

## Wide Range of Two-circuit Switches; Select One for the Operating Environment/Application

### WL/Basic models

- A wide selection of models are available, including the overtravel models with greater OT, indicator-equipped models for checking operation, low-temperature models, heat-resistant models, and corrosion-proof models.
- Microload models are added to the product lineup.
- Approved standards: EC/IEC, UL, CSA, CCC (Chinese standard).

Contact your OMRON representative for information on approved models.



Note: For details of The WL high-sensitivity, high-precision models, refer to *Limit Switch WL-N/WL Datasheet* (Cat. No. C151-E1).

For the most recent information on models that have been certified for safety standards, refer to your OMRON website.



Be sure to read *Safety Precautions* on page 39 to 42 and *Safety Precautions for All Limit Switches*.

## Features

### Standard Models

#### Many Variations in Standard Limit Switches

#### A Wide Range of Models

The WL Series provides a complete range of Limit Switches with a long history of meeting user needs. Select environment-resistant specifications, actuators for essentially any workpiece, operating sensitivity matched to the workpiece, operation indicators to aid operation and maintenance, and various wiring specifications.

### Environment-resistant Models

#### Select from Six Types of Environment Resistance

The series includes Airtight Switches, Hermetic Switches, Heat-resistant Switches, Low-temperature Switches, Corrosion-proof switches, and Weather-proof Switches. Select the one required by the onsite environment.

### Spatter-prevention Models

#### Excellent Performance on Arc Welding Lines or Sites with Spattering Cutting Powder

#### Ideal for Welding Sites

Stainless steel and resins that resist adhesion of spatters are used to prevent troubles caused by zinc powder generated during welding.

### Long-life Models

#### Mechanical Endurance of 30 Million Operations

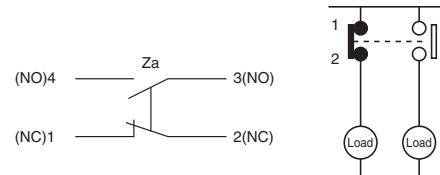
#### Long-life Models for High-frequency Applications

Long life has been achieved by increasing the resistance to friction and creating better sliding properties in the head mechanism. Greater visibility is provided when setting with a fluorescent display for setting the stroke.

### Features Common to All Models

#### DPDB Operation

The double-pole, double-break structure ensures circuit braking.



#### Degree of Protection; IP67

O-rings, cover seals, and other measures provide a water-proof, drip-proof structure (IP67).

#### Approved Standards to Aid Export Machines

Various WL/WLM switches are approved by UL, CSA, TÜV, EN/IEC, and CCC making them ideal for export machines.

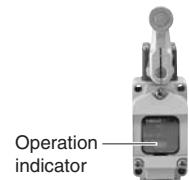
#### Operation Indicators for Easier Daily Inspections\*

Confirm operation with a neon lamp or LED for easier startup confirmations and maintenance.

\* Operation indicators are provided on Indicator-equipped switches, Spatter-prevention Basic Switches, and Long-life Basic Switches.

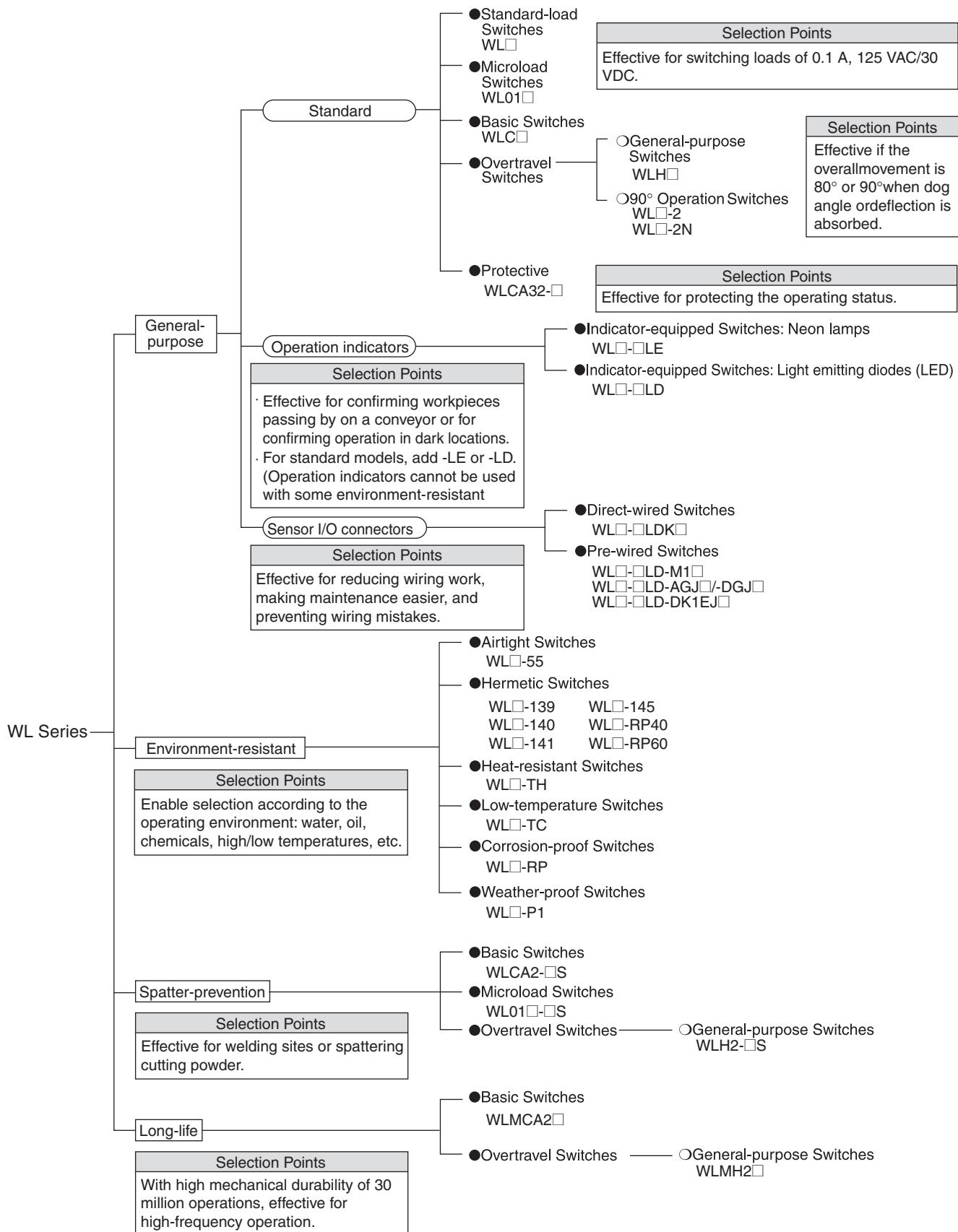
#### Models with Connectors to Reduce Wiring

