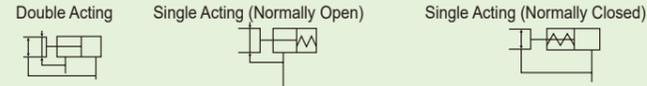




Compact Cross Roller Parallel Gripper Double Acting Type/Single Acting Type

# BHA Series

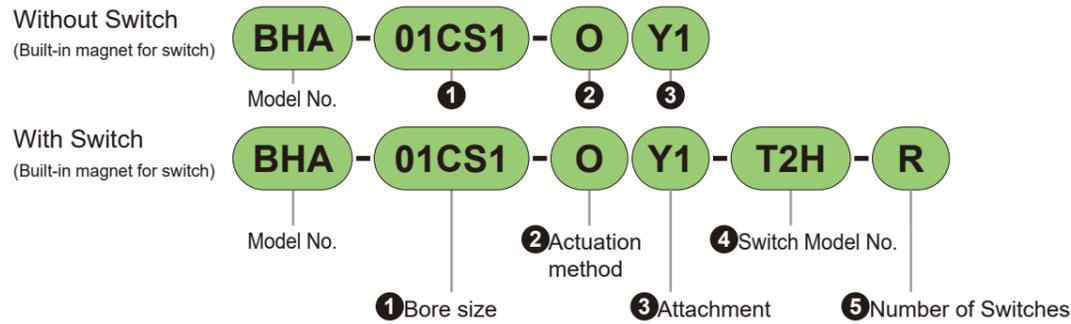
● Operating stroke: 5, 9, 11, 15 mm



## BHA Series

Model No. Notation Method

### Model No. Notation Method



#### 1 Bore Size (mm)

Code	Content
01CS1	φ12
03CS1	φ16
04CS1	φ20
05CS1	φ25

#### 2 Actuation method

Code	Content
Blank	Standard (Double Acting Type)
O	Single Acting (Normally Open)
C	Single Acting (Normally Closed)

#### 3 Attachment

Code	Content
Blank	Without attachments
Y1	With attachments: Material (Steel)
Y2	With attachments: Material (MC Nylon)

Note) For the outline dimensions and compatible models of the attachments, refer to P. 334 and 335. When ordered as an option, it will be shipped pre-assembled with a quantity of 2.

#### 4 Switch Model No.

For switch details, please refer to P. 573. Switches are included with the product and shipped.

Contact	Indicator LED Special Function	Wiring (Output)	Load Voltage (V)		Load Current (mA)		Lead wire *1	
			AC	DC	AC	DC	Straight	L-shape
Solid State	1-Color	2-wire	-	10 to 30	-	5 to 20 *2	T2H□	T2V□
							T2HR3	T2VR3
	1-Color	3-wire (NPN)	-	30 or less	-	100 or less	T3H□	T3V□
							T3PH□	T3PV□

\*1: For "□" in the switch model No., enter the code selected from the "Lead wire length" table.  
 \*2: The maximum load current value above, 20 mA, is at 25 °C. If the switch operating ambient temperature is higher than 25 °C, it will be lower than 20 mA. (At 60 °C, it will be 5 to 10 mA.)  
 \*3: Switches other than the model No.s listed above are also available. (Custom Product) For details, see P. 573.

#### \*Lead wire length

Code	Content
Blank	1 m (Standard)
3	3 m (Option)
5	5 m (Option)

Example) Lead wire length  
 1 m T2H  
 3 m T2H<sup>3</sup>  
 5 m T2H<sup>5</sup>

#### 5 Number of Switches

Code	Content
R	With 1 pc. on Open Side
H	With 1 pc. on Close Side
D	With 2 pcs

Food Manufacturing Process Compatible Specification (Catalog No. CC-1271AA)

● Uses food grade grease that can be used in food manufacturing processes

BHA- ... - FP1

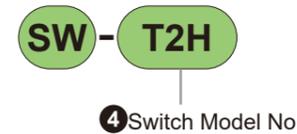
Rechargeable Battery Compatible Specification (Catalog No. CC-1226AA)

● Structure usable in rechargeable battery manufacturing processes

BHA- ... - P4□

\*Please contact us for details.

### Switch Single Unit Model No. Notation Method



\* BHA-LN series with length measurement function (with Linear Norm Sensor) is also available. For details, refer to "Pneumatic Cylinder ④ No. RJ-005AA".

Hand (Gripper)

- LSH-HP
- LSH
- FH100
- BSA2
- BHA
- BHG
- BHE
- LHA
- LHAG
- HAP-1C
- HAP-2 to 4CS
- HKP
- HCP
- HGP
- LST-HP
- HLF2
- HLA/HLB
- HLAG/HLBG
- HLC
- HLD
- HMC-HP
- HMF
- HMF-G
- HMFB
- HFP
- FH500
- HBL
- HJL
- HMD
- HDL
- HJD
- Cylinder Switch
- Ending

Hand (Gripper)

- LSH-HP
- LSH
- FH100
- BSA2
- BHA
- BHG
- BHE
- LHA
- LHAG
- HAP-1C
- HAP-2 to 4CS
- HKP
- HCP
- HGP
- LST-HP
- HLF2
- HLA/HLB
- HLAG/HLBG
- HLC
- HLD
- HMC-HP
- HMF
- HMF-G
- HMFB
- HFP
- FH500
- HBL
- HJL
- HMD
- HDL
- HJD
- Cylinder Switch
- Ending

