



Compact cross roller parallel hand Double acting/single acting

# BHA Series

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

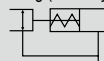
Double acting



Single acting (normally open)



Single acting (normally closed)



## Specifications

Item	BHA				
	01CS1	03CS1	04CS1	05CS1	
Size	01CS1	03CS1	04CS1	05CS1	
Bore size	mm	ø12	ø16	ø20	
Actuation	Double acting/single acting				
Working fluid	Compressed air				
Max. working pressure	MPa	0.7 (≈100 psi, 7 bar)			
Min. working pressure	MPa	0.1 (≈15 psi, 1 bar)			
	Double acting				
	Normally open				
Normally closed	0.3 (≈44 psi, 3 bar)				
Ambient temperature	°C	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 <sup>3</sup>	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.

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  
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)

**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

Code	Description				
<b>A Size</b>					
01CS1					
03CS1					
04CS1					
05CS1					
<b>B Option</b>					
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)				
<b>C Switch model No.</b>					
Axial lead wire	Radial lead wire	Contact	Voltage	Display	Lead wire
			AC	DC	
T2H*	T2V*	Proximity		●	1-color display
T3H*	T3V*			●	3-wire
<b>* Lead wire length</b>					
Blank	1 m (standard)				
3	3 m (option)				
5	5 m (option)				
<b>D Switch quantity</b>					
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.]

**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)

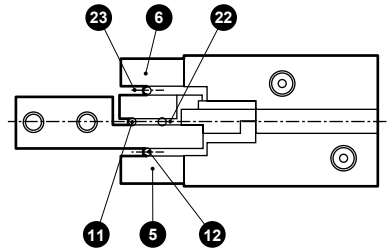
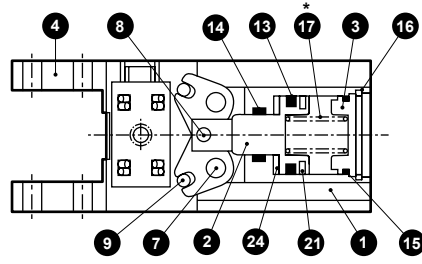
**BHA - ... - P4\*** ● Design compatible with rechargeable battery manufacturing process.

\* Contact CKD for details.

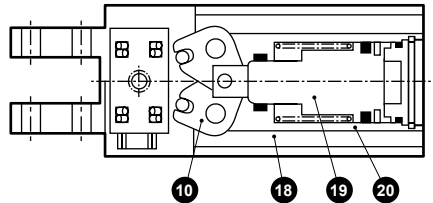
LCM
LCR
LCG
LCW
LCX
STM
STG
STS/STL
STR2
UCA2
ULK*
JSK/M2
JSG
JSC3/JSC4
USSD
UFCD
USC
UB
JSB3
LMB
LML
HCM
HCA
LBC
CAC4
UCAC2
CAC-N
UCAC-N
RCS2
RCC2
PCC
SHC
MCP
GLC
MFC
BBS
RRC
GRC
RV3*
NHS
HRL
LN
<b>Hand</b>
Chuk
MechHnd/Chuk
ShkAbs
FJ
FK
SpdContr
Ending
LSH-HP
LSH
FH100
BSA2
BHA/BHG
LHA
LHAG
HAP
HKP
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 a 17 spring.

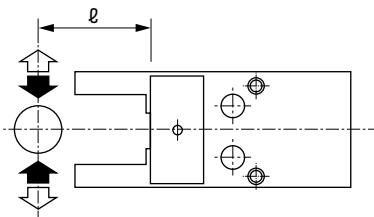
Cannot be disassembled

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

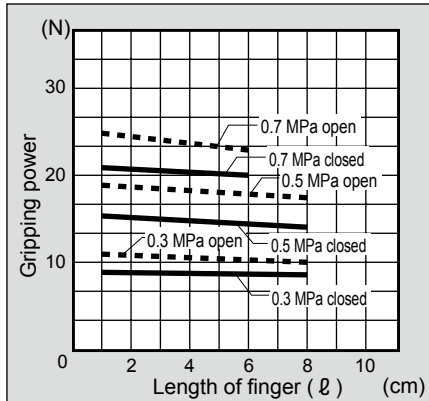
- Gripping power represents the thrust (per one finger) in the arrow direction shown in the figure.
- The gripping power in the opening/closing directions with finger length L of hand with a supply pressure of 0.3, 0.5 and 0.7 MPa is shown.

