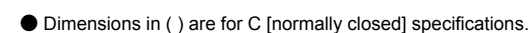
● BHA-04CS1



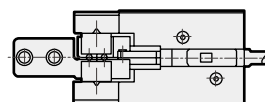
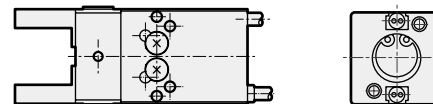
● BHA-05CS1



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

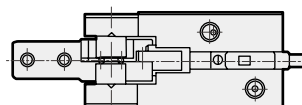
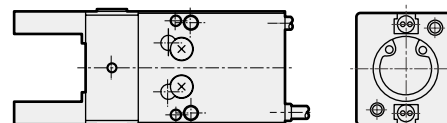


Technical drawing of a mechanical assembly showing a cross-section of a shaft with a key and a nut. The drawing includes dimension lines and labels for various components and measurements.



Note: When using T□H or T□V, the switches of both project from the end face of body head side.

A technical drawing of a shaft-hub assembly. The shaft is shown with a keyway and a key. The hub has a corresponding keyway. The drawing is a cross-section view, showing the internal features of the shaft and hub. The shaft is labeled with a diameter of $\varnothing 30$ and a length of 100. The hub is labeled with a diameter of $\varnothing 30$ and a length of 100. The key is labeled with a width of 10 and a height of 8.

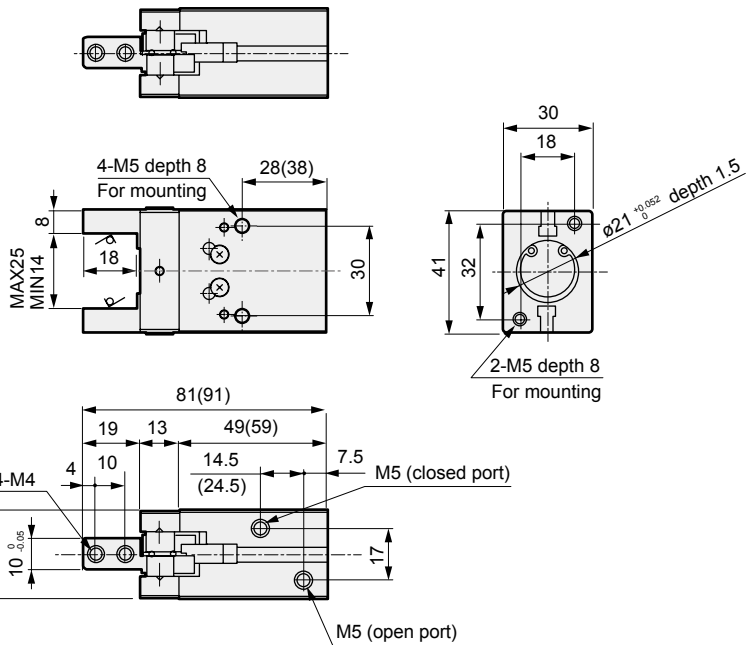


Note: When using T□H or T□V, the switches of both project from the end face of body head side.

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	
HLB	
HJL	
HMD	
HDL	
HJD	
BHF	