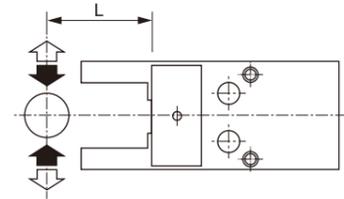
Specifications

Item	BHA-01CS1	BHA-03CS1	BHA-04CS1	BHA-05CS1
Bore size mm	ø12	ø16	ø20	ø25
Actuation method	Double Acting Type/Single Acting Type			
Operating Fluid	Compressed Air			
Max. Working Pressure MPa	0.7			
Min. Operating Pressure MPa	Double Acting Type	0.1		
	Normally Open	0.3		
Normally Closed				
Ambient Temperature °C	5 to 60			
Port Size	M3		M5	
Operating stroke mm	5	9	11	15
Rod diameter mm	ø6	ø8	ø10	ø12
Internal volume (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 (When lubricating, use turbine oil Class 1 ISO VG32)			

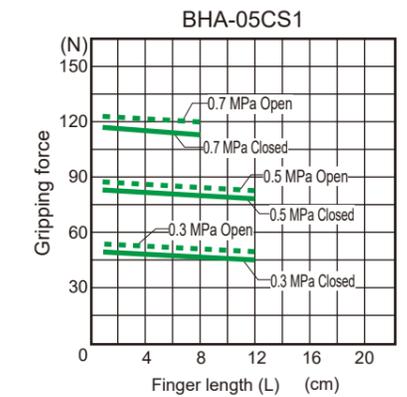
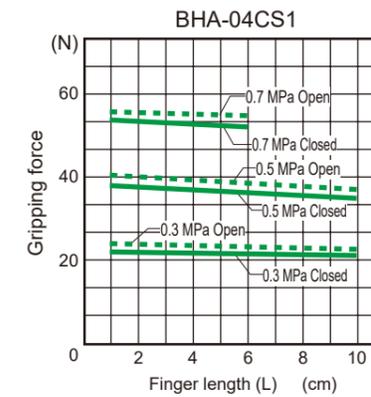
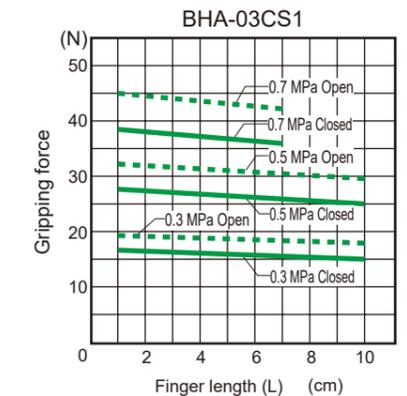
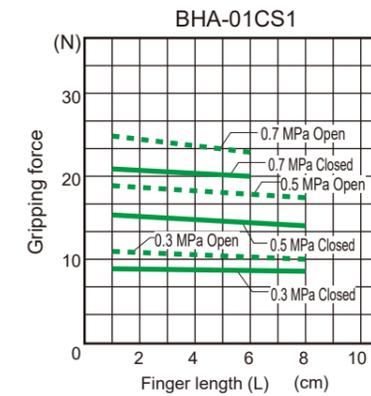
Gripping Force Performance Data

- Gripping force represents the thrust (for one finger) in the direction of the arrow 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.

- Opening direction (←) (Dashed line)
- Closing direction (→) (Solid line)



Note) O type gripping force is approx. 20 to 30 % lower in the closing direction compared to the double acting type. C type gripping force is approx. 10 to 20 % lower in the opening direction compared to the double acting type. When selecting, check the design and selection precautions on P. 336.



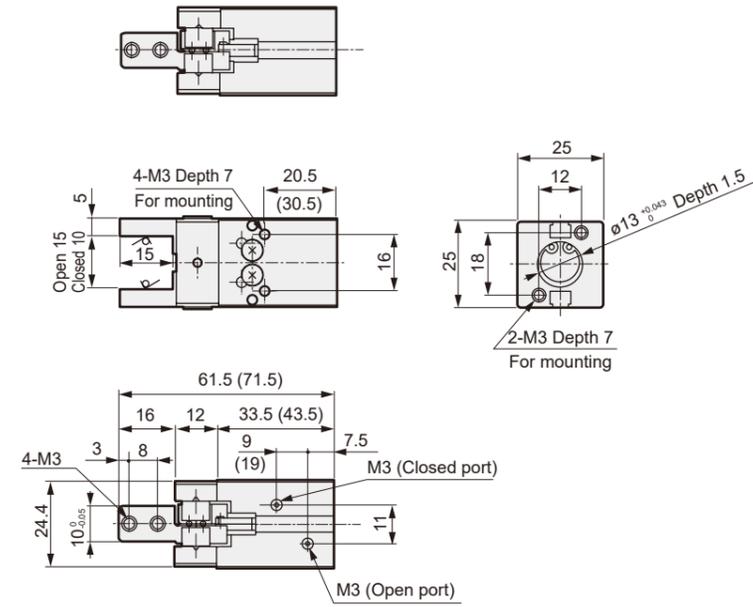
Hand (Gripper)  
LSH-HP  
LSH  
FH100  
BSA2  
BHA  
BHG  
BHE  
LHA  
LHAG  
HAP-1C  
HAP-2 to 4CS  
HKP  
HCP  
HGP  
LST-HP  
HLF2  
HLA/HLB  
HLAG/HLBG  
HLC  
HLD  
HMC-HP  
HMF  
HMF-G  
HMF-B  
HFP  
FH500  
HBL  
HJL  
HMD  
HDL  
HJD  
Cylinder Switch  
Ending

Hand (Gripper)  
LSH-HP  
LSH  
FH100  
BSA2  
BHA  
BHG  
BHE  
LHA  
LHAG  
HAP-1C  
HAP-2 to 4CS  
HKP  
HCP  
HGP  
LST-HP  
HLF2  
HLA/HLB  
HLAG/HLBG  
HLC  
HLD  
HMC-HP  
HMF  
HMF-G  
HMF-B  
HFP  
FH500  
HBL  
HJL  
HMD  
HDL  
HJD  
Cylinder Switch  
Ending