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

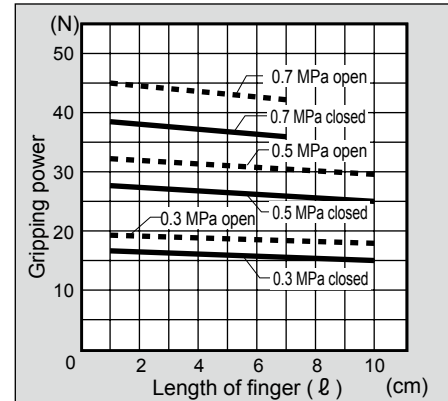


(Note) O type gripping power decreases approximately 20 to 30% in the closed direction compared to double acting. C type gripping power decreases approximately 10 to 20% in the open direction compared to the double acting. When making a selection, read the precautions for design and selection on page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

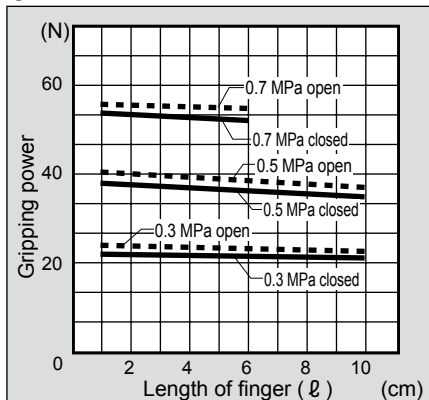
### ● BHA-01CS1



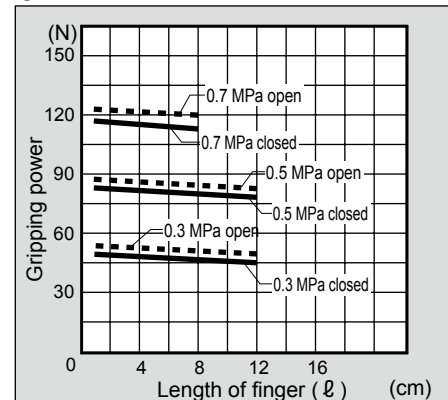
### ● BHA-03CS1



### ● BHA-04CS1



### ● BHA-05CS1

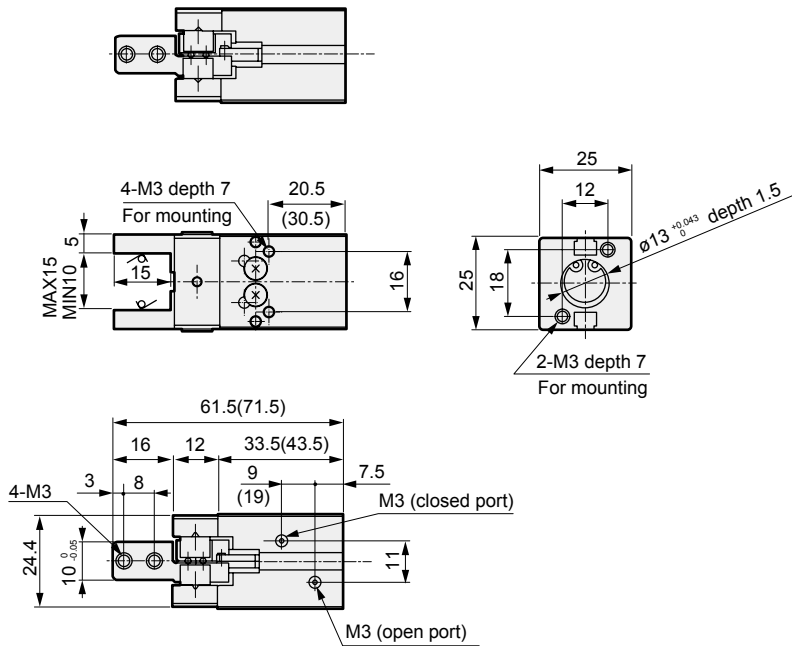


### Dimensions



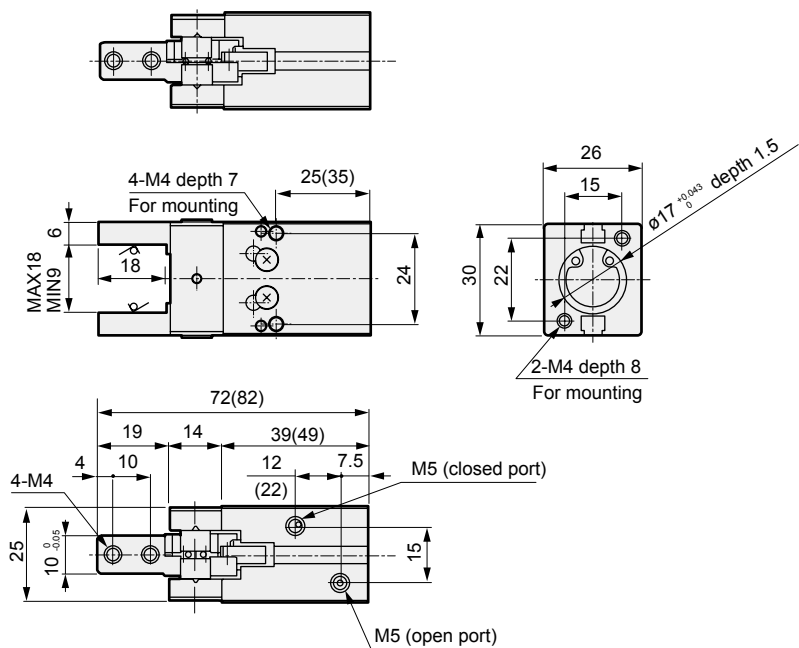