Reduce wiring with one-touch connection. Models with direct-wired and prewired connectors that make Switch replacement easier are also available.



# Product Configuration

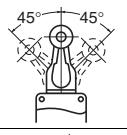
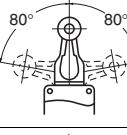
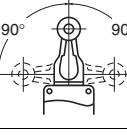
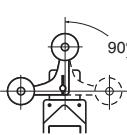
## Selection by Purpose



## Tables of Models

General-purpose Switches	Spatter-prevention Switches	Long-life Switches
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### Heads (Roller levers only)

Type	General purpose	Features	Head specifications		Spatter prevention	Long-life
	Model	Total travel (TT)	One-side operation	Head mounting	Model	Model
Basic	WLC□	• With a Roller Lever 	Possible *1 (Except for long-life models.)	Any of 4 directions	WLCA2-□S	WLMCA2□
General-purpose Overtravel	WLH□	• Overtravel is large, making setting the dog easier. • Mounting is compatible with WLH2. 	Not possible *2	Any of 4 directions	WLH2-□S	WLH2□
Overtravel, 90° operation	WL□-2	• Overtravel is large, making setting the dog easier. • Mounting is compatible with WLCA2-2. 	Not possible *2	Any of 4 directions	—	—
	WL□-2N		Possible *1	Either of 2 directions		
Maintained	WLCA32-□	• When the dog throws the lever, the output is reversed and the reversed output is held even after the dog passed. The original status is returned to only after the dog passed. 	—	Any of 4 directions	—	—

\*1. One-side operation means that three operational directions can be selected electrically, according to the change in direction of the operating plunger. The operating plunger is set for operation on both sides before delivery.

\*2. Those models for which one-side operation is impossible can only operate on both sides.

### Connectors and Conduits

Wiring type	General-purpose	Connector/conduit specifications	Spatter-prevention	Long-life
	Model		Model	Model
Direct-wired connector	WL□-□LDK□	• SC-2F/-4F Connector built-in	—	WLM□-LDK□
Pre-wired connector	WL□-□LD-M1□ WL□-□LD-□GJ□ WL□-□LD-DK1EJ□	• XS2H-series Pre-wired Connector built-in	WL□-□S-M1□J-1 WL□-□S-DGJS03	WLM□-LD-M1J WLM□-LD-□GJ□
Conduit (screw terminal)	WL□-□ WL□-□G1□ WL□-□G□ WL□-□Y□ WL□-□TS□	• G1/2 with no ground terminal • G1/2 with ground terminal • Pg13.5 with ground terminal • M20 with ground terminal • 1/2 14NPT with ground terminal	—	WLM□-LD — — — —

