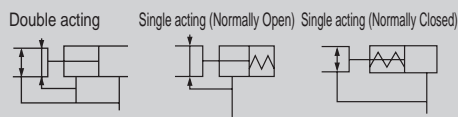




Linear Slide Hand Double acting/Single acting

# LSH-A-HP1 Series

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

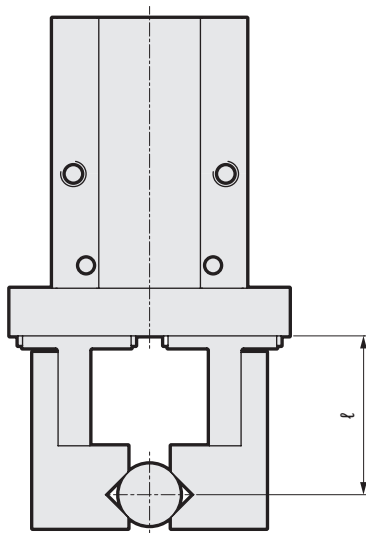


## Specifications

| Item                                    |                    | 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) kg | Finger OP: 1, 2, 3 | 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,  $\ell = 20$  mm, value at 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.

# LSH-A-HP1 Series

## Switch specifications

### Switch specifications

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

\*1: The F type switch uses a bend-resistant lead wire as standard.

| Item                     | 2-wire proximity                     |   | 3-wire proximity                      |                          |
|--------------------------|--------------------------------------|---|---------------------------------------|--------------------------|
|                          | T2H/T2V                              | T2HR3/T2VR3<br>(Lead wire bending type) | T3H/T3V                               | T3PH/T3PV                |
| Applications             | Programmable<br>Controller dedicated |   | Programmable<br>For controller, relay |                          |
| Output method            | -                                    | -                                       | NPN output                            | PNP output               |
| Power supply voltage     | -                                    | -                                       | 10 to 28 VDC                          |                          |
| Load voltage/<br>current | 10 to 30 VDC<br>5 to 20 mA           | 10 to 30 VDC<br>5 to 20 mA              | 30 VDC or less<br>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                         |                          |
| Shock resistance         | 980m/s <sup>2</sup>                  |   |                                       |                          |
| Weight                   | g 1m:18g 3m:49g                      |   |                                       |                          |

### Consumable parts list

| Bore size | Kit No.                   | Consumable parts No.                          | Rail plate kit No. |               |                                   |
|-----------|---------------------------|---|--------------------|---------------|-----------------------------------|
|           |                           |   | For F-switch       | For T-switch  | Description                       |
| ø6        | Cannot be<br>disassembled | -   | LSH-RPF-06-HP      | -             | Rail plate<br>Small machine screw |
| ø10       | LSH-10K-HP                | CR ring/rod packing/<br>Piston packing/O-ring | LSH-RPF-10-HP      | -             |                                   |
| ø16       | LSH-16K-HP                |   | LSH-RPF-16-HP      | -             |                                   |
| ø20       | LSH-20K-HP                | Rod packing<br>Piston packing<br>O-ring       | LSH-RPF-20-HP      | -             |                                   |
| ø25       | LSH-25K-HP                |   | LSH-RPF-25-HP      | -             |                                   |
| ø32       | LSH-32K-HP                |   | LSH-RPF-32-HP      | LSH-RPT-32-HP |                                   |

Refer to the LSH-A Series of "Linear Slide Hand LSH-HP Series (No.CC-1419A)" for dimensions.

|        |  |
|--------|--|
| SCP3   | Long service life cylinder             |
| CMK2   |  |
| SCM    |  |
| SSD2   |  |
| MDC2   |  |
| MSD    |  |
| MSDG-L |  |
| SMG    |  |
| LCR    |  |
| LCG    |  |
| STM    |  |
| STG    |  |
| STR2   |  |
| SCP3   | Environment-resistant cylinder         |
| CMK2   |  |
| SCM    |  |
| SCG    |  |
| SSD2   |  |
| SMG    |  |
| LCR    |  |
| STG    |  |
| STS    |  |
| STL    |  |
| LSH    | Linear Slide Hand                      |
| LSHL   |  |
| LSHM   |  |
| LST    | Low-profile long stroke hand           |
| LSTM   |  |
| HMC    | Wide Parallel Hand                     |
| CKW    | Chuck                                  |
| ABP2   | Air Booster                            |
| SCP3   | Compatible with rechargeable batteries |
| CMK2   |  |
| SCM    |  |
| SSD2   |  |
| MSD    |  |
| MSDG-L |  |
| SMG    |  |
| STG    |  |
| STM    |  |
| LCR    |  |
| LCG    |  |
| STR2   |  |
| LSH    |  |
| LSHL   |  |
| SCP3   | Supports food mfg. processes           |
| CMK2   |  |
| SCM    |  |
| SCG    |  |
| SSD2   |  |
| STG    |  |

# LSH-A-HP1 Series

## 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**

**A** Rubber cover

**B** Bore size

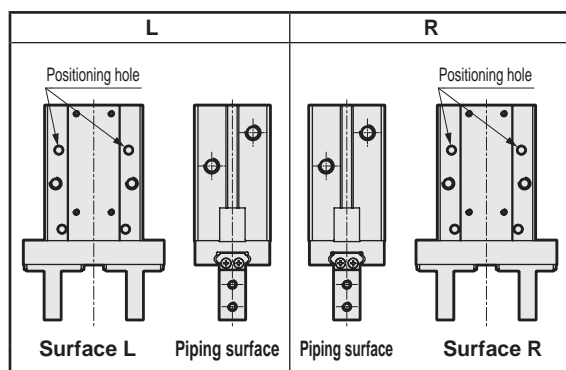
**C** Actuation

**D** Finger

**E** Grip center reference,  
High precision positioning hole

**F** Switch model No.

Grip center reference,  
High precision positioning hole position diagram



Details on each Dimensions "Linear Slide Hand LSH-HP Series  
(No.CC-1419A).

**G** Switch quantity

## How to order switch

**SW - F2H\***

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

[Example of model No.]

