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.
- Approved by CCC (Chinese standard).

Model Number Structure

■ Model Number Legend

HL-5□□
1 2

1. Actuators
- 000: Roller lever
- 030: Adjustable roller lever
- 050: Adjustable rod lever
- 100: Sealed plunger
- 200: Sealed roller plunger
- 300: Coil spring

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

Ordering Information

■ 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

■ Approved Standards

Agency	Standard	File No.
CCC (CQC)	GB14048.5	2003010303077624

Note: Ask your OMRON representative for information on approved models.

■ Approved Standard Ratings

CCC (GB14048.5)

Applicable category and ratings
AC-15 3 A/250 VAC

■ General 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	
125 VDC	0.4 A	0.2 A	---		---		---	
250 VDC	0.4 A	0.2 A	---		---		---	

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

Note: 1. The above figures are for steady-state 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.

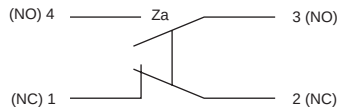
■ Characteristics

Degree of protection	IP65
Durability (see note 3)	Mechanical: 10,000,000 operations min. (under rated conditions) Electrical: See the following *Electrical Durability*.
Operating speed	5 mm/s to 0.5 m/s
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 (see note 4)
Shock resistance	Destruction: 1,000 m/s^2 min. Malfunction: 300 m/s^2 min. (see note 4)
Ambient temperature	Operating: –5°C to 65°C (with no icing)
Ambient humidity	Operating: 35% to 95%
Weight	Approx. 130 to 190 g

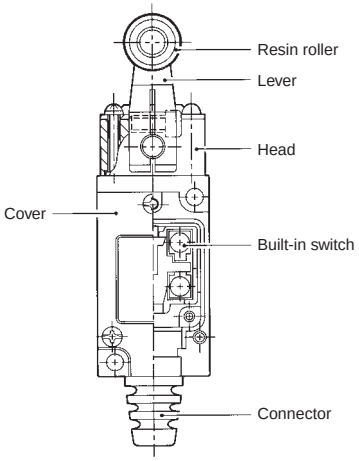
Note: 1. The above figures are initial values.
2. The above characteristics may vary depending on the model. For further details, contact your OMRON sales representative.
3. The values are calculated at an operating temperature of 5°C to 35°C, and an operating humidity of 40% to 70%. Contact your OMRON sales representative for more detailed information on other operating environments.
4. These values do not apply to the coil spring model.

Connections

■ Contact Form



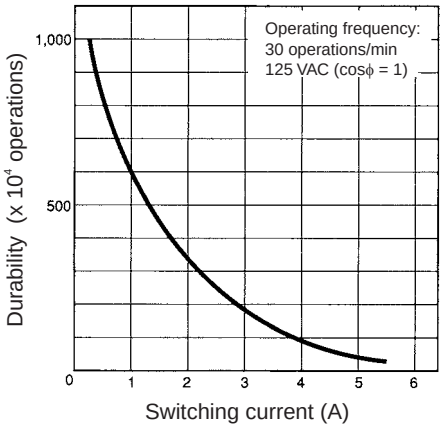
Nomenclature



Engineering Data

■ Electrical Durability (cosϕ=1)

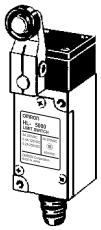
Operating temperature: 5°C to 35°C
Operating humidity: 40% to 70%

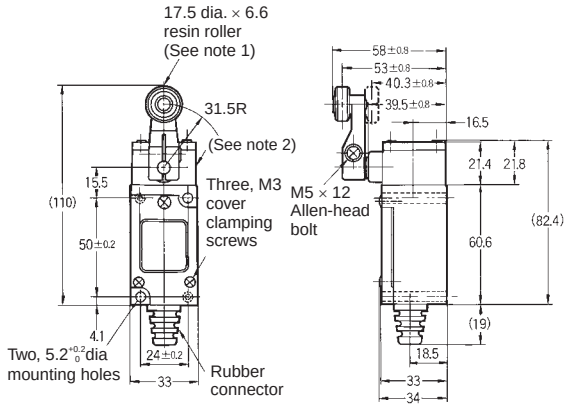


Dimensions

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

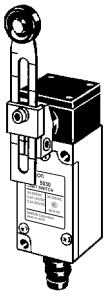


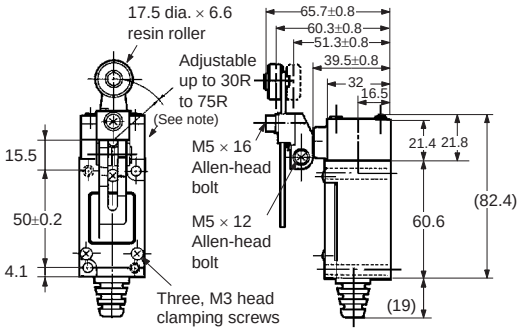


Note: 1. The head can be mounted anywhere in 360°.
2. The head can be mounted in any of the four directions.