## Environment-resistant Switches

Type	Item Model	Environment-resistant		
		Application	Environment-resistant construction	Applicable models
Airtight seal	WL□-55		Uses the W-10FB3-55 Airtight Built-in Switch. Note: Use the SC Connector for the conduit opening.	All models except the low-temperature and heat-resistant models Note: Models can be produced using standard actuators.
Hermetic seal (Molded terminals/ Anti-coolant)	WL□-139	For uses in locations subject to cutting oil or water	Refer to page 25 for information on the environment-resistant construction of Switches with Hermetic Seals.	All models except the low-temperature and heat-resistant models Note: Models can be produced using standard actuators. Only the WLCA2, or WLH2 can be produced for the WL□-141 and WL□-145.
	WL□-140			
	WL□-141			
	WL□-145			
	WL□-RP40			
	WL□-RP60			
Low-temperature *	WL□-TC	Can be used at a temperature of -40°C (operating temperature range: -40 to 40°C), but cannot withstand icing.	<ul style="list-style-type: none"> <li>Uses a general-purpose built-in switch.</li> <li>Silicone rubber is used for rubber parts such as the O-ring, gasket, etc.</li> </ul>	All models except airtight seal, hermetic seal, heat-resistant, corrosion-proof, and indicator-equipped models
Heat-resistant *	WL□-TH	Can be used in temperatures of 120°C (operating temperature range: 5 to 120°C).	<ul style="list-style-type: none"> <li>Uses a special built-in switch made from heat-resistant resin.</li> <li>Silicone rubber is used for rubber parts such as the O-ring, gasket etc.</li> </ul>	All models except airtight seal, hermetic seal, heat-resistant, corrosion-proof, and indicator-equipped, nylon roller (WLCA2-26N), seal roller models, and resin in rod (WLNJ-2) models
Corrosion-proof	WL□-RP	For use in locations subject to corrosive gases and chemicals.	<ul style="list-style-type: none"> <li>Diecast parts, such as the switch box, are made of corrosion-proof aluminum.</li> <li>Rubber sealing parts are made of fluorine rubber which aids in resisting oil, chemicals and adverse weather conditions.</li> <li>Exposed nuts and screws (except the actuator section) are made of stainless steel.</li> <li>Moving and rotary parts such as rollers are made of sintered stainless steel or stainless steel.</li> <li>The Head, box, and cover are yellow.</li> </ul>	All models except overtravel (90° operation), fork lever lock (WLCA32-41 to -43), low-temperature, heat-resistant, and indicator-equipped models
Weather-proof *	WL□-P1	For use in parking lots and other outdoor locations.	<ul style="list-style-type: none"> <li>Rubber parts are made from silicone rubber, which has a high-tolerance to deterioration over time and changes in temperature.</li> <li>Rollers are made of stainless steel to improve corrosion resistance.</li> <li>Exposed nuts and screws are made of stainless steel.</li> </ul>	Only basic (WLCA2/CA12/CL) and general-purpose overtravel (WLH2/H12/HL) models (excluding heat-resistant models).

\* Weather Resistance, Cold Resistance, and Heat Resistance

Silicon rubber is used to increase resistance to weather, cold, and heat. Silicon rubber, however, can generate silicon gas. (This can occur at room temperature, but the amount of silicon gas generated increases at higher temperatures.) Silicon gas will react as a result of arc energy and form silicon oxide ( $\text{SiO}_2$ ). If silicon oxide accumulates on the contacts, contact interference can occur and can interfere with the device. Before using a Switch, test it under actual application conditions (including the environment and operating frequency) to confirm that no problems will occur in actual.

## Selection Guide

With the WL Series, OMRON will combine the switch, Actuator, and wiring method required to build the ideal switch for your application.

**The WL Series consists of four basic types: General-purpose, Environment-resistant, Spatter-prevention, and Long-life Switches. WLCA2 Switches can be used for the most common applications.**

### — According to Operating Environment —

Environment	Key specifications	Models	
Ambient operating temperature	 Normal: Water-resistant to IP67.	WL□	General-purpose Switches
	 High-temperature: To increase heat resistance, the rubber material (silicon rubber) and the material of the built-in switch have been changed.	WL□-TH	Heat-resistant Switches *1
	 Low-temperature: To increase resistance to cold, silicon rubber and other measures are used.	WL□-TC	Low-temperature Switches *1
	Rubber parts are made from silicone rubber, which has a high-tolerance to deterioration over time and changes in temperature. Rollers are made of stainless steel to improve corrosion resistance. Exposed nuts and screws are made of stainless steel.	WL□-P1	Weather-proof Switches *1
	Corrosion-proof aluminum diecast has been used for the housing, fluorine rubber has been used for rubber parts, and stainless steel has been used for screws and nuts (except for actuator) to increase resistance to oils, chemicals, and weather.	WL□-RP	Corrosion-proof Switches *1
	Water drops and mist: Uses an airtight built-in switch.	WL□-55	Airtight Switches *1
	Cables attached. Uses a general-purpose built-in switch. The case cover and conduit opening are molded from epoxy resin to increase the seal. The cover cannot be removed.	WL□-139	Hermetic, Molded-terminal Switches *1, *2
	Cables attached. Uses an airtight built-in switch. The case cover and box interior are molded from epoxy resin to increase the seal. The cover cannot be removed. The SC connector can be removed, so it is possible to use flexible conduits for the cable.	WL□-RP40	Hermetic, Molded-terminal Switches *1, *2
	Cables attached. Uses an airtight built-in switch. The cover screws, case cover, box interior, and conduit opening are molded from epoxy resin to increase the seal. (The cover cannot be removed.)	WL□-140	Hermetic, Molded-terminal Switches *1, *2
	Cables attached. Uses an airtight built-in switch. The cover screws, case cover, box interior, conduit opening, box head, and head screws are molded from epoxy resin to increase the seal. (The cover cannot be removed.) The Head opening is protected from cutting powder. -141: The Head section is molded from epoxy resin; Head direction cannot be changed. -145: The Head section is molded from epoxy resin; Head can be in any of 4 directions.	WL□-141, -145	Hermetic, Molded-terminal Switches *1, *2 (Only the WLCA2 and WLH2 can be produced.)
Coolant	Cables attached. Uses an airtight built-in switch. The case cover, box interior, conduit opening, and head screws are molded from epoxy resin to increase the seal. (The cover cannot be removed.) Rubber parts are made from fluorine rubber to increase resistance to coolant.	WL□-RP60	Hermetic, Molded-terminal Switches *1, *2
Spattering from welding	To prevent spatter during welding, a heat-resistant resin is used for the indicator cover and screws and rollers are all made from stainless steel.	WL□-S	Spatter-prevention Switches

\*1. Not all functions can be combined with environment-resistant switches. Refer to the applicable models on the previous page.

\*2. Refer to page 25 for information on the construction of Hermetic Switches.