#### ● BHA-01CS1 standard/O/C

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

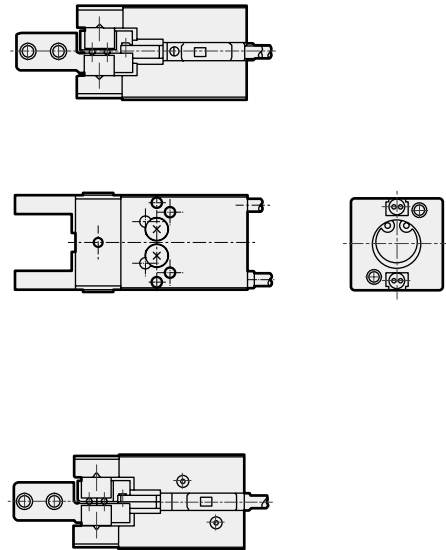


#### ● BHA-03CS1 standard/O/C

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

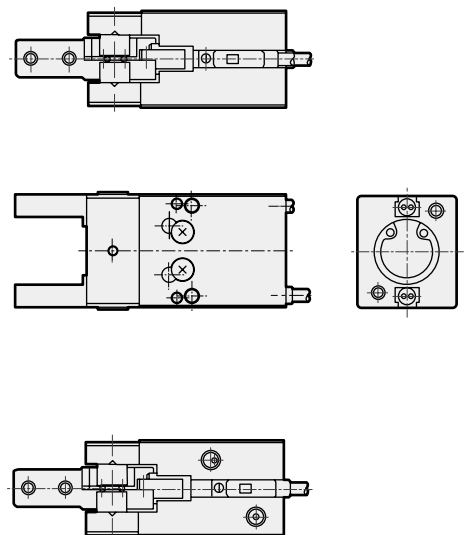


#### ● With switch



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.

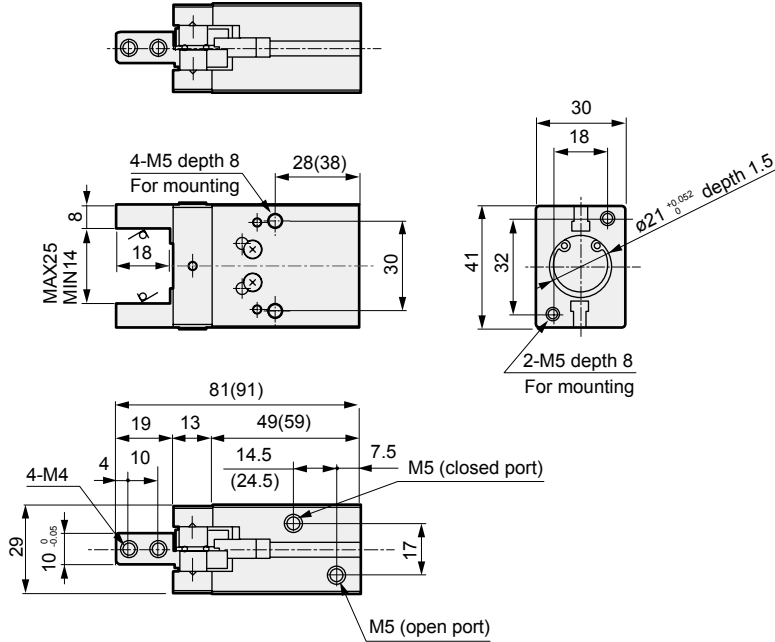
LCM
LCR
LCG
LCW
LCX
STM
STG
STS/STL
STR2
UCA2
ULK*
JSK/M2
JSG
JSC3/JSC4
USSD
UFCD
USC
UB
JSB3
LMB
LML
HCM
HCA
LBC
CAC4
UCAC2
CAC-N
UCAC-N
RCS2
RCC2
PCC
SHC
MCP
GLC
MFC
BBS
RRC
GRC
RV3*
NHS
HRL
LN
<b>Hand</b>
Chuk
MechMod/Chuk
ShkAbs
FJ
FK
SpdContr
Ending
LSH-HP
LSH
FH100
BSA2
<b>BHA/BHG</b>
LHA
LHAG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

