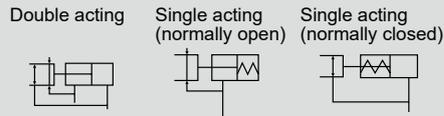




Parallel hand Double acting/single acting

# HAP-1C Series

● Operational stroke length: 8 mm



## Specifications

1 MPa ≈ 145.0 psi, 1 MPa = 10 bar

Item	HAP
Size	1C
Bore size mm	ø15
Actuation	Double acting/single acting
Working fluid	Compressed air
Max. working pressure MPa	0.7 (≈101 psi, 7 bar)
Min. working pressure MPa	0.3 (≈44 psi, 3 bar)
Ambient temperature °C	5 (41°F) to 60 (140°F)
Port size	M5
Operating stroke length mm	8
Rod diameter mm	ø8
Volumetric capacity (reciprocating) cm <sup>3</sup>	2.1
Repeatability mm	±0.03
Weight kg	0.10
Lubrication	Not required (use turbine oil class 1 ISO VG32 if necessary for lubrication)

## How to order

**HAP** - **1C** - **0**

**A** Size  
\*1

**B** Option  
\*2

Code	Description
<b>A</b> Size	
<b>1C</b>	
<b>B</b> Option	
<b>Blank</b>	Standard (double acting)
<b>O</b>	Single acting (normally open)
<b>C</b>	Single acting (normally closed)
<b>Y1</b>	With attachment (S50C)
<b>Y2</b>	With attachment (MC nylon)

## ⚠ Precautions for model No. selection

\*1: Switch cannot be installed onto HAP-1C.

\*2: Refer to pages 1762 and 1763 for the dimensions and compatible models of the attachment.

When ordered as an option, two are included at shipment.

[Example of model No.]

### HAP-1C-0

Model: Parallel hand

**A** Size : 1C

**B** Option: Single acting, normally open

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

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

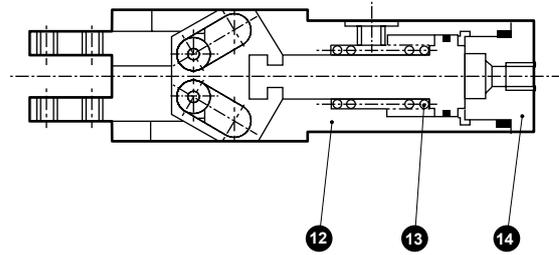
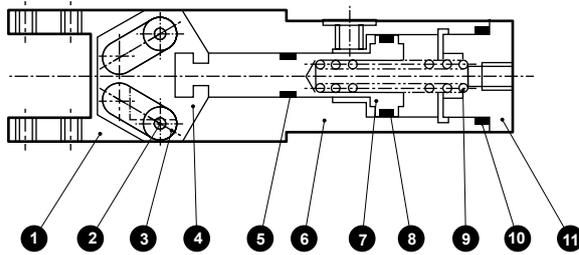
\* Contact CKD for details.

LCM  
LCR  
LCG  
LCW  
LCX  
STM  
STG  
STS/STL  
STR2  
UCA2  
ULK\*  
JSK/M2  
JSG  
JSC3/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

### Internal structure and parts list

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

● C (normally closed)



**Cannot be disassembled**

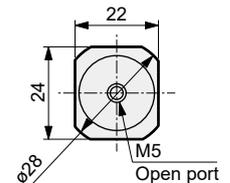
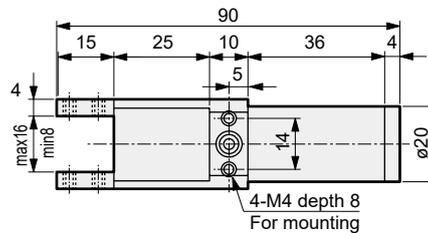
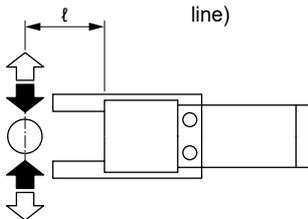
\* Standard (double acting) type does not contain a 9 spring.