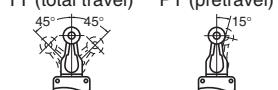
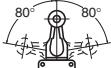
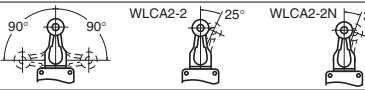
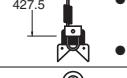
## — According to Application Conditions —

	Conditions	Key specifications	Models	
Load	Switching standard loads	10 A at 125,250, or 500 VAC 0.8 A at 125 VDC 0.4 A at 250 VDC	WL□ WL□-S WLM□	General-purpose Switches Spatter-prevention Switches Long-life Switches
	Switching microloads	0.1 A at 125 VAC, resistive load 0.1 A at 30 VDC, resistive load	WL01□ WL01□-S	General-purpose Microload Switches Spatter-prevention Microload Switches
Durability	Normal durability	Mechanical: 15 million operation min. (10 million operation min. for overtravel general-purpose models or flexible rod models)	WL□ WL□-S	General-purpose Switches Spatter-prevention Switches
	Long-life	Mechanical: 30 million operation min.	WLM□	Long-life Switches

## — According to Ease of Installation and Maintenance —

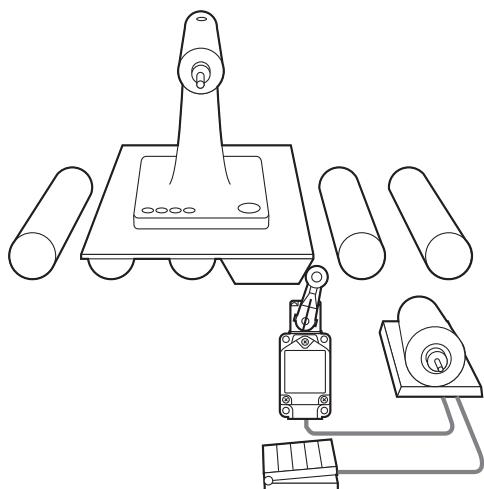
	Conditions	Key specifications	Models	
Operation indicator	Daily inspections and maintenance checks	Switching light-ON between operating/not operating. (Switching not possible for models with molded terminals.) Neon lamp 125 to 250 VAC	WL□-LE WL□-LES	General-purpose, Indicator-equipped (Neon Lamp) Switches Spatter-prevention, Indicator-equipped (Neon Lamp) Switches
		Switching light-ON between operating/not operating. (Switching not possible for models with molded terminals.) LED 10 to 115 VAC/DC	WL□-LD WL□-LDS	General-purpose, Indicator-equipped (LED) Switches Spatter-prevention, Indicator-equipped (LED) Switches
Wiring specification	Screw tightening and installation	Screw terminals. No ground terminal. Conduit size: G1/2	WL□ WLM□	General-purpose Switches Long-life Switches
		Screw terminals. Ground terminal. Conduit size: 4 sizes	WL□	General-purpose Switches
One-touch connector attachment		Direct-wired connector, 2-conductor. Greatly reduces wiring work. Water-proof to IP67.	WL□-□LDK13 WLM□-LDK13	General-purpose, Direct-wired Connector Switches Long-life, Direct-wired Connector Switches
		Direct-wired connector, 4-conductor. Greatly reduces wiring work. Water-proof to IP67.	WL□-□LDK43 WLM□-LDK43	General-purpose, Direct-wired Connector Switches Long-life, Direct-wired Connector Switches
Connector attachment in control and relay boxes		Pre-wired connector, 2-conductor. Greatly reduces wiring work. Water-proof to IP67.	WL□-□LD-M1J WL□-□S-M1J-1 WLM□-LD-M1J	General-purpose, Pre-wired Connector Switches Spatter-prevention, Pre-wired Connector Switches Long-life, Pre-wired Connector Switches
		Pre-wired connector, 4-conductor. Greatly reduces wiring work. Water-proof to IP67.	WL□-□LD-□GJO3 WL□-□S-□GJSO3 WLM□-LD-□GJO3	General-purpose, Pre-wired Connector Switches Spatter-prevention, Pre-wired Connector Switches Long-life, Pre-wired Connector Switches