Model	HL-5000
OF max.	7.35 N
RF min.	0.98 N
PT max.	20°
OT min.	50°
MD max.	12°
OP	---

Adjustable Roller Lever
HL-5030



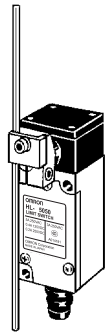


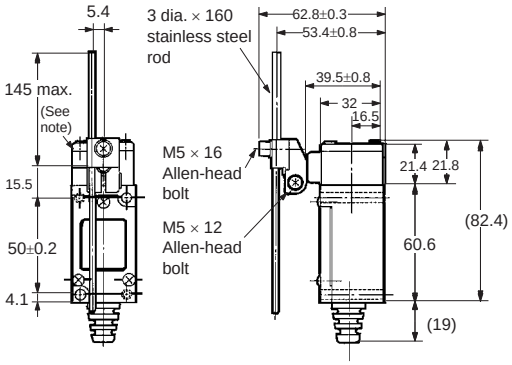
Note: The head can be mounted in any of the four directions. Dimensions not shown are the same as HL-5000.

Model	HL-5030 (see note)
OF max.	7.35 N
RF min.	0.98 N
PT max.	20°
OT min.	50°
MD max.	12°
OP	---

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

Adjustable Rod Lever HL-5050



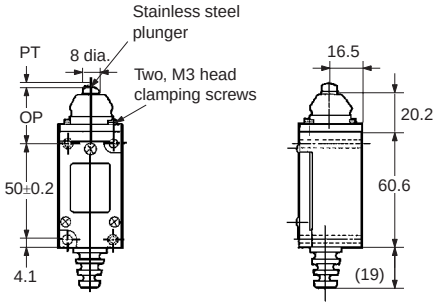


Note: The head can be mounted in any of the four directions. Dimensions not shown are the same as HL-5000.

Model	HL-5050 (see note)
OF max.	7.35 N
RF min.	0.98 N
PT max.	20°
OT min.	50°
MD max.	12°
OP	---

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

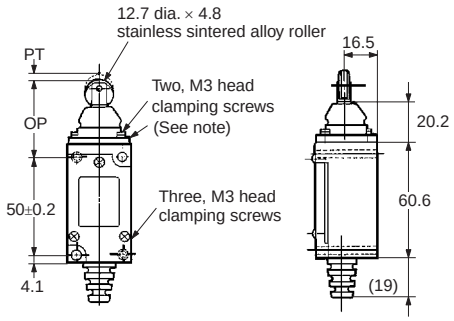
Sealed Plunger HL-5100



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

Model	HL-5100
OF max.	8.83 N
RF min.	1.47 N
PT max.	1.5 mm
OT min.	4 mm
MD max.	1 mm
OP	30±0.8 mm

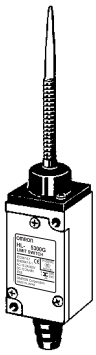
Sealed Roller Plunger HL-5200

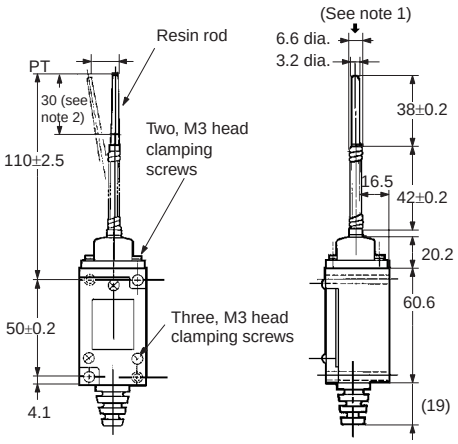


Note: The head can be mounted in either of the two directions. Dimensions not shown are the same as HL-5000.

Model	HL-5200
OF max.	8.83 N
RF min.	1.47 N
PT max.	1.5 mm
OT min.	4 mm
MD max.	1 mm
OP	40±0.8 mm

Coil Spring
HL-5300





Note: 1. The coil spring may be operated from any directions except axial directions (↓).
2. The operating range of the dog or cam is the top third (i.e. from the tip of the rod) of the whole actuator.
3. Dimensions not shown are the same as HL-5000.

Model	HL-5300
OF max.	1.47 N
RF min.	---
PT max.	30 mm
OT min.	---
MD max.	---
OP	---

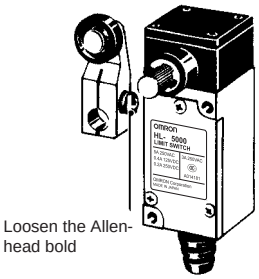
Note: OF and RF measured at the arm length of 75 mm for HL-5030, and 145 mm for HL-5050 (reference values).

