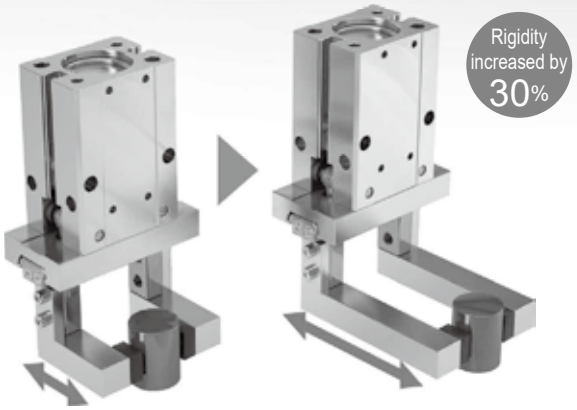
Linear Slide Hand LSH-HP1 Series

Increased linear guide performance

High rigidity

Increased amount of overhang

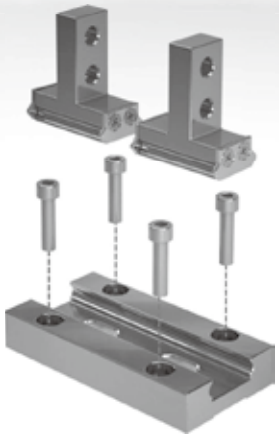
By improving the guide rigidity beyond that of conventional products, the allowable moment has been increased.



High precision

Repeatability ±0.01 mm

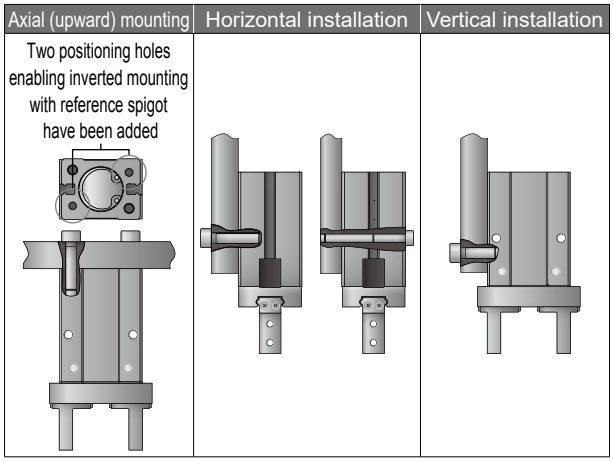
High rigidity and high precision are achieved with a structure integrating the guide rail and finger.



Increased flexibility in design

Can be mounted on three directions

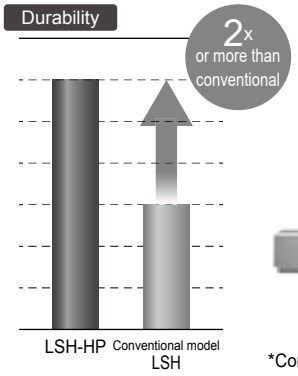
Axial (upward) mounting	Horizontal installation	Vertical installation
Two positioning holes enabling inverted mounting with reference spigot have been added		

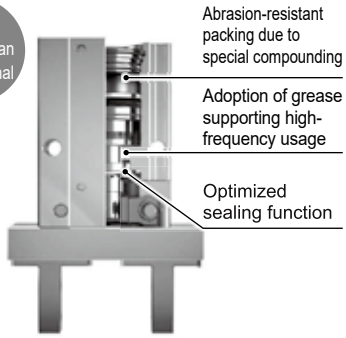


Long service life

Double the durability of conventional models*

Packing design has been optimized. Highly advanced sliding technology has enabled durability twice that of conventional models.



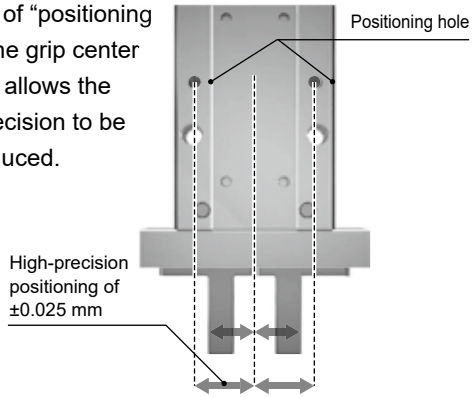


*Compared with our conventional LSH model.

Reduced processes on site

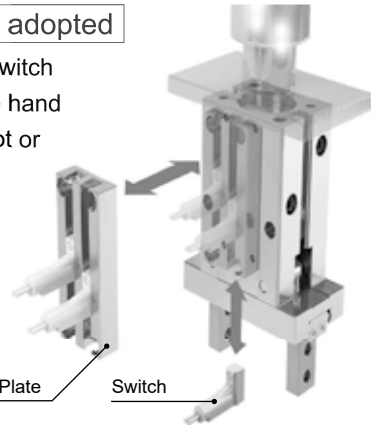
High-precision positioning of ±0.025 mm

The addition of “positioning holes” with the grip center as reference allows the centering precision to be easily reproduced.



Rail plate system adopted

The rail plate allows switch replacement while the hand is attached to the robot or equipment.



Increased productivity begins with the Linear Slide Hand

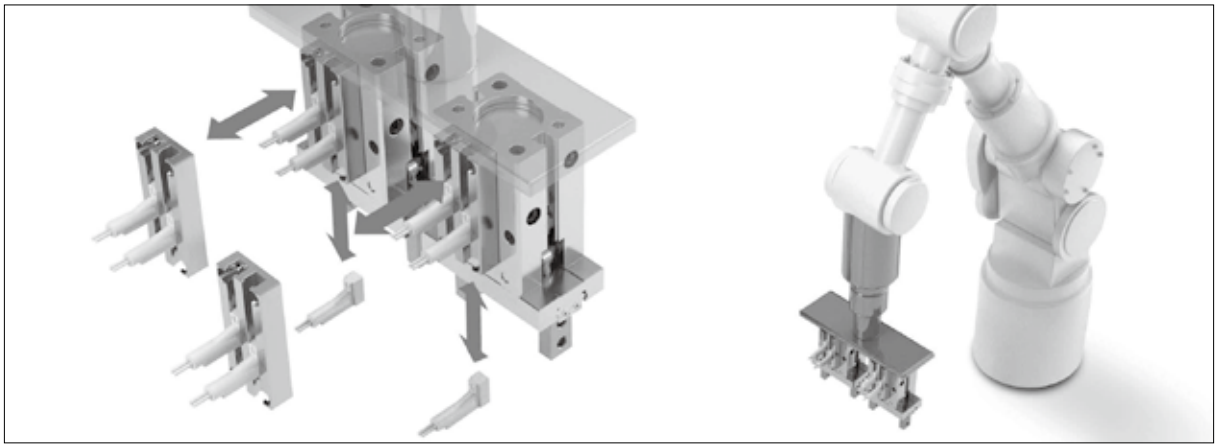
Usage Examples: Reduction of processes on site

Replacement of body

Positioning holes that guarantee centering precision enable highly reproducible mounting, with no fine adjustment required. This contributes to reduced mounting adjustment work-hours and improved reproducibility.

Replacement of switch

The switch can be replaced without detaching the hand from the robot or equipment.



Extensive series variation


Standard


With rubber cover

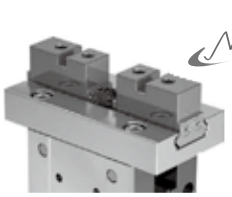

Long stroke length


Long stroke length + with rubber cover


Basic opening/closing direction tap


Side tap


Opening/closing direction through hole



Flat

Linear Slide Hand with Length Measuring Function LSH-HP2 Series

New

High precision

Repeatability ±0.02 mm

A new sensor system is adopted and integrated, achieving higher repeatability than ever before.

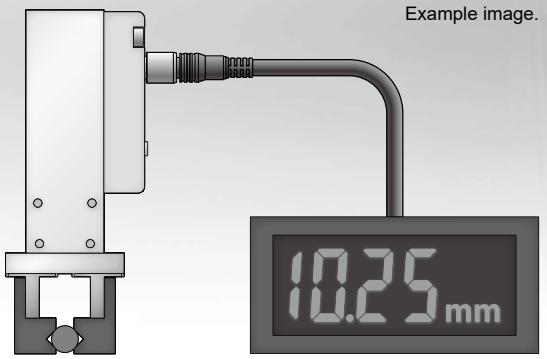
Linearity FS ±0.5%

With correction adapter: FS ±0.5%

Without correction adapter: FS ±3%

A correction adapter is adopted to improve the linear accuracy.

Example image.



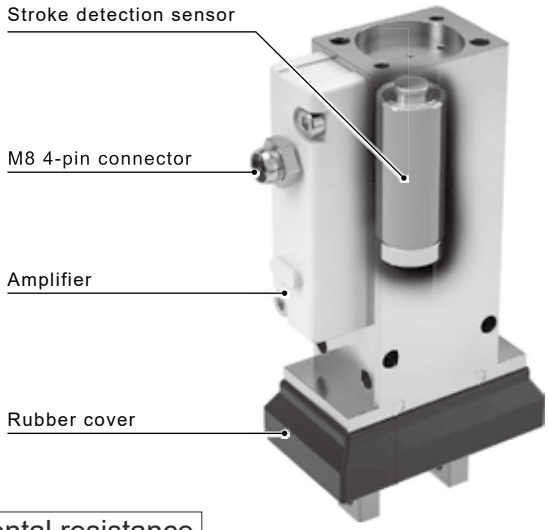
Integrated structure

First in the industry

Adopts an LVDT* sensor highly resistant to vibration and impact.

A displacement sensor is built into the body, achieving a high-precision integrated structure.

* LVDT is short for Linear Variable Differential Transformer, a sensor that converts mechanical displacement into electric signal for output.



Linearity correction adapter

Environmental resistance

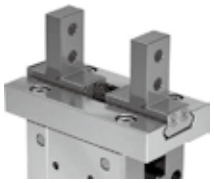
The IP65 equivalent amplifier and rubber cover prevent the ingress of cutting chips and water drops.

Extensive series variation

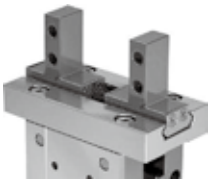
Amplifier side mounting

Amplifier front mounting

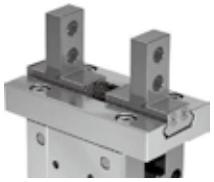
With rubber cover



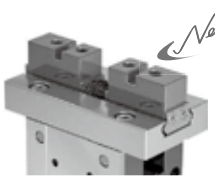
Basic opening/closing direction tap



Side tap



Opening/closing direction through hole



New

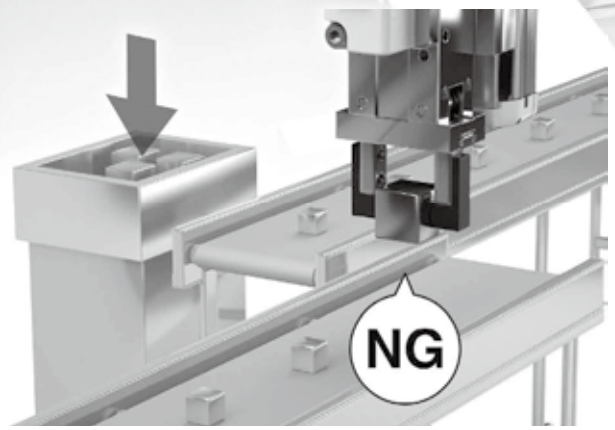
Flat

A new series that combines improved reliability and productivity.

Usage examples

Workpiece foreign object judgment

Grips and measures simultaneously, reducing the number of inspection steps.



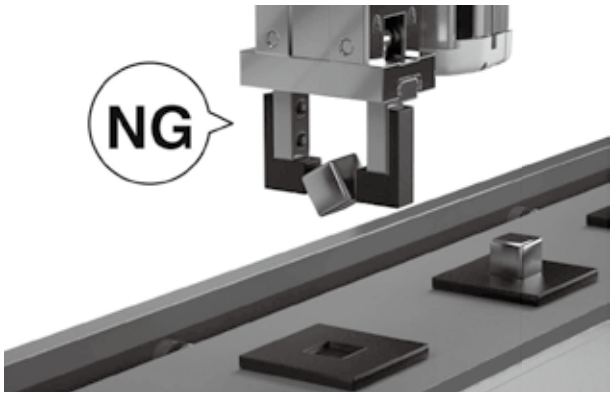
Workpiece model judgment

Capable of instantaneously judging minute differences in workpiece models.

Judging workpiece C.

Gripping orientation judgment

By detecting misaligned orientations when gripped, contact accidents can be prevented at the transported destination.

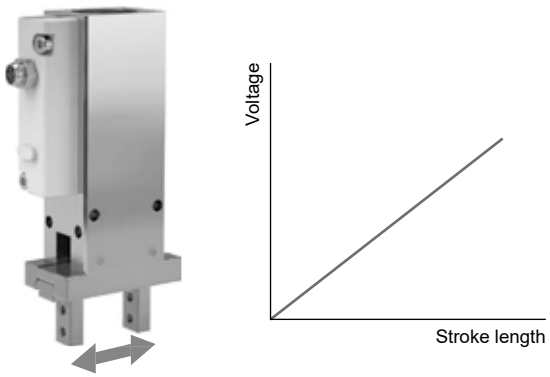


Minute workpiece gripping / missed grip judgment

Accurately judges whether even tiny workpieces were gripped or missed.

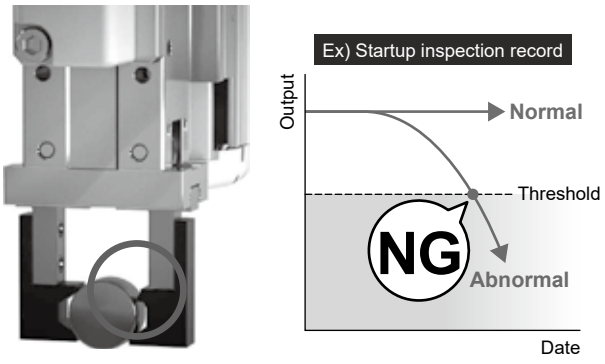
Elimination of human error

All strokes are output in detail, eliminating manual adjustment error as caused by conventional switches.



Predictive maintenance

Monitors abnormal wear and deformation of gripping fingers and jigs through changes in output to prevent equipment and robot damage.



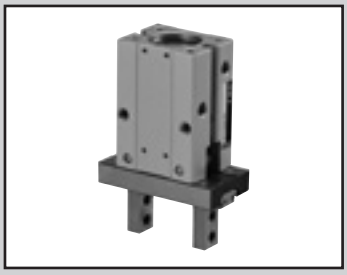
Series variation

Linear Slide Hand LSH-HP Series

	Variation	Model No.	Bore size (mm)
HP1 Series	Double acting/single acting without rubber cover 	LSH-A	ø6
			ø10
			ø16
			ø20
			ø25
			ø32
	Double acting/single acting with rubber cover 	LSH-G LSH-F	ø6
			ø10
			ø16
			ø20
			ø25
			ø32
	Double acting long stroke length without rubber cover 	LSHL-A	ø10
			ø16
			ø20
			ø25
	Double acting long stroke length with rubber cover 	LSHL-G LSHL-F	ø10
			ø16
			ø20
HP2 Series	With length measuring function, double acting without rubber cover 	LSHM-A	ø10
			ø16
			ø20
			ø25
	With length measuring function, double acting with rubber cover 	LSHM-G LSHM-F	ø10
			ø16
			ø20
			ø25

Gripping power (N) 5 10 50 100 200	Operating stroke length (mm)	Switch model No.	Page
	4	F2S F3S F2H/V F3H/V F3PH/V T2H/V T3H/V T2H/VR3 T3PH/V	1512
	6		
	10		
	14		
	22		
	4		1522
	6		
	10		
	14		
	22		
	8		1532
	12		
	18		
	22		
	8		1540
	12		
	18		
	4	—	1546
	6		
	10		
	14		
	4	—	1554
	6		
	10		
	14		

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

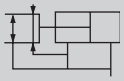


Linear Slide Hand double acting / single acting

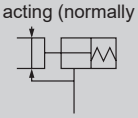
LSH-A Series

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

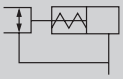
Double acting



Single acting (normally open)



Single acting (normally closed)

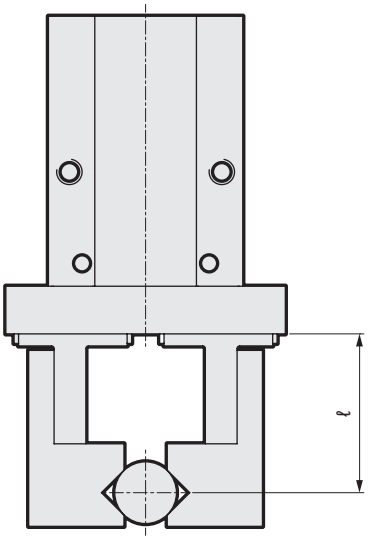


RoHS

Specifications

Descriptions			LSH-A					
Bore size		mm	ø6	ø10	ø16	ø20	ø25	ø32
Actuation			Double acting/single acting (normally open/normally closed)					
Working fluid			Compressed air					
Max. working pressure		MPa	0.7					
Min. working pressure	MPa	Double acting	0.15	0.2	0.1			
		Single acting	0.3	0.35	0.25			
Port size			M3		M5			
Ambient temperature		°C	-10 to 60 (no freezing)					
Operating stroke		mm	4		6	10	14	22
Repeatability		mm	±0.01					
Weight Double acting (Single acting)	Finger OP: 1, 2, 3	kg	0.032	0.06	0.135	0.275 (0.28)	0.49 (0.495)	0.73 (0.78)
	Finger OP: 4				0.14	0.28 (0.285)	0.495 (0.5)	0.76 (0.81)
Lubrication			Not required					

Gripping force



Unit: N

Bore size (mm)	Double acting	
	Open side	Closed side
ø6	6.1	3.3
ø10	17	11
ø16	45	34
ø20	66	42
ø25	104	65
ø32	193	158

Bore size (mm)	Single acting (normally open)	
		Closed side
ø6	-	1.9
ø10		7.1
ø16		27
ø20		33
ø25		45
ø32		131

Bore size (mm)	Single acting (normally closed)	
	Open side	
ø6	3.7	-
ø10	13	
ø16	38	
ø20	57	
ø25	83	
ø32	161	

* At supply pressure of 0.5 MPa, ℓ = 20 mm, stroke center
*1:Avoid gripping the workpiece with single acting spring force as much as possible. The gripping force may become unstable, leading to operation failure.

Switch specifications

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

*1: The F-switch uses a bend-resistant lead wire by default.

Item	Proximity 2-wire		Proximity 3-wire	
	T2H/T2V	T2HR3/T2VR3 (Lead wire, a bend-resistant type)	T3H/T3V	T3PH/T3PV
Applications	Programmable Controller dedicated		Programmable For controller, relay	
Output method	–	–	NPN output	PNP output
Power supply voltage	–	–	DC10 to 28V	
Load voltage/ current	10 to 30 VDC 5 to 20 mA	10 to 30 VDC 5 to 20 mA	30 VDC or less 100 mA or less	
Indicator lamp	Red LED (Lit when ON)	Red LED (Lit when ON)	Red LED (Lit when ON)	Yellow LED (Lit when ON)
Leakage current	1 mA or less	1 mA or less	10 μA or less	
Impact resistance	980 m/s^2			
Weight g	1 m: 18 g 3 m: 49 g			

How to order

Without switch (built-in magnet for switch)

LSH - A 06 D 1 R — HP1

With switch (built-in magnet for switch)

LSH - A 06 D 1 R - F2H - D - HP1

Ⓐ Rubber cover
Ⓑ Bore size
Ⓒ Actuation
Ⓓ Finger
Ⓔ Grip center reference, high precision positioning hole
Ⓕ Switch model No.
Ⓖ Switch quantity

Code	Description
Ⓐ Rubber cover	
A	Without rubber cover
Ⓑ Bore size (mm)	
06	ø6
10	ø10
16	ø16
20	ø20
25	ø25
32	ø32
Ⓒ Actuation	
D	Double acting
S	Single acting / normally open
C	Single acting / normally closed
Ⓓ Finger * Refer to the Dimensions for details.**	
1	Basic
2	Side tap
3	Through hole
4	Flat
Ⓔ Grip center reference, high precision positioning hole	
N	None
L	Refer to the figure at left.
R	

Ⓕ Switch model No.

Blank	No switch, with F-switch rail
N	No switch, no switch rail
A	No switch, with T-switch rail (ø32 only)

Straight lead wire	L-shaped lead wire	Contact	Voltage AC	Voltage DC	Indicator	Lead wire
–	**F2S***	Proximity		●	1-color LED	2-wire
–	**F3S***			●		3-wire
F2H*	**F2V***			●		2-wire
F3H*	**F3V***			●		3-wire
F3PH*	**F3PV***			●		3-wire
T2H*	**T2V***			●		2-wire
T2HR3	**T2VR3**			●		2-wire
T3H*	**T3V***			●		3-wire
T3PH*	**T3PV***			●		3-wire

*** Lead wire length**

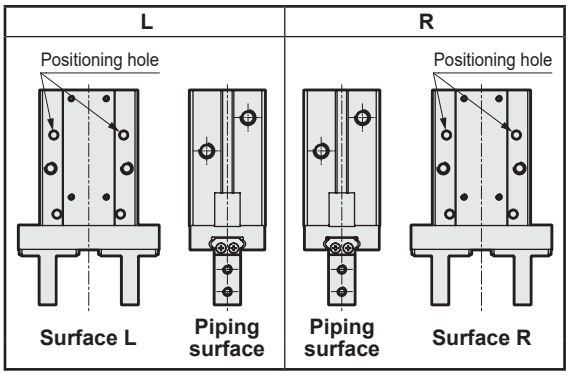
Blank	1 m (standard)
3	3 m (option)

Ⓖ Switch quantity

R	1 on open side
H	1 on closed side
D	2

*1: If the one with the switch is selected, the product comes with a rail plate corresponding to the switch.
*2: Only ø32 can be selected with the T-switch.
*3: Refer to page 1576 for cylinder switch precautions.

Grip center reference, high precision positioning hole position diagram



Refer to the Dimensions (pages 1516 to 1521) and page 1567 for details.

How to order switch

SW - F2H*

Switch model No. (Item Ⓕ above)

Switch mounting availability table

Model No.	Switch model No.	Side mounting	Rail mounting
LSH-A06	F2/3□	●	–
	F2/3S	–	●
LSH-A10	F2/3□	●	●
	F2/3S	●	●
LSH-A16	F2/3□	●	●
	F2/3S	●	●
LSH-A20	F2/3□	●	●
	F2/3S	●	●
LSH-A25	F2/3H·PH	–	●
	F2/3V·PV	●	●
	F2/3S	●	●
LSH-A32	F2/3□	●	●
	F2/3S	●	●
	T2/3□	–	●

[Example of model No.]

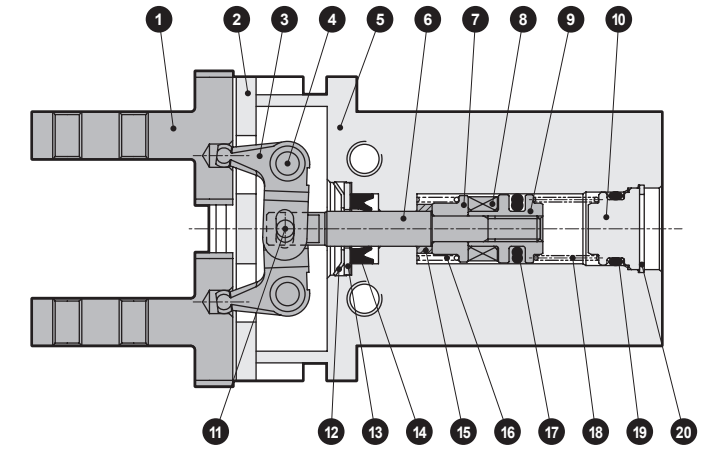
LSH-A06D1R-F2H-D-HP1

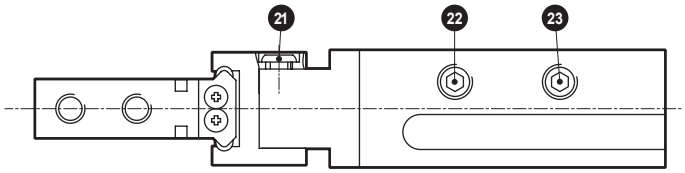
Model: Linear Slide Hand

Ⓐ Rubber cover	: Without rubber cover
Ⓑ Bore size	: ø6
Ⓒ Actuation	: Double acting
Ⓓ Finger	: Basic
Ⓔ Grip center reference, high precision positioning hole	: R
Ⓕ Switch model No.	: Proximity F2H, lead wire 1 m
Ⓖ Switch quantity	: 2

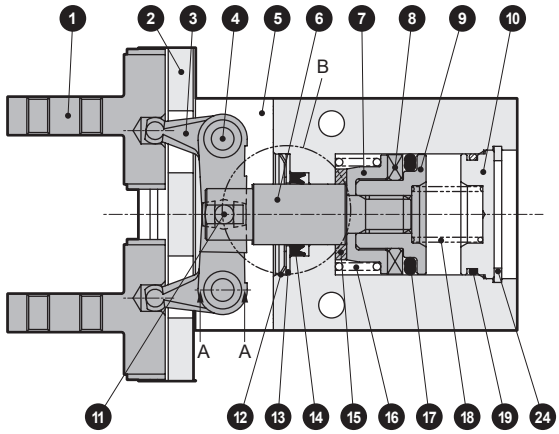
Internal structure and parts list

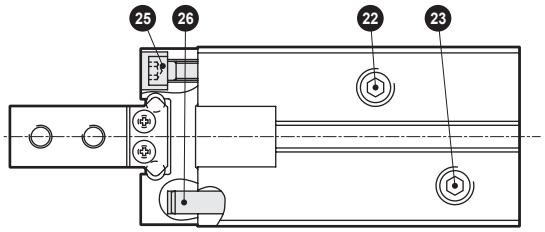
● LSH-A06



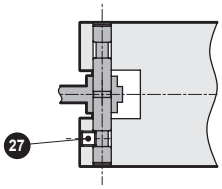


● LSH-A10 to 16

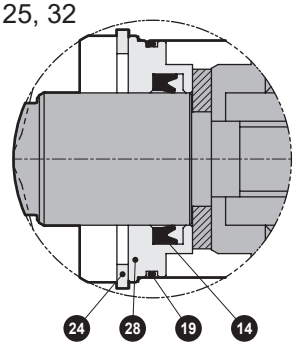




Cross-section A-A



B part ø20, 25, 32



Parts list

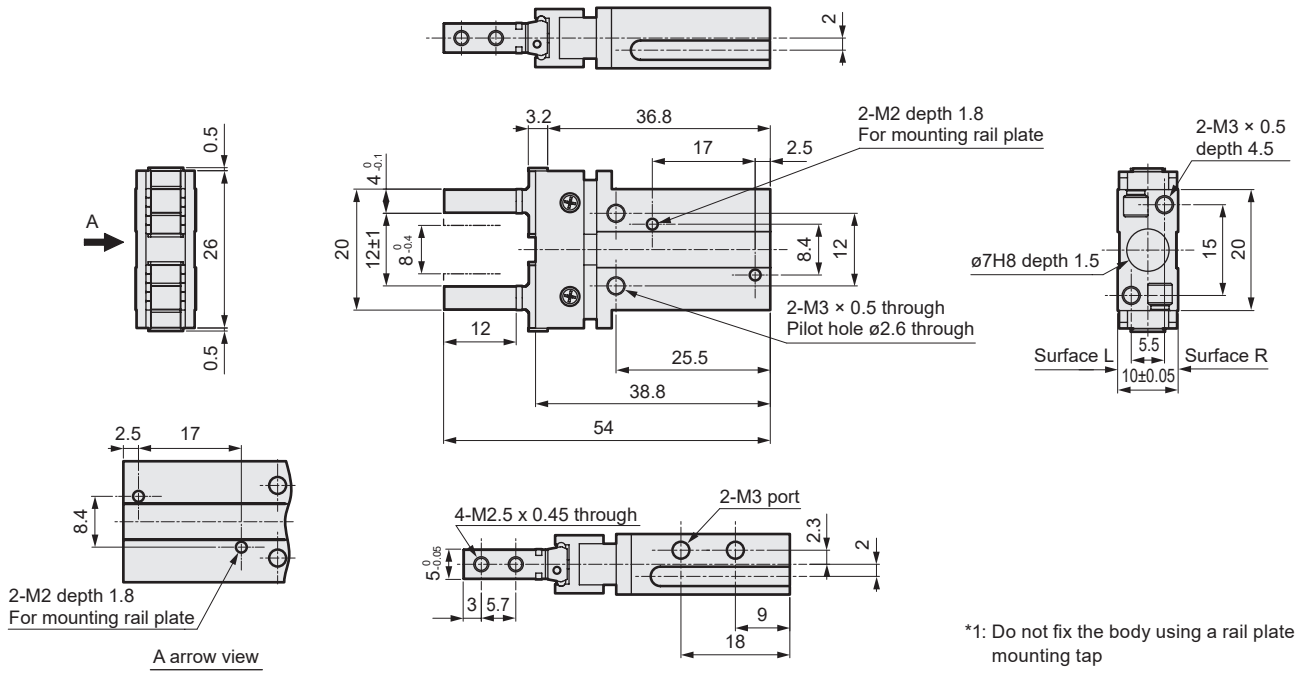
No.	Part name	Material	Remarks	No.	Part name	Material	Remarks
1	Finger	Stainless steel		15	Cushion rubber	Urethane rubber	
2	Linear guide	Stainless steel		16	Coil spring	Piano wire	Single acting C
3	Lever	Stainless steel		17	Piston packing	Nitrile rubber	
4	Fulcrum axis	Steel		18	Coil spring	Piano wire	Single acting S
5	Body	Aluminum alloy		19	O-ring	Nitrile rubber	
6	Piston rod	Stainless steel		20	C-snap ring	Steel	
7	Spring bracket	Aluminum alloy		21	Pan head machine screw	Stainless steel	
8	Magnet			22	Plug	Stainless steel	Single acting C
9	Piston	Aluminum alloy		23	Plug	Stainless steel	Single acting S
10	Head cover	Aluminum alloy		24	C-snap ring	Stainless steel	
11	Operation shaft	Steel alloy		25	Hexagon socket head cap screw	Stainless steel	ø32 is steel
12	CR ring	Stainless steel		26	Pin	Steel	
13	Cap	Stainless steel		27	Hexagon socket set screw	Stainless steel	
14	Rod packing	Nitrile rubber		28	Rod metal	Aluminum alloy	

Repair parts list

Bore size (mm)	Kit No.	Repair part No.	Rail plate kit No.		
			For F-switch	For T-switch	Description
ø6	Cannot be disassembled	-	LSH-RPF-06-HP	–	Rail plate small screw
ø10	LSH-10K-HP	⑫⑭⑰⑲	LSH-RPF-10-HP	–	
ø16	LSH-16K-HP		LSH-RPF-16-HP	–	
ø20	LSH-20K-HP	⑭⑰⑲	LSH-RPF-20-HP	–	
ø25	LSH-25K-HP		LSH-RPF-25-HP	–	
ø32	LSH-32K-HP		LSH-RPF-32-HP	LSH-RPT-32-HP	

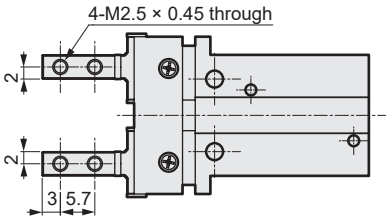
Dimensions (bore size: ø6)

● LSH-A06*1N

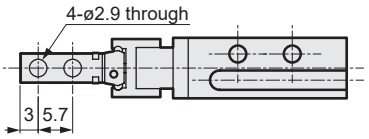


*1: Do not fix the body using a rail plate mounting tap

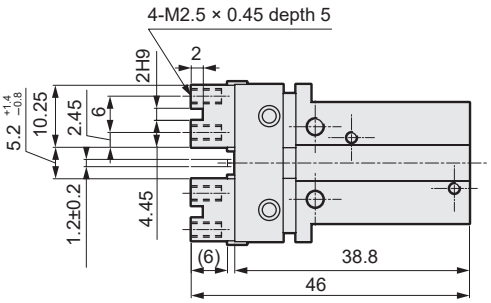
● LSH-A06*2N



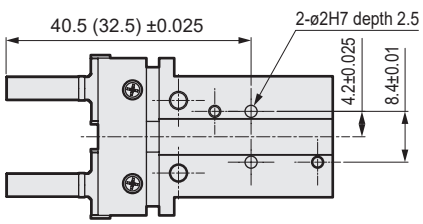
● LSH-A06*3N



● LSH-A06*4N

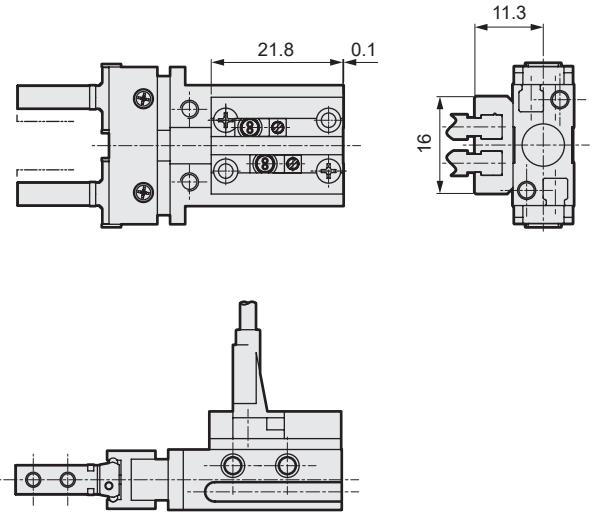


● LSH-A06**R / L



*2: Positioning holes are machined on surface R for LSH-A06**R and surface L for LSH-A06**L. Refer to page 1567 for the base line.
*3: The dimensions in parentheses are the dimensions for LSH-A06*4.

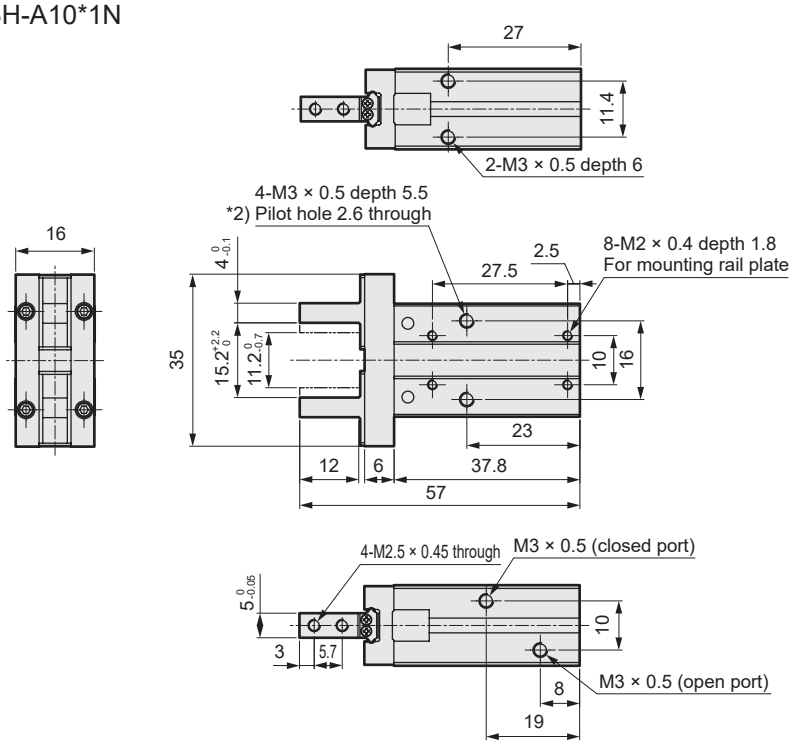
● With switch, rail assembly

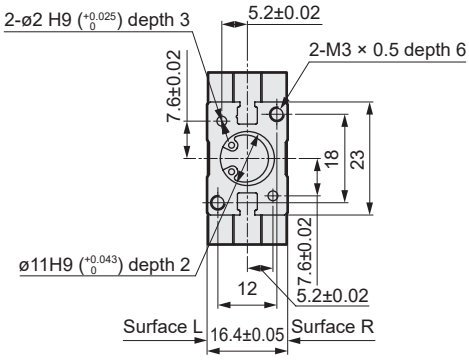


*4: Refer to Page 1576 for cylinder switch precautions.
*5: Use fittings with an outer diameter of ø9 or less to prevent them from interfering with each other.

Dimensions (bore size: ø10)

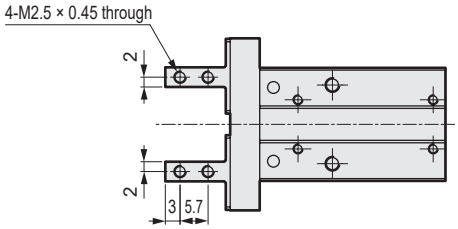
● LSH-A10*1N



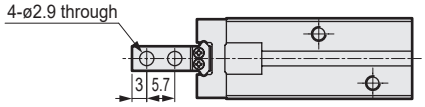


*1: Do not fix the body using a rail plate mounting tap
*2: For switch side/rail mounting, the through hole cannot be used.

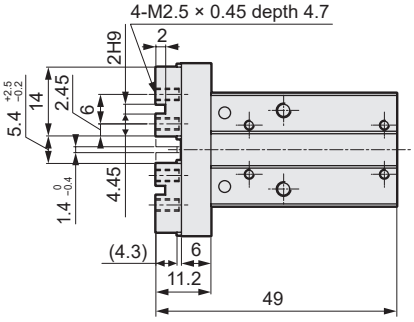
● LSH-A10*2N



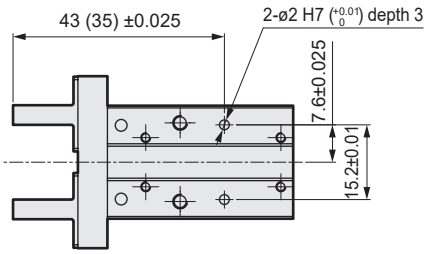
● LSH-A10*3N



● LSH-A10*4N

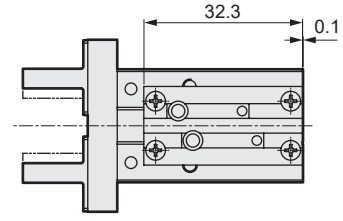


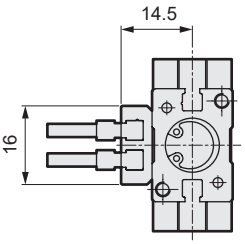
● LSH-A10**R / L

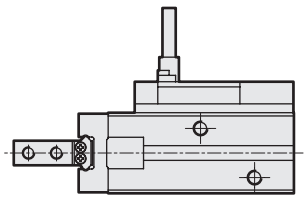


*3: Positioning holes are machined on surface R for LSH-A10**R and surface L for LSH-A10**L. Refer to page 1567 for the base line.
*4: The dimensions in parentheses are the dimensions for LSH-A10*4.

● With switch, rail assembly



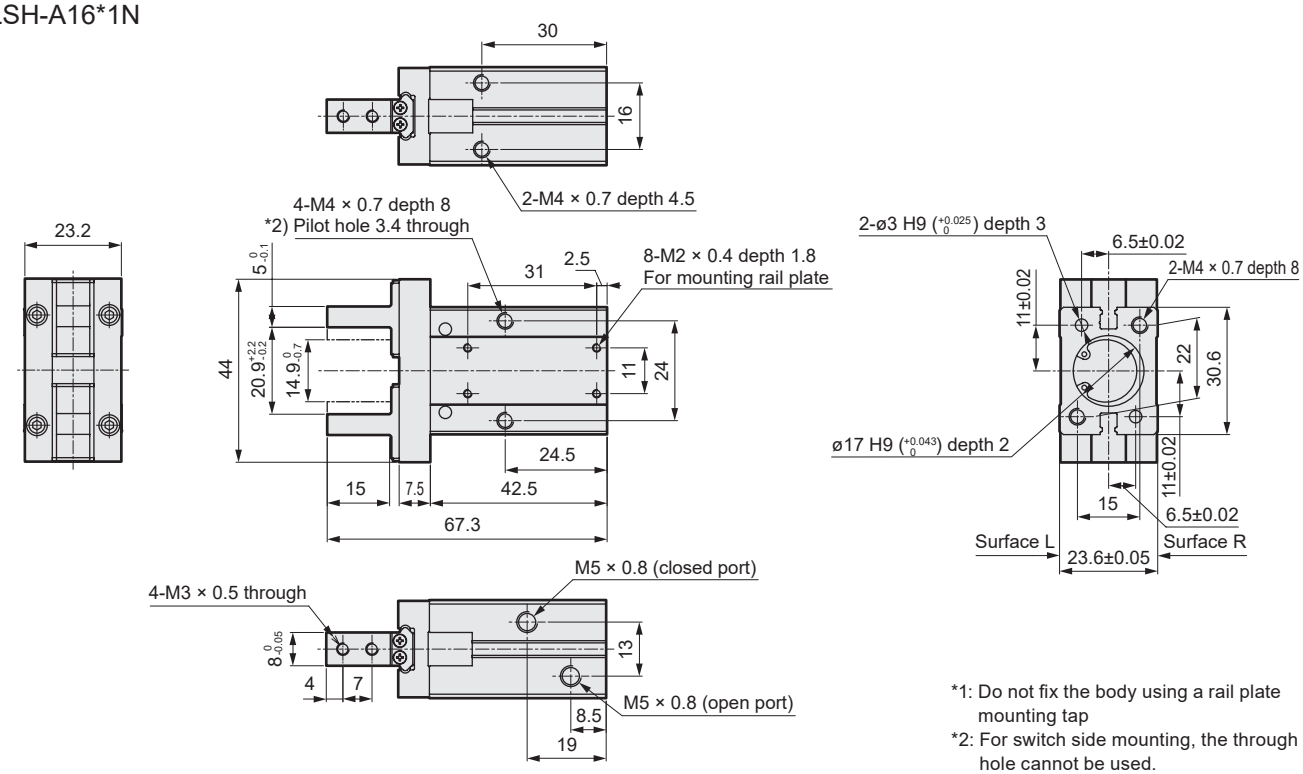




*5: Refer to page 1576 for cylinder switch precautions.