## According to Form of Operation

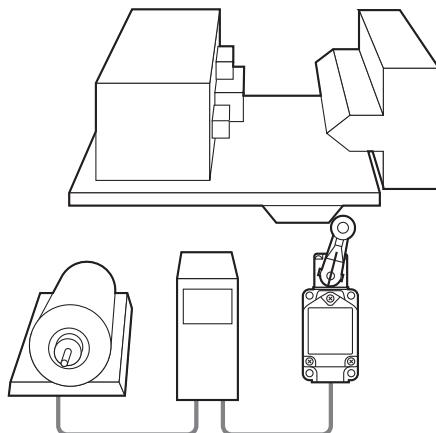
Detection object	Key specifications	Models	
Operation angles	TT (total travel) PT (pretravel) 	WLCA2 WLCA2-□S WLMCA2	General-purpose Switches Spatter-prevention Switches Long-life Switches
	 80° 80° 15°	WLH2 WLH2-□S WLMH2	General-purpose Switches Spatter-prevention Switches Long-life Switches
	 90° 90° 25° 20°	WLCA2-2 WLCA2-2N	General-purpose Switches General-purpose Switches
Dogs and workpieces (Mounts in any of 4 directions)	 ● Short lever ● One-Horizontal operation possible. (WLCA□ only) ● Head mounts in any of 4 directions.	WL□2 WL□2-□S WLM□2	Roller Lever Actuators Roller Lever Actuators Roller Lever Actuators
	 ● Medium lever ● One-Horizontal operation possible. (WLCA□ only) ● Head mounts in any of 4 directions.	WL□2-7	Roller Lever Actuators
	 ● Long lever ● One-Horizontal operation possible. (WLCA□ only) ● Head mounts in any of 4 directions.	WL□2-8	Roller Lever Actuators
	 ● One-Horizontal operation possible. (WLCA□ only) ● Head mounts in any of 4 directions.	WL□12	Adjustable Roller Lever Actuators
Actuators	 ● One-Horizontal operation possible. (WLCL only) ● Head mounts in any of 4 directions.	WL□L	Adjustable Rod Lever Actuators
	 ● One-Horizontal operation not possible. ● Head mounts in any of 4 directions.	WLHAL4	Adjustable Rod Lever Actuator
	 ● One-Horizontal operation not possible. ● Head mounts in any of 4 directions.	WLHAL5	Rod Spring Lever Actuator
Round-trip operation of passing dogs	 ● Head mounts in any of 4 directions.	WLCA32-41	Fork Lever Lock Actuator
	 ● Head mounts in any of 4 directions.	WLCA32-42	Fork Lever Lock Actuator
	 ● Head mounts in any of 4 directions.	WLCA32-43	Fork Lever Lock Actuator
	 ● Head mounts in any of 4 directions.	WLCA32-44	Fork Lever Lock Actuator
Cams or workpieces with vertical movement	 ● Head mounts in any of 4 directions.	WLD	Top Plunger Actuator
	 ● Head mounts in any of 4 directions.	WLSD	Horizontal Plunger Actuator
	 ● Head mounts in any of 4 directions.	WLD3	Top-ball Plunger Actuator
	 ● Head mounts in any of 4 directions.	WLSD3	Horizontal-ball Plunger Actuator
	 ● Available in sealed models. (WLD28□)	WLD2 WLD28	Top-roller Plunger Actuator Sealed Top-roller Plunger Actuator
	 ● Available in sealed models. (WLD28□)	WLSD2	Horizontal-roller Plunger Actuator

## Application Examples

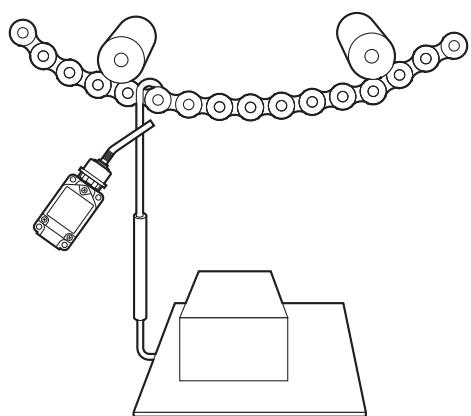
**Positioning on Production Lines**



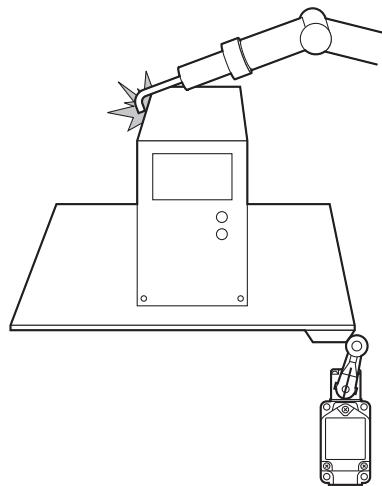
**Positioning of Machine Tools**



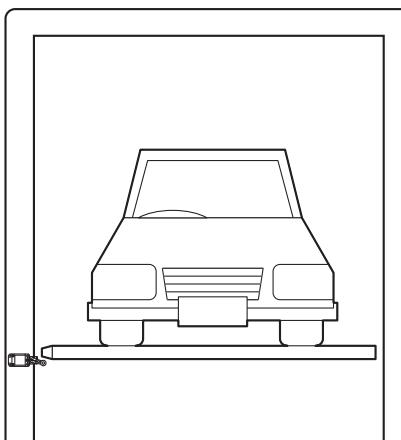
**Positioning on Suspended Conveyors**



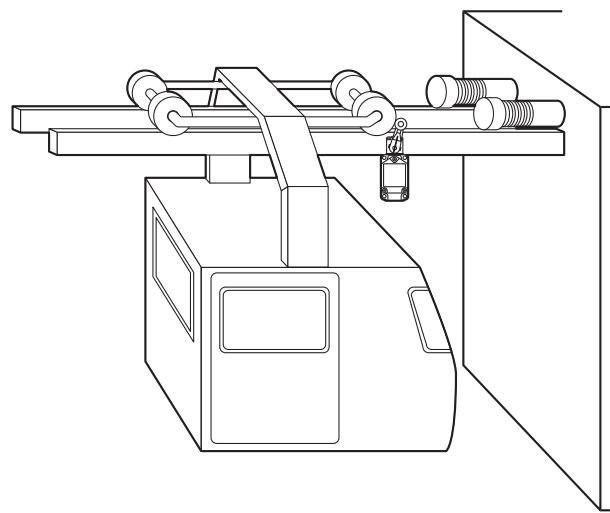
**Pallet Detection in Arc Welding Lines**



**Multilevel Car Parking Towers**



**Limit Detection in Transport Systems**





**General-purpose Switches****Sensor I/O Connector Switches**

WL   -  LD   
 (1) (2) (3) (4) (5)

**(1) Electrical Rating**

Blank	Standard load
01	Microload

Note: Dimensions are the same as the standard models.