## Dimensions

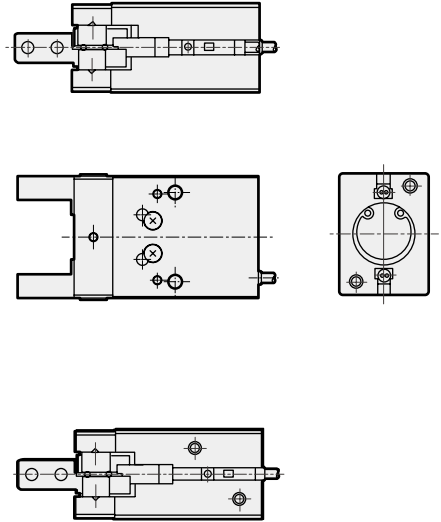


### ● BHA-04CS1 standard/O/C

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

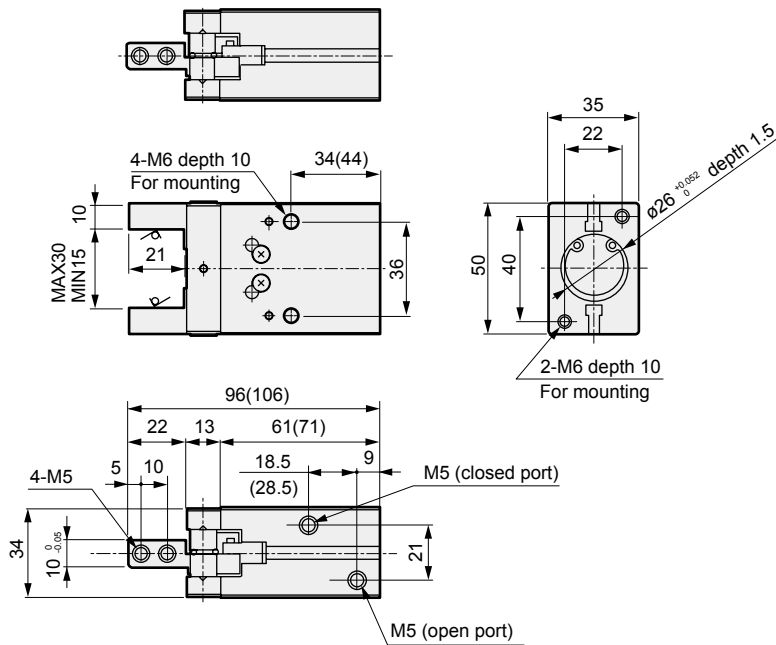


### ● With switch

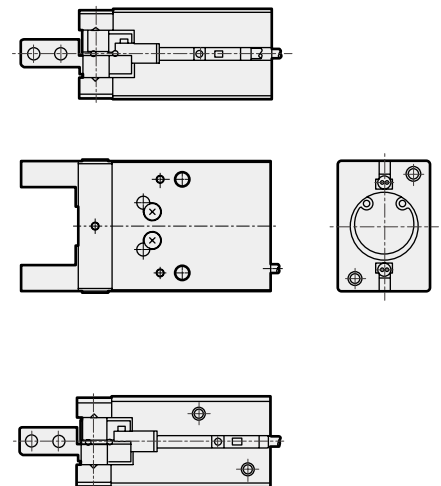


### ● BHA-05CS1 standard/O/C

● 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  
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

# MEMO

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  
MechMtl/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  
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				
	01CS	03CS	04CS	05CS	
Size	01CS	03CS	04CS	05CS	
Bore size	mm	ø12	ø16	ø20	
Actuation	Double acting/single acting				
Working fluid	Compressed air				
Max. working pressure	MPa	0.7 (≈100 psi, 7 bar)			
Min. working pressure	Double acting	0.15 (≈22 psi, 1.5 bar)			
	Normally open				
	Normally closed	0.3 (≈44 psi, 3 bar)			
Ambient temperature	°C	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 <sup>3</sup>	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.