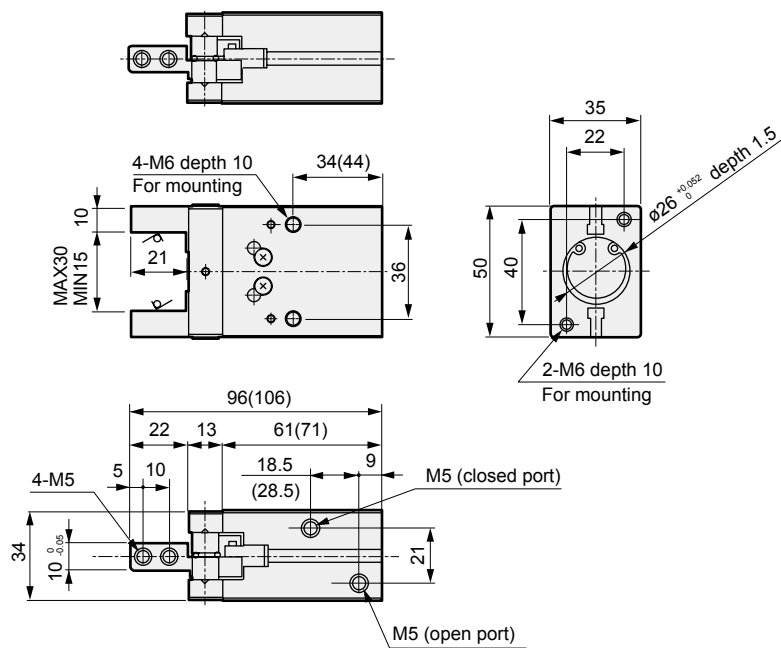
● BHA-04CS1 standard/O/C

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

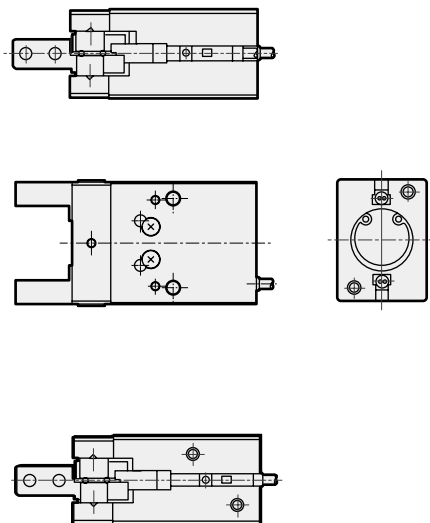


● BHA-05CS1 standard/O/C

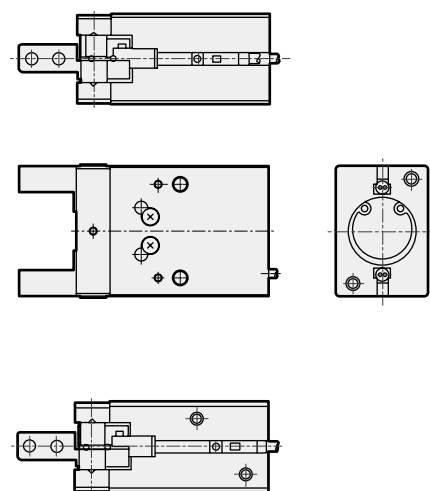
● Dimensions in () are for C [normally closed] specifications.



- With switch



● With switch



LCM
LCR
LCG
LCW
LCX
STM
STG
STS/STL
STR2
UCA2
ULK*
JSK/M2
JSG
JSC3/JSC
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
LSH-HP
LSH
FH100
BSA2
BHA/BHG
LHA
LHAG
HAP
HAK
HCP
HGP
HLF2
HLA/HLB
HLAG/HLBG
HLC
HLD
HMF
HMF-G
HMFB
HFP
FH500
HBL
HJL
HMD
HDL
HJD
BHE

MEMO

LCM
LCR
LCG
LCW
LCX
STM
STG
STS/STL
STR2
UCA2
ULK*
JSK/M2
JSG
JSC3/JSC4
USSD
UFCD
USC
UB
JSB3
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HCM
HCA
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CAC4
UCAC2
CAC-N
UCAC-N
RCS2
RCC2
PCC
SHC
MCP
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MechHnd/Chuk
ShkAbs
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JSC3/JSC4
USSD
UFCD
USC
UB
JSB3
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CAC4
UCAC2
CAC-N
UCAC-N
RCS2
RCC2
PCC
SHC
MCP
GLC
MFC
BBS
RRC
GRC
RV3*
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ShkAbs
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LHAG
HAP
HKP
HCP
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HLF2
HLA/HLB
HLAG/HLBG
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HMF
HMF-G
HMF-B
HFP
FH500
HBL
HJL
HMD
HDL
HJD
BHE