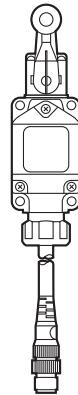
**(2) Actuator Type**

CA2	Roller lever: Standard model
H2	Roller lever: General-purpose overtravel model
D2	Top-roller plunger
D28	Sealed top-roller plunger

**(3) Built-in Switch Type**

Blank	Standard
55	Hermetically sealed

Note: Dimensions are the same as the standard models.

**Direct-wired Connector****Pre-wired Connector****(4) Indicator Type**

LD	LED, 10 to 115 VAC/DC
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**(5) Wiring Specifications**

K13A	Direct-wired Connector (2-conductor: AC, NO wiring, connector pins No. 3, 4)
K13	Direct-wired Connector (2-conductor: DC, NO wiring, connector pins No. 3, 4)
K43A	Direct-wired Connector (4-conductor: AC)
K43	Direct-wired Connector (4-conductor: DC)
-M1J *1	Pre-wired Connector *2 (2-conductor: DC, NO wiring, connector pins No. 3, 4)
-M1GJ *1	Pre-wired Connector *2 (2-conductor: DC, NO wiring, connector pins No. 1, 4)
-M1JB	Pre-wired Connector *2 (2-conductor: DC, NC wiring, connector pins No. 3, 2)
-AGJ03	Pre-wired Connector *2 (4-conductor, AC)
-DGJ03 *1	Pre-wired Connector *2 (4-conductor, DC)
-DK1EJ03 *1	Pre-wired Connector *2 (3-conductor: DC, NO wiring, connector pins No. 2, 3, 4)

\*1. Models with pre-wired connectors and DC specifications have EN/IEC approval (CE marking).

\*2. With 0.3-m cable attached.

**Spatter-prevention Switches**

WL   -  S   
 (1) (2) (3) (4) (5)

**(1) Electrical Rating**

Blank	Standard load
01	Microload

Note: Dimensions are the same as the standard models.

**(2) Actuator Type**

CA2	Roller lever: Standard model
H2	Roller lever: General-purpose Overtravel model
D28	Sealed top-roller plunger

**(3) Built-in Switch Type**

Blank	Standard
55	Hermetically sealed

Note: Dimensions are the same as the standard models.

**(4) Indicator Type**

LD	LED, AC/DC
LE	Neon lamp

Note: Dimensions are the same for both LE and LD models.

**(5) Wiring Specifications**

Blank	Screw terminal: G1/2 conduit
-M1J-1 *1	Pre-wired Connector *2 (2-conductor: DC, NO wiring, connector pins No. 3, 4)
-M1GJ-1 *1	Pre-wired Connector *2 (2-conductor: DC, NO wiring, connector pins No. 1, 4)
-DGJS03 *1	Pre-wired Connector *2 (4-conductor: DC)

\*1. Models with pre-wired connectors and DC specifications are approved by EN/IEC (CE marking) except for LE Models (Neon Lamp Models).

\*2. With 0.3-m cable attached.

**Long-life Switches**

WLM  -LD   
 (1) (2) (3)

**(1) Actuator**

CA2	Roller lever: Standard model
H2	Roller lever: General-purpose overtravel model

**(2) Indicator Type**

LD	LED, 10 to 115 VAC/DC
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**(3) Wiring Specifications**

Blank	Screw terminal: G1/2 conduit
K13A	Direct-wired Connector: 2-conductor, AC
K13	Direct-wired Connector: 2-conductor, DC
K43A	Direct-wired Connector: 4-conductor, AC
K43	Direct-wired Connector: 4-conductor, DC
-M1J	Pre-wired Connector: 2-conductor, DC *
-AGJ03	Pre-wired Connector: 4-conductor, AC *
-DGJ03	Pre-wired Connector: 4-conductor, DC *

\* With 0.3-m cable attached.





## General-purpose Switches

### Sensor I/O Connector Switches

#### Direct-wired Connectors

Actuator						Item	Basic	Overtravel
	Wiring				Built-in switch specification			General-purpose
	2-conductor	DC	NO	connector pins No. 3, 4	Standard	WLCA2-LDK13	WLH2-LDK13	Model
Roller lever	2-conductor	DC	NO	connector pins No. 3, 4	Airtight seal	WLCA2-55LDK13	WLH2-55LDK13	Model
					Standard	WLCA2-LDK43	WLH2-LDK43	Model
	4-conductor	DC			Airtight seal	WLCA2-55LDK43	WLH2-55LDK43	Model
					Standard	WLCA2-LDK43	WLH2-LDK43	Model
Top-roller plunger	2-conductor	DC	NO	connector pins No. 3, 4	Airtight seal	WLD2-LDK13	—	—
					Standard	WLD2-55LDK13	—	—
	4-conductor	DC			Airtight seal	WLD2-LDK43	—	—
					Standard	WLD2-55LDK43	—	—

Note: For details of The WL high-sensitivity, high-precision models, refer to *Limit Switch WL-N/WL Datasheet* (Cat. No. C151-E1).