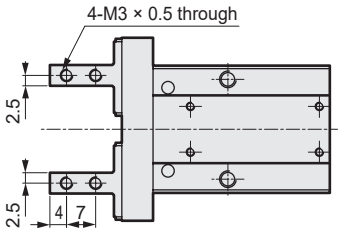
Dimensions (bore size: ø16)

● LSH-A16*1N

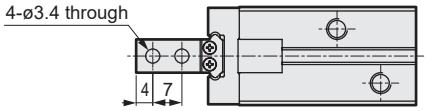


*1: Do not fix the body using a rail plate mounting tap
*2: For switch side mounting, the through hole cannot be used.

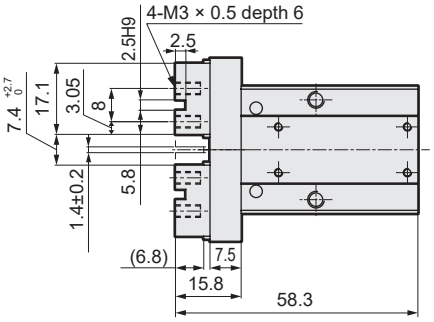
● LSH-A16*2N



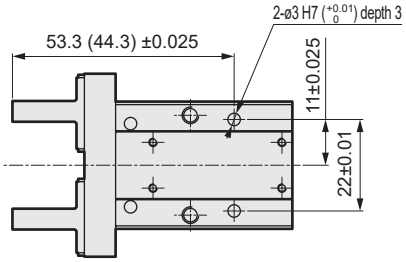
● LSH-A16*3N



● LSH-A16*4N

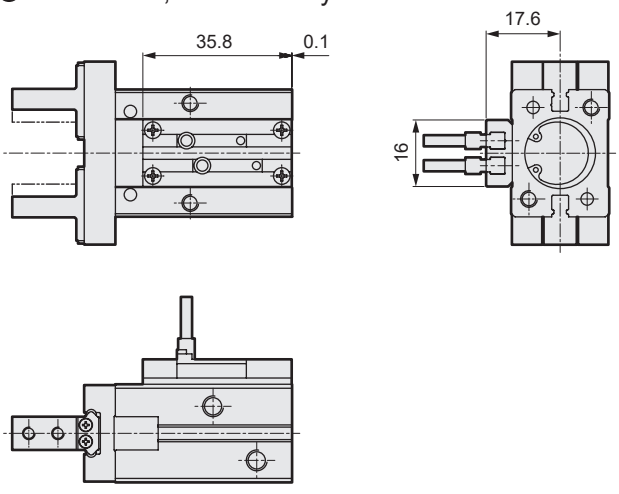


● LSH-A16**R / L



*3: Positioning holes are machined on surface R for LSH-A16**R and surface L for LSH-A16**L. Refer to page 1567 for the base line.
*4: The dimensions in parentheses are the dimensions for LSH-A16*4.

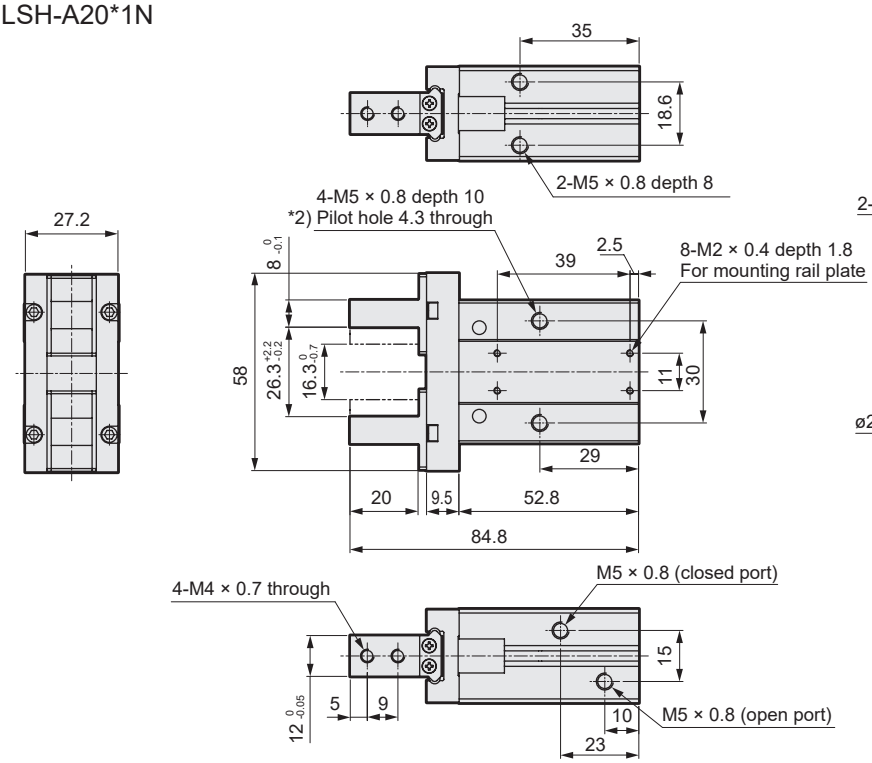
● With switch, rail assembly

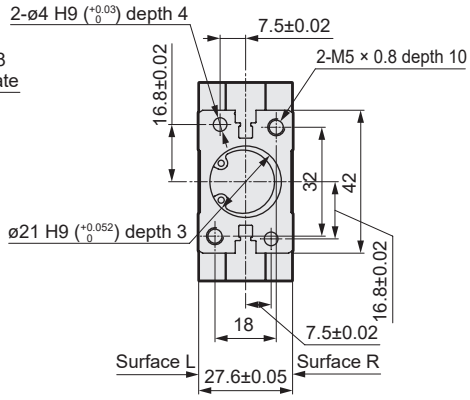


*5: Refer to page 1576 for cylinder switch precautions.

Dimensions (bore size: ø20)

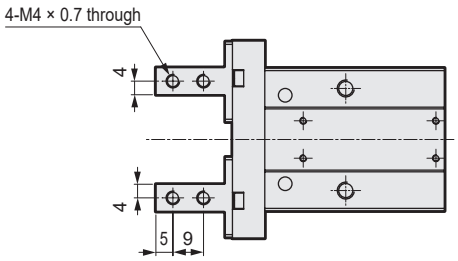
● LSH-A20*1N



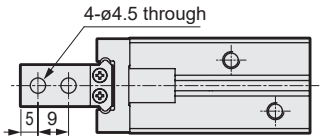


*1: Do not fix the body using a rail plate mounting tap

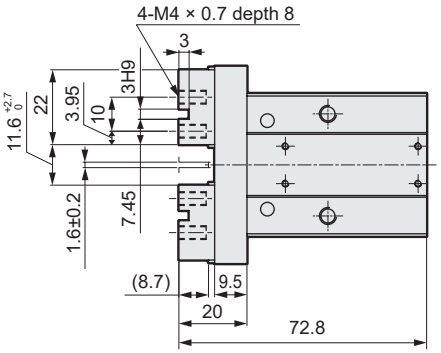
● LSH-A20*2N



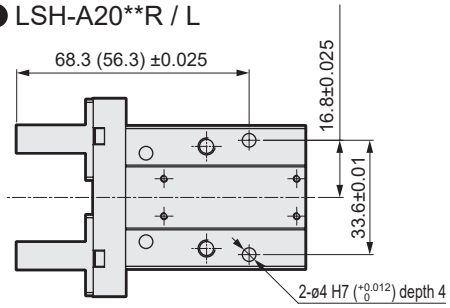
● LSH-A20*3N



● LSH-A20*4N

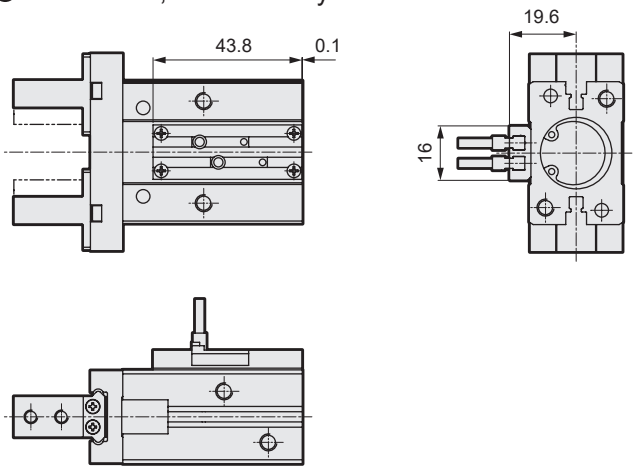


● LSH-A20**R / L



*3: Positioning holes are machined on surface R for LSH-A20**R and surface L for LSH-A20**L. Refer to page 1567 for the base line.
*4: The dimensions in parentheses are the dimensions for LSH-A20*4.

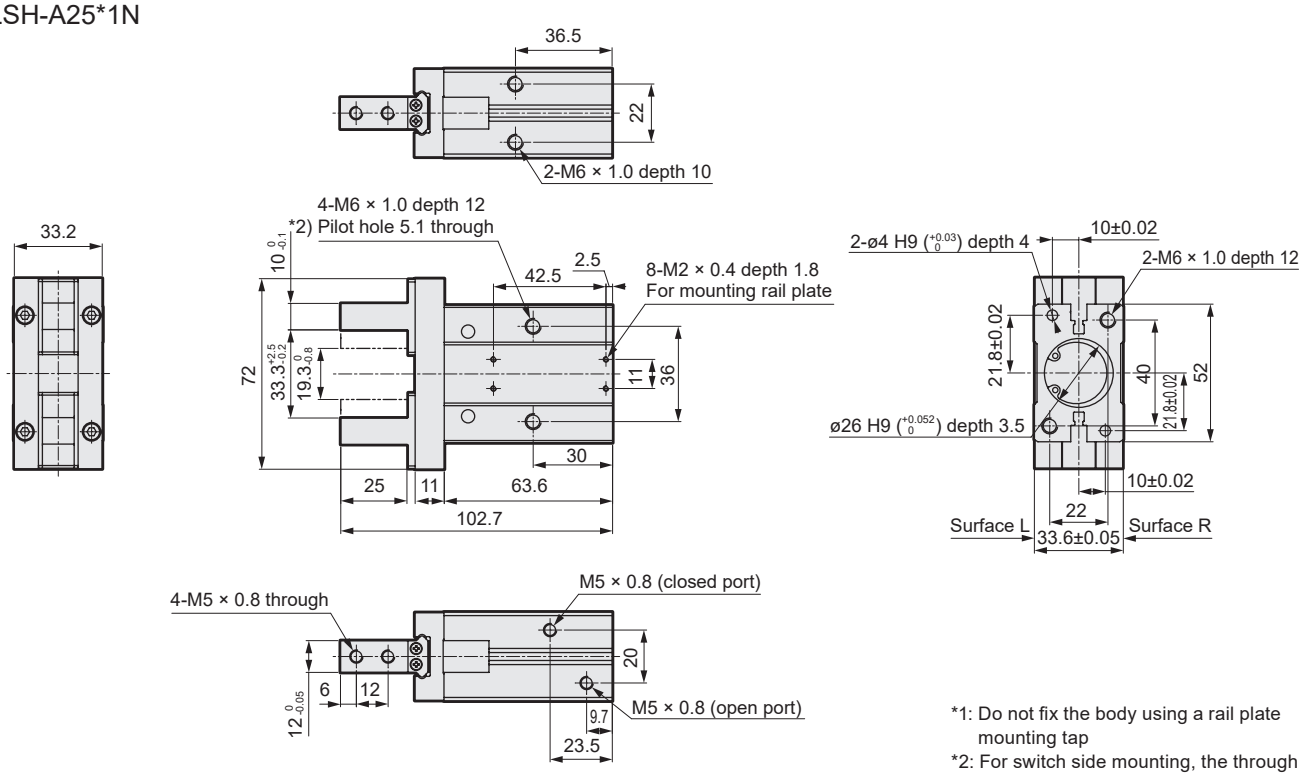
● With switch, rail assembly



*5: Refer to page 1576 for cylinder switch precautions.

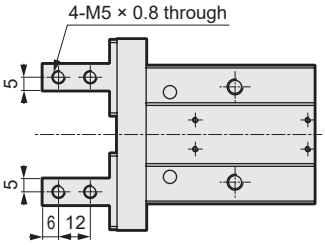
Dimensions (bore size: ø25)

● LSH-A25*1N

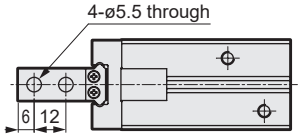


*1: Do not fix the body using a rail plate mounting tap
*2: For switch side mounting, the through hole cannot be used.

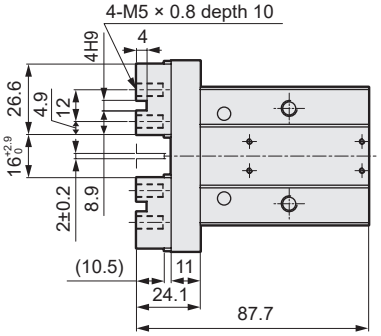
● LSH-A25*2N



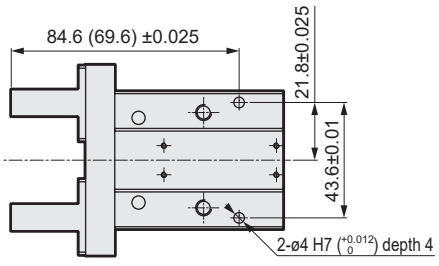
● LSH-A25*3N



● LSH-A25*4N

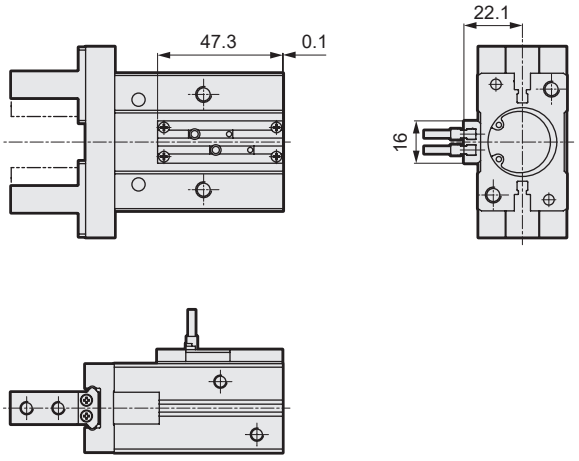


● LSH-A25**R / L



*3: Positioning holes are machined on surface R for LSH-A25**R and surface L for LSH-A25**L. Refer to page 1567 for the base line.
*4: The dimensions in parentheses are the dimensions for LSH-A25*4.

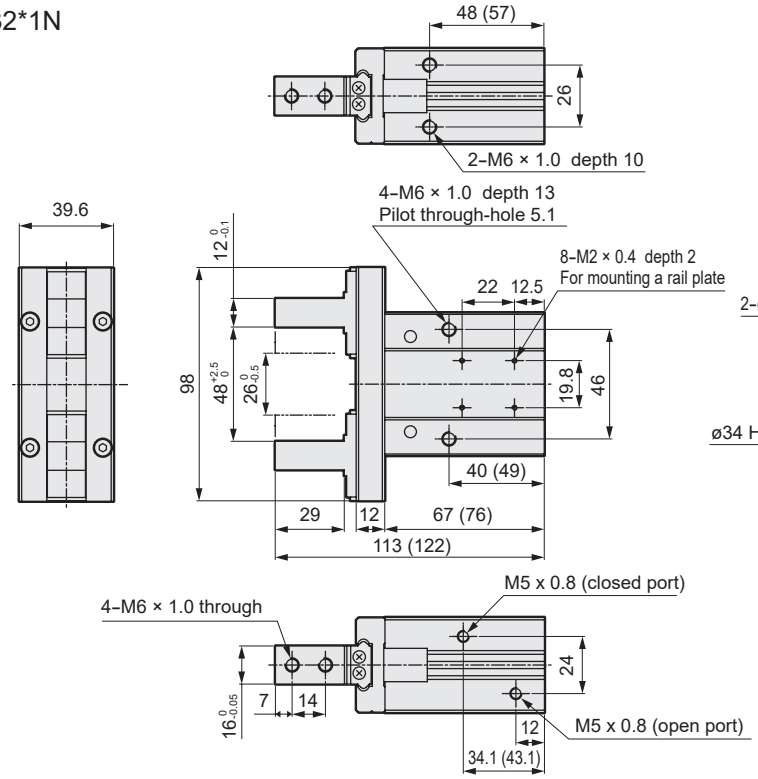
● With switch, rail assembly



*5: Refer to page 1576 for cylinder switch precautions.

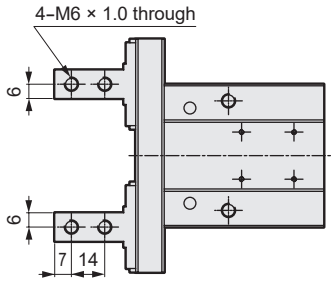
Dimensions (bore size: ø32)

● LSH-A32*1N

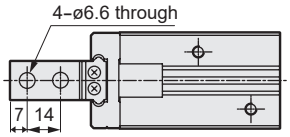


*1: Do not fix the body using a rail plate mounting tap
*2: ( ) are the dimensions during single action.
*3: For switch side mounting, the through-hole cannot be used.

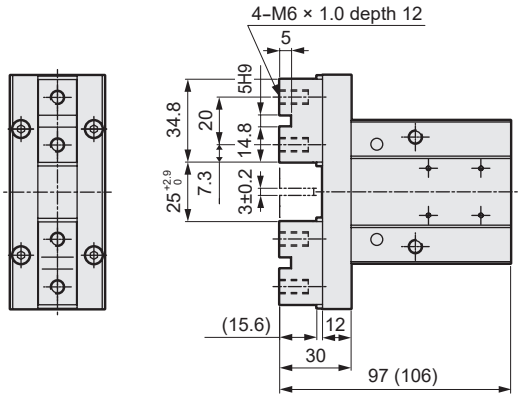
● LSH-A32*2N



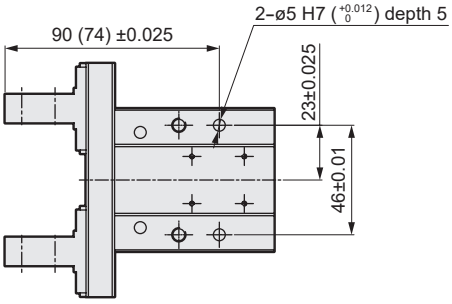
● LSH-A32*3N



● LSH-A32*4N

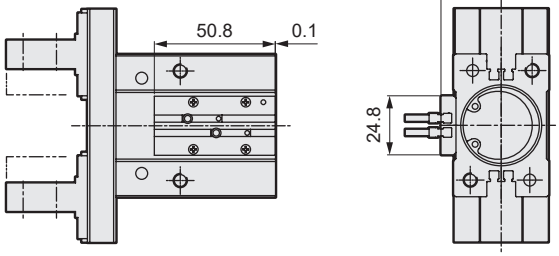


● LSH-A32*1/2/3R/L

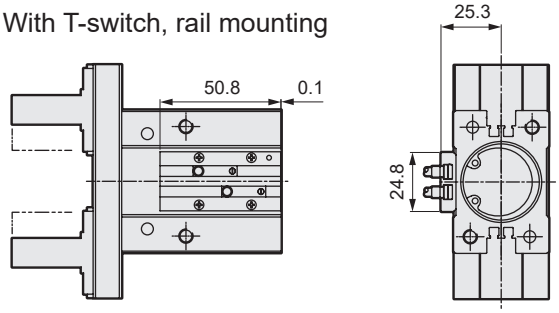


*4: Positioning holes are machined on surface R for LSH-A32**R and L for LSH-A32**L.
Refer to page 1567 for the base line.
*5: The dimensions in parentheses are the dimensions for LSH-A32*4.

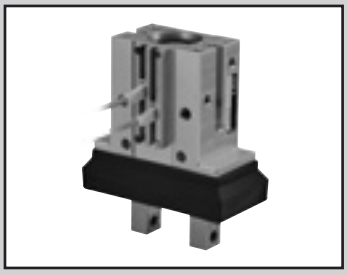
● With F-switch, rail mounting



● With T-switch, rail mounting



*6: Refer to page 1576 for cylinder switch precautions.

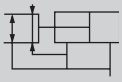


Linear Slide Hand double acting / single acting with rubber cover

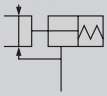
LSH-G / LSH-F Series

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

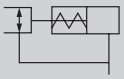
Double acting



Single acting (normally open)



Single acting (normally closed)

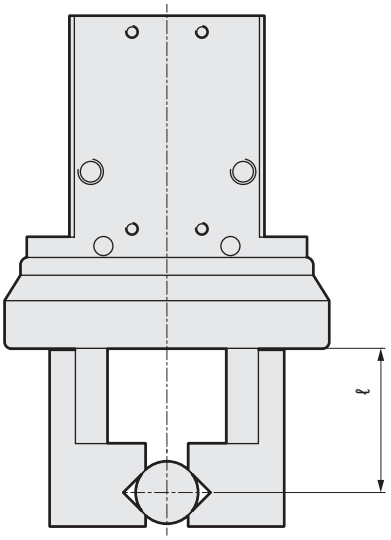


RoHS

Specifications

Descriptions		LSH-G, F					
Bore size	mm	ø6	ø10	ø16	ø20	ø25	ø32
Actuation		Double acting/single acting (normally open/normally closed)					
Working fluid		Compressed air					
Max. working pressure	MPa	0.7					
Min. working pressure MPa	Double acting	0.15	0.2	0.1			
	Single acting	0.3	0.35	0.25			-
Port size		M3		M5			
Ambient temperature	°C	−10 to 60°C (no freezing)					
Operating stroke	mm	4		6	10	14	22
Repeatability	mm	±0.01					
Weight Double acting (single acting)	kg	0.033	0.07	0.15	0.03 (0.035)	0.53 (0.535)	0.81
Lubrication		Not required					

Gripping force



Unit: N

Bore size (mm)	Double acting	
	Open side	Closed side
ø6	6.1	3.3
ø10	17	9.8
ø16	40	30
ø20	66	42
ø25	104	65
ø32	193	158

Bore size (mm)	Single acting (normally open)	
		Closed side
ø6	-	1.9
ø10		6.3
ø16		24
ø20		28
ø25		45

Bore size (mm)	Single acting (normally closed)	
	Open side	
ø6	3.7	-
ø10	12	
ø16	31	
ø20	56	
ø25	83	

* At supply pressure of 0.5 MPa, ℓ = 20 mm, stroke center

*1:Avoid gripping the workpiece with single acting spring force as much as possible. The gripping force may become unstable, leading to operation failure.

Switch specifications

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

*1: The F-switch uses a bend-resistant lead wire by default.

Item	Proximity 2-wire		Proximity 3-wire	
	T2H/T2V	T2HR3/T2VR3 (Lead wire, a bend-resistant type)	T3H/T3V	T3PH/T3PV
Applications	Programmable Controller dedicated		Programmable For controller, relay	
Output method	–	–	NPN output	PNP output
Power supply voltage	–	–	DC10 to 28V	
Load voltage/ current	10 to 30 VDC 5 to 20 mA	10 to 30 VDC 5 to 20 mA	30 VDC or less 100 mA or less	
Indicator	Red LED (Lit when ON)	Red LED (Lit when ON)	Red LED (Lit when ON)	Yellow LED (Lit when ON)
Leakage current	1 mA or less	1 mA or less	10 μA or less	
Shock resistance	980 m/s^2			
Weight g	1 m: 18 g 3 m: 49 g			

How to order

Without switch (built-in magnet for switch)

LSH - G 06 D 1 R — HP1

With switch (built-in magnet for switch)

LSH - G 06 D 1 R - F2H - D - HP1

Ⓐ Rubber cover
Ⓑ Bore size
Ⓒ Actuation
Ⓓ Finger
Ⓔ Grip center reference, high precision positioning hole
Ⓕ Switch model No.
Ⓖ Switch quantity

Code	Description
Ⓐ Rubber cover	
G	Chloroprene rubber
F	Fluoro rubber
Ⓑ Bore size (mm)	
06	ø6
10	ø10
16	ø16
20	ø20
25	ø25
32	ø32
Ⓒ Actuation	
D	Double acting
S	Single acting / normally open (ø32 cannot be selected)
C	Single acting / normally closed (ø32 cannot be selected)
Ⓓ Finger	
1	Basic
Ⓔ Grip center reference, high precision positioning hole	
N	None
L	Refer to the figure at left.
R	

Ⓕ Switch model No.

Blank	No switch, with F-switch rail
N	No switch, no switch rail
A	No switch, with T-switch rail (ø32 only)

Straight lead wire	L-shaped lead wire	Contact	Voltage AC	Voltage DC	Indicator	Lead wire
–	**F2S***	Proximity		●	1-color LED	2-wire
–	**F3S***			●		3-wire
F2H*	**F2V***			●		2-wire
F3H*	**F3V***			●		3-wire
F3PH*	**F3PV***			●		3-wire
T2H*	**T2V***			●		2-wire
T2HR3	**T2VR3**			●		2-wire
T3H*	**T3V***			●		3-wire
T3PH*	**T3PV***			●		3-wire

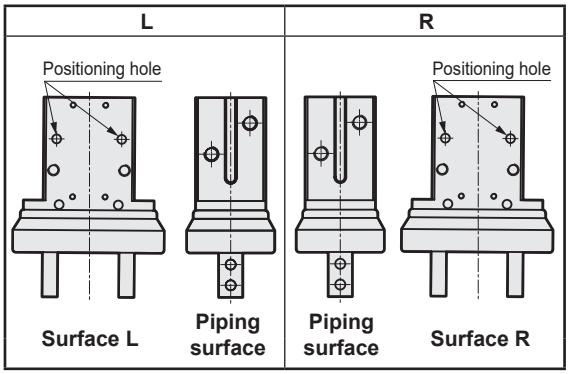
*** Lead wire length**	
Blank	1 m (standard)
3	3 m (option)

Ⓖ Switch quantity

R	1 on open side
H	1 on closed side
D	2

*1: If the one with the switch is selected, the product comes with a rail plate corresponding to the switch.
*2: Only ø32 can be selected with the T-switch.
*3: Refer to page 1577 for cylinder switch precautions.

Grip center reference, high precision positioning hole position diagram



Refer to the Dimensions (pages 1526 to 1531) and page 1567 for details.

How to order switch

SW - F2H*

Switch model No. (Item Ⓕ above)

Switch mounting availability table

Model No.	Switch model No.	Side mounting	Rail mounting
LSH-G/F06	F2/3□	●	–
	F2/3S	–	●
LSH-G/F10	F2/3□	●	●
	F2/3S	●	●
LSH-G/F16	F2/3□	●	●
	F2/3S	●	●
LSH-G/F20	F2/3□	●	●
	F2/3S	●	●
LSH-G/F25	F2/3H·PH·PV	–	●
	F2/3V	●	●
	F2/3S	●	●
LSH-G/F32	F2/3□	●	●
	F2/3S	●	●
	T2/3□	–	●

[Example of model No.]

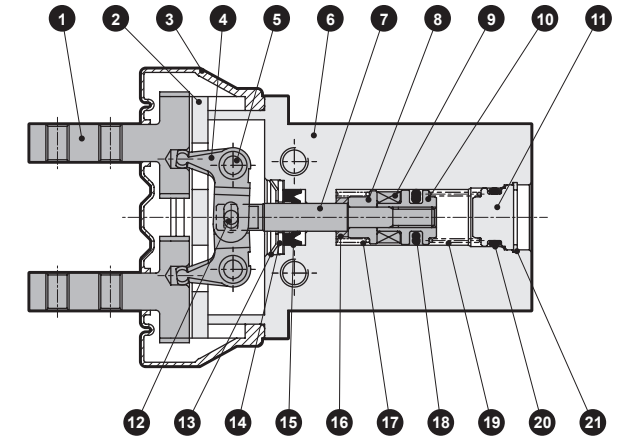
LSH-G06D1R-F2H-D-HP1

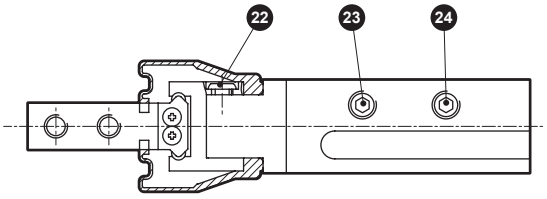
Model: Linear Slide Hand

Ⓐ Rubber cover	: Chloroprene rubber
Ⓑ Bore size	: ø6
Ⓒ Actuation	: Double acting
Ⓓ Finger	: Basic
Ⓔ Grip center reference, high precision positioning hole	: R
Ⓕ Switch model No.	: Proximity F2H, lead wire 1 m
Ⓖ Switch quantity	: 2

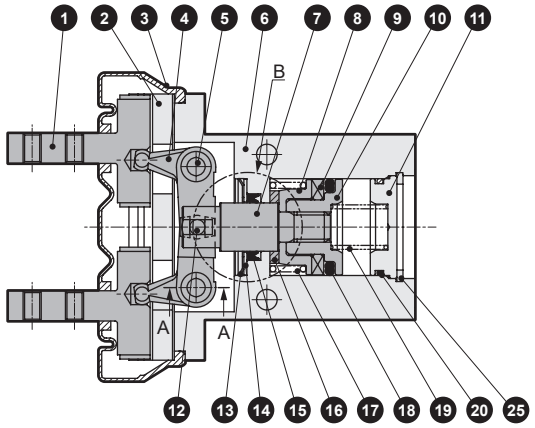
Internal structure and parts list

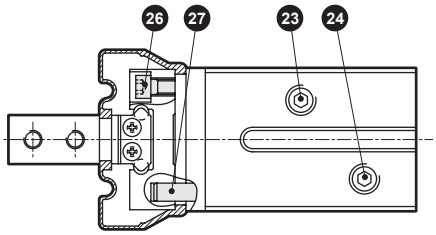
● LSH-G06 / LSH-F06



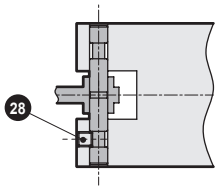


● LSH-G10 to G25 / LSH-F10 to F25

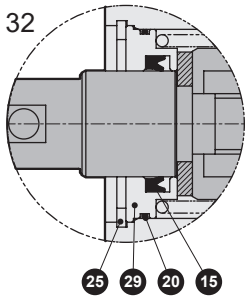




Cross-section A-A



B part ø20, 25, 32



Parts list

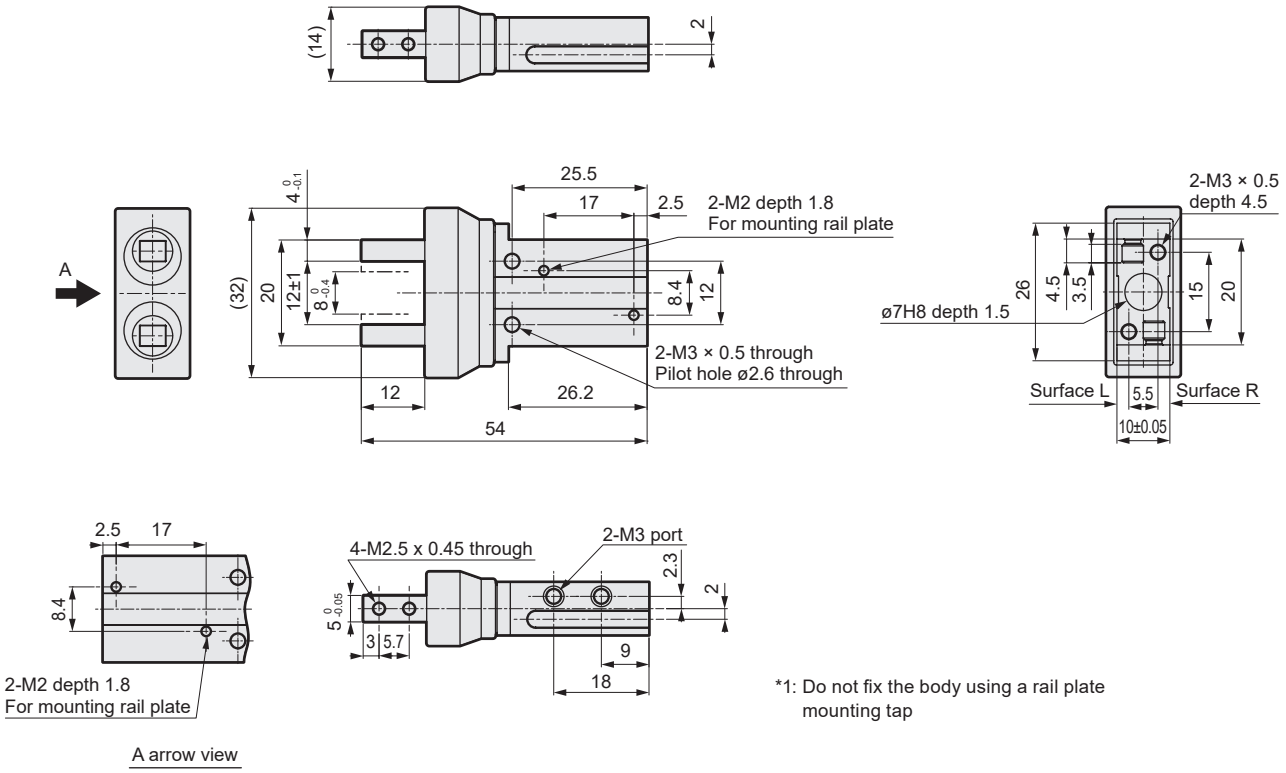
No.	Part name	Material	Remarks	No.	Part name	Material	Remarks
1	Finger	Stainless steel		16	Cushion rubber	Urethane rubber	
2	Linear guide	Stainless steel		17	Coil spring	Piano wire	Single acting C
3	Rubber cover	LSH-G : Chloroprene LSH-F : Fluorine		18	Piston packing	Nitrile rubber	
4	Lever	Stainless steel		19	Coil spring	Piano wire	Single acting S
5	Fulcrum axis	Steel		20	O-ring	Nitrile rubber	
6	Body	Aluminum alloy		21	C-snap ring	Steel	
7	Piston rod	Stainless steel		22	Pan head machine screw	Stainless steel	
8	Spring bracket	Aluminum alloy		23	Plug	Stainless steel	Single acting C
9	Magnet			24	Plug	Stainless steel	Single acting S
10	Piston	Aluminum alloy		25	C-snap ring	Stainless steel	
11	Head cover	Aluminum alloy		26	Hexagon socket head cap screw	Stainless steel	ø32 is steel
12	Operation shaft	Steel alloy		27	Pin	Steel	
13	CR ring	Stainless steel		28	Hexagon socket set screw	Stainless steel	
14	Cap	Stainless steel		29	Rod metal	Aluminum alloy	
15	Rod packing	Nitrile rubber					

Repair parts list

Bore size	Kit No.	Repair part No.	Rubber cover (part No. 3)		Rail plate kit No.		
			LSH-G Chloroprene	LSH-F Fluorine	For F-switch	For T-switch	Description
ø6	Cannot be disassembled	–	LSH-G06K	LSH-F06K	LSH-RPF-06-HP	–	Rail plate small screw
ø10	LSH-10K-HP	13 15 18 20	LSH-G10K	LSH-F10K	LSH-RPF-10-HP	–	
ø16	LSH-16K-HP		LSH-G16K	LSH-F16K	LSH-RPF-16-HP	–	
ø20	LSH-20K-HP	15 18 20	LSH-G20K	LSH-F20K	LSH-RPF-20-HP	–	
ø25	LSH-25K-HP		LSH-G25K	LSH-F25K	LSH-RPF-25-HP	–	
ø32	LSH-32K-HP		LSH-G32K	LSH-F32K	LSH-RPF-32-HP	LSH-RPT-32-HP	

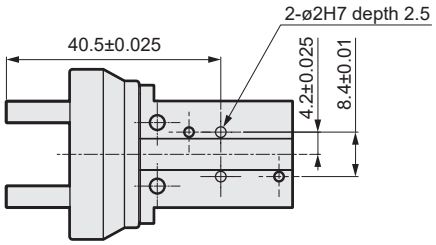
Dimensions (bore size: ø6)

● LSH-G06, LSH-F06



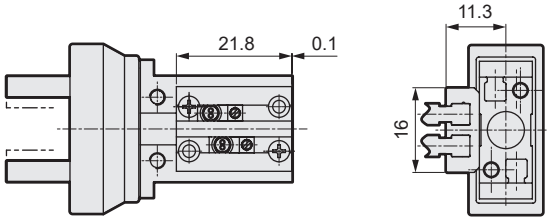
*1: Do not fix the body using a rail plate mounting tap

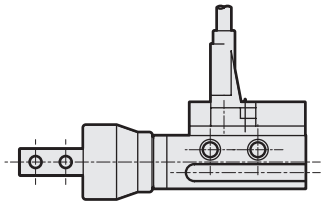
● LSH-G06*1R / L, LSH-F06*1R / L



*2: Pin holes are machined on surface R for LSH-G06*1R and L for LSH-G06*1L. Refer to page 1567 for the base line.

● With switch, rail assembly

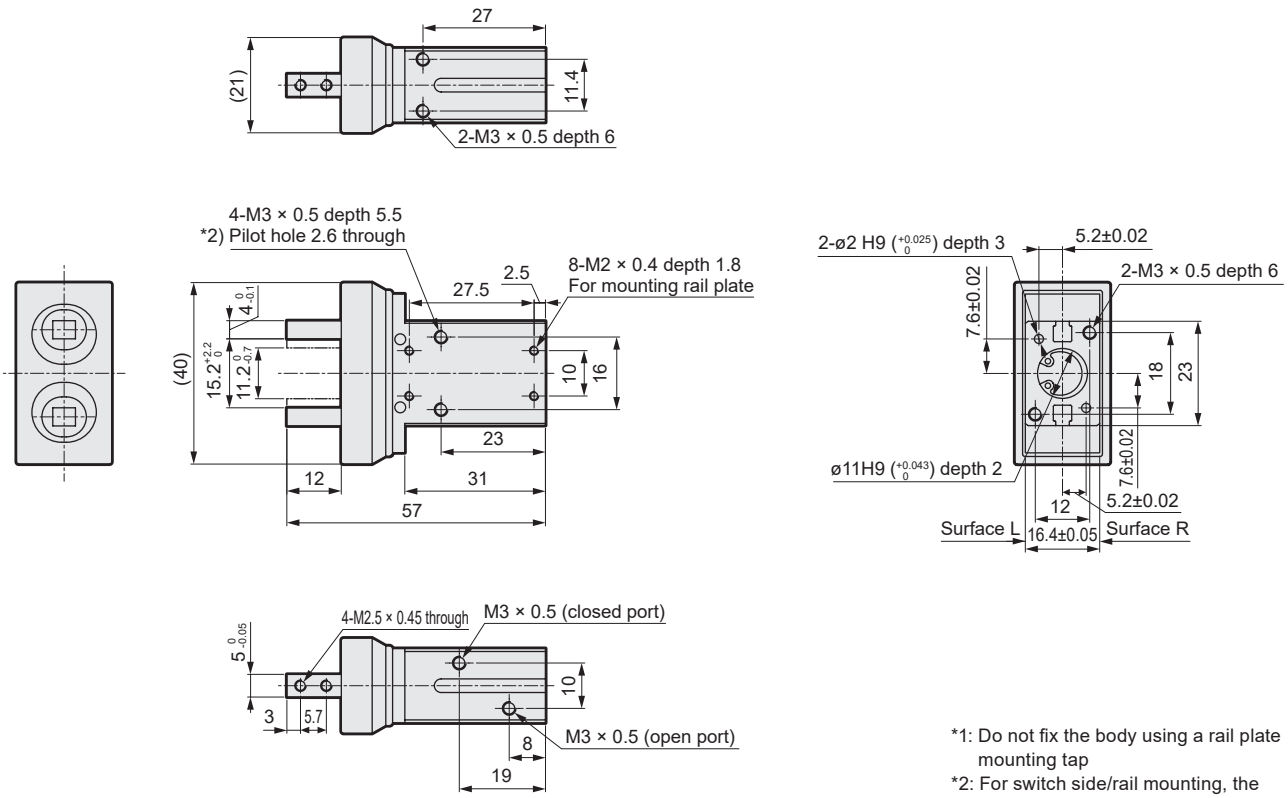




*3: Refer to Page 1577 for cylinder switch precautions.
*4: Use fittings with an outer diameter of ø9 or less to prevent them from interfering with each other.

