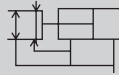


Linear Slide Hand Double acting

# LSH Series

● Operating stroke: 4, 6, 10, 14 mm

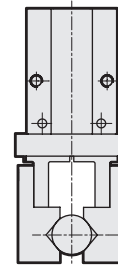


RoHS

## Specifications

| Descriptions          |          | LSH                                                                         |       |       |       |
|-----------------------|----------|-----------------------------------------------------------------------------|-------|-------|-------|
| Bore size             | mm       | ø10                                                                         | ø16   | ø20   | ø25   |
| Actuation             |          | Double acting                                                               |       |       |       |
| Working fluid         |          | Compressed air                                                              |       |       |       |
| Max. working pressure | MPa      | 0.7                                                                         |       |       |       |
| Min. working pressure | Standard | 0.2                                                                         | 0.1   |       |       |
|                       | MPa      | Shockless                                                                   | 0.3   | 0.2   |       |
| Port size             |          | M3                                                                          | M5    |       |       |
| Ambient temperature   |          | °C                                                                          |       |       |       |
|                       |          | -10 to 60 (no freezing)                                                     |       |       |       |
| Operating stroke      | mm       | 4                                                                           | 6     | 10    | 14    |
| Repeatability         |          | mm                                                                          |       |       |       |
|                       |          | ±0.01                                                                       |       |       |       |
| Weight                | Standard | 0.055                                                                       | 0.125 | 0.250 | 0.460 |
|                       | kg       | Shockless                                                                   | 0.063 | 0.143 | 0.278 |
|                       |          | 0.502                                                                       |       |       |       |
| Lubrication           |          | Not required (use turbine oil class 1 ISO VG32 if lubrication is necessary) |       |       |       |

## Gripping force



| Bore size (mm) | Open side | Closed side |
|----------------|-----------|-------------|
| ø10            | 17        | 11          |
| ø16            | 45        | 34          |
| ø20            | 66        | 42          |
| ø25            | 104       | 65          |

\* Values at 0.5 MPa supply pressure, L = 20 mm

Unit: N

## Switch specifications

| Item                     | Proximity 2-wire                     | Proximity 3-wire                      | Proximity 2-wire                     | Proximity 3-wire                      |               |
|--------------------------|--------------------------------------|---------------------------------------|--------------------------------------|---------------------------------------|---------------|
|                          | F2S                                  | F3S                                   | F2H/F2V                              | F3H/F3V                               | F3PH/F3PV     |
| Applications             | Programmable<br>Controller dedicated | Programmable<br>For controller, relay | Programmable<br>Controller dedicated | Programmable<br>For controller, relay |               |
| Output method            | -                                    | NPN output                            | -                                    | NPN output                            | PNP output    |
| Power supply voltage     | -                                    | 10 to 28 VDC                          | -                                    | 10 to 28 VDC                          | 4.5 to 28 VDC |
| Load voltage/<br>current | 10 to 30 VDC<br>5 to 20mA            | 30 VDC,<br>50 mA or less              | 10 to 30 VDC<br>5 to 20mA            | 30 VDC, 50 mA or less                 |               |
| Indicator lamp           | LED (Lit when ON)                    |                                       | Yellow LED (Lit when ON)             |                                       |               |
| Leakage current          | 1 mA or less                         | 10 μA or less                         | 1 mA or less                         | 10 μA or less                         |               |
| Shock resistance         | 980m/s <sup>2</sup>                  |                                       |                                      |                                       |               |
| Weight                   | g 1m:10 3m:29                        |                                       |                                      |                                       |               |

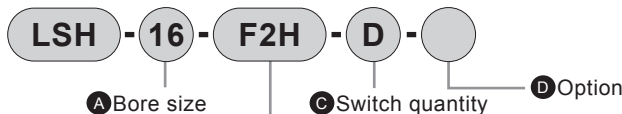
\*1 : The switch uses a bend-resistant lead wire.

## How to order

Without switch



With switch



A Bore size

B Switch model No.

C Switch quantity

D Option

## ⚠ Precautions for model No. selection

\*1: Shock absorbing option is enabled only for the closed side.

[Example of model No.]

**LSH-16-F2H-D**

Model: Linear Slide Hand

A Bore size : ø16

B Switch model No. : Proximity switch F2H  
Lead wire 1 m

C Switch quantity : 2

## How to order switch



Switch model No.  
(Item B above)

LSH-20, 25 Long nut for switch



| Code                    | Description |
|-------------------------|-------------|
| <b>A Bore size (mm)</b> |             |
| 10                      | ø10         |
| 16                      | ø16         |
| 20                      | ø20         |
| 25                      | ø25         |

| <b>B Switch model No.</b> |                       |           |         |    |                |
|---------------------------|-----------------------|-----------|---------|----|----------------|
| Straight<br>Lead wire     | L-shaped<br>Lead wire | Contact   | Voltage |    | Indicator      |
|                           |                       |           | AC      | DC |                |
| -                         | F2S*                  | Proximity |         | ●  | 1-color<br>LED |
| -                         | F3S*                  |           |         | ●  |                |
| F2H*                      | F2V*                  |           |         | ●  |                |
| F3H*                      | F3V*                  |           |         | ●  |                |
| F3PH*                     | F3PV*                 |           |         | ●  |                |

| <b>* Lead wire length</b> |                |
|---------------------------|----------------|
| Blank                     | 1 m (standard) |
| 3                         | 3 m (option)   |

| <b>C Switch quantity</b> |                  |
|--------------------------|------------------|
| R                        | 1 on open side   |
| H                        | 1 on closed side |
| D                        | 2                |