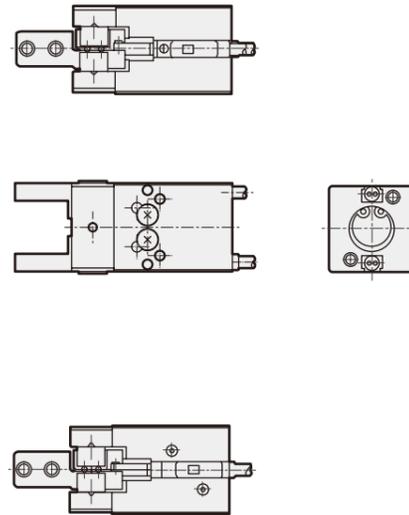
Outline Dimension Drawing

●BHA-01CS1 Standard/O/C

●( ) Dimensions are for C (Normally Closed) type.



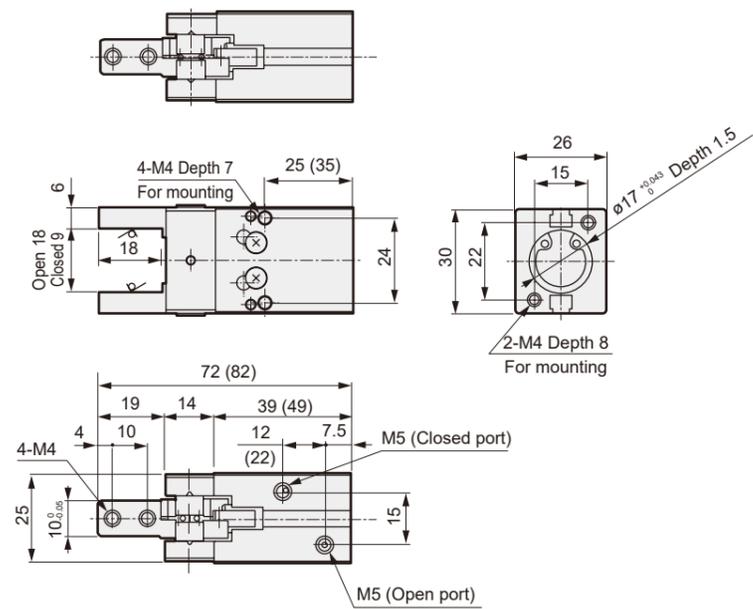
●With Switch



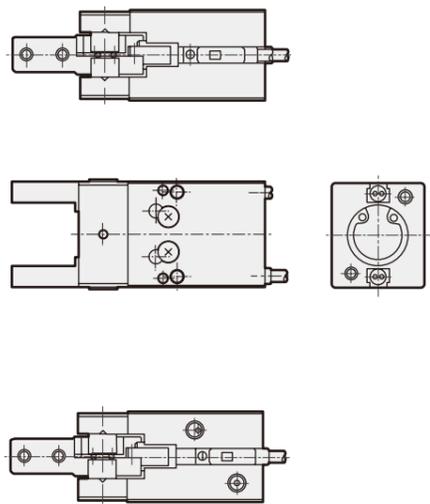
Note) For both T□H, T□V, the switch protrudes from the main body head side end face.

●BHA-03CS1 Standard/O/C

●( ) Dimensions are for C (Normally Closed) type.



●With Switch



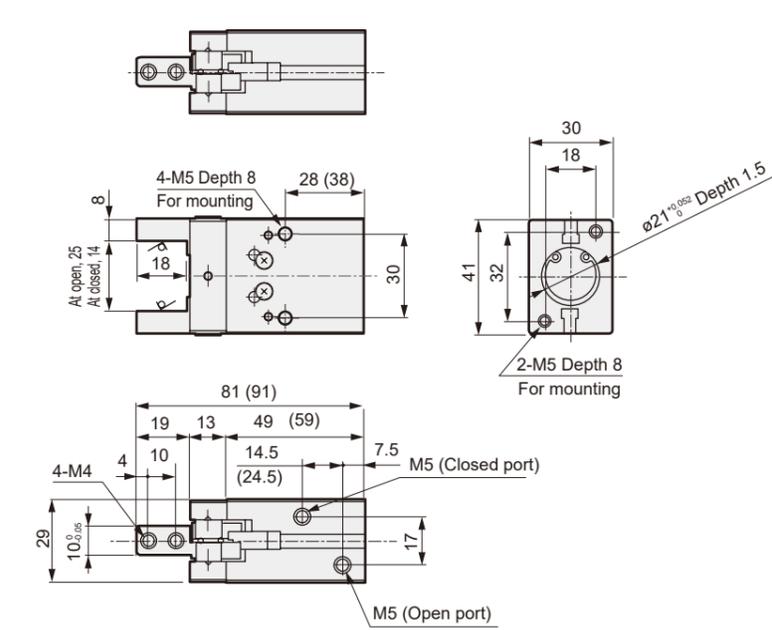
Note) For both T□H, T□V, the switch protrudes from the main body head side end face.