**LSH-A06D1R-F2H-D-HP1**

Model: Linear Slide Hand

**A** Rubber cover : Without rubber cover

**B** Bore size :  $\phi 6$

**C** Actuation : Double acting

**D** Finger : Basic

**E** Grip center reference, : R

High precision positioning hole

**F** Switch model No. : Proximity F2H, lead wire 1 m

**G** Switch quantity : 2

| Code   | Description                              |           |                  |   |                |           |
|--|--|-----------|------------------|---|----------------|-----------|
| A Rubber cover   |  |           |                  |   |                |           |
| A  | Without rubber cover                     |           |                  |   |                |           |
| B Bore size (mm)   |  |           |                  |   |                |           |
| 06   | ø6                                       |           |                  |   |                |           |
| 10   | ø10                                      |           |                  |   |                |           |
| 16   | ø16                                      |           |                  |   |                |           |
| 20   | ø20                                      |           |                  |   |                |           |
| 25   | ø25                                      |           |                  |   |                |           |
| 32   | ø32                                      |           |                  |   |                |           |
| C Actuation  |  |           |                  |   |                |           |
| D  | Double acting                            |           |                  |   |                |           |
| S  | Single acting/Normally Open              |           |                  |   |                |           |
| C  | Single acting/Normally Closed            |           |                  |   |                |           |
| D Finger * Refer to the dimentions for details.          |  |           |                  |   |                |           |
| 1  | Basic                                    |           |                  |   |                |           |
| 2  | Side tap                                 |           |                  |   |                |           |
| 3  | Through hole                             |           |                  |   |                |           |
| 4  | Flat                                     |           |                  |   |                |           |
| E Grip center reference, high precision positioning hole |  |           |                  |   |                |           |
| N  | None                                     |           |                  |   |                |           |
| L  | Refer to the figure at left.             |           |                  |   |                |           |
| R  |  |           |                  |   |                |           |
| F 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) |           |                  |   |                |           |
| Lead wire<br>Straight                                    | Lead wire<br>L-shaped                    | Contact   | Voltage<br>AC DC |   | Indicator      | Lead wire |
| -  | F2S*                                     | Proximity |                  | ● | 1-color<br>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)                             |           |                  |   |                |           |
| G 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  $\phi 32$  can be selected for the T-switch

\*3: Refer to page 121 for cylinder switch precautions.

## Switch mounting availability table

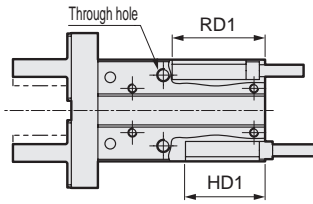
| Model No. | Switch model No. | Side mounting | Rail mounting |
|-----------|------------------|---------------|---------------|
| LSH-A06   | F2/3□            | ●             | -             |
|           | F2/3S            | -             | ●             |
| LSH-A10   | F2/3□            | ●             | ●             |
|           | 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□            | -             | ●             |

## Cylinder switch precautions

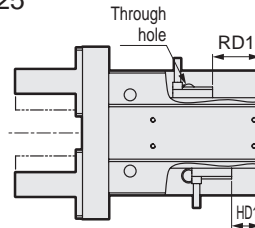
### ● Switch mounting position list

[Side mounting]

ø6 to 20, 32

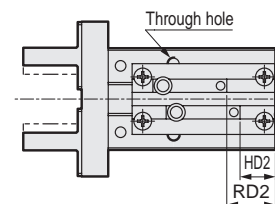


ø25



[Rail mount]

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*   | F2/3H/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)     |

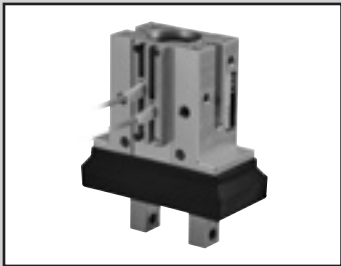
\* When the lead wire is directed toward the head side, the dimension in parentheses apply.

\* "-" indicates it cannot be mounted.

### ● Caution

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

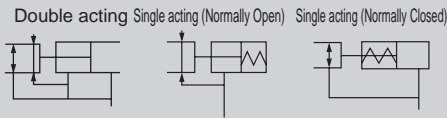
| Category      | Bore size                  |                 |     |     |     |     | Caution   |                            |                 |         |            |         |              |     |              |     |              |     |             |
|---------------|----------------------------|-----------------|-----|-----|-----|-----|---|----------------------------|-----------------|---------|------------|---------|--------------|-----|--------------|-----|--------------|-----|-------------|
|               | ø6                         | ø10             | ø16 | ø20 | ø25 | ø32 |   |                            |                 |         |            |         |              |     |              |     |              |     |             |
| Common items  | ●                          | ●               | ●   | ●   | ●   | ●   | <ul style="list-style-type: none"><li>• 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.</li><li>• One switch can be mounted for one switch rail groove.</li><li>• Since the opening and closing stroke is short, only one of the open or closed states is detected for each switch.<br/>Ex: A single switch alone cannot detect what is shown in the following illustration.<br/>Open (workpiece not gripped): switch OFF (2) Workpiece gripped: switch ON      Closed (workpiece not gripped): switch OFF</li></ul> <div><div>Switch OFF</div><div>Switch ON</div><div>Switch OFF</div></div> |                            |                 |         |            |         |              |     |              |     |              |     |             |
|               | ●                          | ●               | ●   | ●   | ●   | ●   |   |                            |                 |         |            |         |              |     |              |     |              |     |             |
|               | ●                          | ●               | ●   | ●   | ●   | ●   |   |                            |                 |         |            |         |              |     |              |     |              |     |             |
|               | ●                          | ●               | ●   | ●   | ●   | ●   |   |                            |                 |         |            |         |              |     |              |     |              |     |             |
| Side mounting | ●                          | ●               | ●   | ●   |     |     | <ul style="list-style-type: none"><li>• Be careful not to be caught in the lead wires when opening/closing the finger.</li><li>• When using the L-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.</li></ul> <div>Mount position: port side<br/>Switch-type: L-shaped-type</div> <table><tr><th>Bore size (mount position)</th><th>Fitting O.D. øD</th></tr><tr><td>ø6 (RD)</td><td>ø5 or less</td></tr><tr><td>ø6 (HD)</td><td>ø6.9 or less</td></tr><tr><td>ø10</td><td>ø7.4 or less</td></tr><tr><td>ø16</td><td>ø7.9 or less</td></tr><tr><td>ø20</td><td>ø11 or less</td></tr></table> <div>Cylinder switch<br/>ød<br/>Fitting</div> | 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 |
|               | 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                |                 |     |     |     |     |   |                            |                 |         |            |         |              |     |              |     |              |     |             |
| ●             | ●                          | ●               | ●   |     | ●   |     |   |                            |                 |         |            |         |              |     |              |     |              |     |             |
|               | ●                          | ●               | ●   | ●   | ●   |     |   |                            |                 |         |            |         |              |     |              |     |              |     |             |
|               | ●                          |                 |     |     |     |     |   |                            |                 |         |            |         |              |     |              |     |              |     |             |
| Rail mounting |                            | ●               |     |     |     |     | <ul style="list-style-type: none"><li>• 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.</li><li>• For switch side mounting, the through hole cannot be used.</li><li>• For switch rail mounting, the through hole cannot be used.</li></ul>   |                            |                 |         |            |         |              |     |              |     |              |     |             |