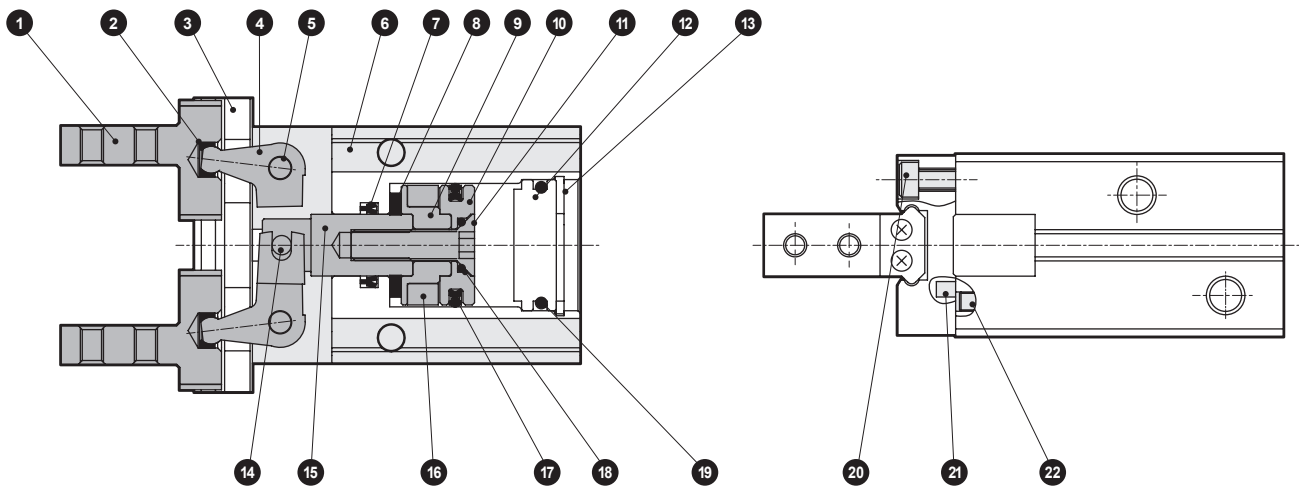
| <b>D Option</b> |                              |
|-----------------|------------------------------|
| Blank           | Standard                     |
| C               | Shockless (closed side only) |

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  
HLA/HLBG  
HLC  
HLD  
HMF  
HMF-G  
HMFB  
HFP  
FH500  
HBL  
HJL  
HMD  
HDL  
HJD  
BHE

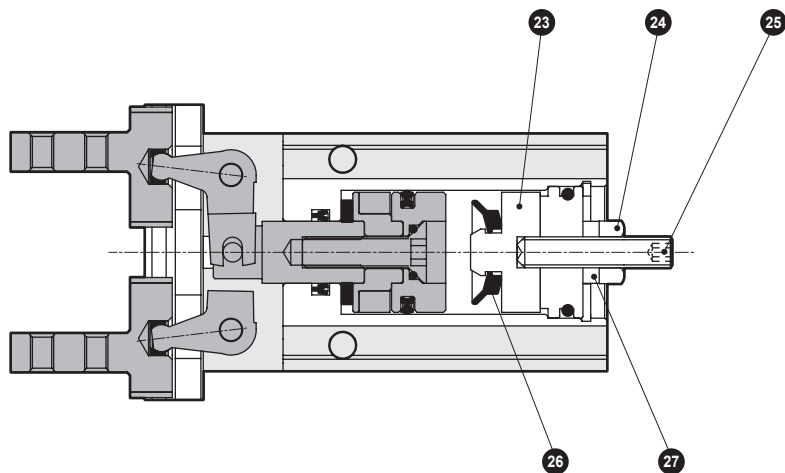
|             |
|-------------|
| LCM         |
| LCR         |
| LCG         |
| LCW         |
| LCX         |
| STM         |
| STG         |
| STS/STL     |
| STR2        |
| UCA2        |
| ULK*        |
| JSK/M2      |
| JSG         |
| JSC3/JSC4   |
| USSD        |
| UFCD        |
| USC         |
| 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      |

Internal structure diagram and parts list

●LSH (Standard)



●LSH-\*-C (Shockless (Closed side only))