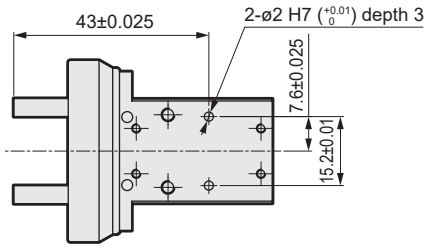
Dimensions (bore size: ø10)

● LSH-G10, LSH-F10



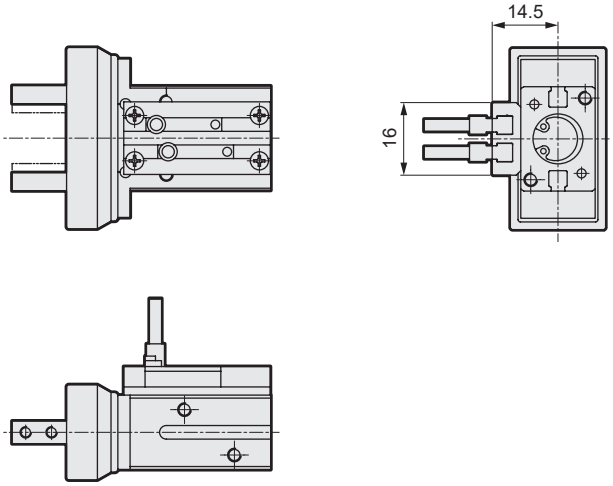
*1: Do not fix the body using a rail plate mounting tap
*2: For switch side/rail mounting, the through hole cannot be used.

● LSH-G10*1R / L, LSH-F10*1R / L



*3: Pin holes are machined on surface R for LSH-G10*1R and L for LSH-G10*1L.
Refer to page 1567 for the base line.

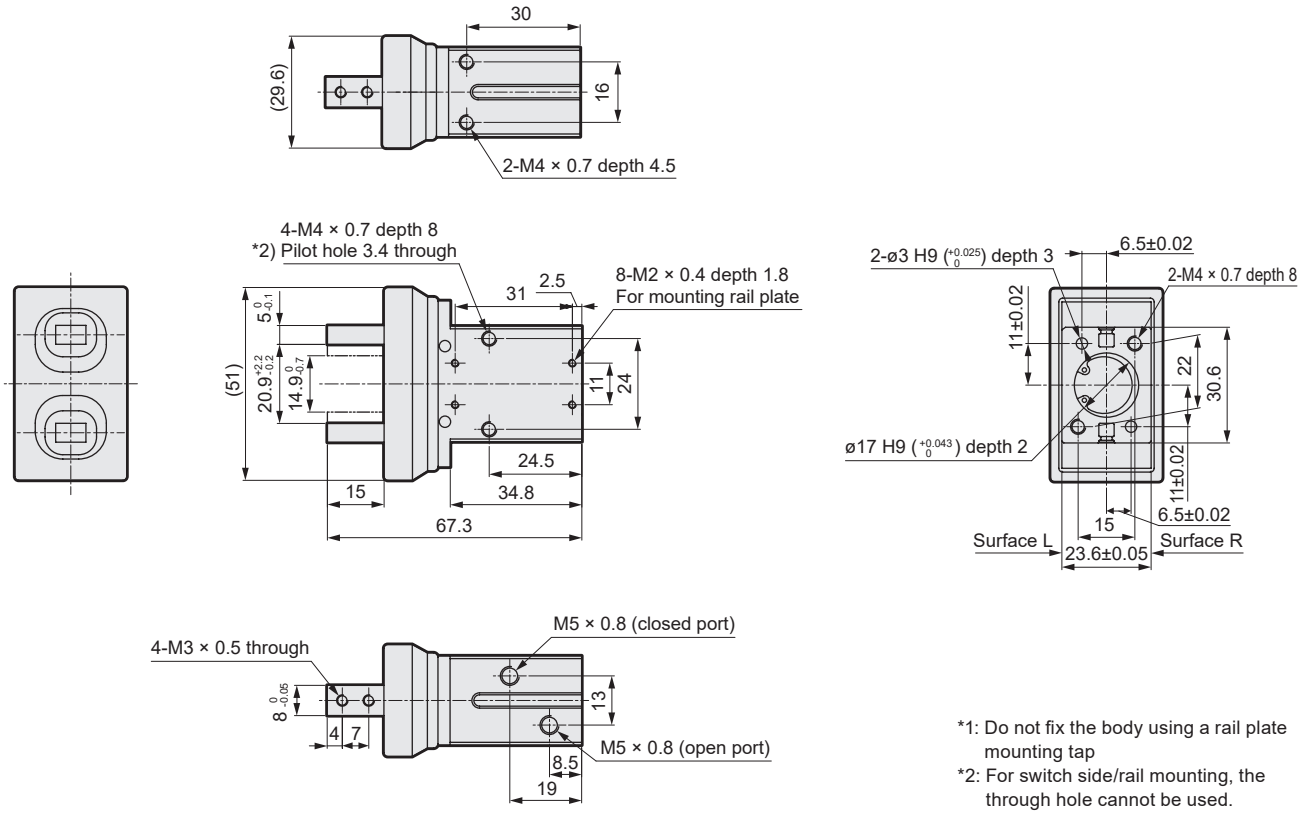
● With switch, rail assembly



*4: Refer to page 1577 for cylinder switch precautions.

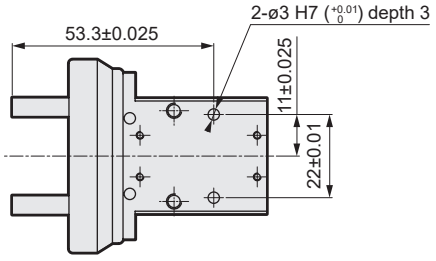
Dimensions (bore size: ø16)

● LSH-G16, LSH-F16



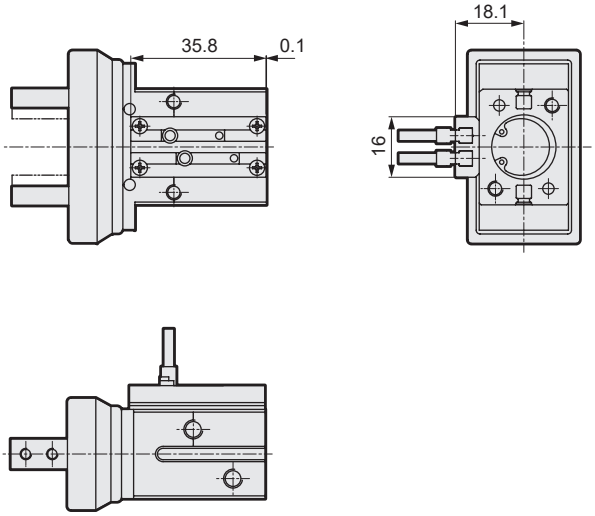
*1: Do not fix the body using a rail plate mounting tap
*2: For switch side/rail mounting, the through hole cannot be used.

● LSH-G16*1R / L, LSH-F16*1R / L



*3: Pin holes are machined on surface R for LSH-G16*1R and L for LSH-G16*1L. Refer to page 1567 for the base line.

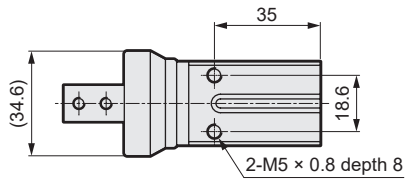
● With switch, rail assembly

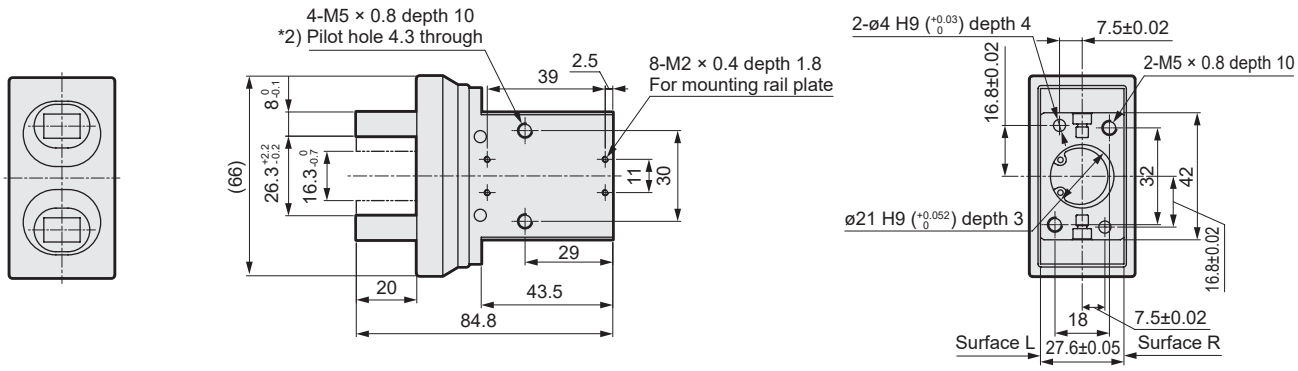


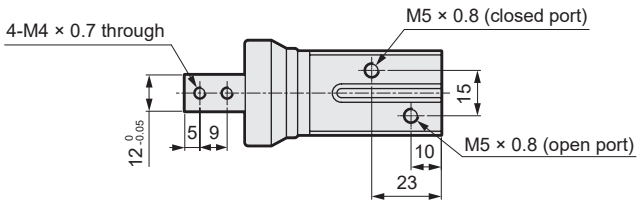
*4: Refer to page 1577 for cylinder switch precautions.

Dimensions (bore size: ø20)

● LSH-G20, LSH-F20

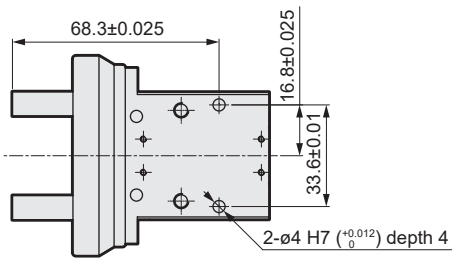






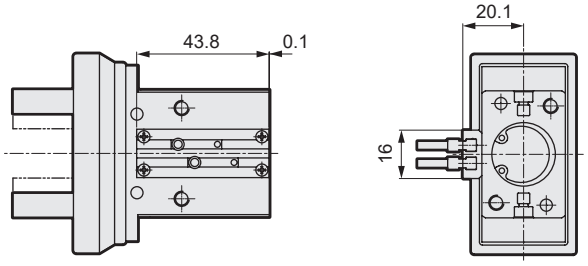
*1: Do not fix the body using a rail plate mounting tap
*2: For switch side mounting, the through hole cannot be used.

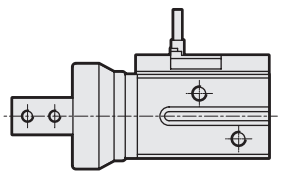
● LSH-G20*1R / L, LSH-F20*1R / L



*3: Pin holes are machined on surface R for LSH-G20*1R and L for LSH-G20*1L. Refer to page 1567 for the base line.

● With switch, rail assembly

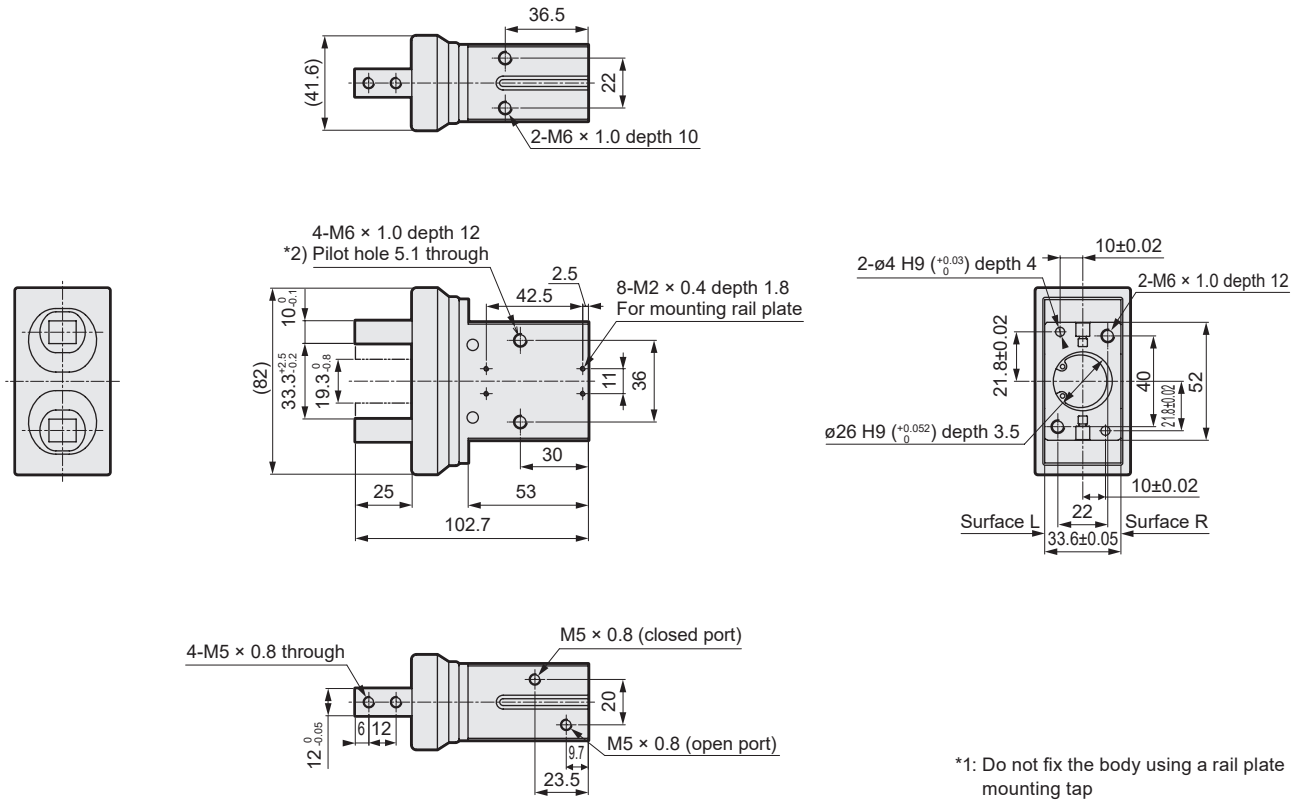




*4: Refer to page 1577 for cylinder switch precautions.

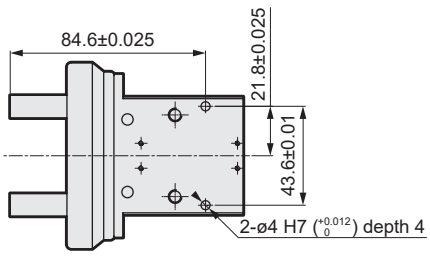
Dimensions (bore size: ø25)

● LSH-G25, LSH-F25



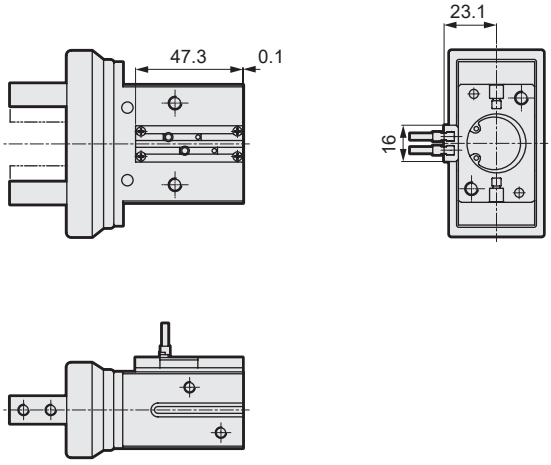
*1: Do not fix the body using a rail plate mounting tap
*2: For switch side mounting, the through hole cannot be used.

● LSH-G25*1R / L, LSH-F25*1R / L



*3: Positioning holes are machined on surface R for LSH-G25*1R and L for LSH-G25*1L.
Refer to page 1567 for the base line.

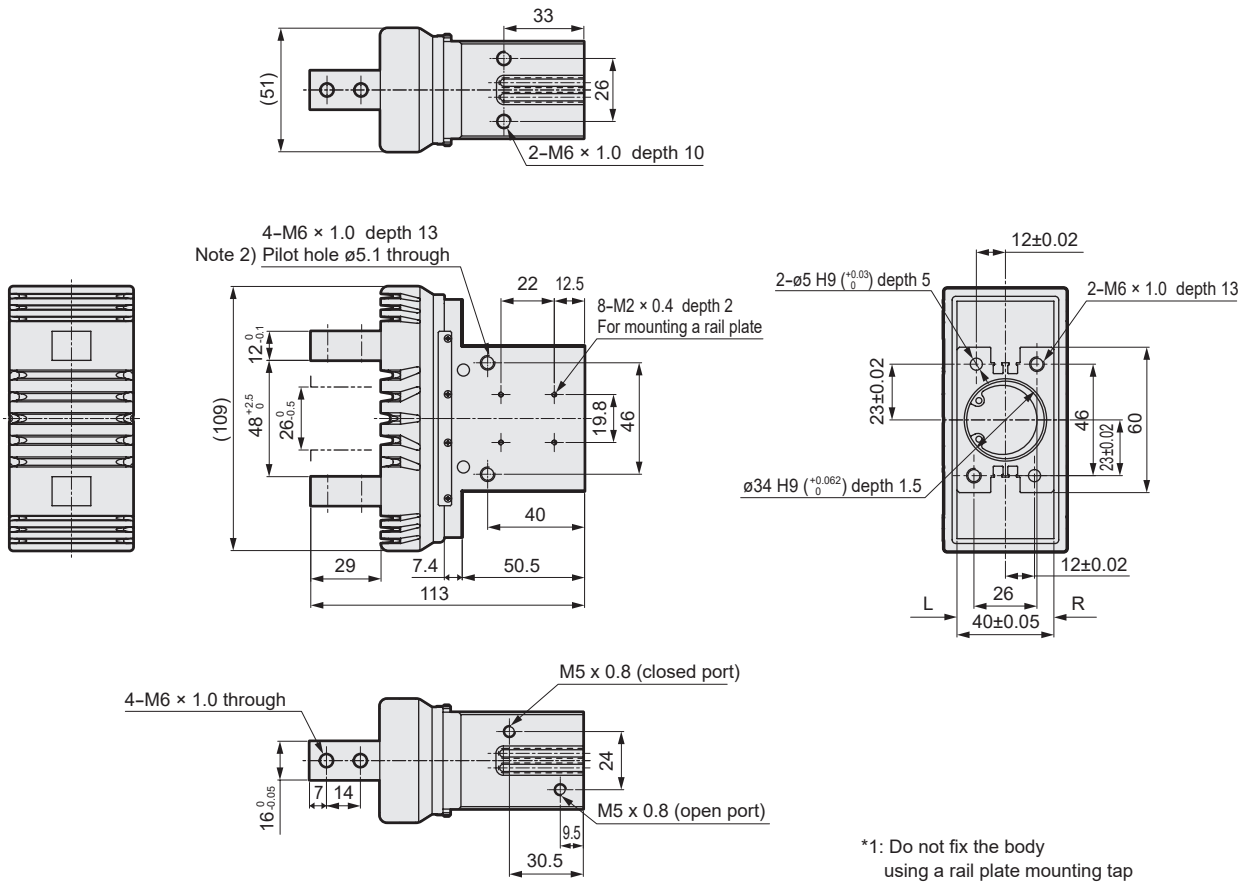
● With switch, rail assembly



*4: Refer to page 1577 for cylinder switch precautions.

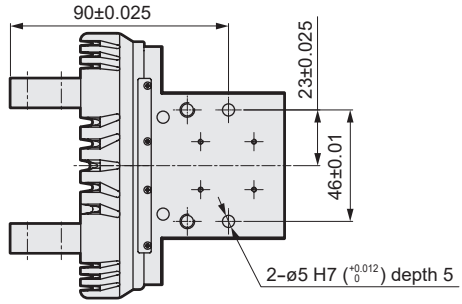
Dimensions (bore size: ø32)

● LSH-G32, LSH-F32



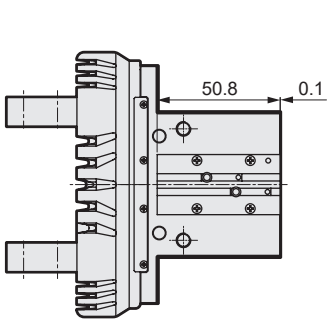
*1: Do not fix the body using a rail plate mounting tap

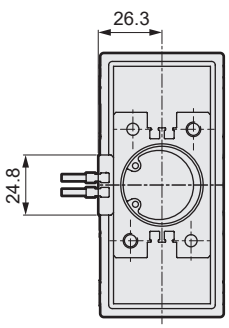
● LSH-G32D1R/L, LSH-F32D1R/L



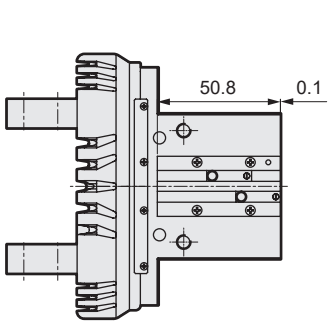
*2: Positioning holes are machined on surface R for LSH-G32D1R and L for LSH-G32D1L. Refer to page 1567 for the base line.

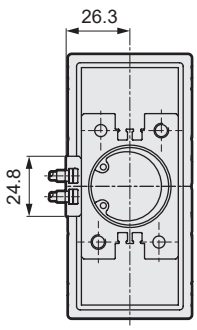
● With F-switch, rail mounting





● With T-switch, rail mounting



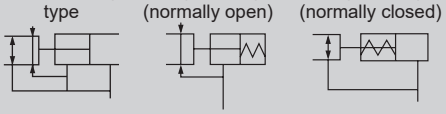


*3: Refer to page 1577 for cylinder switch precautions.

Linear Slide Hand long stroke Double acting type/Single acting type

LSHL-A Series

● Operating stroke: 8, 12, 18, 22 mm

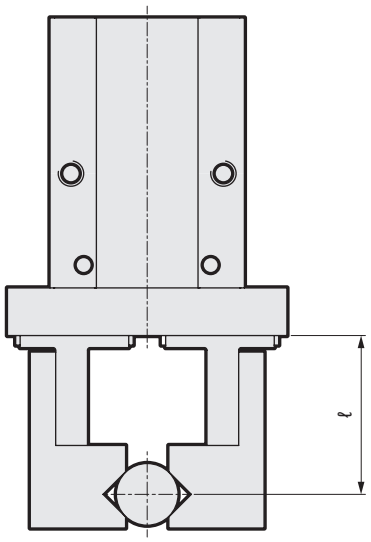


RoHS

Specifications

Descriptions			LSHL-A			
Bore size		mm	ø10	ø16	ø20	ø25
Actuation			Double acting/single acting (normally open/normally closed)			
Working fluid			Compressed air			
Max. working pressure		MPa	0.7			
Min. working pressure	MPa	Double acting	0.2	0.1		
		Single acting	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 Double acting (Single acting)	kg	Finger OP: 1, 2, 3	0.065 (0.075)	0.155 (0.165)	0.315 (0.335)	0.54 (0.585)
		Finger OP: 4		0.16 (0.17)	0.32 (0.34)	0.545 (0.59)
Lubrication			Not required			

Gripping force



Unit: N

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

Bore size (mm)	Single acting (normally open)	
		Closed side
ø10	-	7.1
ø16		27
ø20		33
ø25		50

Bore size (mm)	Single acting (normally closed)	
	Open side	
ø10	13	-
ø16	38	
ø20	57	
ø25	85	

* At supply pressure of 0.5 MPa, ℓ = 20 mm, stroke center

*1: Avoid gripping the workpiece with single acting spring force as much as possible. The gripping force may become unstable, leading to operation failure.

Switch specifications

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

*1: The F-switch uses a bend-resistant lead wire by default.

How to order

Without switch (built-in magnet for switch)

LSHL - A 10 D 1 R ——— HP1

With switch (built-in magnet for switch)

LSHL - A 10 D 1 R - F2H - D - HP1

Code	Description
Ⓐ Rubber cover	
A	Without rubber cover
Ⓑ Bore size (mm)	
10	ø10
16	ø16
20	ø20
25	ø25
Ⓒ Actuation	
D	Double acting
S	Single acting/normally open
C	Single acting/normally closed
Ⓓ Finger	
1	Basic
2	Side tap
3	Through hole
4	Flat
Ⓔ Grip center reference, high precision positioning hole	
N	None
L	Refer to the figure at left.
R	

Ⓐ Rubber cover
Ⓑ Bore size
Ⓒ Actuation
Ⓓ Finger
Ⓔ Grip center reference, high precision positioning hole
Ⓕ Switch model No.
Ⓖ Switch quantity

Ⓕ Switch model No.

Blank	Without switch, rail plate attached
N	Without switch or rail plate

Straight lead wire	L-shaped lead wire	Contact	Voltage AC	Voltage DC	Indicator	Lead wire
–	**F2S***	Proximity		●	1-color LED	2-wire
–	**F3S***			●		3-wire
F2H*	**F2V***			●		2-wire
F3H*	**F3V***			●		3-wire
F3PH*	**F3PV***			●		3-wire

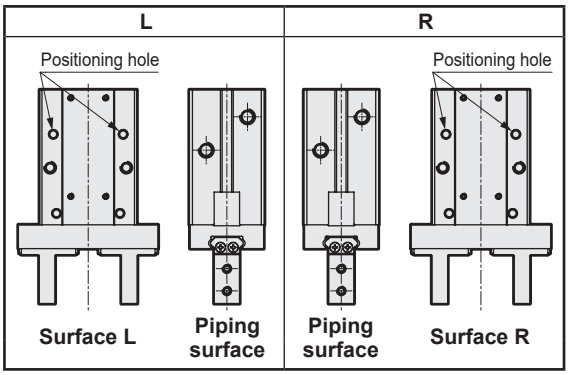
*** Lead wire length**	
Blank	1 m (standard)
3	3 m (option)

Ⓖ Switch quantity

R	1 on open side
H	1 on closed side
D	2

*1: When selecting "With switch", a rail plate is attached.
*2: Refer to page 1578 for cylinder switch precautions.

Grip center reference, high precision positioning hole position diagram



Refer to the Dimensions (page 1535 to 1538) and page 1567 for details.

How to order switch

SW - F2H*

Switch model No. (Item Ⓕ above)

[Example of model No.]

LSHL-A10D1R-N-HP1

Model: Linear Slide Hand, long stroke

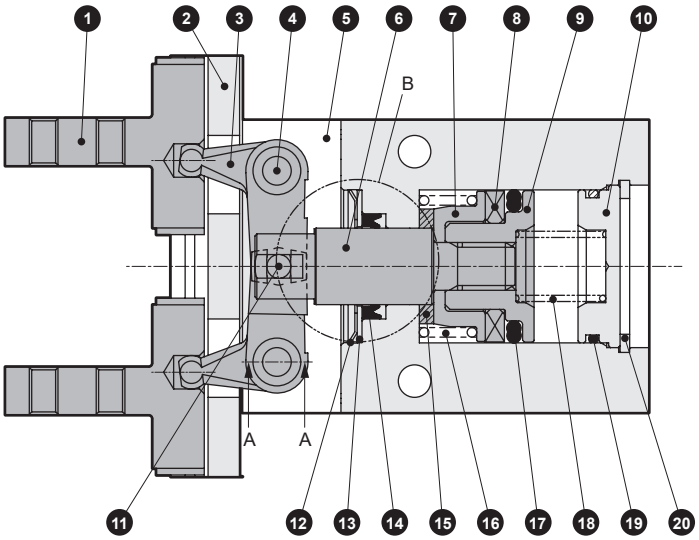
Ⓐ Rubber cover	: Without rubber cover
Ⓑ Bore size	: ø10
Ⓒ Actuation	: Double acting
Ⓓ Finger	: Basic
Ⓔ Grip center reference, high precision positioning hole	: R
Ⓕ Switch model No.	: Without switch or rail plate

Switch mounting availability table

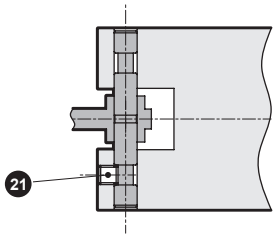
Model No.	Switch model No.	Side mounting	Rail mounting
LSHL-A10	F2/3□	●	●
	F2/3S	●	●
LSHL-A16	F2/3□	●	●
	F2/3S	●	●
LSHL-A20	F2/3□	●	●
	F2/3S	●	●
LSHL-A25	F2/3□	●	●
	F2/3S	●	●

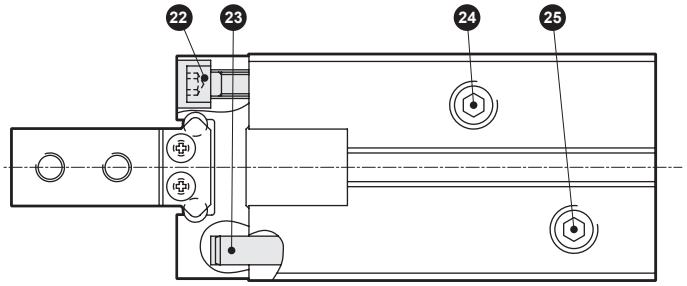
Internal structure and parts list

● LSHL-A10 to 25

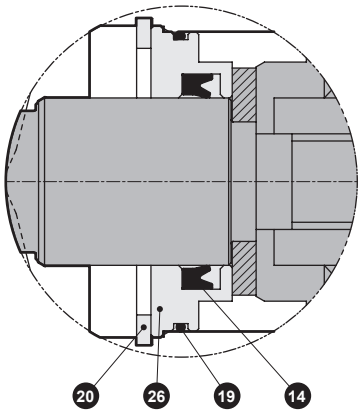


Cross-section A-A





B part ø20, 25



Parts list

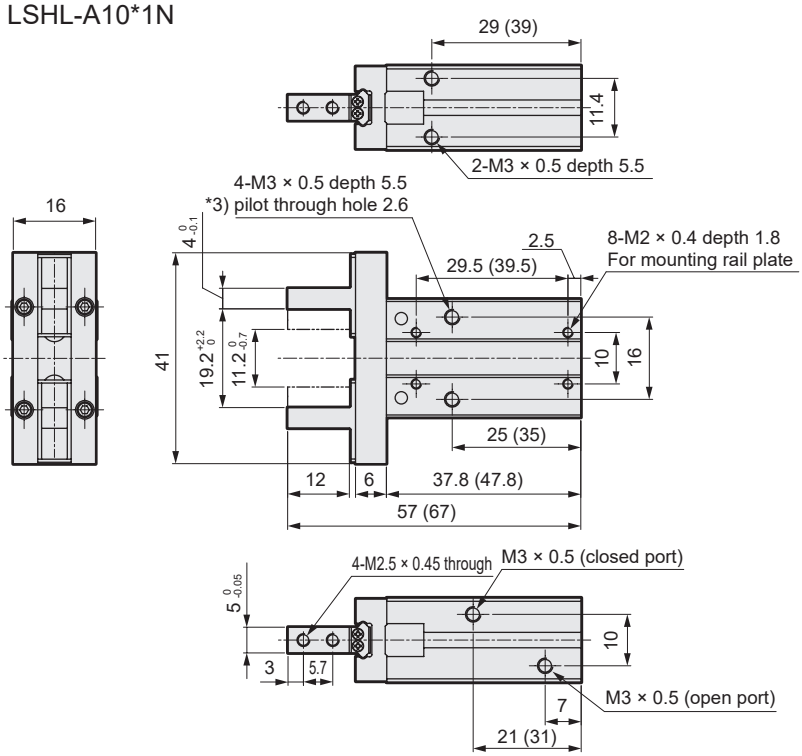
No.	Part name	Material	Remarks	No.	Part name	Material	Remarks
1	Finger	Stainless steel		14	Rod packing	Nitrile rubber	
2	Linear guide	Stainless steel		15	Cushion rubber	Urethane rubber	
3	Lever	Stainless steel		16	Cylindrical spring	Piano wire	Single acting C
4	Fulcrum axis	Steel		17	Piston packing	Nitrile rubber	
5	Body	Aluminum alloy		18	Cylindrical spring	Piano wire	Single acting S
6	Piston rod	Stainless steel		19	O-ring	Nitrile rubber	
7	Spring bracket	Aluminum alloy		20	C-snap 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	Operation shaft	Steel alloy		24	Plug	Stainless steel	Single acting C
12	CR ring	Stainless steel		25	Plug	Stainless steel	Single acting S
13	Cap	Stainless steel		26	Rod metal	Aluminum alloy	

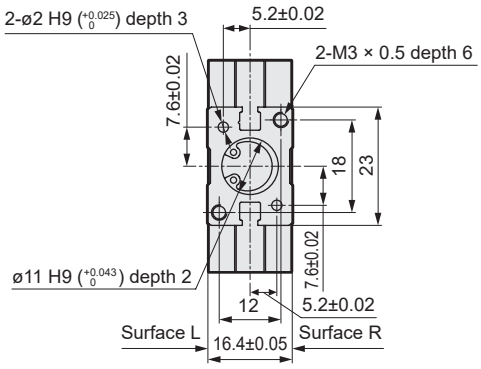
Repair parts list

Bore size	Kit No.	Repair part No.	Rail plate kit No.		
			For double acting	For single acting	Description
ø10	LSHL-10K-HP	12 14 17 19	LSHL-RPF-10-HP	LSHL-RPF2-10-HP	Rail plate small screw
ø16	LSHL-16K-HP		LSHL-RPF-16-HP		
ø20	LSHL-20K-HP	14 17 19	LSHL-RPF-20-HP		
ø25	LSHL-25K-HP		LSHL-RPF-25-HP		

Dimensions (bore size: ø10)

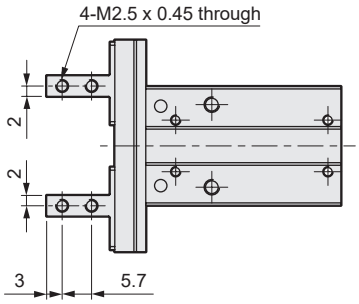
● LSHL-A10*1N



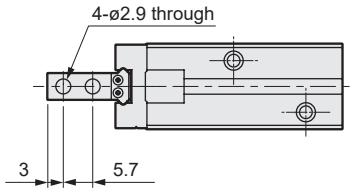


*1: Do not fix the body using a rail plate mounting tap
*2: ( ) are the dimensions during single action.
*3: For switch side/rail mounting, the through hole cannot be used.

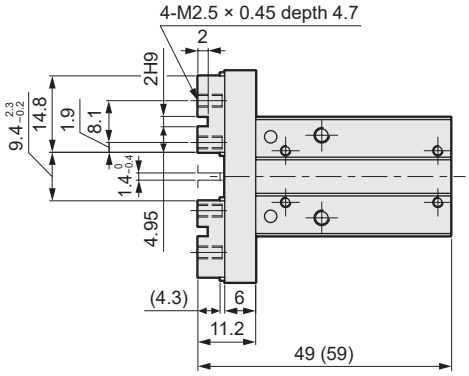
● LSHL-A10*2N



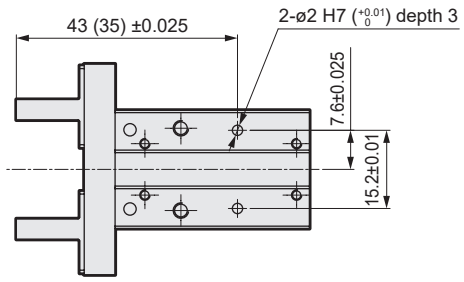
● LSHL-A10*3N



● LSHL-A10*4N

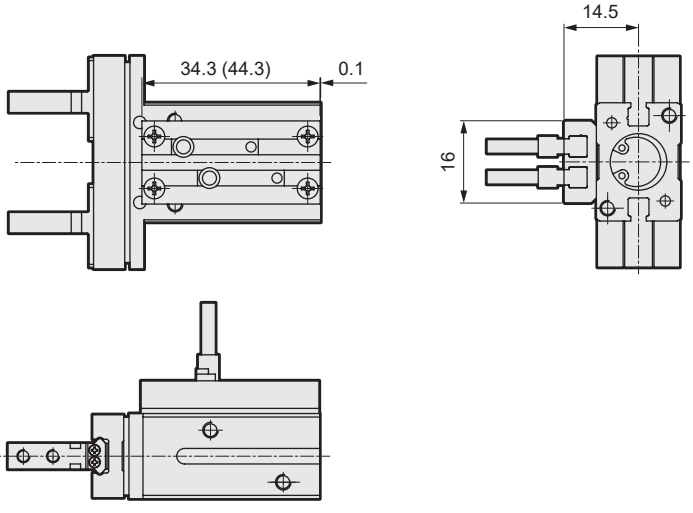


● LSHL-A10**R / L



*4: Pin holes are machined on surface R for LSHL-A10D1R and L for LSHL-A10D1L. Refer to page 1567 for the base line.
*5: The dimensions in parentheses are the dimensions for LSHL-A10*4.

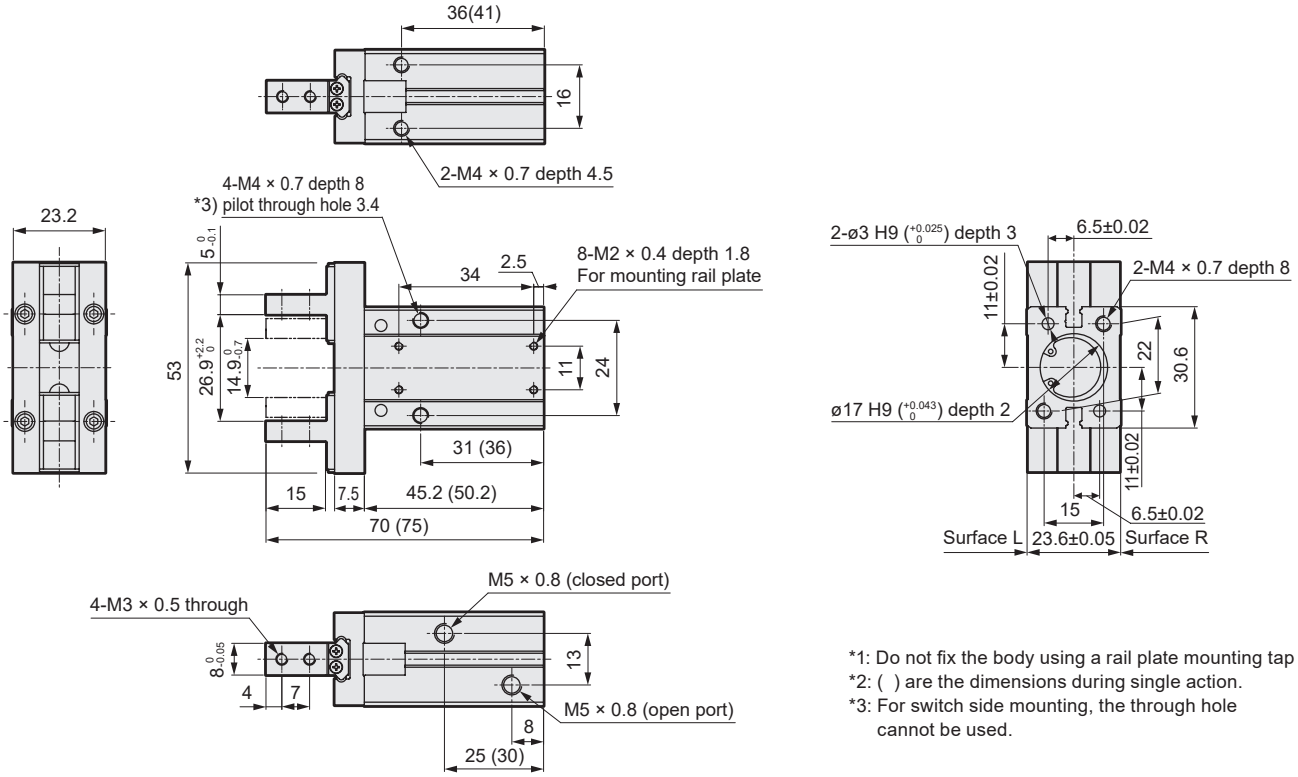
● With switch, rail assembly



*6: ( ) are the dimensions during single action.
*7: Refer to page 1578 for cylinder switch precautions.

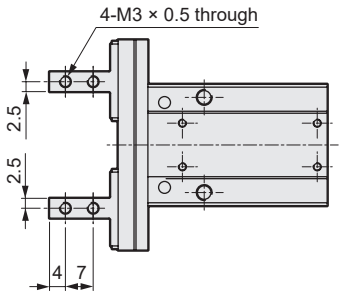
Dimensions (bore size: ø16)

● LSHL-A16*1N

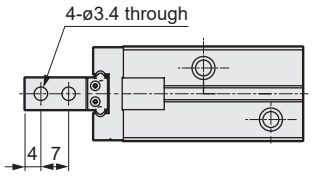


*1: Do not fix the body using a rail plate mounting tap
*2: ( ) are the dimensions during single action.
*3: For switch side mounting, the through hole cannot be used.