# Linear Slide Hand Double acting/Single acting with rubber cover

## LSH-G/LSH-F-HP1 Series

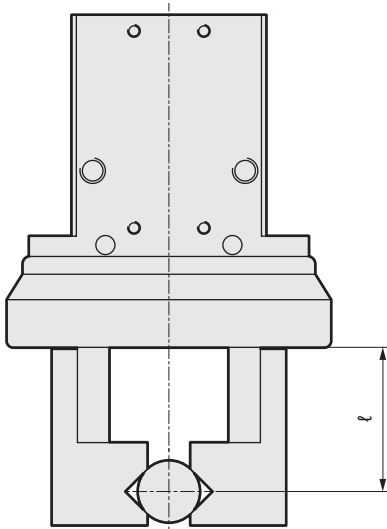
●Operational stroke: 4, 6, 10, 14, 22 mm



### Specifications

| Item                                    |               | 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 | 0.3 (0.35) | 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, value at 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.

# LSH-G/LSH-F-HP1 Series

## Switch specifications

### Switch specifications

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

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

| Item                     | 2-wire proximity                     |   | 3-wire proximity                      |                          |
|--------------------------|--------------------------------------|---|---------------------------------------|--------------------------|
|                          | T2H/T2V                              | T2HR3/T2VR3<br>(Lead wire bending type) | T3H/T3V                               | T3PH/T3PV                |
| Applications             | Programmable<br>Controller dedicated |   | Programmable<br>For controller, relay |                          |
| Output method            | -                                    | -                                       | NPN output                            | PNP output               |
| Power supply voltage     | -                                    | -                                       | 10 to 28 VDC                          |                          |
| Load voltage/<br>current | 10 to 30 VDC<br>5 to 20 mA           | 10 to 30 VDC<br>5 to 20 mA              | 30 VDC or less<br>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                         |                          |
| Shock resistance         | 980m/s <sup>2</sup>                  |   |                                       |                          |
| Weight                   | g<br>1 m: 18 g 3 m: 49 g             |   |                                       |                          |

### Consumable parts list

| Tube<br>Bore<br>size | Kit No.                   | Consumable<br>parts No.                            | Rubber cover (part No. 3) |                | Rail plate kit No. |               | Description                          |
|----------------------|---------------------------|--|---------------------------|----------------|--------------------|---------------|--------------------------------------|
|                      |                           |  | LSH-G Chloroprene         | LSH-F Fluorine | For F-switch       | For T-switch  |                                      |
| ø6                   | Cannot be<br>disassembled | -  | LSH-G06K                  | LSH-F06K       | LSH-RPF-06-HP      | -             | Rail plate<br>Small machine<br>screw |
| ø10                  | LSH-10K-HP                | CR-ring<br>Rod packing<br>Piston packing<br>O-ring | LSH-G10K                  | LSH-F10K       | LSH-RPF-10-HP      | -             |                                      |
| ø16                  | LSH-16K-HP                |  | LSH-G16K                  | LSH-F16K       | LSH-RPF-16-HP      | -             |                                      |
| ø20                  | LSH-20K-HP                | Rod packing<br>Piston packing<br>O-ring            | 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 |                                      |

Refer to the LSH-G/LSH-F Series of "Linear Slide Hand LSH-HP Series (No.CC-1419A)" for dimensions.

|        |  |
|--------|--|
| SCP3   | Long service life cylinder             |
| CMK2   |  |
| SCM    |  |
| SSD2   |  |
| MDC2   |  |
| MSD    |  |
| MSDG-L |  |
| SMG    |  |
| LCR    |  |
| LCG    |  |
| STM    |  |
| STG    |  |
| STR2   |  |
| SCP3   | Environment-resistant cylinder         |
| CMK2   |  |
| SCM    |  |
| SCG    |  |
| SSD2   |  |
| SMG    |  |
| LCR    |  |
| STG    |  |
| STS    |  |
| STL    |  |
| LSH    | Linear Slide Hand                      |
| LSHL   |  |
| LSHM   |  |
| LST    | Low-profile long stroke hand           |
| LSTM   |  |
| HMC    | Wide Parallel Hand                     |
| CKW    | Chuck                                  |
| ABP2   | Air Booster                            |
| SCP3   | Compatible with rechargeable batteries |
| CMK2   |  |
| SCM    |  |
| SSD2   |  |
| MSD    |  |
| MSDG-L |  |
| SMG    |  |
| STG    |  |
| STM    |  |
| LCR    |  |
| LCG    |  |
| STR2   |  |
| LSH    |  |
| LSHL   |  |
| SCP3   | Supports food mfg. processes           |
| CMK2   |  |
| SCM    |  |
| SCG    |  |
| SSD2   |  |
| STG    |  |

# LSH-G/LSH-F-HP1 Series

## 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**

**A** Rubber cover

**B** Bore size

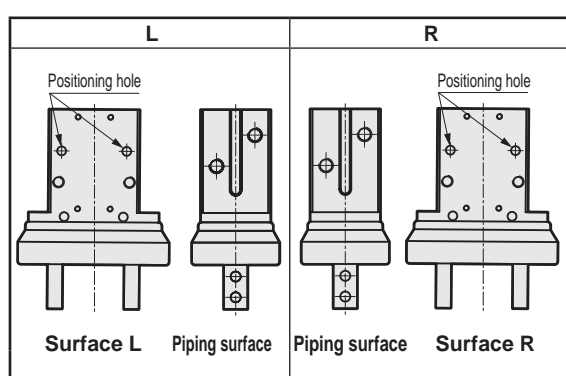
**C** Actuation

**D** Finger

**E** Grip center reference,  
High precision positioning hole

**F** Switch model No.

## Grip center reference, high precision positioning hole position diagram



Details on each dimensions "Linear Slide Hand LSH-HP Series (No.CC-1419A).