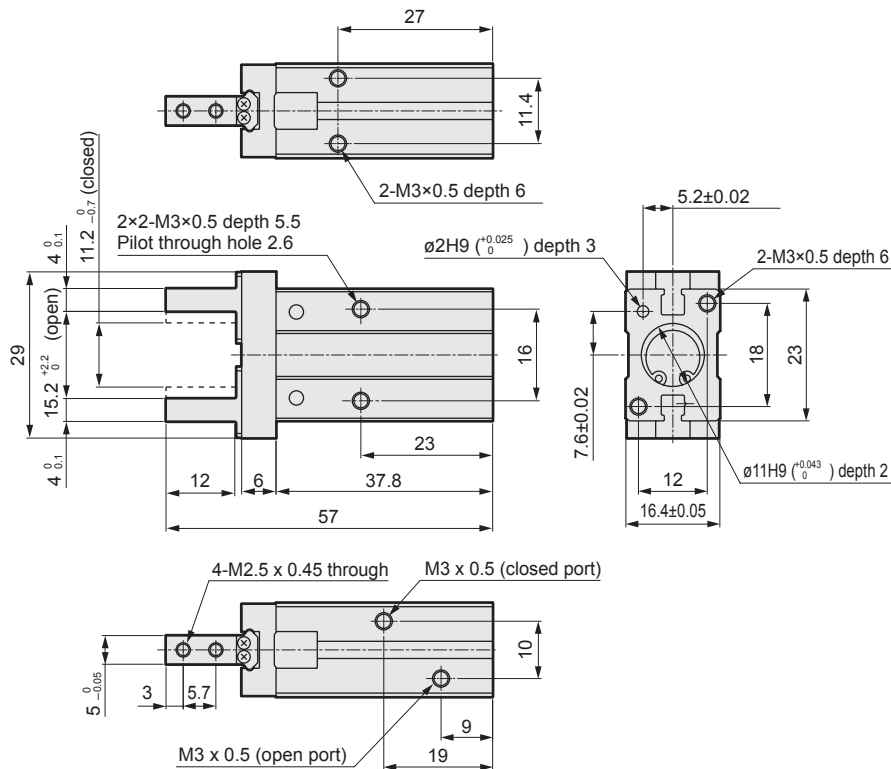
Cannot be disassembled

Parts list

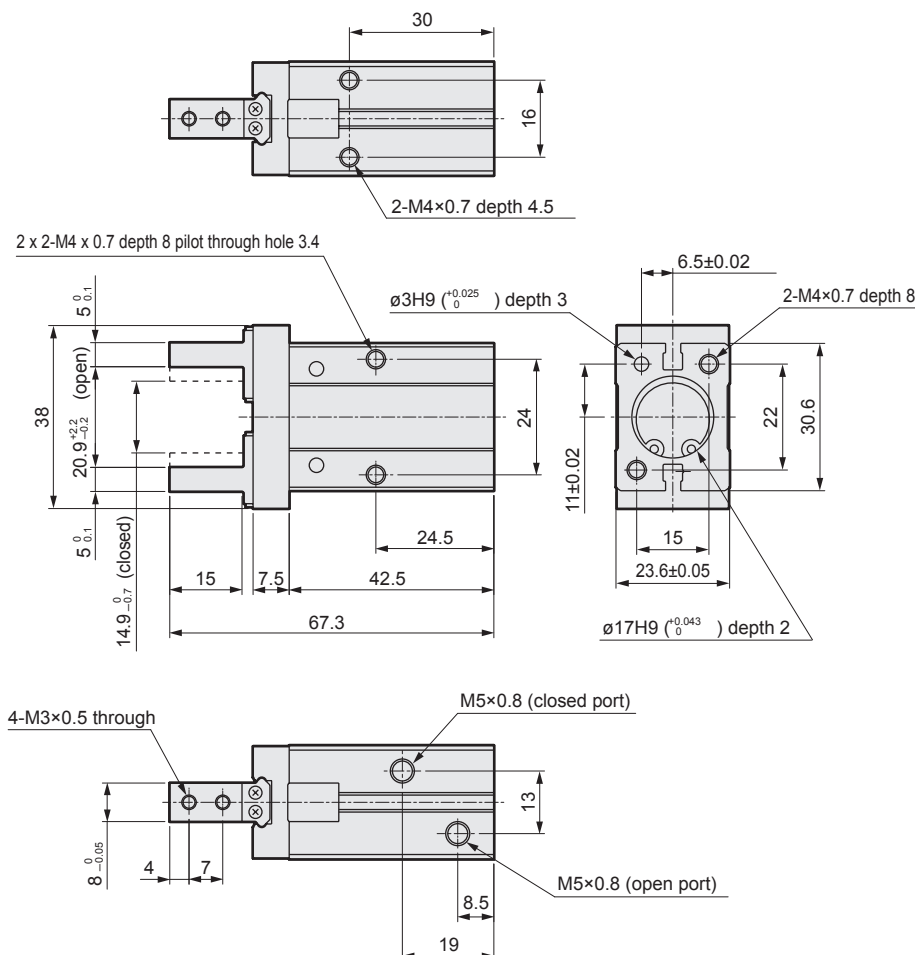
| Part No. | Part name                     | Material        | Remarks | Part No. | Part name                     | Material                         | Remarks      |
|----------|-------------------------------|-----------------|---------|----------|-------------------------------|----------------------------------|--------------|
| 1        | Finger                        | Stainless steel |         | 15       | Piston rod                    | Stainless steel                  |              |
| 2        | Holder                        | Steel alloy     |         | 16       | Magnet                        |                                  |              |
| 3        | Linear guide                  | Stainless steel |         | 17       | Piston packing                | Nitrile rubber                   |              |
| 4        | Lever                         | Stainless steel |         | 18       | O-ring                        | Nitrile rubber                   |              |
| 5        | Fulcrum axis                  | Steel alloy     |         | 19       | O-ring                        | Nitrile rubber                   |              |
| 6        | Body                          | Aluminum alloy  |         | 20       | Hexagon socket head cap screw | Stainless steel                  |              |
| 7        | Rod packing                   | Nitrile rubber  |         | 21       | Pin                           | Steel alloy                      |              |
| 8        | Cushion rubber                | Urethane rubber |         | 22       | Hexagon socket set screw      | Steel alloy                      |              |
| 9        | Spacer                        | Aluminum alloy  |         | 23       | Stopper                       | Aluminum alloy                   | Hard alumite |
| 10       | Piston                        | Aluminum alloy  |         | 24       | Hexagon nut                   | Steel alloy                      |              |
| 11       | Hexagon socket head cap screw | Stainless steel |         | 25       | Hexagon socket set screw      | Steel alloy                      |              |
| 12       | Head cover                    | Aluminum alloy  |         | 26       | Rubber-air cushion            | Special rubber                   |              |
| 13       | C-snap ring                   | Stainless steel |         | 27       | Sealing washer                | Stainless steel + nitrile rubber |              |
| 14       | Operation shaft               | Steel alloy     |         |          |                               |                                  |              |

## Dimensions (bore size: $\varnothing 10$ , $\varnothing 16$ )

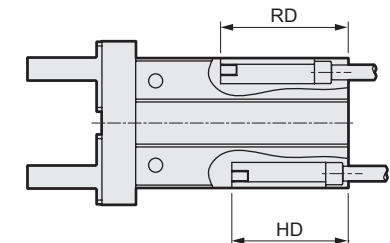
### ● LSH-10 (Standard)



### ● LSH-16 (Standard)



### ● With switch



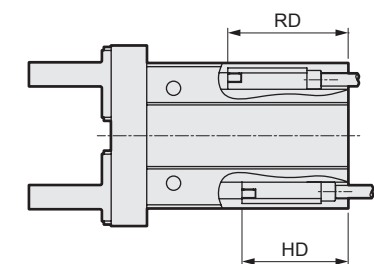
|         |    |      |
|---------|----|------|
| F2/3*   | RD | 22.5 |
|         | HD | 20.5 |
| F2S/F3S | RD | 23.5 |
|         | HD | 21.5 |

\*1: RD dimension is the max. sensitivity position at open side end position and HD dimension at closed side end position. The actual mounting position should be adjusted after confirming the operational status of the switch.

\*2: Switch cannot be mounted when mounting the body with through holes. Refer to page 1768 for details.

\*3: For F□H, the switch lead wire projects from the end face of the head side. If this projection is a problem, use F□V or F□S.