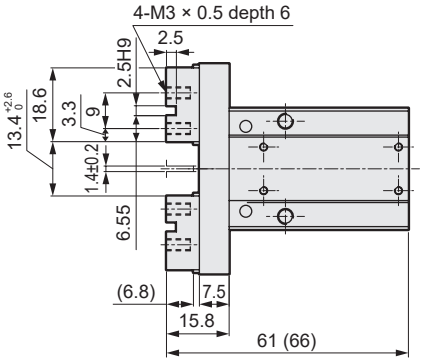
● LSHL-A16*2N



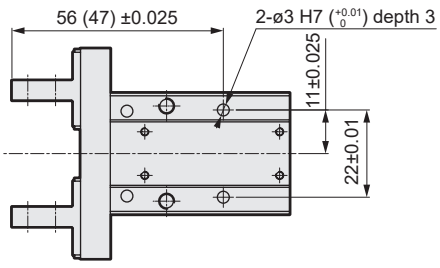
● LSHL-A16*3N



● LSHL-A16*4N

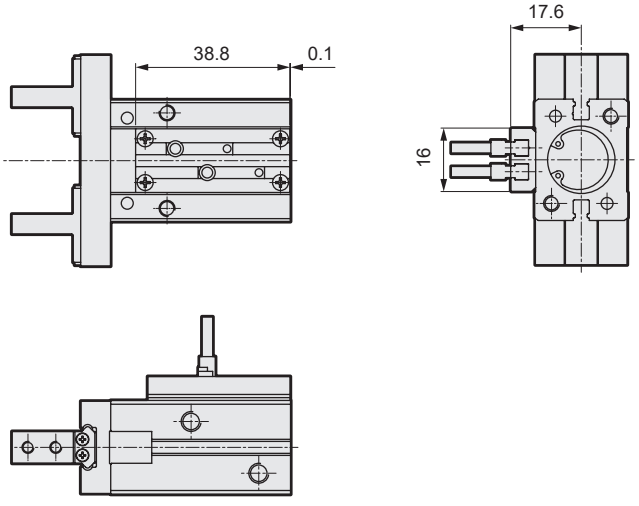


● LSHL-A16**R / L



*4: Pin holes are machined on surface R for LSHL-A16D1R and L for LSHL-A16D1L. Refer to page 1567 for the base line.
*5: The dimensions in parentheses are the dimensions for LSHL-A16*4.

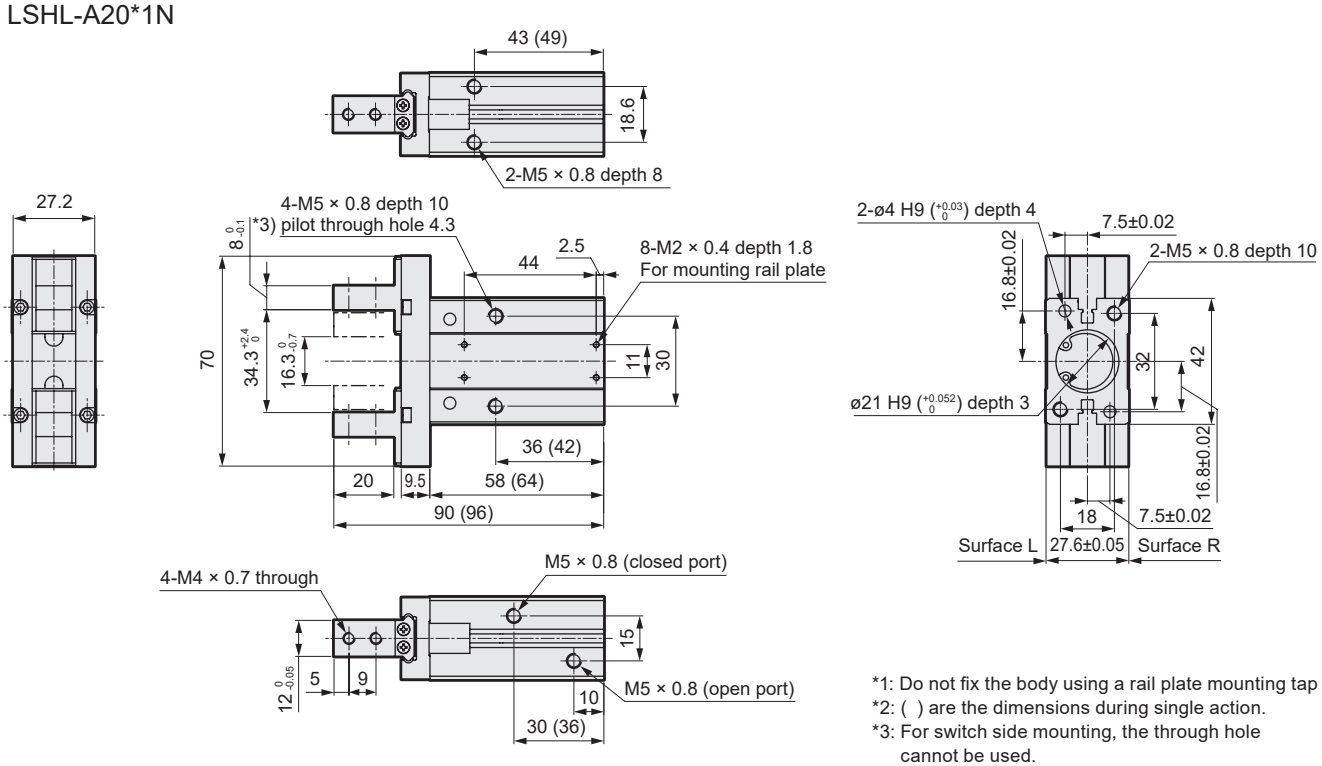
● With switch, rail assembly



*6: Refer to page 1578 for cylinder switch precautions.

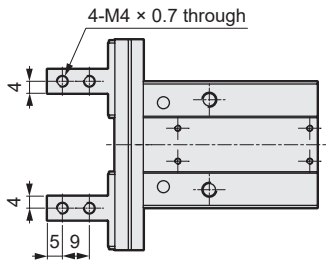
Dimensions (bore size: ø20)

● LSHL-A20*1N

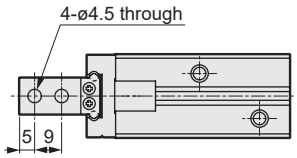


*1: Do not fix the body using a rail plate mounting tap
*2: ( ) are the dimensions during single action.
*3: For switch side mounting, the through hole cannot be used.

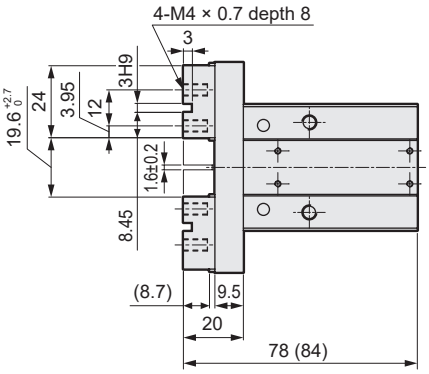
● LSHL-A20*2N



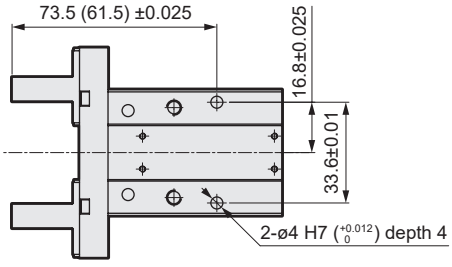
● LSHL-A20*3N



● LSHL-A20*4N

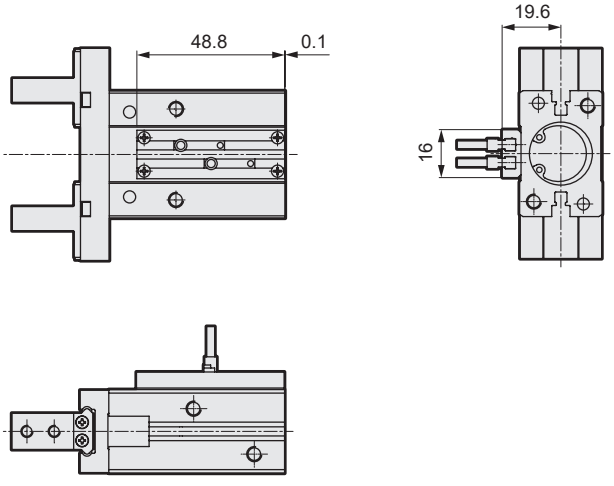


● LSHL-A20**R / L



*4: Pin holes are machined on surface R for LSHL-A20D1R and L for LSHL-A20D1L. Refer to page 1567 for the base line.
*5: The dimensions in parentheses are the dimensions for LSHL-A20*4.

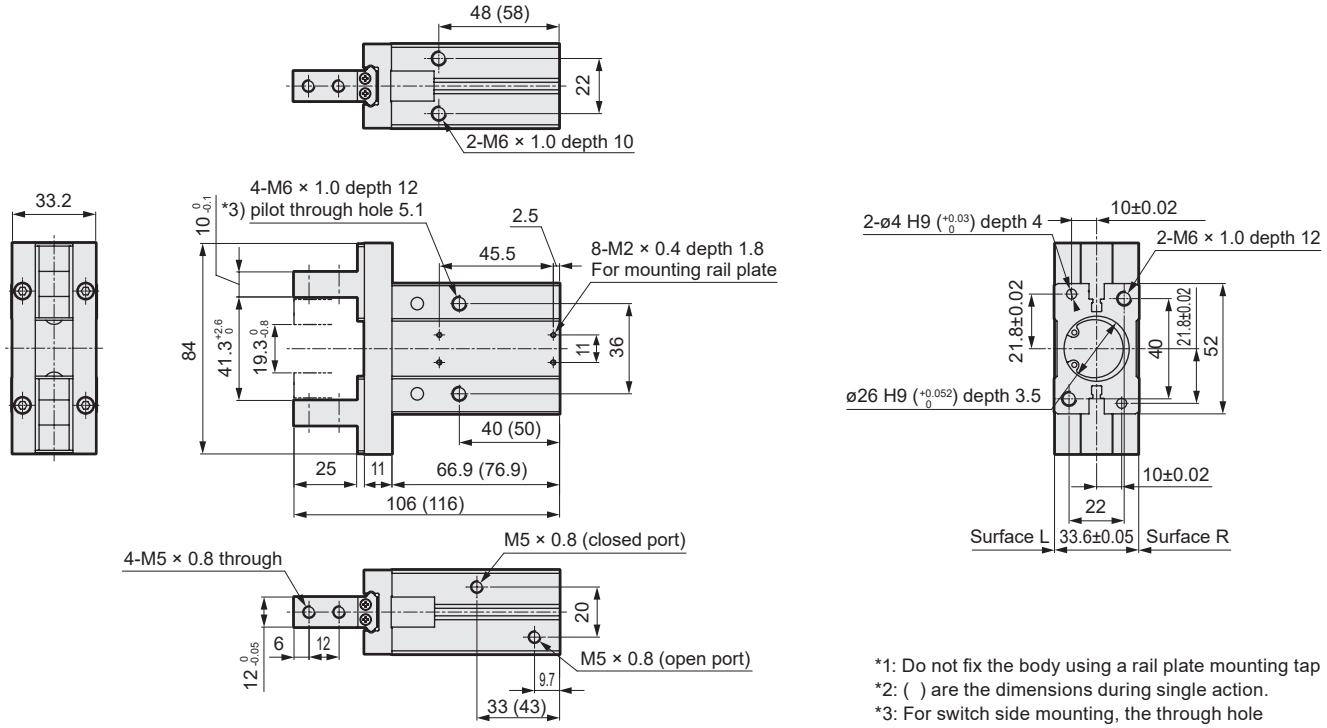
● With switch, rail assembly



*6: Refer to page 1578 for cylinder switch precautions.

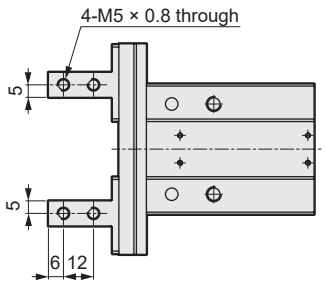
Dimensions (bore size: ø25)

● LSHL-A25*1N

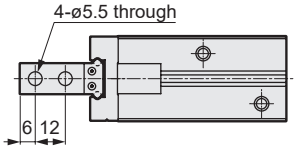


*1: Do not fix the body using a rail plate mounting tap
*2: ( ) are the dimensions during single action.
*3: For switch side mounting, the through hole cannot be used.

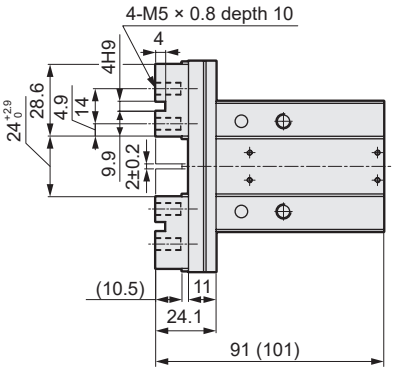
● LSHL-A25*2N



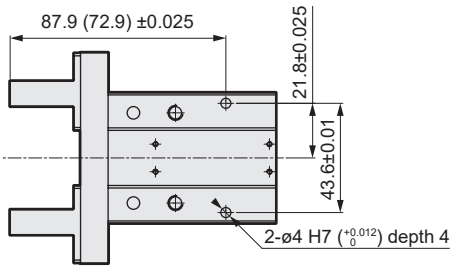
● LSHL-A25*3N



● LSHL-A25*4N

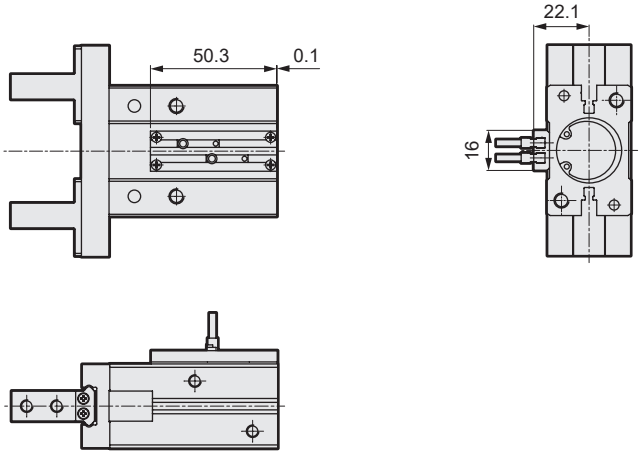


● LSHL-A25**R / L



*4: Positioning holes are machined on surface R for LSHL-A25D1R and L for LSHL-A25D1L.
Refer to page 1567 for the base line.
*5: The dimensions in parentheses are the dimensions for LSHL-A25*4.

● With switch, rail assembly



*6: Refer to page 1578 for cylinder switch precautions.

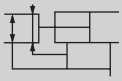
MEMO

Linear Slide Hand, long stroke double acting with rubber cover

LSHL-G / LSHL-F Series

● Operating stroke: 8, 12, 18 mm

Double acting

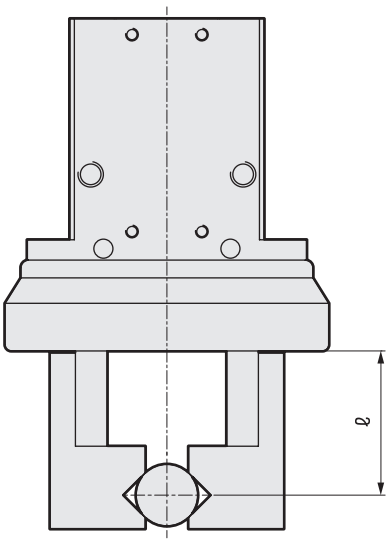


RoHS

Specifications

Item		LSHL-G, F		
Bore size	mm	ø10	ø16	ø20
Actuation		Double acting		
Working fluid		Compressed air		
Max. working pressure	MPa	0.7		
Min. working pressure	MPa	0.2	0.1	
Port size		M3	M5	
Ambient temperature	°C	-10 to 60°C (no freezing)		
Operating stroke	mm	8	12	18
Repeatability	mm	±0.01		
Weight	kg	0.09	0.18	0.39
Lubrication		Not required		

Gripping force



Unit: N

Bore size (mm)	Double acting	
	Open side	Closed side
ø10	17	11
ø16	45	34
ø20	66	42

* At supply pressure of 0.5 MPa, ℓ = 20 mm, stroke center

Switch specifications

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

*1: The F-switch uses a bend-resistant lead wire by default.

How to order

Without switch (built-in magnet for switch)

LSHL - G 10 D 1 R ——— HP1

With switch (built-in magnet for switch)

LSHL - G 10 D 1 R - F2H - D - HP1

Code	Description
Ⓐ Rubber cover	
G	Chloroprene rubber
F	Fluoro rubber
Ⓑ Bore size (mm)	
10	ø10
16	ø16
20	ø20
Ⓒ Actuation	
D	Double acting
Ⓓ Finger	
1	Basic
Ⓔ Grip center reference, high precision positioning hole	
N	None
L	Refer to the figure at left.
R	

Ⓕ Switch model No.

Blank	Without switch, rail plate attached
N	Without switch or rail plate

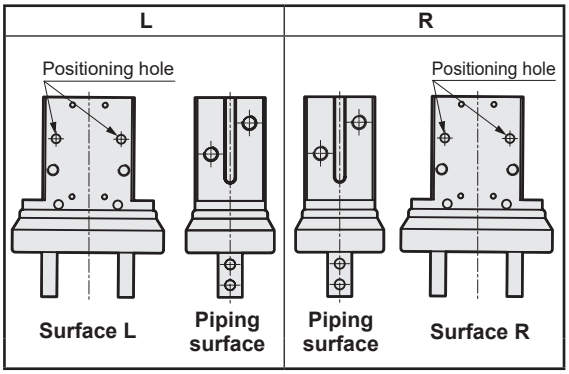
Straight lead wire	L-shaped lead wire	Contact	Voltage AC	Voltage DC	Indicator	Lead wire
F2S*	**F2S***	Proximity		●	1-color LED	2-wire
F3S*	**F3S***			●		3-wire
F2H*	**F2V***			●		2-wire
F3H*	**F3V***			●		3-wire
F3PH*	**F3PV***			●		3-wire

*** Lead wire length**	
Blank	1 m (standard)
3	3 m (option)

Ⓖ Switch quantity	
R	1 on open side
H	1 on closed side
D	2

*1: When selecting "With switch", a rail plate is attached.
*2: Refer to page 1579 for cylinder switch precautions.

Grip center reference, high precision positioning hole position diagram



Refer to the Dimensions (pages 1543 to 1545) and page 1567 for details.

How to order switch

SW - F2H*

Switch model No. (Item Ⓕ above)

Switch mounting availability table

Model No.	Switch model No.	Side mounting	Side mounting
LSHL-G/F10	F2/3□	●	●
	F2/3S	●	●
LSHL-G/F16	F2/3□	●	●
	F2/3S	●	●
LSHL-G/F20	F2/3□	●	●
	F2/3S	●	●

[Example of model No.]

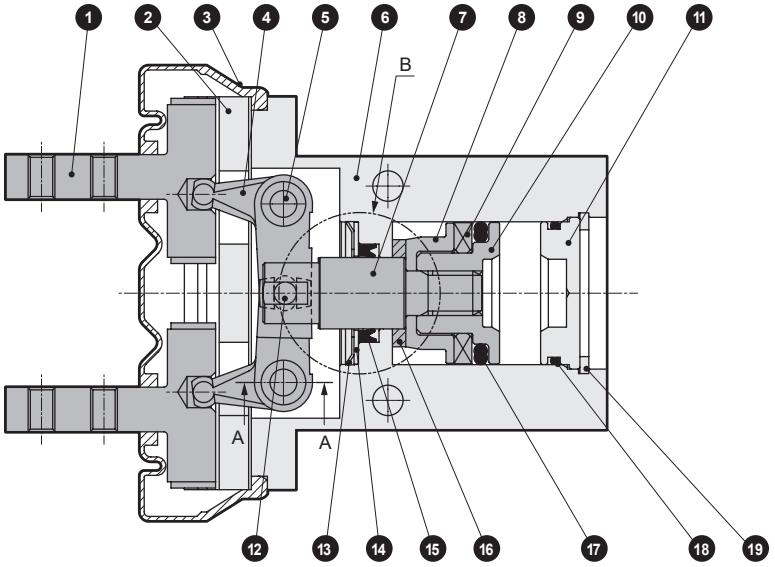
LSHL-G10D1R-F2H-D-HP1

Model: Linear Slide Hand, long stroke

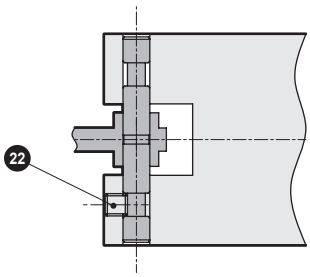
Ⓐ Rubber cover : Chloroprene rubber
Ⓑ Bore size : ø10
Ⓒ Actuation : Double acting
Ⓓ Finger : Basic
Ⓔ Grip center reference, high precision positioning hole : R
Ⓕ Switch model No. : Proximity F2H, lead wire 1 m
Ⓖ Switch quantity : 2

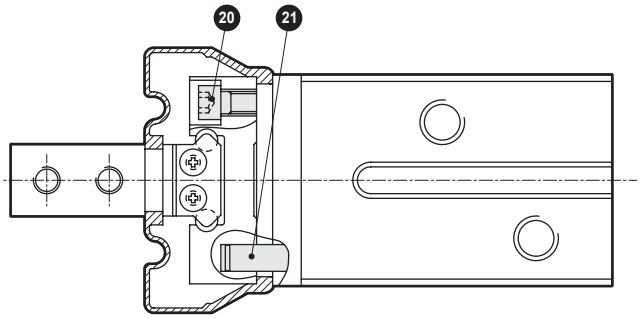
Internal structure diagram and parts list

●LSHL-G10 to G20 / LSHL-F10 to F20

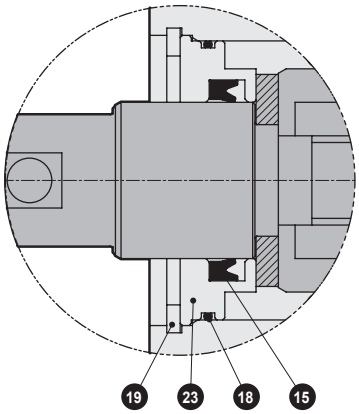


Cross-section A-A





B part ø20



Parts list

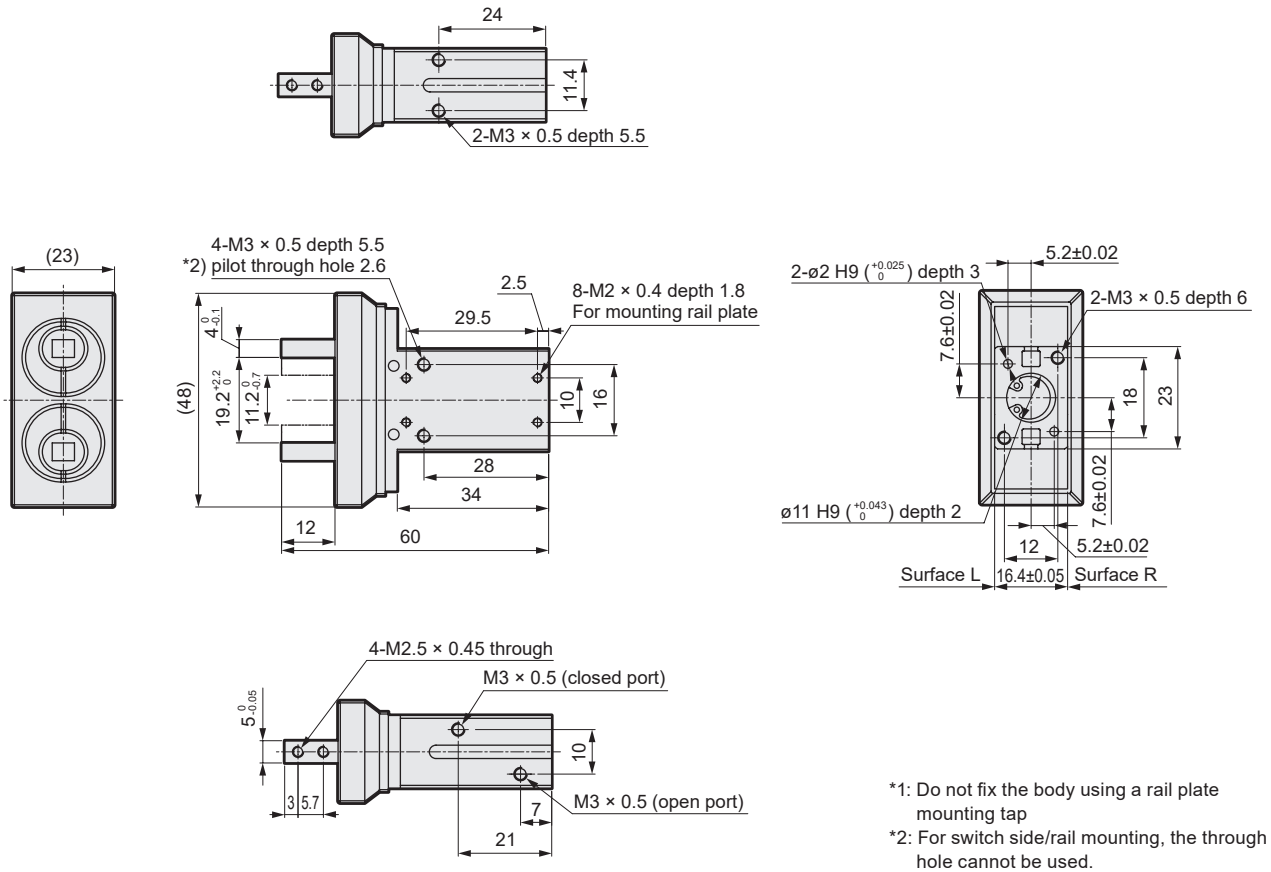
Part No.	Part name	Material	Remarks	Part No.	Part name	Material	Remarks
1	Finger	Stainless steel		13	CR ring	Stainless steel	
2	Linear guide	Stainless steel		14	Cap	Stainless steel	
3	Rubber cover	LSHL-G : Chloroprene LSHL-F : Fluorine		15	Rod packing	Nitrile rubber	
4	Lever	Stainless steel		16	Cushion rubber	Urethane rubber	
5	Fulcrum axis	Steel		17	Piston packing	Nitrile rubber	
6	Body	Aluminum alloy		18	O-ring	Nitrile rubber	
7	Piston rod	Stainless steel		19	C-snap ring	Stainless steel	
8	Spring bracket	Aluminum alloy		20	Hexagon socket head cap screw	Stainless steel	
9	Magnet			21	Pin	Steel	
10	Piston	Aluminum alloy		22	Hexagon socket set screw	Stainless steel	
11	Head cover	Aluminum alloy		23	Rod metal	Aluminum alloy	
12	Operation shaft	Steel alloy					

Consumable parts list

Bore size (mm)	Kit No.	Consumable parts No.	Rubber cover (part No. 3)		Rail plate Kit No.	Item
			LSHL-G Chloroprene	LSHL-F Fluorine		
ø10	LSHL-10K-HP	⑬⑮⑰⑱	LSHL-G10K	LSHL-F10K	LSHL-RPF-10-HP	Rail plate Small machine screw
ø16	LSHL-16K-HP		LSHL-G16K	LSHL-F16K	LSHL-RPF-16-HP	
ø20	LSHL-20K-HP	⑮⑰⑱	LSHL-G20K	LSHL-F20K	LSHL-RPF-20-HP	

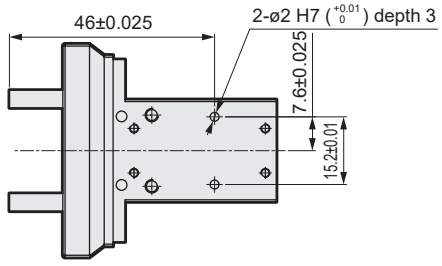
Dimensions (bore size: ø10)

● LSHL-G10D1N, LSHL-F10D1N



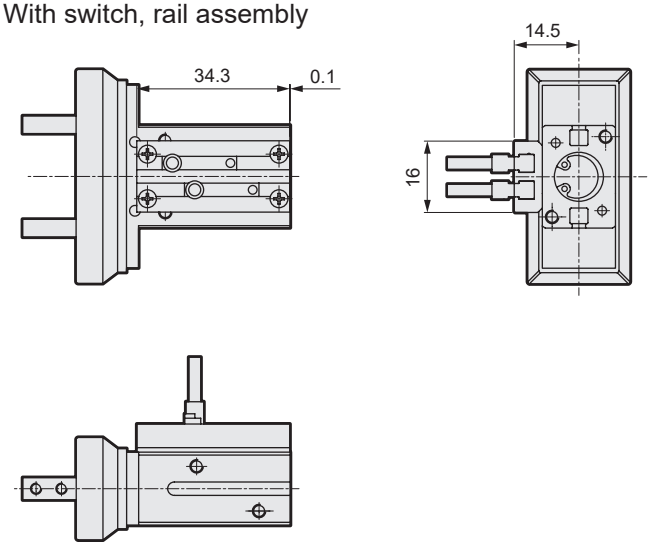
*1: Do not fix the body using a rail plate mounting tap
*2: For switch side/rail mounting, the through hole cannot be used.

● LSHL-G10D1R / L,LSHL-F10D1R / L



*3: Pin holes are machined on surface R for LSHL-G10D1R and L for LSHL-G10D1L. Refer to page 1567 for the base line.

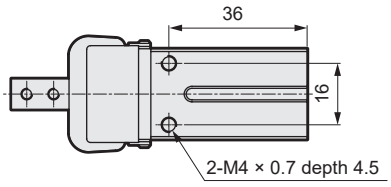
● With switch, rail assembly

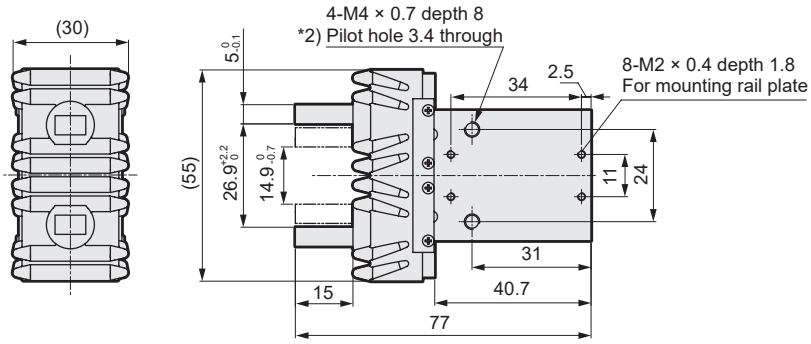


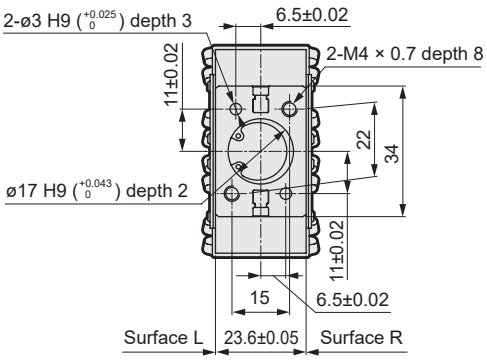
*4: Refer to page 1579 for cylinder switch precautions.

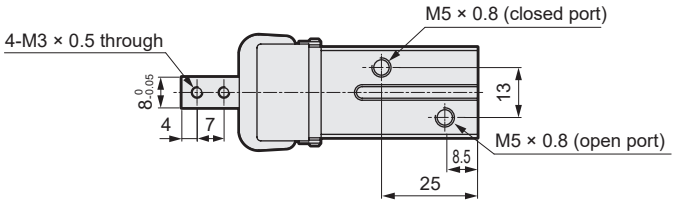
Dimensions (bore size: ø16)

● LSHL-G16D1N, LSHL-F16D1N



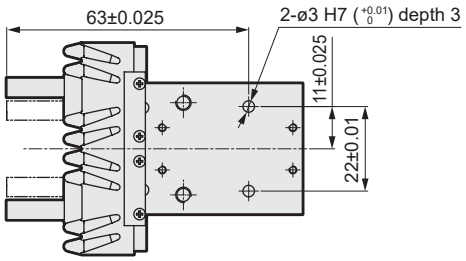






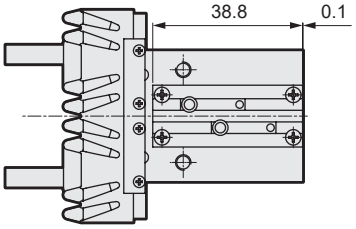
*1: Do not fix the body using a rail plate mounting tap
*2: For switch side mounting, the through hole cannot be used.

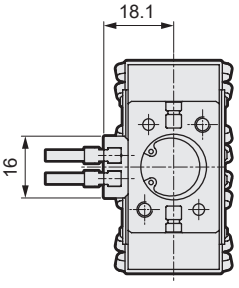
● LSHL-G16D1R / L, LSHL-F16D1R / L

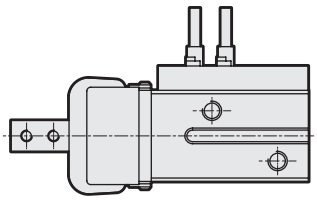


*3: Pin holes are machined on surface R for LSHL-G16D1R and L for LSHL-G16D1L. Refer to page 1567 for the base line.

● With switch, rail assembly



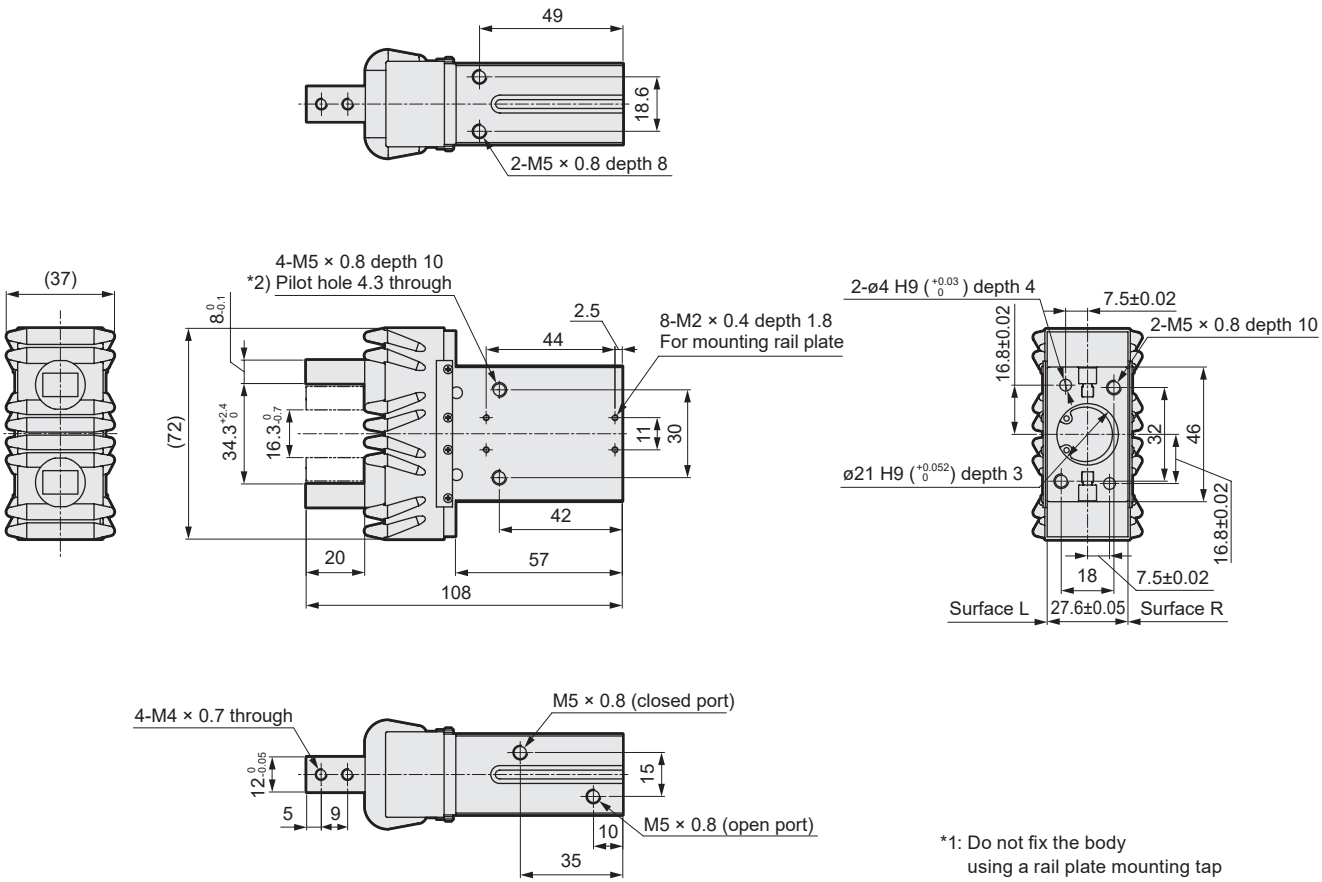




*4: Refer to page 1579 for cylinder switch precautions.

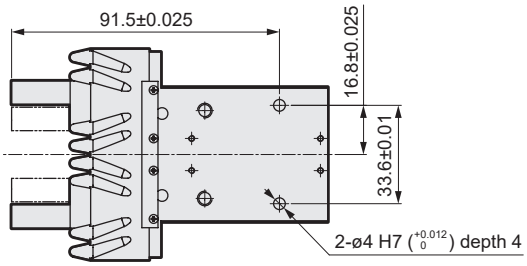
Dimensions (bore size: ø20)

● LSHL-G20D1N, LSHL-F20D1N



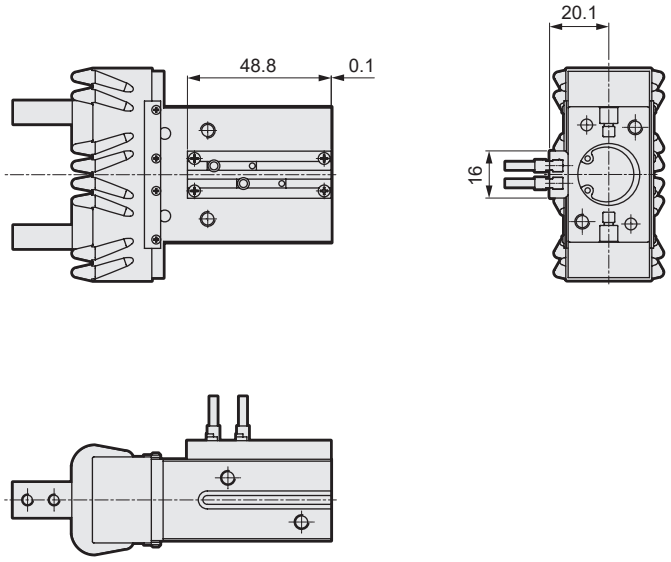
*1: Do not fix the body using a rail plate mounting tap
*2: For switch side mounting, the through hole cannot be used.

● LSHL-G20D1R / L, LSHL-F20D1R/L



*3: Pin holes are machined on surface R for LSHL-G20D1R and L for LSHL-G20D1L. Refer to page 1567 for the base line.

● With switch, rail assembly

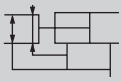


*4: Refer to page 1579 for cylinder switch precautions.

Linear Slide Hand with length measuring function, double acting

LSHM-A Series

● Operating stroke: 4, 6, 10, 14 mm



RoHS

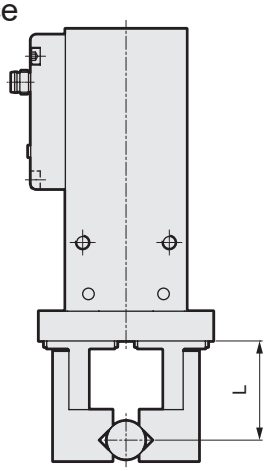
Specifications

Item			LSHM-A							
Bore size mm			ø10		ø16		ø20		ø25	
Actuation			Double acting							
Working fluid			Compressed air							
Max. working 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 lamp			Green LED ON when power applied							
Analog output			When fingers are closed: 1 V; when opened: 5 V *1, connection load: 100 kΩ or more							
Analog output linearity	Without correction adapter		±3% F.S. or less (ambient temperature 25°C)							
	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)							
Valid measured range length mm			4.5		6.5		10		14	
Impact resistance (sensor / amplifier section)			294 m / s²							
Vibration resistance (sensor / amplifier section)			10 to 55 Hz compound amplitude 1.5 mm, 2 hours per X, Y, Z direction							
Degree of protection (sensor / amplifier section)			IEC standards IP65							
Ambient temperature, humidity			10 to 60°C, 85% RH or less (no freezing)							
Amplifier mounting position			Side	Front	Side	Front	Side	Front	Side	Front
Weight kg		Finger OP: 1, 2, 3	0.108	0.120	0.221	0.238	0.437	0.457	0.752	0.773
		Finger OP: 4			0.226	0.243	0.442	0.462	0.782	0.803
Lubrication			Not required							

Note: Refer to page 1562 for the correction adapter.