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  
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)

**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				
<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 attachment (Material S50C)				
Y2	With attachment (Material MC nylon)				
<b>C Switch model No.</b>					
<b>Axial lead wire</b>	<b>Radial lead wire</b>	<b>Contact</b>	<b>Voltage</b>	<b>Display</b>	<b>Lead wire</b>
			AC DC		
T2H*	T2V*	Proximity		●	1-color display
T3H*	T3V*			●	3-wire
<b>* Lead wire length 3-wire</b>					
Blank	1 m (standard)				
3	3 m (option)				
5	5 m (option)				
<b>D Switch quantity</b>					
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.

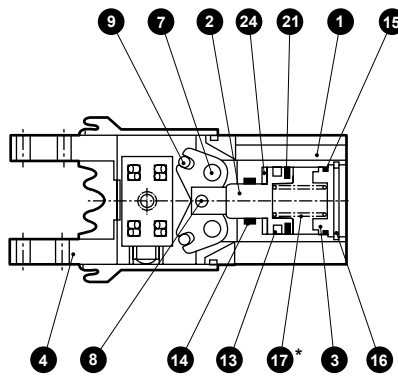
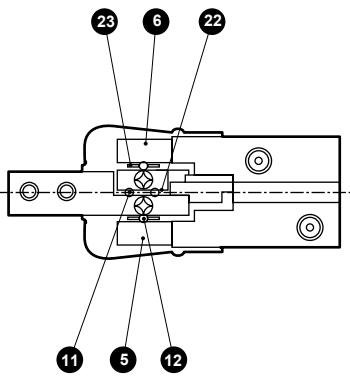
\* Contact CKD for details.

LCM
LCR
LCC
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
<b>Hand</b>
Chuk
MechHnd/Chuk
ShkAbs
FJ
FK
SpdContr
Ending
LSH-HP
LSH
FH100
BSA2
BHA/BHG
LHA
LHAG
HAP
HKP
HCP
HGP
HLF2
HLA/HLB
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HMFB
HFP
FH500
HBL
HJL
HMD
HDL
HJD
BHE

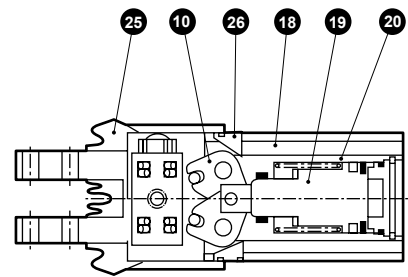


## Internal structure and parts list

● 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		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.

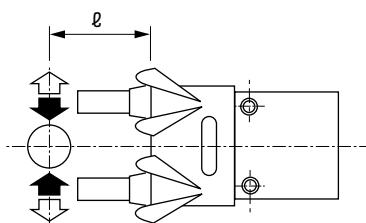
Size	Part model No.	Part No.
01CS	BHG-01K	25
03CS	BHG-03K	
04CS	BHG-04K	
05CS	BHG-05K	

### Gripping power performance data

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

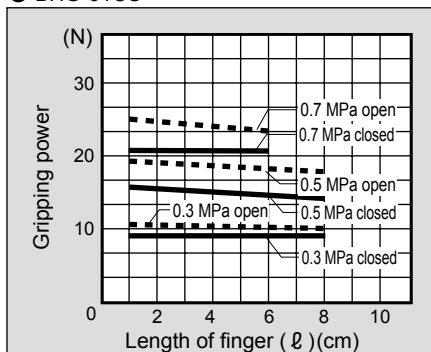
• The gripping power in the opening/closing directions with finger length L of hand with a supply pressure of 0.3, 0.5 and 0.7 MPa is shown.