#### Pre-wired Connectors

Actuator						Item	Basic	Overtravel
	Wiring				Built-in switch specification			General-purpose
	2-conductor	DC	NO	connector pins No. 3, 4	Standard	WLCA2-LD-M1J	WLH2-LD-M1J	Model
Roller lever	2-conductor	DC	NO	connector pins No. 3, 4	Airtight seal	WLCA2-55LD-M1J	—	—
					Standard	WLCA2-LD-M1GJ	WLH2-LD-M1GJ	Model
			NC	connector pins No. 1, 4	Airtight seal	WLCA2-55LD-M1GJ	—	—
					Standard	—	—	—
	4-conductor	DC		connector pins No. 3, 2	Airtight seal	WLCA2-55LD-M1JB	—	—
					Standard	WLCA2-LD-DGJ03	WLH2-LD-DGJ03	Model
	3-conductor	DC		connector pins No. 2, 3, 4	Airtight seal	WLCA2-55LD-DK1EJ03	—	—
					Standard	WLCA2-LD-DK1EJ03	—	—
Top-roller plunger	2-conductor	DC	NO	connector pins No. 3, 4	Airtight seal	WLD2-55LD-M1J	—	—
					Standard	WLD2-55LD-M1J	—	—
			NC	connector pins No. 1, 4	Airtight seal	WLD2-LD-M1GJ	—	—
					Standard	WLD2-55LD-M1GJ	—	—
	4-conductor	DC		connector pins No. 3, 2	Airtight seal	WLD2-55LD-M1JB	—	—
					Standard	WLD2-LD-DGJ03	—	—
	3-conductor	DC		connector pins No. 2, 3, 4	Airtight seal	WLD2-55LD-DK1EJ03	—	—
					Standard	WLD2-LD-DK1EJ03	—	—

Note: For details of The WL high-sensitivity, high-precision models, refer to *Limit Switch WL-N/WL Datasheet* (Cat. No. C151-E1).

## Environment-resistant Switches

Note: Models are also available with ground terminals.

Item	Actuator			 Roller lever R38
	Basic		Overtravel	
	Model	Model	General-purpose	
Airtight seal	No indicator	WLCA2-55	WLH2-55	
	Indicator	LED WLCA2-55LD	WLH2-55LD	
		Neon WLCA2-55LE	WLH2-55LE	
Hermetic seal	Molded terminals	No indicator	WLCA2-139	WLH2-139
		Indicator	NC wiring WLCA2-139LD2	—
			NO wiring WLCA2-139LD3	—
	-139	No indicator	WLCA2-140	WLH2-140
		Indicator	NC wiring WLCA2-140LD2	—
			NO wiring WLCA2-140LD3	—
	-140	No indicator	WLCA2-141	WLH2-141
		Indicator	NC wiring WLCA2-141LD2	—
			NO wiring WLCA2-141LD3	WLH2-141LD3
	Anti-coolant	No indicator	WLCA2-RP60	WLH2-RP60
		Indicator	NC wiring WLCA2-RP60LD2	—
			NO wiring WLCA2-RP60LD3	WLH2-RP60LD3
Heat-resistant	No indicator	WLCA2-TH	WLH2-TH	
Low-temperature		WLCA2-TC	WLH2-TC	
Corrosion-proof		WLCA2-RP	WLH2-RP	
Weather-proof		WLCA2-P1	WLH2-P1	

Note: For details of The WL high-sensitivity, high-precision models, refer to *Limit Switch WL-N/WL Datasheet* (Cat. No. C151-E1).

Item	Actuator			 Roller lever R38
	Overtravel		90° (-2 model)	90° (-2N model)
	Model	Model	Model	Model
Airtight seal	No indicator	WLCA2-255	WLCA2-2N55	
	Indicator	LED WLCA2-255LD	WLCA2-2N55LD	
		Neon WLCA2-255LE	WLCA2-2N55LE	
Hermetic seal	Molded terminals	No indicator	WLCA2-2139	WLCA2-2N139
		Indicator	NC wiring WLCA2-2139LD2	—
			NO wiring WLCA2-2139LD3	—
	-139	No indicator	—	WLCA2-2N140
		Indicator	NC wiring —	—
			NO wiring —	—
	-140	No indicator	—	—
		Indicator	NC wiring —	—
			NO wiring —	—
	-141	No indicator	—	—
		Indicator	NC wiring —	—
			NO wiring —	—
Anti-coolant	No indicator	WLCA2-2RP60	—	
	Indicator	NC wiring WLCA2-2RP60LD2	—	
		NO wiring WLCA2-2RP60LD3	—	
	No indicator	WLCA2-2TH	WLCA2-2NTH	
		WLCA2-2TC	WLCA2-2NTC	
		—	—	
Heat-resistant	No indicator	WLCA2-2TH	WLCA2-2NTH	
Low-temperature		WLCA2-2TC	WLCA2-2NTC	
Corrosion-proof		—	—	

Note: For details of The WL high-sensitivity, high-precision models, refer to *Limit Switch WL-N/WL Datasheet* (Cat. No. C151-E1).

Item	Actuator			Adjustable roller lever	
	Basic	Overtravel			
		General-purpose			
Model	Model	Model	Model	Model	Model
Airtight seal	Molded terminals	No indicator	WLCA12-55	—	
		Indicator	WLCA12-55LD	—	
		LED	WLCA12-55LE	—	
Hermetic seal	Molded terminals	No indicator	WLCA12-139	—	
	-139		WLCA12-140	—	
	-140		WLCA12-141	—	
	-141		WLCA12-RP60	—	
Anti-coolant			WLCA12-TH	WLH12-TH	
Heat-resistant	No indicator		WLCA12-TC	WLH12-TC	
Low-temperature			WLCA12-RP	WLH12-RP	
Corrosion-proof			WLCA12-P1	WLH12-P1	
Weather-proof					

Note: For details of The WL high-sensitivity, high-precision models, refer to *Limit Switch WL-N/WL Datasheet* (Cat. No. C151-E1).