### ● With switch



|         |    |      |
|---------|----|------|
| F2/3*   | RD | 25.5 |
|         | HD | 22.5 |
| F2S/F3S | RD | 26.5 |
|         | HD | 23.5 |

\*1: RD dimension is the max. sensitivity position at open side end position and HD dimension at closed side end position. The actual mounting position should be adjusted after confirming the operational status of the switch.

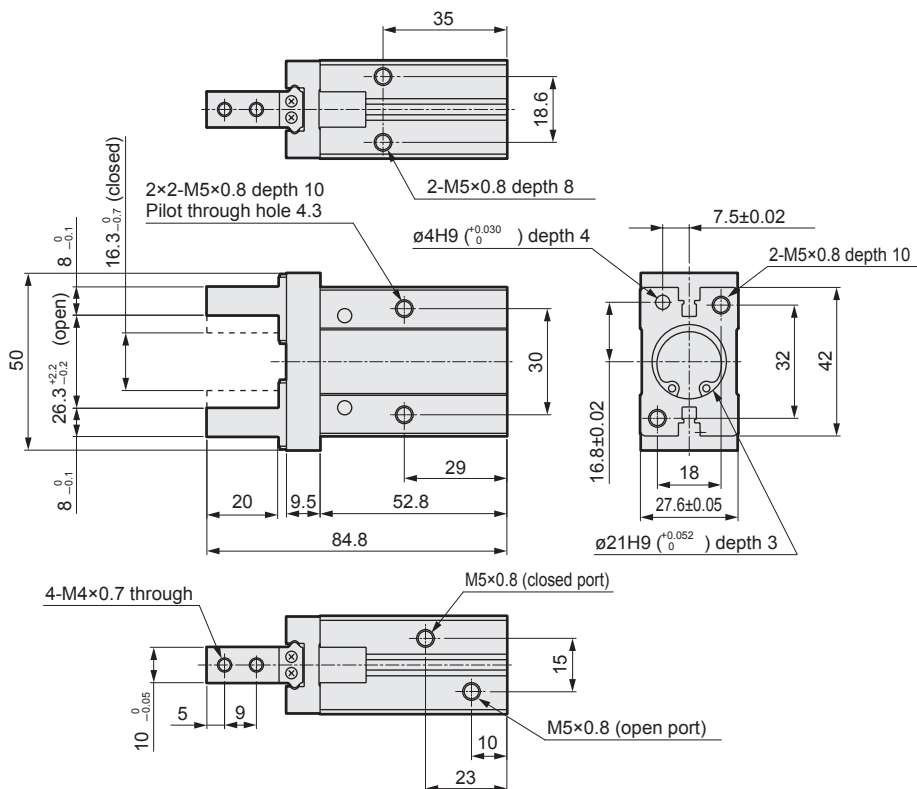
\*2: Switch cannot be mounted when mounting the body with through holes. Refer to page 1768 for details.

\*3: For F□H, the switch lead wire projects from the end face of the head side. If this projection is a problem, use F□V or F□S.

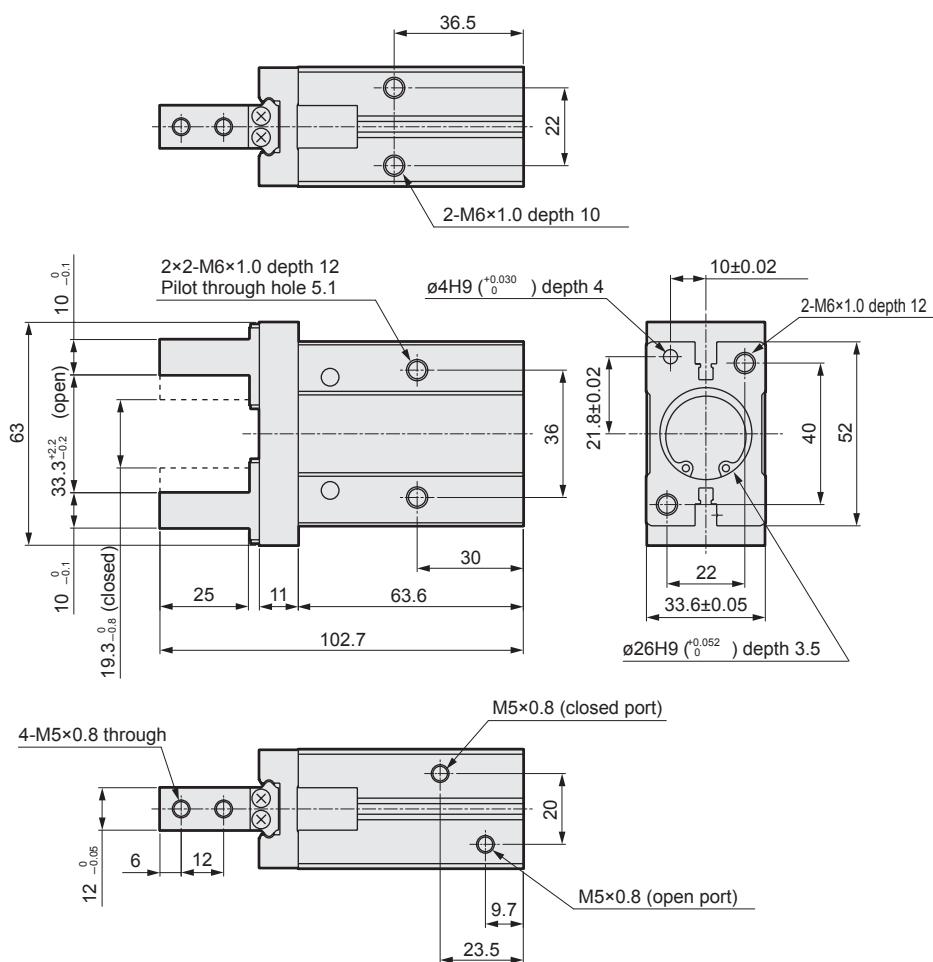
|               |
|---------------|
| LCM           |
| LCR           |
| LCG           |
| LCW           |
| LCX           |
| STM           |
| STG           |
| STS/STL       |
| STR2          |
| UCA2          |
| ULK*          |
| JSK/M2        |
| JSG           |
| JSC3/JSC4     |
| USSD          |
| 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        |
| <b>LSH-HP</b> |
| <b>LSH</b>    |
| 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           |