Outline Dimension Drawing

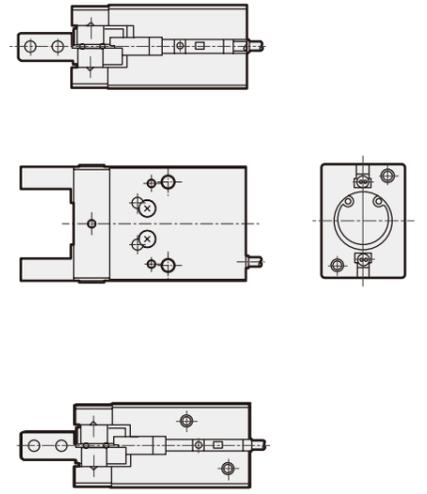
Outline Dimension Drawing

●BHA-04CS1 Standard/O/C

●( ) Dimensions are for C (Normally Closed) type.

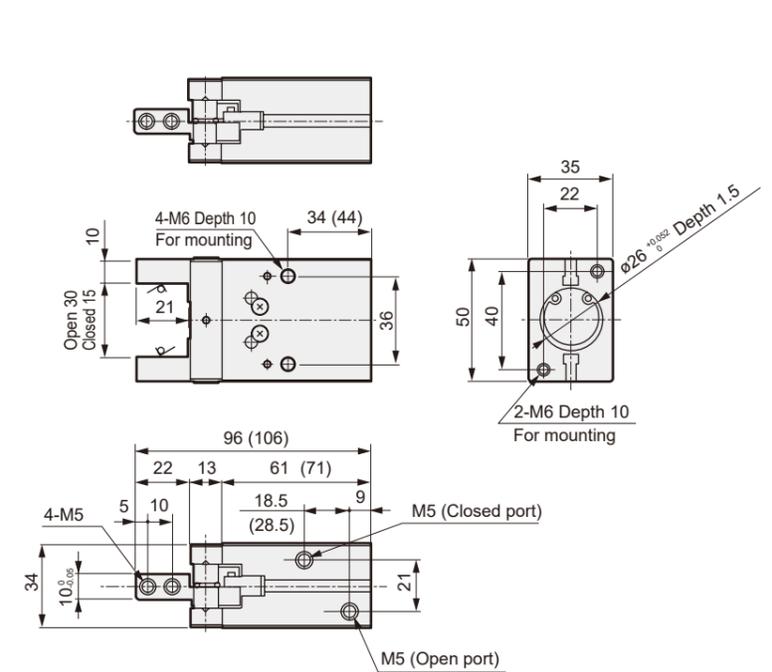


●With Switch

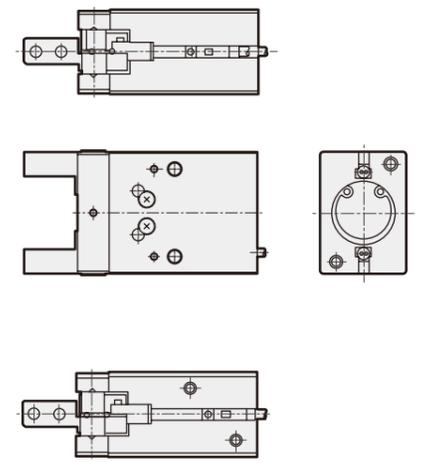


●BHA-05CS1 Standard/O/C

●( ) Dimensions are for C (Normally Closed) type.



●With Switch

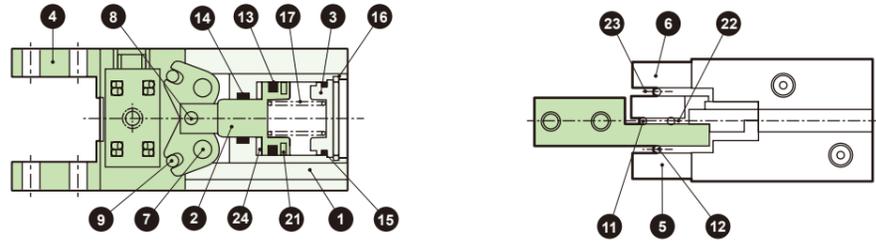


Hand (Gripper)
LSH-HP
LSH
FH100
BSA2
<b>BHA</b>
BHG
BHE
LHA
LHAG
HAP-1C
HAP-2 to 4CS
HKP
HCP
HGP
LST-HP
HLF2
HLA/HLB
HLAG/HLBG
HLC
HLD
HMC-HP
HMF
HMF-G
HMF-B
HFP
FH500
HBL
HJL
HMD
HDL
HJD
Cylinder Switch
Ending

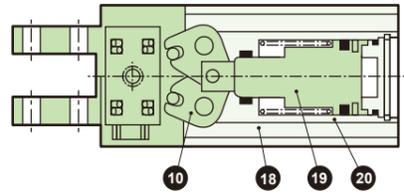
Hand (Gripper)
LSH-HP
LSH
FH100
BSA2
<b>BHA</b>
BHG
BHE
LHA
LHAG
HAP-1C
HAP-2 to 4CS
HKP
HCP
HGP
LST-HP
HLF2
HLA/HLB
HLAG/HLBG
HLC
HLD
HMC-HP
HMF
HMF-G
HMF-B
HFP
FH500
HBL
HJL
HMD
HDL
HJD
Cylinder Switch
Ending

## Internal Structure Diagram/Material

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



●C (Normally Closed) Type



**Do not disassemble**

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 cover	Polyacetal		15	Cylinder Gasket	Nitrile Rubber	
4	Finger	Steel		16	Retaining ring		
5	Bearing guide A	Steel		17	Coil Spring	Stainless Steel	O type only
6	Bearing guide B	Steel		18	Body	Aluminum Alloy	
7	Pivot Shaft	Steel		19	Piston	Stainless Steel	
8	Actuating shaft A	Steel		20	Coil Spring	Stainless Steel	
9	Actuating 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	