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

Gripping force

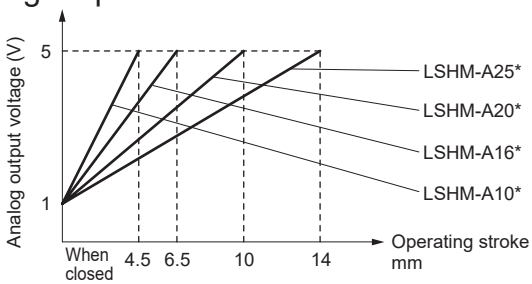


Unit: N

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

*Supply pressure: 0.5 MPa, L = 20 mm, value at stroke center

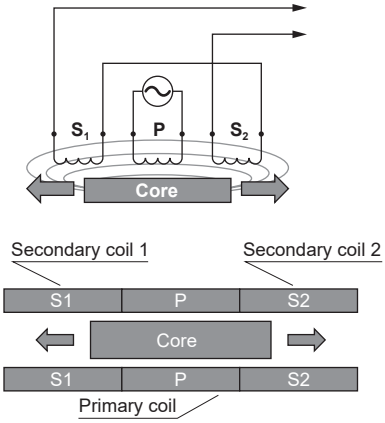
Analog output characteristics



*The analog output voltage at shipment is 1 V on the closed side and 5 V on the open side, with the port closed and pressurized.

LVDT displacement sensor operation principle

When exciting the primary coil (P), induced voltage is generated in the two secondary coils (S1 / S2) by electromagnetic induction. When the Hand is driven, the core position changes and a difference in induced voltage occurs between S1 and S2. This difference is used to output the position of the core as electric signals.



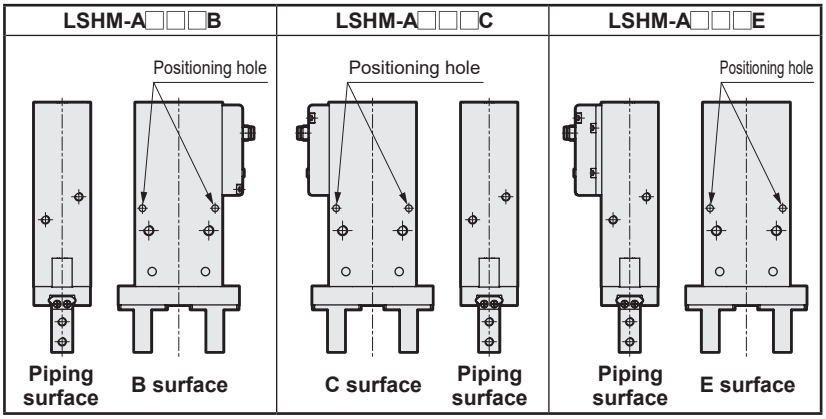
How to order

LSHM - A 10 D 2 A - N - HP2

Code	Description
A Rubber cover	
A	Without rubber cover
B Bore size (mm)	
10	ø10
16	ø16
20	ø20
25	ø25
C Actuation	
D	Double acting
D Finger * Refer to the Dimensions for details.	
1	Basic
2	Side tap
3	Through hole
4	Flat
E Amp mounting position / grip center reference, high precision positioning hole *1	
A	Amp side / no positioning hole
B	Amp side / rear with finger below and piping right
C	Amp side / rear with finger below and piping left
D	Amp front / no positioning hole
E	Amp front / rear with finger below and piping right
F Correction adapter option	
N	Without correction adapter
A	Correction adapter attached

*1

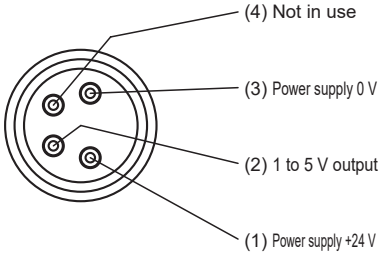
Amp mounting position / grip center reference, high precision positioning hole position diagram



Refer to the Dimensions (pages 1550 to 1553) and page 1567 for details.

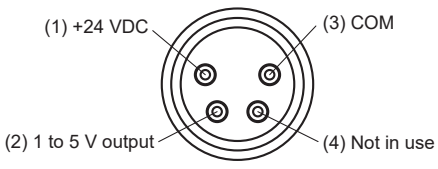
Plug contact array diagram

·Without correction adapter

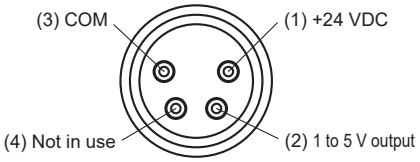


·Correction adapter attached

M8 socket (IN side) pin array



M8 plug (OUT side) pin array



[Example of model No.]

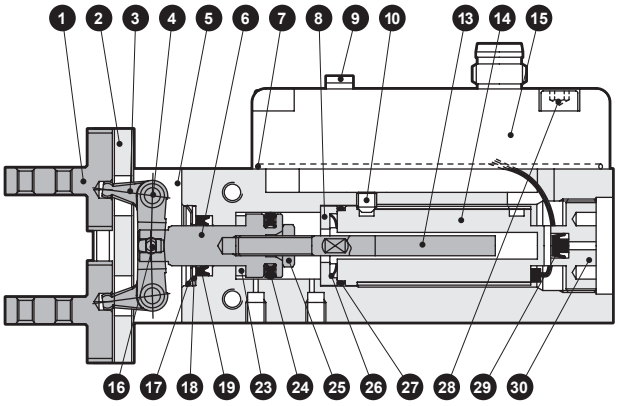
LSHM-A10D2A-N-HP2

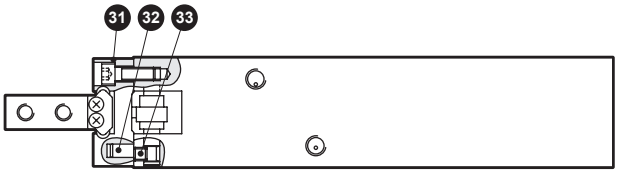
Model: Linear Slide Hand

A Rubber cover	: Without rubber cover
B Bore size	: ø10
C Actuation	: Double acting
D Finger	: Side tap
E Amp mounting position / grip center reference, high precision positioning hole	: Amp side / no positioning hole
F Correction adapter option	: Without correction adapter

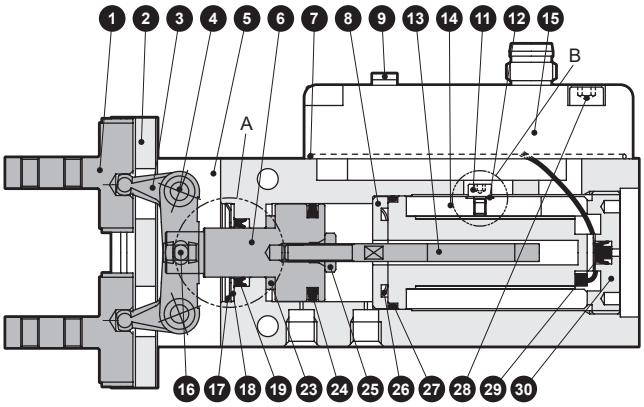
Internal structure and parts list

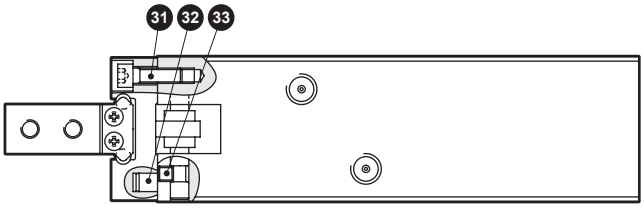
● Amplifier side mounting
ø10



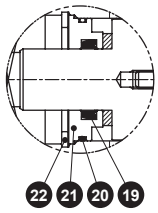


● Amplifier side mounting
ø16 to 25





A part ø20, 25



B part ø20, 25

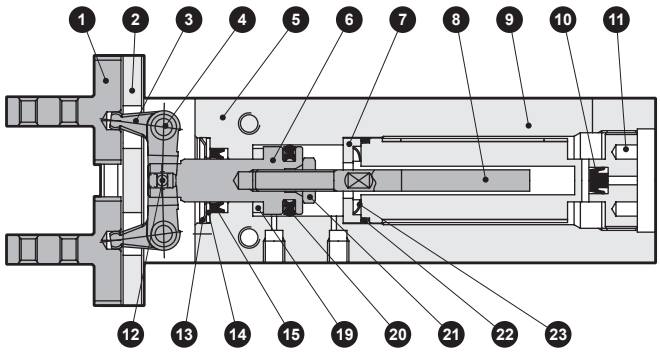
Cannot be disassembled

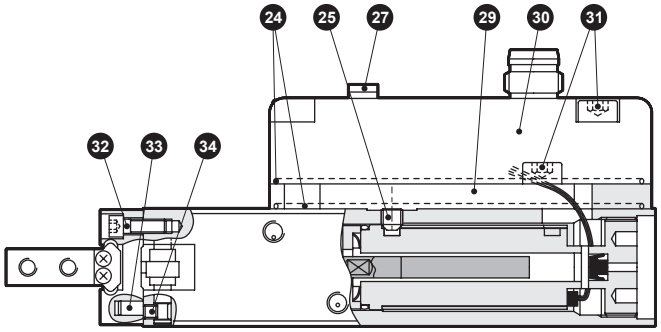
Parts list

No.	Part name	Material	Remarks	No.	Part name	Material	Remarks
1	Finger	Stainless steel		18	Cap	Stainless steel	
2	Linear guide	Stainless steel		19	Rod packing	Nitrile rubber	
3	Lever	Stainless steel		20	O-ring	Nitrile rubber	
4	Fulcrum axis	Steel		21	Rod metal	Aluminum alloy	
5	Body	Aluminum alloy		22	C-snap 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	ø10	27	O-ring	Nitrile rubber	
11	Hexagon socket head cap screw	Stainless steel	ø16 to 25	28	Hexagon socket head cap screw	Stainless steel	
12	Flat washer	Stainless steel	ø16	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	Fulcrum axis	Steel		33	Hexagon socket set screw	Stainless steel	
17	CR ring	Stainless steel					

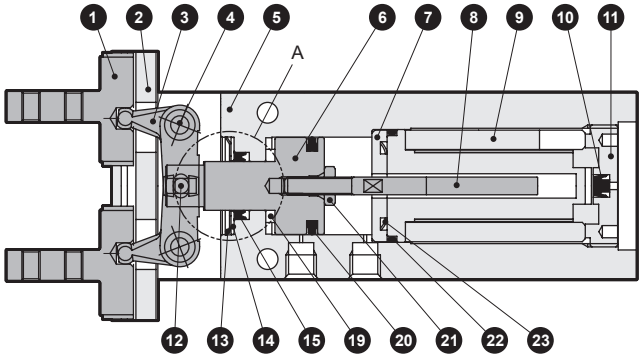
Internal structure and parts list

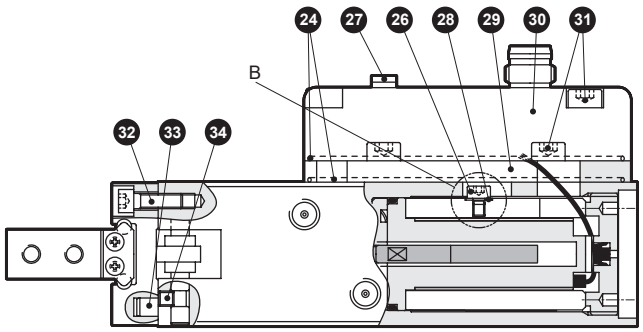
● Amplifier front mounting
ø10



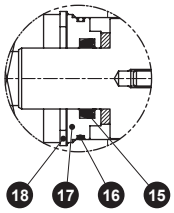


● Amplifier front mounting
ø16 to 25





A part ø20, 25



B part ø20, 25

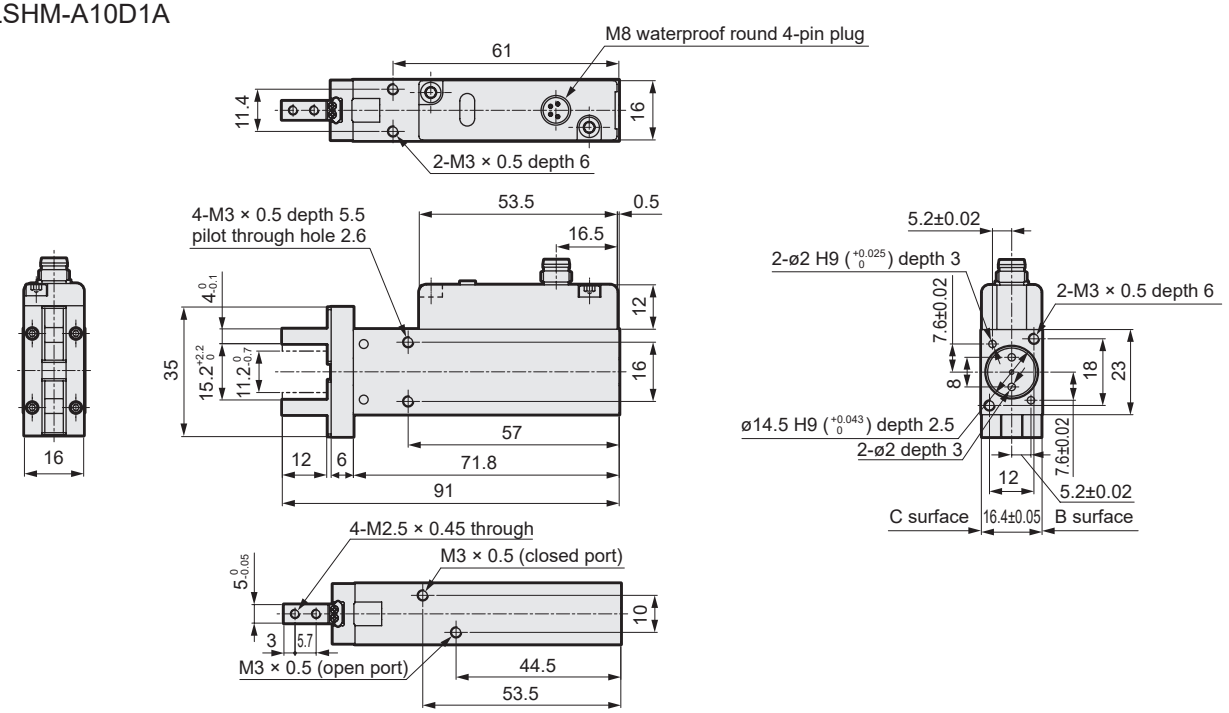
Cannot be disassembled

Parts list

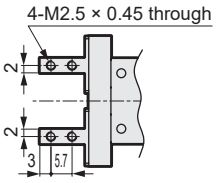
No.	Part name	Material	Remarks	No.	Part name	Material	Remarks
1	Finger	Stainless steel		18	C-snap ring	Steel	
2	Linear guide	Stainless steel		19	Cushion rubber	Urethane rubber	
3	Lever	Stainless steel		20	Piston packing	Nitrile rubber	
4	Fulcrum axis	Steel		21	Nut	Stainless steel	
5	Body	Aluminum alloy		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	ø10
9	Sensor body	-		26	Hexagon socket head cap screw	Stainless steel	ø16 to 25
10	Check valve	Nitrile rubber		27	Plug	Nitrile rubber	
11	Head cover	Aluminum alloy		28	Flat washer	Stainless steel	ø16
12	Fulcrum axis	Steel		29	Amplifier adapter	Aluminum alloy	
13	CR ring	Stainless steel		30	Amplifier	-	
14	Cap	Stainless steel		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	

Dimensions (bore size: ø10)

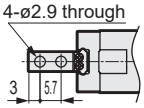
● LSHM-A10D1A



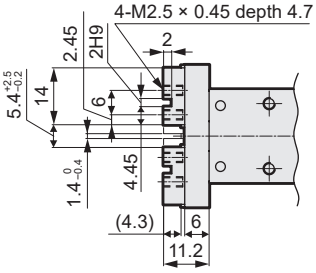
● LSHM-A10D2*



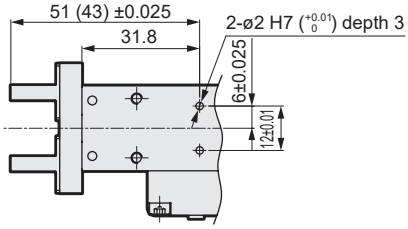
● LSHM-A10D3*



● LSHM-A10D4*

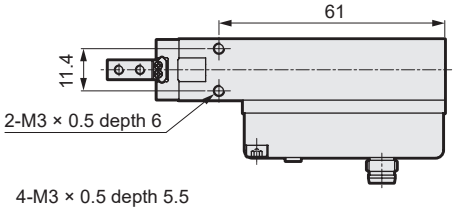


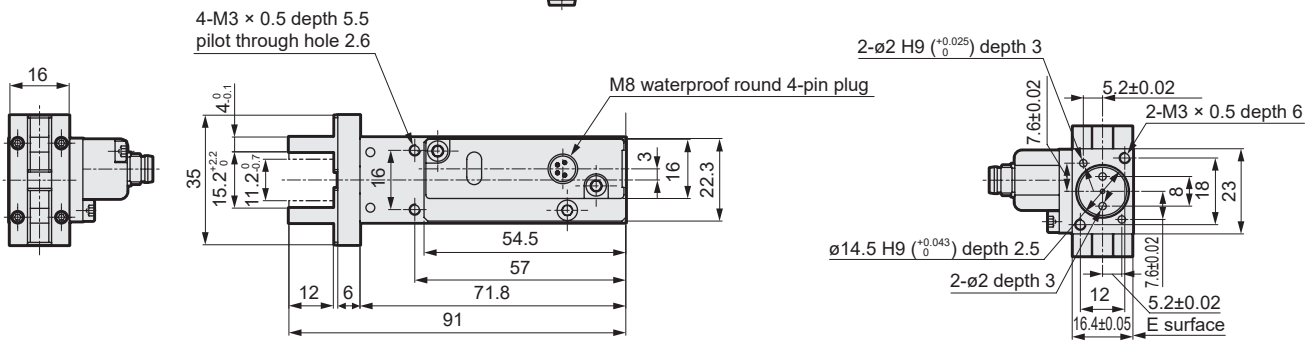
● LSHM-A10D*B/C

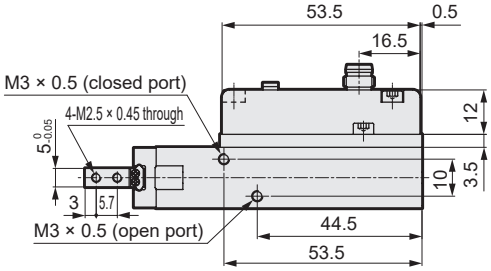


*1: Positioning holes are machined on B surface for LSHM-A10D*B and C surface for LSHM-A10D*C
*2: The dimensions in parentheses are the dimensions for LSHM-A10D4.

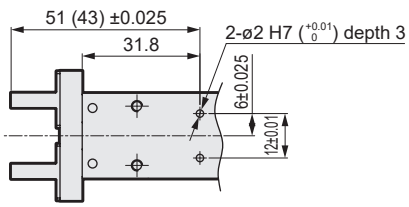
● LSHM-A10D1D





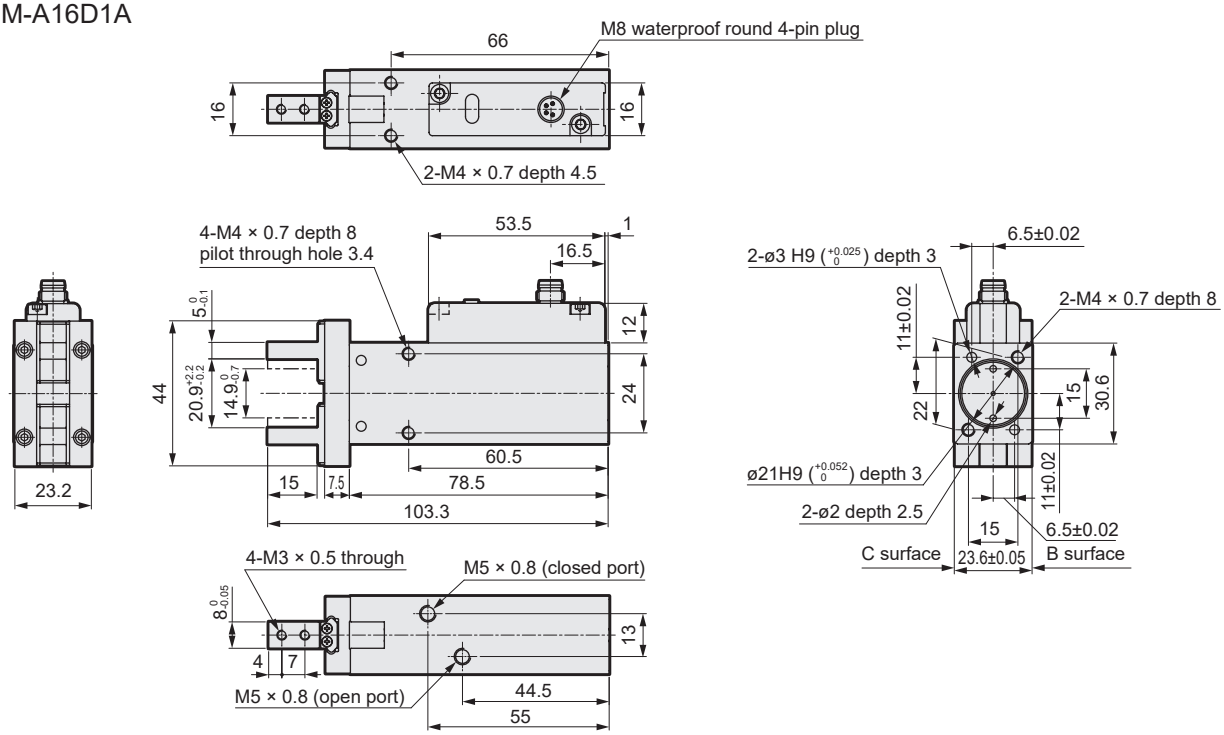


● LSHM-A10D*E

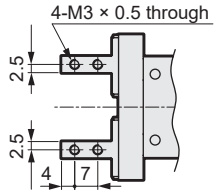


Dimensions (bore size: ø16)

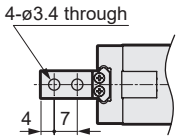
● LSHM-A16D1A



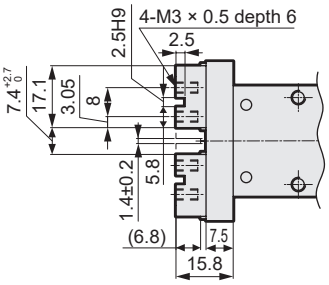
● LSHM-A16D2*



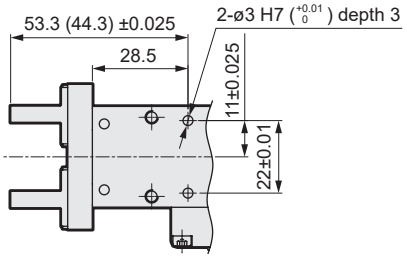
● LSHM-A16D3*



● LSHM-A16D4*

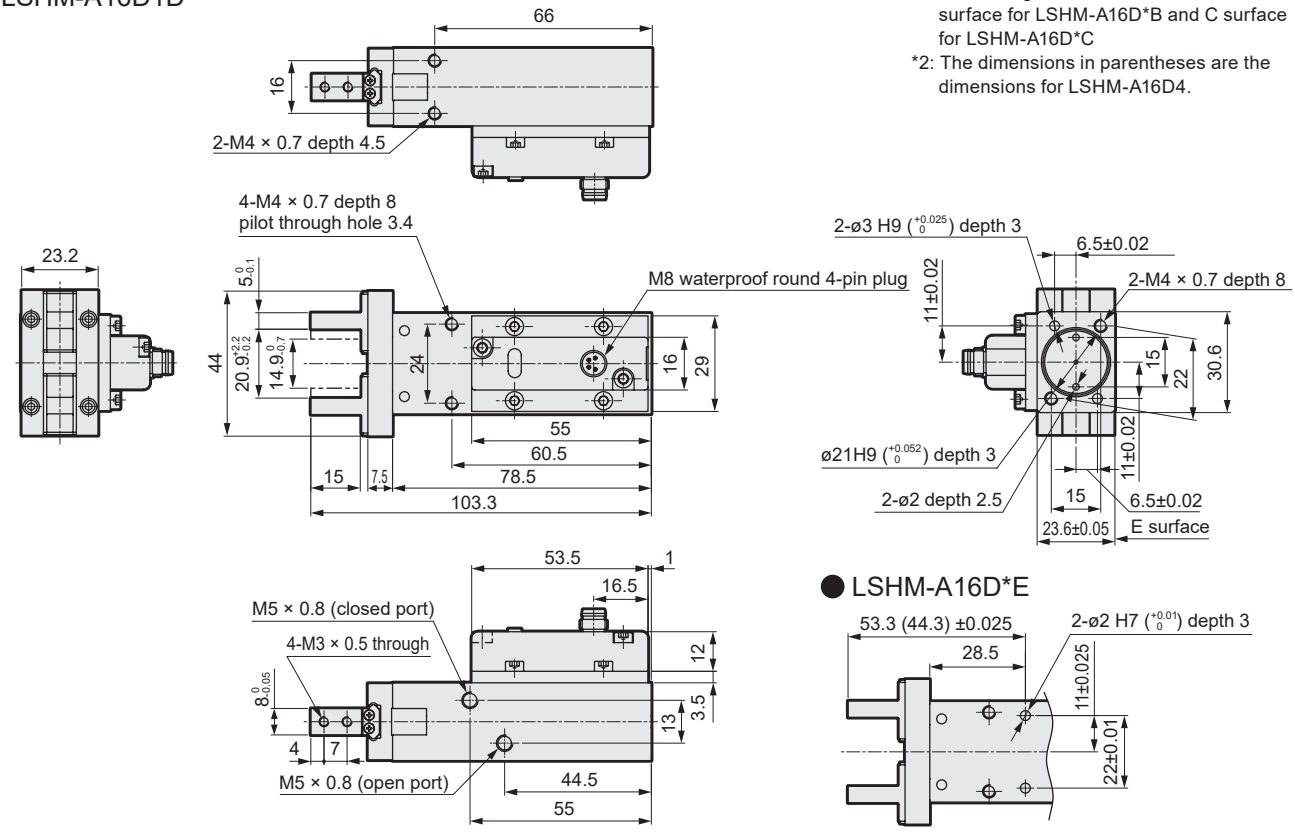


● LSHM-A16D*B / C



*1: Positioning holes are machined on B surface for LSHM-A16D*B and C surface for LSHM-A16D*C
*2: The dimensions in parentheses are the dimensions for LSHM-A16D4.

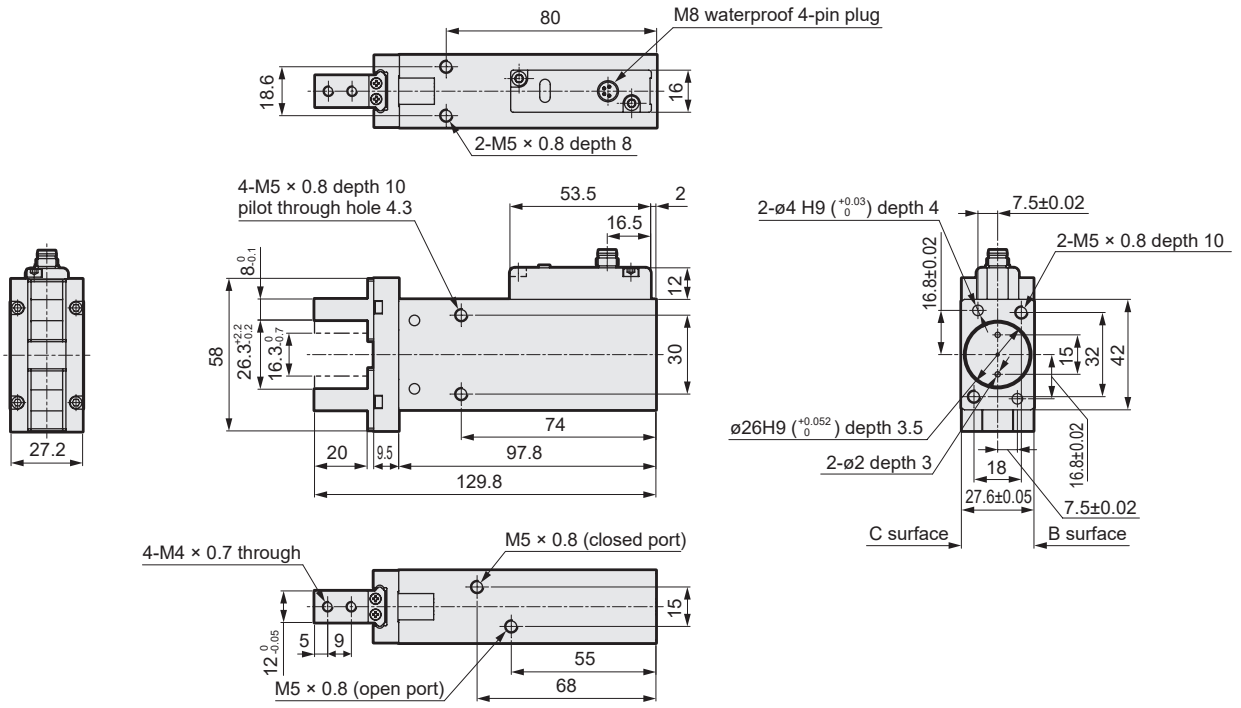
● LSHM-A16D1D



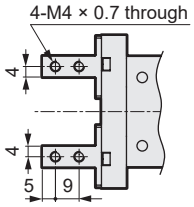
● LSHM-A16D*E

Dimensions (bore size: ø20)

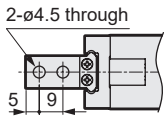
● LSHM-A20D1A



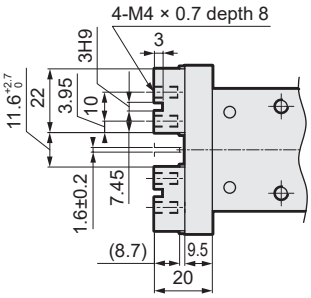
● LSHM-A20D2*



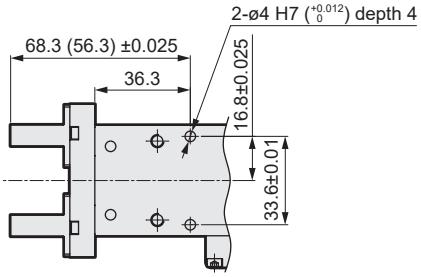
● LSHM-A20D3*



● LSHM-A20D4*

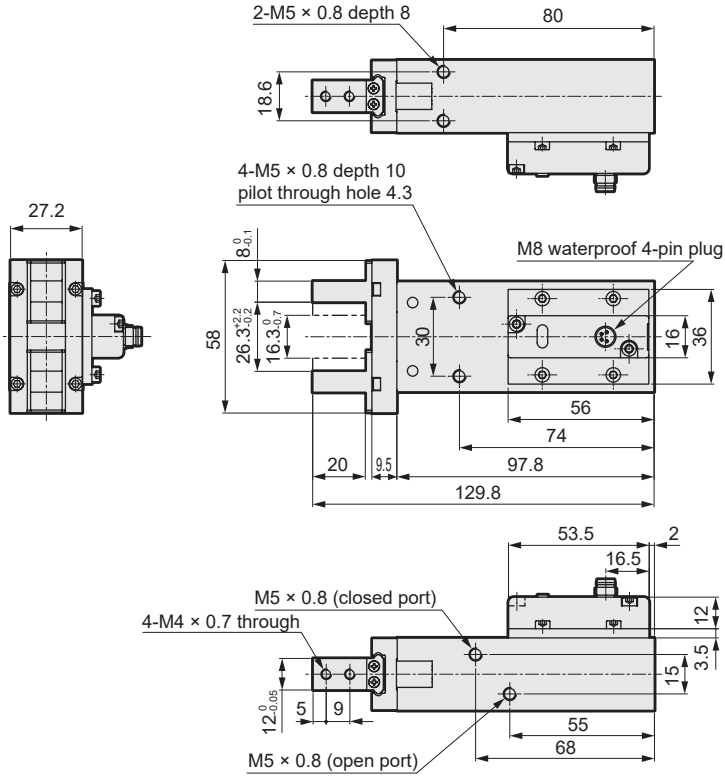


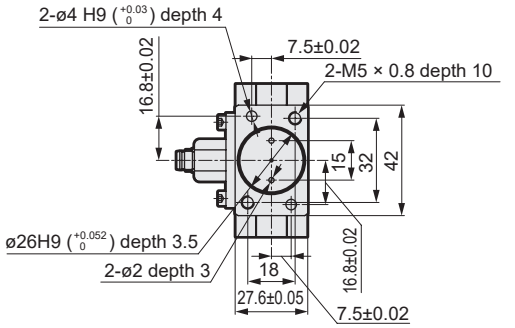
● LSHM-A20D*B / C



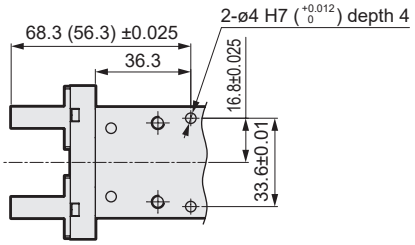
*1: Positioning holes are machined on B surface for LSHM-A20D*B and C surface for LSHM-A20D*C
*2: The dimensions in parentheses are the dimensions for LSHM-A20D4.

● LSHM-A20D1D



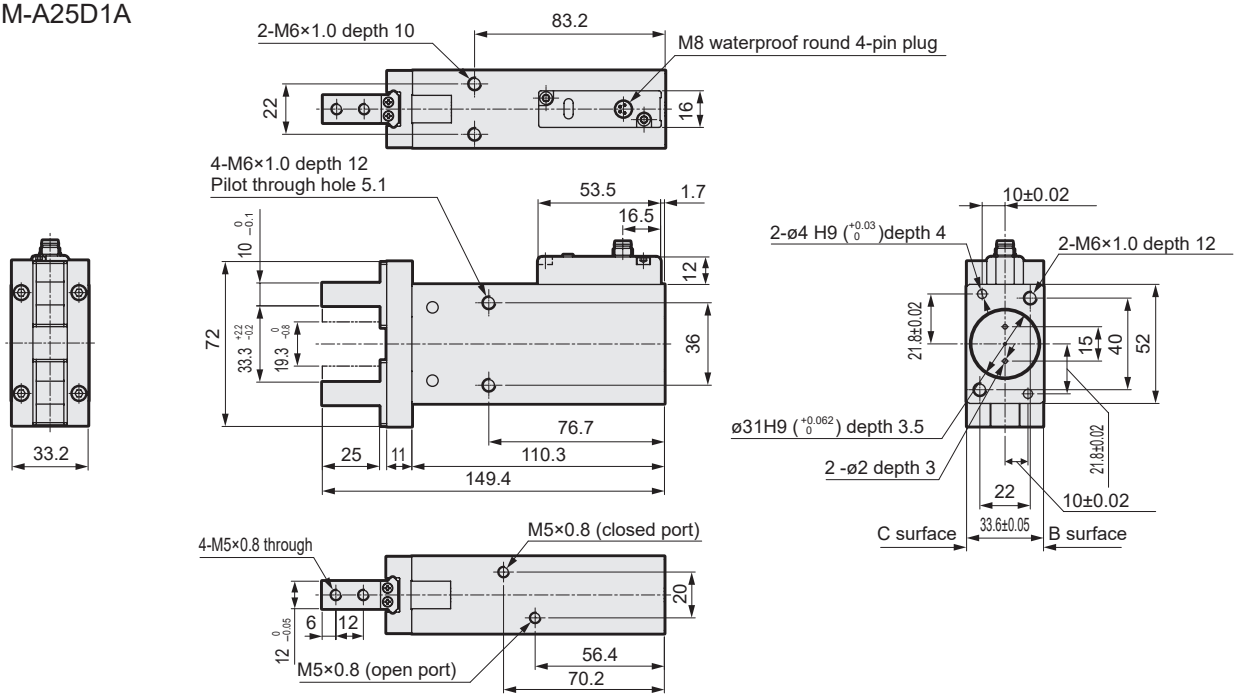


● LSHM-A20D*E

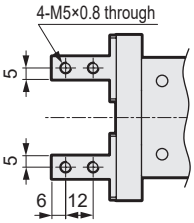


Dimensions (bore size: ø25)

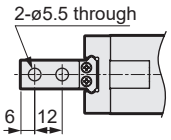
●LSHM-A25D1A



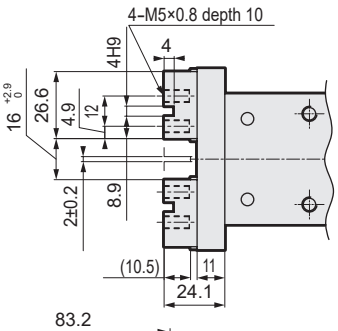
●LSHM-A25D2*



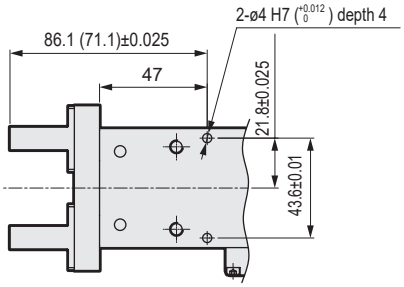
●LSHM-A25D3*



●LSHM-A25D4*

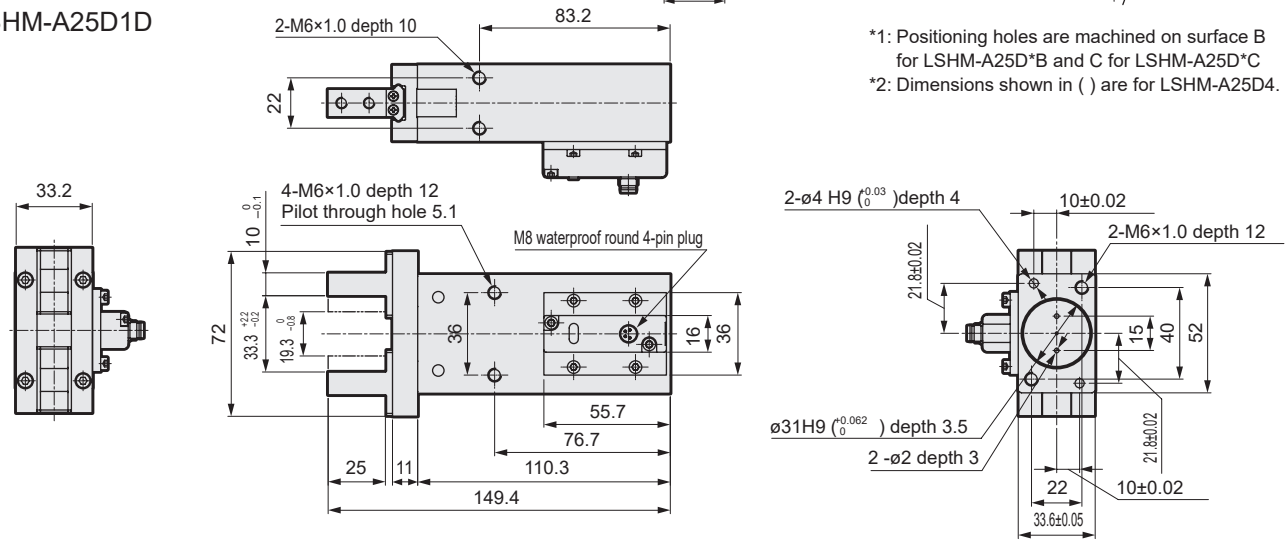


●LSHM-A25D*B/C

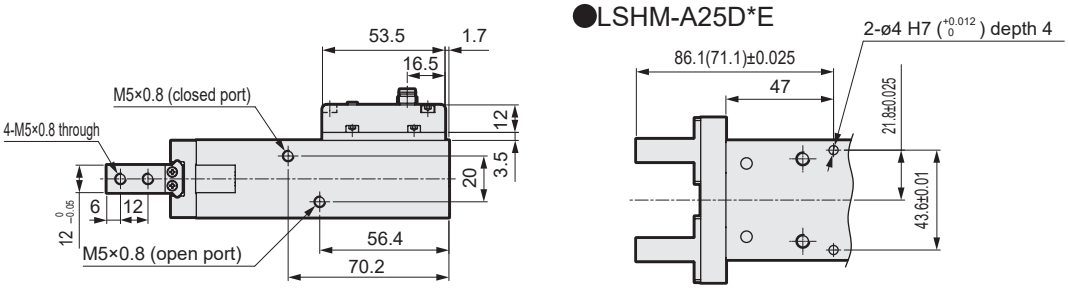


*1: Positioning holes are machined on surface B for LSHM-A25D*B and C for LSHM-A25D*C
*2: Dimensions shown in ( ) are for LSHM-A25D4.