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

BHG Series

● Operating stroke length: 5, 9, 11, 15 mm

Double acting



Single acting (normally open)



Single acting (normally closed)



Specifications

Item		BHG			
Size		01CS	03CS	04CS	05CS
Bore size	mm	ø12	ø16	ø20	ø25
Actuation		Double acting/single acting			
Working fluid		Compressed air			
Max. working pressure		0.7 (≈100 psi, 7 bar)			
Min. working pressure	Double acting	0.15 (≈22 psi, 1.5 bar)			
	Normally open	0.3 (≈44 psi, 3 bar)			
	Normally closed				
MPa					
Ambient temperature		5 (41°F) to 60 (140°F)			
Port size		M3	M5		
Operating stroke length	mm	5	9	11	15
Rod diameter	mm	ø6	ø8	ø10	ø12
Volumetric capacity (reciprocating)	cm ³	0.32	1.58	2.89	6.32
Repeatability	mm	±0.01			
Weight	kg	0.118	0.165	0.238	0.455
Lubrication		Not required (use turbine oil class 1 ISO VG32 if necessary for lubrication)			

Switch specifications and variations

Item	Proximity 2-wire	Proximity 3-wire
	T2H/V	T3H/V
Applications	Dedicated for programmable controller	For programmable controller, relay
Output method	—	Output method
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 lamp	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	

*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.

* The BHG-LN Series with length measuring function (length measuring sensor) is also available.
Refer to page 1465 for details.

How to order

Without switch (built-in magnet for switch)

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

With switch (built-in magnet for switch)

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

A Size

B Option
*1

C Switch model No.

D Switch quantity

Code	Description					
A Size						
01CS						
03CS						
04CS						
05CS						
B Option						
Blank	Standard (double acting)					
O	Single acting (normally open)					
C	Single acting (normally closed)					
Y1	With attachment (Material S50C)					
Y2	With attachment (Material MC nylon)					
C Switch model No.						
Axial lead wire	Radial lead wire	Contact Proximity	Voltage		Display	Lead wire
			AC	DC		
T2H*	T2V*			●	1-color display	2-wire
T3H*	T3V*			●		3-wire
* Lead wire length 3-wire						
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 to 1763 for the dimensions and compatible model of the attachment. When ordered as an option, two are attached at shipment.

[Example of model No.]

BHG-01CS-O-T3H-R

Model: Compact cross roller parallel hand with rubber cover

A Size : 01CS

B Option : Single acting, normally open

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

D Switch quantity : 1 on open side

How to order switch

SW - **T2H**

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

Specifications for rechargeable battery (Catalog No. CC-1226A)

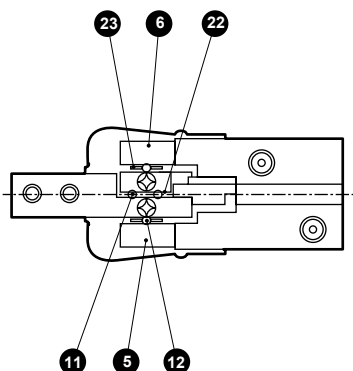
BHG - ... - **P4*** ● Design compatible with rechargeable battery manufacturing process.

* Contact CKD for details.