**G** Switch quantity

## How to order switch

**SW - F2H\***

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

[Example of model No.]

**LSH-G06D1R-F2H-D-HP1**

Model: Linear Slide Hand

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

| Code                  | Description        |
|-----------------------|--------------------|
| <b>A Rubber cover</b> |                    |
| <b>G</b>              | Chloroprene rubber |
| <b>F</b>              | Fluoro rubber      |

|                         |     |
|-------------------------|-----|
| <b>B Bore size (mm)</b> |     |
| <b>06</b>               | ø6  |
| <b>10</b>               | ø10 |
| <b>16</b>               | ø16 |
| <b>20</b>               | ø20 |
| <b>25</b>               | ø25 |
| <b>32</b>               | ø32 |

|                    |  |
|--------------------|--|
| <b>C Actuation</b> |  |
| <b>D</b>           | Double acting  |
| <b>S</b>           | Single acting / Normally Open (ø32 cannot be selected) |
| <b>C</b>           | Single acting/Normally Closed (ø32 cannot be selected) |

|                 |       |
|-----------------|-------|
| <b>D Finger</b> |       |
| <b>1</b>        | Basic |

|   |                              |
|---|------------------------------|
| <b>E Grip center reference, high precision positioning hole</b> |                              |
| <b>N</b>  | None                         |
| <b>L</b>  | Refer to the figure at left. |
| <b>R</b>  |                              |

|                           |  |
|---------------------------|--|
| <b>F Switch model No.</b> |  |
| <b>Blank</b>              | No switch, with F-switch rail            |
| <b>N</b>                  | No switch, no switch rail                |
| <b>A</b>                  | No switch, with T-switch rail (ø32 only) |

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

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

|                          |                  |
|--------------------------|------------------|
| <b>G Switch quantity</b> |                  |
| <b>R</b>                 | 1 on open side   |
| <b>H</b>                 | 1 on closed side |
| <b>D</b>                 | 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 for the T-switch

\*3: Refer to page 125 for cylinder switch precautions.

## 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□            | -             | ●             |

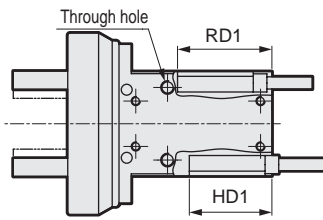


### Cylinder switch precautions

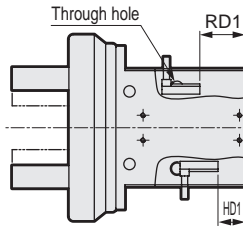
#### ● Switch mounting position list

[Side mounting]

ø6 to 20, 32

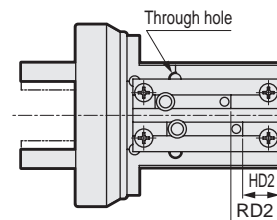


ø25



[Rail mount]

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      | Bore size                  |                 |     |     |     |   | Caution  |                            |                 |         |            |         |              |     |              |     |              |     |             |
|---------------|----------------------------|-----------------|-----|-----|-----|---|--|----------------------------|-----------------|---------|------------|---------|--------------|-----|--------------|-----|--------------|-----|-------------|
|               | ø6                         | ø10             | ø16 | ø20 | ø25 | ø32   |  |                            |                 |         |            |         |              |     |              |     |              |     |             |
| 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 of the open or closed states is detected for each switch.<br>Ex: A single switch alone cannot detect what is shown in the following illustration.<br>Open (workpiece not gripped): switch OFF (2) Workpiece gripped: switch ON      Closed (workpiece not gripped): switch OFF |                            |                 |         |            |         |              |     |              |     |              |     |             |
|               | ●                          | ●               | ●   | ●   | ●   | ●   | <div><div>Switch OFF</div><div>Switch ON</div><div>Switch OFF</div></div>  |                            |                 |         |            |         |              |     |              |     |              |     |             |
| Side mounting | ●                          | ●               | ●   | ●   |     |   | • Be careful not to be caught in the lead wires when opening/closing the finger.   |                            |                 |         |            |         |              |     |              |     |              |     |             |
|               | ●                          | ●               | ●   | ●   |     |   | • When using the L-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.<br><br>Mount position: port side<br>Switch-type: L-shaped-type   |                            |                 |         |            |         |              |     |              |     |              |     |             |
|               |                            |                 |     |     |     |   | <table><tr><th>Bore size (mount position)</th><th>Fitting O.D. øD</th></tr><tr><td>ø6 (RD)</td><td>ø5 or less</td></tr><tr><td>ø6 (HD)</td><td>ø6.9 or less</td></tr><tr><td>ø10</td><td>ø7.4 or less</td></tr><tr><td>ø16</td><td>ø7.9 or less</td></tr><tr><td>ø20</td><td>ø11 or less</td></tr></table>                               | 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 |
|               | 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                |                 |     |     |     |   |  |                            |                 |         |            |         |              |     |              |     |              |     |             |
| ●             | ●                          | ●               | ●   |     | ●   | • 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. |  |                            |                 |         |            |         |              |     |              |     |              |     |             |
|               |                            |                 |     |     | ●   | • The F2/3V switch projects from the end face of the head side.<br>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.   |                            |                 |         |            |         |              |     |              |     |              |     |             |

