

## Productivity improvement starts with the Linear Slide Gripper

### Improved linear guide performance

#### High rigidity

By increasing guide rigidity compared to conventional products, an increase in allowable moment has been achieved.

#### Increased Overhang

Rigidity up 30%



#### High precision

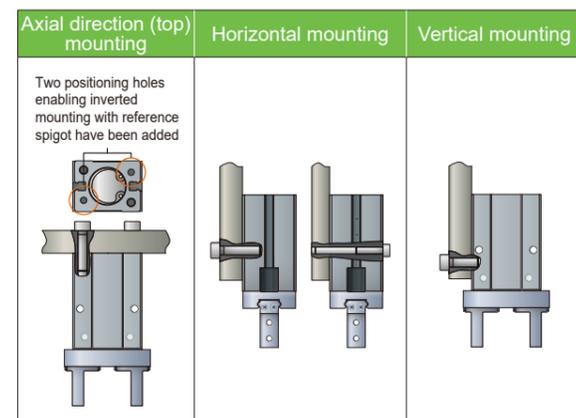
Integrated structure of guide rail and finger achieves high rigidity and high precision.

#### Repeatability ±0.01 mm



### High design freedom

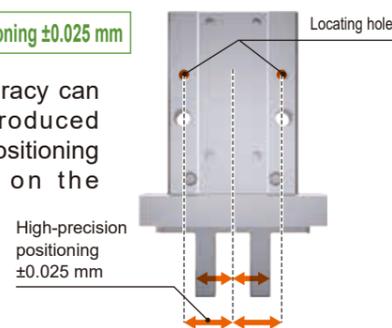
#### Mountable from 3 directions



### Reduced on-site man-hours

#### High-precision positioning ±0.025 mm

Centering accuracy can be easily reproduced by adding a "positioning hole" based on the gripping center.



### Long service life

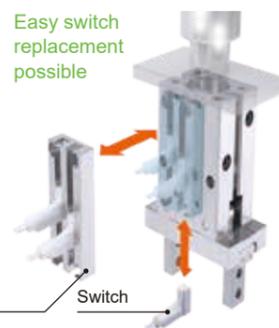
#### Durability 4 times conventional ratio \*1 \*2

Optimized packing part design. Mastering sliding technology, achieved 4 times the durability of conventional products.



#### Rail plate method adopted

With the rail plate, switches can be replaced while the gripper is still included to the robot/equipment.



### Usage examples - Reduction of on-site man-hours -

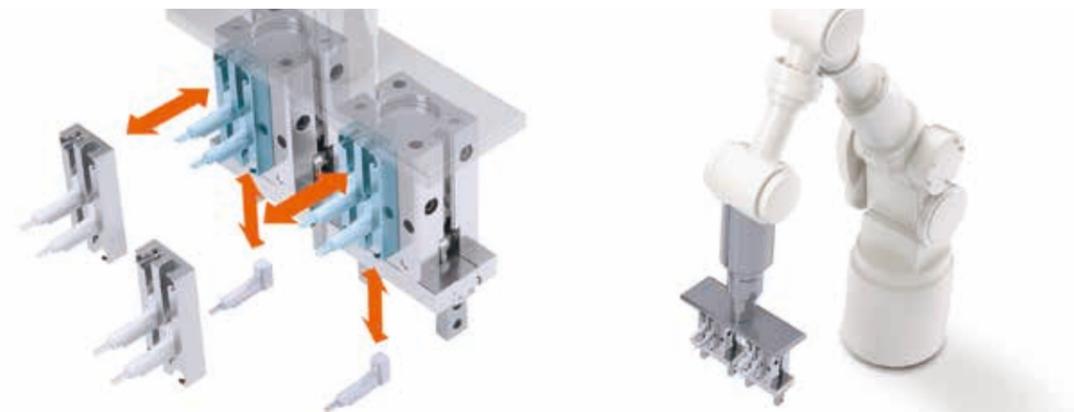
#### Replacement of main body

Locating holes that guarantee centering accuracy enable highly reproducible mounting without fine adjustment. Contributes to reduction of mounting adjustment man-hours and improvement of reproducibility.



#### Replacement of switch

Switches can be replaced without detaching the gripper from the robot or equipment.



### Abundant series variations



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

## New series combining improved reliability and productivity

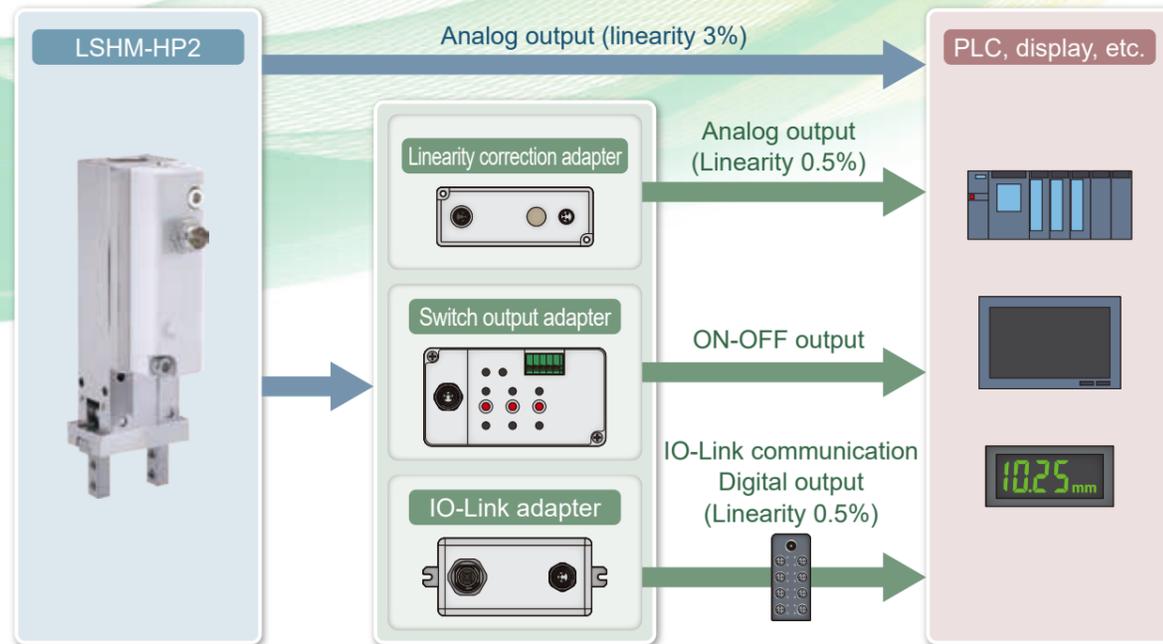
### High precision

Repeatability  $\pm 0.02$  mm

By adopting a new sensor method and integrating it, higher repeatability than ever before has been achieved.

### Selectable output format

Various output forms can be selected according to the application.



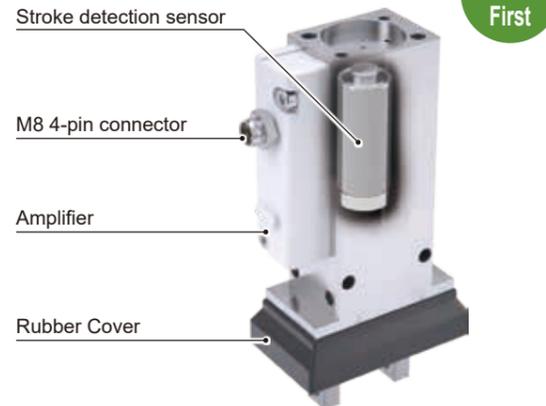
### Integrated structure

Adopts LVDT\* method sensor with excellent vibration and shock resistance. By incorporating a displacement sensor into the body and creating an integrated structure, high precision has been achieved.

\*LVDT is an abbreviation for Linear Variable Differential Transformer, and is a sensor that converts mechanical displacement into an electrical signal and outputs it.

#### Environmental Resistance

IP65 equivalent amplifier and rubber cover prevent internal intrusion of chips and water droplets.



### Linearity correction adapter

Linearity F.S.  $\pm 0.5\%$

- With correction adapter: F.S.  $\pm 0.5\%$
- Without correction adapter: F.S.  $\pm 3\%$

Adoption of the correction adapter has improved linearity accuracy.



### Switch Output Adapter

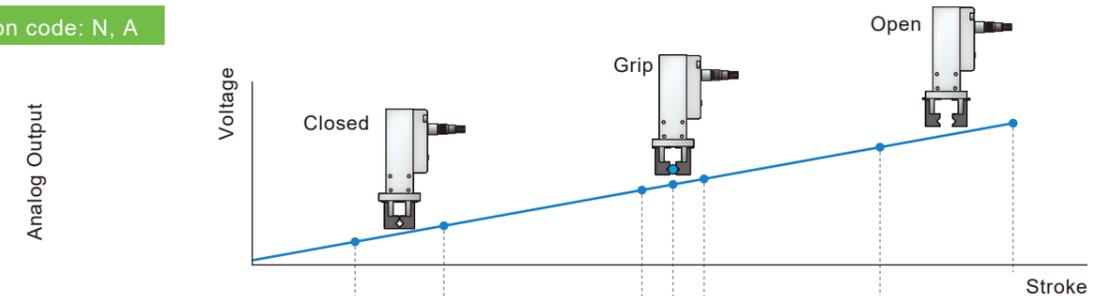
Easy setting

Operating range and output pattern can be easily selected with a rotary switch. Troublesome cylinder switch adjustment work is unnecessary. Also, fine operating ranges can be selected with the high-precision sensor.

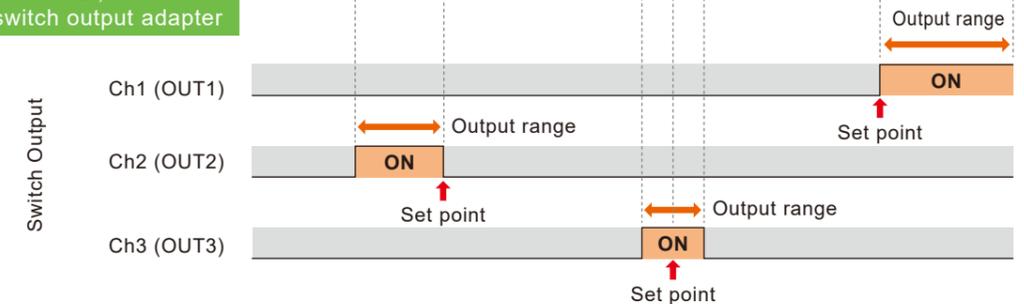


### Operation detection image

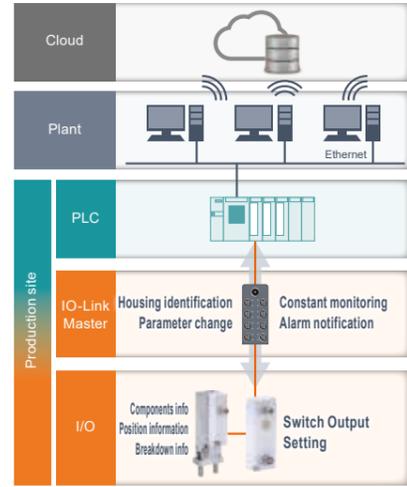
Option code: N, A



Option code: B, C  
With switch output adapter



## IO-Link Adapter



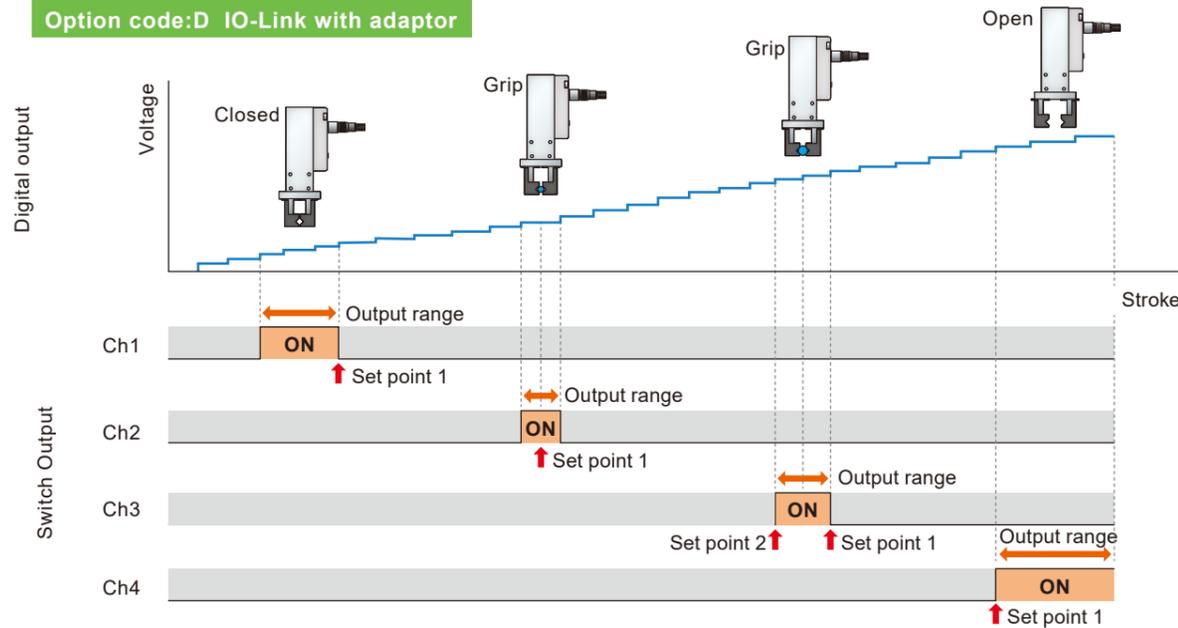
- Digital signal**: Constant monitoring by digital data is possible.
- Parameter remote control**: Since parameters can be set and changed from the network, remote operation of the equipment is possible.
- Housing identification**: Model No., serial No., etc. can be confirmed on the network.
- Data storage**: Since settings can be copied from the master, troublesome parameter resetting during maintenance is unnecessary.
- Error notification**: Device failure and disconnection can be confirmed.
- Connection to fieldbus**: It can also be converted and connected to Ethernet-based networks, enabling IoT of equipment.



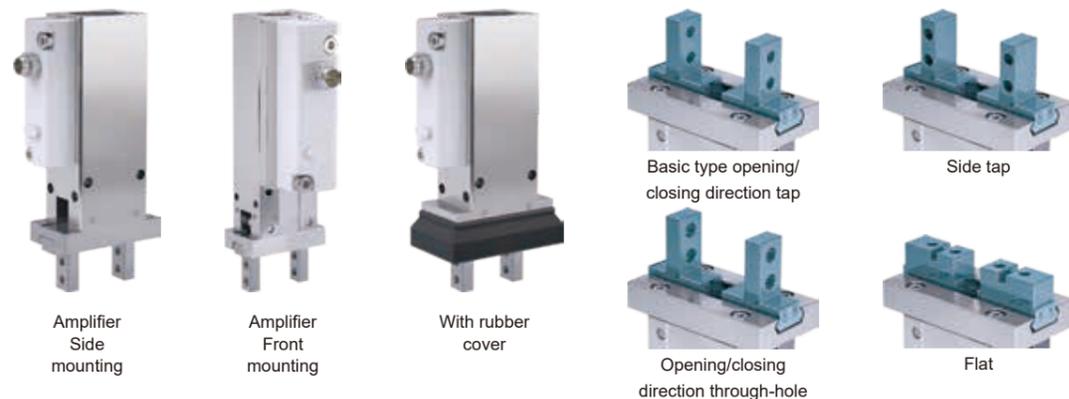
IO-Link is a digital communication standard for sensors and actuators in factory sites. (IEC61131-9) It is possible to transmit parameters and event data that could not be transmitted with analog communication.

### Operation detection image

Option code:D IO-Link with adaptor

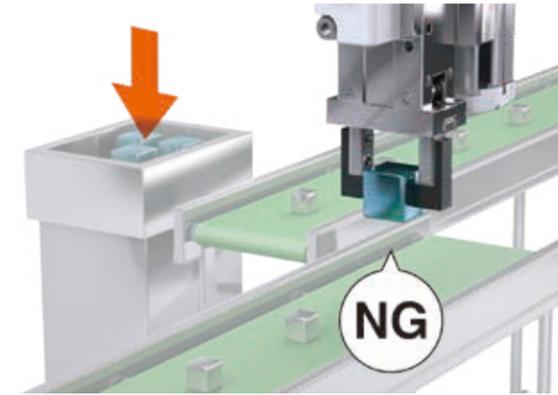


## Abundant series variations

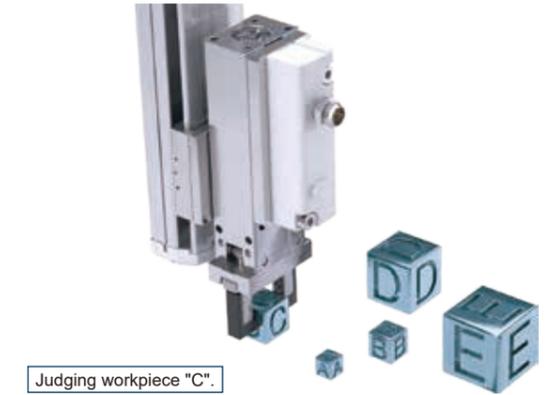


## Usage Examples

**Workpiece non-conforming product judgment**  
Measures length simultaneously with gripping, enabling omission of inspection man-hours.



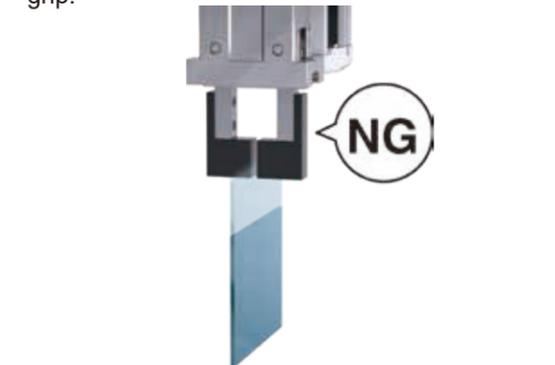
**Workpiece type judgment**  
Even minute differences in workpiece type can be judged instantly.



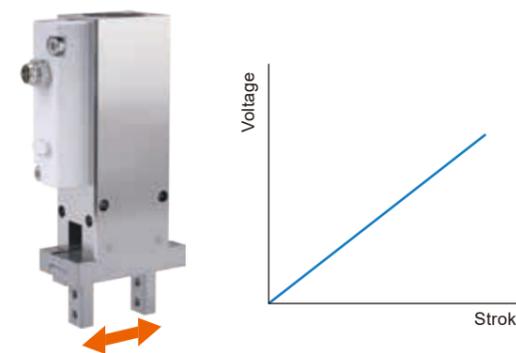
**Gripping posture judgment**  
By detecting posture deviation when gripping, contact accidents at the conveyance destination can be prevented.



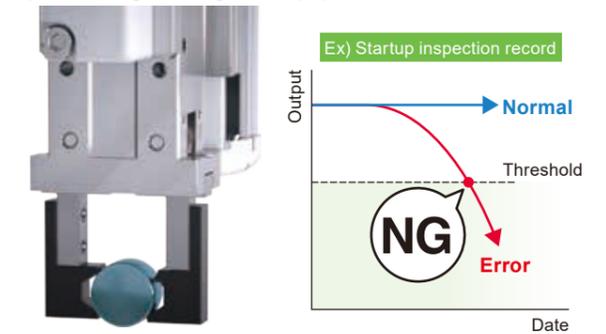
**Minute workpiece gripping/empty gripping judgment**  
It can be accurately judged whether even a minute workpiece has been gripped or if it was an empty grip.



**Elimination of human error**  
The entire stroke is output in detail, eliminating adjustment defects due to manual work that occurred with conventional switches.



**Predictive maintenance**  
Abnormal wear and deformation of gripping fingers and jigs can be monitored from changes in output, preventing damage to equipment and robots.



# System Table Linear Slide Gripper LSH-HP Series (High Durability Equipment)

Variation	Model No.	Bore size (mm)	Gripping Force (N)					Operating Stroke (mm)	Switch Model No.	Page		
			5	10	50	100	200					
<b>HP1 Series</b> Double Acting Type/Single Acting Type Without Rubber Cover 	LSH-A-HP1	ø6	█					4	F2S	12		
		ø10		█								
		ø16			█						6	
		ø20				█					10	
		ø25					█				14	
		ø32						█			22	
	Double Acting Type/Single Acting Type With Rubber Cover 	LSH-G-HP1 LSH-F-HP1	ø6	█					4	F3S	22	
			ø10		█							
			ø16			█						6
			ø20				█					10
			ø25					█				14
			ø32						█			22
Double Acting Type Long Stroke Without Rubber Cover 	LSHL-A-HP1	ø10		█				8	T2H/VR3	32		
		ø16			█						12	
		ø20				█					18	
		ø25					█				22	
Double Acting Type Long Stroke With Rubber Cover 	LSHL-G-HP1 LSHL-F-HP1	ø10		█				8	T3H/V	40		
		ø16			█						12	
		ø20				█					18	
<b>HP2 Series</b> With Length Measurement Function Double Acting Type Without Rubber Cover 	LSHM-A-HP2	ø10		█				4	-	48		
		ø16			█						6	
		ø20				█					10	
		ø25					█				14	
	With Length Measurement Function Double Acting Type With Rubber Cover 	LSHM-G-HP2 LSHM-F-HP2	ø10		█				4	-	56	
			ø16			█						6
			ø20				█					10
			ø25					█				14

\*Range of gripping force at 0.5 MPa supply pressure and 20 mm finger length

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

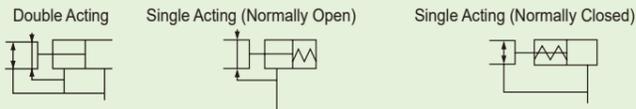
Ending



Linear Slide Gripper Double Acting Type/Single Acting Type (High Durability Equipment)

# LSH-A-HP1 Series

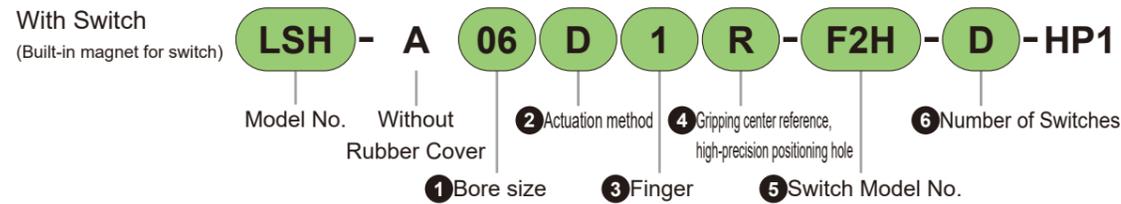
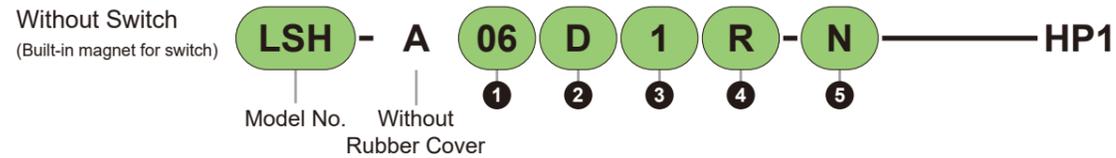
● Operating Stroke: 4, 6, 10, 14, 22 mm



## LSH-A-HP1 Series

Model No. Notation Method

### Model No. Notation Method



#### 1 Bore Size (mm)

Code	Content
06	ø6
10	ø10
16	ø16
20	ø20
25	ø25
32	ø32

#### 2 Actuation method

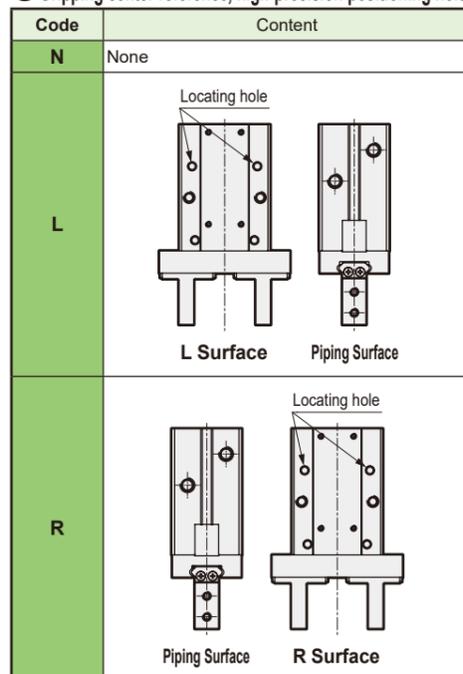
Code	Content
D	Double Acting
S	Single Acting, Normally Open
C	Single Acting, Normally Closed

#### 3 Finger

Code	Content
1	Basic type
2	Side tap
3	Through-hole
4	Flat

Note) For details, refer to the outline dimension drawings.

#### 4 Gripping center reference, high-precision positioning hole



Note) For details, refer to each outline dimension drawing (P. 15 to P. 20) and P. 71.

#### 5 Switch Model No.

Without Switch

Code	Content
Blank	Without switch, F-type switch rail plate included
N	Without switch, without switch rail plate
A	Without switch, T-type switch rail plate included (ø32 only)

With Switch

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

Indicator LED Special Function	Wiring (Output)	Load Voltage (V)		Load Current (mA)		Lead wire *1		
		AC	DC	AC	DC	Straight	L-shape	
Solid State	2-wire	-	10 to 30	-	5 to 20	-	F2S□	
	3-wire (NPN)	-	30 or less	-	50 or less	-	F3S□	
	2-wire	-	10 to 30	-	5 to 20 N *2	F2H□	F2V□	
	3-wire (NPN)	-	30 or less	-	50 or less	F3H□	F3V□	
	3-wire (PNP)	-	30 or less	-	50 or less	F3PH□	F3PV□	
	2-wire	-	10 to 30	-	5 to 20 *2	T2H□	T2V□	
	1-Color Flex-Resistant Lead Wire	2-wire	-	10 to 30	-	5 to 20 *2	T2HR3	T2VR3
	1-Color	3-wire (NPN)	-	30 or less	-	100 or less	T3H□	T3V□
		3-wire (PNP)	-	30 or less	-	100 or less	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: T-type switch can be selected for ø32 only.

\*4: If with switch is selected, a rail plate corresponding to the switch will be included.

\*5: For notes on switches, refer to P. 80.

\*6: Switches other than the model No.s listed above are also available. (Custom Product) For details, see P. 573.

\*7: When mounting a 2-color indicator switch, please consult our sales office.

#### 6 Number of Switches

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

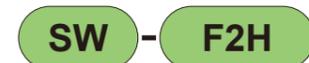
Rechargeable Battery Compatible Specification (Catalog No. CC-1226AA)

● Design compatible with rechargeable battery manufacturing process

**LSH-.....-P4□-HP1**

\*Please contact us for details.

#### Switch Single Unit Model No. Notation Method



5 Switch Model No.

#### \*Lead wire length

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

Example) Lead wire length  
1 m F2S  
3 m F2S[3]

Hand (Gripper)

Hand (Gripper)

LSH-HP

LSH-HP

LSH

LSH

FH100

FH100

BSA2

BSA2

BHA

BHA

BHG

BHG

BHE

BHE

LHA

LHA

LHAG

LHAG

HAP-1C

HAP-1C

HAP-2 to 4CS

HAP-2 to 4CS

HKP

HKP

HCP

HCP

HGP

HGP

LST-HP

LST-HP

HLF2

HLF2

HLA/HLB

HLA/HLB

HLAG/HLBG

HLAG/HLBG

HLC

HLC

HLD

HLD

HMC-HP

HMC-HP

HMF

HMF

HMF-G

HMF-G

HMF-B

HMF-B

HFP

HFP

FH500

FH500

HBL

HBL

HJL

HJL

HMD

HMD

HDL

HDL

HJD

HJD

Cylinder Switch

Cylinder Switch

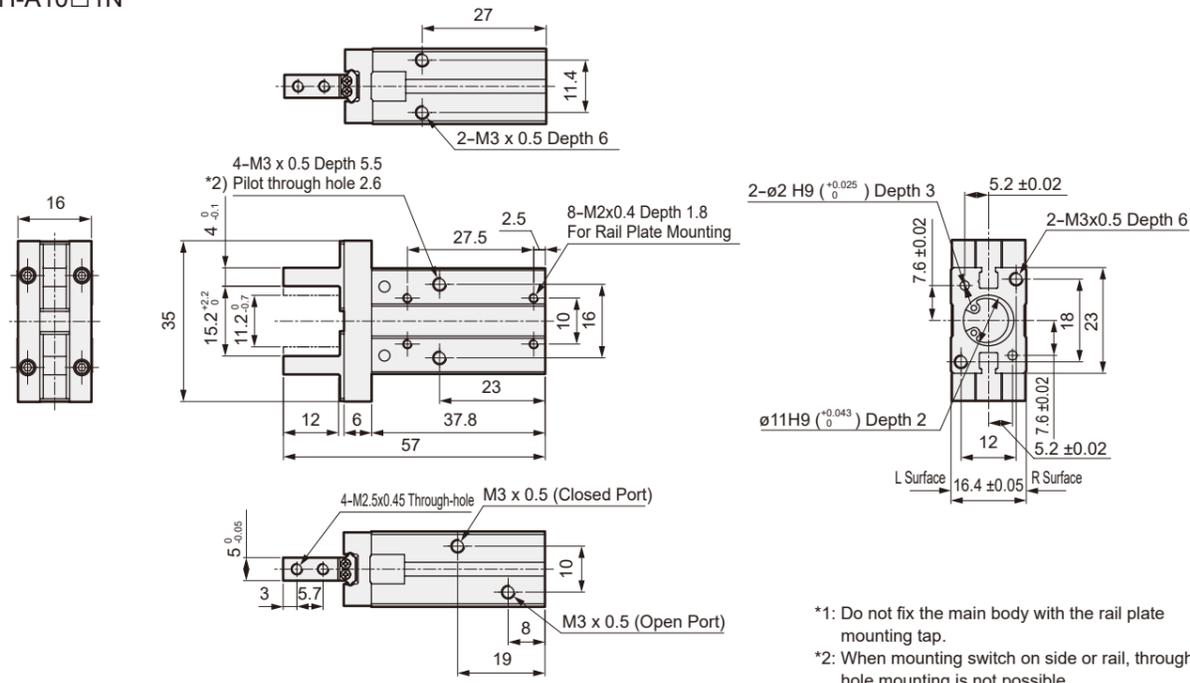
Ending

Ending

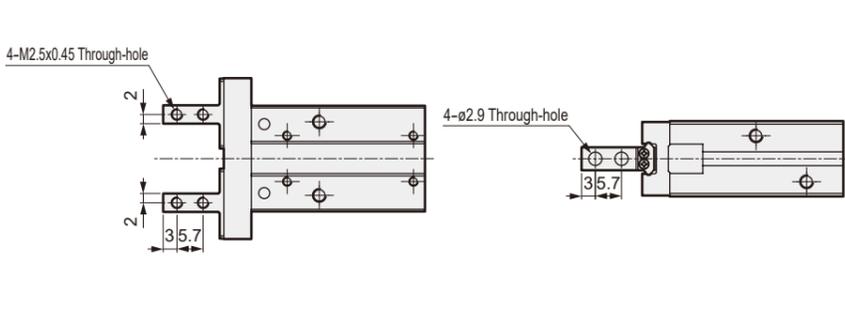


## External dimensions diagram (Bore size: $\phi 10$ )

### ● LSH-A10□1N

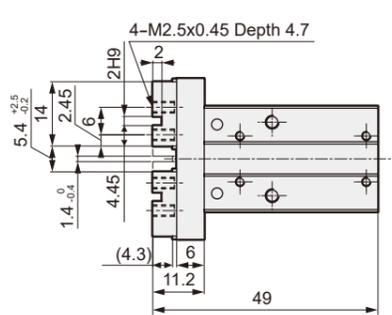


### ● LSH-A10□2N

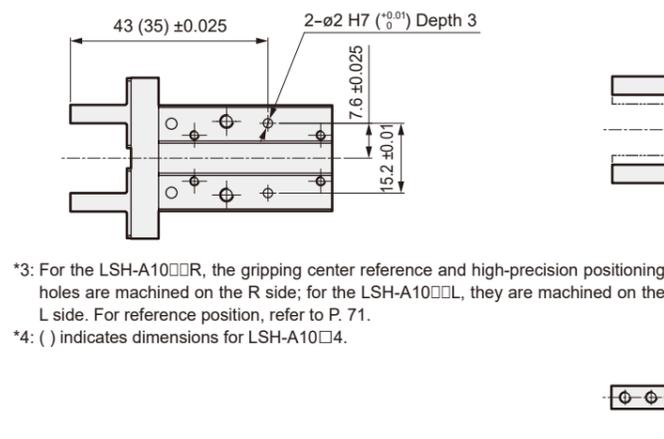


### ● LSH-A10□3N

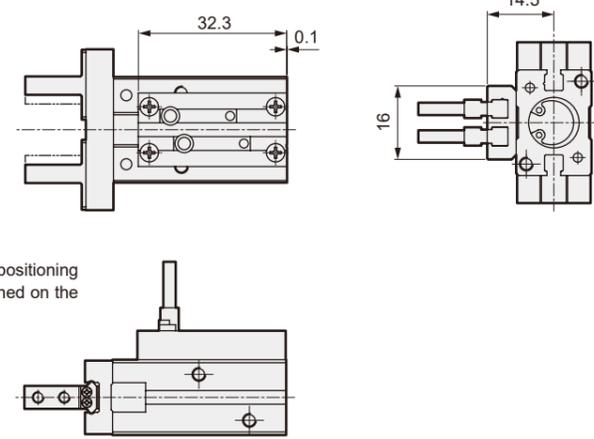
### ● LSH-A10□4N



### ● LSH-A10□□R/L



### ● With Switch Rail Plate Assembled



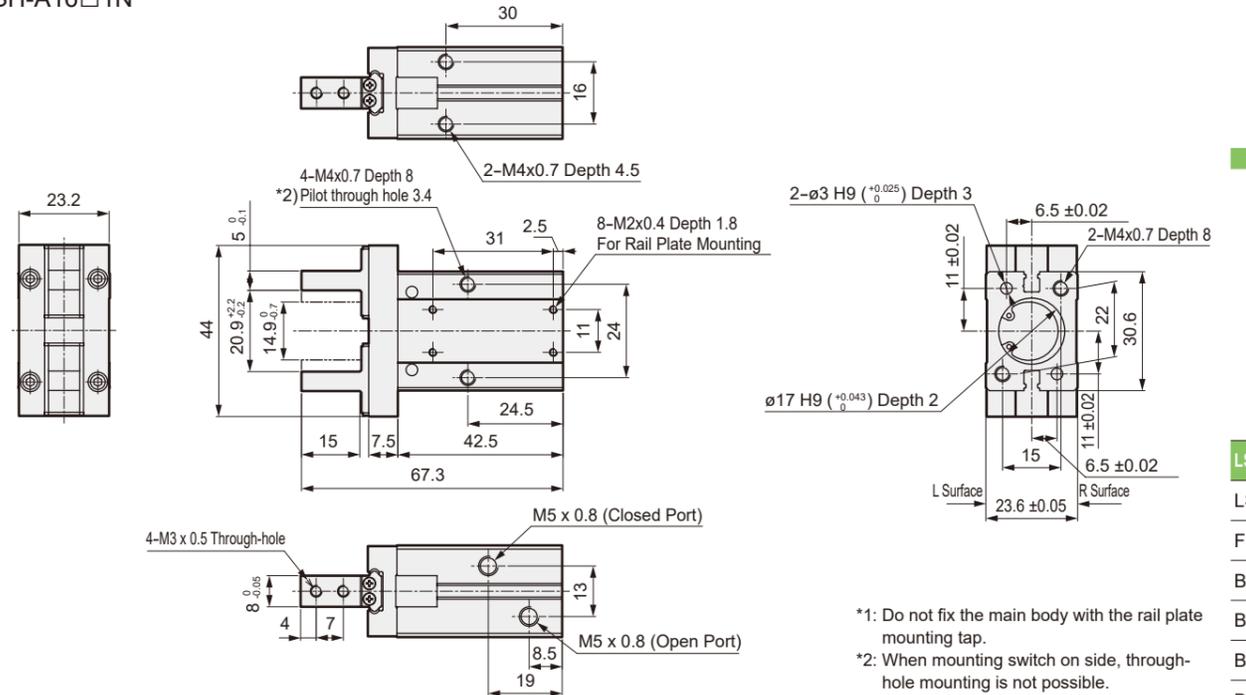
\*3: For the LSH-A10□□R, the gripping center reference and high-precision positioning holes are machined on the R side; for the LSH-A10□□L, they are machined on the L side. For reference position, refer to P. 71.  
\*4: ( ) indicates dimensions for LSH-A10□4.

\*5: For notes on cylinder switches, refer to P. 80.

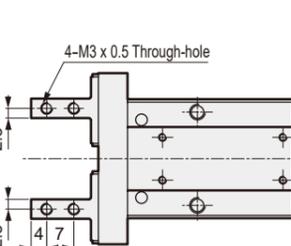
## Outline Dimension Drawing

## Outline dimension drawing (Bore size: $\phi 16$ )

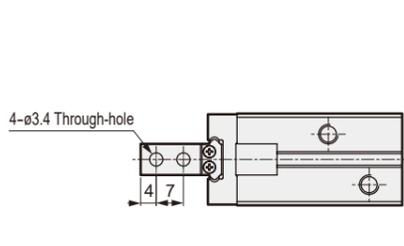
### ● LSH-A16□1N



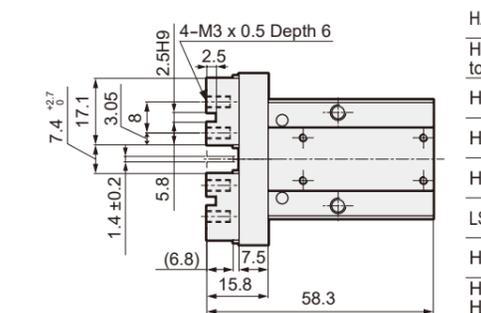
### ● LSH-A16□2N



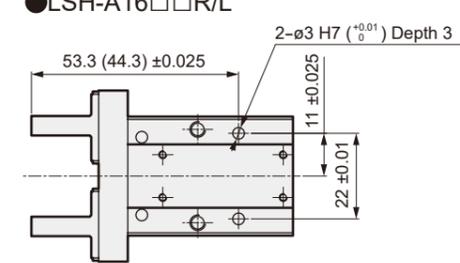
### ● LSH-A16□3N



### ● LSH-A16□4N

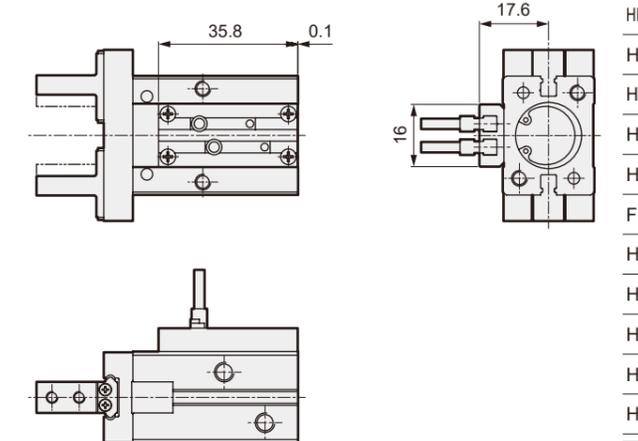


### ● LSH-A16□□R/L



\*3: For the LSH-A16□□R, the gripping center reference and high-precision positioning holes are machined on the R side; for the LSH-A16□□L, they are machined on the L side. For reference position, refer to P. 71.  
\*4: ( ) indicates dimensions for LSH-A16□4.