MEMO

**Do not disassemble**



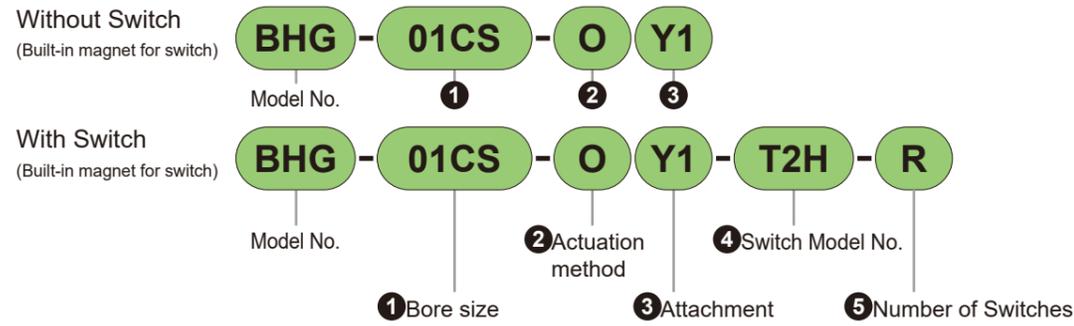
Compact Cross Roller Parallel Gripper with Rubber Cover Double Acting Type/Single Acting Type

# BHG Series

● Operating stroke: 5, 9, 11, 15 mm



## Model No. Notation Method



### ① Bore Size (mm)

Code	Content
01CS	φ12
03CS	φ16
04CS	φ20
05CS	φ25

### ② Actuation method

Code	Content
Blank	Standard (Double Acting Type)
O	Single Acting (Normally Open)
C	Single Acting (Normally Closed)

### ③ Attachment

Code	Content
Blank	Without attachments
Y1	With attachments: Material (Steel)
Y2	With attachments, Material (MC Nylon)

Note) For the outline dimensions and compatible models of the attachments, refer to P. 334 and 335. When ordered as an option, it will be shipped pre-assembled with a quantity of 2.

### ④ Switch Model No.

For switch details, please refer to P. 573. Switches are included with the product and shipped.

Contact	Indicator LED Special Function	Wiring (Output)	Load Voltage (V)		Load Current (mA)		Lead wire *1	
			AC	DC	AC	DC	Straight	L-shape
Solid State	1-Color	2-wire	-	10 to 30	-	5 to 20 *2	T2H□	T2V□
							T2HR3	T2VR3
	1-Color	3-wire (NPN)	-	30 or less	-	100 or less	T3H□	T3V□
							T3PH□	T3PV□

\*1: For "□" in the switch model No., enter the code selected from the "Lead wire length" table.

\*2: The maximum load current value above, 20 mA, is at 25°C.

If the switch operating ambient temperature is higher than 25°C, it will be lower than 20 mA. (At 60°C, it will be 5 to 10 mA.)

\*3: Switches other than the model No.s listed above are also available. (Custom Product) For details, see P. 573.

### \*Lead wire length

Code	Content
Blank	1 m (Standard)
3	3 m (Option)
5	5 m (Option)

Example) Lead wire length  
1 m T2H  
3 m T2H<sup>3</sup>  
5 m T2H<sup>5</sup>

### ⑤ Number of Switches

Code	Content
R	With 1 pc. on Open Side
H	With 1 pc. on Close Side
D	With 2 pcs

Food Manufacturing Process Compatible Specification (Catalog No. CC-1271AA)

● Uses food grade grease that can be used in food manufacturing processes

**BHG- ... - FP1**

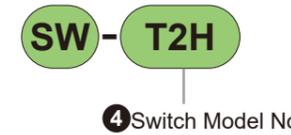
Rechargeable Battery Compatible Specification (Catalog No. CC-1226AA)

● Structure usable in rechargeable battery manufacturing processes

**BHG- ... - P4□**

\* Please contact us for details.

## Switch Single Unit Model No. Notation Method



\* BHG-LN series with length measurement function (with Linear Norm Sensor) is also available. For details, refer to "Pneumatic Cylinder ④ No. RJ-005AA".

Hand (Gripper)

LSH-HP

LSH

FH100

BSA2

BHA

BHG

BHE

LHA

LHAG

HAP-1C

HAP-2 to 4CS

HKP

HCP

HGP

LST-HP

HLF2

HLA/HLB

HLAG/HLBG

HLC

HLD

HMC-HP

HMF

HMF-G

HMF-B

HFP

FH500

HBL

HJL

HMD

HDL

HJD

Cylinder Switch

Ending

Hand (Gripper)

LSH-HP

LSH

FH100

BSA2

BHA

BHG

BHE

LHA

LHAG

HAP-1C

HAP-2 to 4CS

HKP

HCP

HGP

LST-HP

HLF2

HLA/HLB

HLAG/HLBG

HLC

HLD

HMC-HP

HMF

HMF-G

HMF-B

HFP

FH500

HBL

HJL

HMD

HDL

HJD

Cylinder Switch

Ending

Specifications

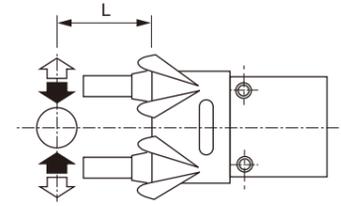
Item	BHG-01CS	BHG-03CS	BHG-04CS	BHG-05CS	
Bore size	mm	ø12	ø16	ø20	ø25
Actuation method	Double Acting Type/Single Acting Type				
Operating Fluid	Compressed Air				
Max. Working Pressure	MPa				
Min. Operating Pressure	Double Acting Type	0.15			
	Normally Open	0.3			
Min. Operating Pressure	Normally Closed	0.3			
		0.3			
Ambient Temperature	°C				
Port Size	M3		M5		
Operating stroke	mm	5	9	11	15
Rod diameter	mm	ø6	ø8	ø10	ø12
Internal volume (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 (When lubricating, use turbine oil Class 1 ISO VG32)				