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

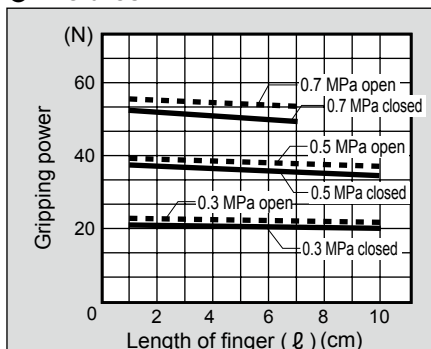


(Note) O type gripping power decreases approximately 20 to 30% in the closed direction compared to double acting. C type gripping power decreases approximately 10 to 20% in the open direction compared to the double acting. When making a selection, read the precautions for design and selection on page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

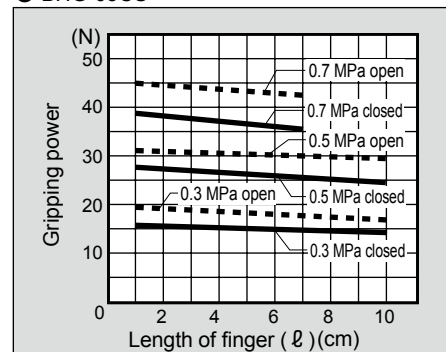
● BHG-01CS



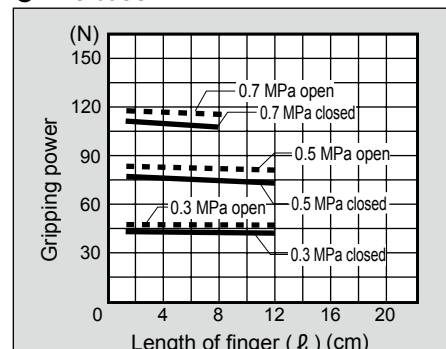
● BHG-04CS



● BHG-03CS



● BHG-05CS

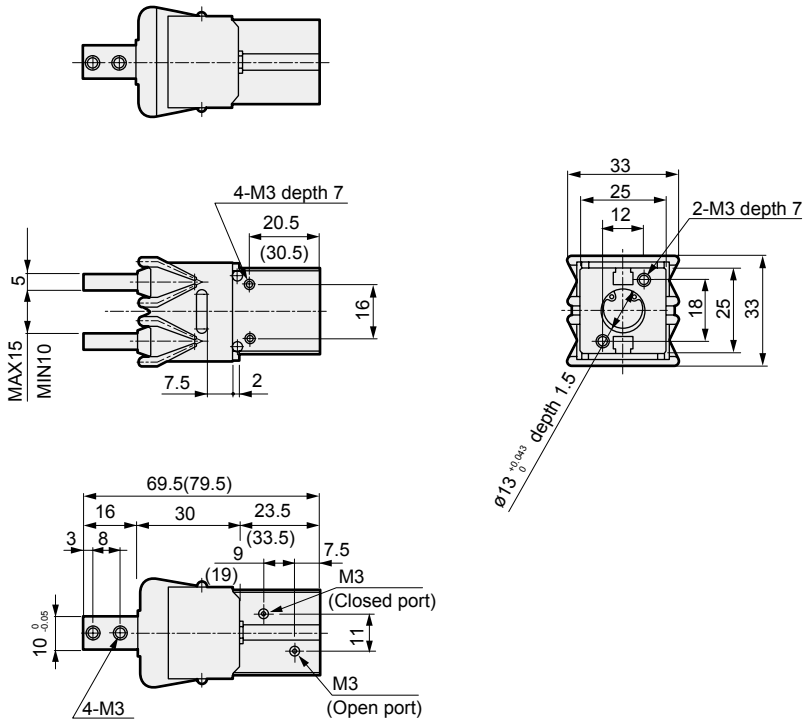


### Dimensions

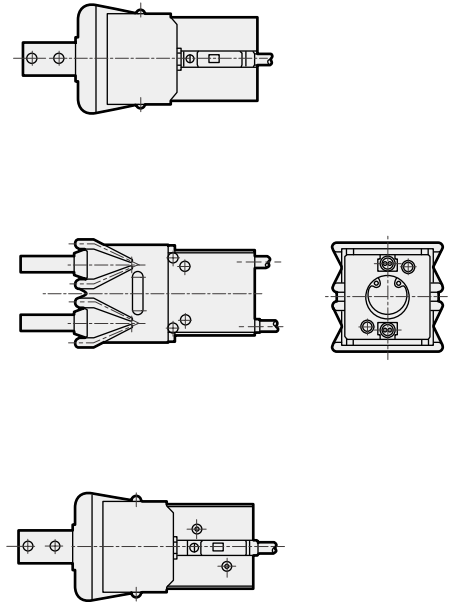