### ● With Switch Rail Plate Assembled



\*5: For notes on cylinder switches, refer to P. 80.

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

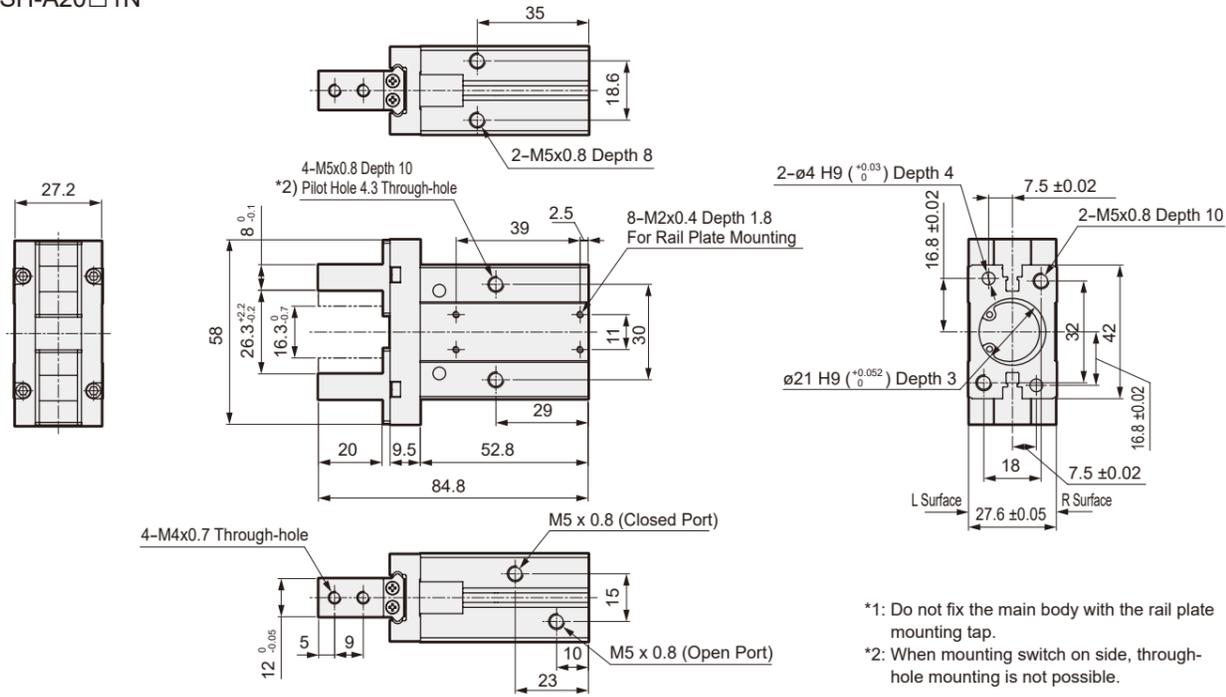
HJD

Cylinder Switch

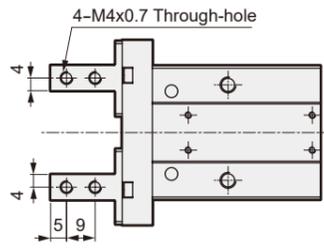
Ending

## Outline dimension drawing (Bore size: $\phi 20$ )

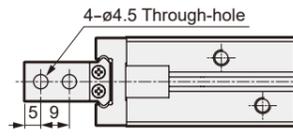
### ●LSH-A20□1N



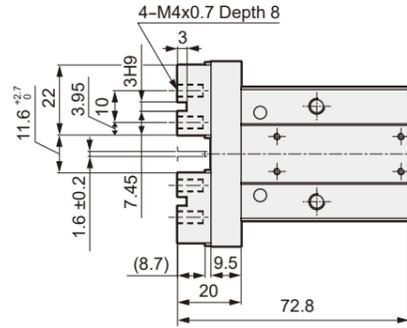
### ●LSH-A20□2N



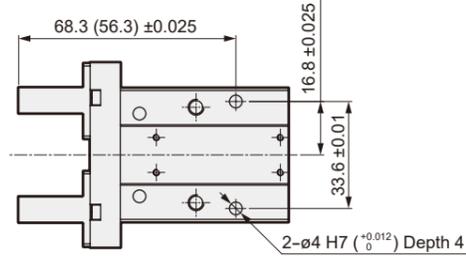
### ●LSH-A20□3N



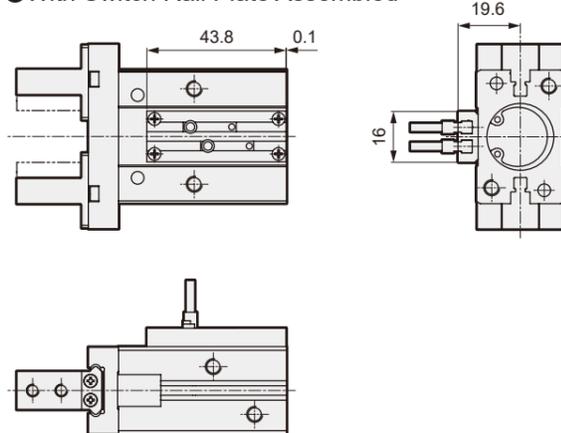
### ●LSH-A20□4N



### ●LSH-A20□□R/L



### ●With Switch Rail Plate Assembled



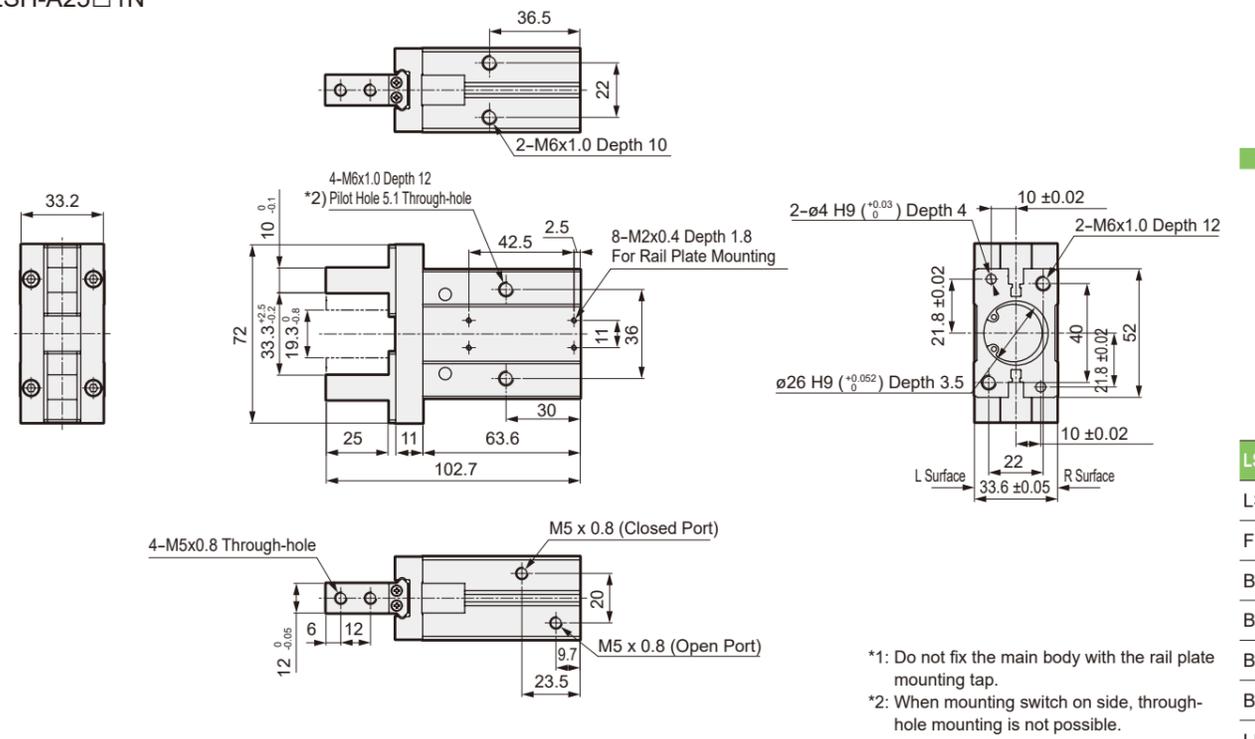
\*3: For the LSH-A20□□R, the gripping center reference and high-precision positioning holes are machined on the R side; for the LSH-A20□□L, they are machined on the L side. For reference position, refer to P. 71.  
\*4: ( ) indicates dimensions for LSH-A20□4.

\*5: For notes on cylinder switches, refer to P. 80.

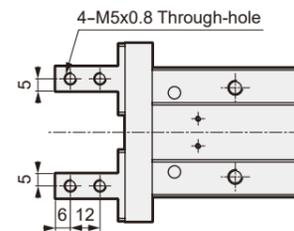
## Outline Dimension Drawing

## Outline Dimension Drawing (Bore size: $\phi 25$ )

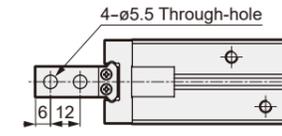
### ●LSH-A25□1N



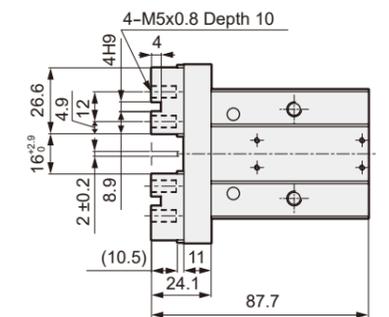
### ●LSH-A25□2N



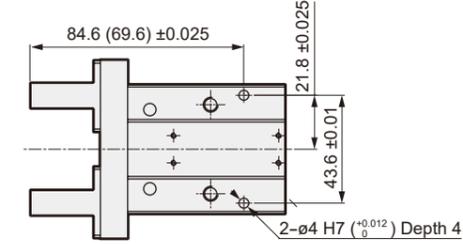
### ●LSH-A25□3N



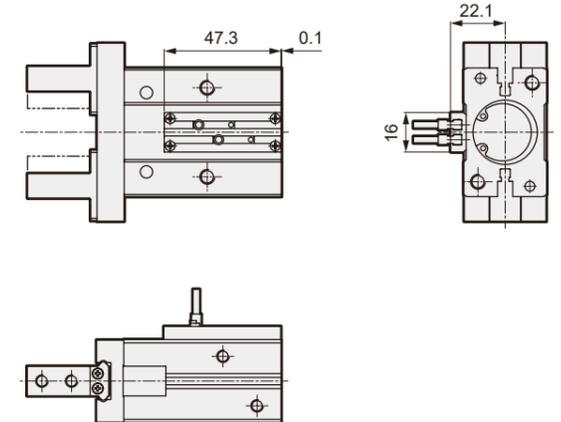
### ●LSH-A25□4N



### ●LSH-A25□□R/L



### ●With Switch Rail Plate Assembled



\*3: For the LSH-A25□□R, the gripping center reference and high-precision positioning holes are machined on the R side; for the LSH-A25□□L, they are machined on the L side. For reference position, refer to P. 71.  
\*4: ( ) indicates dimensions for LSH-A25□4.

\*5: For notes on cylinder switches, refer to P. 80.

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

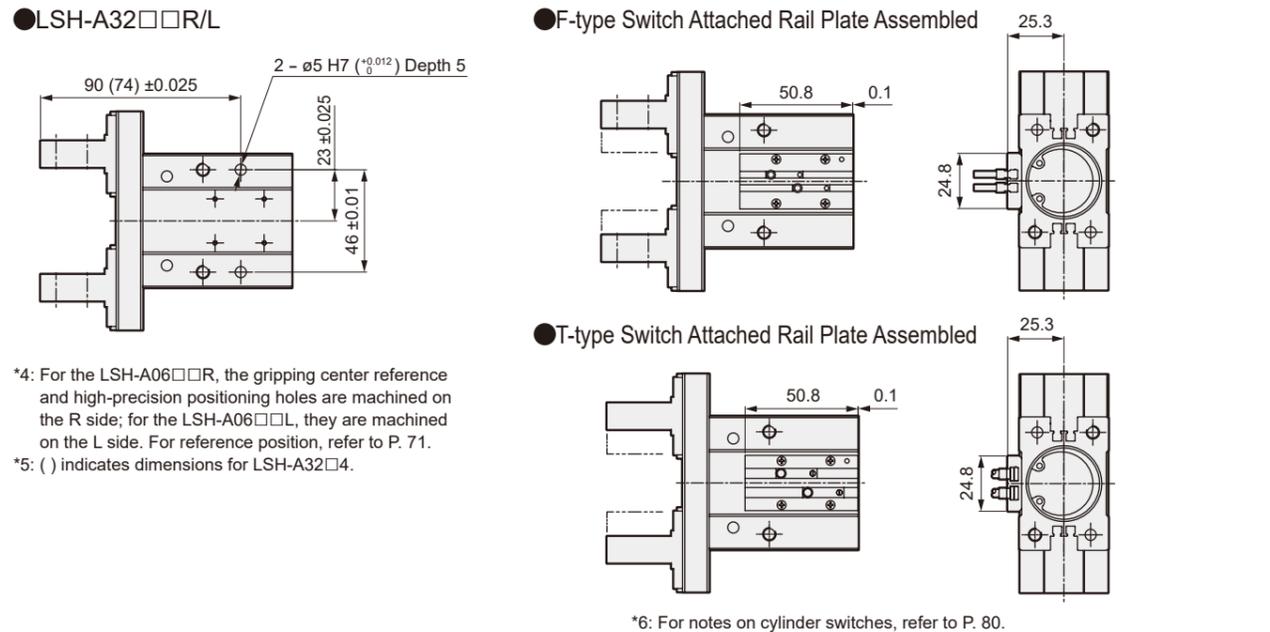
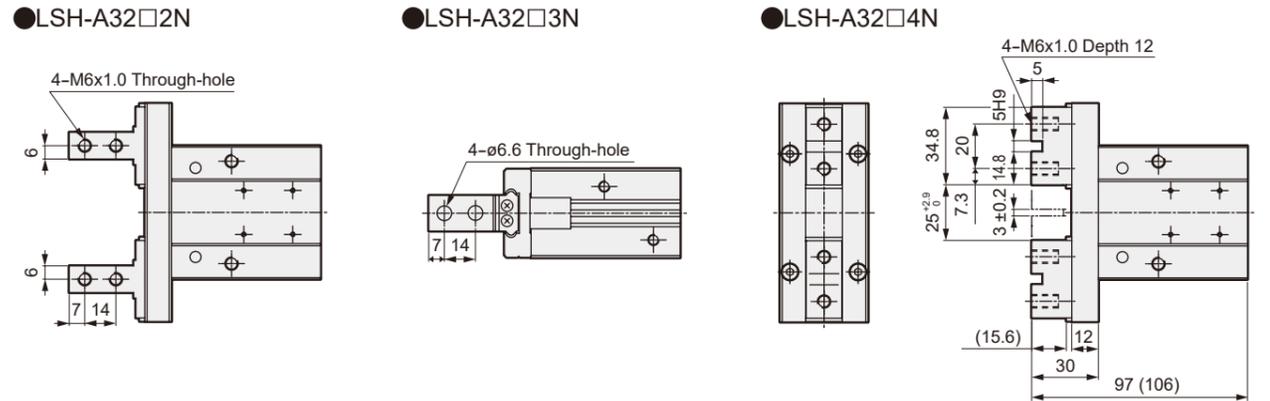
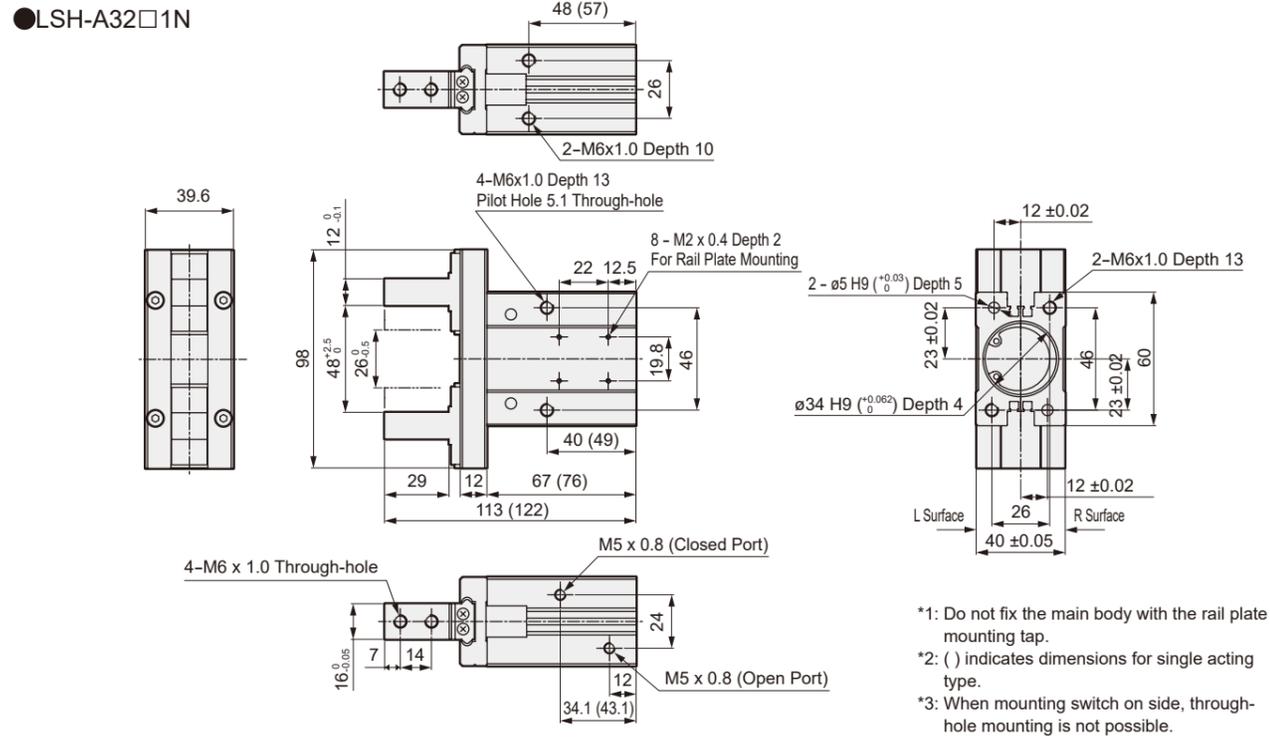
HDL

HJD

Cylinder Switch

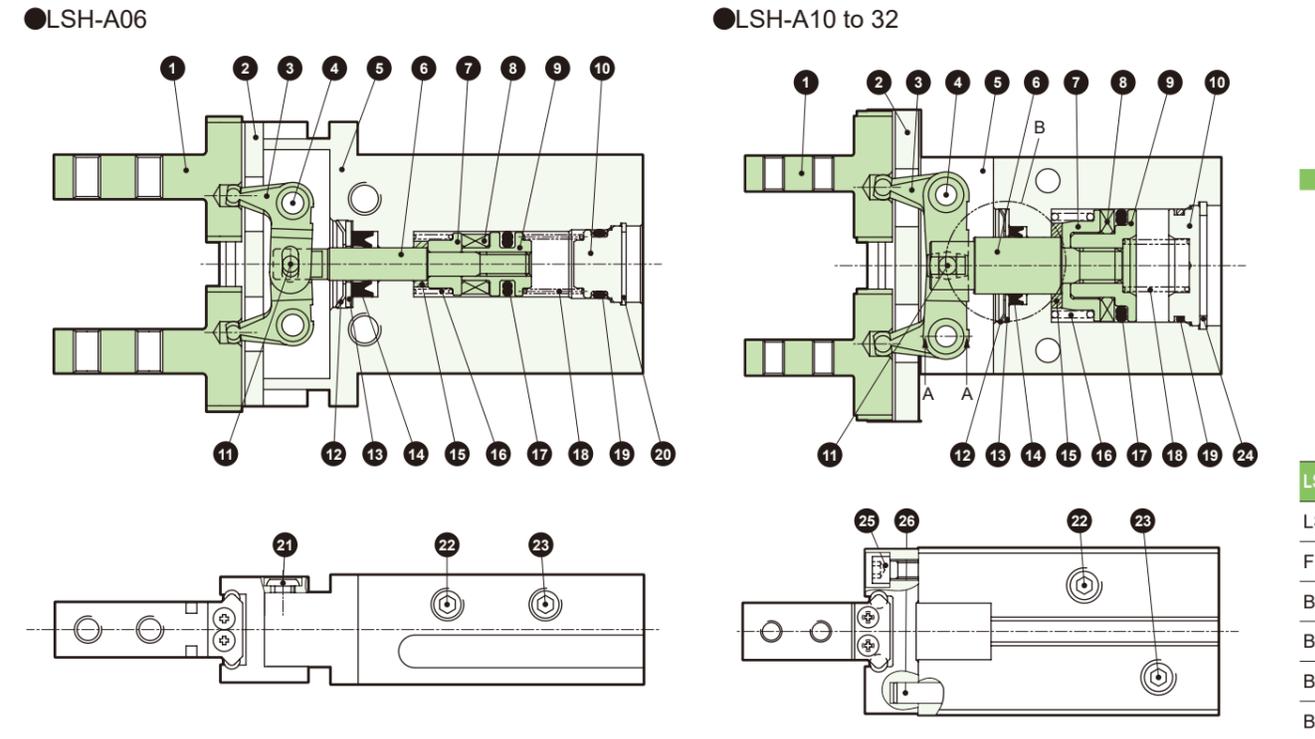
Ending

## External dimensions diagram (Bore size: $\phi 32$ )

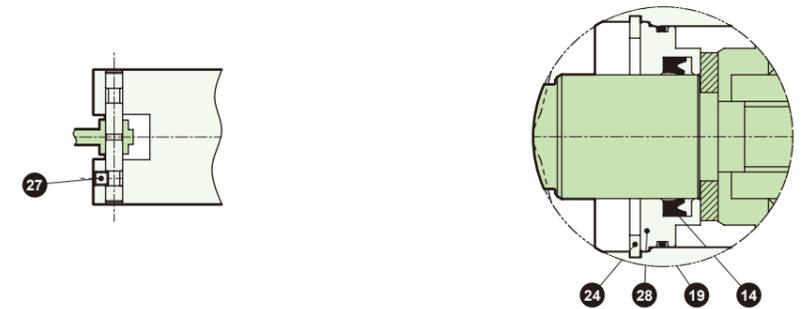


## Internal Structure Diagram/Material

## Internal Structure Diagram/Material



Cross-sectional View A-A ( $\phi 10$  to 32)      Part B ( $\phi 20, 25, 32$ )



Part No.	Part Name	Material	Remarks	Part No.	Part Name	Material	Remarks
1	Finger	Stainless Steel		16	Coil Spring	Piano Wire	Single Acting C only
2	Linear Guide	Stainless Steel		17	Piston Packing	Nitrile Rubber	
3	Lever	Stainless Steel		18	Coil Spring	Piano Wire	Single Acting S only
4	Pivot Shaft	Steel		19	O-ring	Nitrile Rubber	
5	Cylinder Body	Aluminum Alloy		20	C-type retaining ring	Steel	
6	Piston Rod	Stainless Steel		21	Pan Head Screw	Stainless Steel	
7	Spring Retainer	Aluminum Alloy		22	Plug	Stainless Steel	Single Acting C only
8	Magnet			23	Plug	Stainless Steel	Single Acting S only
9	Piston	Aluminum Alloy		24	C-type retaining ring	Stainless Steel	
10	Head Cover	Aluminum Alloy		25	Hexagon Socket Head Cap Screw	ø10 to ø25: Stainless Steel ø32: Steel	
11	Operating Shaft	Alloy Steel		26	Pin	Steel	
12	Retaining ring	Stainless Steel	ø10 to ø16 only	27	Hexagon socket set screw	Stainless Steel	
13	Cap	Stainless Steel	ø10 to ø16 only	28	Rod Metal	Aluminum Alloy	
14	Rod Packing	Nitrile Rubber					
15	Cushion Rubber	Urethane Rubber					

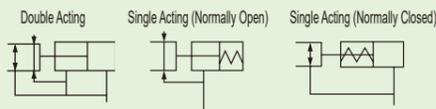
For maintenance parts, please visit the CKD Equipment Product Site  
(<https://www.ckd.co.jp/kiki/en/>) → "model No." → Maintenance Parts



Linear Slide Gripper Double Acting/Single Acting Type, With Rubber Cover (High Durability Equipment)

# LSH-G, F-HP1 Series

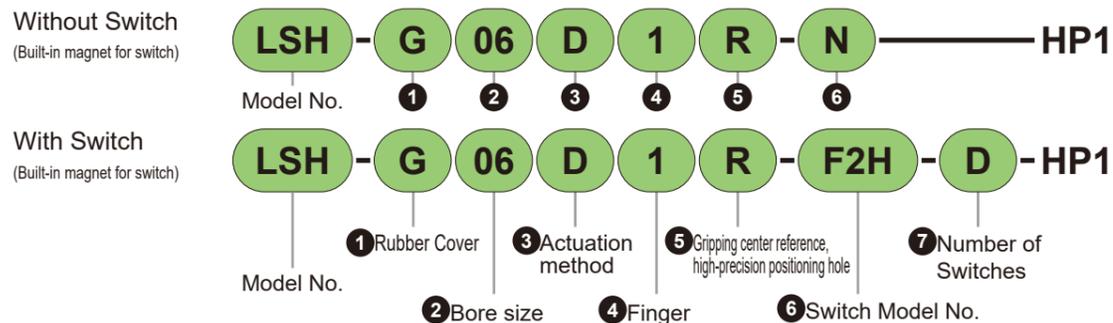
● Operating Stroke: 4, 6, 10, 14, 22 mm



# LSH-G, F-HP1 Series

Model No. Notation Method

## Model No. Notation Method



### 1 Rubber Cover

Code	Content
G	Chloroprene rubber
F	Fluoro Rubber

### 3 Actuation method

Code	Content
D	Double Acting
S	Single Acting, Normally Open (ø6 to ø25 only)
C	Single Acting, Normally Closed (ø6 to ø25 only)

### 4 Finger

Code	Content
1	Basic type

Note) For details, refer to the outline dimension drawings.

### 2 Bore Size (mm)

Code	Content
06	ø6
10	ø10
16	ø16
20	ø20
25	ø25
32	ø32

### 5 Gripping center reference, High-precision positioning hole

Code	Content
N	None
L	<p>L Surface Piping Surface</p>
R	<p>Piping Surface R Surface</p>

Note) For details, refer to each outline dimension drawing (P. 25 to P. 30, and P. 71).

### 6 Switch Model No.

Without Switch

Code	Content
Blank	Without switch, F-type switch rail plate included
N	Without switch, without switch rail plate
A	Without switch, T-type switch rail plate included (ø32 only)

With Switch

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		Image	
			AC	DC	AC	DC	Straight	L-shape		
Solid State		2-wire	-	10 to 30	-	5 to 20	-	F2S□		
		3-wire (NPN)	-	30 or less	-	50 or less	-	F3S□		
		2-wire	-	10 to 30	-	5 to 20 *2	F2H□	F2V□		
		3-wire (NPN)	-	30 or less	-	50 or less	F3H□	F3V□		
		3-wire (PNP)	-	30 or less	-	50 or less	F3PH□	F3PV□		
		2-wire	-	10 to 30	-	5 to 20 *2	T2H□	T2V□		
		1-Color Flex-Resistant Lead Wire	2-wire	-	10 to 30	-	5 to 20 *2	T2HR3	T2VR3	
		1-Color	3-wire (NPN)	-	30 or less	-	100 or less	T3H□	T3V□	
				3-wire (PNP)	-	30 or less	-	100 or less	T3PH□	T3PV□

### \*Lead wire length

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

Example) Lead wire length  
1m F2S  
3m F2S□

\*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: T-type switch can be selected for ø32 only.

\*4: If with switch is selected, a rail plate corresponding to the switch will be included.

\*5: For notes on switches, refer to P. 81.

\*6: Switches other than the model No.s listed above are also available. (Custom Product) For details, see P. 573.

\*7: When mounting a 2-color indicator switch, please consult our sales office.

### 7 Number of Switches

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

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

● Structure usable in Rechargeable battery manufacturing processes

LSH-G/F - ... - P4□ -HP1

\*Please contact us for details.

### Switch Single Unit Model No. Notation Method

SW - F2H

6 Switch Model No.

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

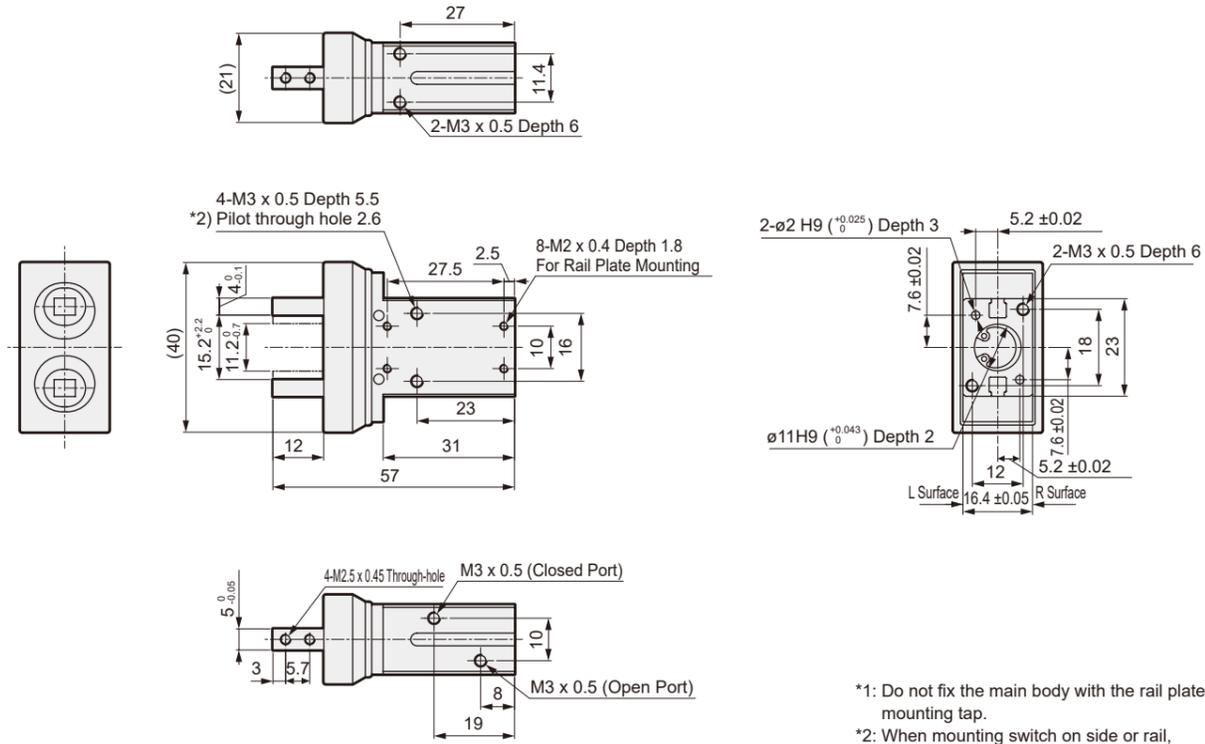
Cylinder Switch

Ending



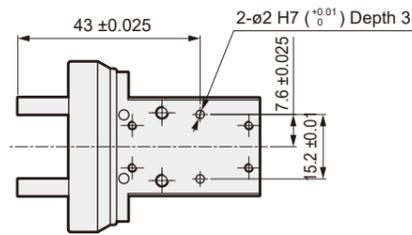
## External dimensions diagram (Bore size: $\phi 10$ )

### ● LSH-G10, LSH-F10



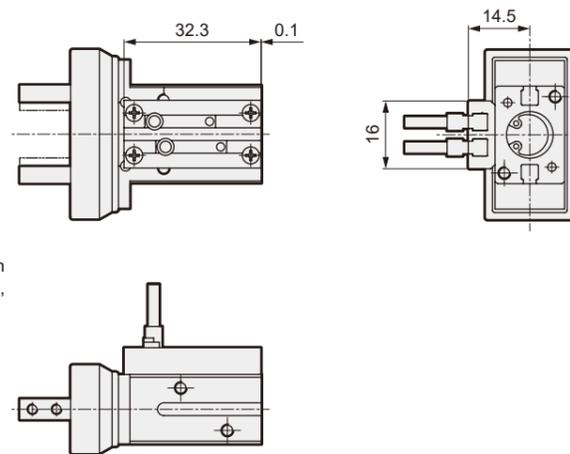
\*1: Do not fix the main body with the rail plate mounting tap.  
\*2: When mounting switch on side or rail, through-hole mounting is not possible.

### ● LSH-G10□1R/L, LSH-F10□1R/L



\*3: For the LSH-G10□1R, the gripping center reference and high-precision positioning holes are machined on the R side; for the LSH-G10□1L, they are machined on the L side. For reference position, refer to P. 71.

### ● With Switch Rail Plate Assembled

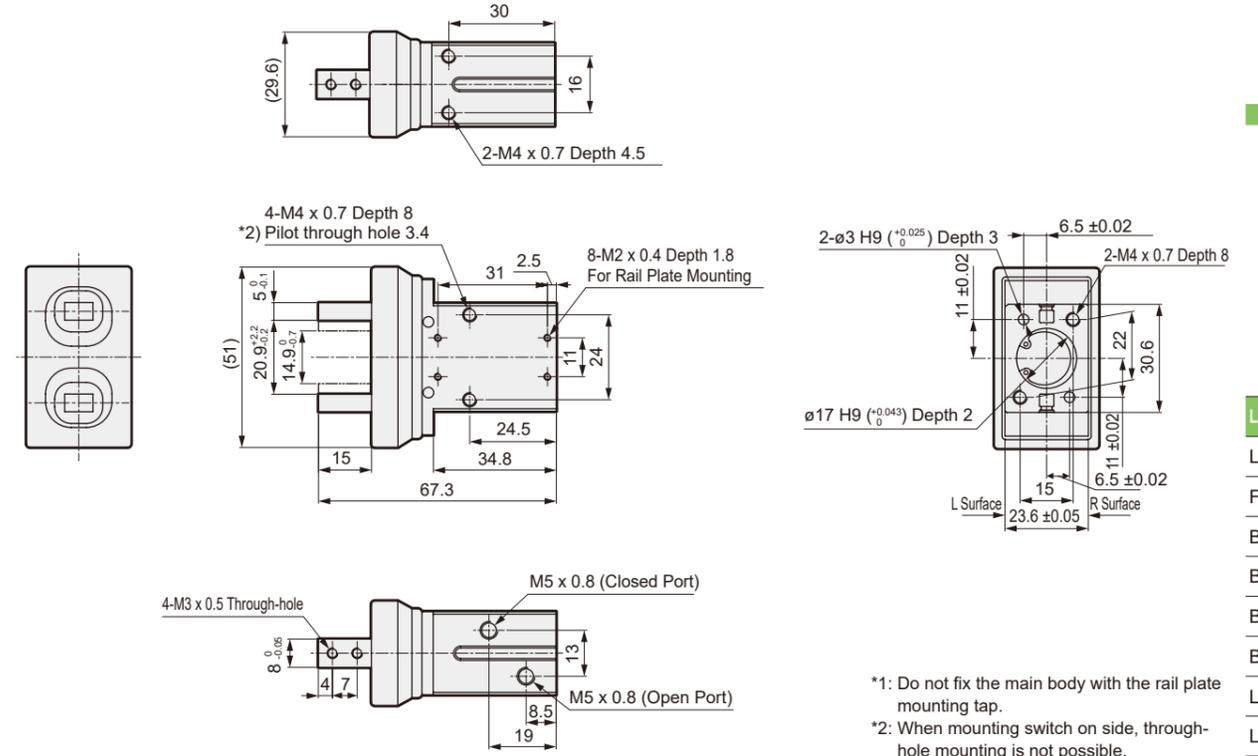


\*4: For notes on cylinder switches, refer to P. 81.

## Outline Dimension Drawing

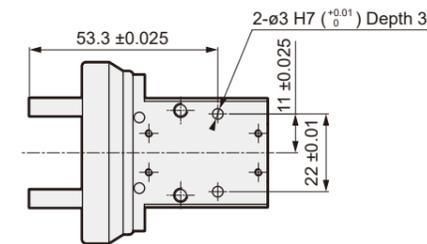
## Outline dimension drawing (Bore size: $\phi 16$ )

### ● LSH-G16, LSH-F16



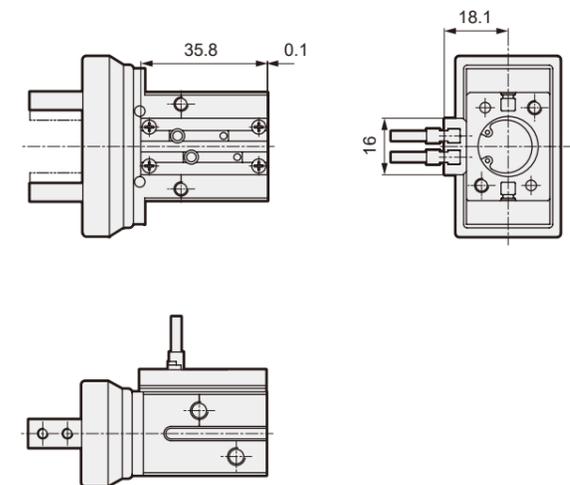
\*1: Do not fix the main body with the rail plate mounting tap.  
\*2: When mounting switch on side, through-hole mounting is not possible.

### ● LSH-G16□1R/L, LSH-F16□1R/L



\*3: For LSH-G16□R, the R surface is machined with gripping center standard, high-precision locating holes. For LSH-G16□L, the L surface is machined. For reference position, refer to P. 71.

