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OMRON

General-purpose Limit Switch

HL-5000

Economical, Miniature Limit Switch Boasting Rigid Construction

- Highly rigid construction (head and cover snugly fit in box).
- Dustproof and drip-proof construction.
- Smooth operation with greater OT.
- Easy-to-wire conduit opening design.
- Models with grounding terminals conform to the CE marking.

Ordering Information

■ Model Number Legend

HL-5□□□
1 2 3

1. Actuators
000: Roller lever
030: Adjustable roller lever
050: Adjustable rod lever
100: Sealed plunger
200: Sealed roller plunger
300: Coil spring
500: Remote control wire

2. Ground Terminal Specifications
Blank: Without ground terminal
G: With ground terminal/M5 tapping on the rear side

3. Contact
Blank: Standard (silver rivet contact)
A: Gold plating

■ List of Models

Actuator	Roller lever	Adjustable roller lever	Adjustable rod lever	Sealed plunger	Sealed roller plunger	Coil spring
Model	HL-5000	HL-5030	HL-5050	HL-5100	HL-5200	HL-5300

Note: HL-5000 Limit Switches are offered with a choice of ground terminal/M5 tapping on the rear side conforming to various standards. When placing an order, add the code to the model number to indicate if ground terminal/M5 tapping on the rear side is required.
-G: with ground terminal/M5 tapping on the rear side

Specifications

■ Ratings

Rated voltage	Non-inductive load				Inductive load			
	Resistive load		Lamp load		Inductive load		Motor load	
	NC	NO	NC	NO	NC	NO	NC	NO
125 VAC	5 A		1.5 A	0.7 A	3 A		2 A	1 A
250 VAC	5 A		1 A	0.5 A	3 A		1.5 A	0.8 A
12 VDC	5 A		3 A		4 A		3 A	
24 VDC	5 A		3 A		4 A		3 A	

Inrush current	NC	24 A max.
	NO	12 A max.

Note: **1.** The above figures are for standard currents.

2. Inductive loads have a power factor of 0.4 min. (AC) and a time constant of 7 ms max. (DC).

3. Lamp load has an inrush current of 10 times the steady-state current.

4. Motor load has an inrush current of 6 times the steady-state current.

■ Characteristics

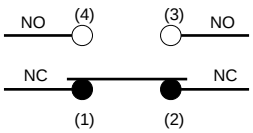
Degree of protection	IP65
Life expectancy (see note 3)	Mechanical: 10,000,000 operations min. (under rated conditions) Electrical: See the following *Electrical Life Expectancy*.
Operating speed	5 mm/s to 0.5 m/s (HL-5000)
Operating frequency	Mechanical: 120 operations/min Electrical: 30 operations/min
Insulation resistance	100 MΩ min. (at 500 VDC)
Contact resistance	25 mΩ max. (initial value)
Dielectric strength	1,000 VAC, 50/60 Hz for 1 min between terminals of the same polarity 1,500 VAC, 50/60 Hz for 1 min between current-carrying metal parts and ground, and between each terminal and non-current-carrying metal part
Rated frequency	50/60 Hz
Vibration resistance	Malfunction: 10 to 55 Hz, 1.5-mm double amplitude
Shock resistance	Destruction: 1,000 m/s^2 min. Malfunction: 300 m/s^2 min.
Ambient temperature	Operating: –5°C to 65°C (with no icing)
Ambient humidity	Operating: 95% max.
Weight	Approx. 130 to 190 g

Note: **1.** The above figures are initial values.

2. The above characteristics may vary depending on the model. For further details, contact your OMRON sales representative.

3. Life expectancy values are calculated at an operating temperature of 5°C to 35°C, and an operating humidity of 40% to 70%. Contact your OMRON sales representative for more detailed information on other operating environments.

Contact Form



■ Operating Characteristics

Model	HL-5000	HL-5030 (see note)	HL-5050 (see note)	HL-5100	HL-5200	HL-5300	HL-5500
OF max.	7.35 N	7.35 N	7.35 N	8.83 N	8.83 N	1.47 N	19.61 N
RF min.	0.98 N	0.98 N	0.98 N	1.47 N	1.47 N	---	1.96 N
PT max.	20°	20°	20°	1.5 mm	1.5 mm	30 mm	1.5 mm
OT min.	50°	50°	50°	4 mm	4 mm	---	4.5 mm
MD max.	12°	12°	12°	1 mm	1 mm	---	0.7 mm
OP	---			30±0.8 mm	40±0.8 mm	---	---

Note: **1.** Measured with the types of the 31.5-mm arm or rod length.