●LSHM-A25D1D



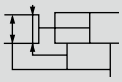
●LSHM-A25D*E



Linear Slide Hand with length measuring function, double acting with rubber cover

LSHM-G / LSHM-F Series

● Operating stroke length: 4, 6, 10, 14 mm



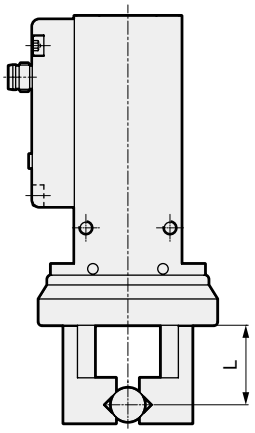
RoHS

Specifications

Item		LSHM-G / LSHM-F							
Bore size mm		ø10		ø16		ø20		ø25	
Actuation		Double acting							
Working fluid		Compressed air							
Max. working pressure MPa		0.7							
Min. working pressure MPa		0.2		0.1		0.1		0.1	
Port size		M3		M5		M5		M5	
Operating stroke length mm		4		6		10		14	
Power supply voltage		24 VDC ±10%							
Current consumption		25 mA or less							
Display lamp		Green LED ON when power applied							
Analog output		When fingers are closed: 1 V; when opened: 5 V *1, connection load: 100 kΩ or more							
Analog output linearity	Without correction adapter	±3% F.S. or less (ambient temperature 25°C)							
	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)							
Valid measured range length mm		4.5		6.5		10		14	
Impact resistance (sensor / amplifier section)		294 m / s^2							
Vibration resistance (sensor / amplifier section)		10 to 55 Hz compound amplitude 1.5 mm, 2 hours per X, Y, Z direction							
Degree of protection (sensor / amplifier section)		IEC standards IP65							
Ambient temperature, humidity		10 to 60°C, 85% RH or less (no freezing)							
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							

Note: Refer to page 1562 for the correction adapter.
*1: There is output fluctuation of 1 mV / °C.

Gripping power

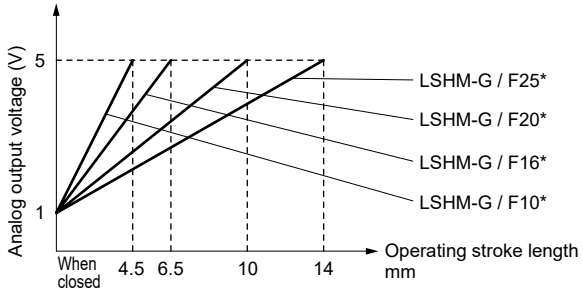


Unit: N

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

*Supply pressure: 0.5 MPa, L = 20 mm, value at stroke center

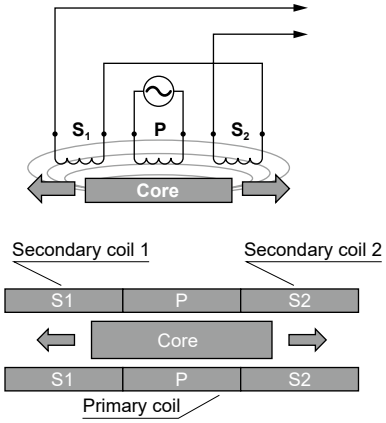
Analog output characteristics



*The analog output voltage at shipment is 1 V on the closed side and 5 V on the open side, with the port closed and pressurized.

LVDT displacement sensor operation principle

When exciting the primary coil (P), induced voltage is generated in the two secondary coils (S1 / S2) by electromagnetic induction. When the Hand is driven, the core position changes and a difference in induced voltage occurs between S1 and S2. This difference is used to output the position of the core as electric signals.



How to order

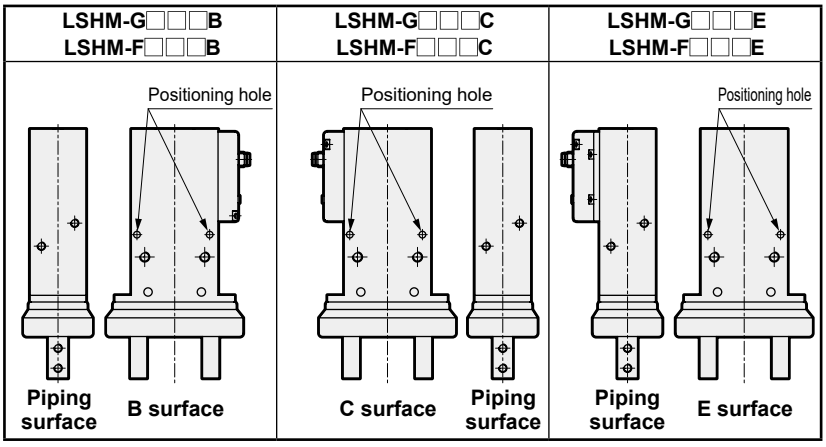
LSHM - G 10 D 1 A - N - HP2

Ⓐ Rubber cover
Ⓑ Bore size
Ⓒ Actuation
Ⓓ Finger
Ⓔ Amp mounting position / grip center reference, high precision positioning hole
Ⓕ Correction adapter option

Code	Description
Ⓐ Rubber cover	
G	Chloroprene rubber
F	Fluoro rubber
Ⓑ Bore size (mm)	
10	ø10
16	ø16
20	ø20
25	ø25
Ⓒ Actuation	
D	Double acting
Ⓓ Finger	
1	Basic
Ⓔ Amp mounting position / grip center reference, high precision positioning hole *1	
A	Amp side / no positioning hole
B	Amp side / rear with finger below and piping right
C	Amp side / rear with finger below and piping left
D	Amp front / no positioning hole
E	Amp front / rear with finger below and piping right
Ⓕ Correction adapter option	
N	Without correction adapter
A	Correction adapter attached

*1

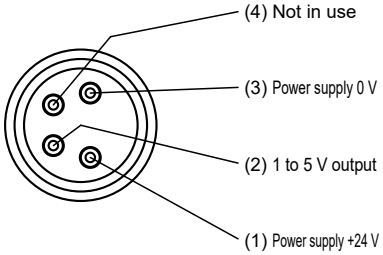
Amp mounting position / grip center reference, high precision positioning hole position diagram



Refer to the Dimensions (pages 1558 to 1561) and page 1567 for details.

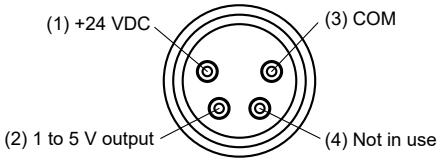
Plug contact array diagram

·Without correction adapter

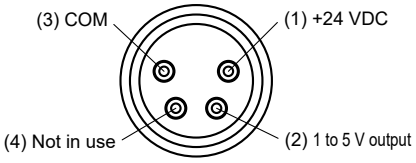


·Correction adapter attached

M8 socket (IN side) pin array



M8 plug (OUT side) pin array



[Example of model No.]

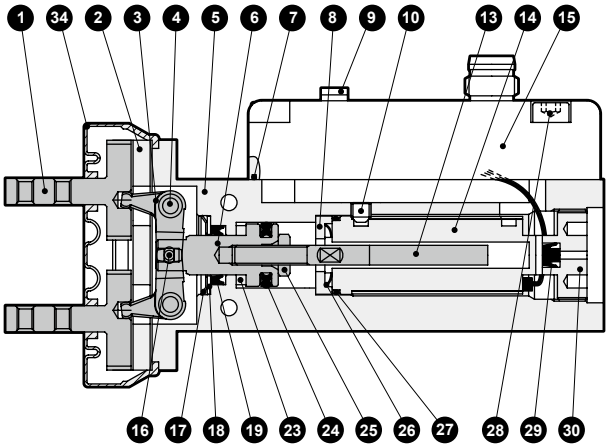
LSHM-G10D1A-N-HP2

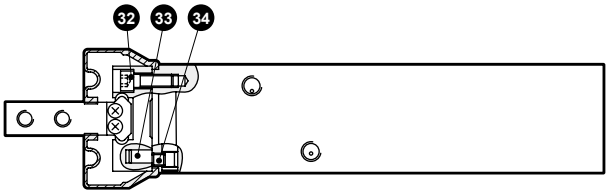
Model: Linear Slide Hand

ⒶRubber cover	: Chloroprene rubber
ⒷBore size	: ø10
ⒸActuation	: Double acting
ⒹFinger	: Basic
ⒺAmp mounting position / grip center reference, high precision positioning hole	: Amp side / no positioning hole
ⒻCorrection adapter option	: Without correction adapter

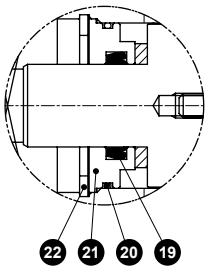
Internal structure and parts list

● Amplifier side mounting
ø10

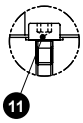




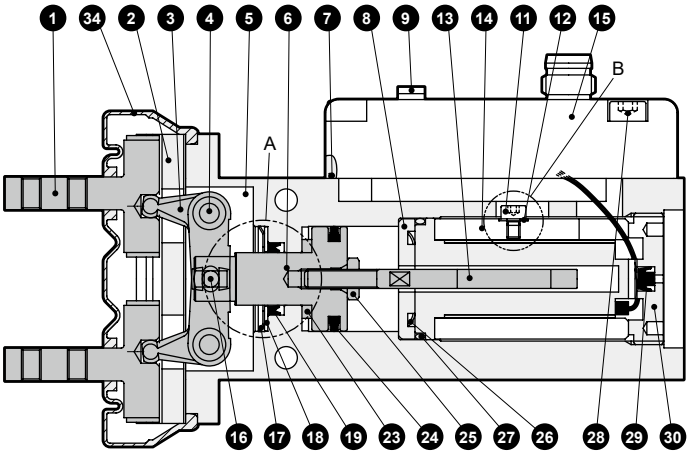
A part ø20, 25

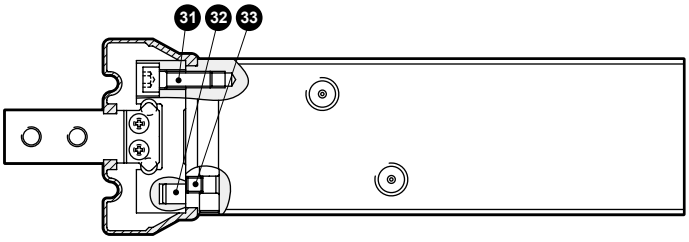


B part ø20, 25



● Amplifier side mounting
ø16 to 25





Cannot be disassembled

Parts list

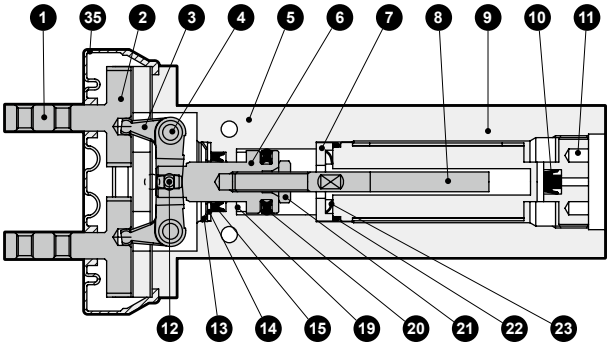
No.	Part name	Material	Remarks	No.	Part name	Material	Remarks
1	Finger	Stainless steel		19	Rod packing	Nitrile rubber	
2	Linear guide	Stainless steel		20	O-ring	Nitrile rubber	
3	Lever	Stainless steel		21	Rod metal	Aluminum alloy	
4	Fulcrum axis	Steel		22	C-snap ring	Steel	
5	Body	Aluminum alloy		23	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	ø10	28	Hexagon socket head cap screw	Stainless steel	
11	Hexagon socket head cap screw	Stainless steel	ø16 to 25	29	Check valve	Nitrile rubber	
12	Flat washer	Stainless steel	ø16	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	Fulcrum axis	Steel		34	Rubber cover	Chloroprene rubber	LSHM-G*
17	CR ring	Stainless steel				Fluoro rubber	LSHM-F*
18	Cap	Stainless steel					

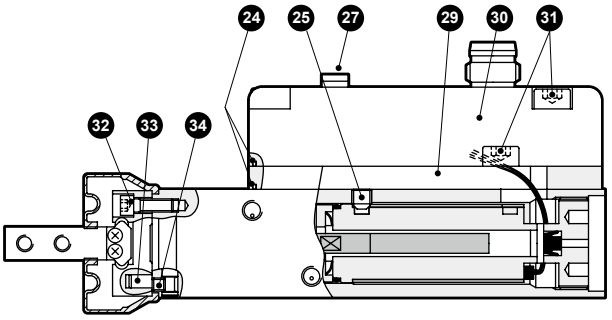
Repair parts list

Bore size (mm)	Material	Kit No.	Repair part No.	Bore size (mm)	Material	Kit No.	Repair part No.
ø10	Chloroprene rubber	LSH-G10K	㉞	ø20	Chloroprene rubber	LSH-G20K	㉞
	Fluoro rubber	LSH-F10K			Fluoro rubber	LSH-F20K	
ø16	Chloroprene rubber	LSH-G16K		ø25	Chloroprene rubber	LSH-G25K	
	Fluoro rubber	LSH-F16K			Fluoro rubber	LSH-F25K	

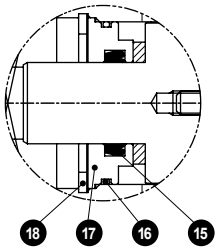
Internal structure and parts list

● Amplifier front mounting
ø10

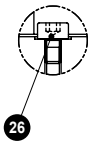




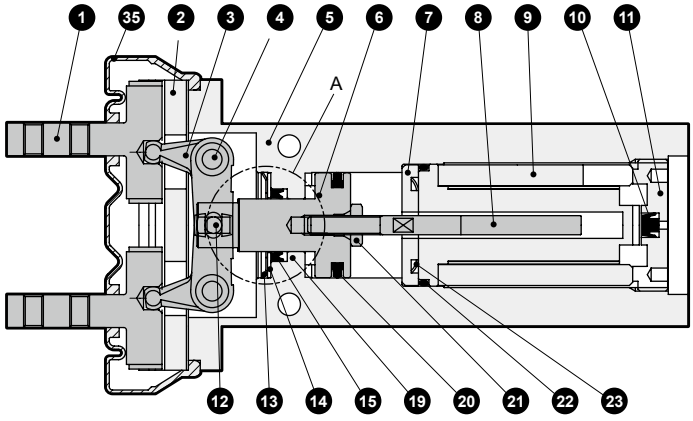
A part ø20, 25

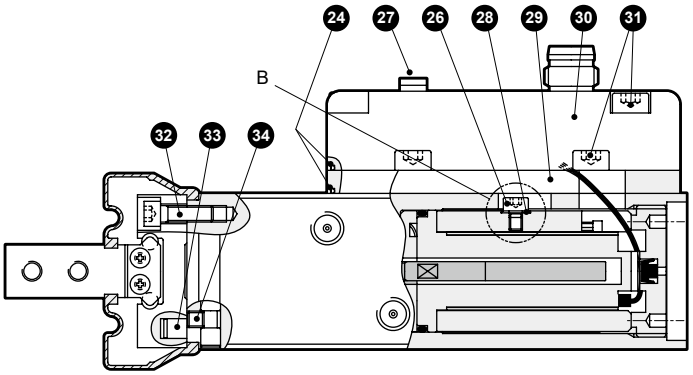


B part ø20, 25



● Amplifier front mounting
ø16 to 25





Cannot be disassembled

Parts list

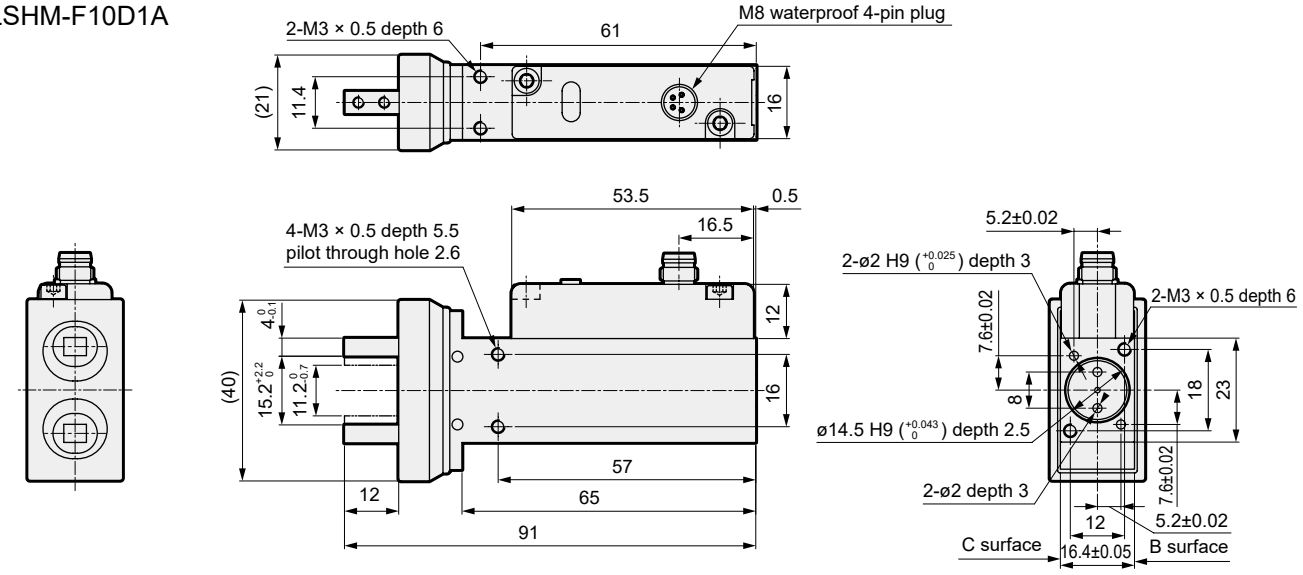
No.	Part name	Material	Remarks	No.	Part name	Material	Remarks
1	Finger	Stainless steel		19	Cushion rubber	Urethane rubber	
2	Linear guide	Stainless steel		20	Piston packing	Nitrile rubber	
3	Lever	Stainless steel		21	Nut	Stainless steel	
4	Fulcrum axis	Steel		22	O-ring	Nitrile rubber	
5	Body	Aluminum 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	ø10
8	Core shaft	Steel		26	Hexagon socket head cap screw	Stainless steel	ø16 to 25
9	Sensor body	-		27	Plug	Nitrile rubber	
10	Check valve	Nitrile rubber		28	Flat washer	Stainless steel	ø16
11	Head cover	Aluminum alloy		29	Amplifier adapter	Aluminum alloy	
12	Fulcrum axis	Steel		30	Amplifier	-	
13	CR ring	Stainless steel		31	Hexagon socket head cap screw	Stainless steel	
14	Cap	Stainless steel		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	Chloroprene rubber	LSHM-G*
18	C-snap ring	Steel				Fluoro rubber	LSHM-F*

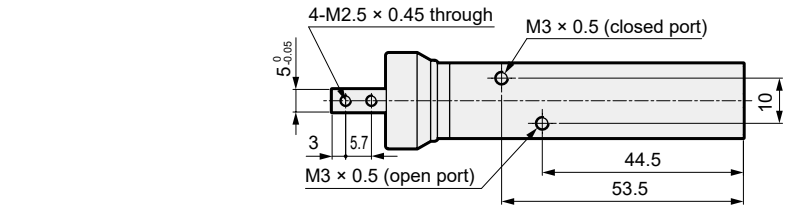
Repair parts list

Bore size (mm)	Material	Kit No.	Repair part No.	Bore size (mm)	Material	Kit No.	Repair part No.
ø10	Chloroprene rubber	LSH-G10K	35	ø20	Chloroprene rubber	LSH-G20K	35
	Fluoro rubber	LSH-F10K			Fluoro rubber	LSH-F20K	
ø16	Chloroprene rubber	LSH-G16K		ø25	Chloroprene rubber	LSH-G25K	
	Fluoro rubber	LSH-F16K			Fluoro rubber	LSH-F25K	

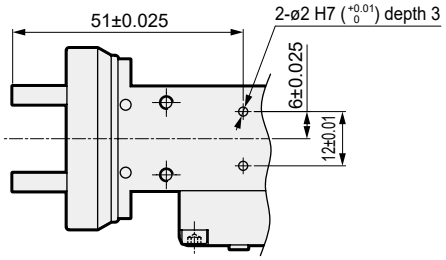
Dimensions (bore size: ø10)

● LSHM-G10D1A
LSHM-F10D1A



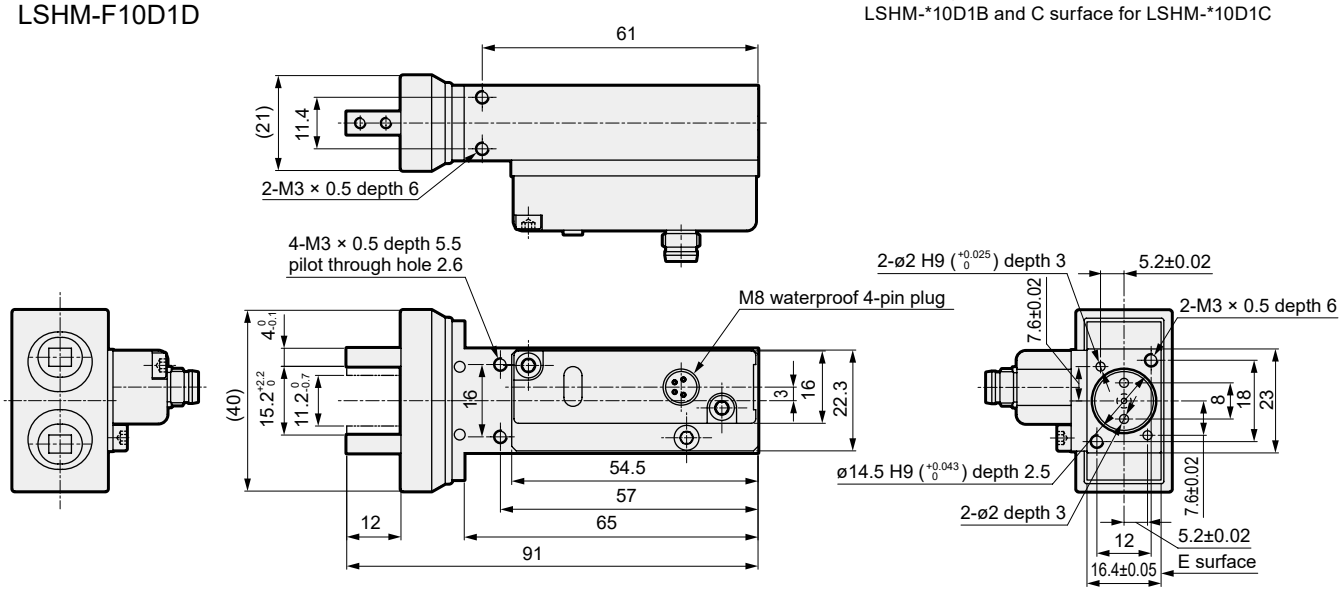


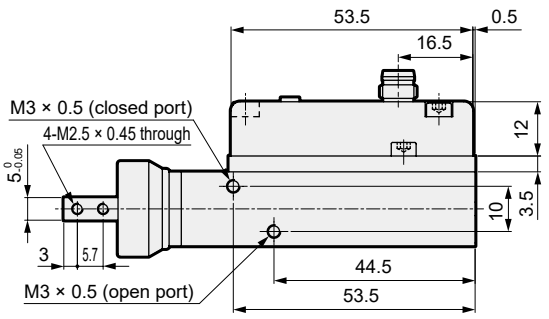
● LSHM-G10D1B / C
LSHM-F10D1B / C



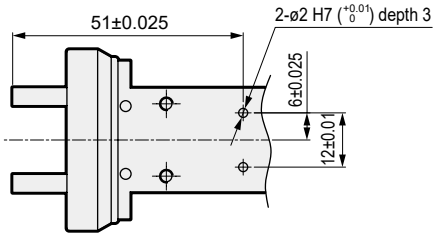
*1: Positioning holes are machined on B surface for LSHM-*10D1B and C surface for LSHM-*10D1C

● LSHM-G10D1D
LSHM-F10D1D



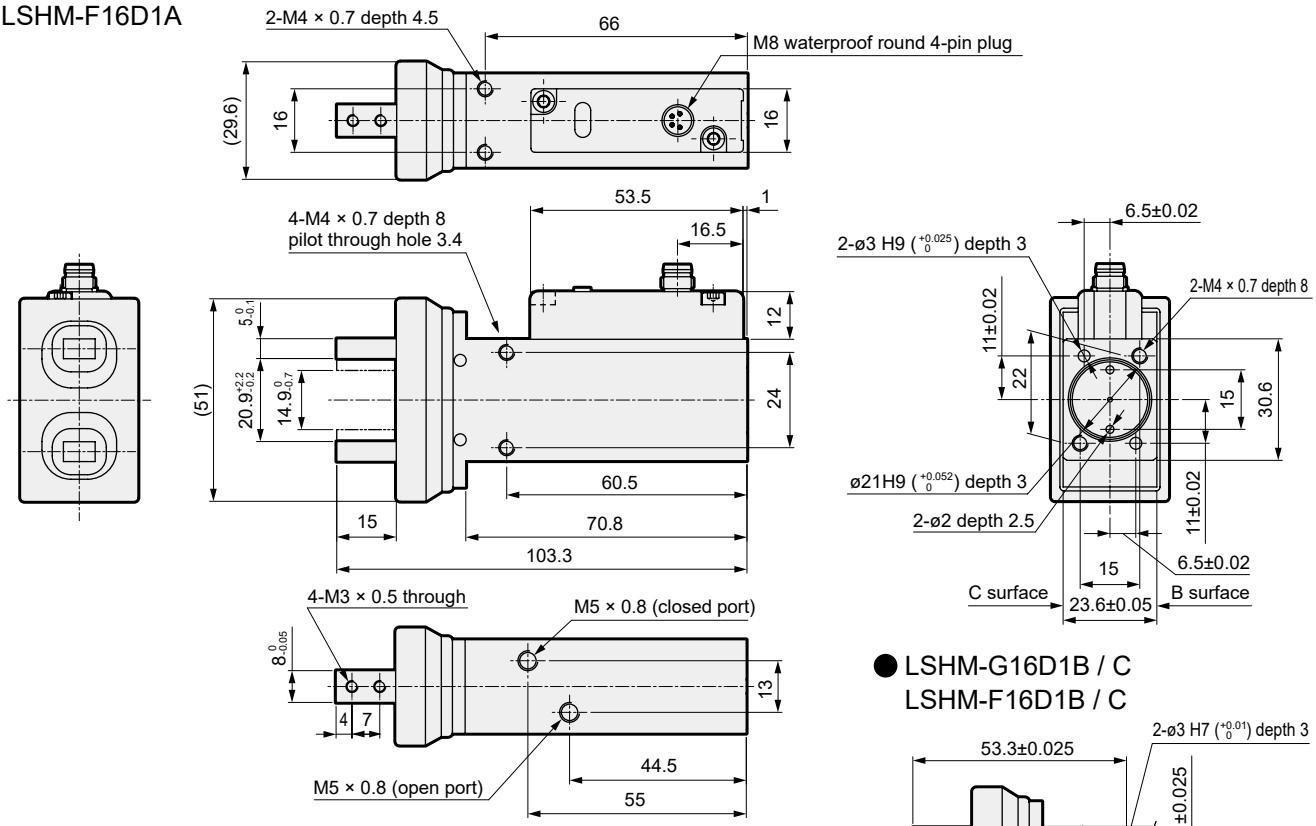


● LSHM-G10D1E
LSHM-F10D1E

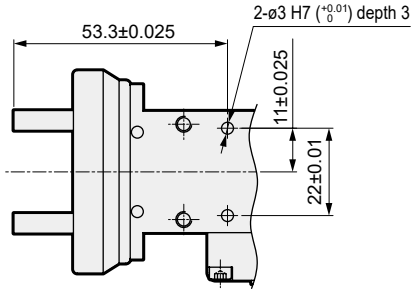


Dimensions (bore size: ø16)

● LSHM-G16D1A
LSHM-F16D1A

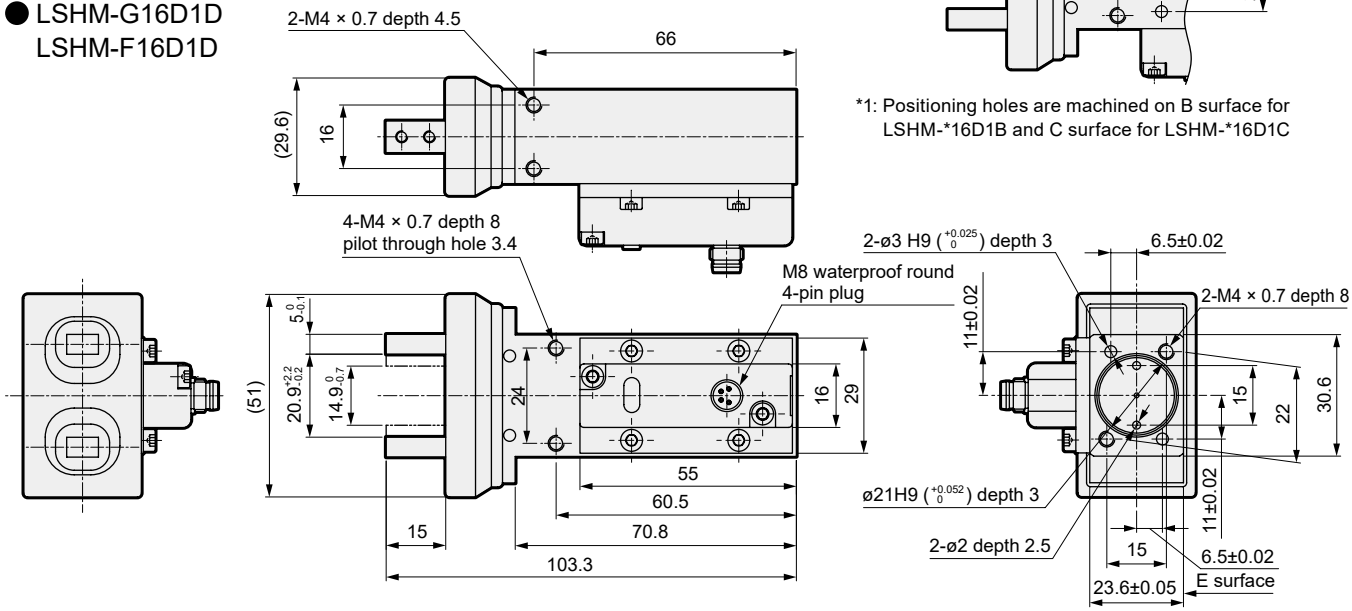


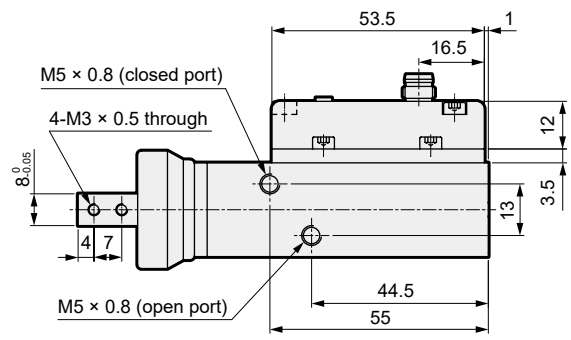
● LSHM-G16D1B / C
LSHM-F16D1B / C



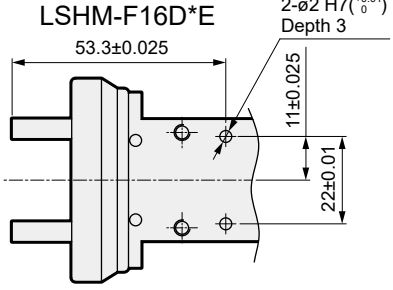
*1: Positioning holes are machined on B surface for LSHM-*16D1B and C surface for LSHM-*16D1C

● LSHM-G16D1D
LSHM-F16D1D



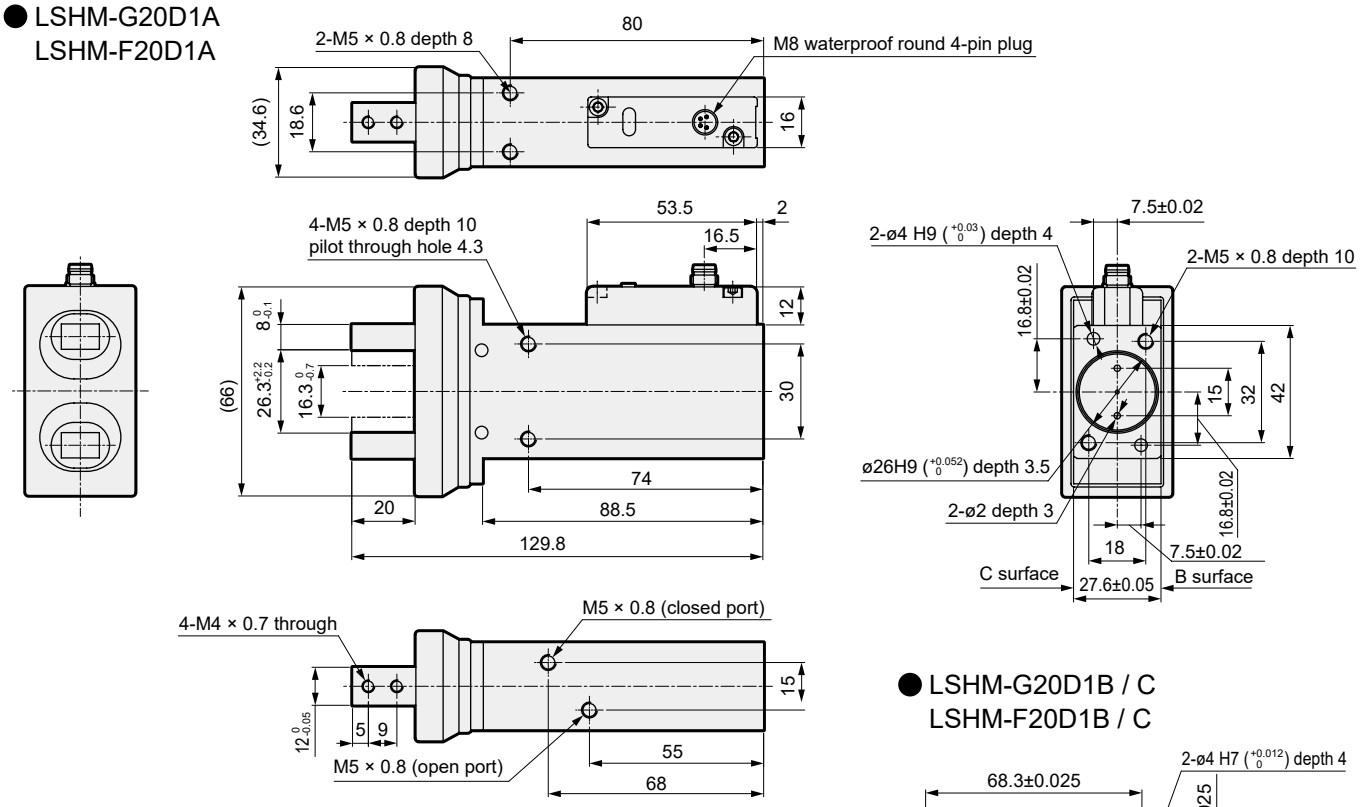


● LSHM-G16D*E
LSHM-F16D*E

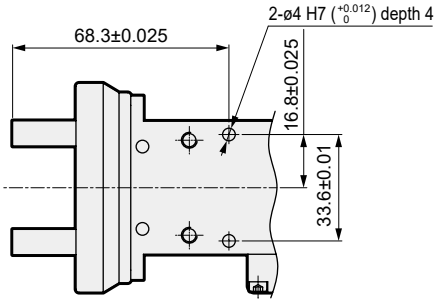


Dimensions (bore size: ø20)

● LSHM-G20D1A
LSHM-F20D1A

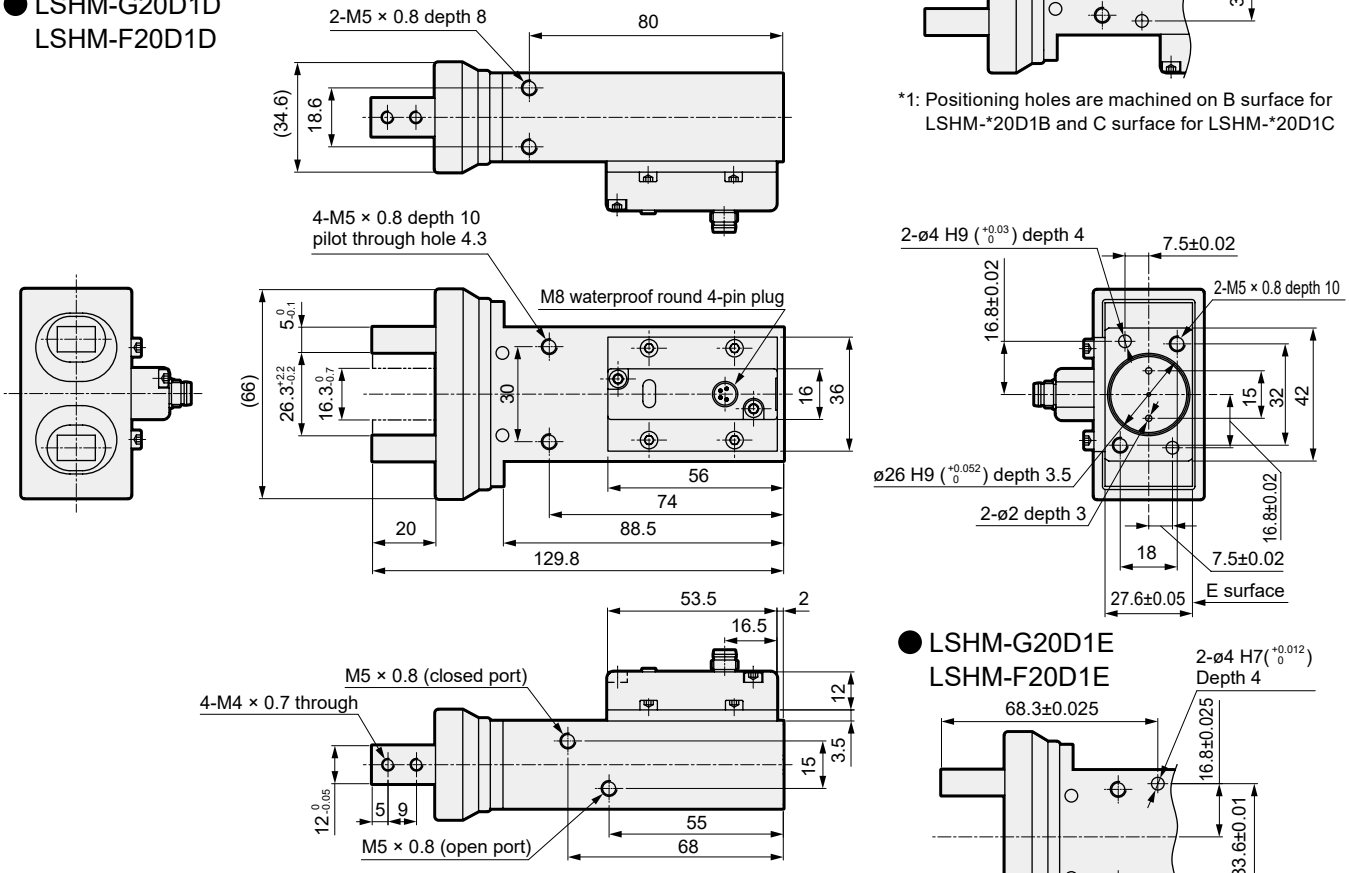


● LSHM-G20D1B / C
LSHM-F20D1B / C

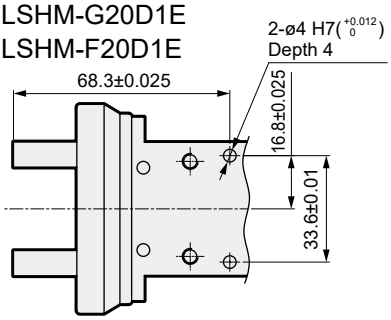


*1: Positioning holes are machined on B surface for LSHM-*20D1B and C surface for LSHM-*20D1C