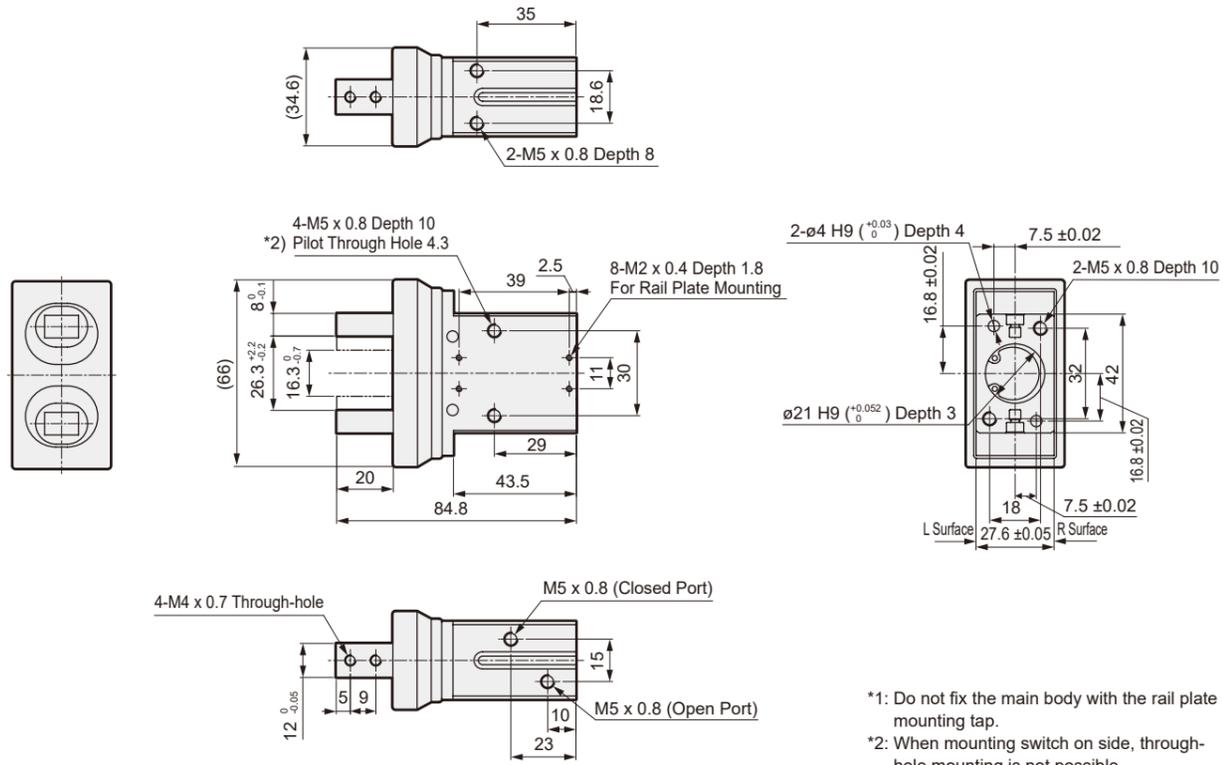
### ● With Switch Rail Plate Assembled



\*4: For notes on cylinder switches, refer to P. 81.

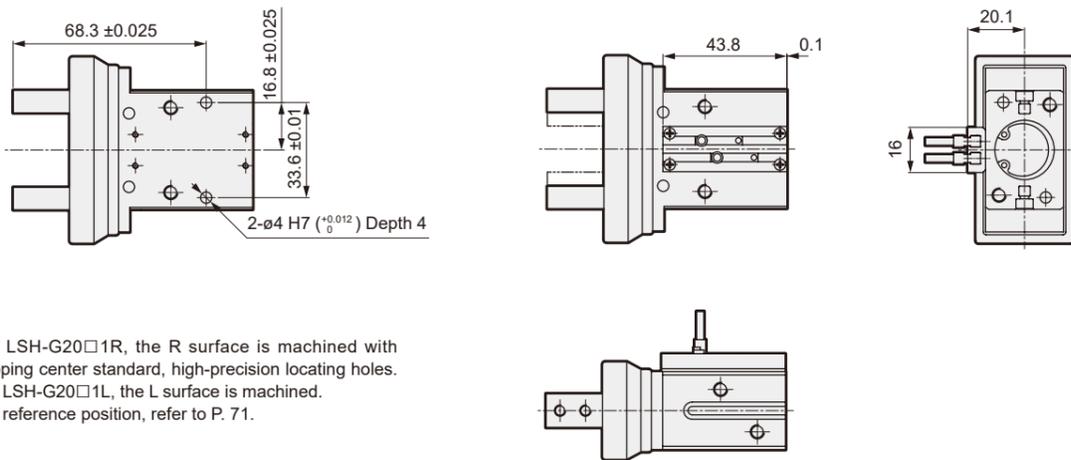
## Outline dimension drawing (Bore size: $\phi 20$ )

### ● LSH-G20, LSH-F20



### ● LSH-G20□1R/L, LSH-F20□1R/L

### ● With Switch Rail Plate Assembled

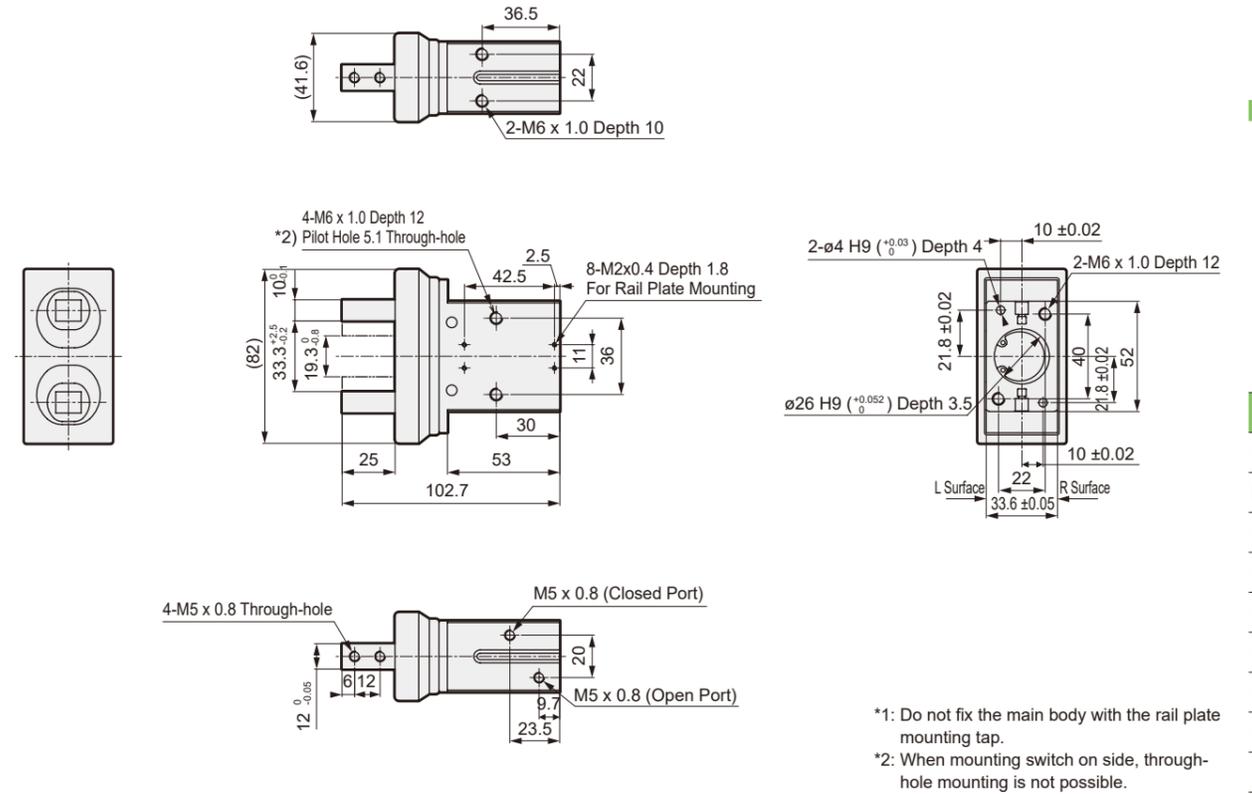


\*4: For notes on cylinder switches, refer to P. 81.

## Outline Dimension Drawing

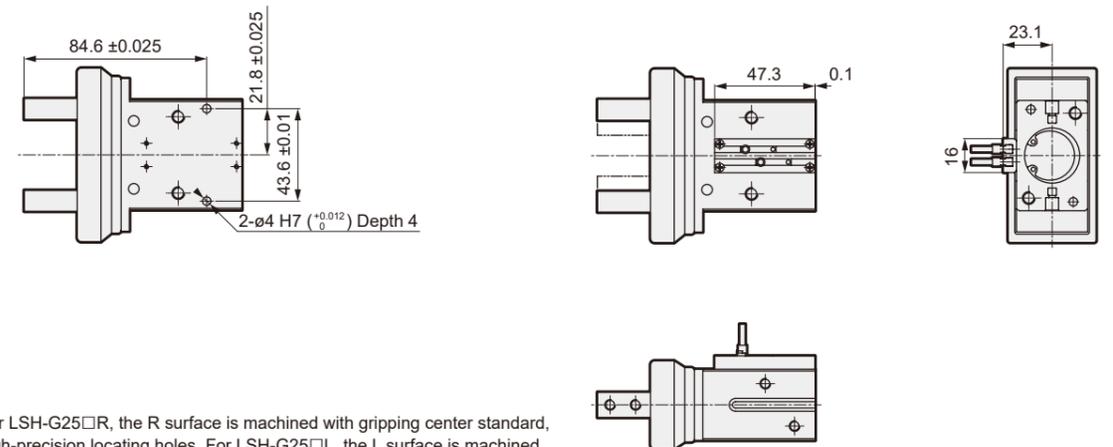
## Outline Dimension Drawing (Bore size: $\phi 25$ )

### ● LSH-G25, LSH-F25



### ● LSH-G25□1R/L, LSH-F25□1R/L

### ● With Switch Rail Plate Assembled

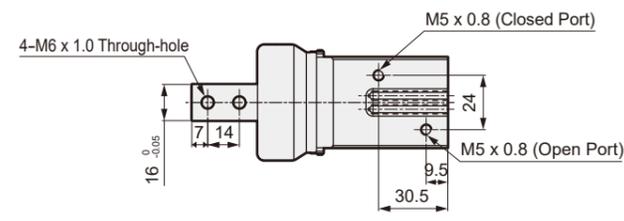
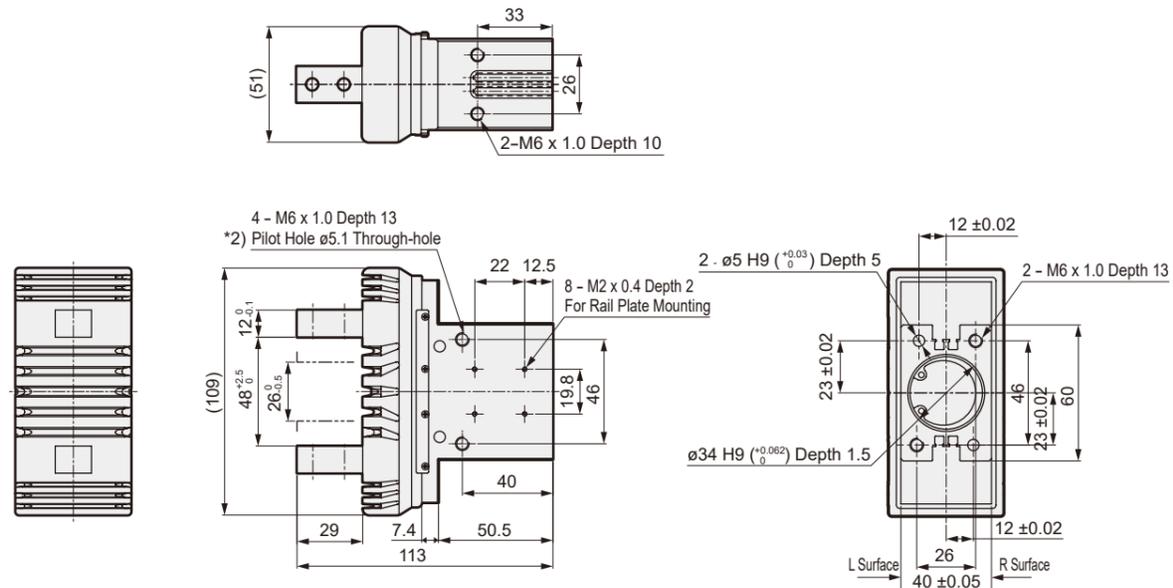


\*3: For LSH-G25□R, the R surface is machined with gripping center standard, high-precision locating holes. For LSH-G25□L, the L surface is machined. For reference position, refer to P. 71.

\*4: For notes on cylinder switches, refer to P. 81.

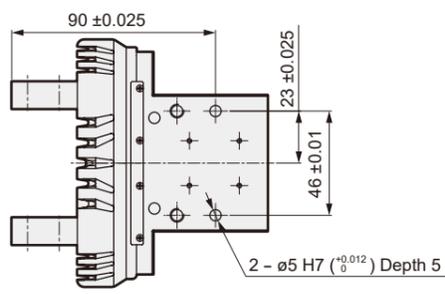
## External dimensions diagram (Bore size: $\phi 32$ )

### ● LSH-G32, LSH-F32



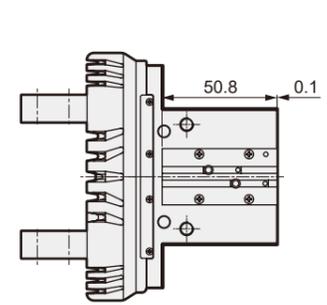
\*1: Do not fix the main body with the rail plate mounting tap.

### ● LSH-G32D1R/L, LSH-F32D1R/L

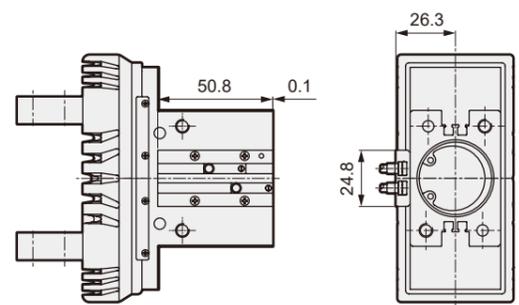


\*2: For LSH-G32D1R, the R surface is machined with gripping center standard, high-precision locating holes. For LSH-G32D1L, the L surface is machined. For reference position, refer to P. 71.

### ● F-type Switch Attached Rail Plate Assembled



### ● T-type Switch Attached Rail Plate Assembled

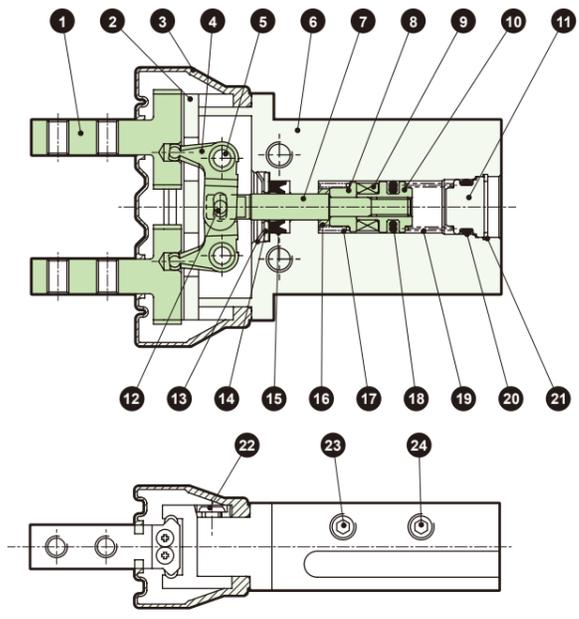


\*3: For notes on cylinder switches, refer to P. 81.

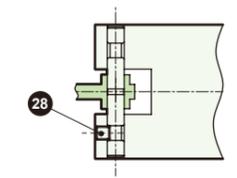
## Internal Structure Diagram/Material

## Internal Structure Diagram/Material

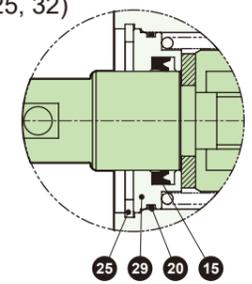
### ● LSH-G06 / LSH-F06



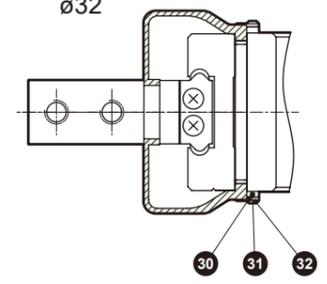
Cross-sectional View A-A ( $\phi 10$  to  $\phi 32$ )



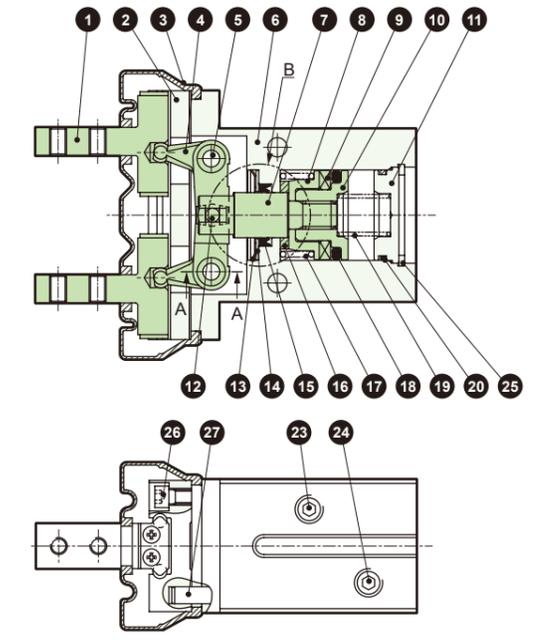
Part B ( $\phi 20$ ,  $\phi 25$ ,  $\phi 32$ )



$\phi 32$



### ● LSH-G10 to G32 / LSH-F10 to F32



Part No.	Part Name	Material	Remarks	Part No.	Part Name	Material	Remarks
1	Finger	Stainless Steel		17	Coil Spring	Piano Wire	Single Acting C only
2	Linear Guide	Stainless Steel		18	Piston Packing	Nitrile Rubber	
3	Rubber Cover	LSH-G: Chloroprene rubber LSH-F: Fluoro Rubber		19	Coil Spring	Piano Wire	Single Acting S only
4	Lever	Stainless Steel		20	O-ring	Nitrile Rubber	
5	Pivot Shaft	Steel		21	C-type retaining ring	Steel	
6	Cylinder Body	Aluminum Alloy		22	Pan Head Screw	Stainless Steel	
7	Piston Rod	Stainless Steel		23	Plug	Stainless Steel	Single Acting C only
8	Spring Retainer	Aluminum Alloy		24	Plug	Stainless Steel	Single Acting S only
9	Magnet			25	C-type retaining ring	Stainless Steel	
10	Piston	Aluminum Alloy		26	Hexagon Socket Head Cap Screw	$\phi 10$ to $\phi 25$ : Stainless Steel $\phi 32$ : Steel	
11	Head Cover	Aluminum Alloy		27	Pin	Steel	
12	Operating Shaft	Alloy Steel		28	Hexagon socket set screw	Stainless Steel	
13	Retaining ring	Stainless Steel	$\phi 10$ to $\phi 25$ only	29	Rod Metal	Aluminum Alloy	
14	Cap	Stainless Steel	$\phi 10$ to $\phi 25$ only	30	Cover Retainer Plate	Stainless Steel	$\phi 32$ only
15	Rod Packing	Nitrile Rubber		31	Cover Spacer	Stainless Steel	$\phi 32$ only
16	Cushion Rubber	Urethane Rubber		32	Pan Head Screw	Stainless Steel	$\phi 32$ only

For maintenance parts, refer to the CKD component product site  
[\(https://www.ckd.co.jp/kiki/en/\)](https://www.ckd.co.jp/kiki/en/) → "Model No." → See "Maintenance Parts"

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

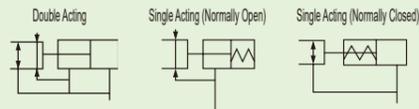
Hand (Gripper)  
LSH-HP  
LSH  
FH100  
BSA2  
BHA  
BHG  
BHE  
LHA  
LHAG  
HAP-1C  
HAP-2 to 4CS  
HKP  
HCP  
HGP  
LST-HP  
HLF2  
HLA/HLB  
HLAG/HLBG  
HLC  
HLD  
HMC-HP  
HMF  
HMF-G  
HMF-B  
HFP  
FH500  
HBL  
HJL  
HMD  
HDL  
HJD  
Cylinder Switch  
Ending



Linear Slide Gripper Long Stroke Double Acting Type/Single Acting Type

# LSHL-A-HP1 Series

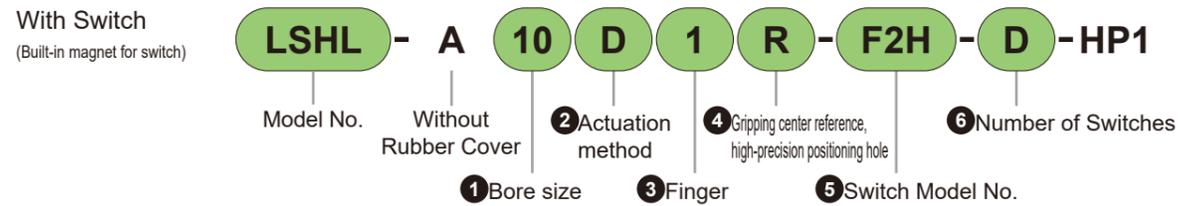
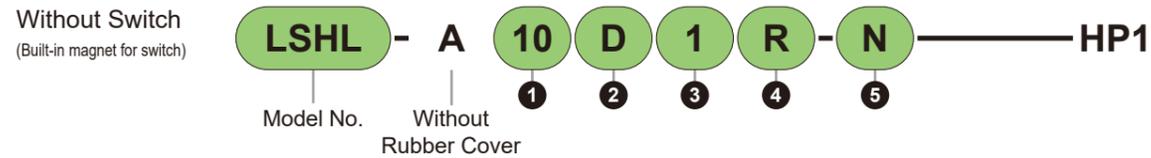
● Operating Stroke: 8, 12, 18, 22 mm



# LSHL-A-HP1 Series

Model No. Notation Method

## Model No. Notation Method



### 1 Bore Size (mm)

Code	Content
10	ø10
16	ø16
20	ø20
25	ø25

### 2 Actuation method

Code	Content
D	Double Acting
S	Single Acting, Normally Open
C	Single Acting, Normally Closed

### 3 Finger

Code	Content
1	Basic type
2	Side tap
3	Through-hole
4	Flat

Note) For details, refer to the outline dimension drawings.

### 4 Gripping center reference, high-precision positioning hole

Code	Content
N	None
L	<p>L Surface Piping Surface</p>
R	<p>Piping Surface R Surface</p>

Note) For details, refer to each outline dimension drawing (P. 35 to P. 38, and P. 71).

### 5 Switch Model No.

Without Switch

Code	Content
Blank	Without Switch, Rail Plate Attached
N	Without Switch, Without Rail Plate

With Switch

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		Image
			AC	DC	AC	DC	Straight	L-shape	
Solid State	1-Color	2-wire	-	10 to 30	-	5 to 20	-	F2S□	
		3-wire (NPN)	-	30 or less	-	50 or less	-	F3S□	
		2-wire	-	10 to 30	-	5 to 20 *2	F2H□	F2V□	
		3-wire (NPN)	-	30 or less	-	50 or less	F3H□	F3V□	
		3-wire (PNP)	-	30 or less	-	50 or less	F3PH□	F3PV□	

\*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: If with switch is selected, a rail plate will be included.

\*4: For notes on switches, refer to P. 82.

\*5: Switches other than the model No.s listed above are also available. (Custom Product) For details, see P. 573.

\*6: When mounting a 2-color indicator switch, please consult our sales office.

### 6 Number of Switches

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

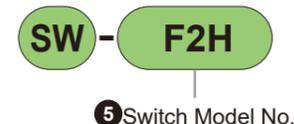
### Rechargeable Battery Compatible Specification (Catalog No. CC-1226AA)

● Design compatible with rechargeable battery manufacturing process

LSHL- .... - P4□ - HP1

\*Please contact us for details.

### Switch Single Unit Model No. Notation Method



### \*Lead wire length

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

Example) Lead wire length  
1 m F2S  
3 m F2S<sup>3</sup>

Hand (Gripper)

Hand (Gripper)

LSH-HP

LSH-HP

LSH

LSH

FH100

FH100

BSA2

BSA2

BHA

BHA

BHG

BHG

BHE

BHE

LHA

LHA

LHAG

LHAG

HAP-1C

HAP-1C

HAP-2 to 4CS

HAP-2 to 4CS

HKP

HKP

HCP

HCP

HGP

HGP

LST-HP

LST-HP

HLF2

HLF2

HLA/HLB

HLA/HLB

HLAG/HLBG

HLAG/HLBG

HLC

HLC

HLD

HLD

HMC-HP

HMC-HP

HMF

HMF

HMF-G

HMF-G

HMF-B

HMF-B

HFP

HFP

FH500

FH500

HBL

HBL

HJL

HJL

HMD

HMD

HDL

HDL

HJD

HJD

Cylinder Switch

Cylinder Switch

Ending

Ending

## Specifications

Item		LSHL-A-HP1			
Bore size	mm	ø10	ø16	ø20	ø25
Actuation method		Double Acting Type / Single Acting Type (Normally Open / Normally Closed)			
Operating Fluid		Compressed Air			
Maximum Operating Pressure	MPa	0.7			
Min. working pressure	MPa	Double Acting Type	0.2	0.1	
		Single acting type	0.35	0.25	
Port Size		M3		M5	
Ambient Temperature	°C	-10 to 60 (No freezing)			
Operating Stroke	mm	8	12	18	22
Repeatability	mm	±0.01			
Weight	kg	Finger Code: 1,2,3	0.155 (0.165)	0.315 (0.335)	0.54 (0.585)
		Finger Code: 4	0.065 (0.075)	0.16 (0.17)	0.32 (0.34)
Lubrication		Not Required			

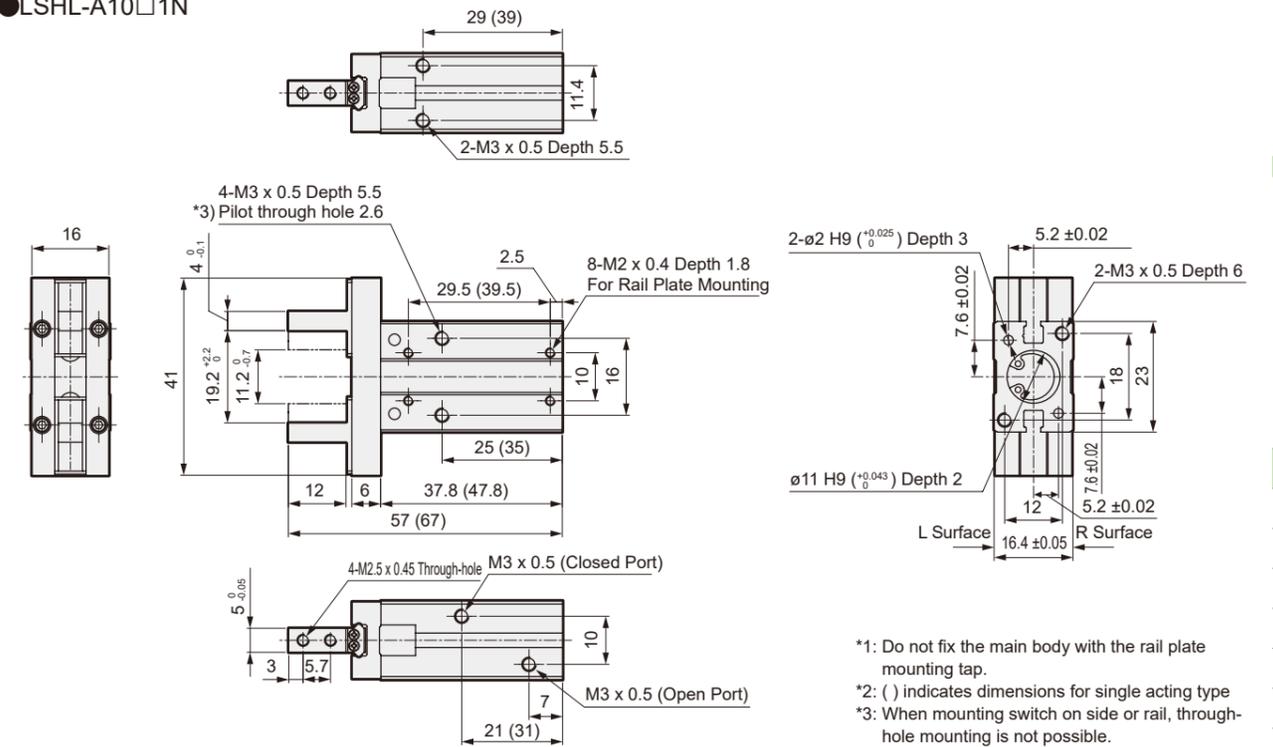
Note) For gripping force performance data, refer to P. 74.

## Switch Mounting Availability Table

Model No.	Switch Model No.	Side surface mounting	Rail Mounting
LSHL-A10	F2/3□	●	●
	F2/3S	●	●
LSHL-A16	F2/3□	●	●
	F2/3S	●	●
LSHL-A20	F2/3□	●	●
	F2/3S	●	●
LSHL-A25	F2/3□	●	●
	F2/3S	●	●

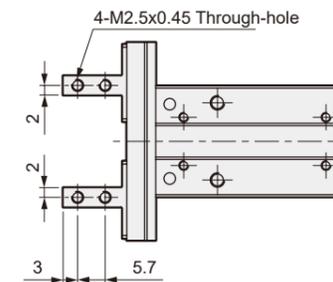
## Outline Dimension Drawing (Bore size: ø10)

### ●LSHL-A10□1N

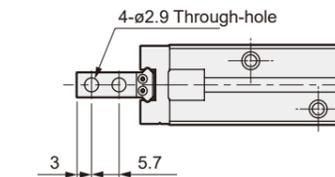


- \*1: Do not fix the main body with the rail plate mounting tap.
- \*2: ( ) indicates dimensions for single acting type
- \*3: When mounting switch on side or rail, through-hole mounting is not possible.

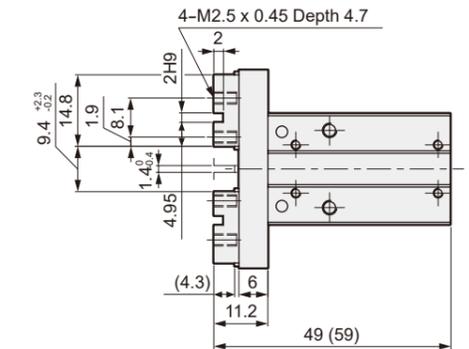
### ●LSHL-A10□2N



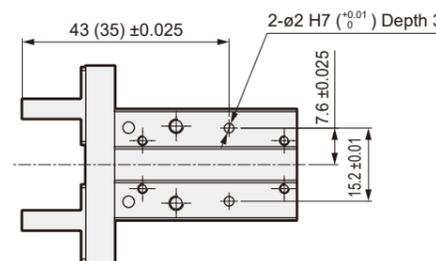
### ●LSHL-A10□3N



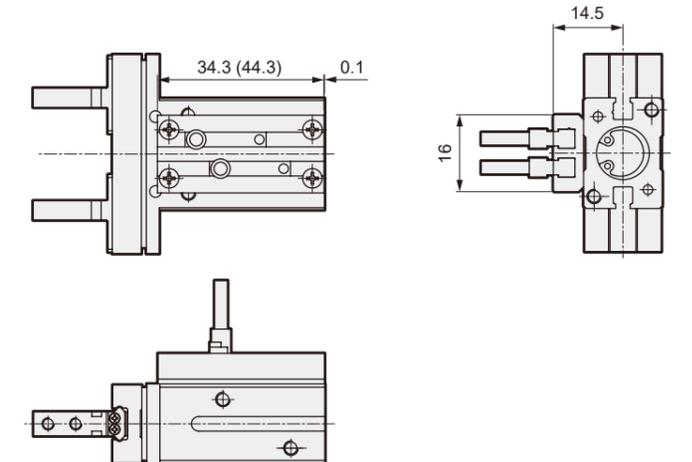
### ●LSHL-A10□4N



### ●LSHL-A10□□R/L



### ●With Switch Rail Plate Assembled

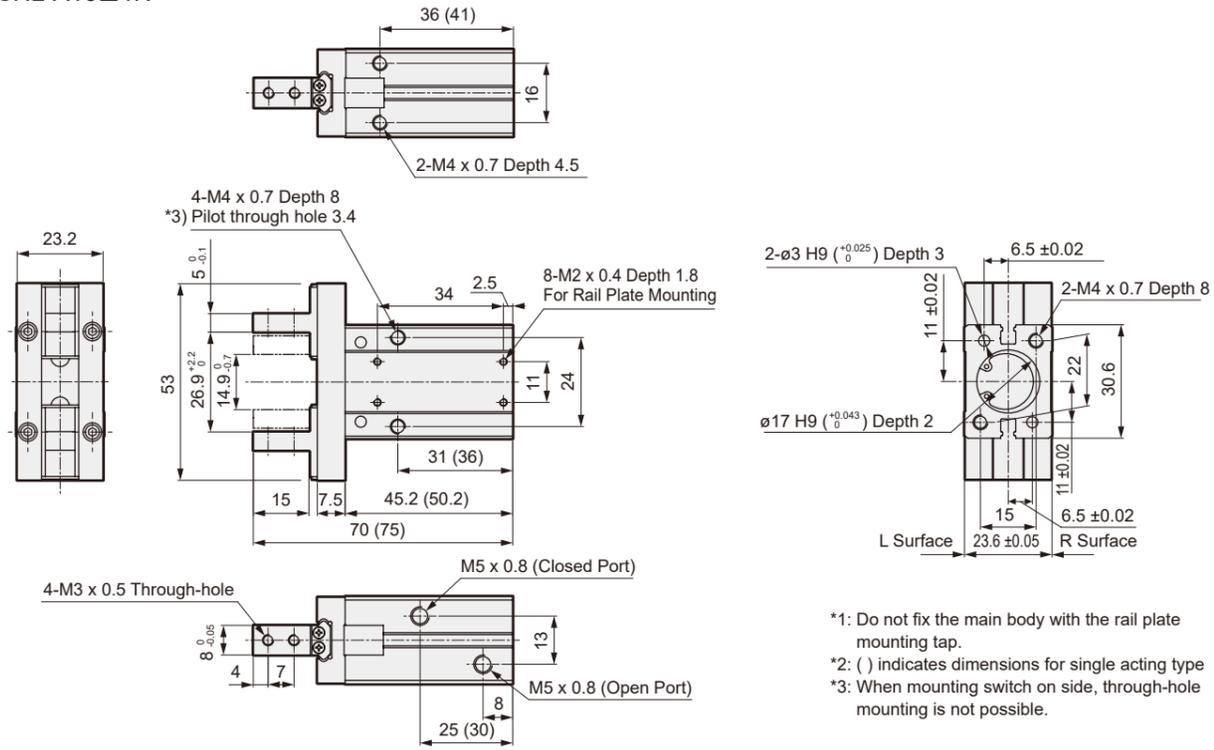


- \*4: For the LSHL-A10D1R, the gripping center reference and high-precision positioning holes are machined on the R side; for the LSHL-A10D1L, they are machined on the L side. For reference position, refer to P. 71.
- \*5: ( ) indicates dimensions for LSHL-A10□4.

- \*6: ( ) indicates dimensions for single acting type.
- \*7: For notes on cylinder switches, refer to P. 82.

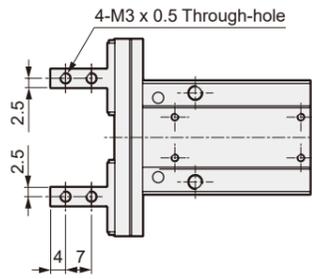
## Outline dimension drawing (Bore size: $\phi 16$ )

### LSHL-A16□1N

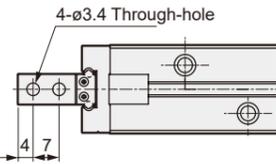


- \*1: Do not fix the main body with the rail plate mounting tap.
- \*2: ( ) indicates dimensions for single acting type
- \*3: When mounting switch on side, through-hole mounting is not possible.