Gripping Force Performance Data

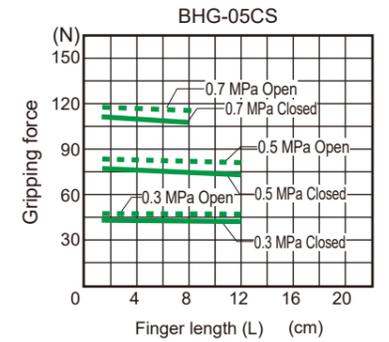
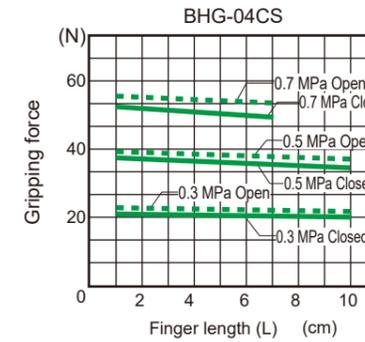
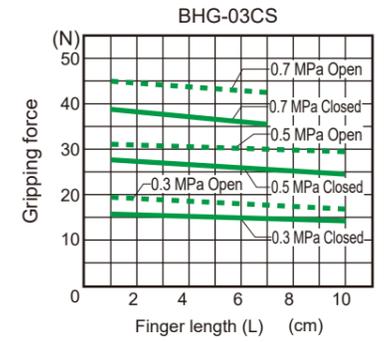
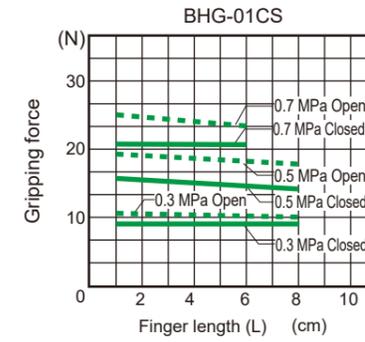
Gripping Force Performance Data

- Gripping force represents the thrust (for one finger) in the direction of the arrow 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.

- Opening direction ( ← ) (Dashed line)
- Closing direction ( → ) (Solid line)



Note) O type gripping force is approx. 20 to 30 % lower in the closing direction compared to the double acting type. C type gripping force is approx. 10 to 20 % lower in the opening direction compared to the double acting type. When selecting, check the design and selection precautions on P. 336.



Hand (Gripper)

- LSH-HP
- LSH
- FH100
- BSA2
- BHA
- BHG**
- BHE
- LHA
- LHAG
- HAP-1C
- HAP-2 to 4CS
- HKP
- HCP
- HGP
- LST-HP
- HLF2
- HLA/HLB
- HLAG/HLBG
- HLC
- HLD
- HMC-HP
- HMF
- HMF-G
- HMF-B
- HFP
- FH500
- HBL
- HJL
- HMD
- HDL
- HJD
- Cylinder Switch
- Ending

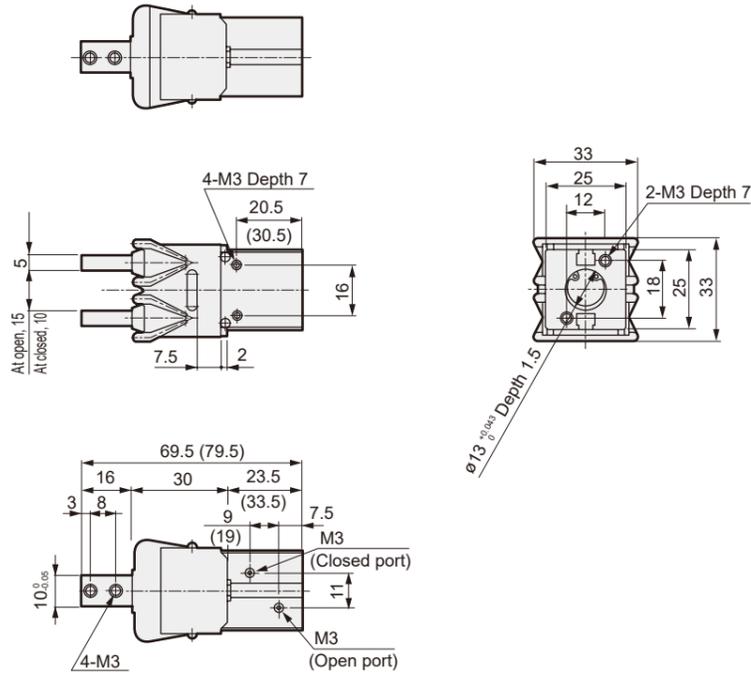
Hand (Gripper)

- LSH-HP
- LSH
- FH100
- BSA2
- BHA
- BHG**
- BHE
- LHA
- LHAG
- HAP-1C
- HAP-2 to 4CS
- HKP
- HCP
- HGP
- LST-HP
- HLF2
- HLA/HLB
- HLAG/HLBG
- HLC
- HLD
- HMC-HP
- HMF
- HMF-G
- HMF-B
- HFP
- FH500
- HBL
- HJL
- HMD
- HDL
- HJD
- Cylinder Switch
- Ending

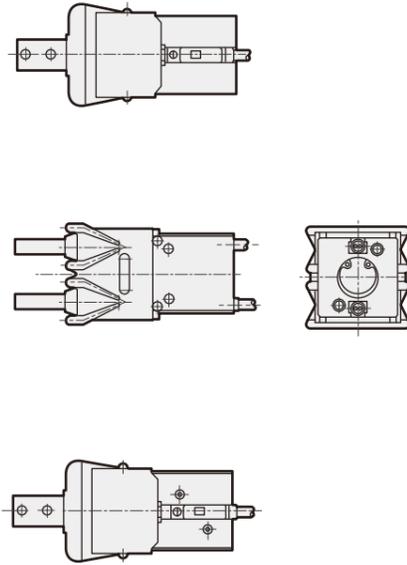
Outline Dimension Drawing

●BHG-01CS Standard/O/C

●Dimensions in ( ) are for C [Normally Closed] specification.