## Dimensions (bore size: $\varnothing 20$ , $\varnothing 25$ )

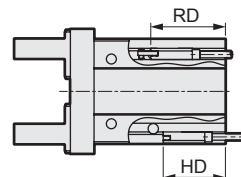
### ● LSH-20 (Standard)



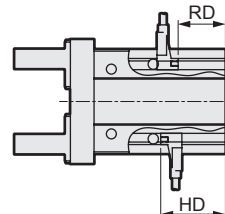
### ● LSH-25 (Standard)



### ● With F2H/F3H, F2V/F3V switches



### ● With F2S/F3S switch



|         |    |    |
|---------|----|----|
| F2/3*   | RD | 30 |
|         | HD | 25 |
| F2S/F3S | RD | 19 |
|         | HD | 26 |

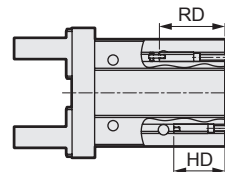
\*1: RD dimension is the max. sensitivity position at open side end position and HD dimension at closed side end position. The actual mounting position should be adjusted after confirming the operational status of the switch.

\*2: Switch cannot be mounted when mounting the body with through holes. Refer to page 1768 for details.

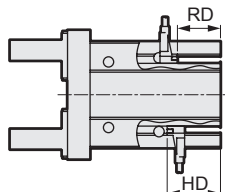
\*3: For F□H, the switch lead wire projects from the end face of the head side. If this projection is a problem, use F□V or F□S.

\*4: When installing the F2/3H or F2/3V switch in a position with RD dimensions 27.5 to 30, replace the switch fixing nut with the attached long nut according to the switch mounting procedure included with the product.

### ● With F2H/F3H, F2V/F3V switches



### ● With F2S/F3S switch



|         |    |    |
|---------|----|----|
| F2/3*   | RD | 32 |
|         | HD | 25 |
| F2S/F3S | RD | 21 |
|         | HD | 26 |

\*1: RD dimension is the max. sensitivity position at open side end position and HD dimension at closed side end position. The actual mounting position should be adjusted after confirming the operational status of the switch.

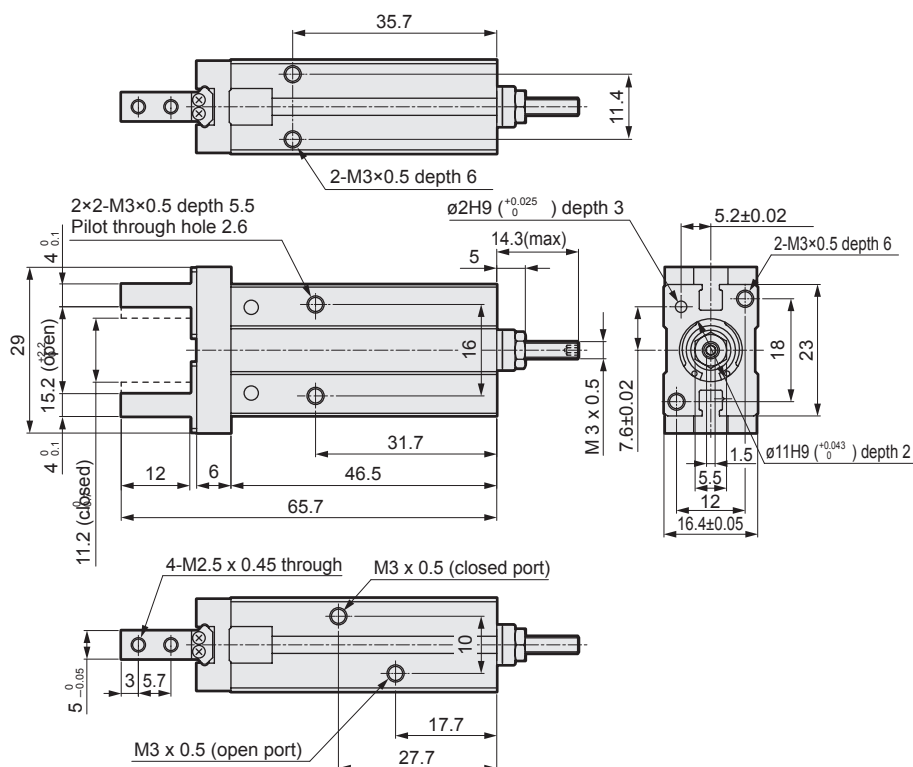
\*2: Switch cannot be mounted when mounting the body with through holes. Refer to page 1768 for details.

\*3: For F□H, the switch lead wire projects from the end face of the head side. If this projection is a problem, use F□V or F□S.

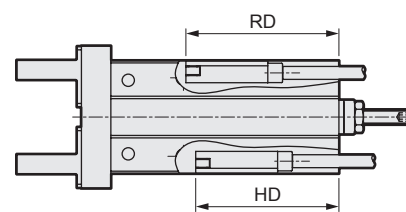
\*4: When mounting the F2/3H or F2/3V switch to RD dimensions 29 to 33, replace the switch fixing nut with the attached long nut according to the switch mounting procedure included with the product.