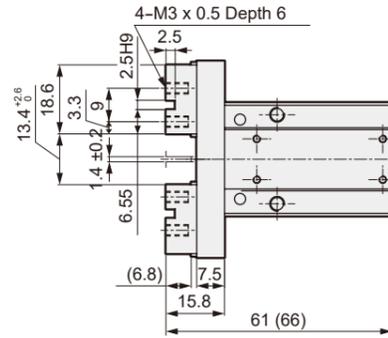
### LSHL-A16□2N



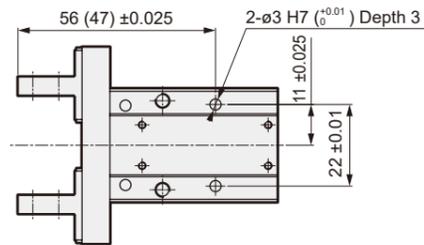
### LSHL-A16□3N



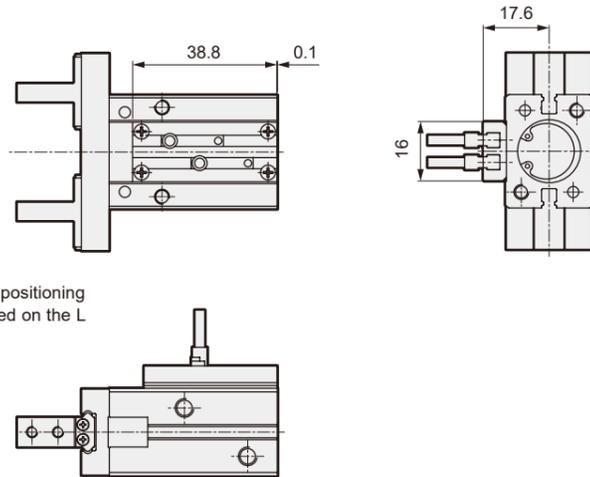
### LSHL-A16□4N



### LSHL-A16□□R/L



### With Switch Rail Plate Assembled



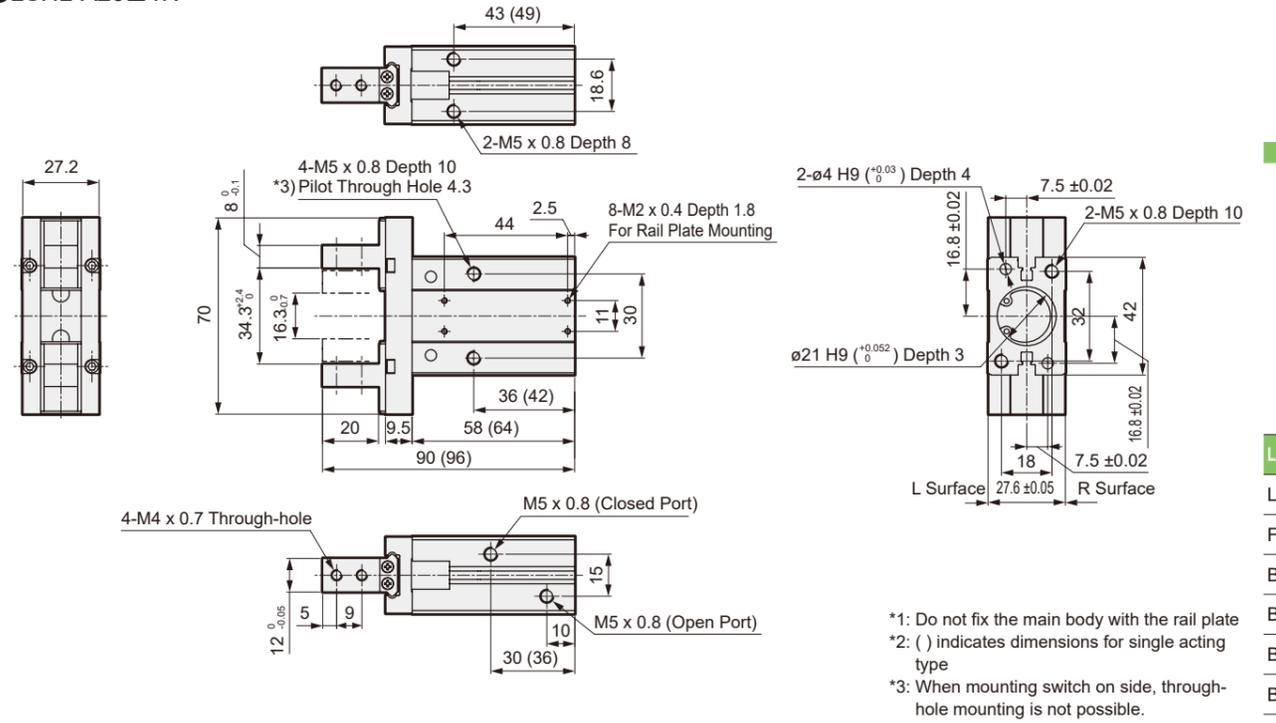
- \*4: For the LSHL-A16D1R, the gripping center reference and high-precision positioning holes are machined on the R side; for the LSHL-A16D1L, they are machined on the L side. For reference position, refer to P. 71.
- \*5: ( ) indicates dimensions for LSHL-A16□4.

\*6: For notes on cylinder switches, refer to P. 82.

## Outline Dimension Drawing

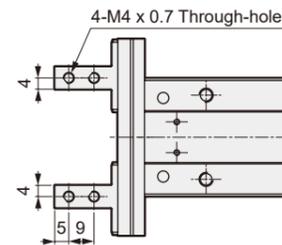
## Outline dimension drawing (Bore size: $\phi 20$ )

### LSHL-A20□1N

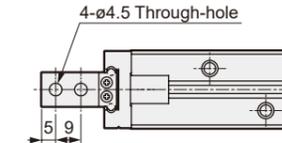


- \*1: Do not fix the main body with the rail plate mounting tap.
- \*2: ( ) indicates dimensions for single acting type
- \*3: When mounting switch on side, through-hole mounting is not possible.

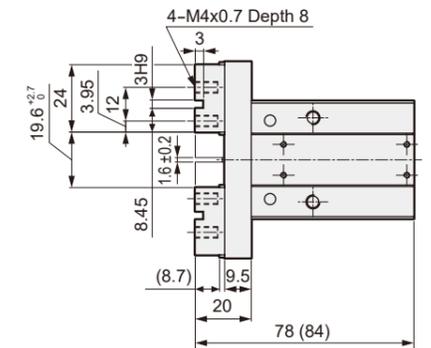
### LSHL-A20□2N



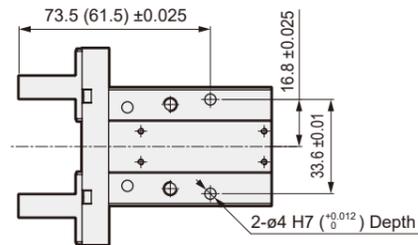
### LSHL-A20□3N



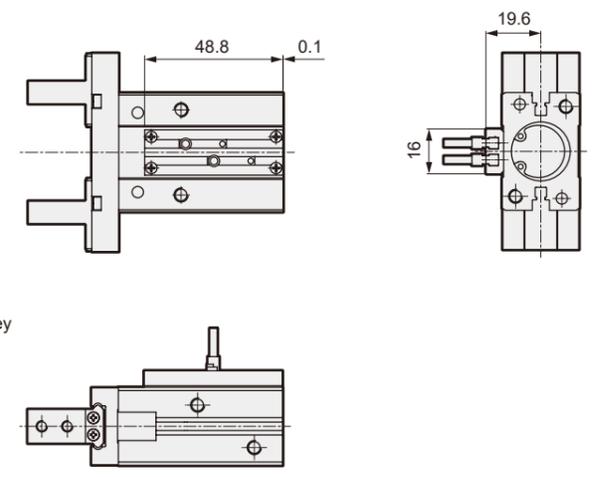
### LSHL-A20□4N



### LSHL-A20□□R/L



### With Switch Rail Plate Assembled

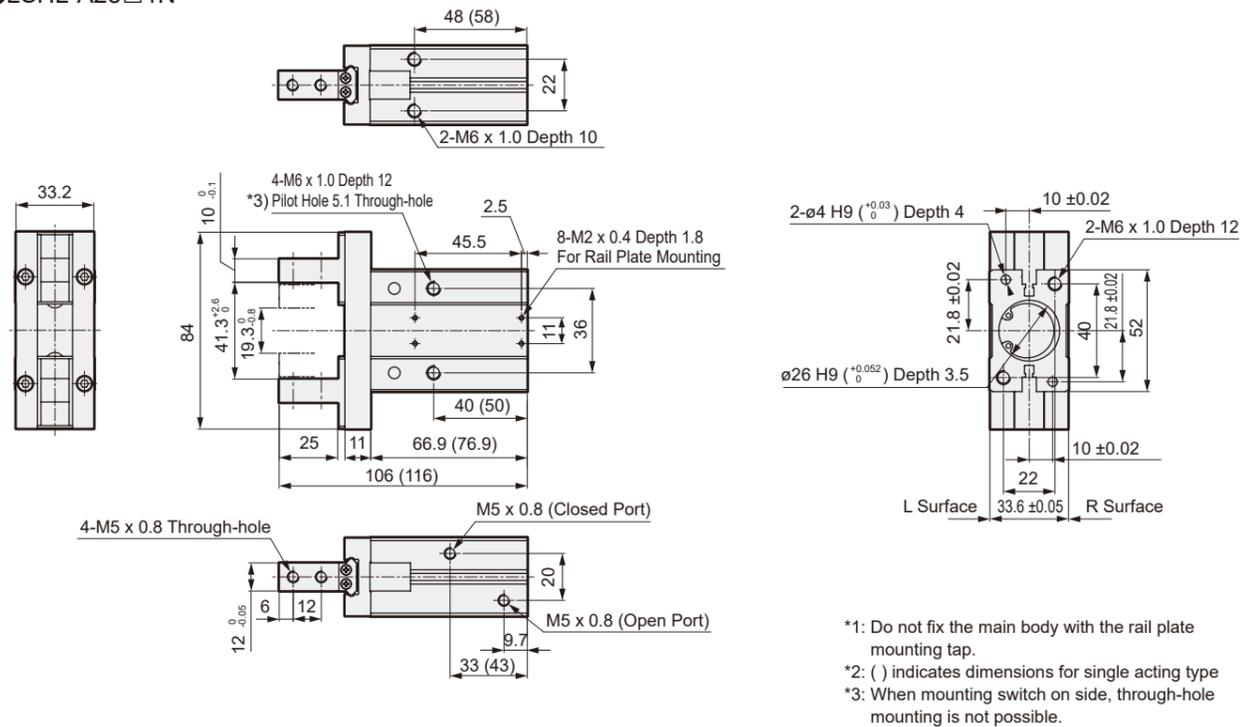


- \*4: For the LSHL-A20D1R, the gripping center reference and high-precision positioning holes are machined on the R side; for the LSHL-A20D1L, they are machined on the L side. For reference position, refer to P. 71.
- \*5: ( ) indicates dimensions for LSHL-A20□4.

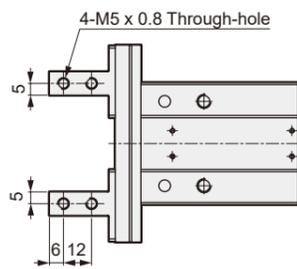
\*6: For notes on cylinder switches, refer to P. 82.

## Outline Dimension Drawing (Bore size: $\phi 25$ )

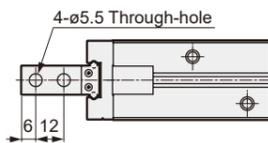
### ●LSHL-A25□1N



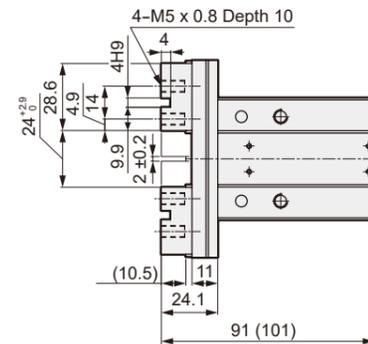
### ●LSHL-A25□2N



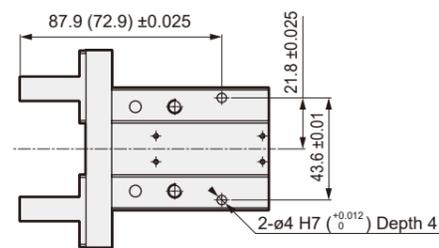
### ●LSHL-A25□3N



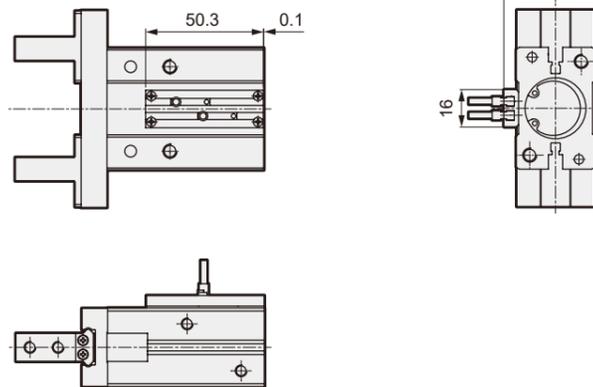
### ●LSHL-A25□4N



### ●LSHL-A25□□R/L



### ●With Switch Rail Plate Assembled



\*4: For the LSHL-A25D1R, the gripping center reference and high-precision positioning holes are machined on the R side; for the LSHL-A25D1L, they are machined on the L side. For reference position, refer to P. 71.

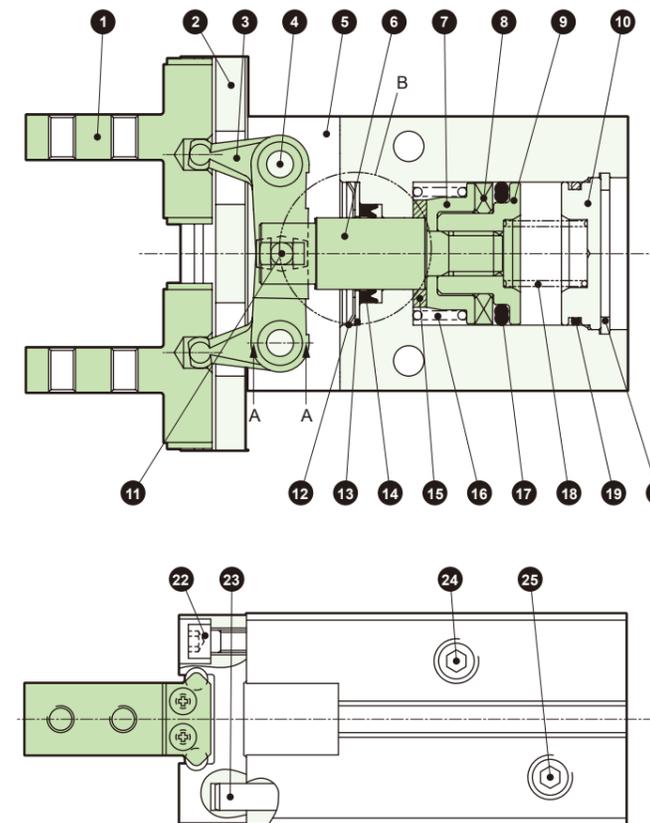
\*5: ( ) indicates dimensions for LSHL-A25□4.

\*6: For notes on cylinder switches, refer to P. 82.

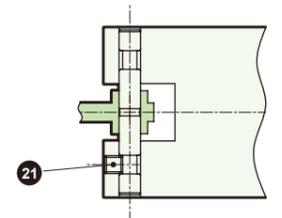
## Internal Structure Diagram/Material

## Internal Structure Diagram/Material

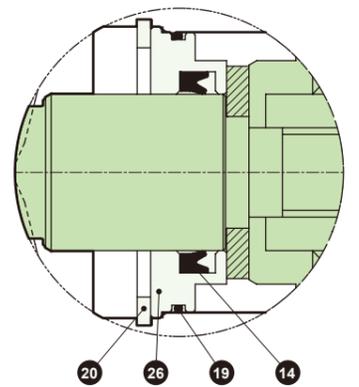
### ●LSHL-A10 to 25



Cross-sectional View A-A ( $\phi 10$  to  $25$ )



Part B ( $\phi 20, 25$ )



Part No.	Part Name	Material	Remarks	Part No.	Part Name	Material	Remarks
1	Finger	Stainless Steel		14	Rod Packing	Nitrile Rubber	
2	Linear Guide	Stainless Steel		15	Cushion Rubber	Urethane Rubber	
3	Lever	Stainless Steel		16	Coil Spring	Piano Wire	Single Acting C only
4	Pivot Shaft	Steel		17	Piston Packing	Nitrile Rubber	
5	Cylinder Body	Aluminum Alloy		18	Coil Spring	Piano Wire	Single Acting S only
6	Piston Rod	Stainless Steel		19	O-ring	Nitrile Rubber	
7	Spring Retainer	Aluminum Alloy		20	C-type retaining ring	Stainless Steel	
8	Magnet			21	Hexagon socket set screw	Stainless Steel	
9	Piston	Aluminum Alloy		22	Hexagon Socket Head Cap Screw	Stainless Steel	
10	Head Cover	Aluminum Alloy		23	Pin	Steel	
11	Operating Shaft	Alloy Steel		24	Plug	Stainless Steel	Single Acting C only
12	Retaining ring	Stainless Steel	$\phi 10, \phi 16$ only	25	Plug	Stainless Steel	Single Acting S only
13	Cap	Stainless Steel	$\phi 10, \phi 16$ only	26	Rod Metal	Aluminum Alloy	

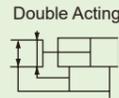
For maintenance parts, refer to the CKD component product site  
 (<https://www.ckd.co.jp/kiki/en/>) → "Model No." → See "Maintenance Parts"



Linear Slide Gripper Long Stroke Double Acting Type, With Rubber Cover (High Durability Equipment)

# LSHL-G, F-HP1 Series

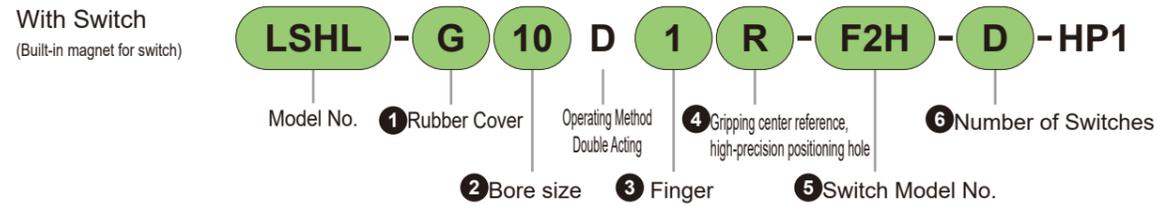
● Operating Stroke: 8, 12, 18 mm



# LSHL-G, F-HP1 Series

Model No. Notation Method

## Model No. Notation Method



### 1 Rubber Cover

Code	Content
G	Chloroprene rubber
F	Fluoro Rubber

### 2 Bore Size (mm)

Code	Content
10	ø10
16	ø16
20	ø20

### 3 Finger

Code	Content
1	Basic type

Note) For details, refer to the outline dimension drawings.

### 4 Gripping center reference, high-precision positioning hole

Code	Content
N	None
L	<p>L Surface    Piping Surface</p>
R	<p>Piping Surface    R Surface</p>

Note) For details, refer to each outline dimension drawing (P. 43 to P. 45) and P. 71.

### 5 Switch Model No.

Without Switch

Code	Content
Blank	Without Switch, Rail Plate Attached
N	Without Switch, Without Rail Plate

With Switch

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		Image
			AC	DC	AC	DC	Straight	L-shape	
Solid State	1-Color	2-wire	-	10 to 30	-	5 to 20	-	F2S□	
		3-wire (NPN)	-	30 or less	-	50 or less	-	F3S□	
		2-wire	-	10 to 30	-	5 to 20 *2	F2H□	F2V□	
		3-wire (NPN)	-	30 or less	-	50 or less	F3H□	F3V□	
		3-wire (PNP)	-	30 or less	-	50 or less	F3PH□	F3PV□	

\*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: If with switch is selected, a rail plate will be included.

\*4: For notes on switches, refer to P. 83.

\*5: Switches other than the model No.s listed above are also available. (Custom Product) For details, see P. 573.

\*6: When mounting a 2-color indicator switch, please consult our sales office.

### 6 Number of Switches

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

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

● Design compatible with rechargeable battery manufacturing process

LSHL-G/F- ... - P4□ - HP1

\*Please contact us for details.

### Switch Single Unit Model No. Notation Method

SW - F2H

5 Switch Model No.

### \*Lead wire length

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

Example) Lead wire length  
1 m F2S  
3 m F2S<sup>3</sup>

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

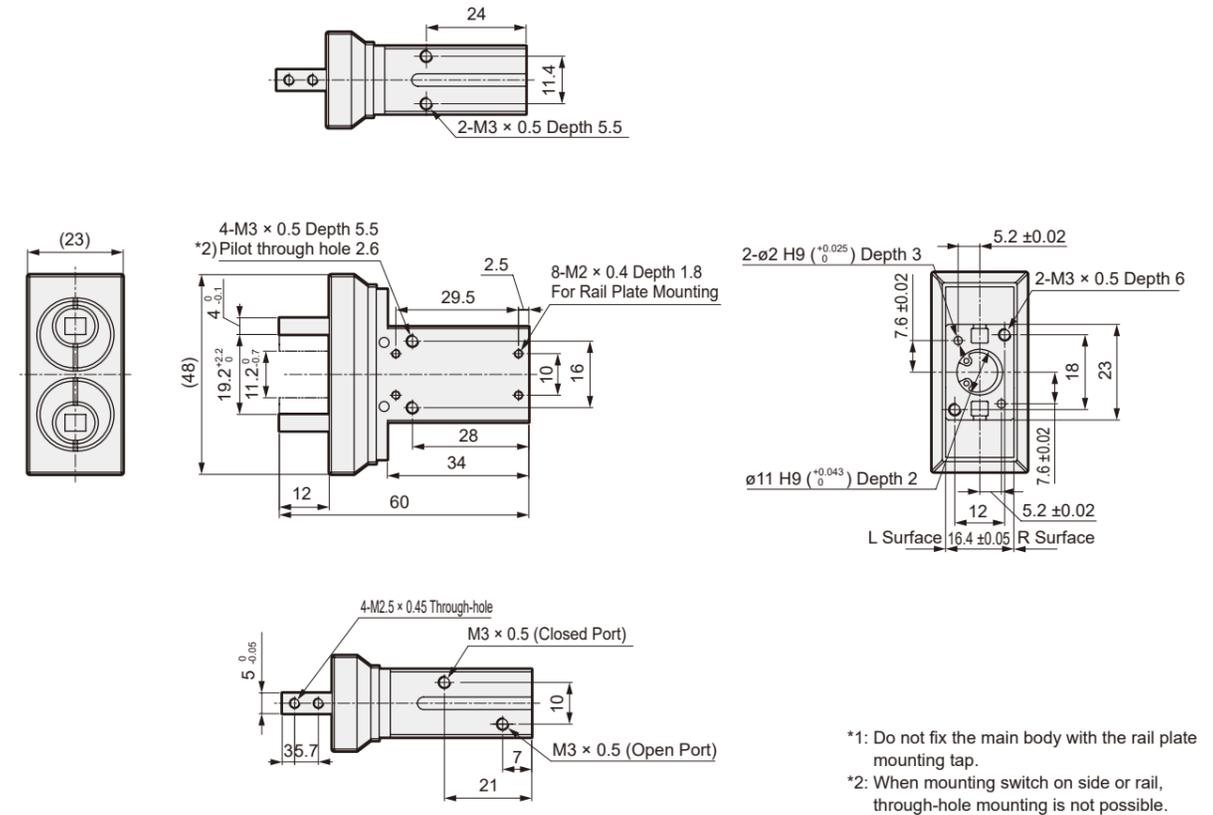
## Specifications

Item	LSHL-G, F-HP1			
	mm	ø10	ø16	ø20
Bore size	mm	ø10	ø16	ø20
Actuation method		Double Acting Type		
Operating Fluid		Compressed Air		
Maximum Operating Pressure	MPa	0.7		
Min. working pressure	MPa	0.2	0.1	
Port Size		M3	M5	
Ambient Temperature	°C	-10 to 60°C (provided there is no freezing)		
Operating Stroke	mm	8	12	18
Repeatability	mm	±0.01		
Weight	kg	0.09	0.18	0.39
Lubrication		Not Required		

(Note) For gripping force performance data, refer to P. 76.

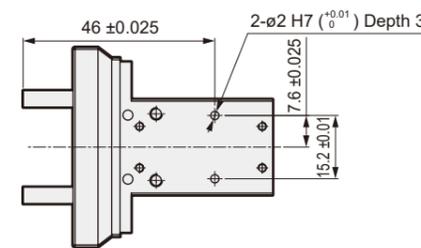
## Outline Dimension Drawing (Bore size: ø10)

### ●LSHL-G10D1N, LSHL-F10D1N



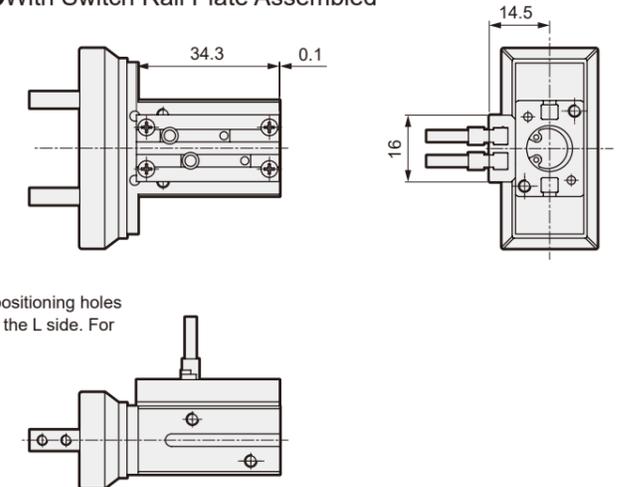
\*1: Do not fix the main body with the rail plate mounting tap.  
\*2: When mounting switch on side or rail, through-hole mounting is not possible.

### ●LSHL-G10D1R/L, LSHL-F10D1R/L



\*3: For the LSHL-G10D1R, the gripping center reference and high-precision positioning holes are machined on the R side; for the LSHL-G10D1L, they are machined on the L side. For reference position, refer to P. 71.

### ●With Switch Rail Plate Assembled



\*4: For notes on cylinder switches, refer to P. 83.

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

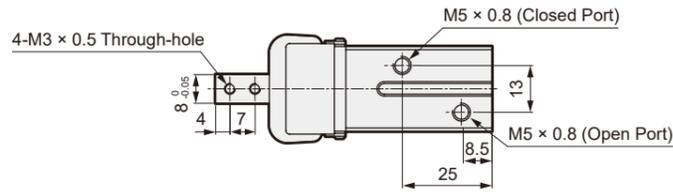
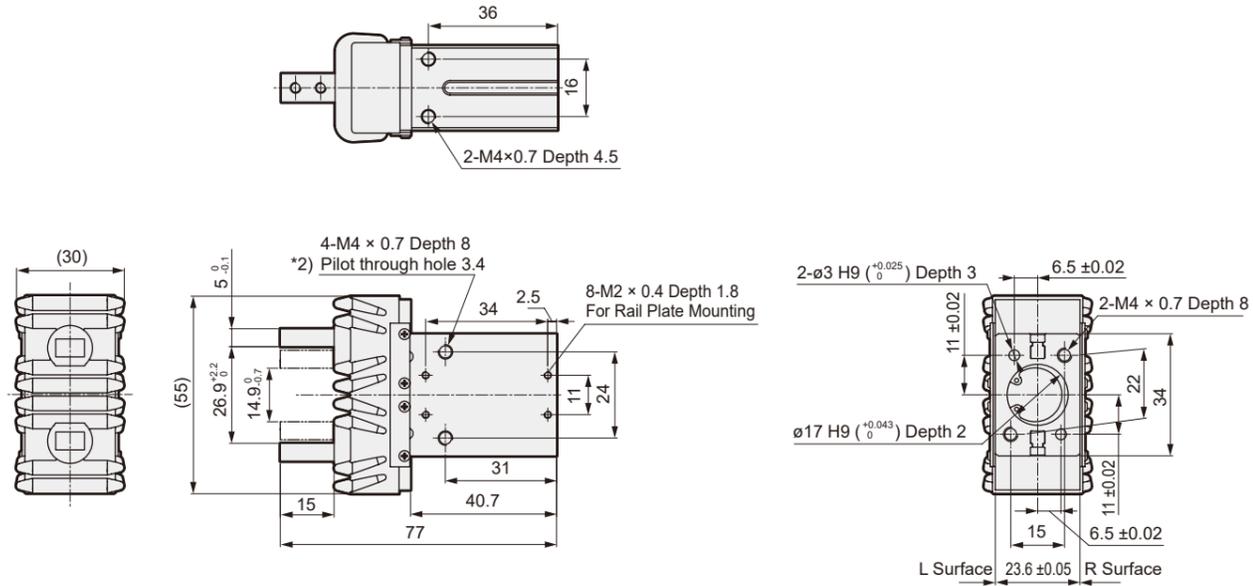
HJD

Cylinder Switch

Ending

## Outline dimension drawing (Bore size: $\phi 16$ )

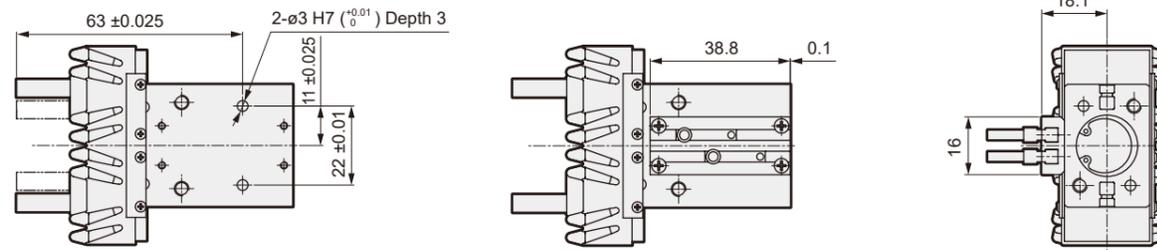
### ●LSHL-G16D1N, LSHL-F16D1N



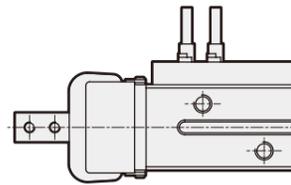
\*1: Do not fix the main body with the rail plate mounting tap.  
\*2: When mounting switch on side, through-hole mounting is not possible.

### ●LSHL-G16D1R/L, LSHL-F16D1R/L

### ●With Switch Rail Plate Assembled



\*3: For the LSHL-G16D1R, the gripping center reference and high-precision positioning holes are machined on the R side; for the LSHL-G16D1L, they are machined on the L side. For reference position, refer to P. 71.

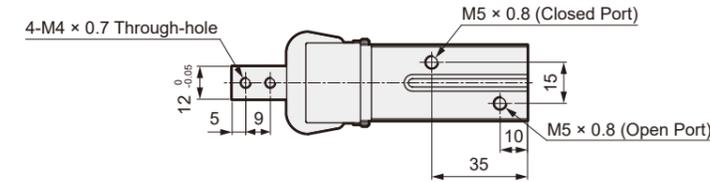
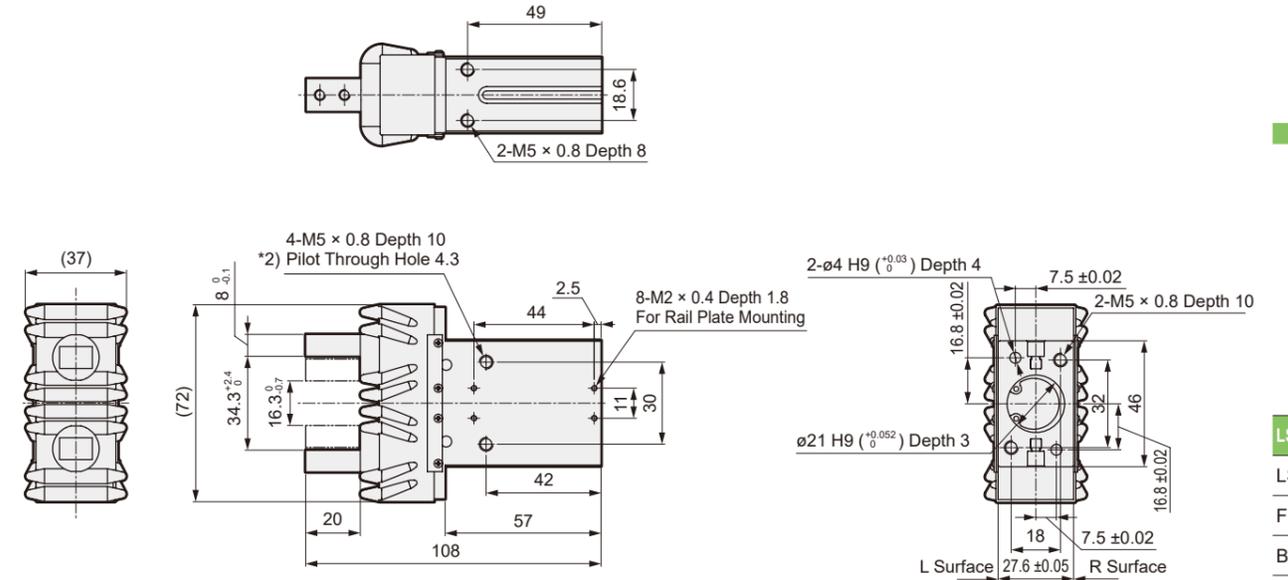


\*4: For notes on cylinder switches, refer to P. 83.

## Outline Dimension Drawing

## Outline dimension drawing (Bore size: $\phi 20$ )

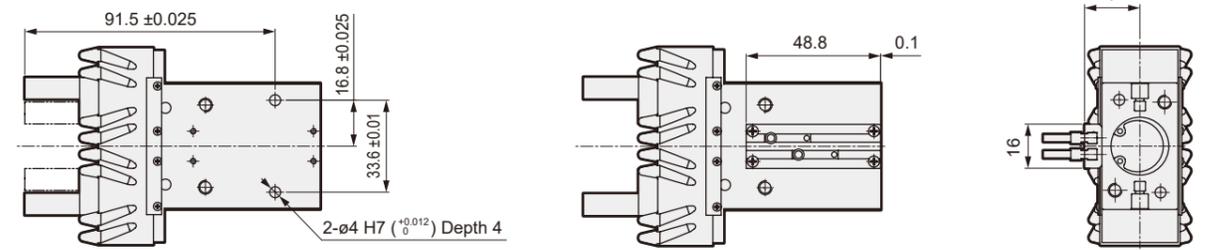
### ●LSHL-G20D1N, LSHL-F20D1N



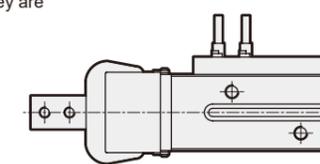
\*1: Do not fix the main body with the rail plate mounting tap.  
\*2: When mounting switch on side, through-hole mounting is not possible.

### ●LSHL-G20D1R/L, LSHL-F20D1R/L

### ●With Switch Rail Plate Assembled



\*3: For the LSHL-G20D1R, the gripping center reference and high-precision positioning holes are machined on the R side; for the LSHL-G20D1L, they are machined on the L side. For reference position, refer to P. 71.



\*4: For notes on cylinder switches, refer to P. 83.

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

HMFB

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

HMFB

HMF

HMF-G

HMFB

HFP

FH500

HBL

HJL

HMD

HDL

HJD

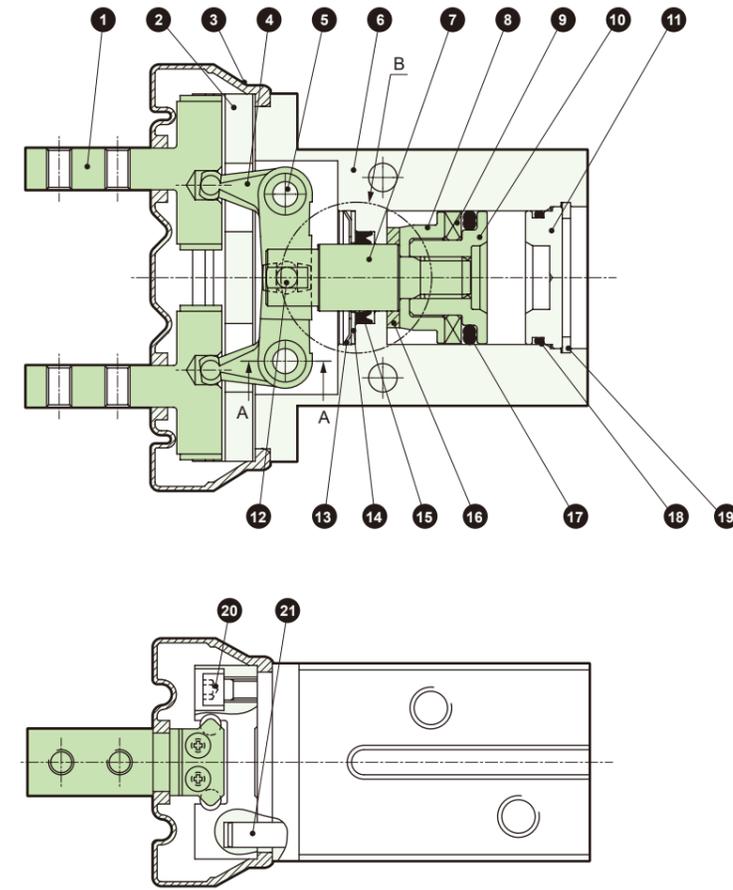
Cylinder Switch

Ending

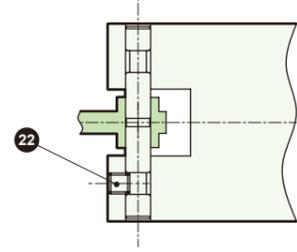
# LSHL-G, F-HP1 Series

## Internal Structure Diagram/Material

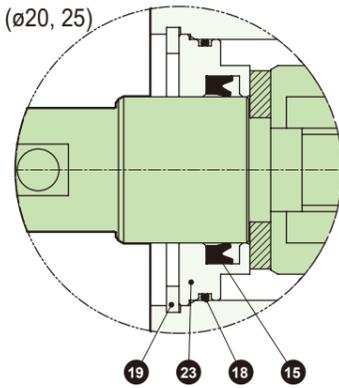
●LSHL-G10 to G20 / LSHL-F10 to F20



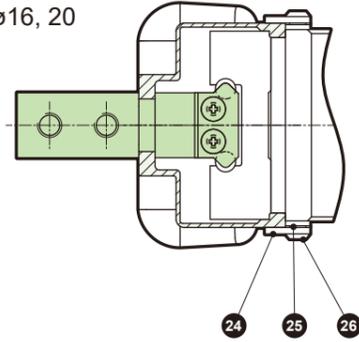
Cross-sectional View A-A (ø10 to 20)



Part B (ø20, 25)



ø16, 20



Part No.	Part Name	Material	Remarks	Part No.	Part Name	Material	Remarks
1	Finger	Stainless Steel		14	Cap	Stainless Steel	ø10, ø16 only
2	Linear Guide	Stainless Steel		15	Rod Packing	Nitrile Rubber	
3	Rubber Cover	LSHL-G: Chloroprene rubber LSHL-F: Fluoro Rubber		16	Cushion Rubber	Urethane Rubber	
4	Lever	Stainless Steel		17	Piston Packing	Nitrile Rubber	
5	Pivot Shaft	Steel		18	O-ring	Nitrile Rubber	
6	Cylinder Body	Aluminum Alloy		19	C-type retaining ring	Stainless Steel	
7	Piston Rod	Stainless Steel		20	Hexagon Socket Head Cap Screw	Stainless Steel	
8	Spring Retainer	Aluminum Alloy		21	Pin	Steel	
9	Magnet			22	Hexagon socket set screw	Stainless Steel	
10	Piston	Aluminum Alloy		23	Rod Metal	Aluminum Alloy	
11	Head Cover	Aluminum Alloy		24	Cover Retainer Plate	Stainless Steel	ø16, ø20 only
12	Operating Shaft	Alloy Steel		25	Cover Spacer	Stainless Steel	ø16, ø20 only
13	Retaining ring	Stainless Steel	ø10, ø16 only	26	Pan Head Screw	Stainless Steel	ø16, ø20 only

For maintenance parts, refer to the CKD component product site  
[\(https://www.ckd.co.jp/kiki/en/\)](https://www.ckd.co.jp/kiki/en/) → "Model No." → See "Maintenance Parts"

MEMO

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

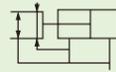
Ending



With Length Measurement Function Linear Slide Gripper Double Acting Type (High Durability Equipment)

# LSHM-A-HP2 Series

● Operating stroke: 4, 6, 10, 14 mm



For suitable detailed model No.s, please see our website.