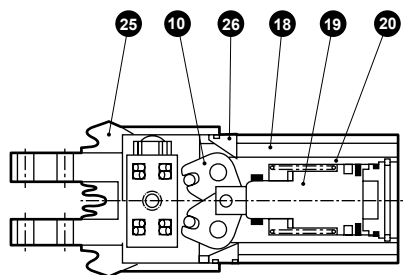
LCM
LCR
LCG
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LCX
STM
STG
STS/STL
STR2
UCA2
ULK*
JSK/M2
JSG
JSC3/JSC4
USSD
UFCD
USC
UB
JSB3
LMB
LML
HCM
HCA
LBC
CAC4
UCAC2
CAC-N
UCAC-N
RCS2
RCC2
PCC
SHC
MCP
GLC
MFC
BBS
RRC
GRC
RV3*
NHS
HRL
LN
Hand
Chuk
Meethnd/Chuk
ShkAbs
FJ
FK
SpdContr
Ending
LSH-HP
LSH
FH100
BSA2
BHA/BHG
LHA
LHAG
HAP
HKP
HCP
HGP
HLF2
HLA/HLB
HLA/HLBG
HLC
HLD
HMF
HMF-G
HMFB
HFP
FH500
HLB
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 a 17 spring.

Cannot be disassembled

No.	Part name	Material	Remarks	No.	Part name	Material	Remarks
1	Body	Aluminum alloy		14	Rod packing	Nitrile rubber	
2	Piston	Stainless steel		15	Cylinder gasket	Nitrile rubber	
3	Cylinder guard	Acetal resin		16	Snap ring	Stainless steel	
4	Finger	Steel		17	Spring	Stainless steel	O type only
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 shaft A	Steel		21	Magnet		
9	Operation shaft 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	Nitrile rubber		26	Bracket	Aluminum alloy	

Rubber cover part model No.

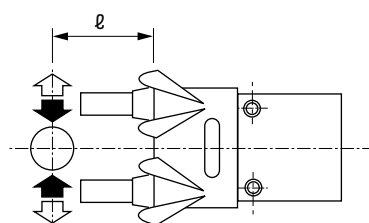
Size	Part model No.	Part No.
01CS	BHG-01K	25
03CS	BHG-03K	
04CS	BHG-04K	
05CS	BHG-05K	

Gripping power performance data

• Gripping power represents the thrust (per one finger) in the arrow direction shown in the figure.

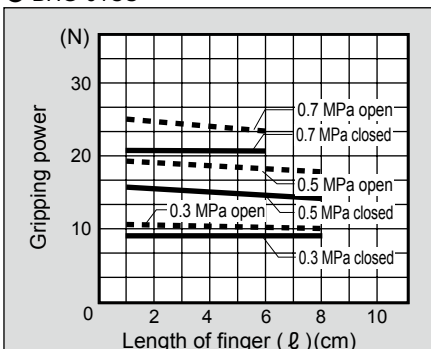
• The gripping power in the opening/closing directions with finger length L of hand with a supply pressure of 0.3, 0.5 and 0.7 MPa is shown.

- Open direction (↖) (shown with broken line)
- Closed direction (↗) (shown with continuous line)

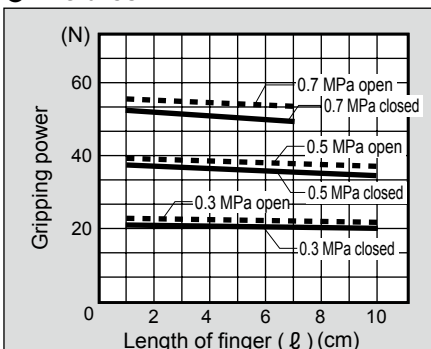


(Note) O type gripping power decreases approximately 20 to 30% in the closed direction compared to double acting. C type gripping power decreases approximately 10 to 20% in the open direction compared to the double acting. When making a selection, read the precautions for design and selection on page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