## Dimensions (bore size: $\varnothing 10$ , $\varnothing 16$ )

### ● LSH-10-C (Shockless (closed side only))



### ● With switch



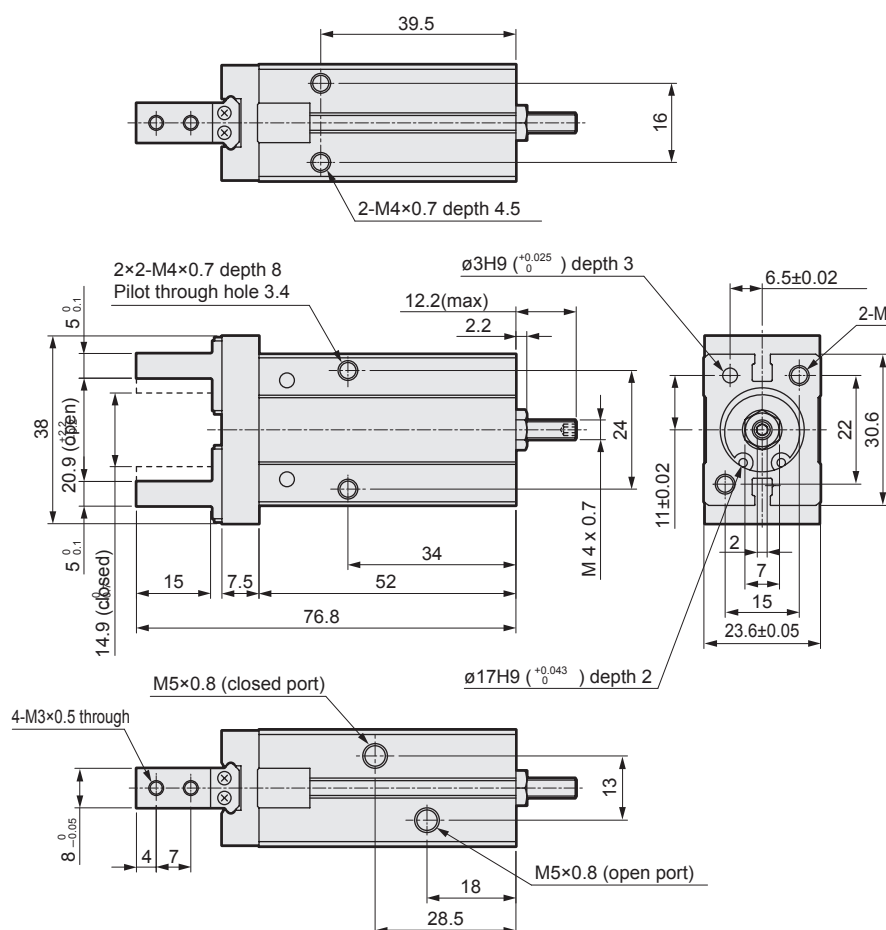
|         |    |    |
|---------|----|----|
| F2/3*   | RD | 31 |
|         | HD | 29 |
| F2S/F3S | RD | 32 |
|         | HD | 30 |

\*1: RD dimension is the max. sensitivity position at open side end position and HD dimension at closed side end position. The actual mounting position should be adjusted after confirming the operational status of the switch.

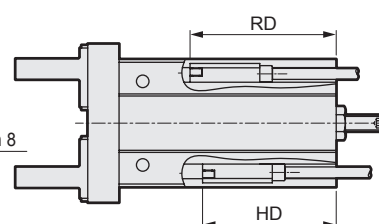
\*2: Switch cannot be mounted when mounting the body with through holes. For details, refer to page 1768.

\*3: For F□H, the switch lead wire projects from the end face of the head side. If this projection is a problem, use F□V or F□S.

### ● LSH-16-C (Shockless (closed side only))



### ● With switch



|         |    |    |
|---------|----|----|
| F2/3*   | RD | 35 |
|         | HD | 32 |
| F2S/F3S | RD | 36 |
|         | HD | 33 |

\*1: RD dimension is the max. sensitivity position at open side end position and HD dimension at closed side end position. The actual mounting position should be adjusted after confirming the operational status of the switch.

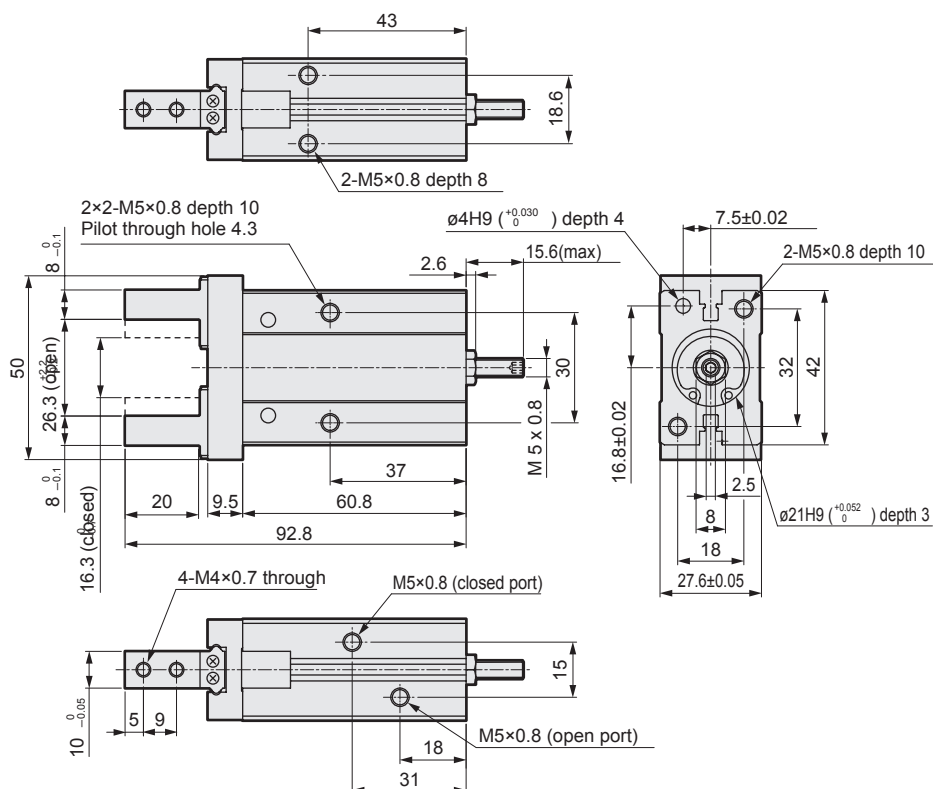
\*2: Switch cannot be mounted when mounting the body with through holes. For details, refer to page 1768.

\*3: For F□H, the switch lead wire projects from the end face of the head side. If this projection is a problem, use F□V or F□S.