#### ● BHG-01CS standard/O/C

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



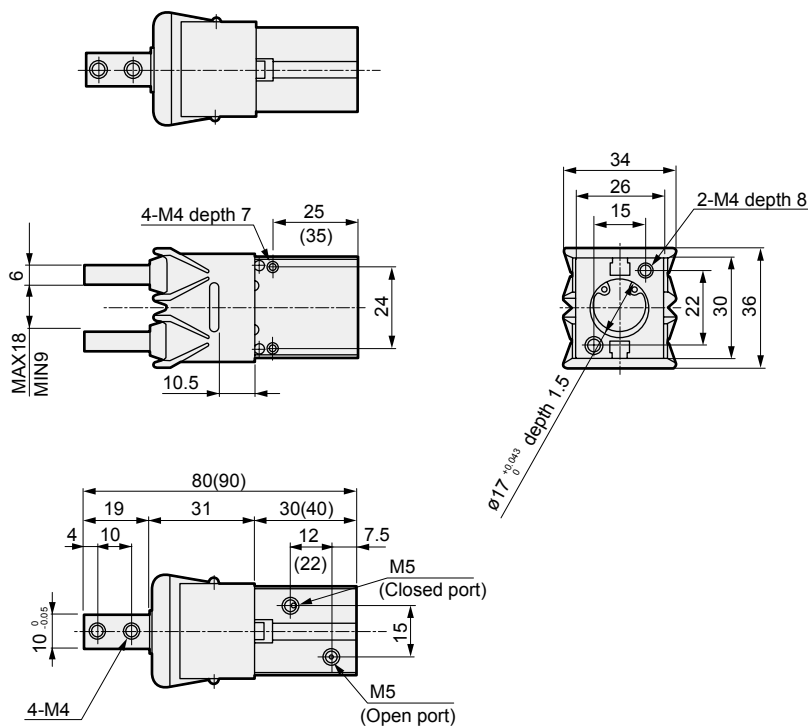
#### ● With switch



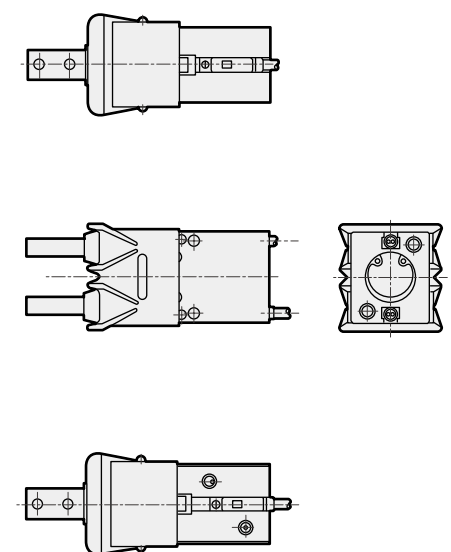
Note: When using T□H or T□V, the switches of both project from the end face of body head side.

#### ● 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.

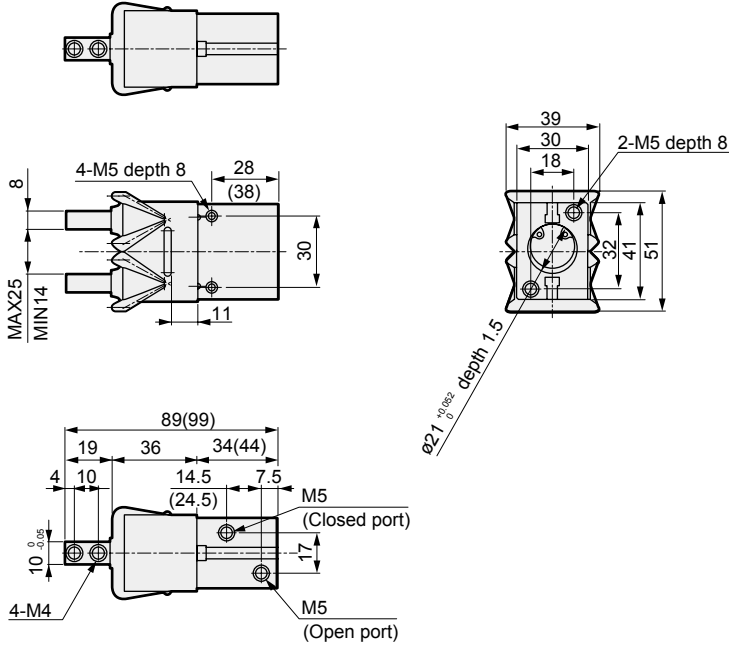
LCM
LCR
LCG
LCW
LCX
STM
STG
STS/STL
STR2
UCA2
ULK*
JSK/M2
JSG
JSC3/JSC4
USSD
UFCD
USC
UB
JSB3
LMB
LML
HCM
HCA
LBC
CAC4
UCAC2
CAC-N
UCAC-N
RCS2
RCC2
PCC
SHC
MCP
GLC
MFC
BBS
RRC
GRC
RV3*
NHS
HRL
LN
<b>Hand</b>
Chuk
MechHnd/Chuk
ShkAbs
FJ
FK
SpdContr
Ending
LSH-HP
LSH
FH100
BSA2
<b>BHA/BHG</b>
LHA
LHAG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