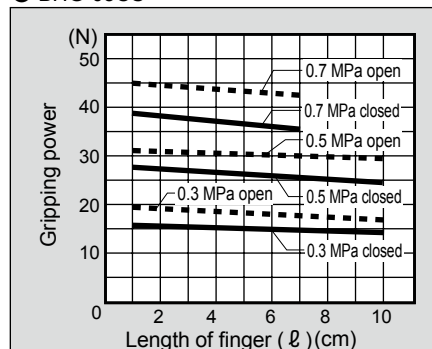
● BHG-01CS



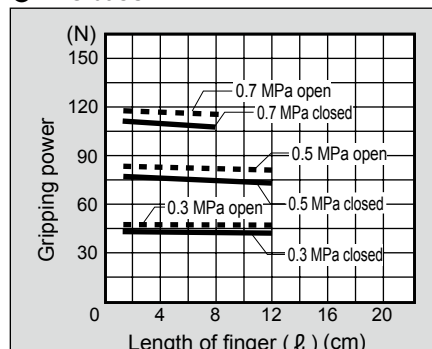
● BHG-04CS



● BHG-03CS



● BHG-05CS

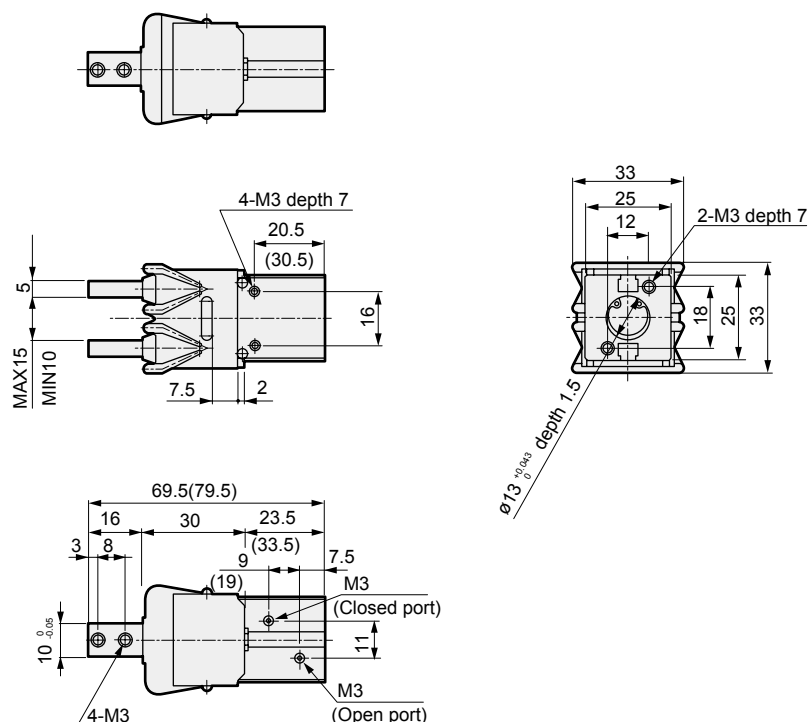


Dimensions



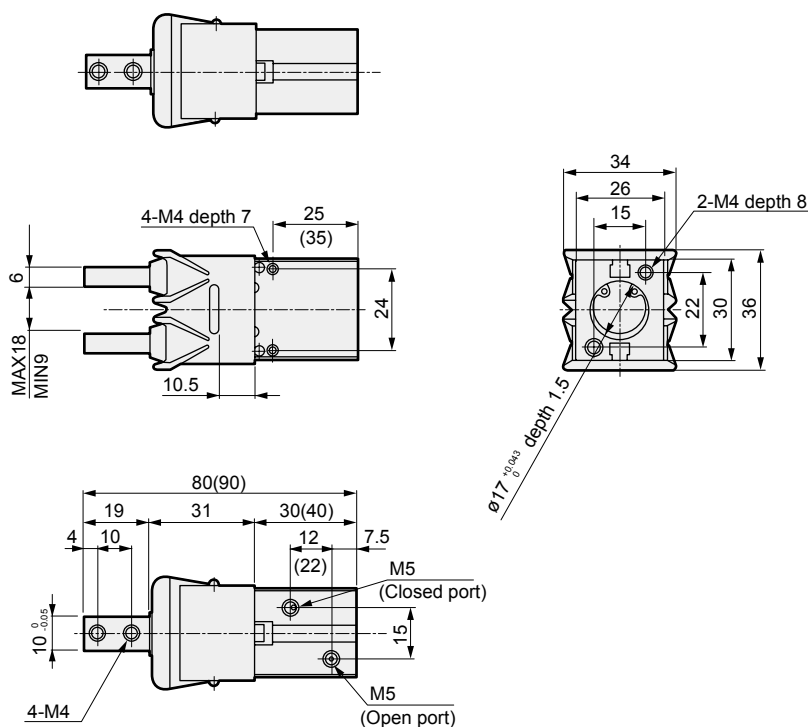
● BHG-01CS standard/O/C

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

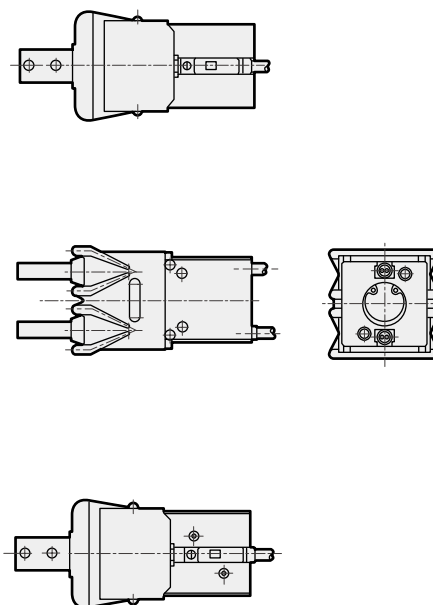


● BHG-03CS standard/O/C

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

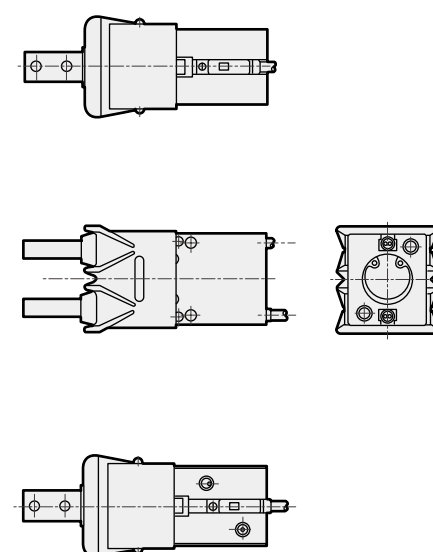


● With switch



Note: When using T□H or T□V, the switches of both project from the end face of body head side.