● LSHM-G20D1D
LSHM-F20D1D

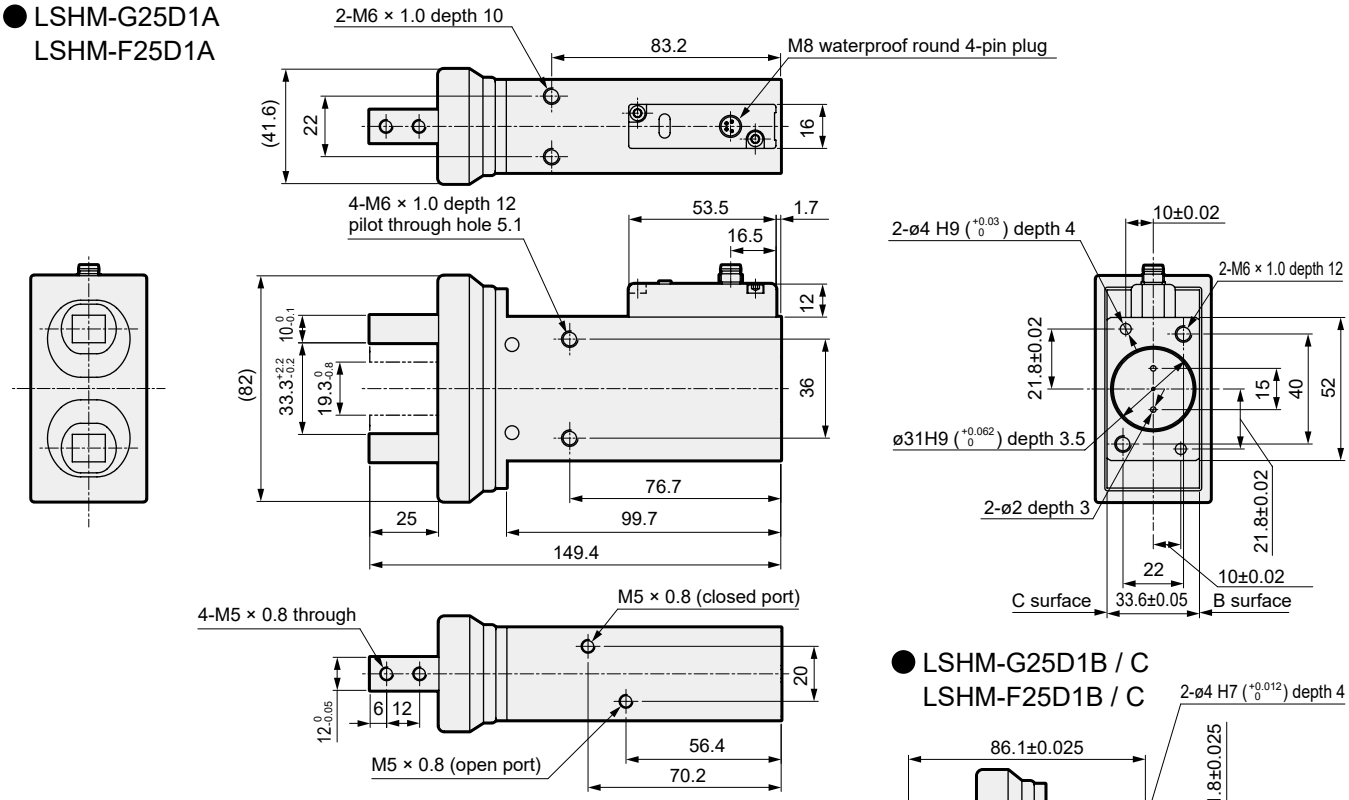


● LSHM-G20D1E
LSHM-F20D1E

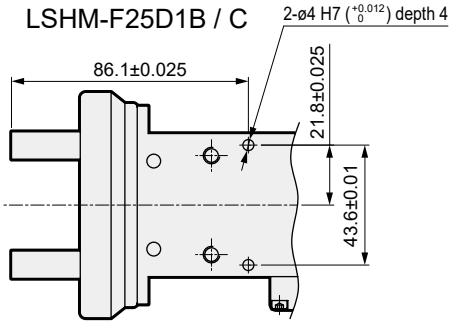


Dimensions (bore size: ø25)

● LSHM-G25D1A
LSHM-F25D1A

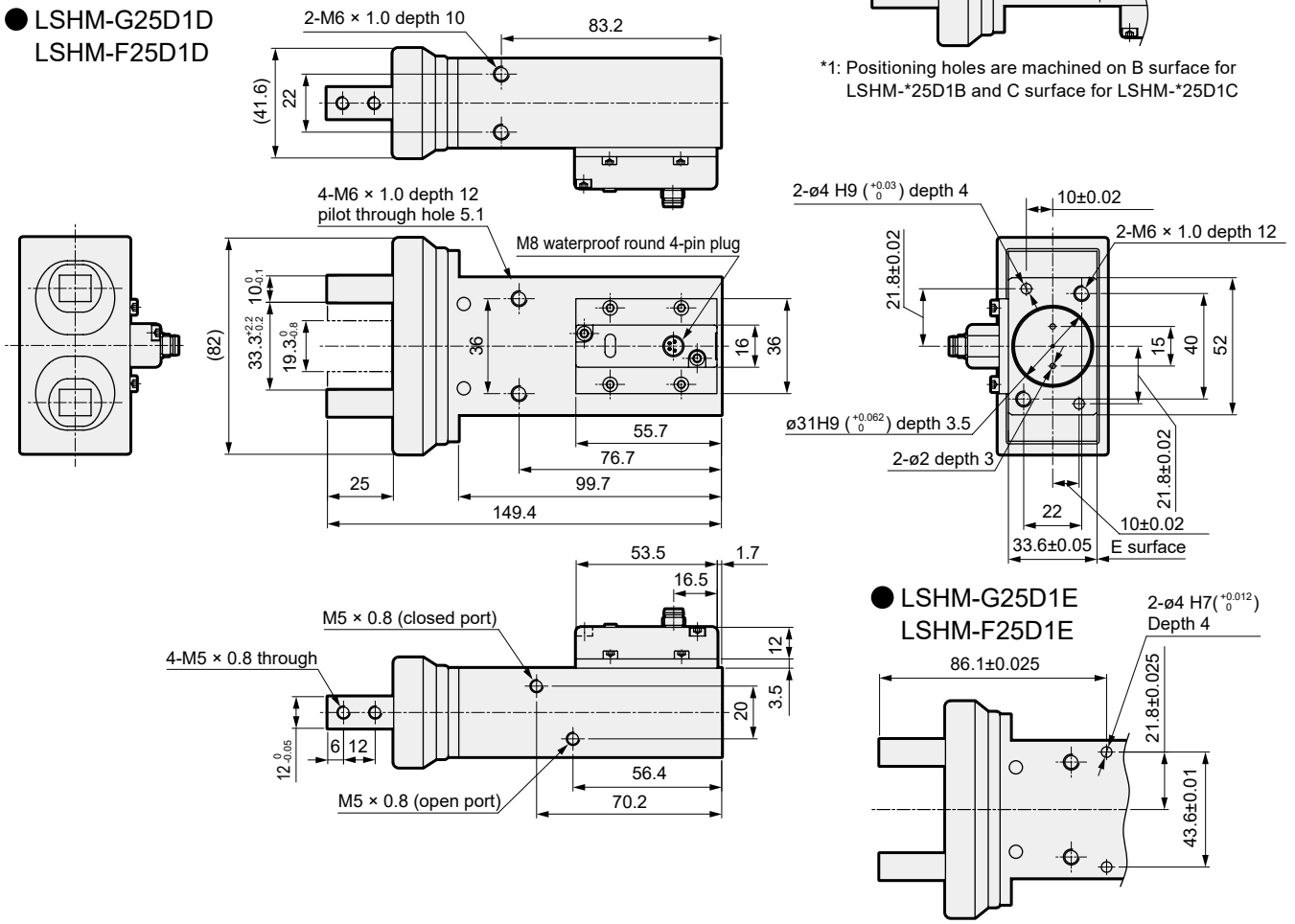


● LSHM-G25D1B / C
LSHM-F25D1B / C



*1: Positioning holes are machined on B surface for LSHM-*25D1B and C surface for LSHM-*25D1C

● LSHM-G25D1D
LSHM-F25D1D



● LSHM-G25D1E
LSHM-F25D1E

Correction adapter

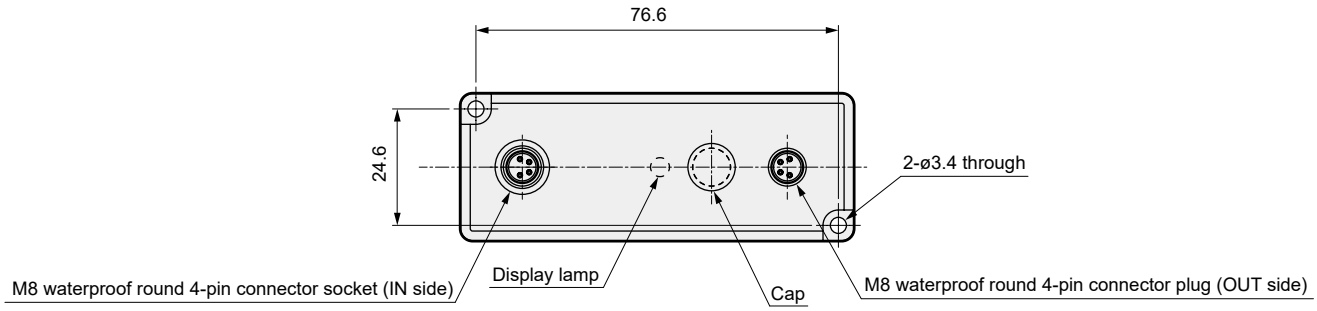
The analog output linearity will be corrected. Please use for applications where high-accuracy linearity is required.

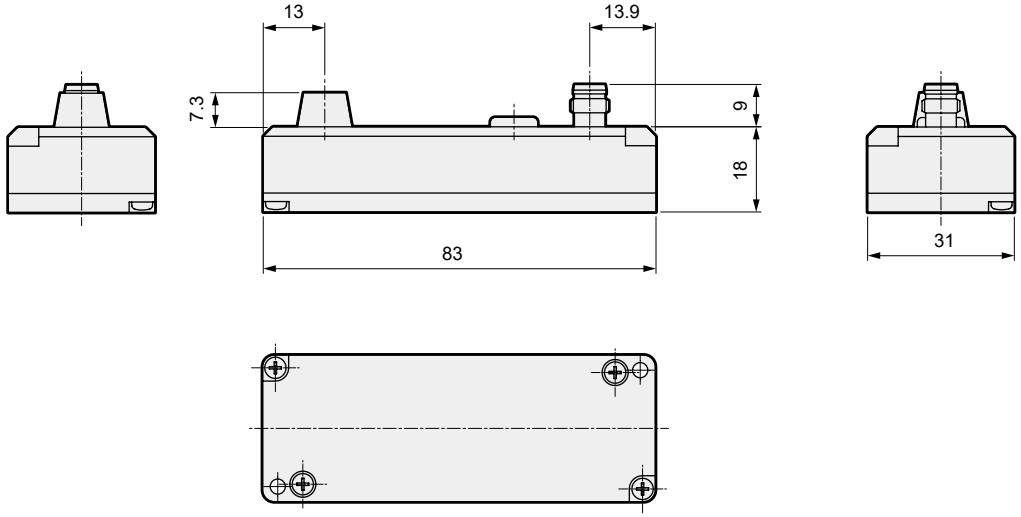
Specifications

Item	Description
Power supply voltage	24 VDC ±10%
Current consumption	35 mA or less
Display lamp	Red LED lit when power 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, CKD provided measuring 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
Impact resistance	294 m/s^2
Degree of protection	IEC standards IP65
Ambient temperature, humidity	10 to 60°C, 85% RH or less
Mounting method	Direct mounting
Weight	40 g

*Use the default combination of LSHM and correction adapter.

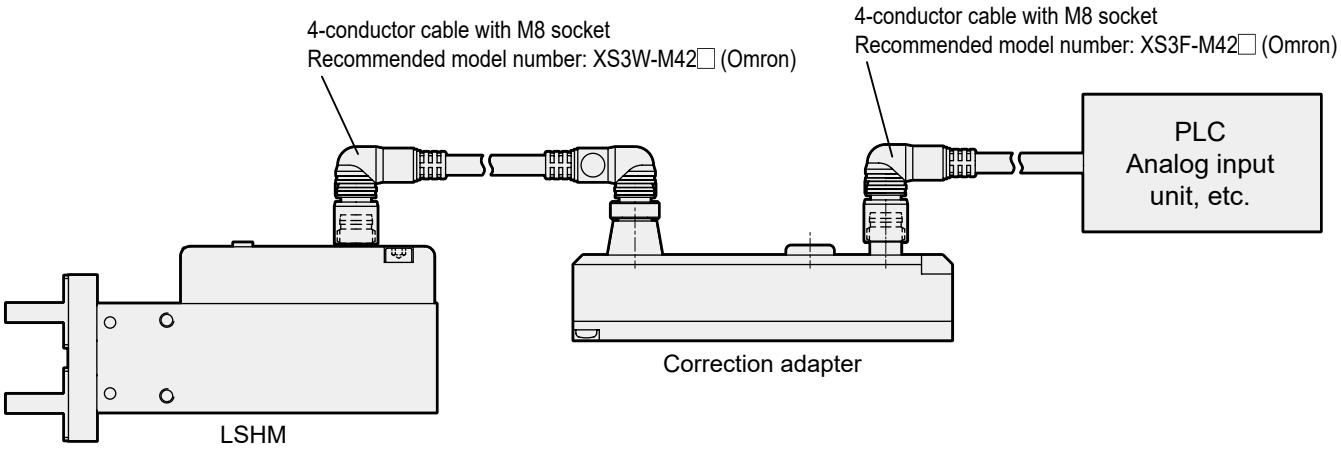
Dimensions



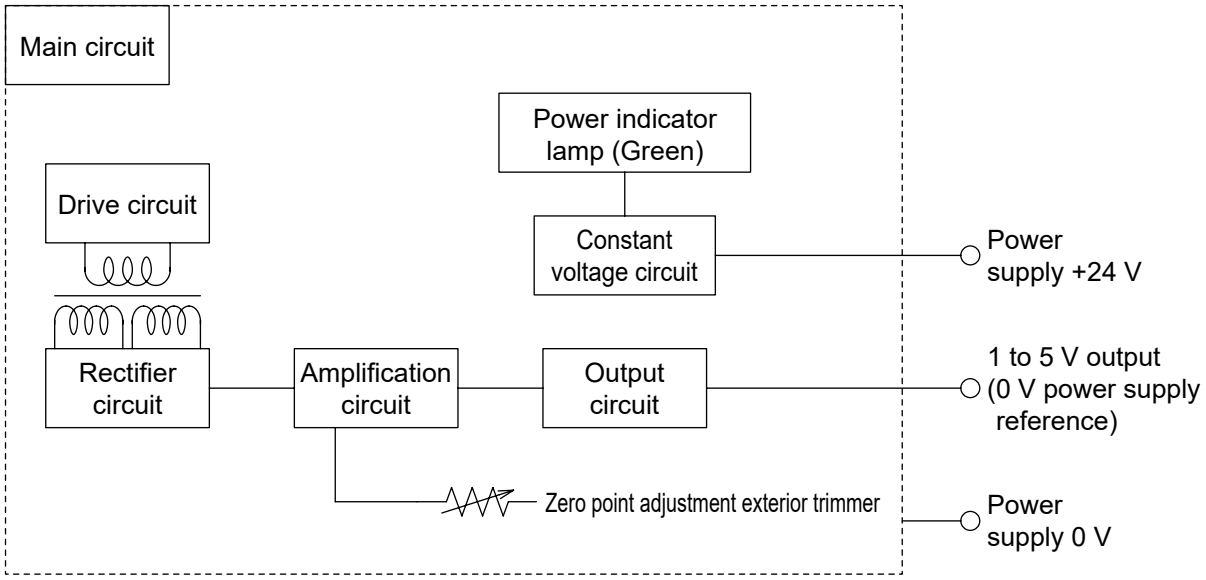


MEMO

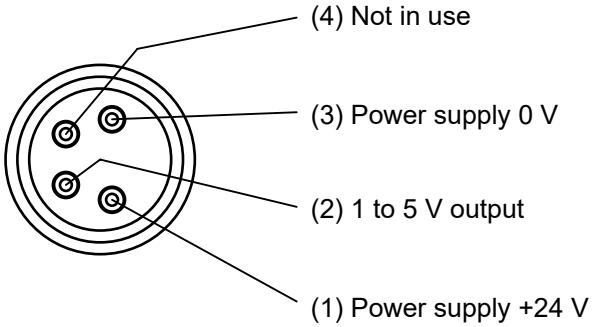
System configuration



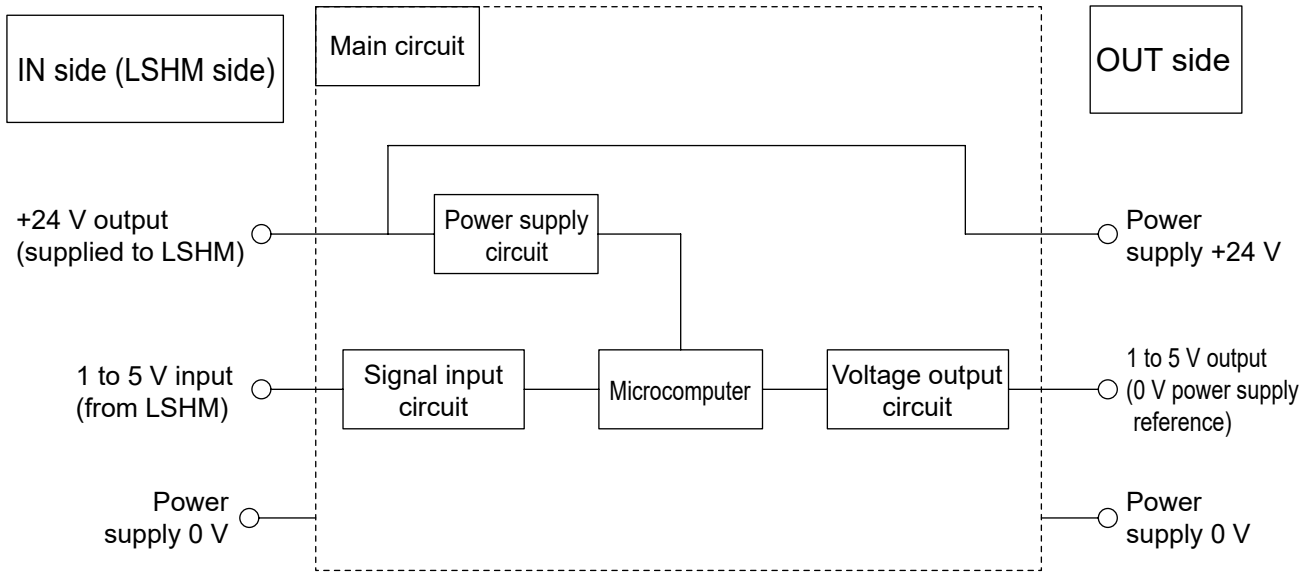
Internal circuit



Plug contact array diagram (LSHM)

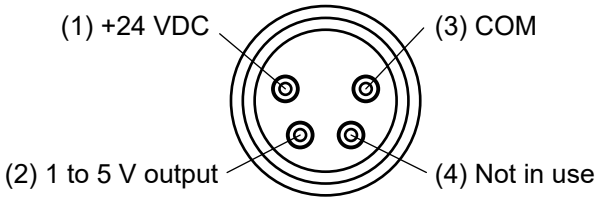


Internal circuit (correction adapter)

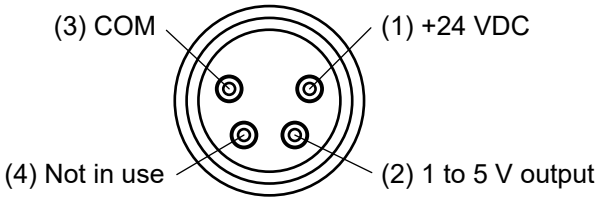


Plug contact array diagram (correction adapter)

M8 socket (IN side) pin array



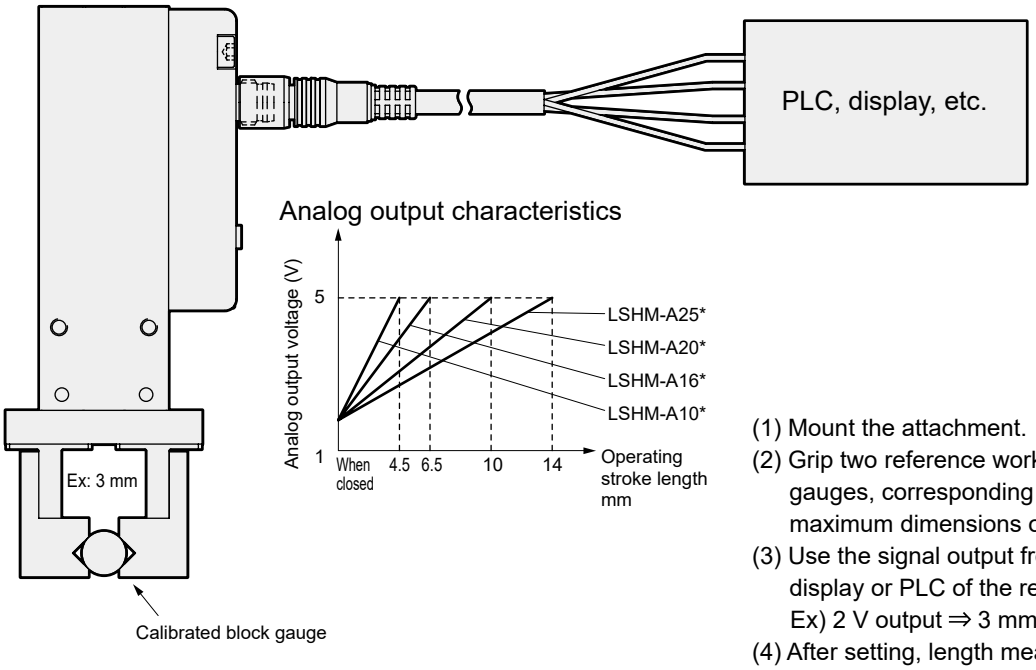
M8 plug (OUT side) pin array



LSHM Series usage guide

Workpiece measurement using the entire operating stroke length range

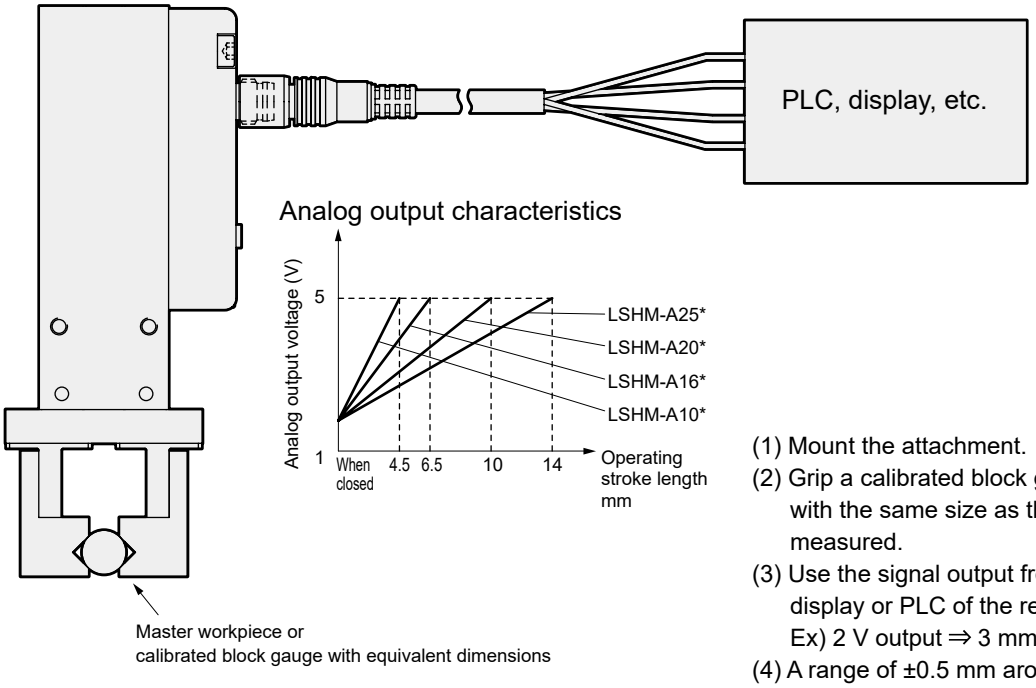
Ex) Judgment of workpiece model in multi-model production equipment, etc.



(1) Mount the attachment.
(2) Grip two reference workpieces such as block gauges, corresponding to the minimum and maximum dimensions of the workpiece to be used.
(3) Use the signal output from the sensor to set the display or PLC of the receiving side.
Ex) 2 V output ⇒ 3 mm, 4 V output ⇒ 8 mm
(4) After setting, length measurement is possible with linearity of ±3% F.S. (±0.5% F.S. with correction adapter option) over the entire stroke

Higher-precision measurement through limiting the measurement range

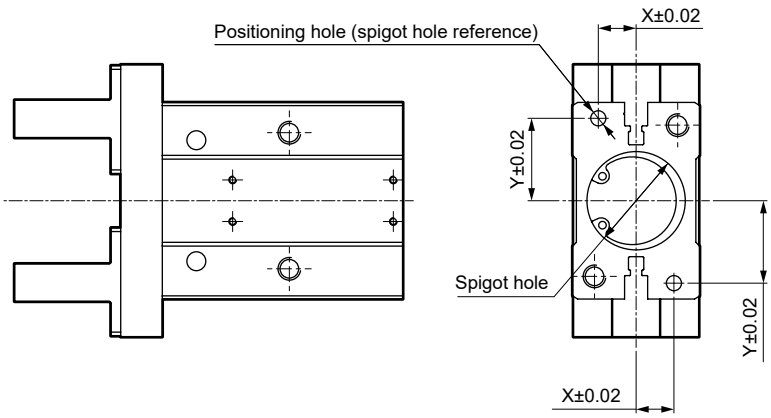
Ex) Confirming that workpiece dimensions are within tolerance range, confirming wear and deformation of attachments and jigs, etc.



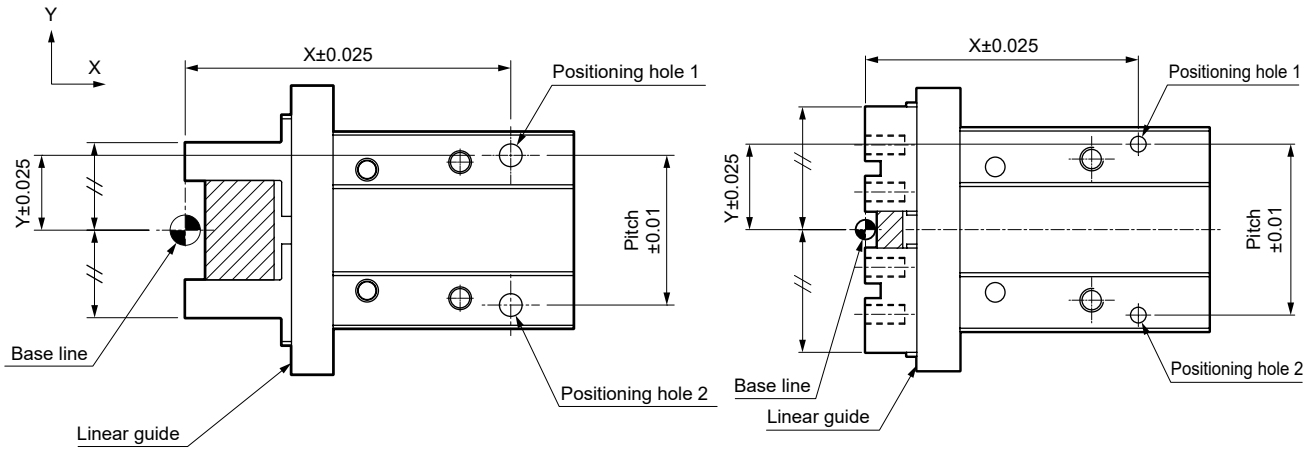
(1) Mount the attachment.
(2) Grip a calibrated block gauge or master workpiece with the same size as the workpiece to be measured.
(3) Use the signal output from the sensor to set the display or PLC of the receiving side.
Ex) 2 V output ⇒ 3 mm
(4) A range of ±0.5 mm around the set dimensions can be measured with linearity of ±0.5%FS (reference value when without correction adapter).

Positional reference of positioning hole

● Positioning hole on body end face

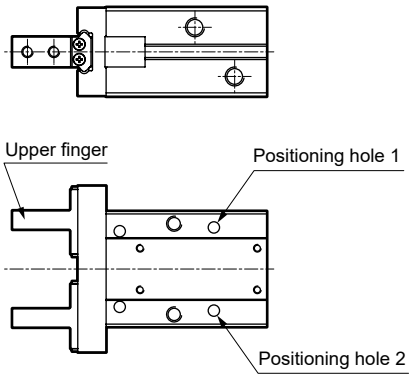


● Grip center reference, high precision positioning hole
Positioning can be performed with reference to the gripping center

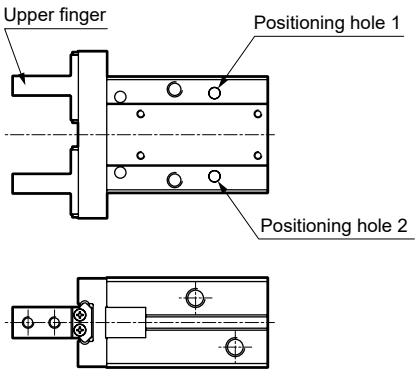


Base line of positioning hole
With the workpiece gripped at custom stroke length, the finger facing left and the linear direction of the linear guide as the Y axis,
X axis direction reference: Upper finger tip
Y axis direction reference: Center of outer surface of finger

Ex) When standard finger faces left and piping is on top
LSH*-□□□□R



Ex) When standard finger faces left and piping is underneath
LSH*-□□□□L



LSH-HP selection guide

STEP-1 Select a suitable model by required gripping force

(1) Calculation of required gripping force

Gripping force F_W satisfying the following equation is required to transport the workpiece (weight W_L).

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

F_W : Required gripping force [N]
n : Number of attachments = 2
W_L : Weight of workpiece [kg]
g : Gravity acceleration 9.8 [m/s^2]
K : Transport coefficient
5 [holding only]
10 [normal transport]
20 [suddenly accelerated transport]

Transport coefficient K

Calculation example: When decelerating and stopping in 0.1 second from transport speed of V = 0.75 m/s with friction coefficient μ of workpiece and finger as 0.1, see below.

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

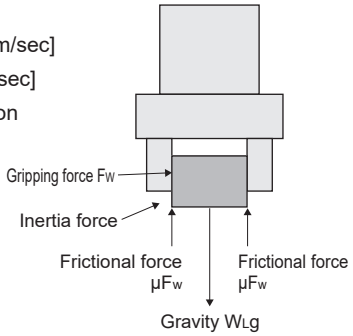
V: Transport speed [m/sec]
t: Deceleration time [sec]
μ: Coefficient of friction

·Inertial force = W_L (V/t)

·Gravity = W_L g

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

∴Here, the transport coefficient K is calculated from the above equation: $\frac{V/t+g}{\mu g} = \frac{0.75/0.1+9.8}{0.1 \times 9.8} \approx 20$



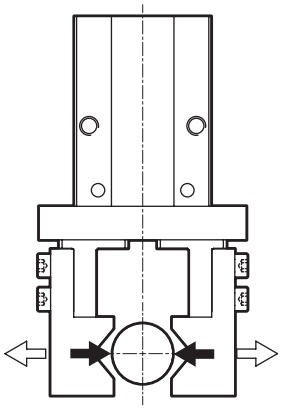
Note) Allowance is required for transport coefficient K due to impacts during transportation, etc. Even when the coefficient of friction μ is higher than μ = 0.1, set transport coefficient K from 10 to 20 or more for safety.

(2) Model selection by required gripping force

The gripping force changes depending on the "grip direction", "attachment length", and "supply pressure". Confirm on the gripping force graph that sufficient force can be obtained under the usage conditions.

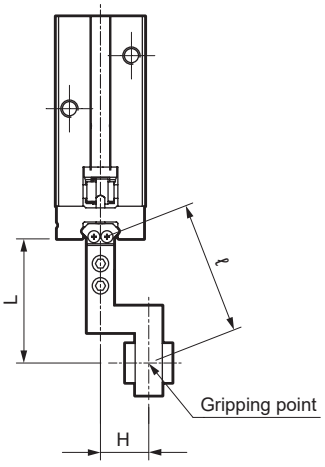
Gripping force graph page	
LSH*-A**D	Page 1570
LSH*-A**S/C	Page 1571
LSH*-G/F**D	Page 1572
LSH*-G/F**S/C	Page 1573

Grip direction



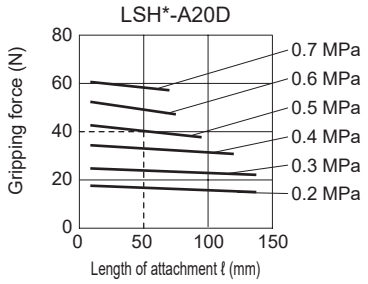
● Open direction (⇦)
● Closed direction (➡)

Attachment length ℓ



Understanding the gripping force graph

(For LSH-A20D closing direction)

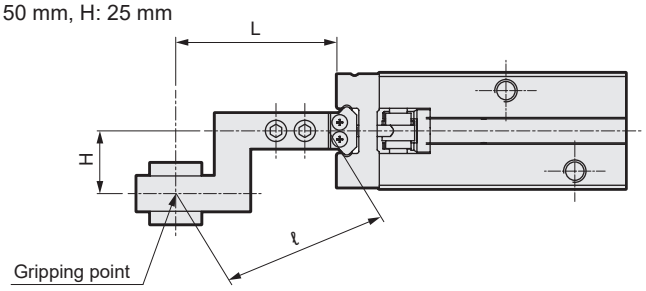


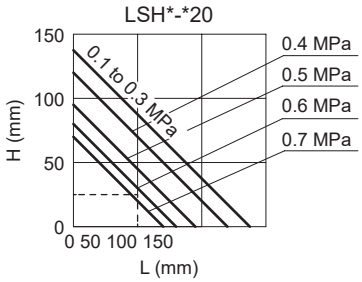
For example, when supply pressure is 0.5 MPa and attachment length is 50 mm, the gripping force is 40 N.

STEP-2 Confirmation of attachment shape

Use the attachment within the range shown on page 1574.

Example) L: 50 mm, H: 25 mm





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

●Use attachments that are as short and lightweight as possible.

If the attachment is long and heavy, inertia increases when opening and closing. This may cause play in the finger, and adversely affect durability.

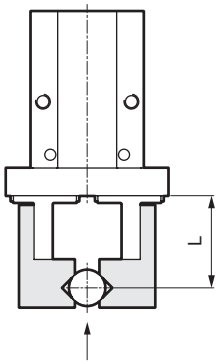
●Even if the attachment shape is within the performance data, by making it as small as possible enables the product to have a longer service life. Also, if ℓ is long, unexpected vibration, etc., could cause erroneous gripping and falling during transport. With "Cylinder diameter x1.3/working pressure" as a guide, if ℓ is longer than that, set the transport coefficient of STEP-1 to a high value (Guideline: Transport coefficient 20 or more)

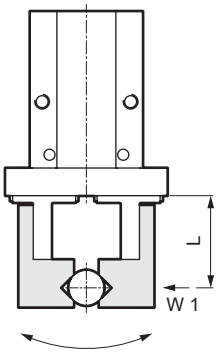
●The weight of the attachment affects the service life, so check that the weight is less than the following value.

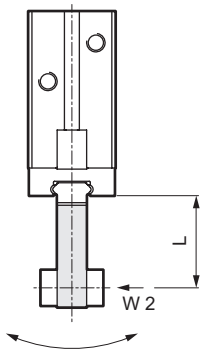
W<1/4H (1 pc.) W: Weight of attachment
H: Product weight of Hand

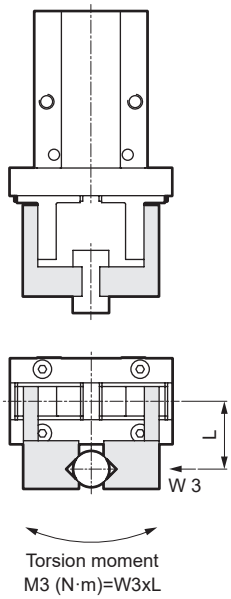
STEP-3 Confirmation of external forces applied to finger

When an external force is applied to a finger such as when conveying and inserting workpieces, use it within [Table 1] parameters.
*When in use during transport, consider the impact at the end.









[Table 1] Allowable load value

Bore size	Vertical load Wmax (N)	Bending moment M1max (N·m)	Radial moment M2max (N·m)	Torsion moment M3max (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

L: Distance to the point where load is applied

If multiple external forces are applied, the resultant external forces (formula below) must be less than 1.
WT=W/Wmax+M1/M1max+M2/M2max+M3/M3max<1

When using the product with radial moment of ( ) or less, keep L and H dimensions at 2/3 or less of the length stipulated on page 1570.

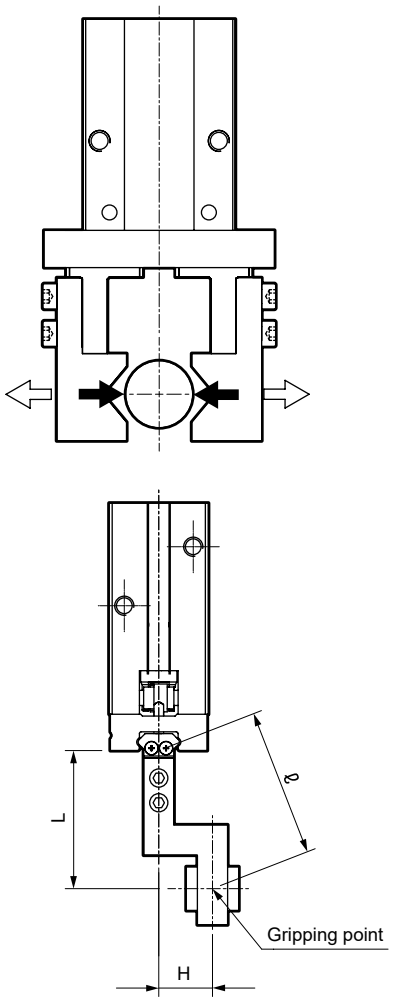
Sample calculation (1): When conveying a workpiece
Model No.: LSH-A20D, When a workpiece (weight: m=0.8kg, center of gravity: L=60mm) is gripped and transported with an attachment (weight: mk:0.06kg, center of gravity: Lk=30mm)
(g: Gravity acceleration 9.8m/s^2, α: Coefficient of impact generated at end = 3)
M_1= α x W_1xL = αx (m_kxgxL_kx2+mx$g$xL)
= 3 x (0.06 x 9.8 x 30 x 10^{-3} x 2 + 0.8 x 9.8 x 60 x 10^{-3}) ≈ 1.5 N·m, and M_1max = 2.1 N·m or below, and therefore, can be used.

Sample calculation (2): When inserting a workpiece
Model No.: LSH-A20D, L=40mm for load W_1: When 40 N is added
M_1=W_1xL=40x40x10^{-3}= 1.6 N·m and $M1_{max}$= 2.1 N·m or less, so use is possible

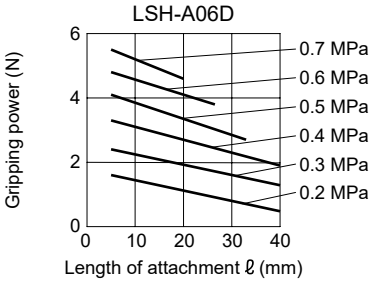
Gripping power performance data LSH-A**D / LSHL-A**D / LSHM-A**D (double acting)

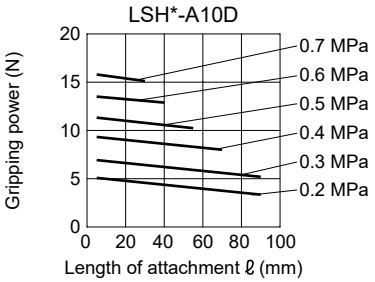
· The gripping power indicates the thrust (for one finger) in the direction of the arrow shown in the figure.
· The gripping power operating in the opening/closing directions against the length (ℓ) of the attachment when the supply pressure is 0.7 MPa or less is shown.