No	Part name	Material	Remarks	No	Part name	Material	Remarks
1	Finger	Steel alloy		8	Piston packing	Nitrile rubber	
2	Fulcrum axis	Steel alloy		9	Spring	Steel	O type only
3	Bearing	Steel alloy		10	Cylinder gasket	Nitrile rubber	
4	Cam	Stainless steel		11	Head cover	Aluminum alloy	
5	Rod packing	Nitrile rubber		12	Body	Aluminum alloy	
6	Body	Aluminum alloy		13	Spring	Steel	
7	Piston	Stainless steel		14	Head cover	Aluminum alloy	

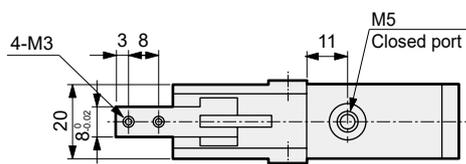
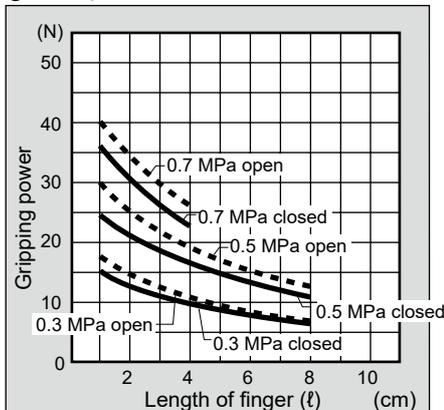
### Gripping power performance data Dimensions

- 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  $\ell$  of the 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)



● HAP-1C



- (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 double acting.
- For selection, see page 1764 for design and selection precautions.

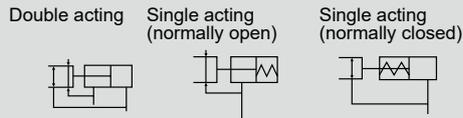
- LCM
- LCR
- LCG
- LCW
- LCX
- STM
- STG
- STS/STL
- STR2
- UCA2
- ULK\*
- JSK/M2
- JSG
- JSC3/JSC4
- USSD
- UFCD
- USC
- UB
- JSB3
- LMB
- LML
- HCM
- HCA
- LBC
- CAC4
- UCAC2
- CAC-N
- UCAC-N
- RCS2
- RCC2
- PCC
- SHC
- MCP
- GLC
- MFC
- BBS
- RRC
- GRC
- RV3\*
- NHS
- HRL
- LN
- Hand**
- Chuk
- MechMtd/Chuk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



Parallel hand Double acting/single acting

# HAP-<sup>2</sup>/<sub>4</sub> CS Series

● Operating stroke length: 16, 26, 41 mm



## Specifications

1 MPa ≈ 145.0 psi, 1 MPa = 10 bar

Item	HAP		
	2CS	3CS	4CS
Size			
Bore size	mm	ø20	ø25
Actuation	Double acting/single acting		
Working fluid	Compressed air		
Max. working pressure	MPa	0.7 (≈101 psi, 7 bar)	
Min. working pressure	MPa	0.3 (≈44 psi, 3 bar)	
Ambient temperature	°C	5 (41°F) to 60 (140°F)	
Port size		M5	Rc1/8
Operating stroke length	mm	16	26
Rod diameter	mm	ø10	ø14
Volumetric capacity (reciprocating)	cm <sup>3</sup>	4.4	10.8
Repeatability	mm	±0.03	
Weight	kg	0.28	0.58
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
Display 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 *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
- LX
- STM
- STG
- STS/STL
- STR2
- UCA2
- ULK\*
- JSK/M2
- JSG
- JSC3/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

## How to order

Without switch (built-in magnet for switch)

**HAP - 2CS - O**

With switch (built-in magnet for switch)

**HAP - 2CS - 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>					
2CS					
3CS					
4CS					
<b>B Option</b>					
Blank	Standard (double acting)				
O	Single acting (normally open)				
C	Single acting (normally closed)				
Y1	With attachment (S50C)				
Y2	With attachment (MC nylon)				
<b>C Switch model No.</b>					
Lead wire Straight	Lead wire Radial	Contact	Voltage AC DC	Display	Lead wire
T2H*	T2V*	Proximity	●	1-color	2-wire
T3H*	T3V*		●	display	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 and 1763 for the dimensions and compatible models of the attachment. When ordered as an option, two are included at shipment.