# LSHM-A-HP2 Series

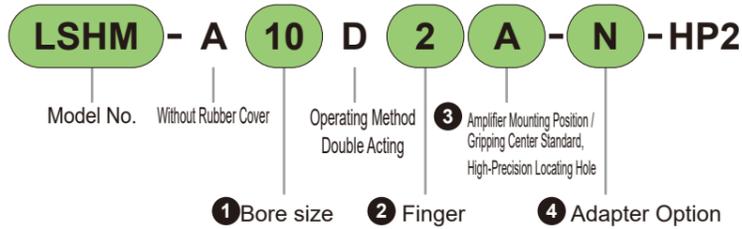
Specifications

## Specifications

Item	LSHM-A-HP2							
Bore size	mm	ø10	ø16	ø20	ø25			
Actuation method	Double Acting Type							
Operating Fluid	Compressed Air							
Max. Operating Pressure	MPa	0.7						
Min. Working Pressure	MPa	0.2	0.1	0.1	0.1			
Port Size		M3	M5	M5	M5			
Operating Stroke	mm	4	6	10	14			
Power supply voltage	24 VDC ±10%							
Current consumption	25 mA or less							
Indicator LED	Green LED lights up when power is applied							
Analog Output	Finger Closed 1 V - Open 5 V <sup>*</sup> , Connection Load 100 kΩ or more							
Analog Output	Without Correction Adapter	±3% F.S. or less (Ambient temperature 25°C)						
Linearity	With Correction Adapter	±0.5% F.S. or less (Ambient temperature 25°C)						
Repeatability of analog output	±0.02 mm or less (Ambient temperature 25°C, no deformation or wear of actuator/jig)							
Effective Measurement Range	mm	4.5	6.5	10	14			
Shock Resistance (Sensor/Amplifier Unit)	294 m/s <sup>2</sup>							
Vibration Resistance (Sensor/Amplifier Unit)	10 to 55 Hz Double amplitude 1.5 mm, X, Y, Z directions, 2 hours each							
Protection Structure (Sensor/Amplifier Unit)	IEC Standard IP65							
Ambient Temperature, Humidity	10 to 60°C, 85% RH or less							
Amplifier Mounting Position	Side	Front	Side	Front	Side	Front	Side	Front
Weight kg	Finger Code: 1,2,3		0.221	0.238	0.437	0.457	0.752	0.773
	Finger Code: 4		0.226	0.243	0.442	0.462	0.782	0.803
Lubrication	Not Required							

\*1: For correction adapter, refer to P. 64.  
 \*2: There is an output fluctuation of 1 mV/°C.  
 \*3: For gripping force performance data, refer to P. 74.

## Model No. Notation Method



### 1 Bore Size (mm)

Code	Content
10	ø10
16	ø16
20	ø20
25	ø25

### 2 Finger

Code	Content
1	Basic type
2	Side tap
3	Through-hole
4	Flat

Note) For details, refer to the outline dimension drawings.

### 3 Amplifier Mounting Position / Gripping Center Standard, High-Precision Locating Hole

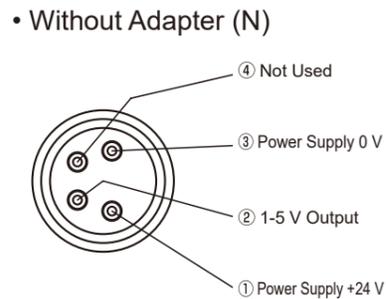
Code	Content
A	Amplifier Side / Without Locating Hole
B	Amplifier Side / Below Finger, Piping to the Right, Rear Surface
C	Amplifier Side / Below Finger, Piping to the Left, Rear Surface

### 4 Adapter Option

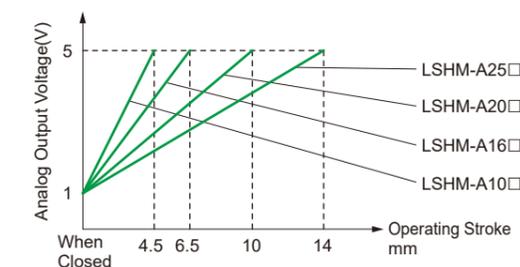
Code	Content
N	Without Adapter
A	Correction Adapter
B	Switch Output Adapter (NPN)
C	Switch Output Adapter (PNP)
D	IO-Link Adapter

Note) shipped included to the product.

### Plug Contact Arrangement Diagram



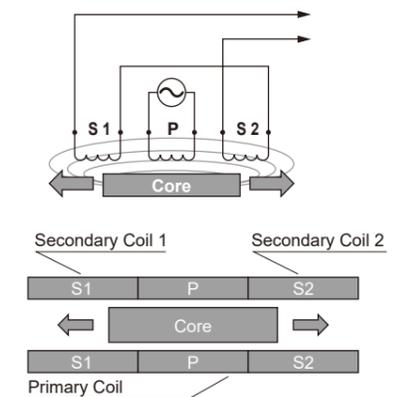
## Analog Output Characteristics



\* Analog output voltage at shipment is 1 V on the close side and 5 V on the open side with the close port pressurized.

## LVDT Type Displacement Sensor Operating Principle

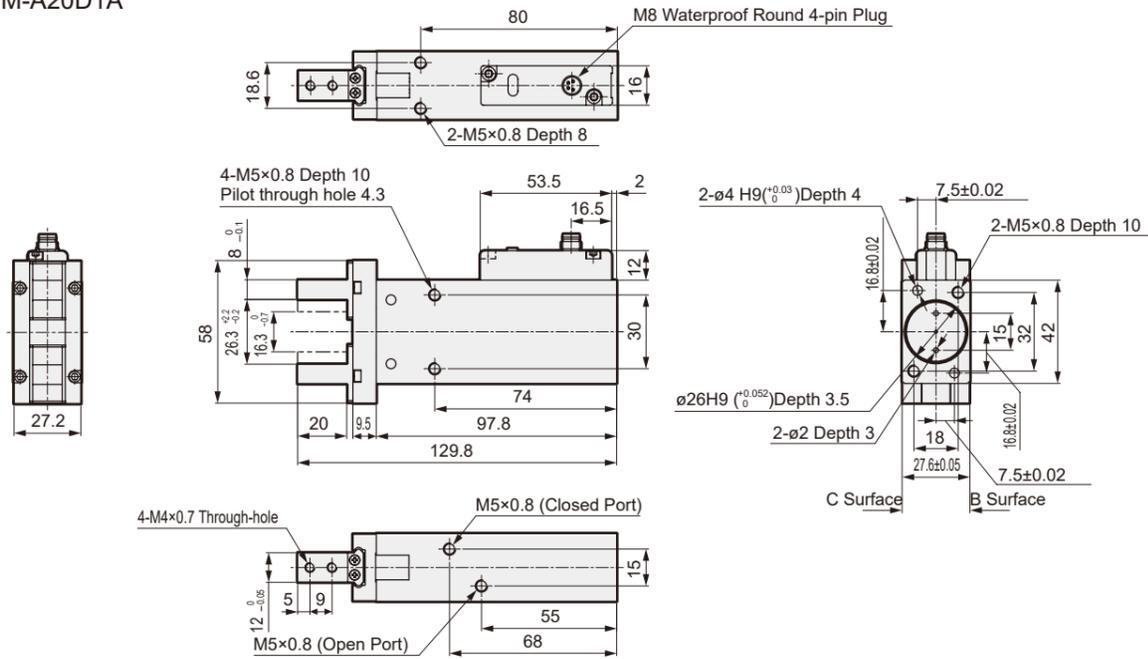
When the primary coil (P) is excited, an induced voltage is generated in the two secondary coils (S1 and S2) by electromagnetic induction. When the gripper is driven, the position of the core changes, creating a difference in the induced voltages of S1 and S2. This difference is used to output the core position as an electrical signal.



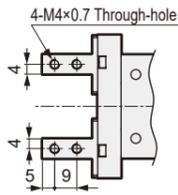


## Outline dimension drawing (Bore size: $\varnothing 20$ )

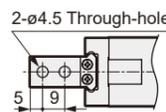
### ● LSHM-A20D1A



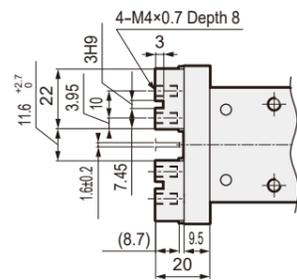
### ● LSHM-A20D2□



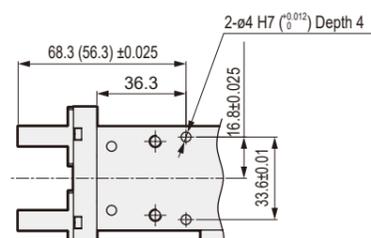
### ● LSHM-A20D3□



### ● LSHM-A20D4□

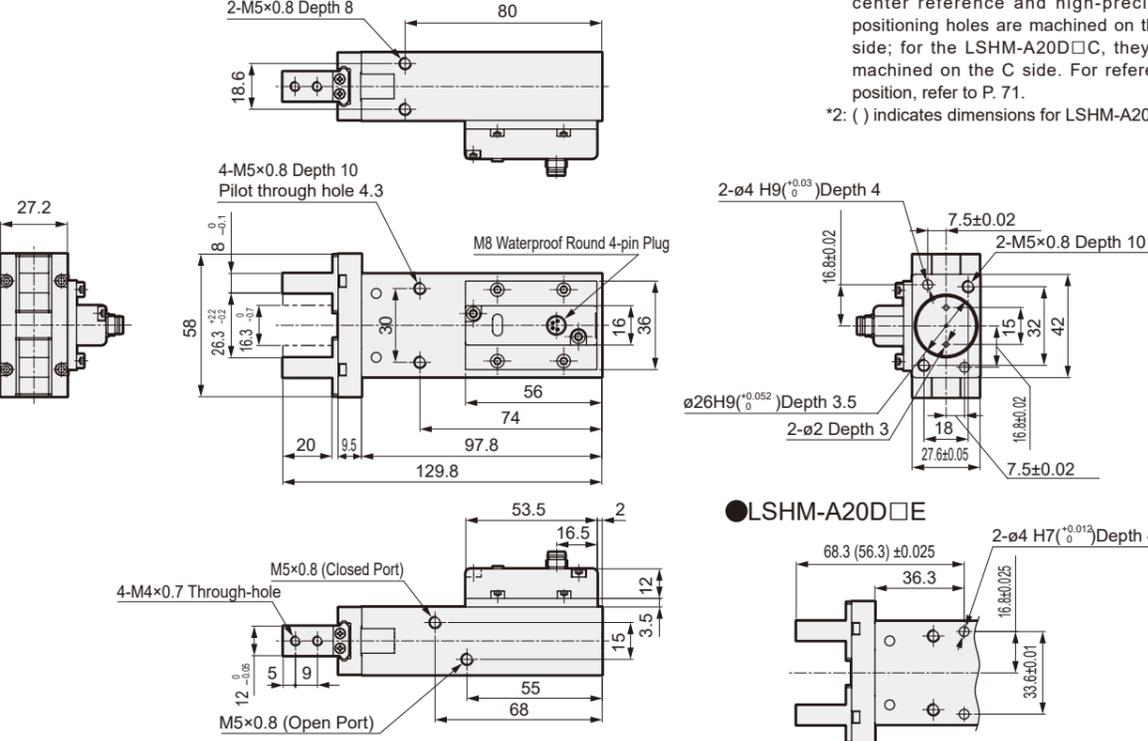


### ● LSHM-A20D□B/C

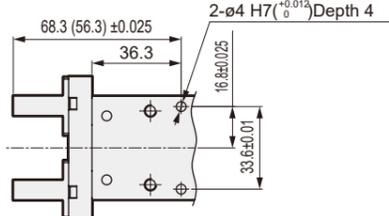


\*1: For the LSHM-A20D□B, the gripping center reference and high-precision positioning holes are machined on the B side; for the LSHM-A20D□C, they are machined on the C side. For reference position, refer to P. 71.  
\*2: ( ) indicates dimensions for LSHM-A20D4.

### ● LSHM-A20D1D

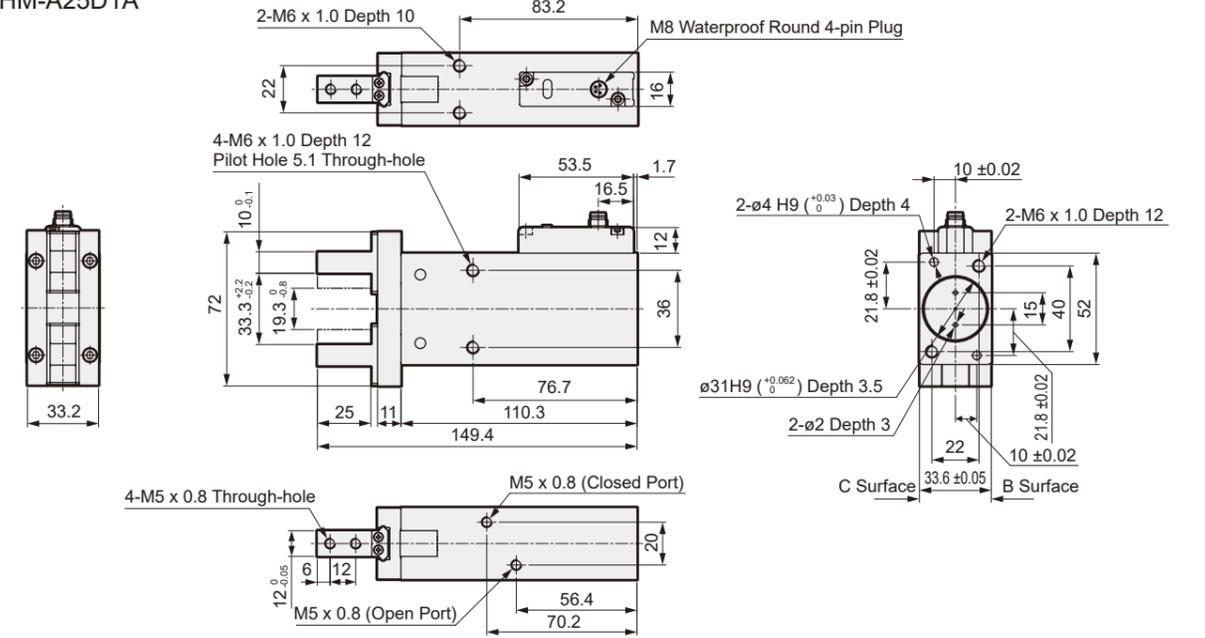


### ● LSHM-A20D□E

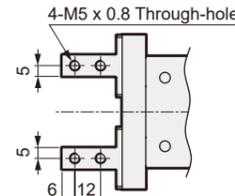


## Outline Dimension Drawing (Bore size: $\varnothing 25$ )

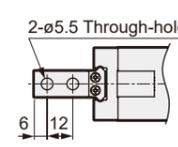
### ● LSHM-A25D1A



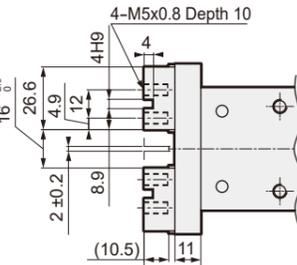
### ● LSHM-A25D2□



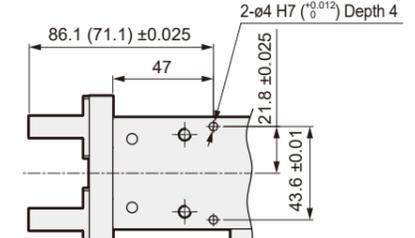
### ● LSHM-A20D3□



### ● LSHM-A25D4□

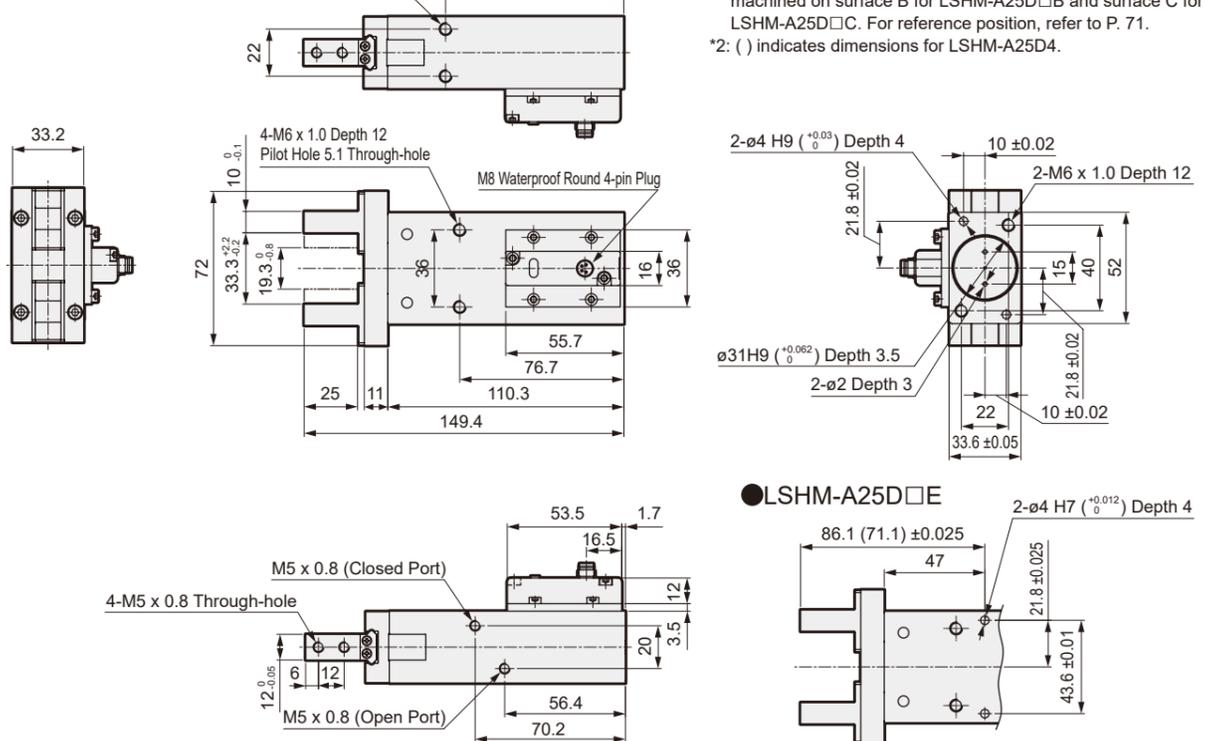


### ● LSHM-A25D□B/C

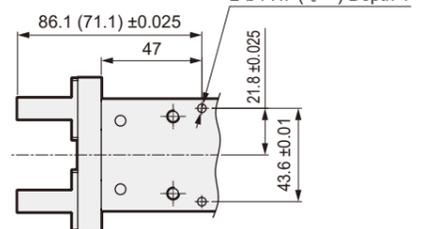


\*1: Grip center reference and high precision positioning hole are machined on surface B for LSHM-A25D□B and surface C for LSHM-A25D□C. For reference position, refer to P. 71.  
\*2: ( ) indicates dimensions for LSHM-A25D4.

### ● LSHM-A25D1D



### ● LSHM-A25D□E

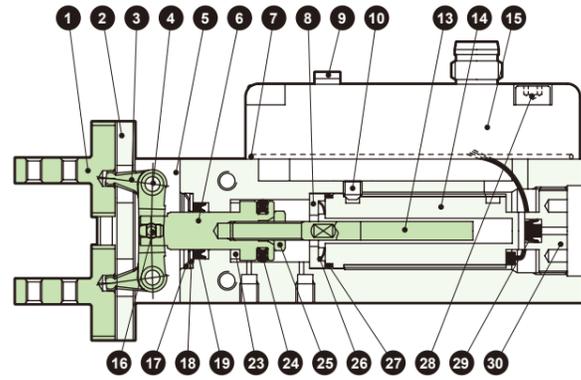


Hand (Gripper)  
LSH-HP  
LSH  
FH100  
BSA2  
BHA  
BHG  
BHE  
LHA  
LHAG  
HAP-1C  
HAP-2 to 4CS  
HKP  
HCP  
HGP  
LST-HP  
HLF2  
HLA/HLB  
HLAG/HLBG  
HLC  
HLD  
HMC-HP  
HMF  
HMF-G  
HMF-B  
HFP  
FH500  
HBL  
HJL  
HMD  
HDL  
HJD  
Cylinder Switch  
Ending

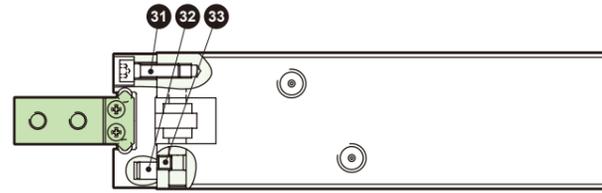
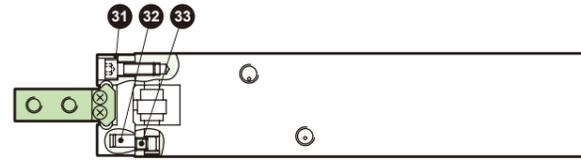
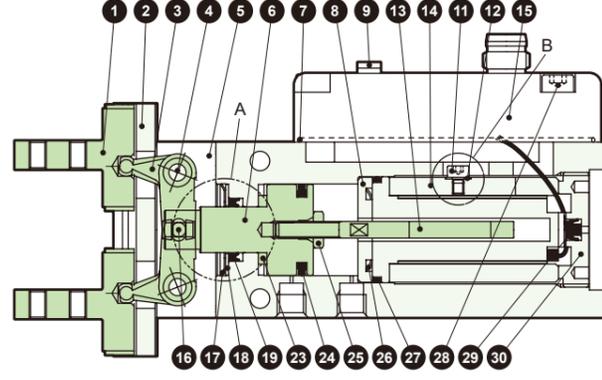
Hand (Gripper)  
LSH-HP  
LSH  
FH100  
BSA2  
BHA  
BHG  
BHE  
LHA  
LHAG  
HAP-1C  
HAP-2 to 4CS  
HKP  
HCP  
HGP  
LST-HP  
HLF2  
HLA/HLB  
HLAG/HLBG  
HLC  
HLD  
HMC-HP  
HMF  
HMF-G  
HMF-B  
HFP  
FH500  
HBL  
HJL  
HMD  
HDL  
HJD  
Cylinder Switch  
Ending

## Internal Structure Diagram/Material

### ● Amplifier Side Mounting ø10

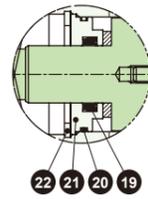


### ● Amplifier Side Mounting ø16 to 25



Part A (ø20, 25)

Part B (ø20, 25)



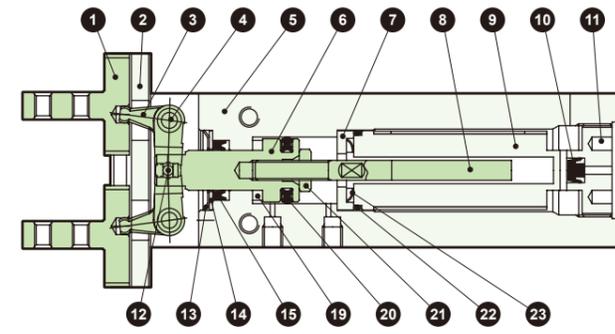
**Do not disassemble**

Part No.	Part Name	Material	Remarks	Part No.	Part Name	Material	Remarks
1	Finger	Stainless Steel		18	Cap	Stainless Steel	ø10, ø16 only
2	Linear Guide	Stainless Steel		19	Rod Packing	Nitrile Rubber	
3	Lever	Stainless Steel		20	O-ring	Nitrile Rubber	
4	Pivot Shaft	Steel		21	Rod Metal	Aluminum Alloy	
5	Cylinder Body	Aluminum Alloy		22	C-type retaining ring	Steel	
6	Piston Rod	Stainless Steel		23	Cushion Rubber	Urethane Rubber	
7	Gasket	Nitrile Rubber		24	Piston Packing	Nitrile Rubber	
8	Washer Retainer	Aluminum Alloy		25	Nut	Stainless Steel	
9	Plug	Nitrile Rubber		26	Wave Washer	Stainless Steel	
10	Hexagon socket set screw	Stainless Steel		27	O-ring	Nitrile rubber	
11	Hexagon Socket Head Cap Screw	Stainless Steel		28	Hexagon Socket Head Cap Screw	Stainless Steel	
12	Plain Washer	Stainless Steel	ø16 only	29	Check Valve	Nitrile Rubber	
13	Core Shaft	Steel		30	Head Cover	Aluminum Alloy	
14	Sensor Body	-		31	Hexagon Socket Head Cap Screw	Stainless Steel	
15	Amplifier	-		32	Pin	Steel	
16	Operating Shaft	Steel		33	Hexagon socket set screw	Stainless Steel	
17	Retaining ring	Stainless Steel	ø10, ø16 only				

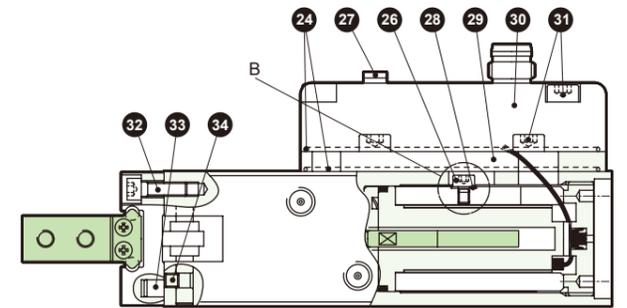
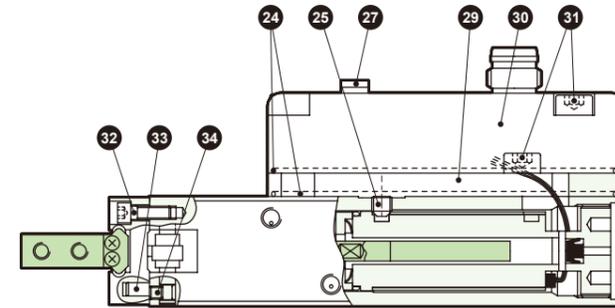
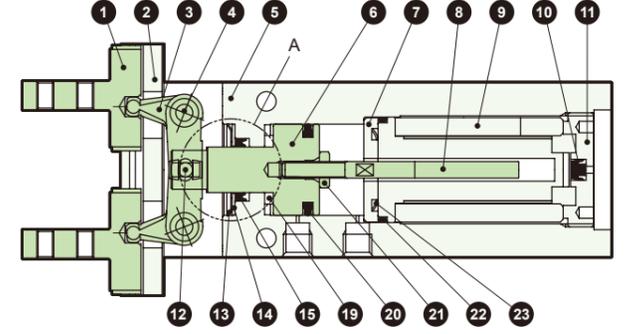
## Internal Structure Diagram/Material

## Internal Structure Diagram/Material

### ● Amplifier Front Mounting ø10

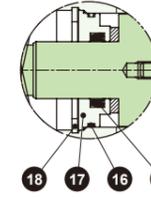


### ● Amplifier Front Mounting ø16 to 25



Part A (ø20, 25)

Part B (ø20, 25)



**Do not disassemble**

Part No.	Part Name	Material	Remarks	Part No.	Part Name	Material	Remarks
1	Finger	Stainless Steel		18	C-type retaining ring	Steel	
2	Linear Guide	Stainless Steel		19	Cushion Rubber	Urethane Rubber	
3	Lever	Stainless Steel		20	Piston Packing	Nitrile Rubber	
4	Pivot Shaft	Steel		21	Nut	Stainless Steel	
5	Cylinder Body	Aluminum Alloy		22	O-ring	Nitrile rubber	
6	Piston Rod	Stainless Steel		23	Wave Washer	Stainless Steel	
7	Washer Retainer	Aluminum Alloy		24	Gasket	Nitrile Rubber	
8	Core Shaft	Steel		25	Hexagon socket set screw	Stainless Steel	
9	Sensor Body	-		26	Hexagon Socket Head Cap Screw	Stainless Steel	
10	Check Valve	Nitrile Rubber		27	Plug	Nitrile Rubber	
11	Head Cover	Aluminum Alloy		28	Plain Washer	Stainless Steel	ø16 only
12	Operating Shaft	Steel		29	Amplifier Adapter	Aluminum Alloy	
13	Retaining ring	Stainless Steel	ø10, ø16 only	30	Amplifier	-	
14	Cap	Stainless Steel	ø10, ø16 only	31	Hexagon Socket Head Cap Screw	Stainless Steel	
15	Rod Packing	Nitrile Rubber		32	Hexagon Socket Head Cap Screw	Stainless Steel	
16	O-ring	Nitrile Rubber		33	Pin	Steel	
17	Rod Metal	Aluminum Alloy		34	Hexagon socket set screw	Stainless Steel	

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

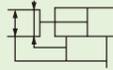
Ending



Linear Slide Gripper with Length Measurement Function Double Acting Type with Rubber Cover (High Durability)

# LSHM-G, LSHM-F-HP2 Series

● Operating stroke: 4, 6, 10, 14 mm



For suitable detailed model No.s, please see our website.

# LSHM-G, LSHM-F-HP2 Series

Specifications

## Specifications

Item	LSHM-G / LSHM-F-HP2									
	mm		ø10	ø16	ø20	ø25				
Bore size	mm		ø10	ø16	ø20	ø25				
Actuation method	Double Acting Type									
Operating Fluid	Compressed Air									
Max. Operating Pressure	MPa		0.7							
Min. Working Pressure	MPa		0.2	0.1	0.1	0.1				
Port Size			M3	M5	M5	M5				
Operating Stroke	mm		4	6	10	14				
Power supply voltage	24 VDC ±10%									
Current consumption	25 mA or less									
Indicator LED	Green LED lights up when power is applied									
Analog Output	Finger Closed 1 V - Open 5 V *1, Connection Load 100 kΩ or more									
Analog Output	Without Correction Adapter		±3% F.S. or less (Ambient temperature 25°C)							
Linearity	With Correction Adapter		±0.5% F.S. or less (Ambient temperature 25°C)							
Repeatability of analog output	±0.02 mm or less (Ambient temperature 25°C, no deformation or wear of actuator/jig)									
Effective Measurement Range	mm		4.5	6.5	10	14				
Shock Resistance (Sensor/Amplifier Unit)	294 m/s <sup>2</sup>									
Vibration Resistance (Sensor/Amplifier Unit)	10 to 55 Hz Double amplitude 1.5 mm, X, Y, Z directions, 2 hours each									
Protection Structure (Sensor/Amplifier Unit)	IEC Standard IP65									
Ambient Temperature, Humidity	10 to 60°C, 85% RH or less									
Amplifier Mounting Position	Side	Front	Side	Front	Side	Front	Side	Front		
Weight	kg		0.113	0.125	0.236	0.253	0.462	0.482	0.792	0.813
Lubrication	Not Required									

\*1: For correction adapter, refer to P. 64.

\*2: There is an output fluctuation of 1 mV/°C.

\*3: For gripping force performance data, refer to P. 76.

## Model No. Notation Method

**LSHM - G 10 D 1 A - N - HP2**

Model No. **1** Rubber Cover **2** Bore size **3** Finger **4** Amplifier Mounting Position / Gripping Center Standard, High-Precision Locating Hole **5** Adapter Option

### 1 Rubber Cover

Code	Content
<b>G</b>	Chloroprene rubber
<b>F</b>	Fluoro Rubber

### 2 Bore Size (mm)

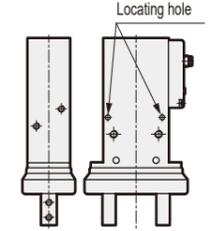
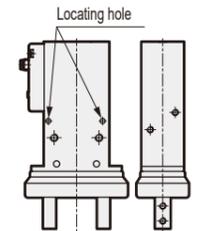
Code	Content
<b>10</b>	ø10
<b>16</b>	ø16
<b>20</b>	ø20
<b>25</b>	ø25

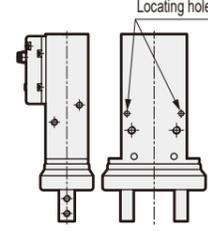
### 3 Finger

Code	Content
<b>1</b>	Basic type 

Note) For details, refer to the outline dimension drawings.

### 4 Amplifier Mounting Position / Gripping Center Standard, High-Precision Locating Hole

Code	Content
<b>A</b>	Amplifier Side / Without Locating Hole
<b>B</b>	Amplifier Side / Below Finger, Piping to the Right, Rear Surface 
<b>C</b>	Amplifier Side / Below Finger, Piping to the Left, Rear Surface 

Code	Content
<b>D</b>	Amplifier Front / Without Locating Hole
<b>E</b>	Amplifier Front / Below Finger, Piping to the Right, Rear Surface 

Note) For details, refer to each outline dimension drawing (P. 58 to P. 61) and P. 71.

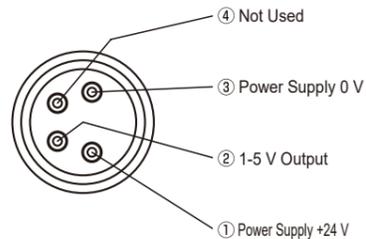
### 5 Adapter Option

Code	Content
<b>N</b>	Without Adapter
<b>A</b>	Correction Adapter
<b>B</b>	Switch Output Adapter (NPN)
<b>C</b>	Switch Output Adapter (PNP)
<b>D</b>	IO-Link Adapter

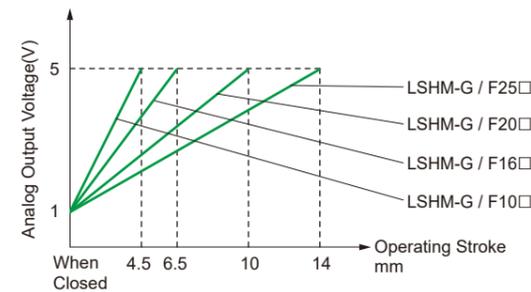
Note) shipped included to the product.

### Plug Contact Arrangement Diagram

#### • Without Adapter (N)



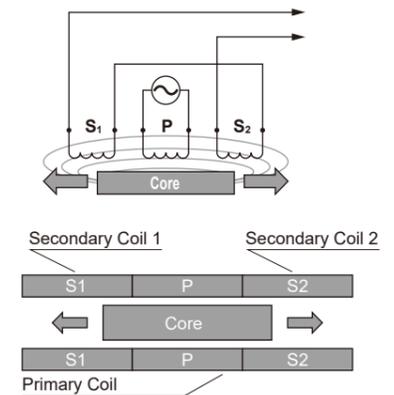
## Analog Output Characteristics



● Analog output voltage at shipment is 1 V on the close side and 5 V on the open side with the close port pressurized.

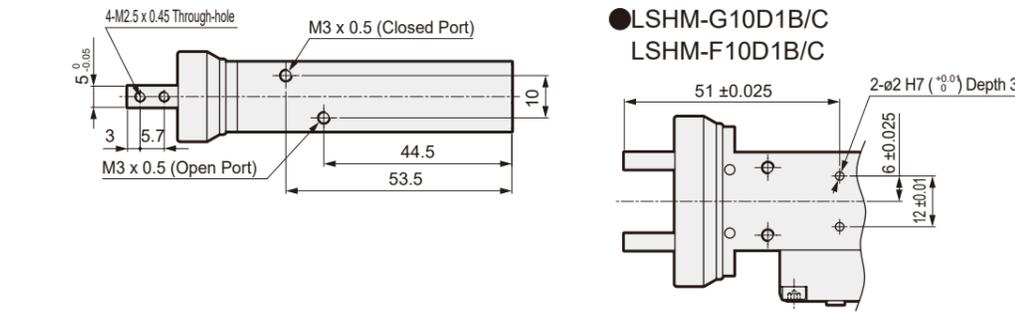
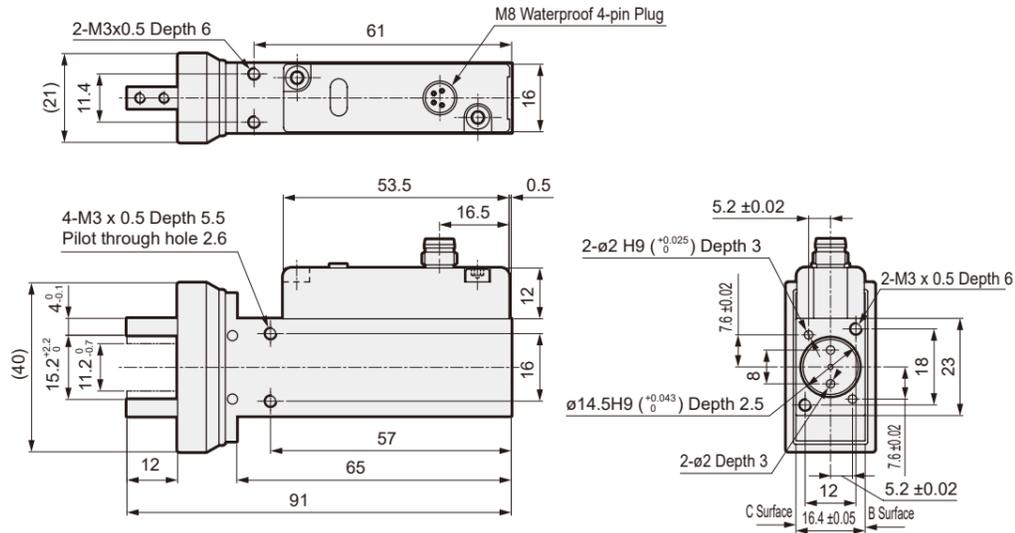
## LVDT Type Displacement Sensor Operating Principle

When the primary coil (P) is excited, an induced voltage is generated in the two secondary coils (S1 and S2) by electromagnetic induction. When the gripper is driven, the position of the core changes, creating a difference in the induced voltages of S1 and S2. This difference is used to output the core position as an electrical signal.