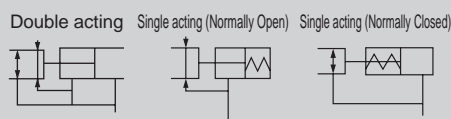




Linear Slide Hand Long stroke Double acting/single acting

# LSHL-A-HP1 Series

●Operating stroke: 8, 12, 18, 22 mm

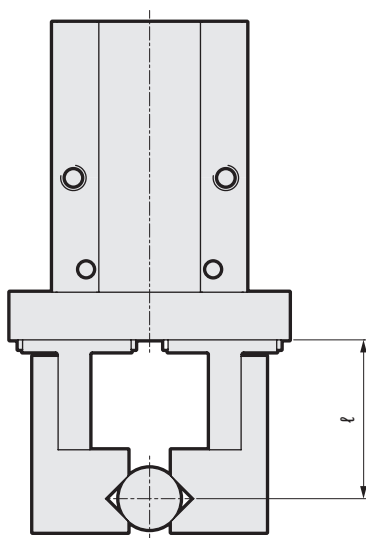


## Specifications

| Item                                    |                                    | 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<br>Finger OP: 4 | 0.065 (0.075)   | 0.155 (0.165)<br>0.16 (0.17) | 0.315 (0.335)<br>0.32 (0.34) | 0.54 (0.585)<br>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,  $\ell = 20$  mm, value at 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                     | 2-wire proximity                     | 3-wire proximity                      | 2-wire proximity                     | 3-wire proximity                      |               |
|--------------------------|--------------------------------------|---------------------------------------|--------------------------------------|---------------------------------------|---------------|
|                          | F2S                                  | F3S                                   | F2H/F2V                              | F3H/F3V                               | F3PH/F3PV     |
| Applications             | Programmable<br>Controller dedicated | Programmable<br>For controller, relay | Programmable<br>Controller dedicated | Programmable<br>For controller, relay |               |
| Output method            | -                                    | NPN output                            | -                                    | NPN output                            | PNP output    |
| Power supply voltage     | -                                    | 10 to 28 VDC                          | -                                    | 10 to 28 VDC                          | 4.5 to 28 VDC |
| Load voltage/<br>current | 10 to 30 VDC<br>5 to 20 mA           | 30 VDC,<br>50 mA or less              | 10 to 30 VDC<br>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                         |               |
| Shock resistance         | 980m/s <sup>2</sup>                  |                                       |                                      |                                       |               |
| Weight                   | 1 m: 10 3 m: 29                      |                                       |                                      |                                       |               |

\*1: The F type switch uses a bend-resistant lead wire as standard.

Refer to the LSHL-A Series of "Linear Slide Hand LSH-HP Series (No.CC-1419A)" for dimentions.

### 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**

**A** Rubber cover

**B** Bore size

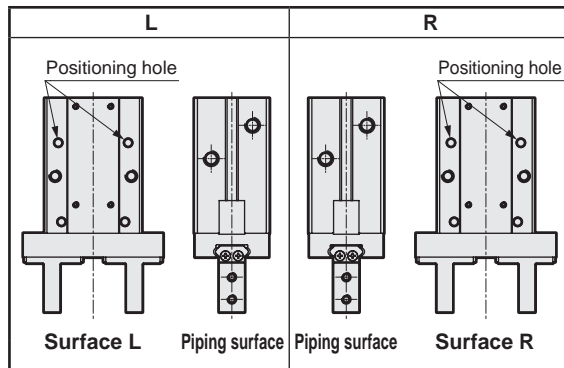
**C** Actuation

**D** Finger

**E** Grip center reference,  
High precision positioning hole

**F** Switch model No.

### Grip center reference, High precision positioning hole position diagram



Details on each dimensions "Linear Slide Hand LSH-HP Series (No.CC-1419A).

### How to order switch

**SW - F2H\***

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

[Example of model No.]

**LSHL-A10D1R-N-HP1**

Model: Linear Slide Hand, long stroke

- A** Rubber cover : Without rubber cover
- B** Bore size :  $\phi 10$
- C** Actuation : Double acting
- D** Finger : Basic
- E** Grip center reference, : R  
high precision positioning hole
- F** Switch model No. : No switch,  
Without rail plate

| Code  |                       | Description                         |                  |   |                |           |
|---|-----------------------|-------------------------------------|------------------|---|----------------|-----------|
| <b>A Rubber cover</b>   |                       |                                     |                  |   |                |           |
| <b>A</b>  |                       | Without rubber cover                |                  |   |                |           |
| <b>B Bore size (mm)</b>   |                       |                                     |                  |   |                |           |
| <b>10</b>   |                       | ø10                                 |                  |   |                |           |
| <b>16</b>   |                       | ø16                                 |                  |   |                |           |
| <b>20</b>   |                       | ø20                                 |                  |   |                |           |
| <b>25</b>   |                       | ø25                                 |                  |   |                |           |
| <b>C Actuation</b>  |                       |                                     |                  |   |                |           |
| <b>D</b>  |                       | Double acting                       |                  |   |                |           |
| <b>S</b>  |                       | Single acting/Normally Open         |                  |   |                |           |
| <b>C</b>  |                       | Single acting/Normally Closed       |                  |   |                |           |
| <b>D Finger</b> * Refer to the dimentions for details           |                       |                                     |                  |   |                |           |
| <b>1</b>  |                       | Basic                               |                  |   |                |           |
| <b>2</b>  |                       | Side tap                            |                  |   |                |           |
| <b>3</b>  |                       | Through hole                        |                  |   |                |           |
| <b>4</b>  |                       | Flat                                |                  |   |                |           |
| <b>E Grip center reference, high precision positioning hole</b> |                       |                                     |                  |   |                |           |
| <b>N</b>  |                       | None                                |                  |   |                |           |
| <b>L</b>  |                       | Refer to the figure at left.        |                  |   |                |           |
| <b>R</b>  |                       |                                     |                  |   |                |           |
| <b>F Switch model No.</b>                                       |                       |                                     |                  |   |                |           |
| <b>Blank</b>  |                       | Without switch, rail plate attached |                  |   |                |           |
| <b>N</b>  |                       | Without switch or rail plate        |                  |   |                |           |
| Lead wire<br>Straight   | Lead wire<br>L-shaped | Contact                             | Voltage<br>AC DC |   | Indicator      | Lead wire |
| -   | <b>F2S*</b>           | Proximity                           |                  | ● | 1-color<br>LED | 2-wire    |
| -   | <b>F3S*</b>           |                                     |                  | ● |                | 3-wire    |
| <b>F2H*</b>   | <b>F2V*</b>           |                                     |                  | ● |                | 2-wire    |
| <b>F3H*</b>   | <b>F3V*</b>           |                                     |                  | ● |                | 3-wire    |
| <b>F3PH*</b>  | <b>F3PV*</b>          |                                     |                  | ● |                | 3-wire    |
| <b>* Lead wire length</b>                                       |                       |                                     |                  |   |                |           |
| <b>Blank</b>  |                       | 1 m (standard)                      |                  |   |                |           |
| <b>3</b>  |                       | 3 m (option)                        |                  |   |                |           |
| <b>G Switch quantity</b>  |                       |                                     |                  |   |                |           |
| <b>R</b>  |                       | 1 on open side                      |                  |   |                |           |
| <b>H</b>  |                       | 1 on closed side                    |                  |   |                |           |
| <b>D</b>  |                       | 2                                   |                  |   |                |           |