● With switch



Note: When using T□H or T□V, the switches of both project from the end face of body head side.

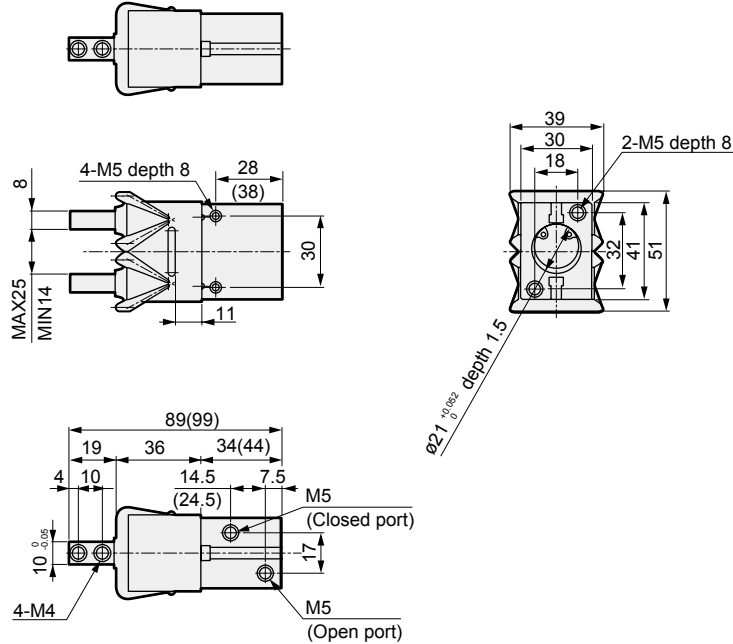
LCM
LCR
LCG
LCW
LCX
STM
STG
STS/STL
STR2
UCA2
ULK*
JSK/M2
JSG
JSC3/JSC4
USSD
UFCD
USC
UB
JSB3
LMB
LML
HCM
HCA
LBC
CAC4
UCAC2
CAC-N
UCAC-N
RCS2
RCC2
PCC
SHC
MCP
GLC
MFC
BBS
RRC
GRC
RV3*
NHS
HRL
LN
Hand
Chuk
MechHnd/Chuk
ShkAbs
FJ
FK
SpdContr
Ending
LSH-HP
LSH
FH100
BSA2
BHA/BHG
LHA
LHAG
HAP
HKP
HCP
HGP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