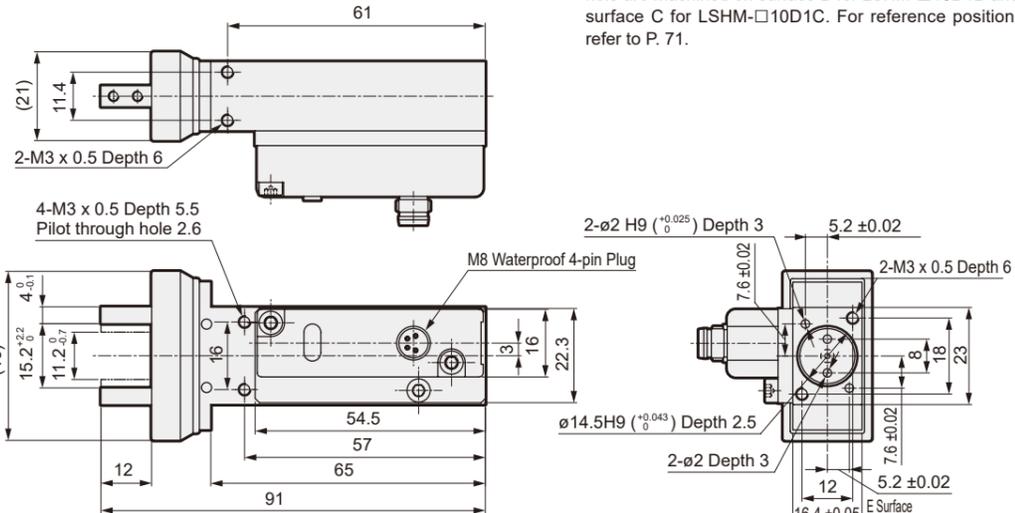


External dimensions diagram (Bore size:  $\phi 10$ )

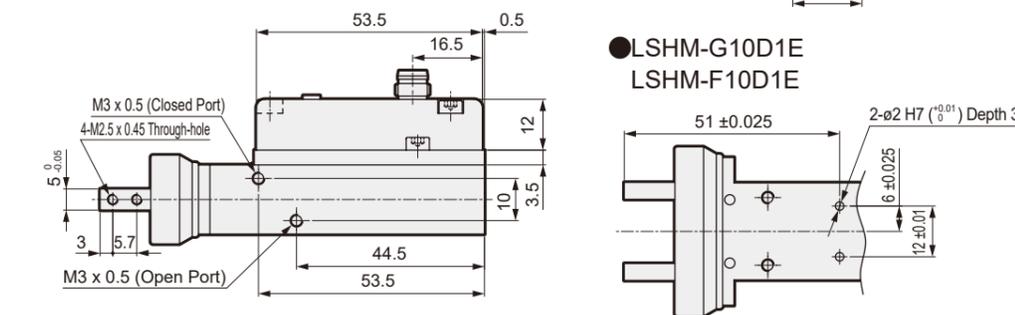
● LSHM-G10D1A  
LSHM-F10D1A



● LSHM-G10D1D  
LSHM-F10D1D



● LSHM-G10D1E  
LSHM-F10D1E

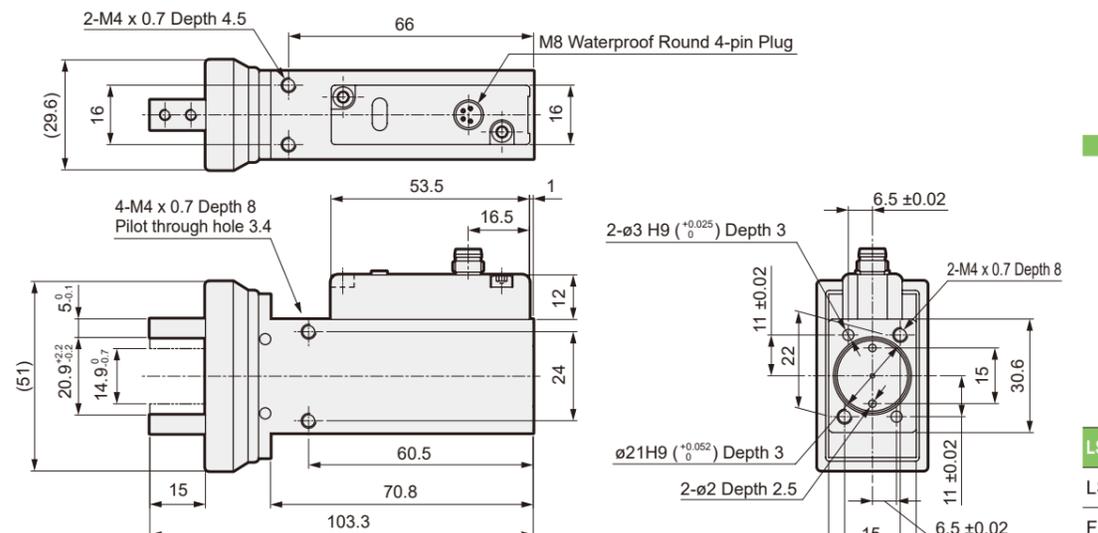


\*1: Grip center reference and high precision positioning hole are machined on surface B for LSHM-□10D1B and surface C for LSHM-□10D1C. For reference position, refer to P. 71.

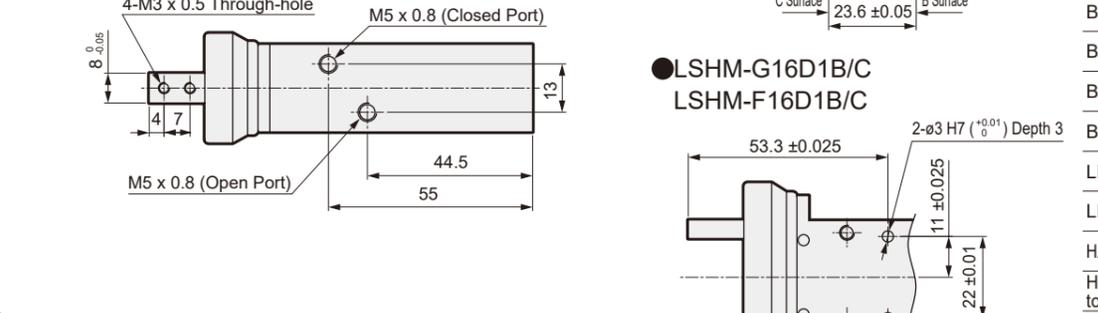
Outline Dimension Drawing

Outline dimension drawing (Bore size:  $\phi 16$ )

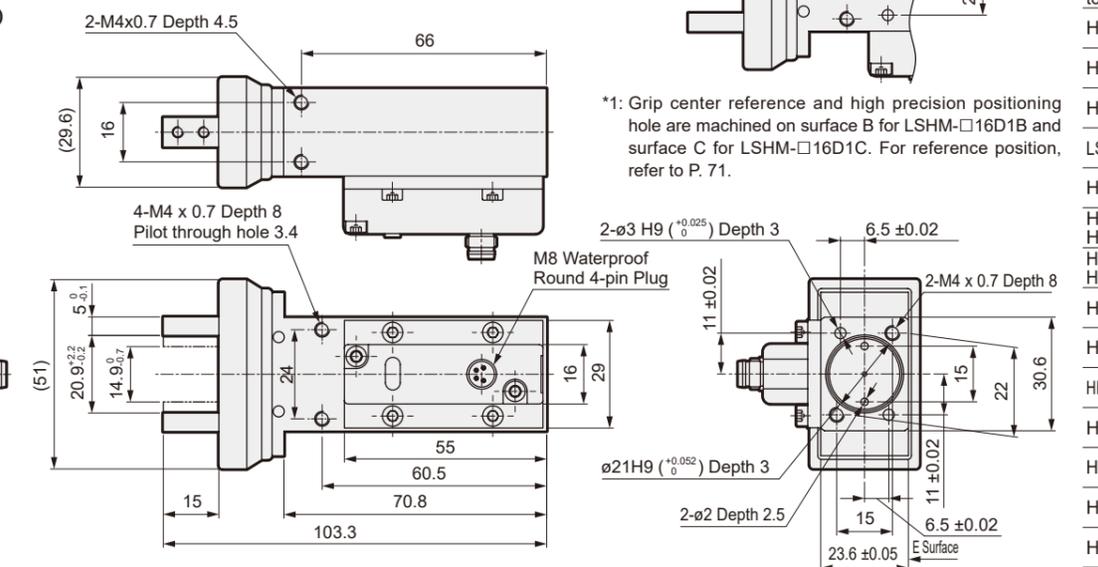
● LSHM-G16D1A  
LSHM-F16D1A



● LSHM-G16D1B/C  
LSHM-F16D1B/C

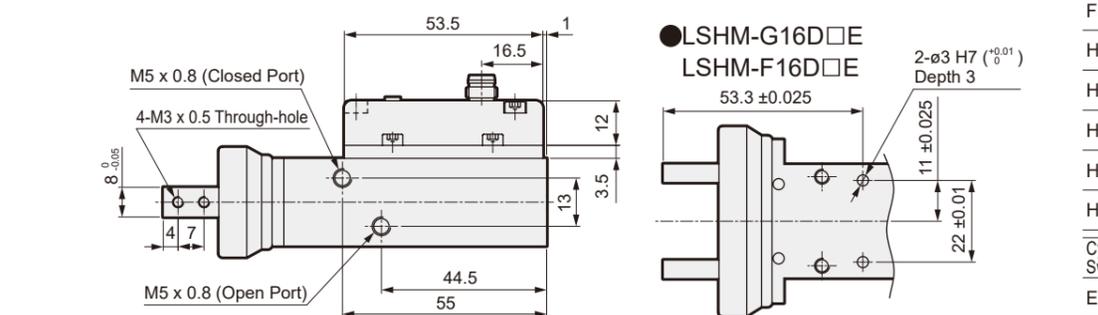


● LSHM-G16D1D  
LSHM-F16D1D



\*1: Grip center reference and high precision positioning hole are machined on surface B for LSHM-□16D1B and surface C for LSHM-□16D1C. For reference position, refer to P. 71.

● LSHM-G16D□E  
LSHM-F16D□E

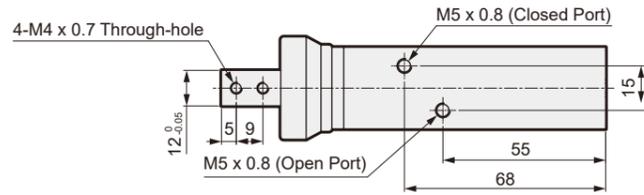
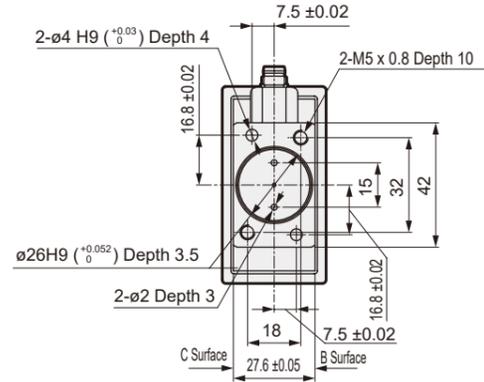
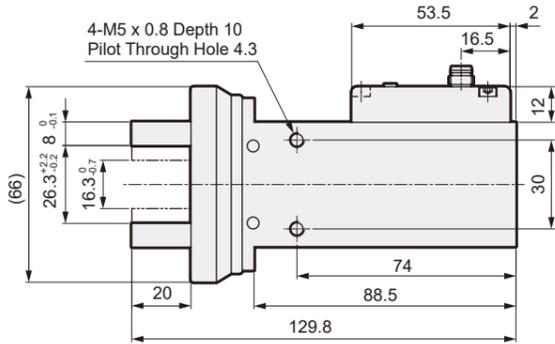
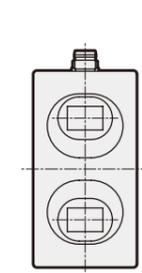
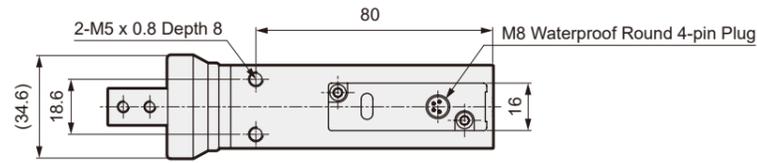


Hand (Gripper)  
LSH-HP  
LSH  
FH100  
BSA2  
BHA  
BHG  
BHE  
LHA  
LHAG  
HAP-1C  
HAP-2 to 4CS  
HKP  
HCP  
HGP  
LST-HP  
HLF2  
HLA/HLB  
HLAG/HLBG  
HLC  
HLD  
HMC-HP  
HMF  
HMF-G  
HMF-B  
HFP  
FH500  
HBL  
HJL  
HMD  
HDL  
HJD  
Cylinder Switch  
Ending

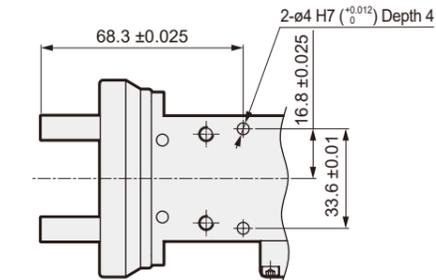
Hand (Gripper)  
LSH-HP  
LSH  
FH100  
BSA2  
BHA  
BHG  
BHE  
LHA  
LHAG  
HAP-1C  
HAP-2 to 4CS  
HKP  
HCP  
HGP  
LST-HP  
HLF2  
HLA/HLB  
HLAG/HLBG  
HLC  
HLD  
HMC-HP  
HMF  
HMF-G  
HMF-B  
HFP  
FH500  
HBL  
HJL  
HMD  
HDL  
HJD  
Cylinder Switch  
Ending

Outline dimension drawing (Bore size:  $\varnothing 20$ )

● LSHM-G20D1A  
LSHM-F20D1A

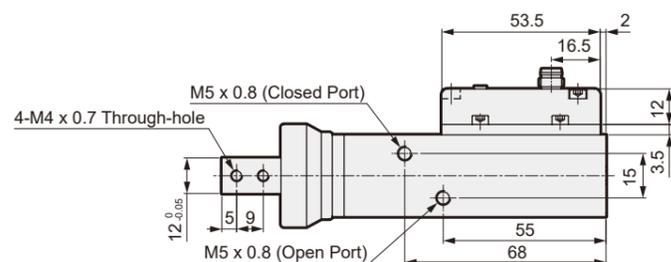
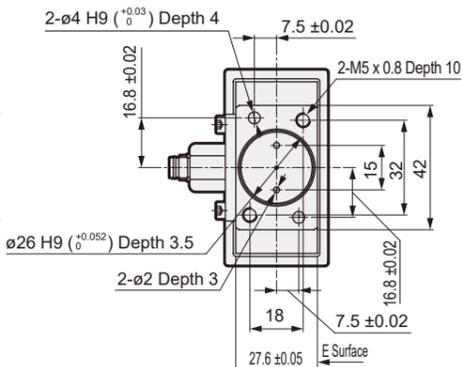
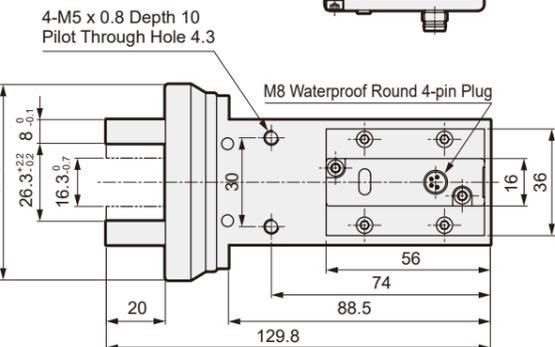
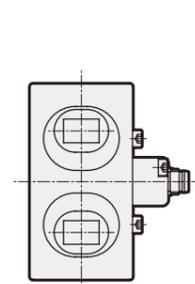
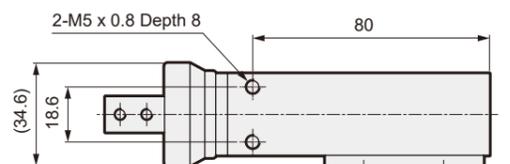


● LSHM-G20D1B/C  
LSHM-F20D1B/C

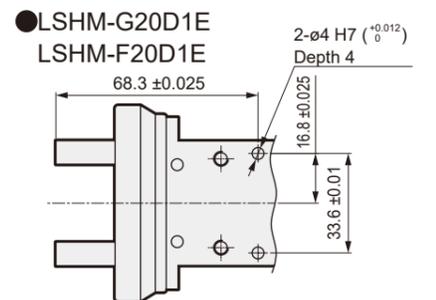


\*1: LSHM-□20D1B machine surface B, LSHM-□20D1C machine surface C grip center reference, high precision positioning hole. For reference position, refer to P. 71.

● LSHM-G20D1D  
LSHM-F20D1D



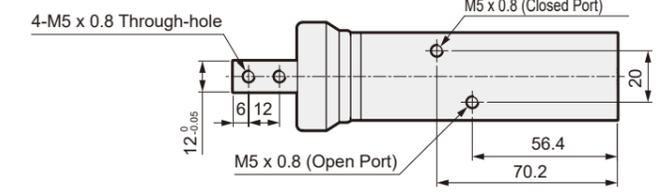
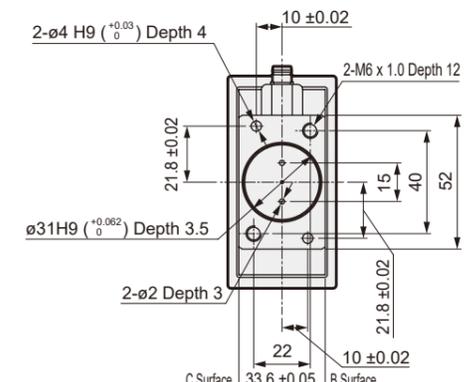
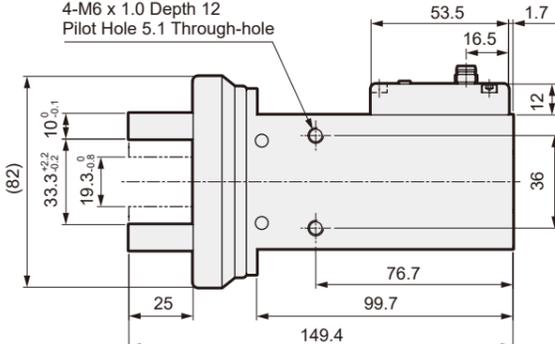
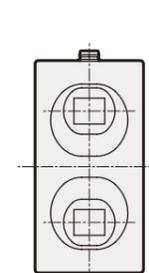
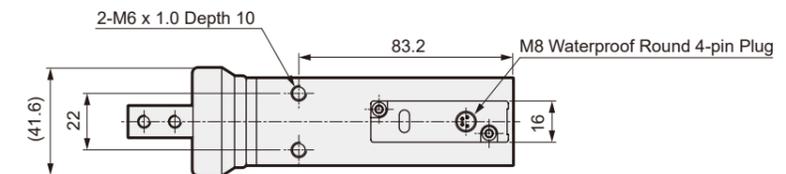
● LSHM-G20D1E  
LSHM-F20D1E



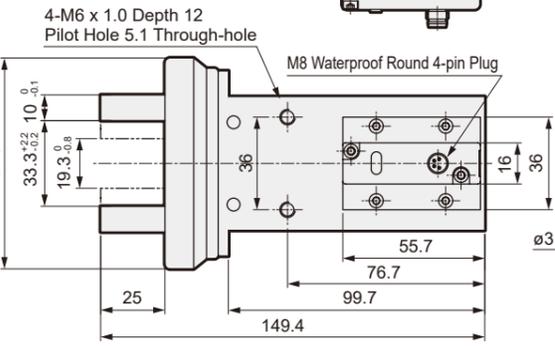
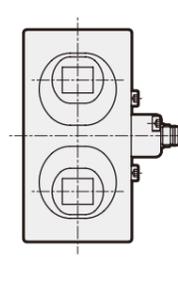
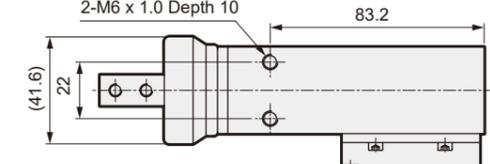
Outline Dimension Drawing

Outline Dimension Drawing (Bore size:  $\varnothing 25$ )

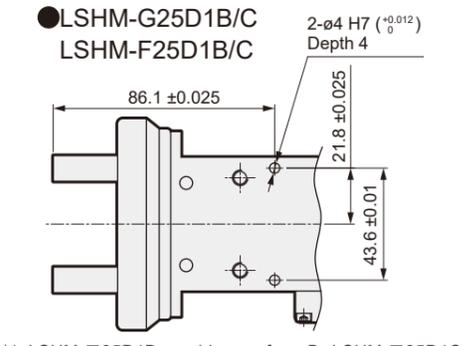
● LSHM-G25D1A  
LSHM-F25D1A



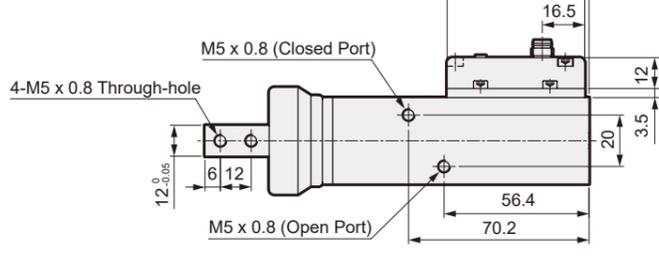
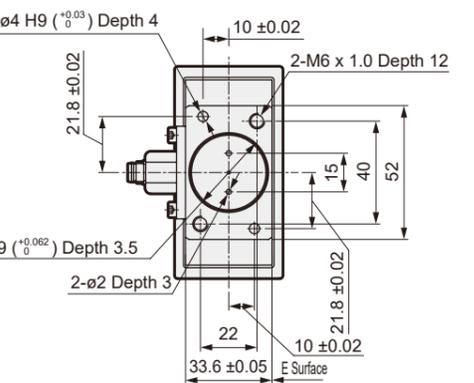
● LSHM-G25D1D  
LSHM-F25D1D



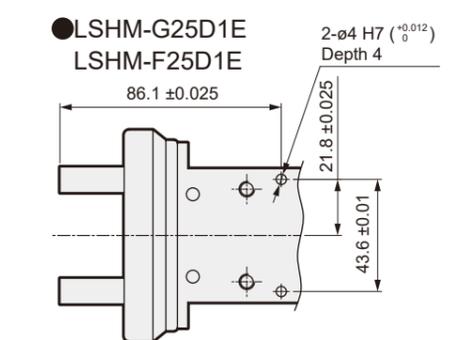
● LSHM-G25D1B/C  
LSHM-F25D1B/C



\*1: LSHM-□25D1B machine surface B, LSHM-□25D1C machine surface C grip center reference, high precision positioning hole. For reference position, refer to P. 71.



● LSHM-G25D1E  
LSHM-F25D1E



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

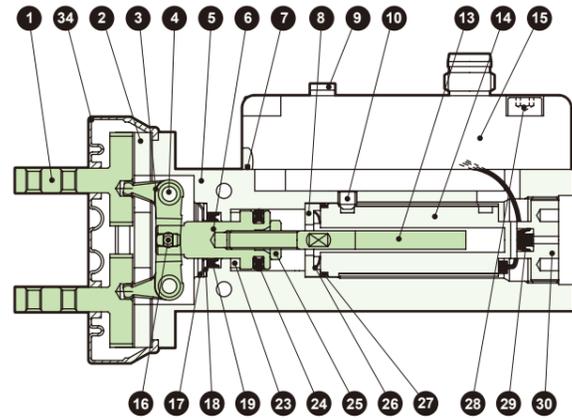
HJD

Cylinder Switch

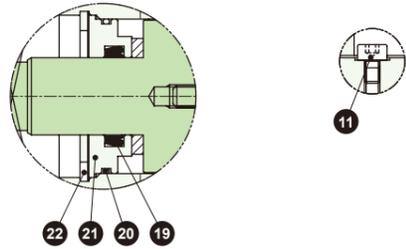
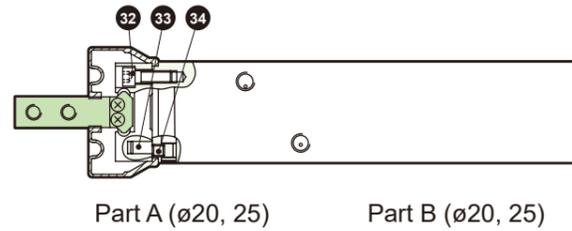
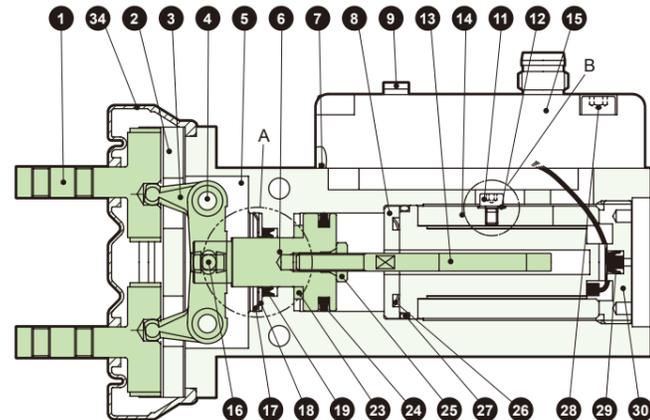
Ending

## Internal Structure Diagram/Material

● Amplifier Side Mounting (A, B, C)  
ø10



● Amplifier Side Mounting (A, B, C)  
ø16 to 25



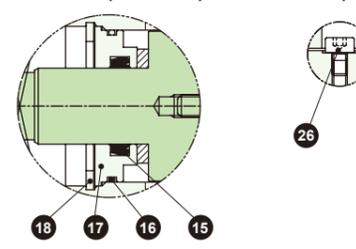
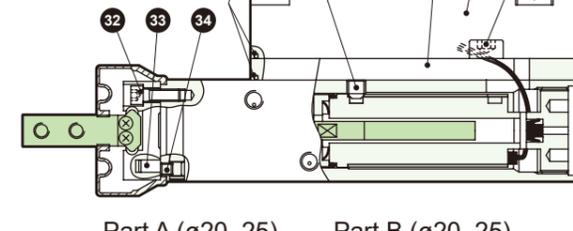
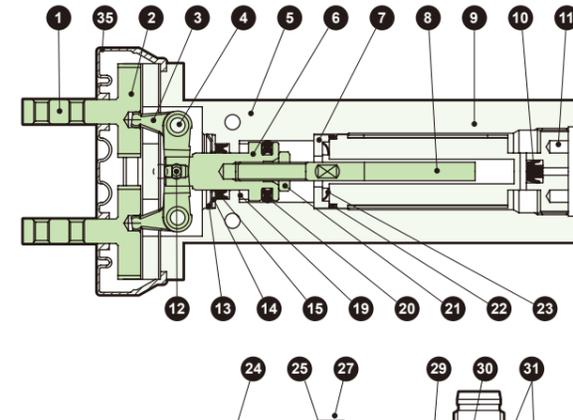
**Do not disassemble**

Part No.	Part Name	Material	Remarks	Part No.	Part Name	Material	Remarks
1	Finger	Stainless Steel		19	Rod Packing	Nitrile Rubber	
2	Linear Guide	Stainless Steel		20	O-ring	Nitrile rubber	
3	Lever	Stainless Steel		21	Rod Metal	Aluminum Alloy	
4	Pivot Shaft	Steel		22	C-type retaining ring	Steel	
5	Cylinder Body	Aluminum Alloy		23	Cushion Rubber	Urethane Rubber	
6	Piston Rod	Stainless Steel		24	Piston Packing	Nitrile Rubber	
7	Gasket	Nitrile Rubber		25	Nut	Stainless Steel	
8	Washer Retainer	Aluminum Alloy		26	Wave Washer	Stainless Steel	
9	Plug	Nitrile Rubber		27	O-ring	Nitrile Rubber	
10	Hexagon socket set screw	Stainless Steel		28	Hexagon Socket Head Cap Screw	Stainless Steel	
11	Hexagon Socket Head Cap Screw	Stainless Steel		29	Check Valve	Nitrile Rubber	
12	Plain Washer	Stainless Steel	ø16 only	30	Head Cover	Aluminum Alloy	
13	Core Shaft	Steel		31	Hexagon Socket Head Cap Screw	Stainless Steel	
14	Sensor Body			32	Pin	Steel	
15	Amplifier			33	Hexagon socket set screw	Stainless Steel	
16	Operating Shaft	Steel		34	Rubber Cover	LSHM-G: Chloroprene rubber LSHM-F: Fluoro Rubber	
17	Retaining ring	Stainless Steel	ø10, ø16 only				
18	Cap	Stainless Steel	ø10, ø16 only				

## Internal Structure Diagram/Material

## Internal Structure Diagram/Material

● Amplifier Front Mounting (D, E)  
ø10



**Do not disassemble**

Part No.	Part Name	Material	Remarks	Part No.	Part Name	Material	Remarks
1	Finger	Stainless Steel		19	Cushion Rubber	Urethane Rubber	
2	Linear Guide	Stainless Steel		20	Piston Packing	Nitrile Rubber	
3	Lever	Stainless Steel		21	Nut	Stainless Steel	
4	Pivot Shaft	Steel		22	O-ring	Nitrile Rubber	
5	Cylinder Body	Aluminum Alloy		23	Wave Washer	Stainless Steel	
6	Piston Rod	Stainless Steel		24	Gasket	Nitrile Rubber	
7	Washer Retainer	Aluminum Alloy		25	Hexagon socket set screw	Stainless Steel	
8	Core Shaft	Steel		26	Hexagon Socket Head Cap Screw	Stainless Steel	
9	Sensor Body			27	Plug	Nitrile Rubber	
10	Check Valve	Nitrile Rubber		28	Plain Washer	Stainless Steel	ø16 only
11	Head Cover	Aluminum Alloy		29	Amplifier Adapter	Aluminum Alloy	
12	Operating Shaft	Steel		30	Amplifier		
13	Retaining ring	Stainless Steel	ø10, ø16 only	31	Hexagon Socket Head Cap Screw	Stainless Steel	
14	Cap	Stainless Steel	ø10, ø16 only	32	Hexagon Socket Head Cap Screw	Stainless Steel	
15	Rod Packing	Nitrile Rubber		33	Pin	Steel	
16	O-ring	Nitrile Rubber		34	Hexagon socket set screw	Stainless Steel	
17	Rod Metal	Aluminum Alloy		35	Rubber Cover	LSHM-G: Chloroprene rubber LSHM-F: Fluoro Rubber	
18	C-type retaining ring	Steel					

Correction Adapter

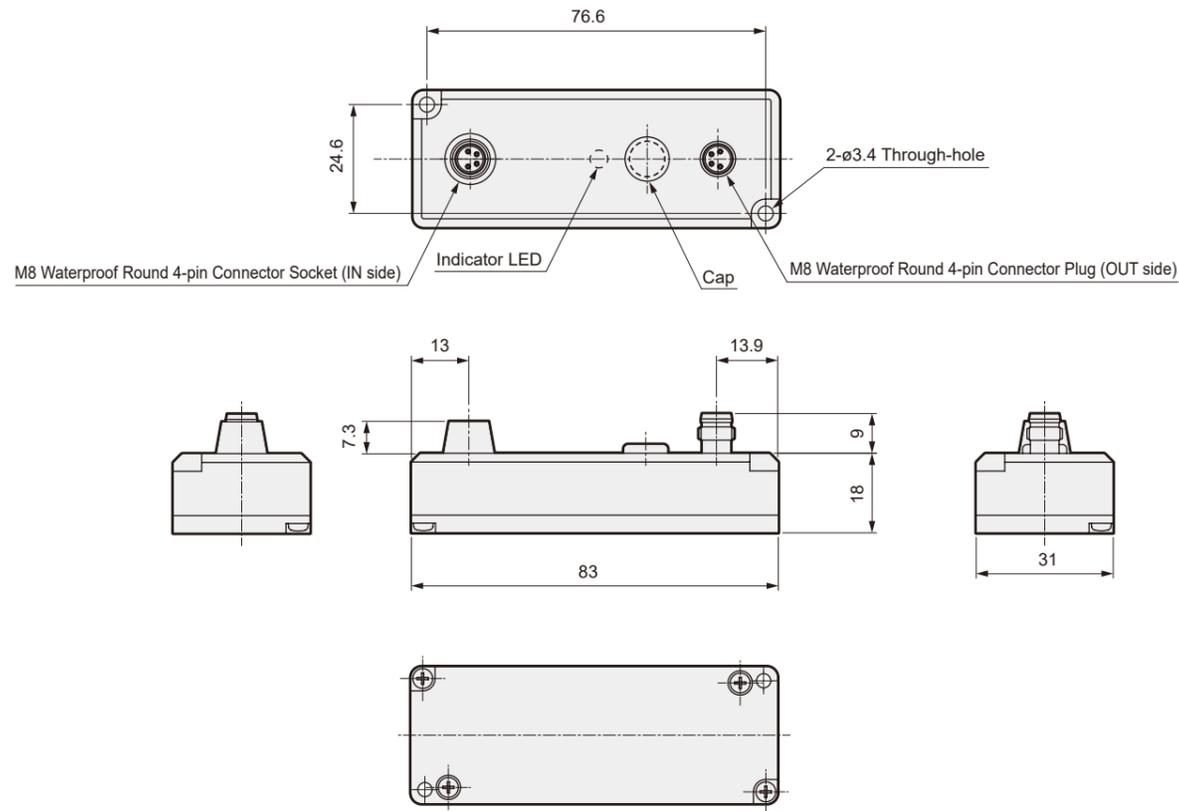
Corrects analog output linearity. Use for applications requiring high-precision linearity.

Specifications

Item	Contents
Power supply voltage	24 VDC ±10%
Current consumption	35 mA or less
Indicator LED	Red LED lights up when power is applied
Analog Input	1 to 5 V (LSHM Series output voltage)
Analog Output	1 to 5 V, connection load 50 kΩ or more
Analog Output Linearity	±0.5% F.S. or less (Ambient temperature 25°C, LSHM Series connection, according to our company's specified measurement method)
Repeatability of analog output	±0.02 mm or less (Ambient temperature 25°C, no deformation or wear of actuator/jig)
Input Connector	M8 Waterproof Round 4-pin Connector Socket
Output Connector	M8 Waterproof Round 4-pin Connector Plug
Shock resistance	294 m/s <sup>2</sup>
Protection structure	IEC Standard IP65
Ambient Temperature, Humidity	10 to 60°C, 85% RH or less
Mounting method	Direct Mounting
Weight	40 g

Note) Use LSHM and correction adapter in the combination as shipped.

Outline Dimension Drawing



Switch Output Adapter

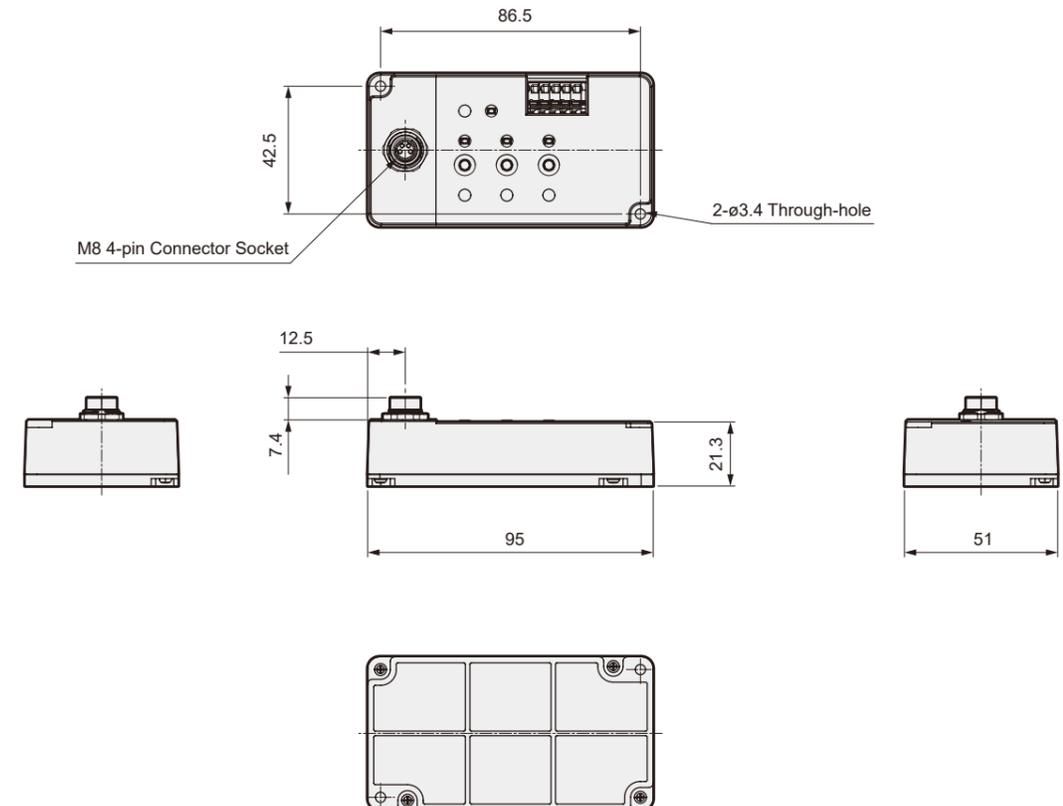
Specifications

Item	Switch Output Adapter (NPN) Option code: B	Switch Output Adapter (PNP) Option code: C
Power supply voltage	24 VDC ±10%	
Current consumption	35 mA or less	
Power Indicator LED	Green LED lights up when power is applied	
Switch indicator light	Red LED lights up when ON	
Number of Switch Outputs	3	
Switch Output (Per 1ch)	NPN: Open Collector Max. Power Supply Voltage: 24 VDC Max. Load Current: 50 mA Internal voltage drop: 1.2 V or less	PNP: Open Collector Max. Power Supply Voltage: 24 VDC Max. Load Current: 50 mA *1 Internal voltage drop: 1.5 V or less
Operating range	0.2 / 0.5 / 1.0 mm *2	
Analog Input	1 to 5 V (LSHM Series output voltage)	
Input Connector	M8 Connector 4-pin (Socket)	
Shock resistance	294 m/s <sup>2</sup>	
Protection structure	IEC Standard IP40	
Ambient Temperature, Humidity	10 to 60°C, 85% RH or less	
Mounting method	Direct Mounting	
Insulation resistance	20 MΩ or more with 500 VDC megger	
Dielectric strength	No abnormality when 1000 VAC is applied	
Vibration Resistance	10 Hz to 55 Hz, double amplitude 1.5 mm, X, Y, Z, 2 hours each direction	
Weight	65 g	

\*1: Ensure the total of all ch is 100 mA or less.