\*1: When selecting "With switch", a rail plate is attached.

\*2: Refer to page 128 for cylinder switch precautions.

### 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            | ●             | ●             |

### Consumable parts list

| Tube<br>Bore size | Kit No.     | Consumable<br>parts No.       | Rail plate kit No. |                   |                                      |
|-------------------|-------------|-------------------------------|--------------------|-------------------|--------------------------------------|
|                   |             |                               | For double acting  | For single acting | Description                          |
| ø10               | LSHL-10K-HP | CR-ring<br>Rod packing        | LSHL-RPF-10-HP     | LSHL-RPF2-10-HP   | Rail plate<br>Small machine<br>screw |
| ø16               | LSHL-16K-HP | Piston packing<br>O-ring      | LSHL-RPF-16-HP     |                   |                                      |
| ø20               | LSH-20K-HP  | Rod packing<br>Piston packing | LSHL-RPF-20-HP     |                   |                                      |
| ø25               | LSH-25K-HP  | O-ring                        | LSHL-RPF-25-HP     |                   |                                      |

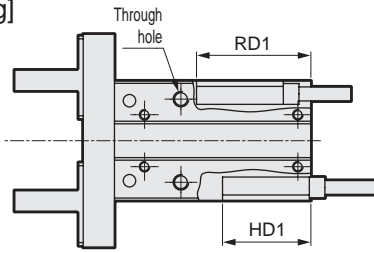
# LSHL-A-HP1 Series

## Cylinder switch precautions

### ● Switch mounting position list

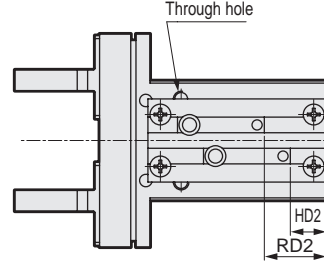
[Side mounting]

ø10 to 25



[Rail mount]

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.

### ● Caution

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

| Category      | Bore size |                 |     |  | Caution   |           |                 |     |              |     |              |     |             |
|---------------|-----------|-----------------|-----|--|---|-----------|-----------------|-----|--------------|-----|--------------|-----|-------------|
|               | ø10       | ø16             | ø20 | ø25  |   |           |                 |     |              |     |              |     |             |
| Common items  | ●         | ●               | ●   | ●  | <ul style="list-style-type: none"><li>• 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.</li><li>• One switch can be mounted for one switch rail groove.</li><li>• Since the opening and closing stroke is short, only one of the open or closed states is detected for each switch.<br/>Ex: A single switch alone cannot detect what is shown in the following illustration.<br/>Open (workpiece not gripped): switch OFF (2) Workpiece gripped: switch ON      Closed (workpiece not gripped): switch OFF</li></ul> <div><div>Switch OFF</div><div>Switch ON</div><div>Switch OFF</div></div> |           |                 |     |              |     |              |     |             |
|               | ●         | ●               | ●   | ●  |   |           |                 |     |              |     |              |     |             |
|               | ●         | ●               | ●   | ●  |   |           |                 |     |              |     |              |     |             |
|               | ●         | ●               | ●   | ●  |   |           |                 |     |              |     |              |     |             |
| Side mounting | ●         | ●               | ●   | ●  | <ul style="list-style-type: none"><li>• Be careful not to be caught in the lead wires when opening/closing the finger.</li><li>• When using the L-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.</li></ul> <div>Mount position: port side<br/>Switch-type: L-shaped-type</div> <table><tr><th>Bore size</th><th>Fitting O.D. øD</th></tr><tr><td>ø10</td><td>ø7.4 or less</td></tr><tr><td>ø16</td><td>ø7.9 or less</td></tr><tr><td>ø20</td><td>ø11 or less</td></tr></table> <div>Cylinder switch<br/>ød<br/>Fitting</div>  | Bore size | Fitting O.D. øD | ø10 | ø7.4 or less | ø16 | ø7.9 or less | ø20 | ø11 or less |
|               | Bore size | Fitting O.D. øD |     |  |   |           |                 |     |              |     |              |     |             |
|               | ø10       | ø7.4 or less    |     |  |   |           |                 |     |              |     |              |     |             |
|               | ø16       | ø7.9 or less    |     |  |   |           |                 |     |              |     |              |     |             |
|               | ø20       | ø11 or less     |     |  |   |           |                 |     |              |     |              |     |             |
| ●             | ●         | ●               | ●   | <ul style="list-style-type: none"><li>• For the lead wire straight switch, the switch and lead wire protrude from the end face on the head side. If this protrusion is a problem, use F2/3V or F2/3S, or mount a rail.</li></ul> |   |           |                 |     |              |     |              |     |             |
| ●             | ●         | ●               | ●   | <ul style="list-style-type: none"><li>• The F3PV switch projects from the end face of the head side. If this protrusion is a problem, use F2/3V or F2/3S, or mount a rail.</li></ul>   |   |           |                 |     |              |     |              |     |             |
| ●             | ●         | ●               | ●   | <ul style="list-style-type: none"><li>• For switch side mounting, the through hole cannot be used.</li></ul>   |   |           |                 |     |              |     |              |     |             |
| Rail mounting | ●         |                 |     |  | <ul style="list-style-type: none"><li>• For switch rail mounting, the through hole cannot be used.</li></ul>  |           |                 |     |              |     |              |     |             |