2. OF and RF measured at the arm length of 75 mm for HL-5030, and 145 mm for HL-5050 (reference values).

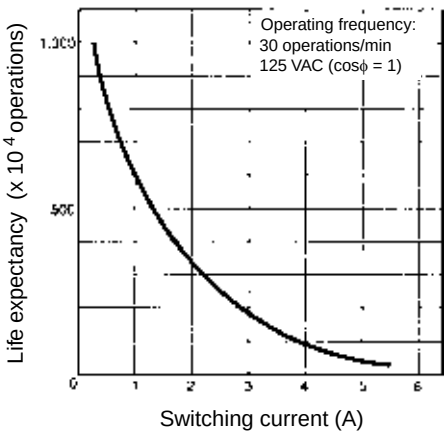
Model	HL-5030	HL-5050
OF	3.09 N	1.60 N
RF	0.41 N	0.22 N

Engineering Data

■ Reference Data

Electrical Life Expectancy (cosϕ=1)

Operating temperature: 5°C to 30°C
Operating humidity: 40% to 70%

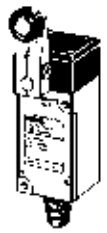


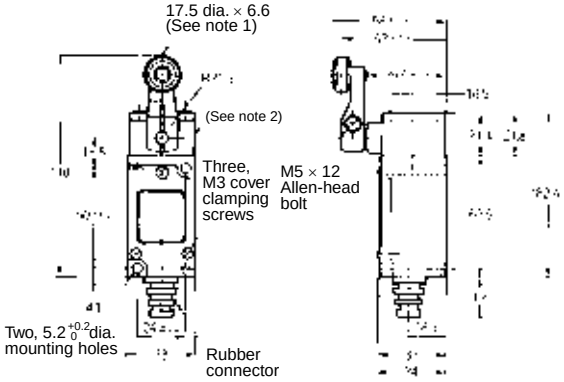
Dimensions

Note: **1.** All units are in millimeters unless otherwise indicated.

2. Unless otherwise specified, a tolerance of ±0.4 mm applies to all dimensions.

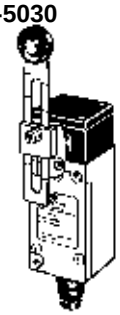
Roller Lever
HL-5000

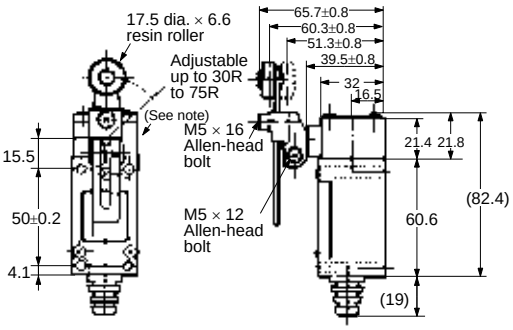




Note: 1. The resin roller can be mounted anywhere in 360°.
2. The head can be mounted in any of the four directions.

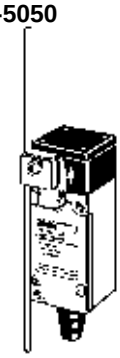
Adjustable Roller Lever
HL-5030

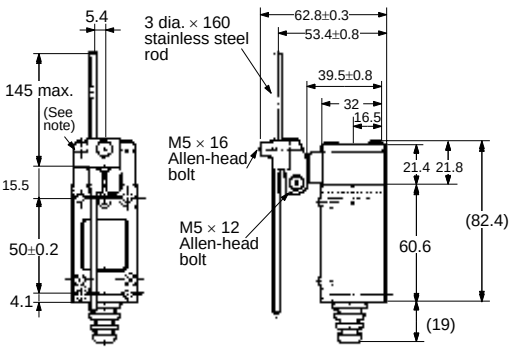




Note: The head can be mounted in any of the four directions. Dimensions not shown are the same as HL-5000.