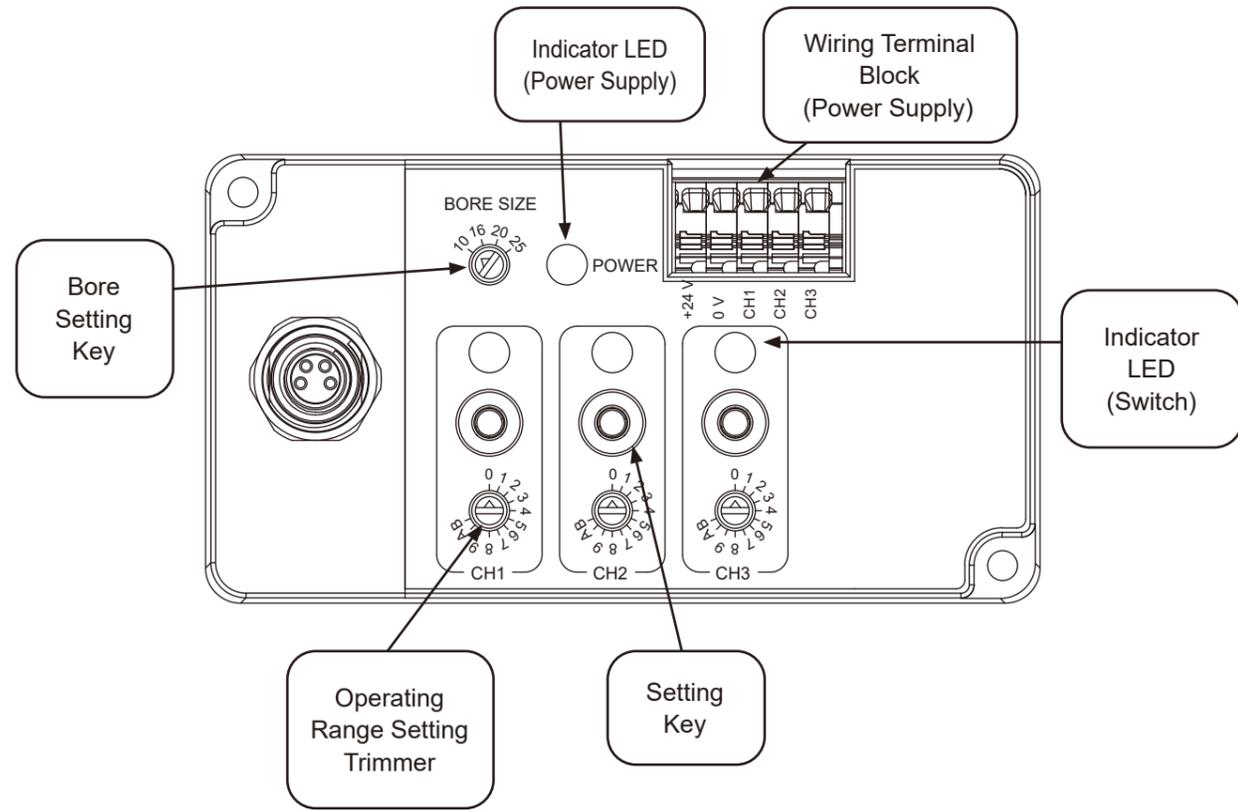
\*2: There is a hysteresis of 0.04 mm on one side.

Outline Dimension Drawing



Switch Output Adapter

Operating Part and Each Part



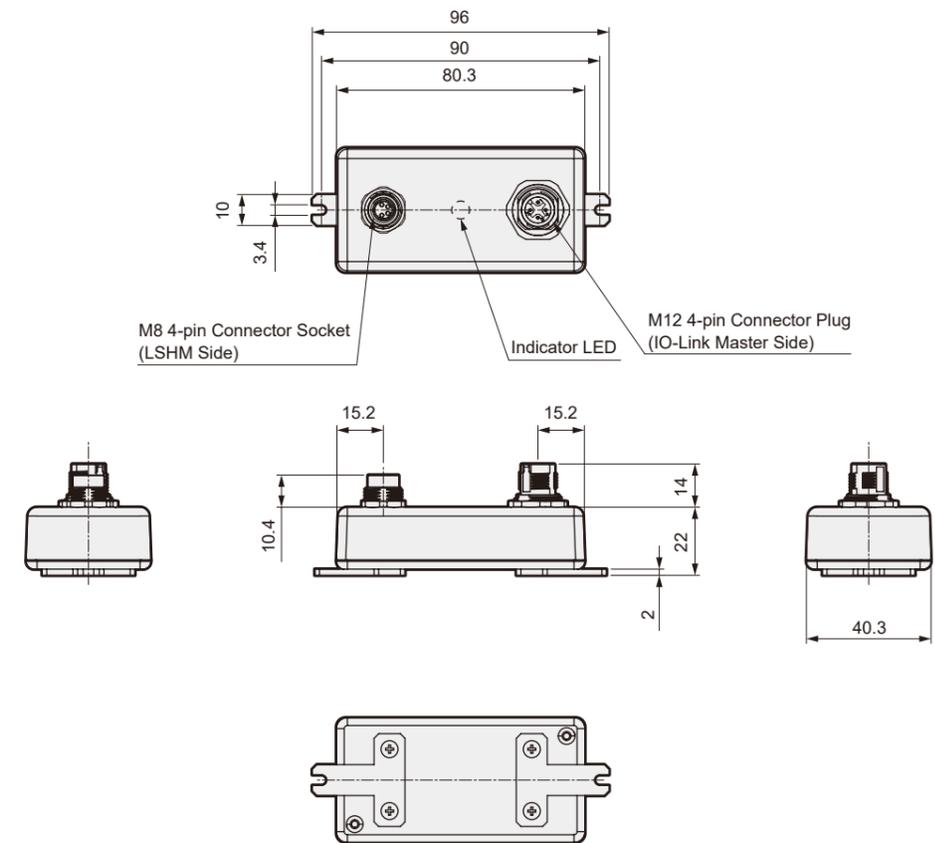
Adapter Option

IO-Link Adapter

Specifications

Item	Contents
Power supply voltage	24 VDC ±10%
Current consumption	35 mA or less
Indicator LED	Green LED lights up when power is applied
Analog Input	1 to 5 V (LSHM Series output voltage)
Input Connector	M8 Connector 4-pin (Socket)
Output Connector	M12 Connector 4-pin (Plug)
Non-linearity	±0.5% F.S. or less (Ambient temperature 25°C, LSHM Series connection, according to our company's specified measurement method)
Insulation resistance	20 MΩ or more with 500 VDC megger
Dielectric strength	No abnormality when 1000 VAC is applied
Shock resistance	294 m/s <sup>2</sup>
Protection structure	IEC Standard IP40
Ambient Temperature, Humidity	10 to 60°C, 85% RH or less
Mounting method	Direct Mounting
Vibration Resistance	10 Hz to 55 Hz, double amplitude 1.5 mm, X, Y, Z, 2 hours each direction
Weight	70 g

Outline Dimension Drawing



## IO-Link Communication Specifications

Item	Details
Communication Protocol	IO-Link
Communication Protocol Version	V1.1
Transmission speed	COM3 (230.4 kbps)
Port	Class A
Process Data Length (Input)	4 byte
Process Data Length (Output)	0 byte
Min. Cycle Time	1 ms
Data Storage	1 kbyte
SIO Mode Support	None

Bit	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16
	MSB															LSB
Data Name	Output Voltage															
Data Range	2 byte															
Format	UInteger16															

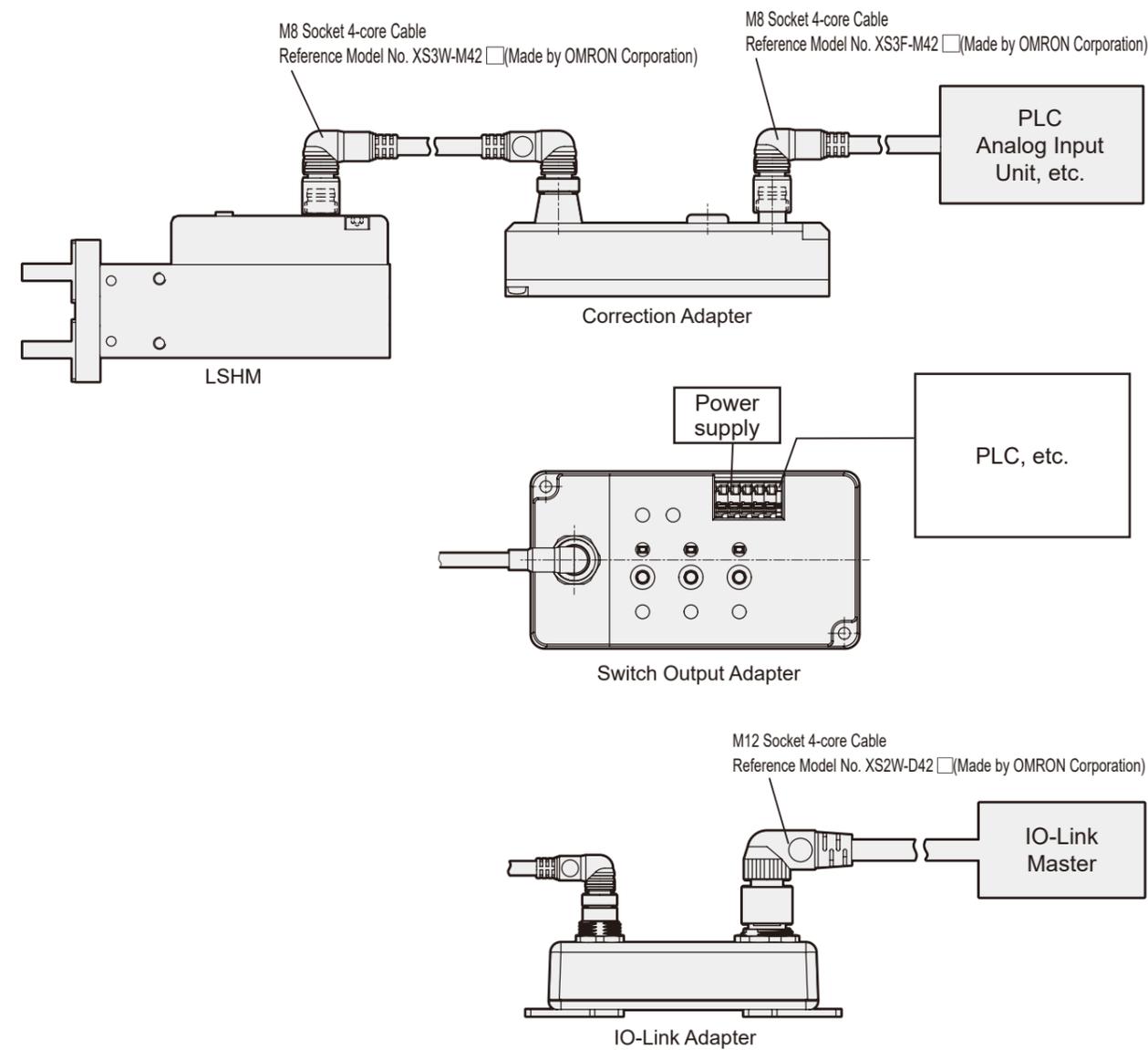
Bit	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Data Name	Error	Warning	-	-	Switch Output				Unused							
					4	3	2	1								
Data Range	True/False															
Format	Boolean															

Note) IODD file can be downloaded from our homepage.

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

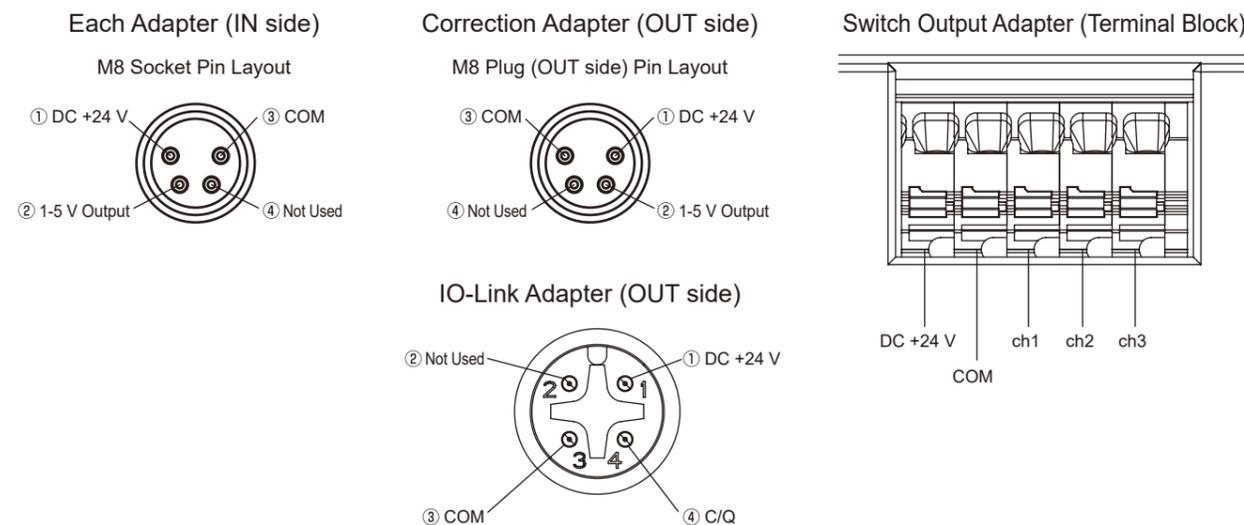
Each Adapter System Configuration / Plug Contact Arrangement Diagram

## Each Adapter System Configuration



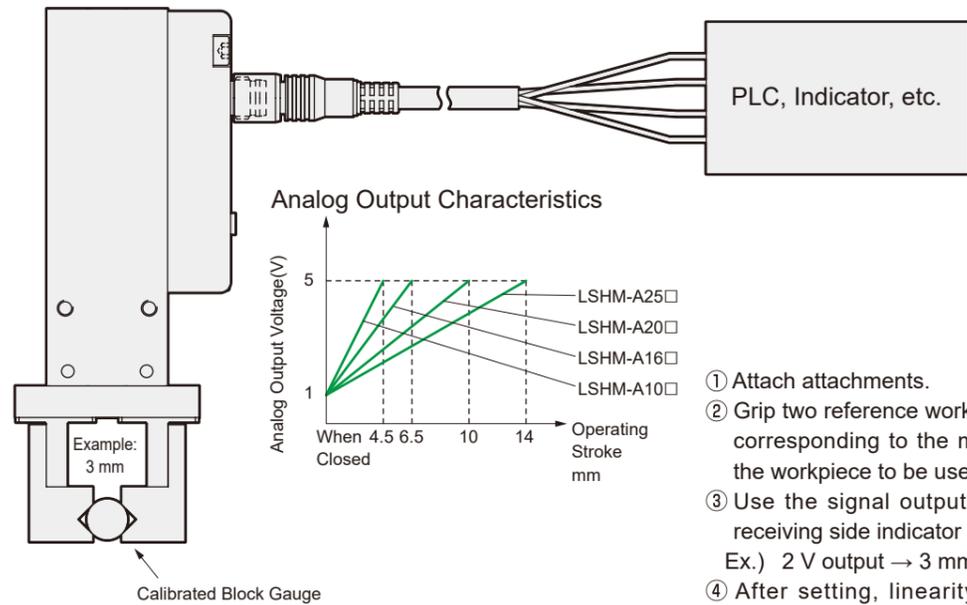
Hand (Gripper)  
LSH-HP  
LSH  
FH100  
BSA2  
BHA  
BHG  
BHE  
LHA  
LHAG  
HAP-1C  
HAP-2 to 4CS  
HKP  
HCP  
HGP  
LST-HP  
HLF2  
HLA/HLB  
HLAG/HLBG  
HLC  
HLD  
HMC-HP  
HMF  
HMF-G  
HMF-B  
HFP  
FH500  
HBL  
HJL  
HMD  
HDL  
HJD  
Cylinder Switch  
Ending

## Plug Contact Arrangement Diagram

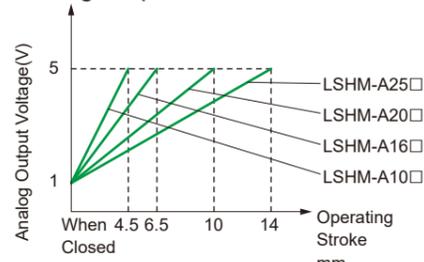


**Method for measuring workpiece using the entire operating stroke**

Ex.) Judgment of workpiece type in multi-product production equipment, etc.



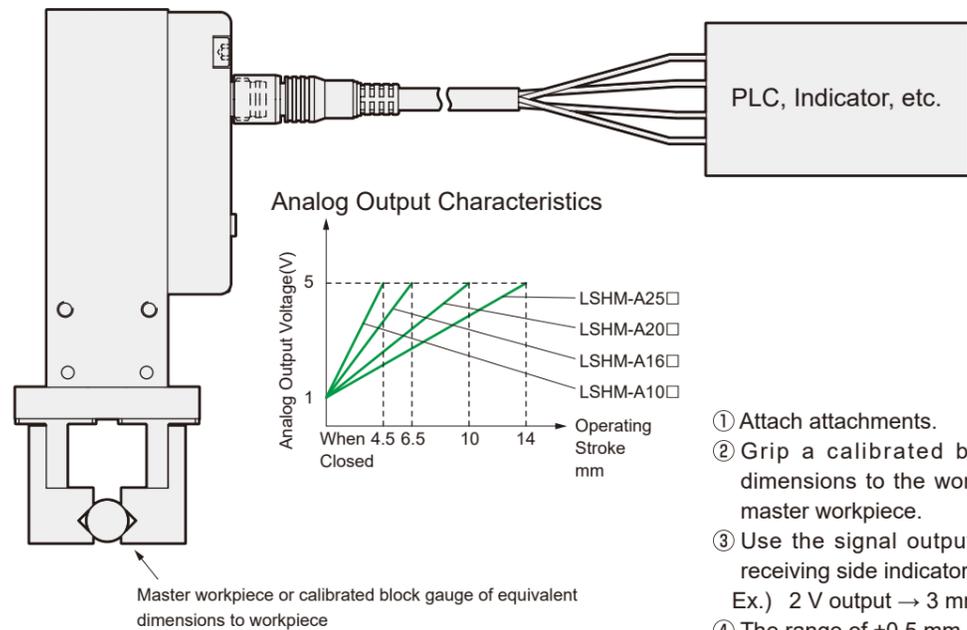
Analog Output Characteristics



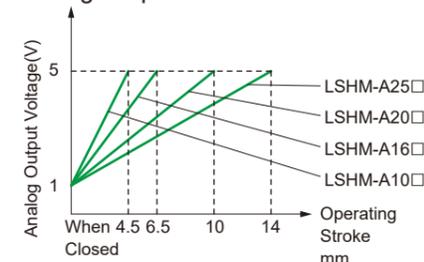
- 1 Attach attachments.
- 2 Grip two reference workpieces such as block gauges corresponding to the min. and max. dimensions of the workpiece to be used.
- 3 Use the signal output from the sensor to set the receiving side indicator or PLC.  
Ex.) 2 V output → 3 mm, 4 V output → 8 mm
- 4 After setting, linearity ±3% F.S. over the entire stroke (With correction adapter option: ±0.5% F.S.) length measurement possible

**Method for measuring with even higher precision by limiting the measurement range**

Ex.) Confirmation that workpiece dimensions are within tolerance range, confirmation of wear or deformation of attachments or jigs, etc.



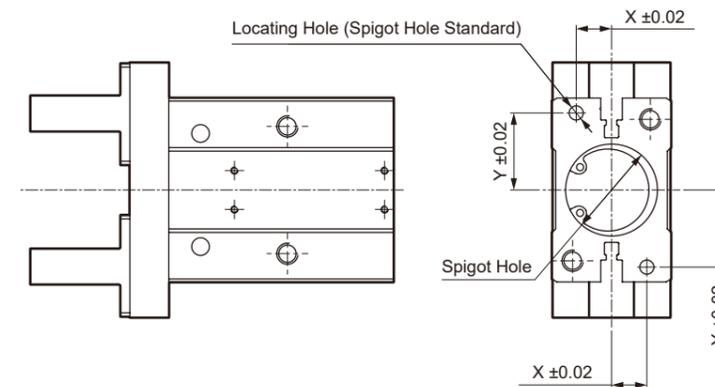
Analog Output Characteristics



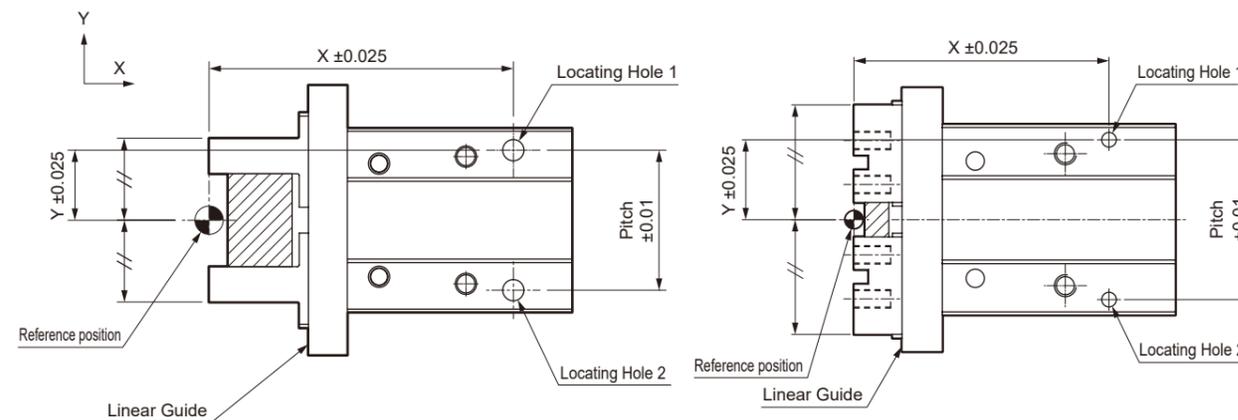
- 1 Attach attachments.
- 2 Grip a calibrated block gauge of equivalent dimensions to the workpiece to be measured, or a master workpiece.
- 3 Use the signal output from the sensor to set the receiving side indicator or PLC.  
Ex.) 2 V output → 3 mm
- 4 The range of ±0.5 mm centered on the set dimension can be measured with linearity ±0.5% F.S. (reference value without correction adapter).

Reference for Locating Hole Position

● Locating hole on main body end face



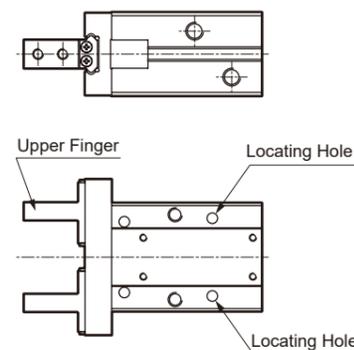
● Gripping center reference, high-precision positioning hole  
Positioning can be done with gripping center standard



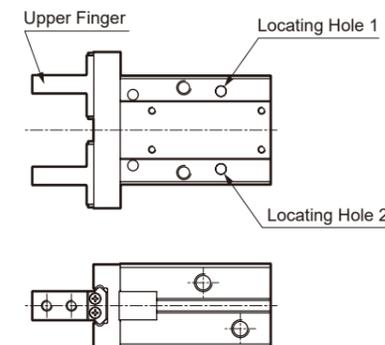
Reference Position of Locating Hole

Gripping the workpiece at mid-stroke, with the finger facing left and the linear guide's linear motion direction as the Y-axis,  
X-axis Direction Standard: Upper finger tip  
Y-axis Direction Standard: Center of finger outer surface

Ex.) Standard finger left-facing, piping top surface  
LSH□-□□□□R



Ex.) Standard finger left-facing, piping bottom surface  
LSH□-□□□□L



**STEP-1 Select appropriate model from required gripping force**

① Calculation of Required Gripping Force

To transport a workpiece (weight WL), a gripping force FW that satisfies the following formula is required.

$$F_w > \frac{W_L \times g \times K}{n}$$

- F<sub>w</sub> : Required Gripping Force [N]
- n : Number of Fingers = 2
- W<sub>L</sub> : Workpiece Weight [kg]
- g : Gravitational acceleration = 9.8 [m/s<sup>2</sup>]
- K : Conveyance Factor
- 5 [Holding only]
- 10 [Normal transport]
- 20 [Rapid acceleration transport]

About Conveyance Factor K

Calculation Example) When decelerating from a conveyance speed V = 0.75 m/s to stop in 0.1 seconds, with a friction coefficient μ of 0.1 between the workpiece and finger, it is as follows.

Determine the transport coefficient K from the force applied to the workpiece

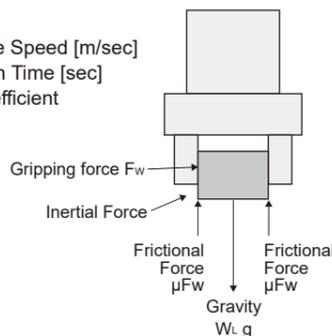
- Inertial force = W<sub>L</sub> (V/t)
- Gravity = W<sub>L</sub>g

$$\text{Required gripping force } F_w > \frac{W_L(V/t) + W_Lg}{n\mu} = \frac{W_L(V/t+g)}{n\mu} = \frac{17.3 W_L}{2 \times 0.1} = 86.5 W_L$$

$$\therefore \text{The transport coefficient K at this time is, from the above formula } \frac{V/t + g}{\mu g} = \frac{0.75/0.1 + 9.8}{0.1 \times 9.8} \approx 20$$

Note) The transport coefficient K needs to allow a margin for impacts during transport, etc. Even if the friction coefficient μ is higher than μ=0.1, set the conveyance factor K to 10 to 20 or more for safety.

- V : Conveyance Speed [m/sec]
- t : Deceleration Time [sec]
- μ : Friction Coefficient

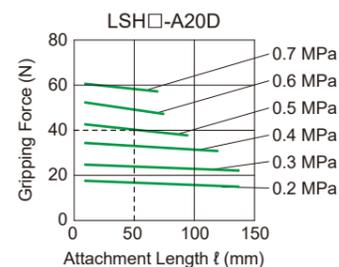


② Model selection from required gripping force

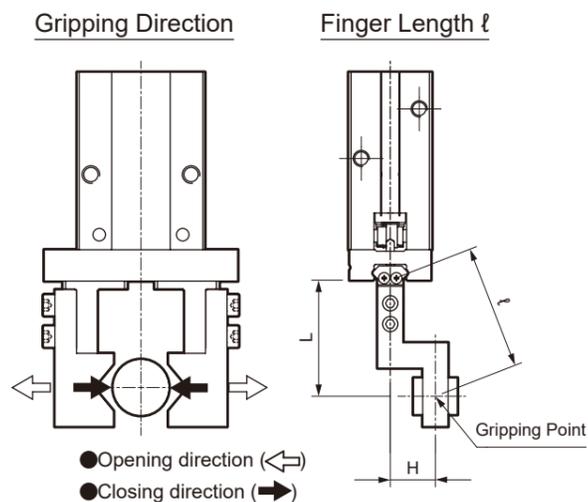
Gripping force changes depending on "gripping direction," "attachment length," and "supply pressure." Confirm from the gripping force graph that sufficient gripping force can be obtained under your operating conditions.

Gripping force graph page	
LSH□-A□□□D	74
LSH□-A□□S/C	75
LSH□-G/F□□□D	76
LSH□-G/F□□□S/C	77

How to Read Gripping Force Graph (For LSH-A20D Close Direction)



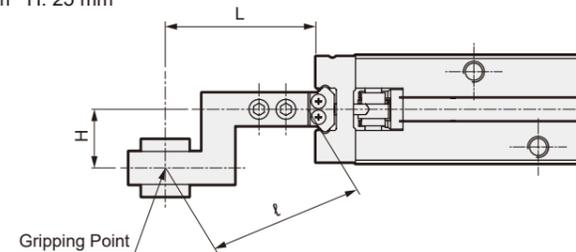
For example, if the supply pressure is 0.5 MPa and the attachment length is 50 mm, the obtainable gripping force will be 40 N.



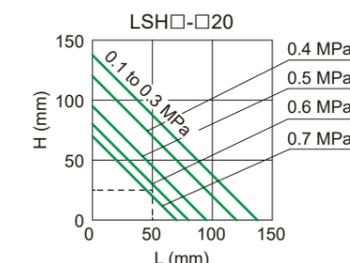
**STEP-2 Confirmation of Attachment Shape**

Use fingers within the range on P. 78.

Ex) L: 50 mm H: 25 mm



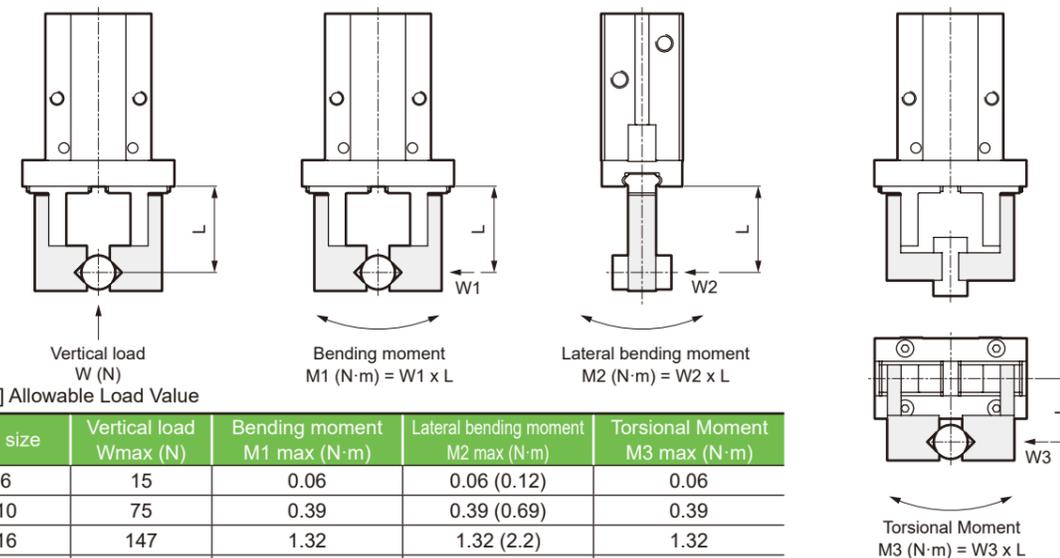
When LSH-A20D is selected, L: 50 mm, H: The intersection of 25 mm is located inside the supply pressure line of 0.5 MPa, so it can be used.



- Use fingers that are as lightweight and short as possible. If they are long and heavy, the inertial force during opening and closing becomes large, which may cause backlash in the fingers or accelerate wear of the finger sliding parts, adversely affecting the service life.
- Even if the finger shape is within the performance data, making it as small as possible will allow the product to be used for a long time. Also, if ℓ is long, there is a risk of gripping errors, dropping during transport, etc., due to unexpected vibrations. As a guideline, use "Cylinder bore x 1.3 / Operating pressure". If ℓ is longer than that, set a higher transport coefficient in STEP-1 (Guideline: Transport coefficient of 20 or more).
- The weight of the fingers affects the service life, so please keep it below the following.  
W < 1/4H (1 piece) W: Weight of finger H: Gripper Product Weight

**STEP-3 Confirmation of external force applied to fingers**

When external force is applied to the fingers, such as when transporting or inserting a workpiece, use within the range shown in [Table 1]. \*When using for transport, consider the impact at the end of the stroke.



[Table 1] Allowable Load Value

Bore size	Vertical load Wmax (N)	Bending moment M1 max (N·m)	Lateral bending moment M2 max (N·m)	Torsional Moment M3 max (N·m)
ø6	15	0.06	0.06 (0.12)	0.06
ø10	75	0.39	0.39 (0.69)	0.39
ø16	147	1.32	1.32 (2.2)	1.32
ø20	265	2.1	2.1 (4.0)	2.1
ø25	343	3.0	3.0 (6.0)	3.0
ø32	490	4.5	4.5 (9.0)	4.5

When multiple external forces are applied, the sum of the external forces (formula below) must be less than 1.

$$WT = W/W_{max} + M1/M1_{max} + M2/M2_{max} + M3/M3_{max} < 1$$

The lateral bending moment can be used even if it is below the value in ( ), but in that case, use L and H dimensions that are 2/3 or less of the length specified on P. 74.

Calculation Example ①: When conveying workpieces  
Model No.: LSH-A20D, attachment (weight m<sub>k</sub>): When a workpiece (weight: m=0.8 kg, center of gravity: L<sub>k</sub>=60 mm) is gripped and transported at 0.06 kg with center of gravity: L<sub>k</sub> = 30 mm  
(g: Gravity acceleration 9.8 m/s<sup>2</sup>, α: Assuming an impact factor of 3 at the end of the stroke)

$$M_1 = \alpha \times W_1 \times L = \alpha \times (m_k \times g \times L_k \times 2 + m \times g \times L) = 3 \times (0.06 \times 9.8 \times 30 \times 10^{-3} \times 2 + 0.8 \times 9.8 \times 60 \times 10^{-3}) \approx 1.5 \text{ N}\cdot\text{m}, \text{ which is } M1_{max} = 2.1 \text{ N}\cdot\text{m} \text{ or less, so it can be used.}$$

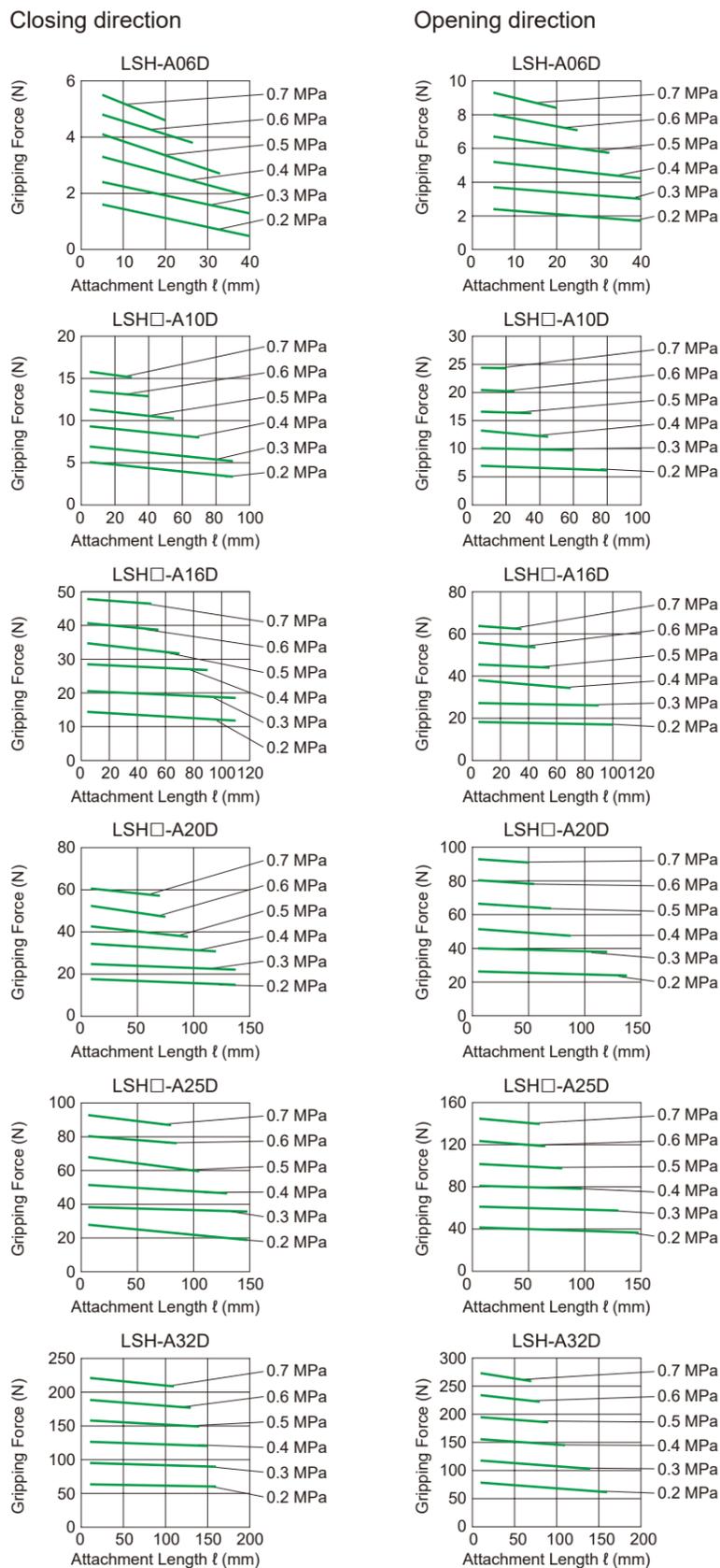
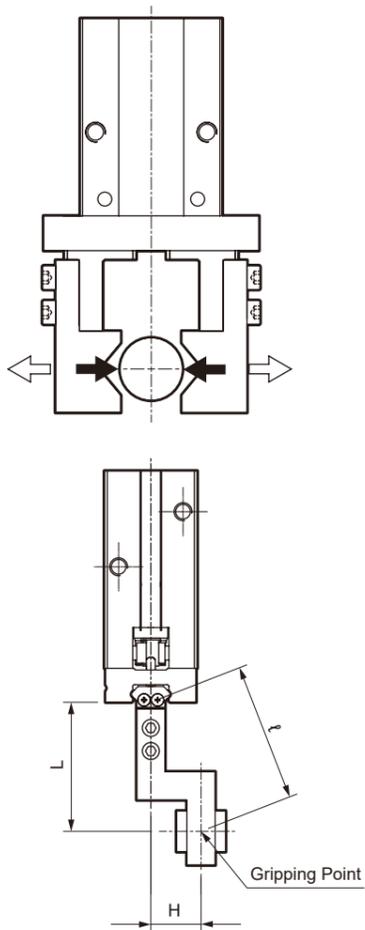
Calculation Example ②: When inserting a workpiece  
Model No.: When load W<sub>1</sub>:40 N is applied to LSH-A20D, L=40 mm

$$M_1 = W_1 \times L = 40 \times 40 \times 10^{-3} = 1.6 \text{ N}\cdot\text{m}, \text{ which is } M1_{max} = 2.1 \text{ N}\cdot\text{m} \text{ or less, so it can be used.}$$

## Gripping Force Performance Data LSH-A□□D, LSHL-A□□D, LSHM-A□□D (Double Acting)

- Gripping force represents the thrust (for one finger) in the direction of the arrow shown in the figure.
- Indicates the gripping force acting in the opening and closing directions at the attachment length  $\ell$  when the supply pressure is up to 0.7 MPa.