|  |        |
|--|--------|
| Long service life cylinder             | SCPD3  |
|  | CMK2   |
|  | SCM    |
|  | SSD2   |
|  | MDC2   |
|  | MSD    |
|  | MSDG-L |
|  | SMG    |
|  | LCR    |
|  | LCG    |
|  | STM    |
|  | STG    |
|  | STR2   |
|  | STR2   |
| Environment-resistant cylinder         | SCPD3  |
|  | CMK2   |
|  | SCM    |
|  | SCG    |
|  | SSD2   |
|  | SMG    |
|  | LCR    |
|  | STG    |
|  | STS    |
|  | STL    |
| Linear Slide Hand                      | LSH    |
|  | LSHL   |
|  | LSHM   |
| Low-profile long stroke hand           | LST    |
|  | LSTM   |
| Wide Parallel Hand                     | HMC    |
|  | CKW    |
| Air Booster                            | ABP2   |
| Compatible with rechargeable batteries | SCPD3  |
|  | CMK2   |
|  | SCM    |
|  | SSD2   |
|  | MSD    |
|  | MSDG-L |
|  | SMG    |
|  | STG    |
|  | STM    |
|  | LCR    |
|  | LCG    |
|  | STR2   |
|  | LSH    |
|  | LSHL   |
| Supports food mfg. processes           | SCPD3  |
|  | CMK2   |
|  | SCM    |
|  | SCG    |
|  | SSD2   |
|  | STG    |

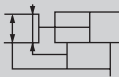


Linear Slide Hand Long stroke Double acting With rubber cover

# LSHL-G/LSHL-F-HP1 Series

●Operational stroke: 8, 12, 18 mm

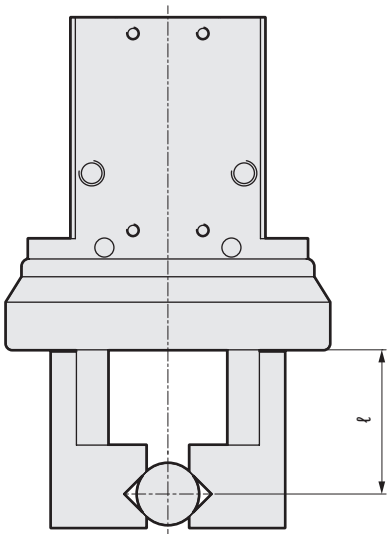
Double acting



## 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, value at stroke

## Switch specifications

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

\*1: The F type switch uses a bend-resistant lead wire as standard.

Refer to the LSHL-G/LSHL-F Series of "Linear Slide Hand LSH-HP Series (No.CC-1419A)" for dimentions.

# LSHL-G/LSHL-F-HP1 Series

How to order

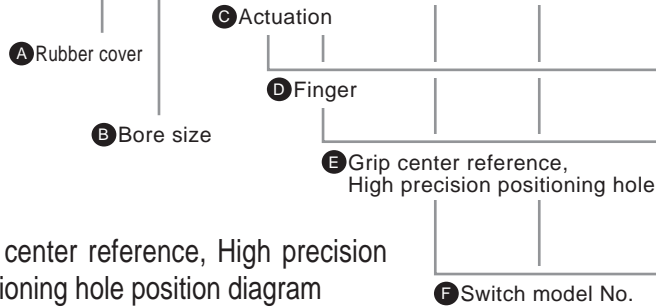
## How to order

Without switch (built-in magnet for switch)

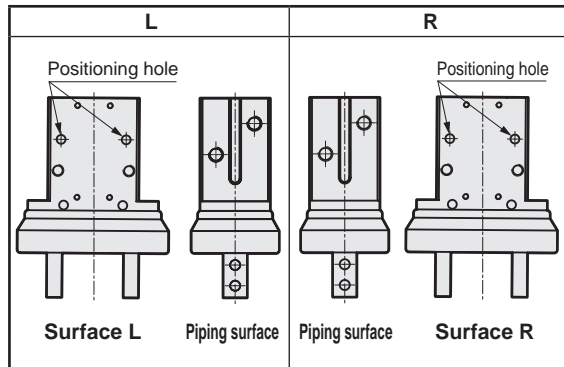
**LSHL - G 10 D 1 R** ————— **HP1**

With switch (built-in magnet for switch)

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



Grip center reference, High precision positioning hole position diagram



Details on each dimensions "Linear Slide Hand LSH-HP Series (No.CC-1419A).

## How to order switch

**SW - F2H\***

Switch model No.  
(above Item F)

[Example of model No.]

**LSHL-G10D1R-F2H-D-HP1**

Model: Linear Slide Hand, long stroke

A Rubber cover : Chloroprene rubber

B Bore size : ø10

C Actuation : Double acting

D Finger : Basic

E Grip center reference, : R  
high precision positioning hole

F Switch model No. : Proximity F2H, lead wire 1 m

G Switch quantity : 2

## Consumable parts list

| Bore size<br>(mm ) | Kit No.     | Consumable parts<br>No.                            | Rubber cover (part No. 3) |                 | Rail plate<br>Kit No. | Description                          |
|--------------------|-------------|--|---------------------------|-----------------|-----------------------|--------------------------------------|
|                    |             |  | LSHL-G Chloroprene        | LSHL-F Fluorine |                       |                                      |
| ø10                | LSHL-10K-HP | CR-ring<br>Rod packing<br>Piston packing<br>O-ring | LSHL-G10K                 | LSHL-F10K       | LSHL-RPF-10-HP        | Rail plate<br>Small machine<br>screw |
| ø16                | LSHL-16K-HP |  | LSHL-G16K                 | LSHL-F16K       | LSHL-RPF-16-HP        |                                      |
| ø20                | LSH-20K-HP  | Rod packing<br>Piston packing<br>O-ring            | LSHL-G20K                 | LSHL-F20K       | LSHL-RPF-20-HP        |                                      |