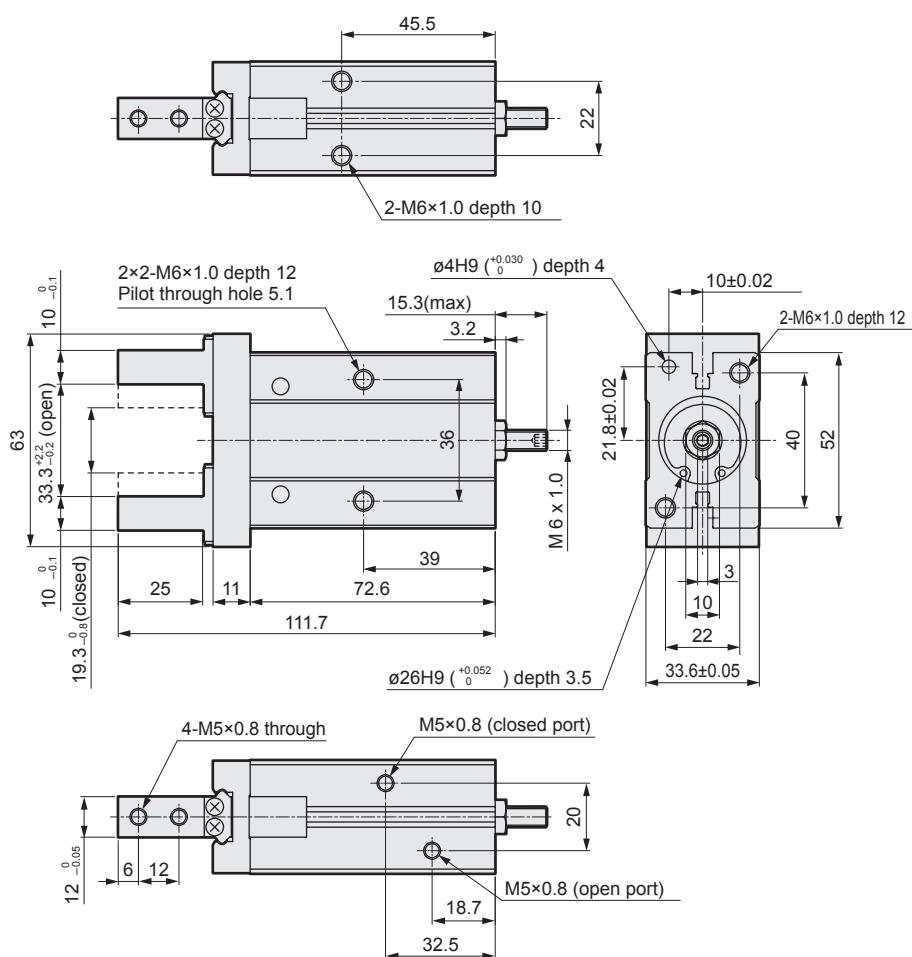
|              |
|--------------|
| LCM          |
| LCR          |
| LCG          |
| LCW          |
| LCX          |
| STM          |
| STG          |
| STS/STL      |
| STR2         |
| UCA2         |
| ULK*         |
| JSK/M2       |
| JSG          |
| JSC3/JSC4    |
| USSD         |
| UFCD         |
| 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         |
| MechMod/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 (bore size: $\varnothing 20$ , $\varnothing 25$ )

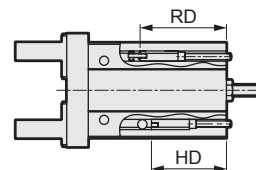
### ●LSH-20-C (Shockless (closed side only))



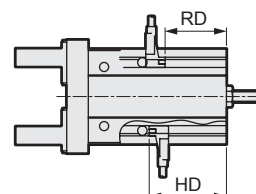
### ●LSH-25-C (Shockless (closed side only))



### ●With F2H/F3H, F2V/F3V switches



### ●With F2S/F3S switch



|         |    |    |
|---------|----|----|
| F2/3*   | RD | 38 |
|         | HD | 33 |
| F2S/F3S | RD | 27 |
|         | HD | 34 |

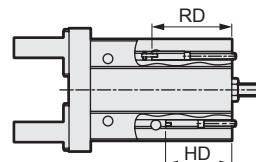
\*1: RD dimension is the max. sensitivity position at open side end position and HD dimension at closed side end position. The actual mounting position should be adjusted after confirming the operational status of the switch.

\*2: Switch cannot be mounted when mounting the body with through holes. For details, refer to page 1768.

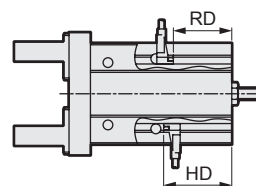
\*3: For F□H, the switch lead wire projects from the end face of the head side. If this projection is a problem, use F□V or F□S.

\*4: When installing the F2/3H or F2/3V switch in a position with RD dimensions 35.5 to 38, replace the switch fixing nut with the attached long nut according to the switch mounting procedure included with the product.

### ●With F2H/F3H, F2V/F3V switches



### ●With F2S/F3S switch



|         |    |    |
|---------|----|----|
| F2/3*   | RD | 41 |
|         | HD | 34 |
| F2S/F3S | RD | 30 |
|         | HD | 35 |

\*1: RD dimension is the max. sensitivity position at open side end position and HD dimension at closed side end position. The actual mounting position should be adjusted after confirming the operational status of the switch.

\*2: Switch cannot be mounted when mounting the body with through holes. For details, refer to page 1768.

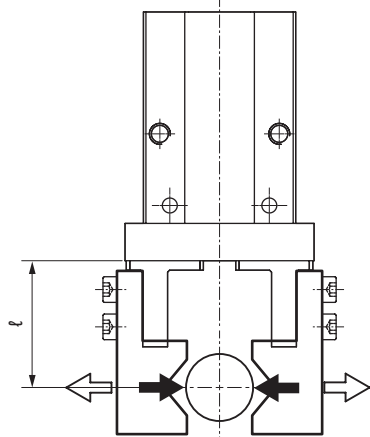
\*3: For F□H, the switch lead wire projects from the end face of the head side. If this projection is a problem, use F□V or F□S.

\*4: When mounting the F2/3H or F2/3V switch to RD dimensions 38 to 42, replace the switch fixing nut with the attached long nut according to the switch mounting procedure included with the product.