[Example of model No.]

**HAP-2CS-O-T2H-R**

Model: Parallel hand

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

### How to order switch

● For switch T\*H\*

• Switch body + mounting bracket set

**HAP - T2H**

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

• Switch body

**SW - T2H**

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

• Mounting bracket set

**HAP - T**

● For switch T\*V\*

• Switch body + mounting bracket set

**HAP - T2V - \***

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

• Switch body

**SW - T2V**

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

• Mounting bracket set

**HAP - 2CS - TV - \***

Size  
(Item **A** above)

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

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

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

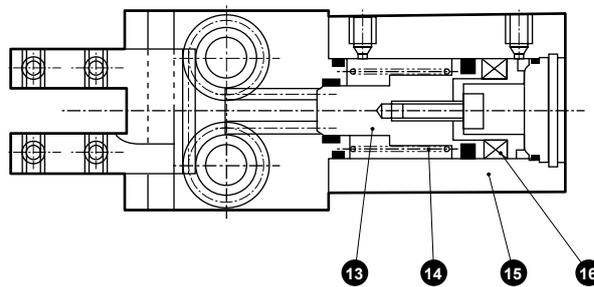
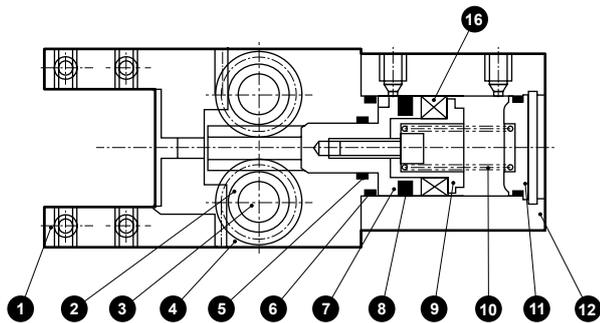
\* Contact CKD for details.

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
<b>HAP</b>
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) type does not contain a ⑩ spring.

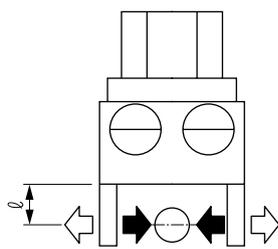
**Cannot be disassembled**

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

## Gripping power performance data

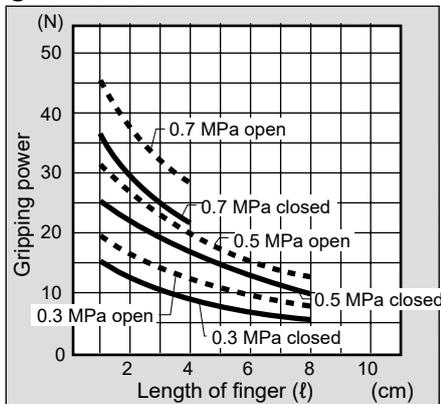
- Gripping power represents the thrust (per one finger) in the arrow direction shown in the figure.
- The gripping power in the opening/closing directions with finger length  $l$  of the hand with a supply pressure of 0.3, 0.5 and 0.7 MPa is shown.

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

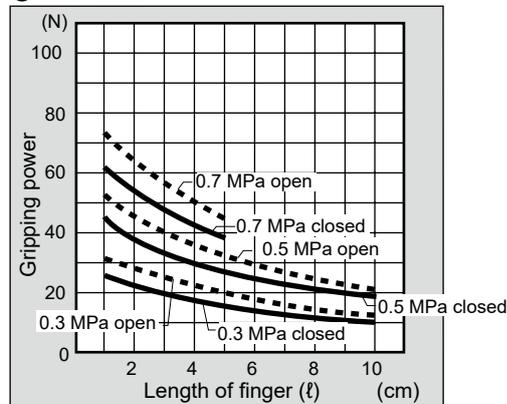


(Note) O type gripping power decreases approximately 20 to 30% in the closed direction compared to double acting. C type gripping power decreases approximately 10 to 20% in the open direction compared to double acting. For selection, see page 1764 for design and selection precautions.