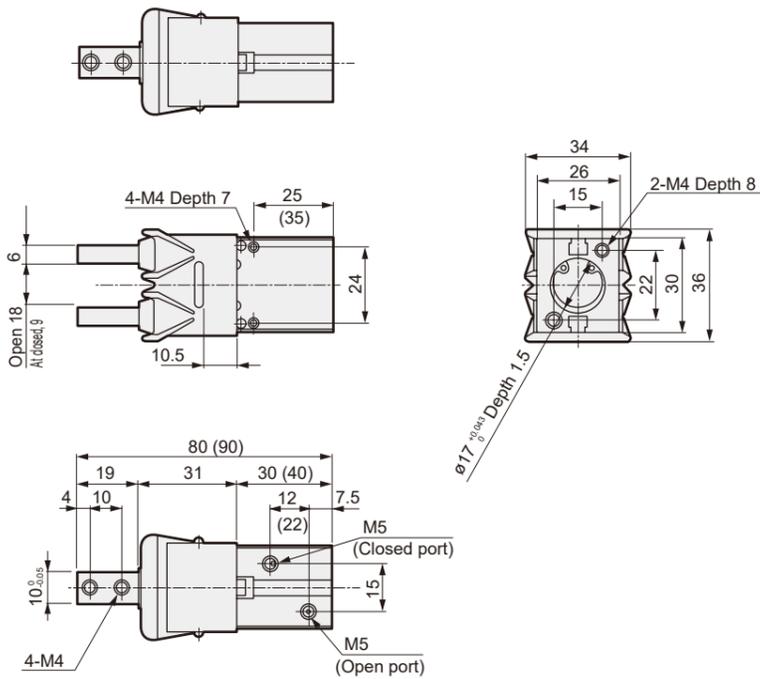
●With Switch



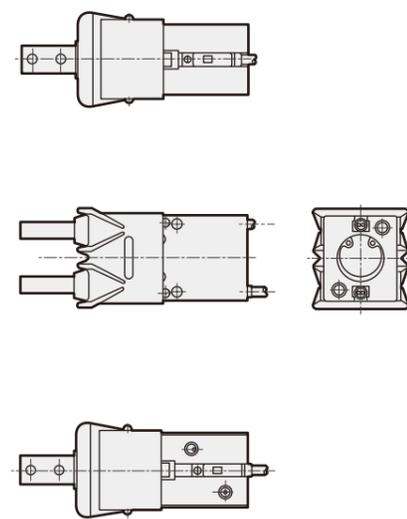
Note: For both T□H, T□V, the switch protrudes from the main body head side end face.

●BHG-03CS Standard/O/C

●( ) Dimensions are for C (Normally Closed) type.



●With Switch



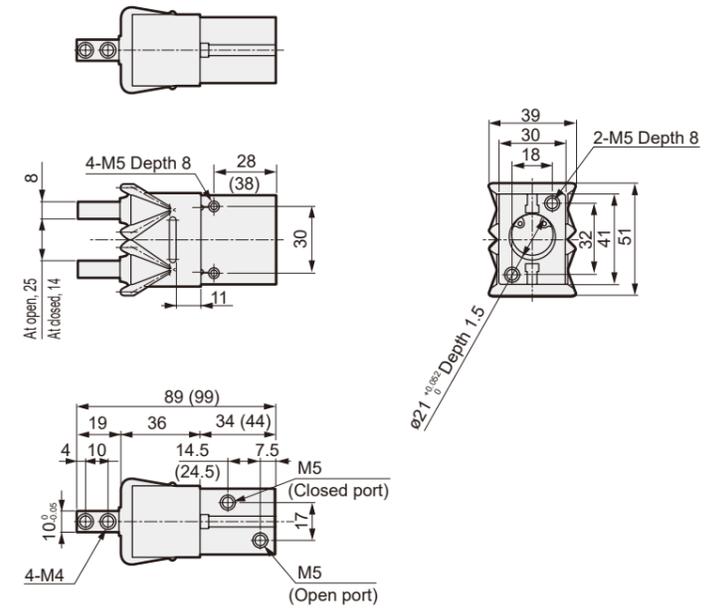
Note: For both T□H, T□V, the switch protrudes from the main body head side end face.

Outline Dimension Drawing

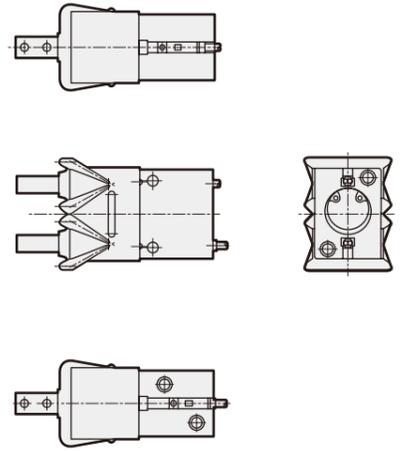
Outline Dimension Drawing

●BHG-04CS Standard/O/C

●( ) Dimensions are for C (Normally Closed) type.