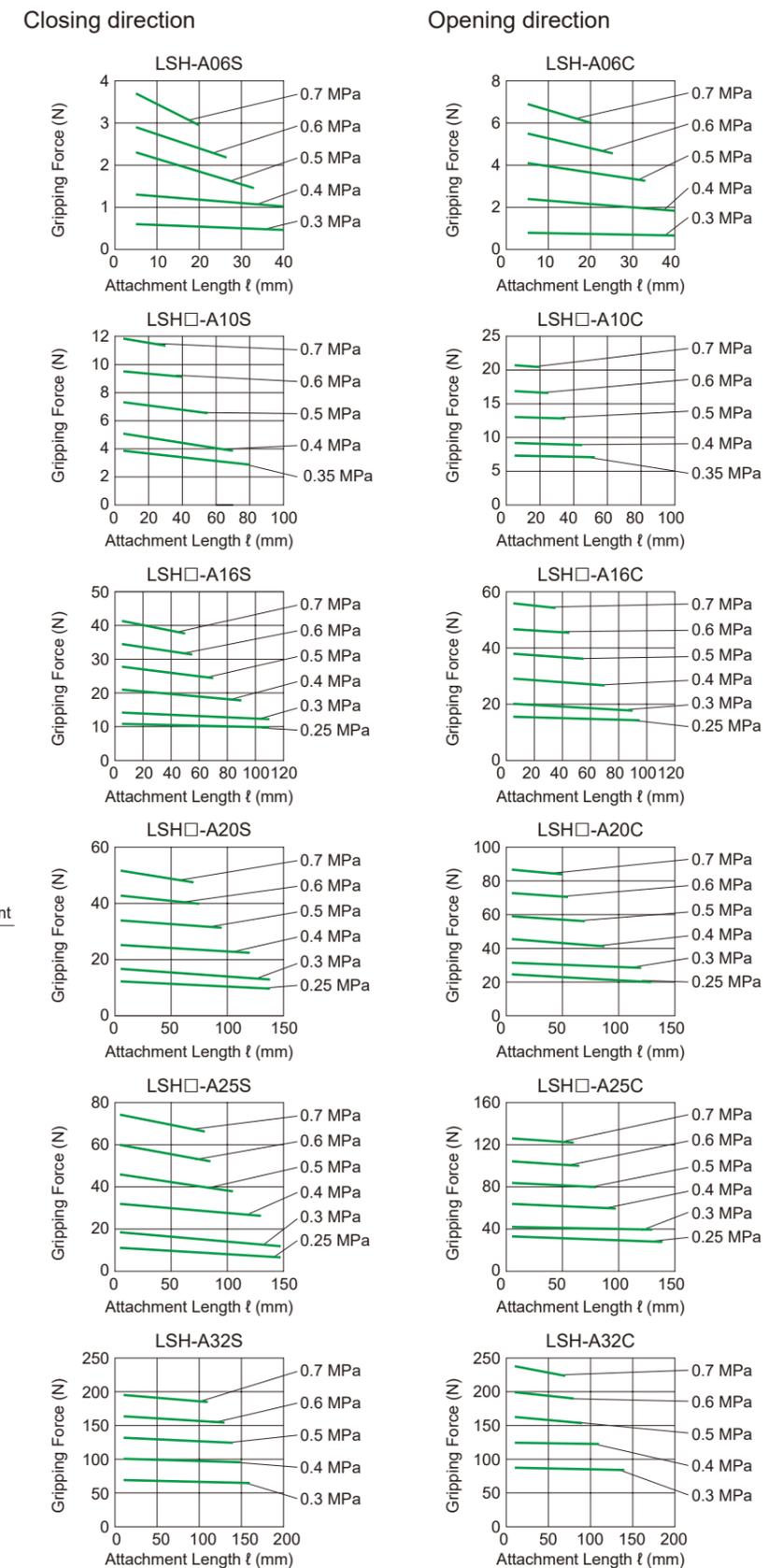
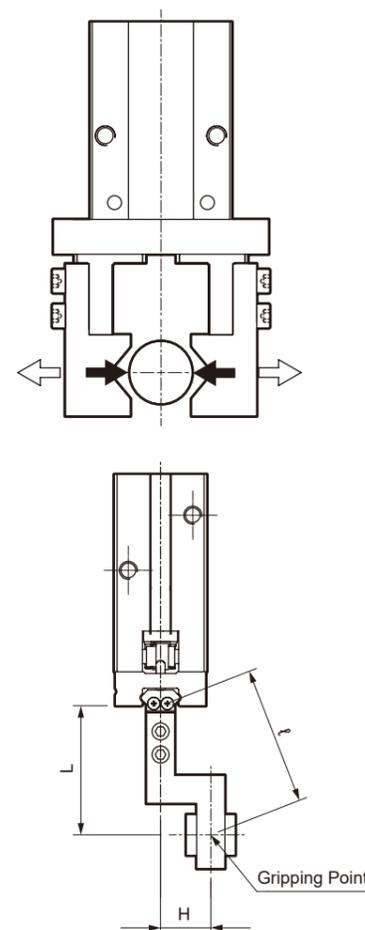
- Opening direction (←)
- Closing direction (→)



## Gripping Force Performance Data LSH-A□□S/C (Single Acting)

- Gripping force represents the thrust (for one finger) in the direction of the arrow shown in the figure.
- Indicates the gripping force acting in the opening and closing directions at the attachment length  $\ell$  when the supply pressure is up to 0.7 MPa.

- Opening direction (←)
- Closing direction (→)



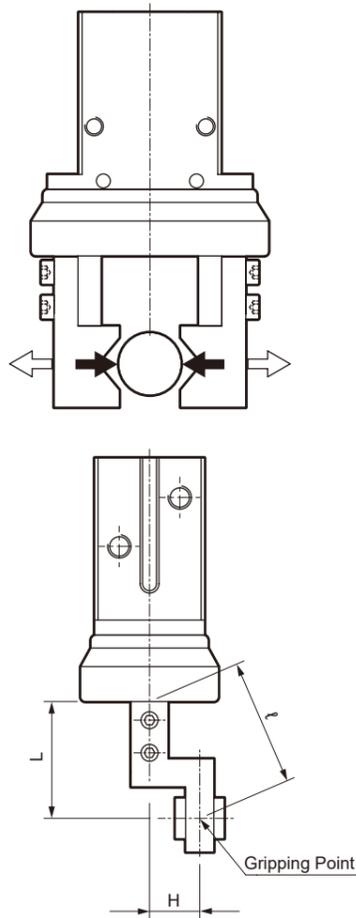
Hand (Gripper)
LSH-HP
LSH
FH100
BSA2
BHA
BHG
BHE
LHA
LHAG
HAP-1C
HAP-2 to 4CS
HKP
HCP
HGP
LST-HP
HLF2
HLA/HLB
HLAG/HLBG
HLC
HLD
HMC-HP
HMF
HMF-G
HMF-B
HFP
FH500
HBL
HJL
HMD
HDL
HJD
Cylinder Switch
Ending

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
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FH500
HBL
HJL
HMD
HDL
HJD
Cylinder Switch
Ending

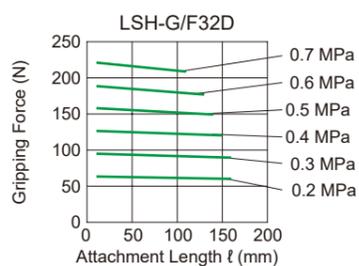
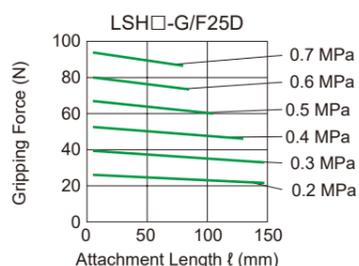
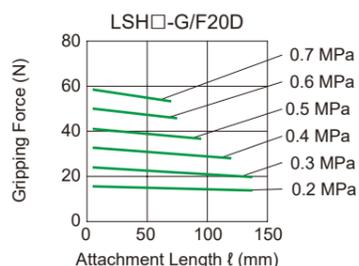
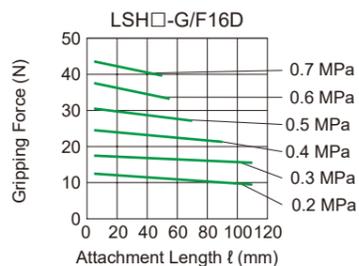
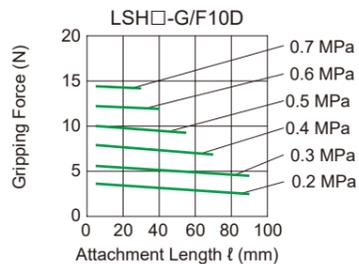
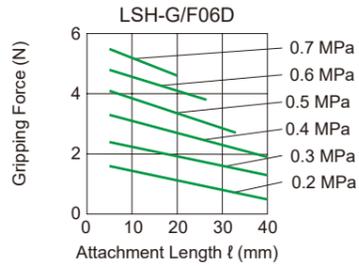
## Gripping Force Performance Data LSH-G/F□□D, LSHL-G/F□□D, LSHM-G/F□□D (Double Acting)

- Gripping force represents the thrust (for one finger) in the direction of the arrow shown in the figure.
- Indicates the gripping force acting in the opening and closing directions at the attachment length  $l$  when the supply pressure is up to 0.7 MPa.

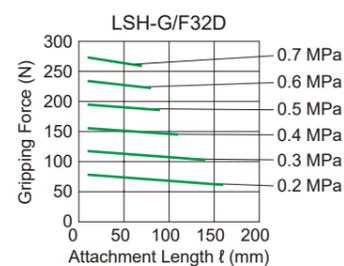
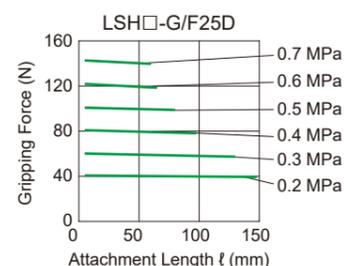
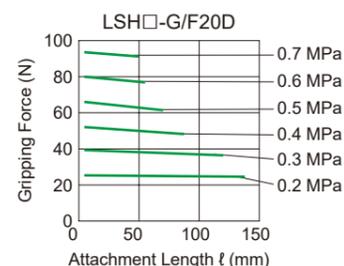
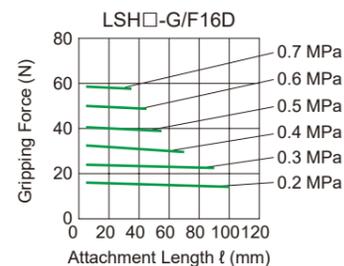
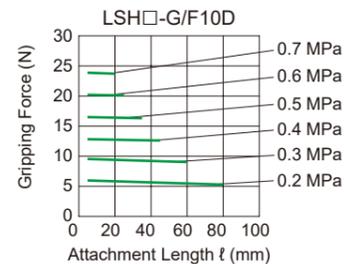
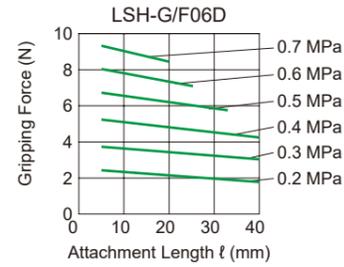
- Opening direction (←)
- Closing direction (→)



Closing direction



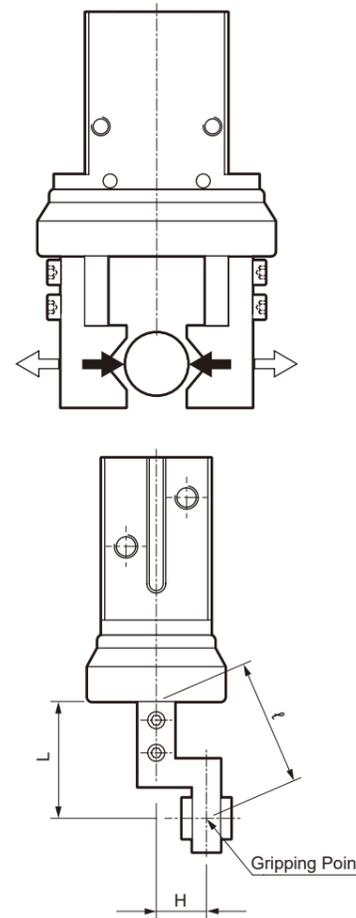
Opening direction



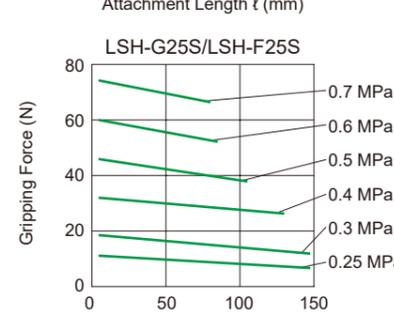
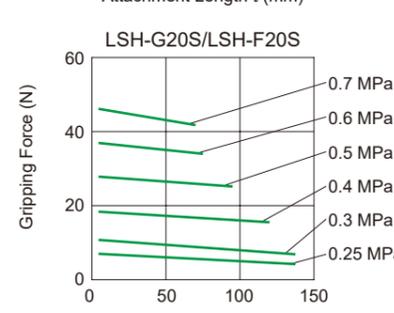
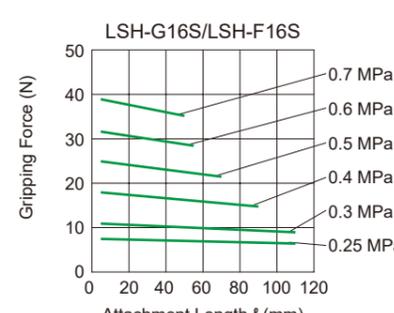
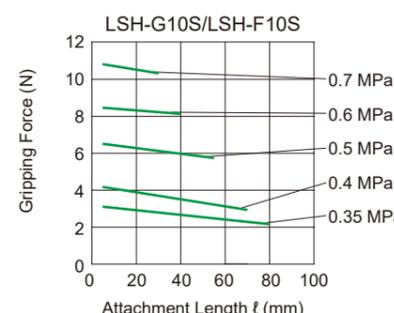
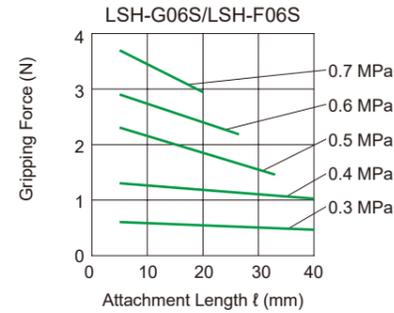
## Gripping Force Performance Data LSH-G/F□□S/C (Single Acting)

- Gripping force represents the thrust (for one finger) in the direction of the arrow shown in the figure.
- Indicates the gripping force acting in the opening and closing directions at the attachment length  $l$  when the supply pressure is up to 0.7 MPa.

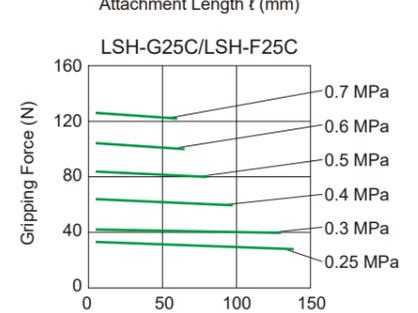
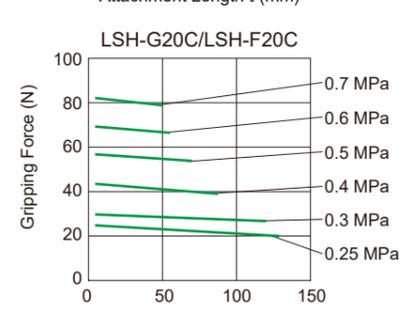
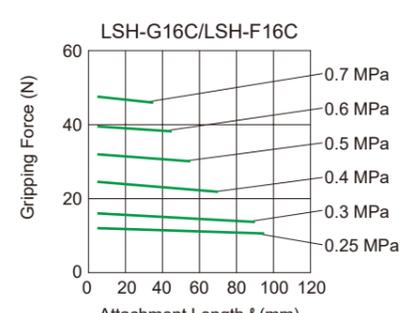
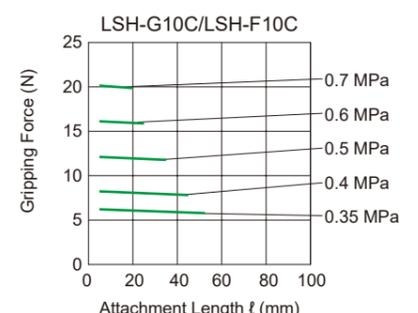
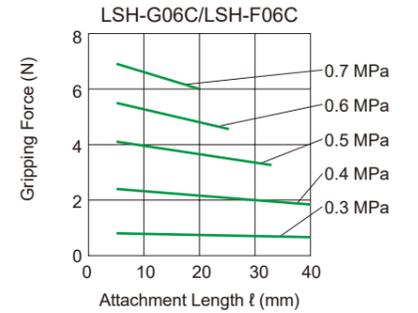
- Opening direction (←)
- Closing direction (→)



Closing direction



Opening direction



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

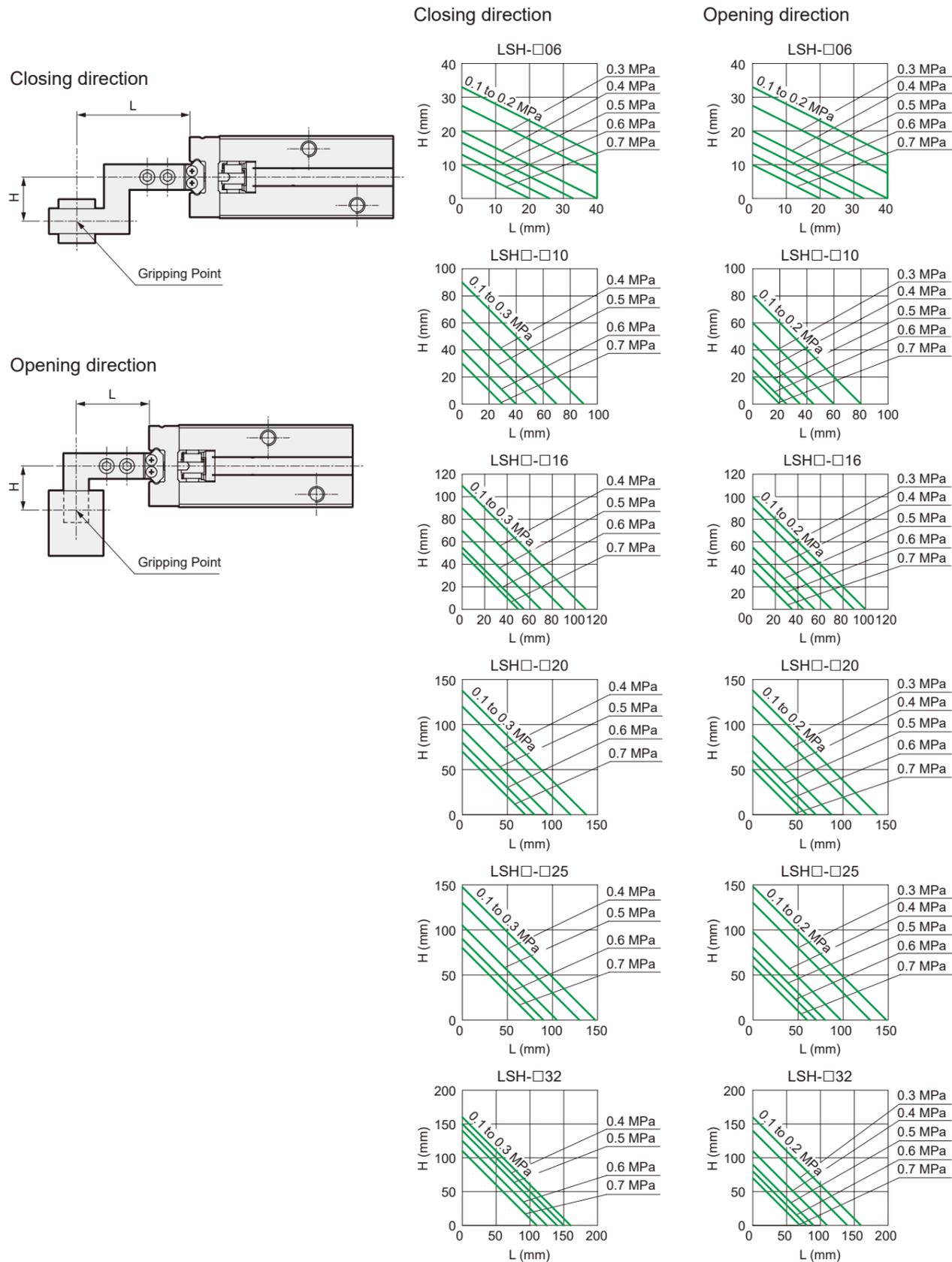
Cylinder Switch

Ending

## Finger length

When installing L-shaped fingers, use them within the range shown in the figure on the right.

MEMO



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

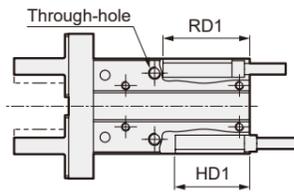
Ending

Cylinder Switch Precautions

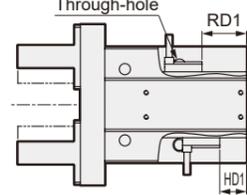
● Switch Mounting Position List

[Side Mounting]

ø6 to 20, 32

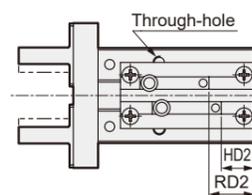


ø25



[Rail Plate Mounting]

ø6 to 32



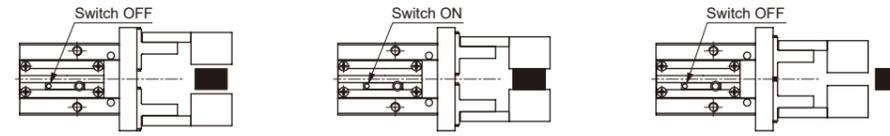
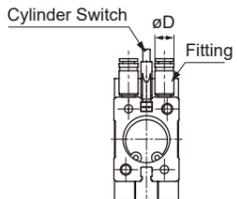
Model No.	Switch Model No.	Side surface mounting		Rail Plate Mounting	
		RD1	HD1	RD2	HD2
LSH-A06□	F2/3□	20.5	18	-	-
	F2/3S	-	-	9.5 (-)	7 (-)
LSH-A10□	F2/3□	21	18	11 (21)	8 (18)
	F2/3S	22	19	10 (22)	7 (19)
LSH-A16□	F2/3□	21	17	11 (21)	7 (17)
	F2/3S	22	18	10 (22)	6 (18)
LSH-A20□	F2/3□	26	20	16 (26)	10 (20)
	F2/3S	27	21	15 (27)	9 (21)
LSH-A25□	F2/3H, PH	-	-	20 (30)	12 (22)
	F2/3 V, PV	20	12	20 (30)	12 (22)
LSH-A32D	F2/3S	19	11	19 (31)	11 (23)
	F2/3□	32.5	20.5	22.5 (32.5)	10.5 (20.5)
LSH-A32S/C	F2/3S	33.5	21.5	21.5 (33.5)	9.5 (21.5)
	T2/3□	-	-	18.5 (36.5)	6.5 (24.5)
LSH-A32S/C	F2/3□	41	29	31 (41)	19 (29)
	F2/3S	42	30	30 (42)	18 (30)
LSH-A32S/C	T2/3□	-	-	27 (45)	15 (33)

Note1) When the lead wire is facing the head side in rail assembly, the dimensions will be as shown in ( ).

Note2) "-" indicates that mounting is not possible.

● Precautions

Please check the precautions for the bore size you will be using from the table below.

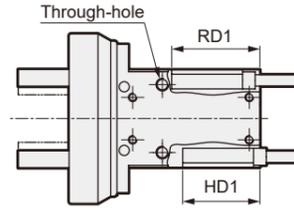
Category	Bore size						Precautions												
	ø6	ø10	ø16	ø20	ø25	ø32													
Common Items	●	●	●	●	●	●	• The RD dimension is the highest sensitivity position at the open end position, and the HD dimension is the highest sensitivity position at the closed end position. Please adjust the actual mounting position after confirming the operating status of the switch.												
	●	●	●	●	●	●	• Only one switch can be mounted in one switch rail groove.												
	●	●	●	●	●	●	• Due to the short opening/closing stroke, only the open or closed state can be detected for each switch. Example: With one switch, the detection shown in the figure below is not possible. ① Open end (workpiece not gripped): Switch OFF    ② Workpiece gripped: Switch ON    ③ Open end (workpiece not gripped): Switch ON												
Side surface mounting	●	●	●	●	●	●	• Be careful not to get the lead wire caught when opening and closing the fingers. 												
	●	●	●	●	●	●	• When using an L-type switch for port side mounting, the fitting and switch may interfere. Keep the fitting outer diameter below the values in the table below. Mounting Position: Port side Switch shape: L-shaped type <table border="1" data-bbox="534 1680 905 1858"> <thead> <tr> <th>Bore size (Mounting position)</th> <th>Fitting outer diameter øD</th> </tr> </thead> <tbody> <tr> <td>ø6 (RD)</td> <td>ø5 or less</td> </tr> <tr> <td>ø6 (HD)</td> <td>ø6.9 or less</td> </tr> <tr> <td>ø10</td> <td>ø7.4 or less</td> </tr> <tr> <td>ø16</td> <td>ø7.9 or less</td> </tr> <tr> <td>ø20</td> <td>ø11 or less</td> </tr> </tbody> </table> 	Bore size (Mounting position)	Fitting outer diameter øD	ø6 (RD)	ø5 or less	ø6 (HD)	ø6.9 or less	ø10	ø7.4 or less	ø16	ø7.9 or less	ø20	ø11 or less
	Bore size (Mounting position)	Fitting outer diameter øD																	
ø6 (RD)	ø5 or less																		
ø6 (HD)	ø6.9 or less																		
ø10	ø7.4 or less																		
ø16	ø7.9 or less																		
ø20	ø11 or less																		
●	●	●	●	●	●	• For straight lead wire type and F3PV switches, the switch and lead wire will protrude from the head side end face. If protrusion is a problem, use F2/3 V, F2/3S, or rail plate mounting.													
Rail Mounting	●	●	●	●	●	●	• Through-hole mounting is not possible when mounting the switch on the side.												
Rail Mounting	-	●	-	-	-	-	• Through-hole mounting is not possible when mounting the switch rail plate.												

Cylinder Switch Precautions

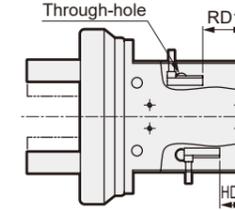
● Switch Mounting Position List

[Side Mounting]

ø6 to 20, 32

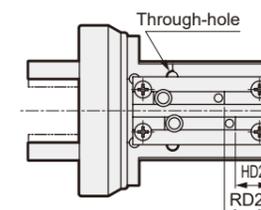


ø25



[Rail Plate Mounting]

ø6 to 32



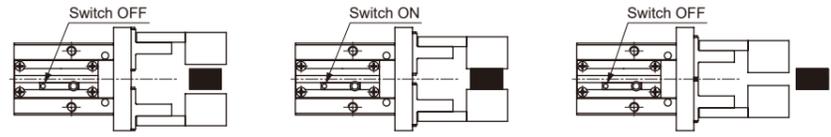
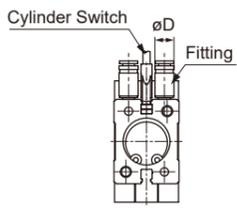
Model No.	Switch Model No.	Side surface mounting		Rail Plate Mounting	
		RD1	HD1	RD2	HD2
LSH-G/F06	F2/3□	20.5	18	-	-
	F2/3S	-	-	9.5 (-)	7 (-)
LSH-G/F10	F2/3□	21	18	11 (21)	8 (18)
	F2/3S	22	19	10 (22)	7 (19)
LSH-G/F16	F2/3□	21	17	11 (21)	7 (17)
	F2/3S	22	18	10 (22)	6 (18)
LSH-G/F20	F2/3□	26	20	16 (26)	10 (20)
	F2/3S	27	21	15 (27)	9 (21)
LSH-G/F25	F2/3□	-	-	20 (30)	12 (22)
	F2/3 V	20	12	20 (30)	12 (22)
LSH-G/F25	F2/3S	19	11	19 (31)	11 (23)
	F2/3□	26	14	16 (26)	4 (14)
LSH-G/F32	F2/3S	27	15	15 (27)	3 (15)
	T2/3□	-	-	12 (30)	0 (18)

Note1) When the lead wire is facing the head side in rail assembly, the dimensions will be as shown in ( ).

Note2) "-" indicates that mounting is not possible.

● Precautions

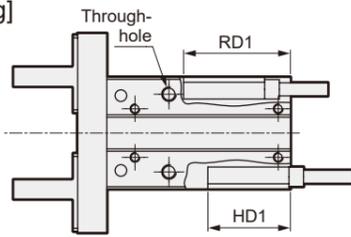
Please check the precautions for the bore size you will be using from the table below.

Category	Bore size						Precautions												
	ø6	ø10	ø16	ø20	ø25	ø32													
Common Items	●	●	●	●	●	●	• The RD dimension is the highest sensitivity position at the open end position, and the HD dimension is the highest sensitivity position at the closed end position. Please adjust the actual mounting position after confirming the operating status of the switch.												
	●	●	●	●	●	●	• Only one switch can be mounted in one switch rail groove.												
	●	●	●	●	●	●	• Due to the short opening/closing stroke, only the open or closed state can be detected for each switch. Example: With one switch, the detection shown in the figure below is not possible. ① Open end (workpiece not gripped): Switch OFF    ② Workpiece gripped: Switch ON    ③ Open end (workpiece not gripped): Switch OFF 												
Side surface mounting	●	●	●	●	●	●	• Be careful not to get the lead wire caught when opening and closing the fingers.												
	●	●	●	●	●	●	• When using an L-type switch for port side mounting, the fitting and switch may interfere. Keep the fitting outer diameter below the values in the table below. Mounting Position: Port side Switch shape: L-shaped type <table border="1" data-bbox="2047 1627 2418 1806"> <thead> <tr> <th>Bore size (Mounting position)</th> <th>Fitting outer diameter øD</th> </tr> </thead> <tbody> <tr> <td>ø6 (RD)</td> <td>ø5 or less</td> </tr> <tr> <td>ø6 (HD)</td> <td>ø6.9 or less</td> </tr> <tr> <td>ø10</td> <td>ø7.4 or less</td> </tr> <tr> <td>ø16</td> <td>ø7.9 or less</td> </tr> <tr> <td>ø20</td> <td>ø11 or less</td> </tr> </tbody> </table> 	Bore size (Mounting position)	Fitting outer diameter øD	ø6 (RD)	ø5 or less	ø6 (HD)	ø6.9 or less	ø10	ø7.4 or less	ø16	ø7.9 or less	ø20	ø11 or less
	Bore size (Mounting position)	Fitting outer diameter øD																	
ø6 (RD)	ø5 or less																		
ø6 (HD)	ø6.9 or less																		
ø10	ø7.4 or less																		
ø16	ø7.9 or less																		
ø20	ø11 or less																		
●	●	●	●	●	●	• For straight lead wire type and F3PV switches, the switch and lead wire will protrude from the head side end face. If protrusion is a problem, use F2/3 V, F2/3S, or rail plate mounting.													
Rail Mounting	-	●	-	-	-	●	• For F2/3 V switches, the switch protrudes from the head side end face. If protrusion is a problem, use F2/3S or rail plate mounting.												
	-	●	●	●	●	-	• Through-hole mounting is not possible when mounting the switch on the side.												
	-	●	-	-	-	-	• Through-hole mounting is not possible when mounting the switch rail plate.												

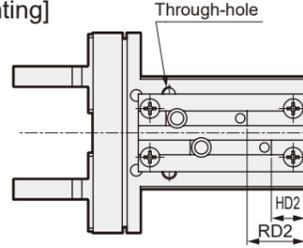
Cylinder Switch Precautions

● Switch Mounting Position List

[Side Mounting]  
ø10 to 25



[Rail Plate Mounting]  
ø10 to 25



Model No.	Switch Model No.	Side surface mounting		Rail Plate Mounting	
		RD1	HD1	RD2	HD2
LSHL-A10D	F2/3□	22	17	12 (22)	7 (17)
	F2/3S	23	18	11 (23)	6 (18)
LSHL-A16D	F2/3□	24.5	16.5	14.5 (24.5)	6.5 (16.5)
	F2/3S	25.5	17.5	13.5 (25.5)	5.5 (17.5)
LSHL-A20D	F2/3□	30	20	20 (30)	10 (20)
	F2/3S	31	21	19 (31)	9 (21)
LSHL-A25D	F2/3□	33	21.5	23 (33)	11.5 (21.5)
	F2/3S	34	22.5	22 (34)	10.5 (22.5)
LSHL-A10S/C	F2/3□	28	23	18 (28)	13 (23)
	F2/3S	29	24	17 (29)	12 (24)
LSHL-A16S/C	F2/3□	27.5	20	17.5 (27.5)	10 (20)
	F2/3S	28.5	21	16.5 (28.5)	9 (21)
LSHL-A20S/C	F2/3□	33.5	23	23.5 (33.5)	13 (23)
	F2/3S	34.5	24	22.5 (34.5)	12 (24)
LSHL-A25S/C	F2/3□	38.5	27	28.5 (38.5)	17 (27)
	F2/3S	39.5	28	27.5 (39.5)	16 (28)

Note) When the lead wire is facing the head side in rail assembly, the dimensions will be as shown in ( ).

● Precautions

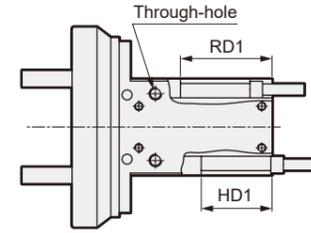
Please check the precautions for the bore size you will be using from the table below.

Category	Bore size				Precautions								
	ø10	ø16	ø20	ø25									
Common Items	●	●	●	●	• The RD dimension is the highest sensitivity position at the open end position, and the HD dimension is the highest sensitivity position at the closed end position. Please adjust the actual mounting position after confirming the operating status of the switch.								
	●	●	●	●	• Only one switch can be mounted in one switch rail groove.								
	●	●	●	●	• Due to the short opening/closing stroke, only the open or closed state can be detected for each switch. Example: With one switch, the detection shown in the figure below is not possible. ① Open end (workpiece not gripped): Switch OFF    ② Workpiece gripped: Switch ON    ③ Open end (workpiece not gripped): Switch OFF								
Side surface mounting	●	●	●	●	• Be careful not to get the lead wire caught when opening and closing the fingers.								
	●	●	●	●	• When using an L-type switch for port side mounting, the fitting and switch may interfere. Keep the fitting outer diameter below the values in the table below.								
	●	●	●	●	Mounting Position: Port side Switch shape: L-shaped type <table border="1" style="margin: 10px auto;"> <thead> <tr> <th>Bore size</th> <th>Fitting outer diameter øD</th> </tr> </thead> <tbody> <tr> <td>ø10</td> <td>ø7.4 or less</td> </tr> <tr> <td>ø16</td> <td>ø7.9 or less</td> </tr> <tr> <td>ø20</td> <td>ø11 or less</td> </tr> </tbody> </table>	Bore size	Fitting outer diameter øD	ø10	ø7.4 or less	ø16	ø7.9 or less	ø20	ø11 or less
	Bore size	Fitting outer diameter øD											
ø10	ø7.4 or less												
ø16	ø7.9 or less												
ø20	ø11 or less												
●	●	●	●	• For straight lead wire type switches, the switch and lead wire will protrude from the head side end face. If protrusion is a problem, use F2/3 V, F2/3S, or rail plate mounting.									
Rail Mounting	●	—	—	—	• Through-hole mounting is not possible when mounting the switch on the side.								
	●	—	—	—	• For F3PV switches, the switch protrudes from the head side end face. If protrusion is a problem, use F2/3 V, F2/3S, or rail plate mounting.								
	●	—	—	—	• Through-hole mounting is not possible when mounting the switch rail plate.								

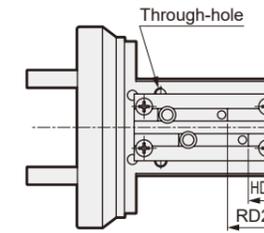
Cylinder Switch Precautions

● Switch Mounting Position List

[Side Mounting]  
ø10 to 20



[Rail Plate Mounting]  
ø10 to 20



Model No.	Switch Model No.	Side surface mounting		Rail Plate Mounting	
		RD1	HD1	RD2	HD2
LSHL-G/F10	F2/3□	22	17	12 (22)	7 (17)
	F2/3S	23	18	11 (23)	6 (18)
LSHL-G/F16	F2/3□	25	17	15 (25)	7 (17)
	F2/3S	26	18	14 (26)	6 (18)
LSHL-G/F20	F2/3□	35.5	25.5	25.5 (35.5)	15.5 (25.5)
	F2/3S	36.5	26.5	24.5 (36.5)	14.4 (26.5)

Note) When the lead wire is facing the head side in rail assembly, the dimensions will be as shown in ( ).

● Precautions

Please check the precautions for the bore size you will be using from the table below.

Category	Bore size			Precautions								
	ø10	ø16	ø20									
Common Items	●	●	●	• The RD dimension is the highest sensitivity position at the open end position, and the HD dimension is the highest sensitivity position at the closed end position. Please adjust the actual mounting position after confirming the operating status of the switch.								
	●	●	●	• Only one switch can be mounted in one switch rail groove.								
	●	●	●	• Due to the short opening/closing stroke, only the open or closed state can be detected for each switch. Example: With one switch, the detection shown in the figure below is not possible. ① Open end (workpiece not gripped): Switch OFF    ② Workpiece gripped: Switch ON    ③ Open end (workpiece not gripped): Switch OFF								
Side surface mounting	●	●	●	• Be careful not to get the lead wire caught when opening and closing the fingers.								
	●	●	●	• When using an L-type switch for port side mounting, the fitting and switch may interfere. Keep the fitting outer diameter below the values in the table below.								
	●	●	●	Mounting Position: Port side Switch shape: L-shaped type <table border="1" style="margin: 10px auto;"> <thead> <tr> <th>Bore size</th> <th>Fitting outer diameter øD</th> </tr> </thead> <tbody> <tr> <td>ø10</td> <td>ø7.4 or less</td> </tr> <tr> <td>ø16</td> <td>ø7.9 or less</td> </tr> <tr> <td>ø20</td> <td>ø11 or less</td> </tr> </tbody> </table>	Bore size	Fitting outer diameter øD	ø10	ø7.4 or less	ø16	ø7.9 or less	ø20	ø11 or less
	Bore size	Fitting outer diameter øD										
ø10	ø7.4 or less											
ø16	ø7.9 or less											
ø20	ø11 or less											
●	●	●	• For straight lead wire type switches, the switch and lead wire will protrude from the head side end face. If protrusion is a problem, use F2/3 V, F2/3S, or rail plate mounting.									
Rail Mounting	●	—	—	• Through-hole mounting is not possible when mounting the switch on the side.								
	●	—	—	• For F3PV switches, the switch protrudes from the head side end face. If protrusion is a problem, use F2/3 V, F2/3S, or rail plate mounting.								
	●	—	—	• Through-hole mounting is not possible when mounting the switch rail plate.								