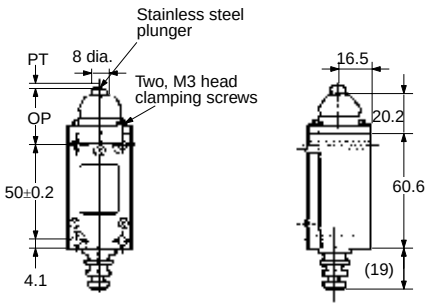
Adjustable Rod Lever
HL-5050





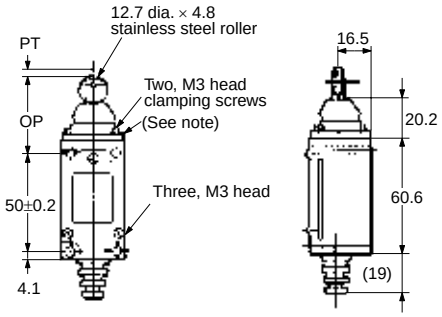
Note: The head can be mounted in any of the four directions. Dimensions not shown are the same as HL-5000.

Sealed Plunger
HL-5100



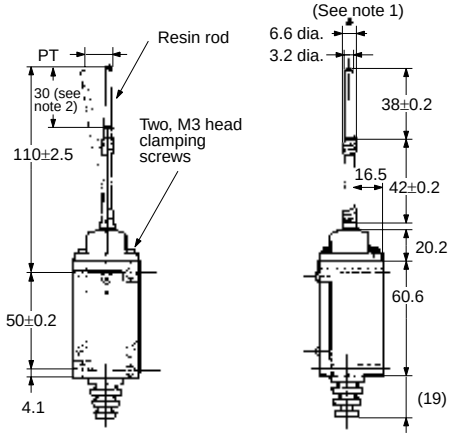
Note: Dimensions not shown are the same as HL-5000.

Sealed Roller Plunger
HL-5200



Note: The head can be mounted in either of the two directions. Dimensions not shown are the same as HL-5000.

Coil Spring
HL-5300

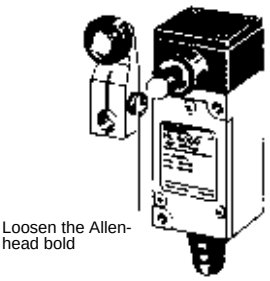


Note: 1. The coil spring may be operated from any directions except axial directions (↓).
2. Be sure to use the dog or cam within 30 mm from the top end of the spring. (Avoid use within 80 mm from the mounting hole.)
3. Dimensions not shown are the same as HL-5000.

■ Operation of Limit Switch

Actuator Position Change (HL-5000, HL-5030, HL-5050)

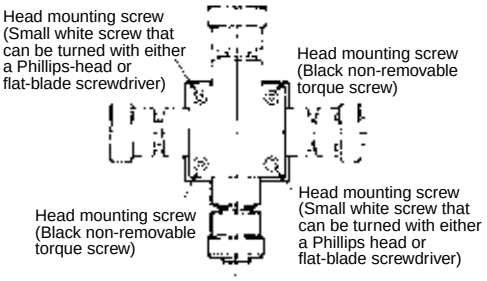
To change the angle of the actuator, loosen the Allen-head bolt on the side of the actuator lever. Then the actuator can be set at any angle.



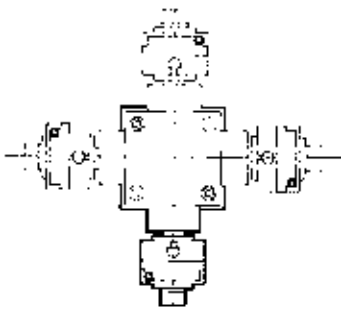
Head Direction Change (HL-5000, HL-5030) (HL-5050, HL5200)

To change the head direction, loosen the two mounting screws. Then the head can be changed at 90° increments in one of four directions.

HL-5000
HL-5030

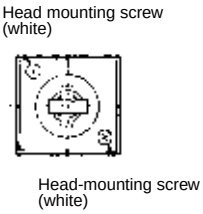


HL-5050



The head of the HL-5200 can be mounted in two directions only.
Refer to the following illustration.

HL-5200

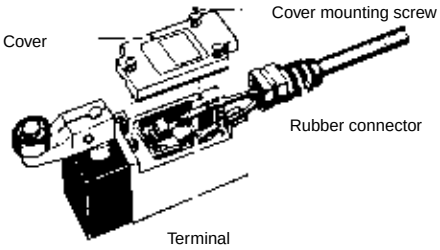


Precautions

Wiring

Wiring Procedure

1. Loosen the cover mounting screws and remove the cover.
2. Disconnect the rubber connector from the box conduit and press-fit a solderless terminal. The following solderless terminals are available.
3. After inserting the solderless terminal into the Switch, tighten the terminal screws securely.
4. After wiring the Limit Switch, insert the rubber connector into the groove of the box securely.
5. Tighten the three mounting screws evenly. The optimum tightening torque for each screw is 0.49 to 0.59 N • m {5 to 6 kgf • cm}.