### Gripping force performance data

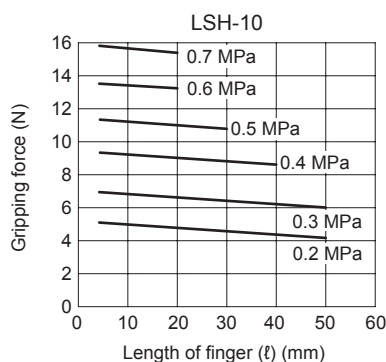
- Gripping force represents the thrust (per finger) in the arrow direction shown in the figure.
- The gripping force in the opening/closing directions with finger length  $l$  with a supply pressure of 0.2 to 0.7 MPa is shown.

- Open direction (←)
- Closed direction (→)

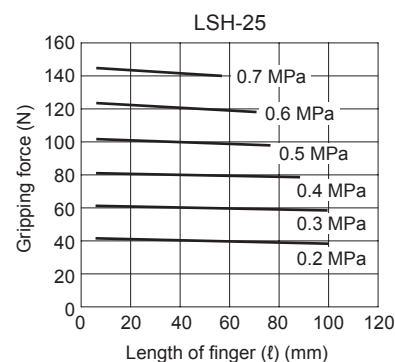
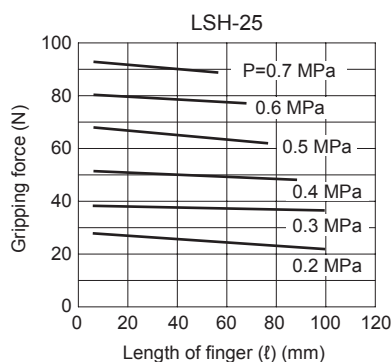
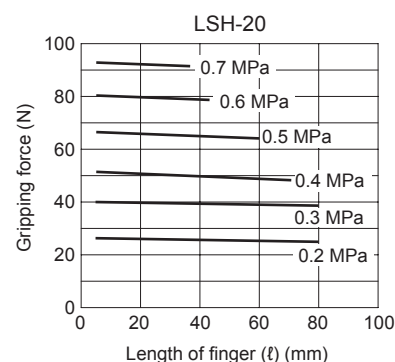
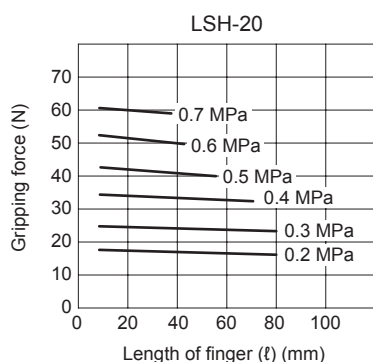
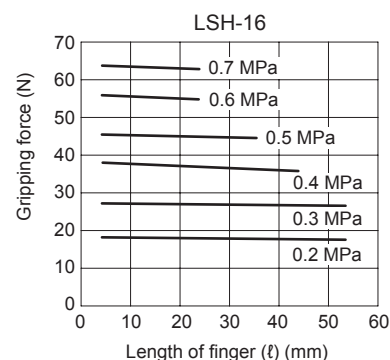
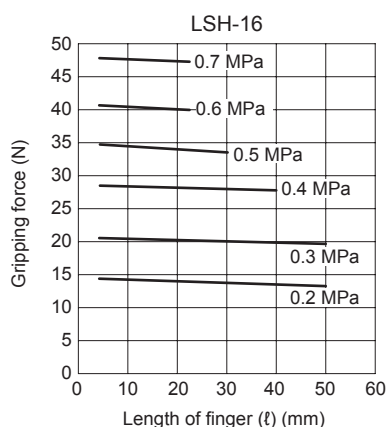
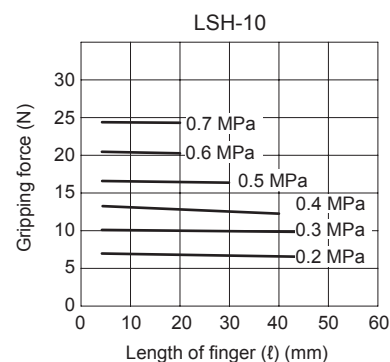


(Note) When making a selection, read the precautions for design and selection on page 1764.

Closed direction



Open direction

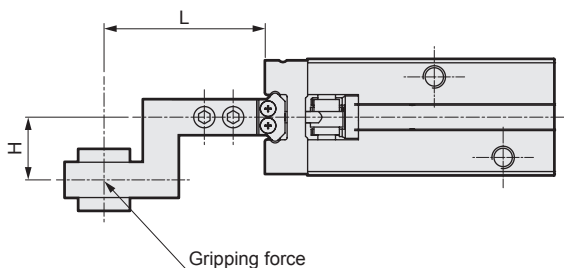


|              |
|--------------|
| LCM          |
| LCR          |
| LCG          |
| LCW          |
| LCX          |
| STM          |
| STG          |
| STS/STL      |
| STR2         |
| UCA2         |
| ULK*         |
| JSK/M2       |
| JSG          |
| JSC3/JSC4    |
| USSD         |
| UFCD         |
| 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          |
| BHE          |

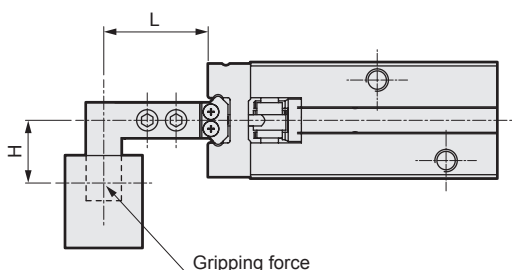
## Finger length

When mounting an L-shaped attachment, use within the range given in the figure at right.

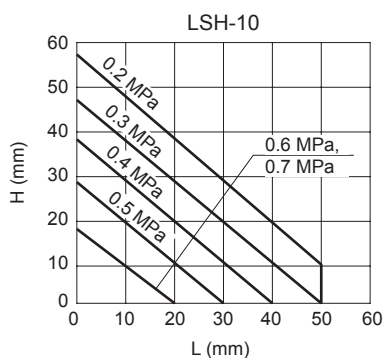
Closed direction



Open direction



Closed direction



Open direction