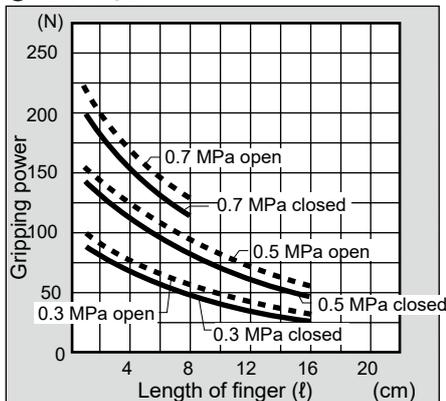
### ● HAP-2CS



### ● HAP-3CS



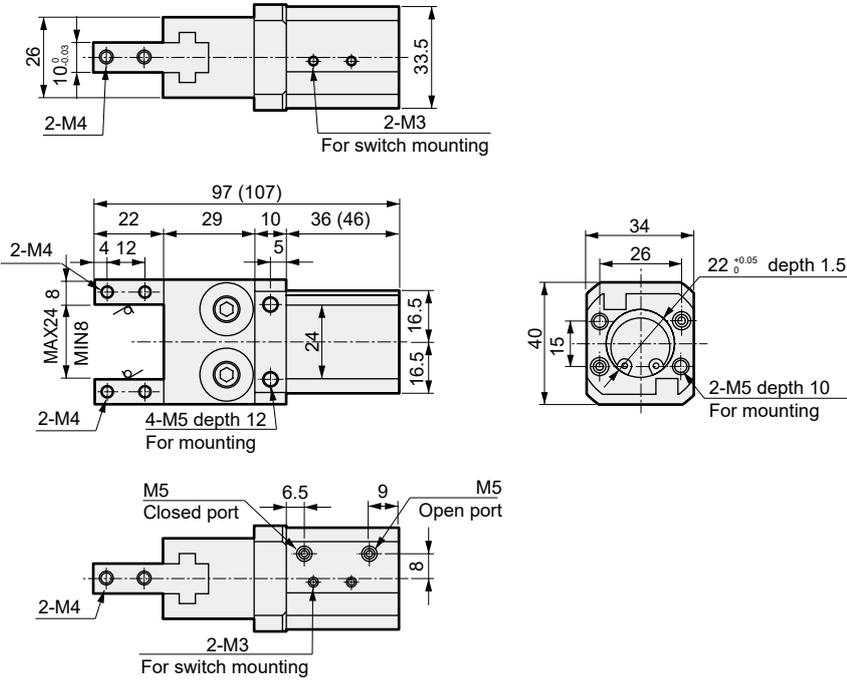
### ● HAP-4CS



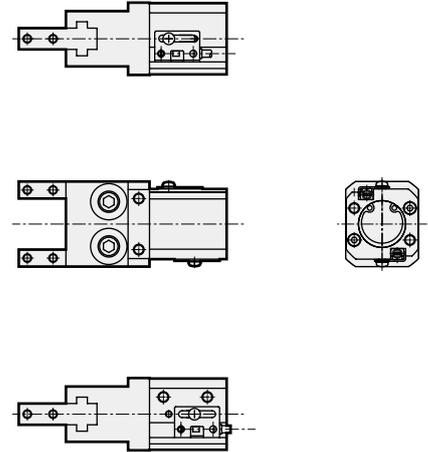
## Dimensions

### ● HAP-2CS Standard/O/C

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

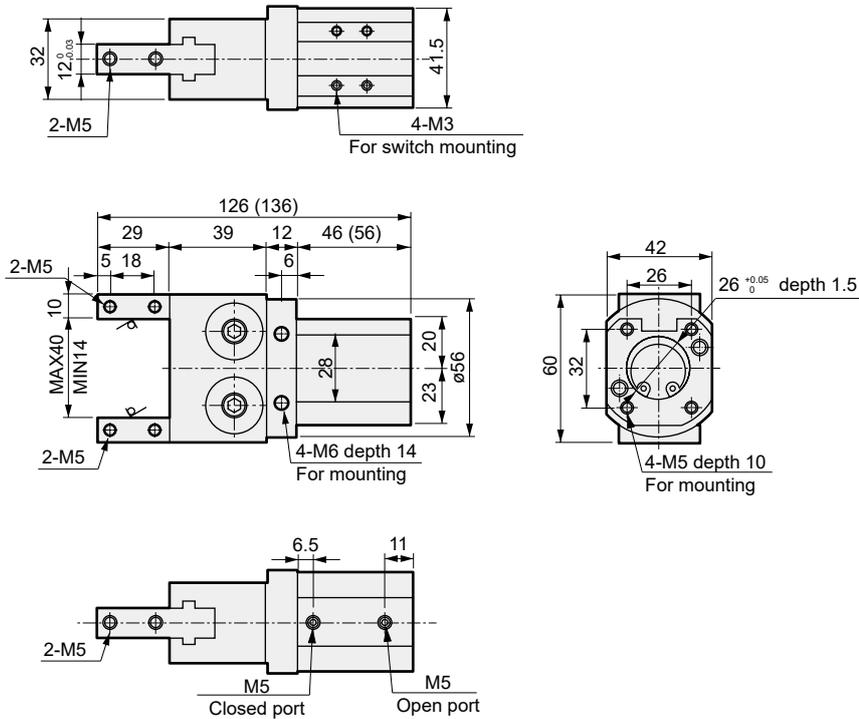


● With switch

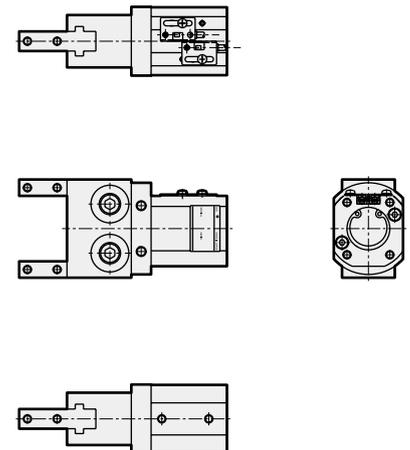


### ● HAP-3CS Standard/O/C

● 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
<b>Hand</b>
Chuk
MechHnd/Chuk
ShkAbs
FJ
FK
SpdContr
Ending
LSH-HP
LSH
FH100
BSA2
BHA/BHG
LHA
LHAG
<b>HAP</b>
HKP
HCP
HGP
HLF2
HLA/HLB