| Code   | Description                         |           |         |    |                |           |
|--|-------------------------------------|-----------|---------|----|----------------|-----------|
| A Rubber cover   |                                     |           |         |    |                |           |
| G  | Chloroprene rubber                  |           |         |    |                |           |
| F  | Fluoro rubber                       |           |         |    |                |           |
| B Bore size (mm)   |                                     |           |         |    |                |           |
| 10   | ø10                                 |           |         |    |                |           |
| 16   | ø16                                 |           |         |    |                |           |
| 20   | ø20                                 |           |         |    |                |           |
| C Actuation  |                                     |           |         |    |                |           |
| D  | Double acting                       |           |         |    |                |           |
| D Finger   |                                     |           |         |    |                |           |
| 1  | Basic                               |           |         |    |                |           |
| E Grip center reference, high precision positioning hole |                                     |           |         |    |                |           |
| N  | None                                |           |         |    |                |           |
| L  | Refer to the figure at left.        |           |         |    |                |           |
| R  |                                     |           |         |    |                |           |
| F Switch model No.                                       |                                     |           |         |    |                |           |
| Blank  | Without switch, rail plate attached |           |         |    |                |           |
| N  | Without switch or rail plate        |           |         |    |                |           |
| Lead wire<br>Straight                                    | Lead wire<br>L-shaped               | Contact   | Voltage |    | Indicator      | Lead wire |
| -  | F2S*                                | Proximity | AC      | DC | 1-color<br>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)                        |           |         |    |                |           |
| G 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 132 for cylinder switch precautions.

## Switch mounting availability table

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



# LSHL-G/LSHL-F-HP1 Series

## Cylinder switch precautions

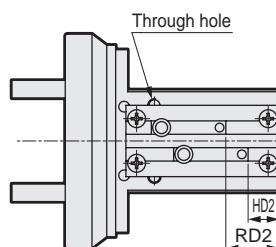
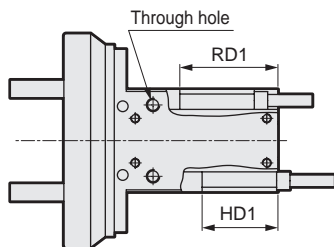
### ● Switch mounting position list

[Side mounting]

ø10 to 20

[Rail mount]

ø10 to 20

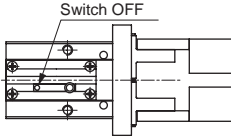
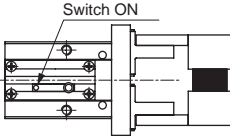
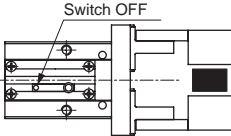
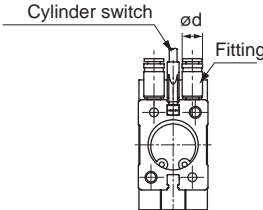


| Model No.  | Switch Model No. | Side mounting |      | Rail mounting |             |
|------------|------------------|---------------|------|---------------|-------------|
|            |                  | RD1           | HD1  | RD2           | HD2         |
| LSHL-G/F10 | F2/3□            | 22            | 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.

### ● Caution

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

| Category      | Bore size |                 |     | Caution   |           |                 |     |              |     |              |     |             |
|---------------|-----------|-----------------|-----|---|-----------|-----------------|-----|--------------|-----|--------------|-----|-------------|
|               | ø10       | ø16             | ø20 |   |           |                 |     |              |     |              |     |             |
| Common items  | ●         | ●               | ●   | <ul style="list-style-type: none"><li>• 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.</li><li>• One switch can be mounted for one switch rail groove.</li><li>• Since the opening and closing stroke is short, only one of the open or closed states is detected for each switch.</li></ul> <p>Ex: A single switch alone cannot detect what is shown in the following illustration.</p> <p>Open (workpiece not gripped): switch OFF (2) Workpiece gripped: switch ON      Closed (workpiece not gripped): switch OFF</p> <div></div> |           |                 |     |              |     |              |     |             |
|               | ●         | ●               | ●   |   |           |                 |     |              |     |              |     |             |
|               | ●         | ●               | ●   |   |           |                 |     |              |     |              |     |             |
|               | ●         | ●               | ●   |   |           |                 |     |              |     |              |     |             |
|               | ●         | ●               | ●   |   |           |                 |     |              |     |              |     |             |
| Side mounting | ●         | ●               | ●   | <ul style="list-style-type: none"><li>• Be careful not to be caught in the lead wires when opening/closing the finger.</li><li>• When using the L-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.</li></ul> <p>Mount position: port side<br/>Switch-type: L-shaped-type</p> <table><tr><th>Bore size</th><th>Fitting O.D. øD</th></tr><tr><td>ø10</td><td>ø7.4 or less</td></tr><tr><td>ø16</td><td>ø7.9 or less</td></tr><tr><td>ø20</td><td>ø11 or less</td></tr></table> <div></div>   | Bore size | Fitting O.D. øD | ø10 | ø7.4 or less | ø16 | ø7.9 or less | ø20 | ø11 or less |
|               | Bore size | Fitting O.D. øD |     |   |           |                 |     |              |     |              |     |             |
|               | ø10       | ø7.4 or less    |     |   |           |                 |     |              |     |              |     |             |
|               | ø16       | ø7.9 or less    |     |   |           |                 |     |              |     |              |     |             |
|               | ø20       | ø11 or less     |     |   |           |                 |     |              |     |              |     |             |
| ●             | ●         | ●               |     |   |           |                 |     |              |     |              |     |             |
| ●             | ●         | ●               |     |   |           |                 |     |              |     |              |     |             |
| ●             | ●         | ●               |     |   |           |                 |     |              |     |              |     |             |
| ●             | ●         | ●               |     |   |           |                 |     |              |     |              |     |             |
| Rail mounting | ●         |                 |     | <ul style="list-style-type: none"><li>• For the lead wire straight switch, the switch and lead wire protrude from the end face on the head side. If this protrusion is a problem, use F2/3V or F2/3S, or mount a rail.</li><li>• The F3PV switch projects from the end face of the head side. If this protrusion is a problem, use F2/3V or F2/3S, or mount a rail.</li><li>• For switch side mounting, the through hole cannot be used.</li><li>• For switch rail mounting, the through hole cannot be used.</li></ul>   |           |                 |     |              |     |              |     |             |
|               | ●         |                 |     |   |           |                 |     |              |     |              |     |             |