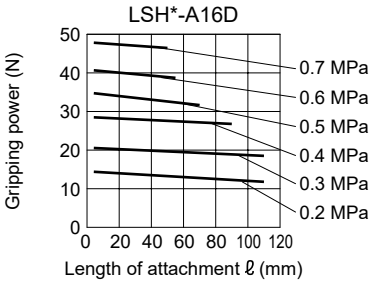
● Open direction (⇦)
● Closed direction (➡)

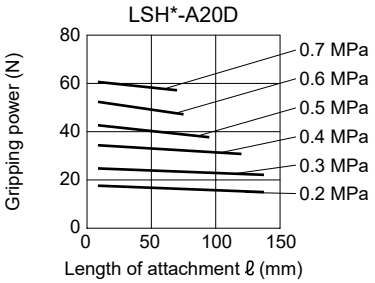


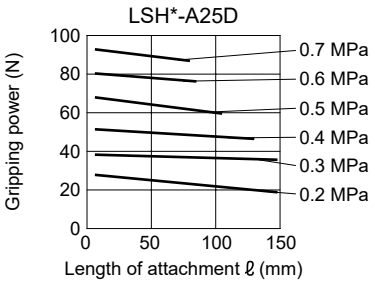
Closed direction

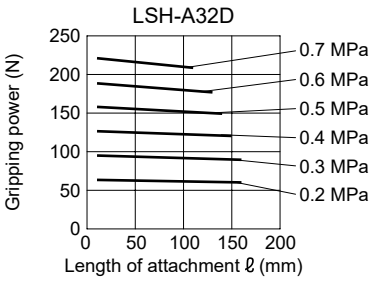




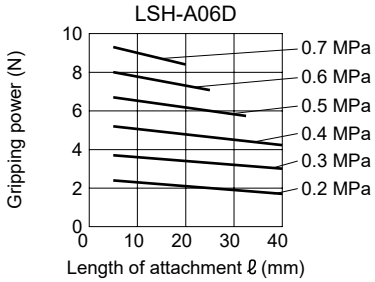


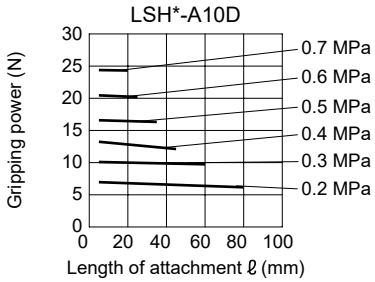


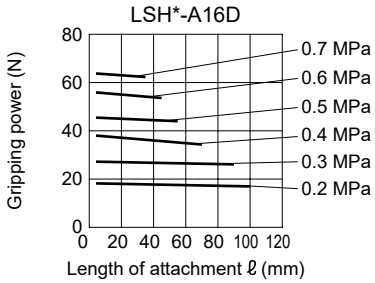


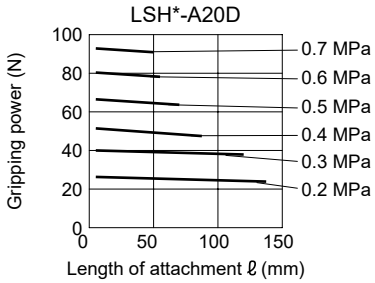


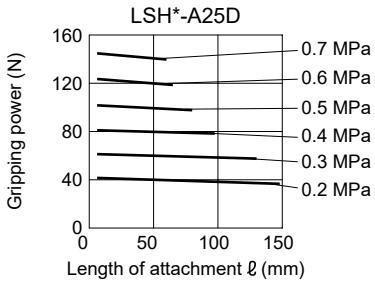
Open direction

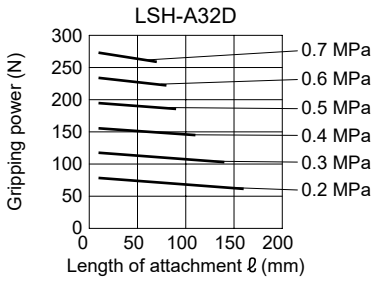








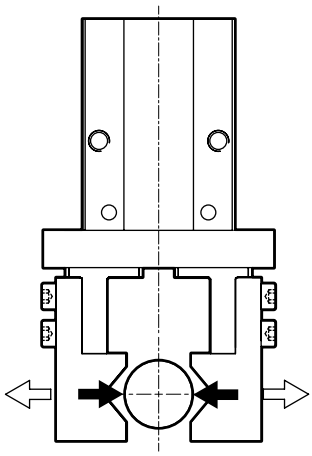


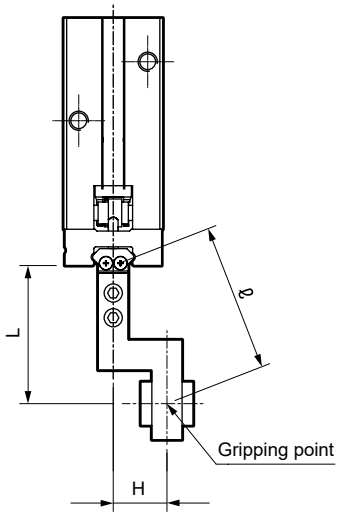


Gripping power performance data LSH-A**S / C (single acting)

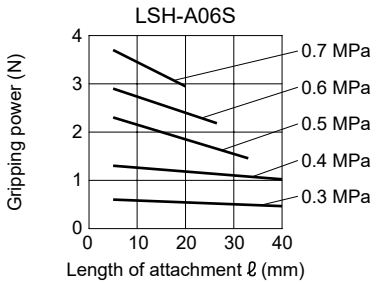
· The gripping power indicates the thrust (for one finger) in the direction of the arrow shown in the figure.
· The gripping power operating in the opening/closing directions against the length (ℓ) of the attachment when the supply pressure is 0.7 MPa or less is shown.

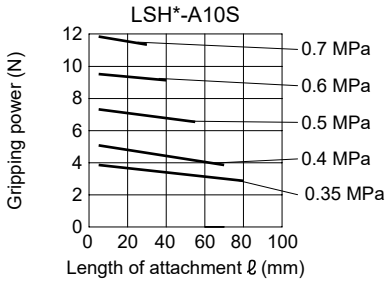
● Open direction (⇦)
● Closed direction (➡)

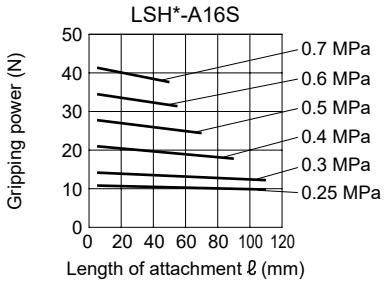


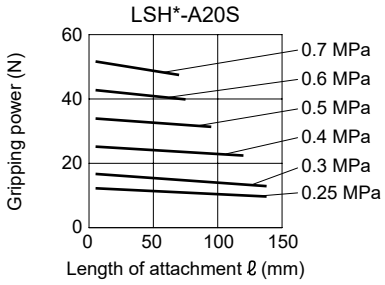


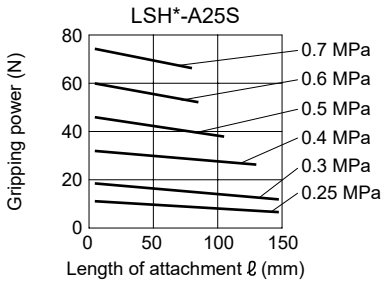
Closed direction

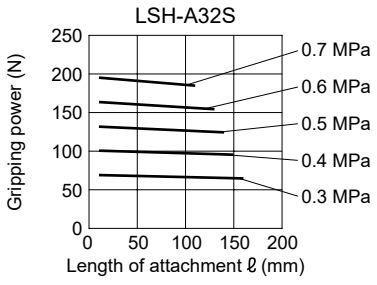




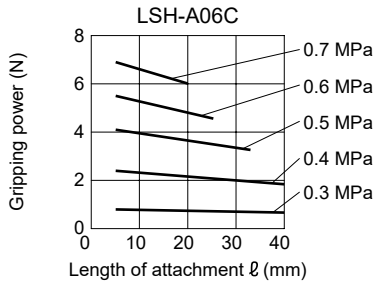


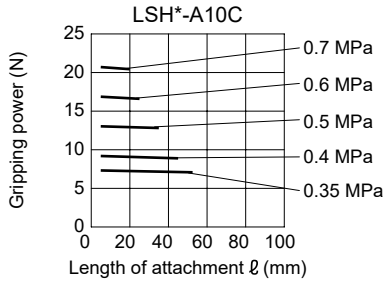


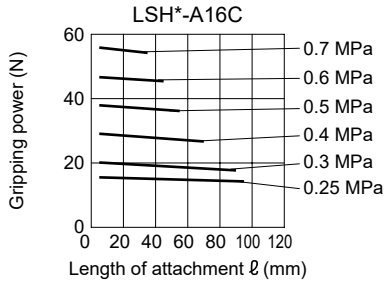


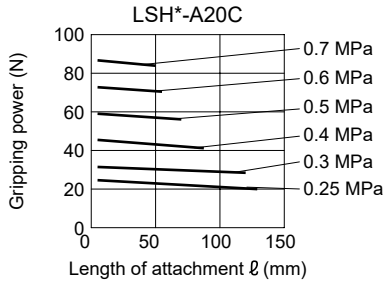


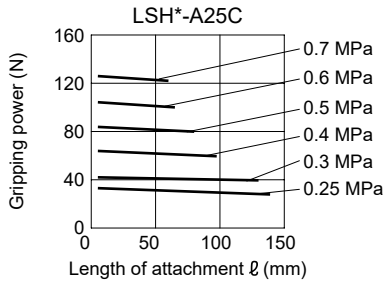
Open direction

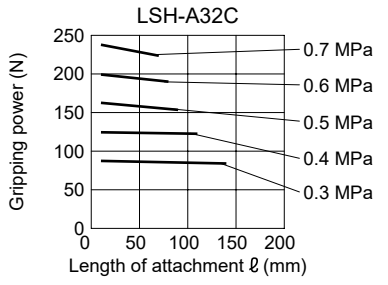








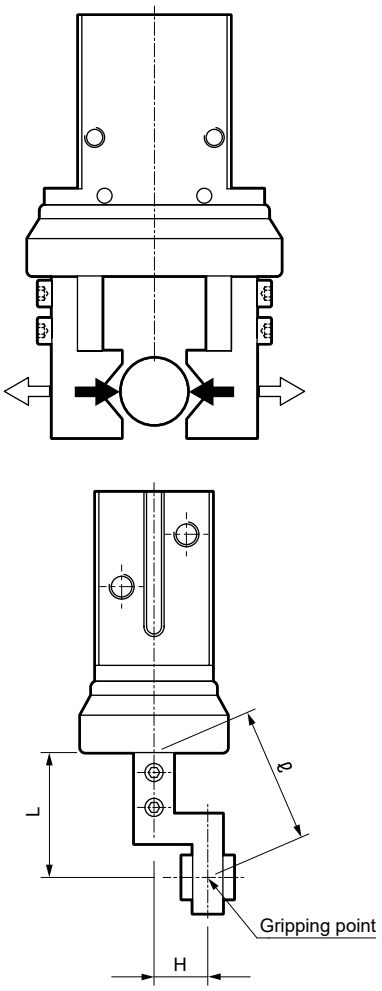




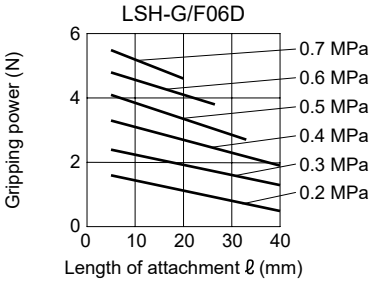
Gripping power performance data LSH-G / F**D / LSHL-G / F**D / LSHM-G / F**D (double acting)

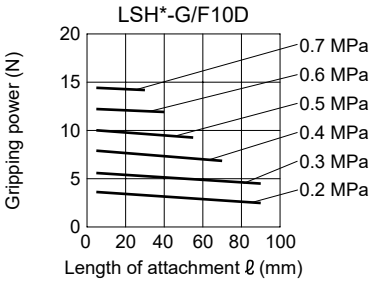
· The gripping power indicates the thrust (for one finger) in the direction of the arrow shown in the figure.
· The gripping power operating in the opening/closing directions against the length (ℓ) of the attachment when the supply pressure is 0.7 MPa or less is shown.

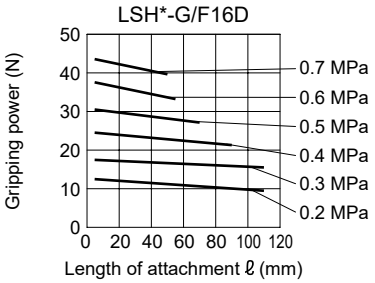
● Open direction (⇦)
● Closed direction (➡)

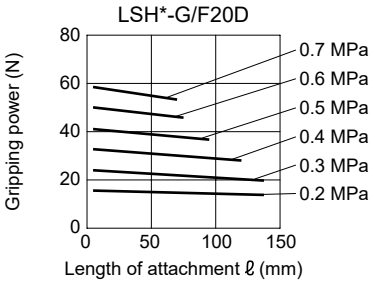


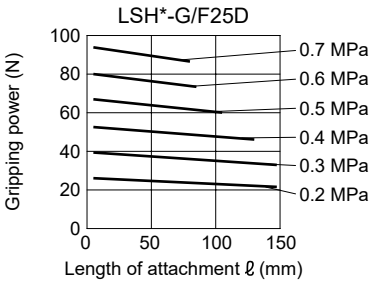
Closed direction

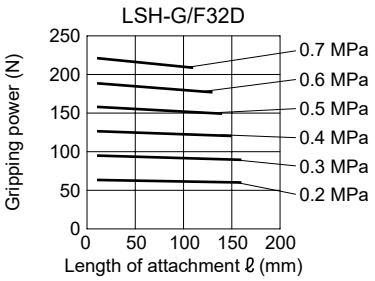




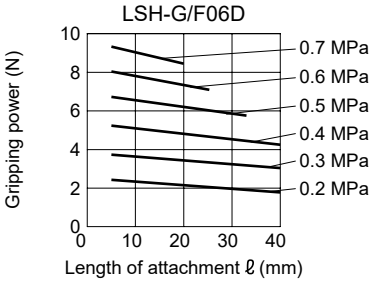


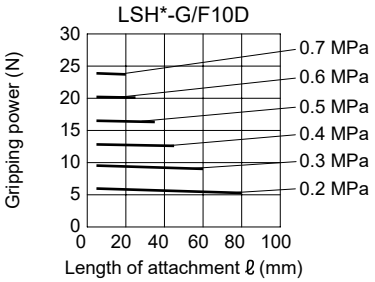


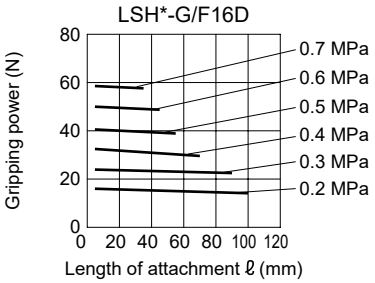


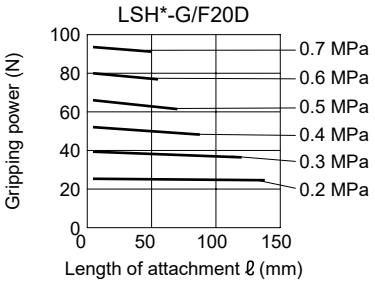


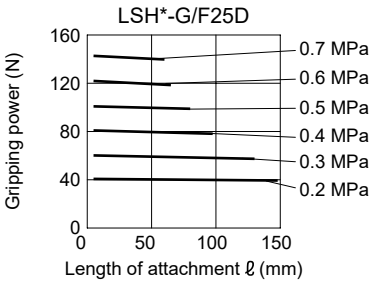
Open direction

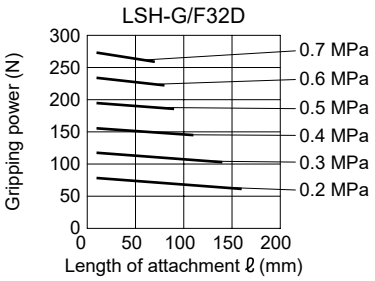








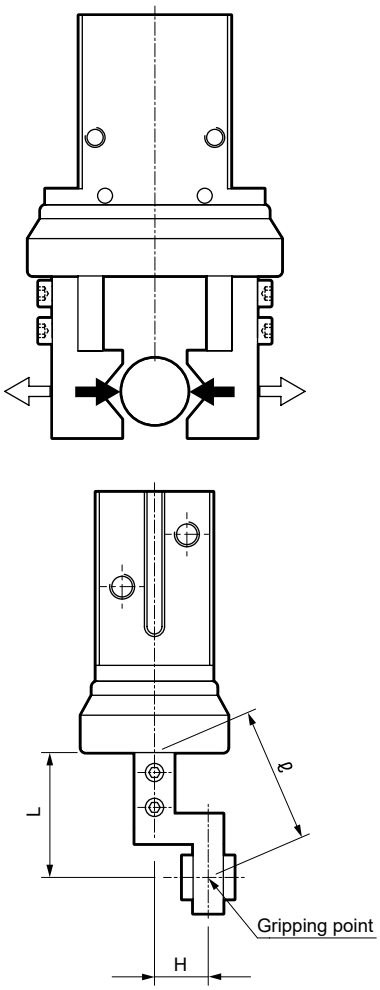




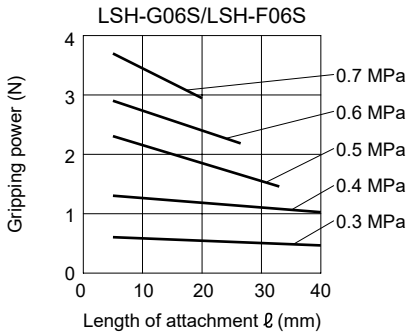
Gripping power performance data LSH-G / F**S / C (single acting)

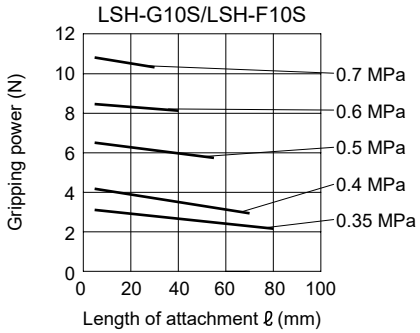
· The gripping power indicates the thrust (for one finger) in the direction of the arrow shown in the figure.
· The gripping power operating in the opening/closing directions against the length (ℓ) of the attachment when the supply pressure is 0.7 MPa or less is shown.

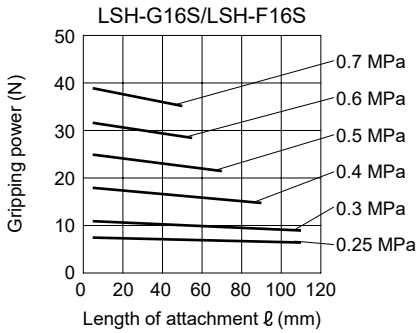
● Open direction (⇦)
● Closed direction (➡)

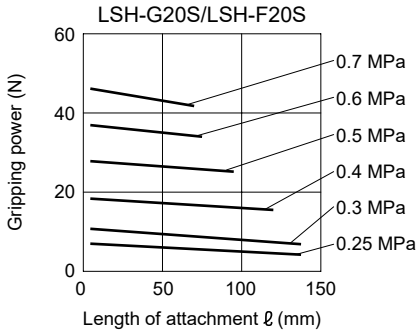


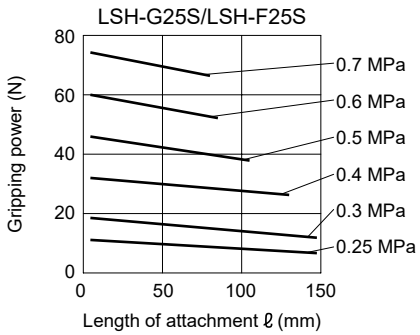
Closed direction



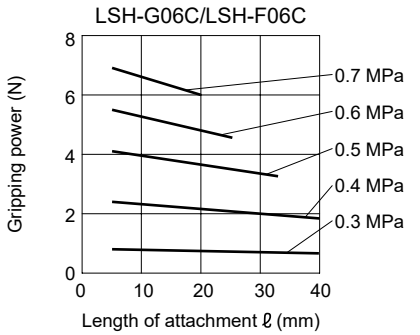


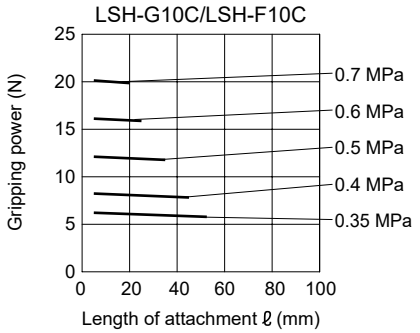


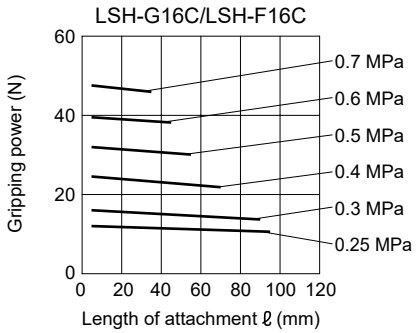


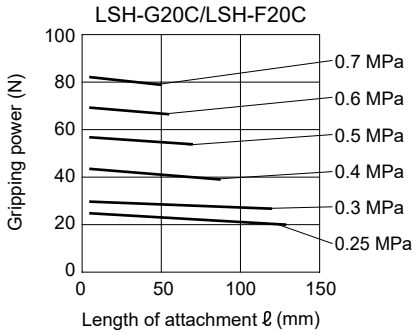


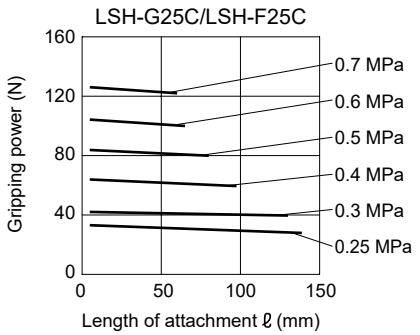
Open direction







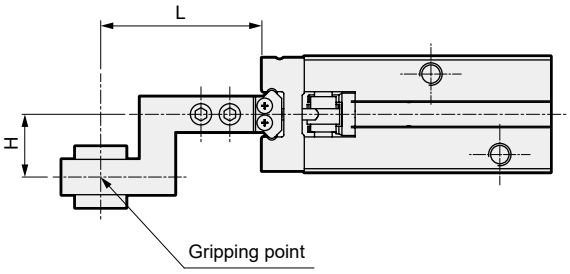




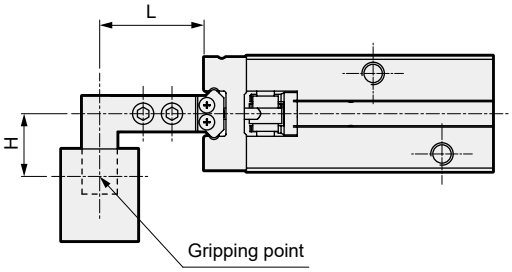
Attachment length

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

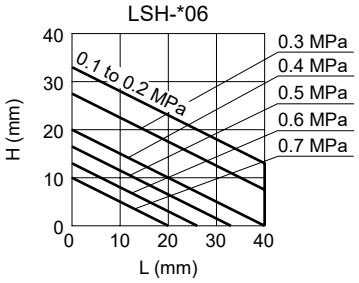
Closed direction

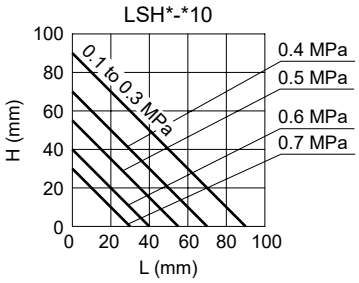


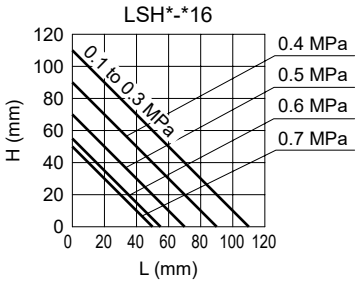
Open direction

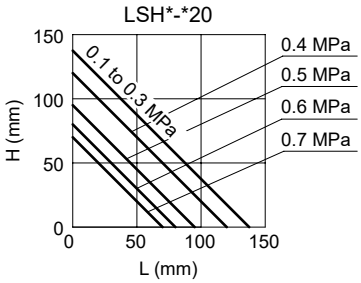


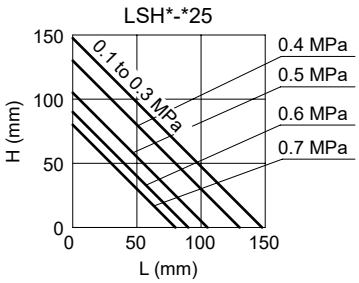
Closed direction

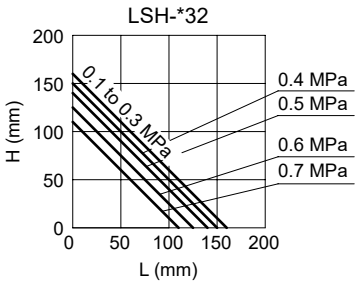




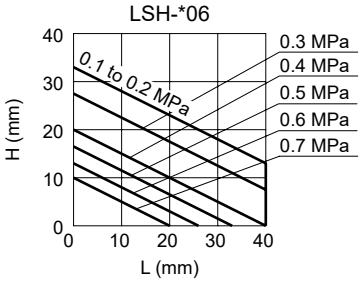


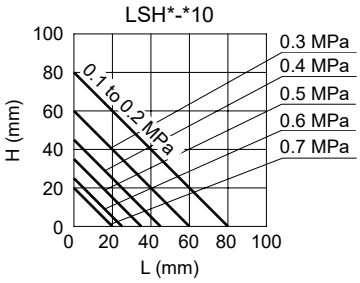


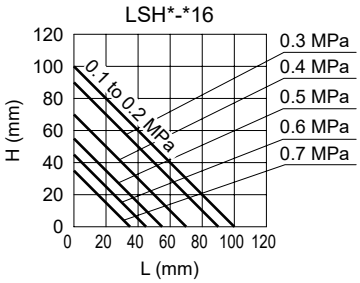


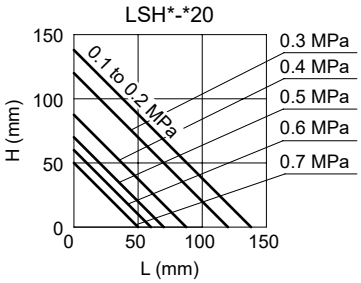


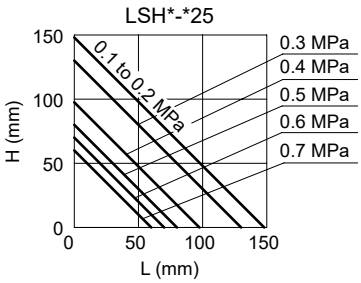
Open direction

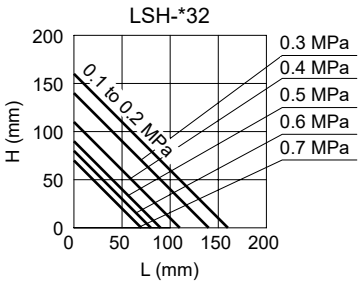












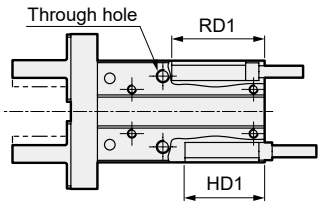
MEMO

Cylinder switch precautions

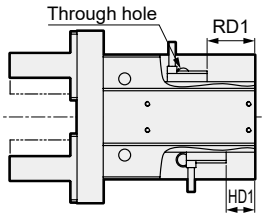
● Switch mounting position list

<Side mounting>

ø6 to 20, 32

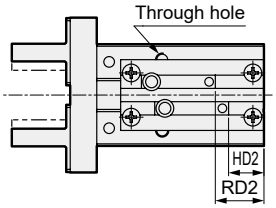


ø25



<Rail mounting>

ø6 to 32

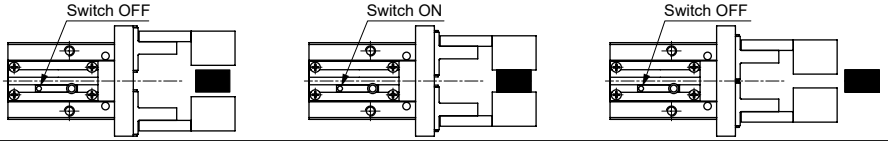
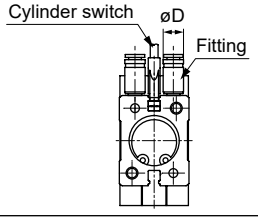


Model No.	Switch Model No.	Side mounting		Rail mounting	
		RD1	HD1	RD2	HD2
LSH-A06*	F2/3□	20.5	18	–	–
	F2/3S	–	–	9.5 (–)	7 (–)
LSH-A10*	F2/3□	21	18	11 (21)	8 (18)
	F2/3S	22	19	10 (22)	7 (19)
LSH-A16*	F2/3□	21	17	11 (21)	7 (17)
	F2/3S	22	18	10 (22)	6 (18)
LSH-A20*	F2/3□	26	20	16 (26)	10 (20)
	F2/3S	27	21	15 (27)	9 (21)
LSH-A25*	F2/3-PH	–	–	20 (30)	12 (22)
	F2/3V-PV	20	12	20 (30)	12 (22)
	F2/3S	19	11	19 (31)	11 (23)
LSH-A32D	F2/3□	32.5	20.5	22.5 (32.5)	10.5 (20.5)
	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)
	T2/3□	–	–	27 (45)	15 (33)

*When the lead wire is directed toward the head side, the dimension in parentheses apply.
*"–" indicates it cannot be mounted.

● Precautions

Refer to precautions in the following table for the bore size to be used.

Category	ø6	ø10	ø16	ø20	ø25	ø32	precautions
Common items	●	●	●	●	●	●	*RD dimension is the max. sensitivity position at open side end position and HD dimension at closed side end position. The actual mounting position should be adjusted after confirming the operational status of the switch.
	●	●	●	●	●	●	*One switch can be mounted for one switch rail groove.
	●	●	●	●	●	●	*Since the opening and closing stroke is short, only one side of the open or closed state is detected for each switch. Ex: A single switch alone cannot detect what is shown in the following illustration. (1) Open (workpiece not gripped): switch OFF (2) Workpiece gripped: switch ON (3) Closed (workpiece not gripped): switch OFF 
	●	●	●	●	●	●	*Be careful not to be caught in the lead wires when opening/closing the finger.
Side mounting	●	●	●	●			*When using the L type switch for side mounting on the side of the port, the fittings may interfere with the switch. Use fittings whose outer diameters are below those indicated in the following table. Mount position: port side Switch type: L-shaped type 
	●	●	●	●		●	*When using a lead wire straight F3PV switch, the switch and lead wire protrude from the end face of the head side. If this protrusion is a problem, use F2/3V or F2/3S, or mount a rail.
		●	●	●	●	●	*For switch side mounting, the through hole cannot be used.
Rail Mounting		●					*For switch rail mounting, the through hole cannot be used.

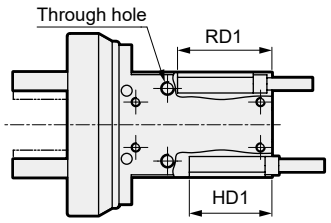
Bore size (mount position)	Fitting O.D. øD
ø6 (RD)	ø5 or less
ø6 (HD)	ø6.9 or less
ø10	ø7.4 or less
ø16	ø7.9 or less
ø20	ø11 or less

Cylinder switch precautions

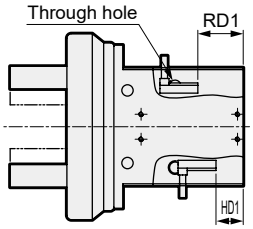
● Switch mounting position list

<Side mounting>

ø6 to 20, 32

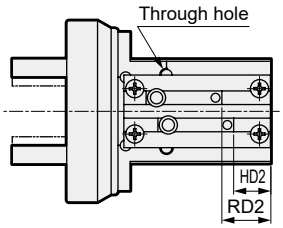


ø25



<Rail mounting>

ø6 to 32

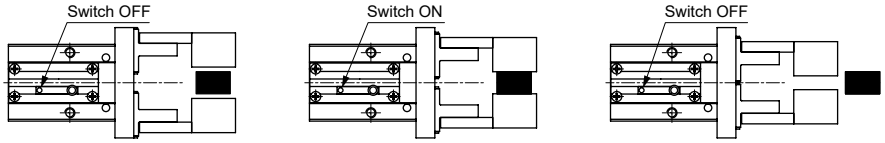
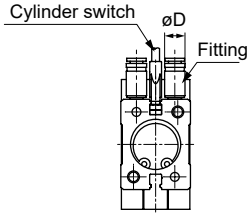


Model No.	Switch Model No.	Side mounting		Rail mounting	
		RD1	HD1	RD2	HD2
LSH-G/F06	F2/3□	20.5	18	–	–
	F2/3S	–	–	9.5 (−)	7 (−)
LSH-G/F10	F2/3□	21	18	11 (21)	8 (18)
	F2/3S	22	19	10 (22)	7 (19)
LSH-G/F16	F2/3□	21	17	11 (21)	7 (17)
	F2/3S	22	18	10 (22)	6 (18)
LSH-G/F20	F2/3□	26	20	16 (26)	10 (20)
	F2/3S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

*When the lead wire is directed toward the head side, the dimension in parentheses apply.
*"–" indicates it cannot be mounted.

● Precautions

Refer to precautions in the following table for the bore size to be used.

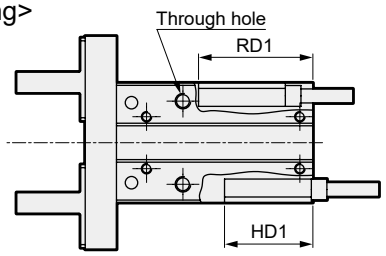
Category	ø6	ø10	ø16	ø20	ø25	ø32	precautions
Common items	●	●	●	●	●	●	*RD dimension is the max. sensitivity position at open side end position and HD dimension at closed side end position. The actual mounting position should be adjusted after confirming the operational status of the switch.
	●	●	●	●	●	●	*One switch can be mounted for one switch rail groove.
	●	●	●	●	●	●	*Since the opening and closing stroke is short, only one side of the open or closed state is detected for each switch. Ex: A single switch alone cannot detect what is shown in the following illustration. (1) Open (workpiece not gripped): switch OFF (2) Workpiece gripped: switch ON (3) Closed (workpiece not gripped): switch OFF 
	●	●	●	●	●	●	*Be careful not to be caught in the lead wires when opening/closing the finger.
Side mounting	●	●	●	●			*When using the L type switch for side mounting on the side of the port, the fittings may interfere with the switch. Use fittings whose outer diameters are below those indicated in the following table. Mount position: port side Switch type: L-shaped type 
	●	●	●	●		●	*When using a lead wire straight F3PV switch, the switch and lead wire protrude from the end face of the head side. If this protrusion is a problem, use F2/3V or F2/3S, or mount a rail.
						●	*When using an F2/3V switch, this switch protrudes from the end face of the head side. If this protrusion is a problem, use F2/3S or mount a rail.
		●	●	●	●		*For switch side mounting, the through hole cannot be used.
Rail Mounting		●					*For switch rail mounting, the through hole cannot be used.

Bore size (mount position)	Fitting O.D. 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

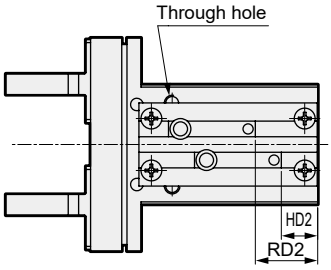
Cylinder switch precautions

● Switch mounting position list

<Side mounting>
ø10 to 25



<Rail mounting>
ø10 to 25

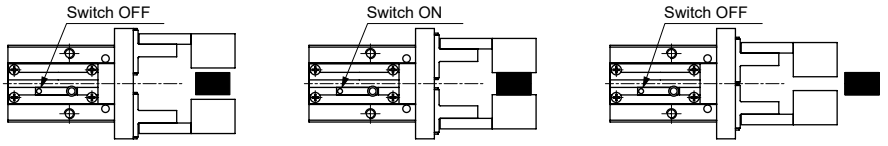
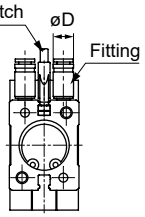


Model No.	Switch Model No.	Side mounting		Rail mounting	
		RD1	HD1	RD2	HD2
LSHL-A10D	F2/3□	22	17	12 (22)	7 (17)
	F2/3S	23	18	11 (23)	6 (18)
LSHL-A16D	F2/3□	24.5	16.5	14.5 (24.5)	6.5 (16.5)
	F2/3S	25.5	17.5	13.5 (25.5)	5.5 (17.5)
LSHL-A20D	F2/3□	30	20	20 (30)	10 (20)
	F2/3S	31	21	19 (31)	9 (21)
LSHL-A25D	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)

*When the lead wire is directed toward the head side, the dimension in parentheses apply.

● Precautions

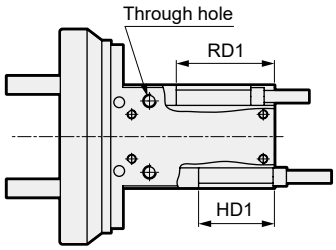
Refer to precautions in the following table for the bore size to be used.

Category	ø10	ø16	ø20	ø25	precautions
Common items	●	●	●	●	*RD dimension is the max. sensitivity position at open side end position and HD dimension at closed side end position. The actual mounting position should be adjusted after confirming the operational status of the switch.
	●	●	●	●	*One switch can be mounted for one switch rail groove.
	●	●	●	●	*Since the opening and closing stroke is short, only one side of the open or closed state is detected for each switch. Ex: A single switch alone cannot detect what is shown in the following illustration. (1) Open (workpiece not gripped): switch OFF (2) Workpiece gripped: switch ON (3) Closed (workpiece not gripped): switch OFF 
	●	●	●	●	*Be careful not to be caught in the lead wires when opening/closing the finger.
Side mounting	●	●	●		*When using the L type switch for side mounting on the side of the port, the fittings may interfere with the switch. Use fittings whose outer diameters are below those indicated in the following table. Mount position: port side Switch type: L-shaped type Bore size / Fitting O.D. øD: ø10 / ø7.4 or less; ø16 / ø7.9 or less; ø20 / ø11 or less 
	●	●	●	●	*When using the lead wire straight switch, the switch and lead wire protrude from the end face of the head side. If this protrusion is a problem, use F2/3V or F2/3S, or mount a rail.
	●	●	●		*When using F3PV switch, the switch protrudes from the end face of the head side. If this protrusion is a problem, use F2/3V or F2/3S, or mount a rail.
	●	●	●	●	*For switch side mounting, the through hole cannot be used.
Rail Mounting	●				*For switch rail mounting, the through hole cannot be used.

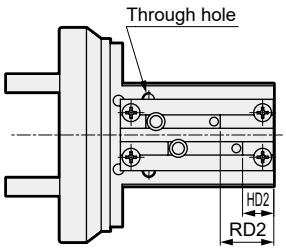
Cylinder switch precautions

● Switch mounting position list

<Side mounting>
ø10 to 20



<Rail mounting>
ø10 to 20

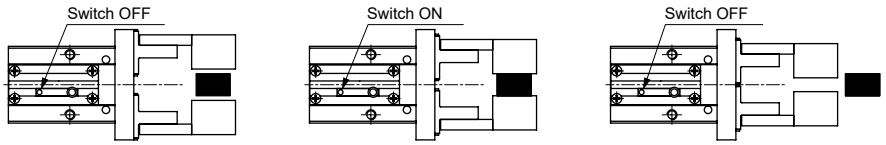
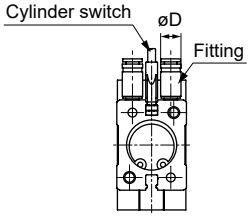


Model No.	Switch Model No.	Side mounting		Rail mounting	
		RD1	HD1	RD2	HD2
LSHL-G/F10	F2/3□	22	17	12 (22)	7 (17)
	F2/3S	23	18	11 (23)	6 (18)
LSHL-G/F16	F2/3□	25	17	15 (25)	7 (17)
	F2/3S	26	18	14 (26)	6 (18)
LSHL-G/F20	F2/3□	35.5	25.5	25.5 (35.5)	15.5 (25.5)
	F2/3S	36.5	26.5	24.5 (36.5)	14.4 (26.5)

*When the lead wire is directed toward the head side, the dimension in parentheses apply.

● Precautions

Refer to precautions in the following table for the bore size to be used.

Category	Bore size ø10	Bore size ø16	Bore size ø20	precautions
Common items	●	●	●	*RD dimension is the max. sensitivity position at open side end position and HD dimension at closed side end position. The actual mounting position should be adjusted after confirming the operational status of the switch.
	●	●	●	*One switch can be mounted for one switch rail groove.
	●	●	●	*Since the opening and closing stroke is short, only one side of the open or closed state is detected for each switch. Ex: A single switch alone cannot detect what is shown in the following illustration. (1) Open (workpiece not gripped): switch OFF (2) Workpiece gripped: switch ON (3) Closed (workpiece not gripped): switch OFF 
	●	●	●	*Be careful not to be caught in the lead wires when opening/closing the finger.
Side mounting	●	●	●	*When using the L type switch for side mounting on the side of the port, the fittings may interfere with the switch. Use fittings whose outer diameters are below those indicated in the following table. Mount position: port side Switch type: L-shaped type Bore size / Fitting O.D. øD: ø10 / ø7.4 or less; ø16 / ø7.9 or less; ø20 / ø11 or less 
	●	●	●	*When using the lead wire straight switch, the switch and lead wire protrude from the end face of the head side. If this protrusion is a problem, use F2/3V or F2/3S, or mount a rail.
	●	●		*When using F3PV switch, the switch protrudes from the end face of the head side. If this protrusion is a problem, use F2/3V or F2/3S, or mount a rail.
	●	●	●	*For switch side mounting, the through hole cannot be used.
Rail Mounting	●			*For switch rail mounting, the through hole cannot be used.