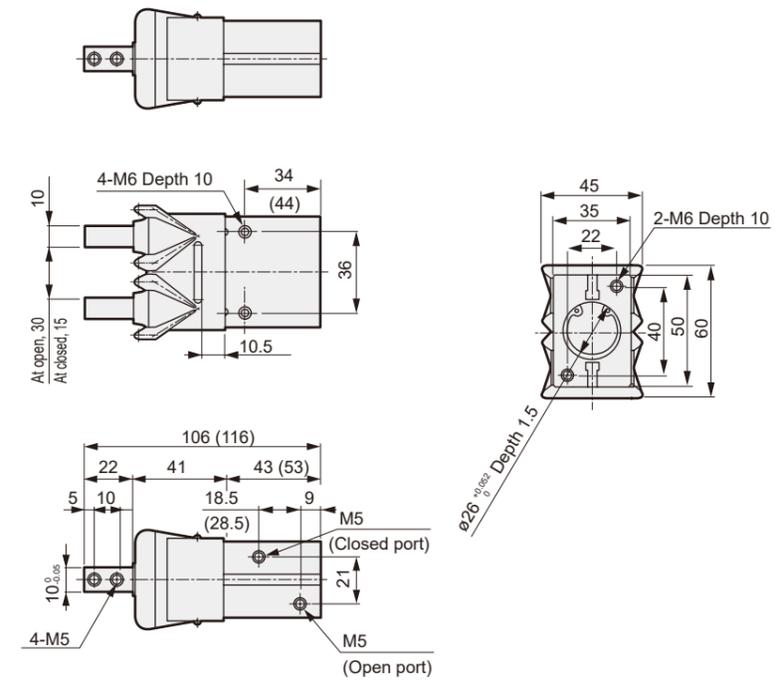


●With Switch

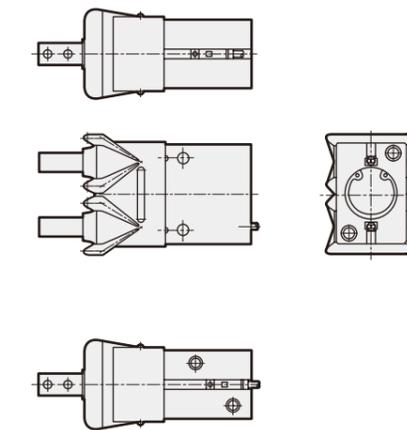


●BHG-05CS Standard/O/C

●( ) Dimensions are for C (Normally Closed) type.



●With Switch



Hand (Gripper)

LSH-HP

LSH

FH100

BSA2

BHA

**BHG**

BHE

LHA

LHAG

HAP-1C

HAP-2 to 4CS

HKP

HCP

HGP

LST-HP

HLF2

HLA/HLB

HLAG/HLBG

HLC

HLD

HMC-HP

HMF

HMF-G

HMF-B

HFP

FH500

HBL

HJL

HMD

HDL

HJD

Cylinder Switch

Ending

Hand (Gripper)

LSH-HP

LSH

FH100

BSA2

BHA

**BHG**

BHE

LHA

LHAG

HAP-1C

HAP-2 to 4CS

HKP

HCP

HGP

LST-HP

HLF2

HLA/HLB

HLAG/HLBG

HLC

HLD

HMC-HP

HMF

HMF-G

HMF-B

HFP

FH500

HBL

HJL

HMD

HDL

HJD

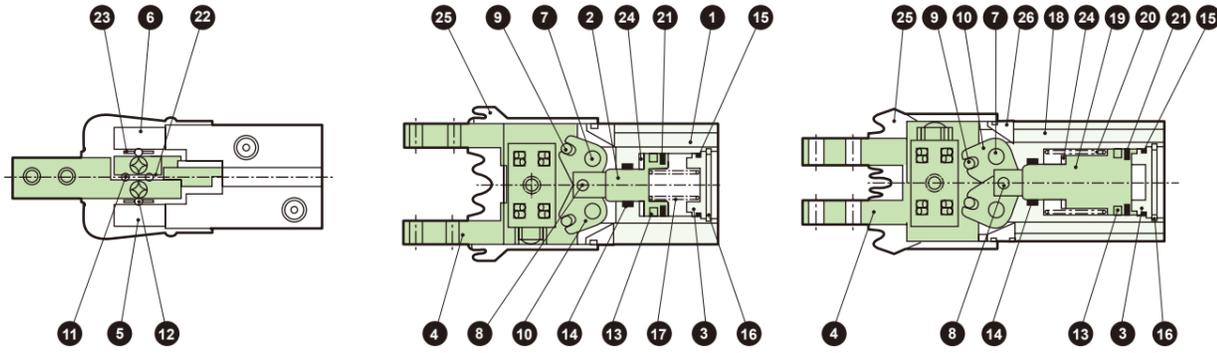
Cylinder Switch

Ending

## Internal Structure Diagram/Material

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

● C (Normally Closed) Type



**Do not disassemble**

No.	Part Name	Material	Remarks	No.	Part Name	Material	Remarks
1	Body	Aluminum Alloy		14	Rod Packing	Nitrile Rubber	
2	Piston	Stainless Steel		15	Gasket	Nitrile Rubber	
3	Cover	Polyacetal		16	Retaining ring	Stainless Steel	
4	Finger	Steel		17	Coil 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	Pivot Shaft	Steel		20	Coil Spring	Stainless Steel	C type only
8	Actuating shaft A	Steel		21	Magnet		
9	Actuating 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	Adapter	Aluminum Alloy	

### Rubber cover part model No.

Size	Part Model No.	Part number
01CS	<b>BHG-01K</b>	25
03CS	<b>BHG-03K</b>	
04CS	<b>BHG-04K</b>	
05CS	<b>BHG-05K</b>	

MEMO