## Dimensions

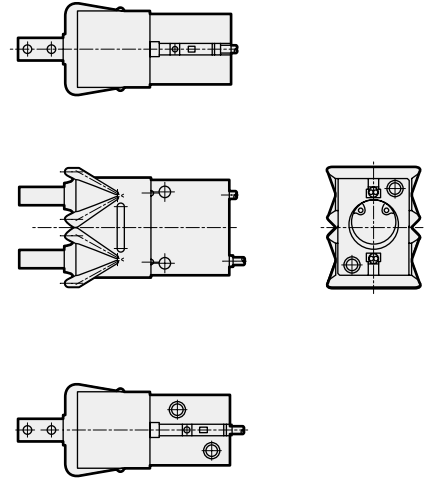


### ● BHG-04CS standard/O/C

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

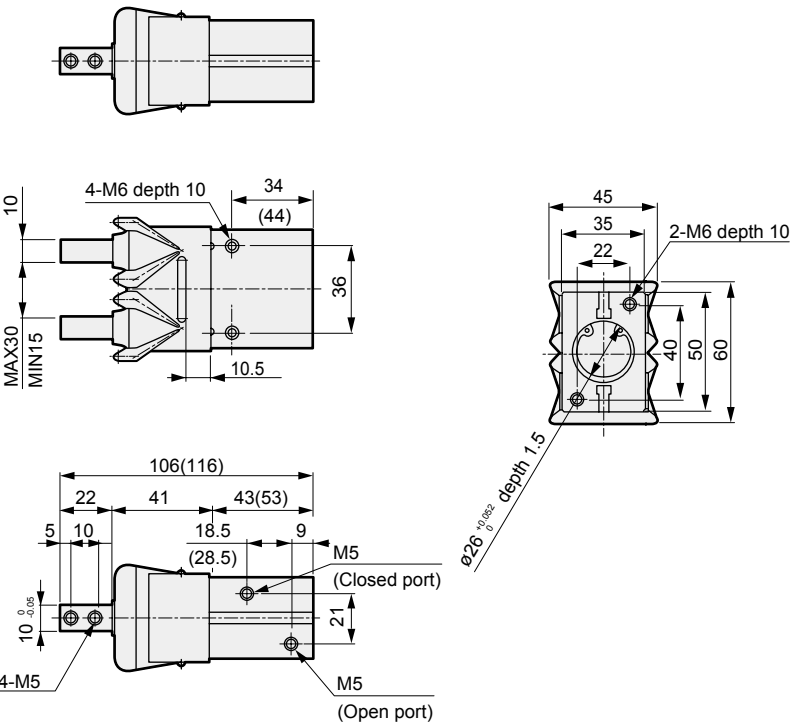


### ● With switch

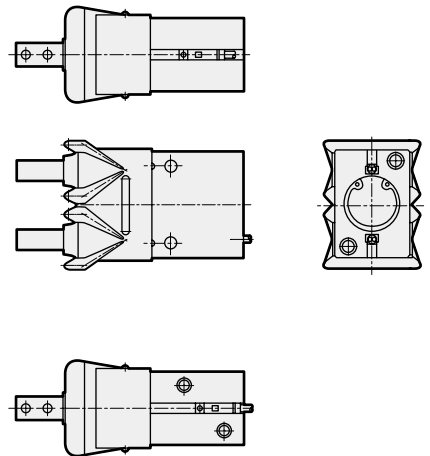


### ● BHG-05CS standard/O/C

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



### ● With switch



- 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
- 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