Dimensions

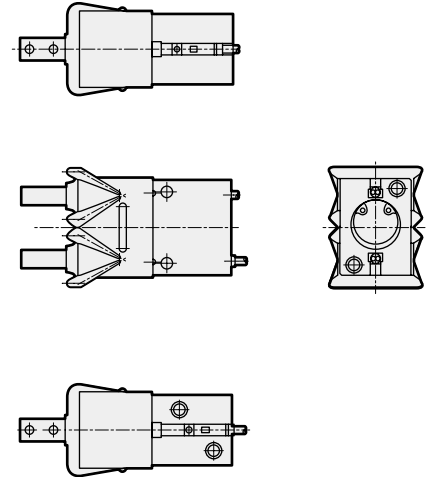


● BHG-04CS standard/O/C

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

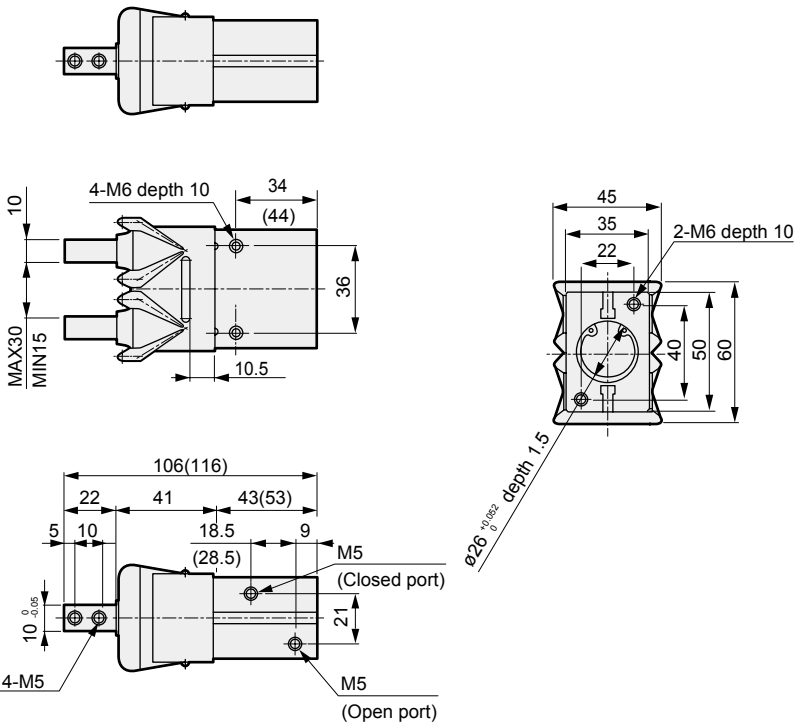


● With switch



● BHG-05CS standard/O/C

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



● With switch