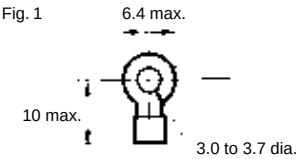
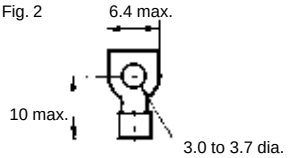
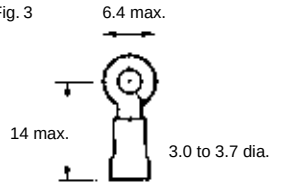
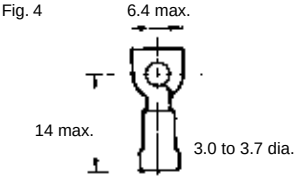
Applicable Lead Wires

Wire name	Applicable wire		
	Number of conductors	Conductor size	External size
Vinyl cabtire cord (VCTF)	2 3 4	0.75 mm^2	Round, 6 to 9 dia. Flat, 9.4 max.
Vinyl cabtire cable (VCT)	2	0.75 mm^2	
600-V vinyl-insulated sheath cable	2	1 dia./1.2 dia./1.6 dia.	

Note: Do not use wires containing silicone, otherwise a contact failure may result.

Applicable Solderless Terminal

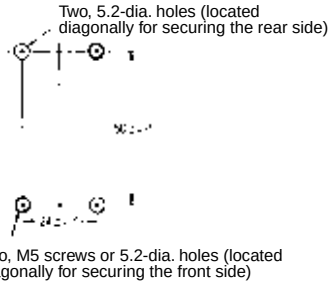
The following solderless terminals are available. Do not use fork or any other type of terminals, otherwise an accidental disconnection resulting in a ground fault may result.

Bare terminal		Terminal with insulated grip	
Fig. 1  	Fig. 2  	Fig. 3  	Fig. 4 

Mounting

To mount the Limit Switch securely, be sure to use two M5 Allen-head bolts and washers. The tightening torque applied to each bolt is 4.90 to 5.88 N • m {or 50 to 60 kgf • cm}. To mount the Limit Switch more securely, use two M5 screw holes on the rear panel and rear holes for positioning if the model is the HL-5□□□G-Series Limit Switches.

Mounting holes



Only the HL-5□□□G has M5 x 0.8 screw holes on the rear side.

Others

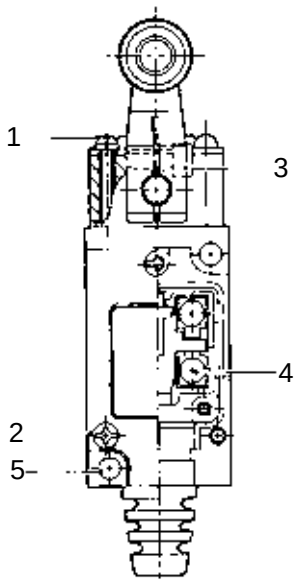
- Do not use the Limit Switch outdoors, otherwise the Limit Switch will become damaged by rust or ozone.
- The Limit Switch is not suitable in places exposed to the spray of rainwater, seawater, or oily water. Consult your OMRON representative for models resisting rainwater, seawater, and oily water.
- If high-sealing performance is required along with shielded wiring or conduit wiring, use the D4C or WL.

Correct Tightening Torque

A loose screw may result in a malfunction. Be sure to tighten each screw to the proper tightening torque as shown below.

No.	Type	Optimum tightening torque
1	Head mounting screw	0.49 to 0.59 N • m
2	Cover mounting screw	0.49 to 0.59 N • m
3	Allen-head bolt	4.90 to 5.88 N • m
4	Terminal screw	0.49 to 0.59 N • m
5	Switch mounting screw	4.90 to 5.88 N • m

Note: If the head direction has been changed, check the torque of each screw and make sure that the screws are free of foreign substances, and that each screw is tightened to the proper torque.



ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.
To convert millimeters into inches, multiply by 0.03937. To convert grams into ounces, multiply by 0.03527.