HLAG/HLBG
HLC
HLD
HMf
HMf-G
HMFB
HFP
FH500
HBL
HJL
HMD
HDL
HJD
BHE

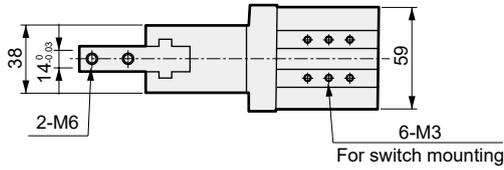
# HAP-4CS Series

## Dimensions

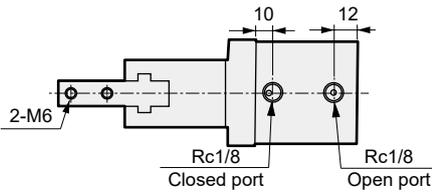
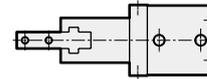
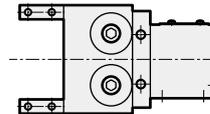
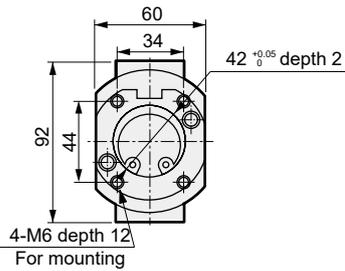
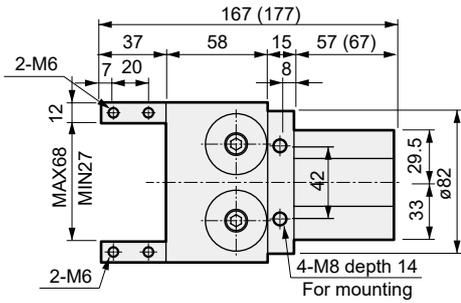
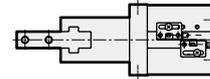


### ● HAP-4CS Standard/O/C

● 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/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
- HMFB
- HFP
- FH500
- HBL
- HJL
- HMD
- HDL
- HJD
- BHE