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

Installation

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

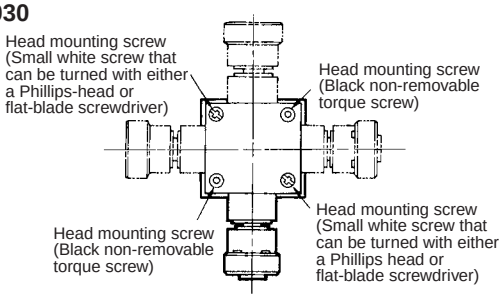
To change the angle of the actuator, loosen the Allen-head bolt on the side of the actuator lever. Then the actuator can be set at any angle.



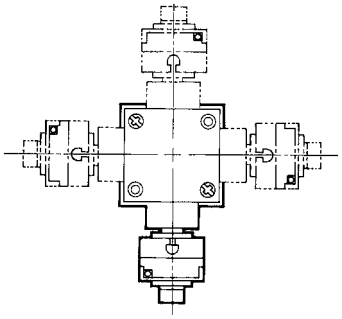
Head Direction Change (HL-5000, HL-5030, HL-5050, HL5200)

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

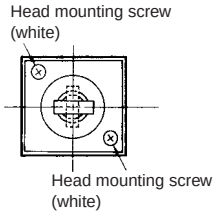


HL-5050



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

HL-5200



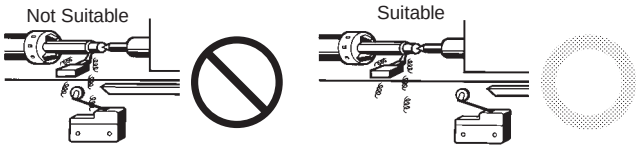
Precautions

Refer to the *"Precautions for General-purpose Limit Switches (Including Multiple Limit Switches, Mechanical Touch Switches, High-precision Switches, Touch Switches, On-site Flexible Switches; Not Including Safety Switches)" on page 17.*

■ Correct Use

Operating Environment

- Seal material may deteriorate if a Switch is used outdoor or where subject to special cutting oils, solvents, or chemicals. Always appraise performance under actual application conditions and set suitable maintenance and replacement periods.
- Install Switches where they will not be directly subject to cutting chips, dust, or dirt. The Actuator and Switch must also be protected from the accumulation of cutting chips or sludge.

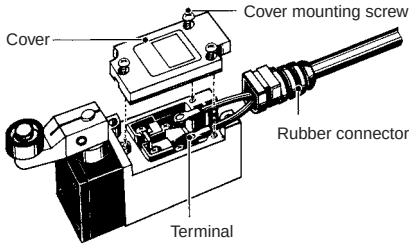


- Constantly subjecting a Switch to vibration or shock can result in wear, which can lead to contact interference with contacts, operation failure, reduced durability, and other problems. Excessive vibration or shock can lead to false contact operation or damage. Install Switches in locations not subject to shock and vibration and in orientations that will not produce resonance.
- The Switches have physical contacts. Using them in environments containing silicon gas will result in the formation of silicon oxide (SiO_2) due to arc energy. If silicon oxide accumulates on the contacts, contact interference can occur. If silicon oil, silicon filling agents, silicon cables, or other silicon products are present near the Switch, suppress arcing with contact protective circuits (surge killers) or remove the source of silicon gas.

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.



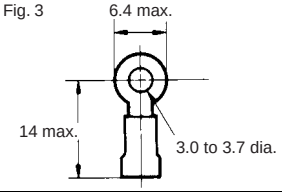
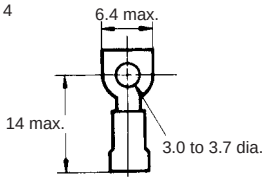
Applicable Lead Wires

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

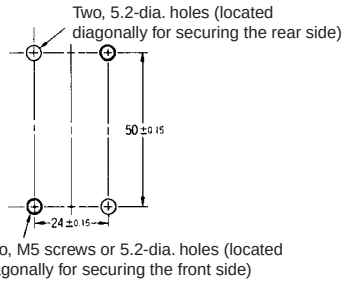
The following solderless terminals are available. Do not use fork or any other type of terminals, otherwise an accidental disconnection resulting in a ground fault may result.

Terminal with insulated grip	
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. 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.

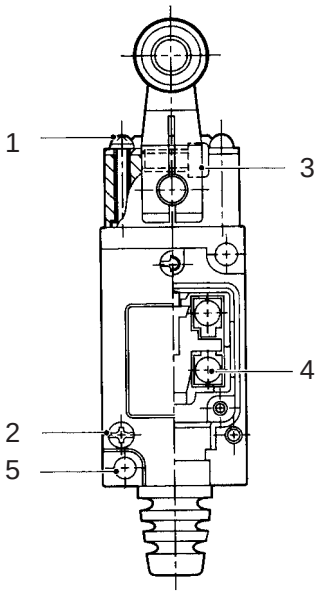
If high-sealing performance is required along with shielded wiring or conduit wiring, use the D4C or WL.

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 (M3 screw)	0.49 to 0.59 N·m
5	Switch mounting screw (M5 Allen-head bolt)	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.

Cat. No. C004-E1-12