Item	Actuator			Adjustable roller lever	
	90° (-2 model)	Overtravel			
		90° (-2N model)			
Model	Model	Model	Model	Model	Model
Heat-resistant	No indicator	WLCA12-2TH	WLCA12-2NTH		
Low-temperature		WLCA12-2TC	WLCA12-2NTC		

Item	Actuator			Adjustable rod lever 25 to 140 mm	
	Basic	Overtravel			
		General-purpose			
Model	Model	Model	Model	Model	Model
Airtight seal	Molded terminals	No indicator	WLCL-55	—	
		Indicator	WLCL-55LD	—	
		LED	—	—	
Hermetic seal	Molded terminals	No indicator	WLCL-139	—	
	-139		WLCL-140	—	
	-140		—	—	
	-141		WLCL-RP60	—	
Anti-coolant			WLCL-TH	WLHL-TH	
Heat-resistant	No indicator		WLCL-TC	WLHL-TC	
Low-temperature			WLCL-RP	WLHL-RP	
Corrosion-proof			WLCL-P1	WLHL-P1	
Weather-proof					

Note: For details of The WL high-sensitivity, high-precision models, refer to *Limit Switch WL-N/WL Datasheet* (Cat. No. C151-E1).

Item	Actuator			Adjustable rod lever 25 to 140 mm	
	90° (-2 model)	Overtravel			
		90° (-2N model)			
Model	Model	Model	Model	Model	Model
Heat-resistant	No indicator	WLCL-2TH	WLCL-2NTH		
Low-temperature		WLCL-2TC	WLCL-2NTC		
Corrosion-proof		WLCL-2RP	—		

Item			Actuator	Top-roller plunger 	Sealed top-roller plunger 	Horizontal plunger 	
				Model	Model	Model	
Airtight seal		No indicator		WLD2-55	WLD28-55	WLSD-55	
		Indicator	LED	WLD2-55LD	WLD28-55LD	WLSD-55LD	
			Neon	WLD2-55LE	WLD28-55LE	—	
Hermetic seal	Molded terminals	-139	No indicator	WLD2-139	WLD28-139	WLSD-139	
		-140		—	WLD28-140	—	
	Anti-coolant			WLD2-RP60	WLD28-RP60	WLSD-RP60	
Heat-resistant		No indicator	WLD2-TH	WLD28-TH	WLSD-TH	—	
Low-temperature			WLD2-TC	—	WLSD-TC	—	
Corrosion-proof			WLD2-RP	WLD28-RP	WLSD-RP	—	

Note: The standard cable length for models with airtight seals is 5 m.

Item			Actuator	Horizontal-roller plunger 	Coil spring (spring diameter: 6.5) 	Coil spring (resin rod diameter: 8) 	
				Model	Model	Model	
Airtight seal		No indicator		WLSD2-55	WLNJ-55	WLNJ-255	
		Indicator	LED	WLSD2-55LD	WLNJ-55LD	WLNJ-255LD	
			Neon	—	—	—	
Hermetic seal	Molded terminals	-139	No indicator	WLSD2-139	WLNJ-139	—	
		-140		WLSD2-140	WLNJ-140	WLNJ-2140	
	Anti-coolant			WLSD2-RP60	WLNJ-RP60	WLNJ-2RP60	
Heat-resistant		No indicator	WLSD2-TH	WLNJ-TH	—	—	
Low-temperature			WLSD2-TC	WLNJ-TC	WLNJ-2TC	—	
Corrosion-proof			WLSD2-RP	WLNJ-RP	WLNJ-2RP	—	

Note: The standard cable length for models with airtight seals is 5 m.

## Spatter-prevention Switches

Actuator		Roller lever		Sealed top-roller plunger
		Double nut lever	Allen-head lever	
		Model	Model	
Neon lamp operation indicator	Basic	WLCA2-LEAS	WLCA2-LES	WLD28-LES
	Overtravel General-purpose	WLH2-LEAS	WLH2-LES	—
LED operation indicator	Basic	WLCA2-LDAS	WLCA2-LDS	WLD28-LDS
	Overtravel General-purpose	WLH2-LDAS	WLH2-LDS	—

Note: 1. For details of The WL high-sensitivity, high-precision models, refer to *Limit Switch WL-N/WL Datasheet* (Cat. No. C151-E1).  
 2. Ask your OMRON representative about WL01□-□S Microload Switches.

## Long-life Switches

Actuator		Item			LED operation indicator *1			
		Basic		Overtravel				
		Model		General-purpose				
			WLMCA2-LD		WLMH2-LD			
	2-conductor	AC	WLMCA2-LDK13A		WLMH2-LDK13A			
		DC	WLMCA2-LDK13		WLMH2-LDK13			
	4-conductor	AC	WLMCA2-LDK43A		WLMH2-LDK43A			
		DC	WLMCA2-LDK43		WLMH2-LDK43			
		2-conductor	DC	WLMCA2-LD-M1J		WLMH2-LD-M1J		
		4-conductor	DC	WLMCA2-LD-DGJ03		WLMH2-LD-DGJ03		

Note: For details of The WL high-sensitivity, high-precision models, refer to *Limit Switch WL-N/WL Datasheet* (Cat. No. C151-E1).

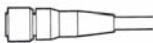
\*1. The default setting is "light-ON when not operating."

Turn the lamp holder by 180° to change the setting to "light-ON when operating". (Ask your OMRON representative about 2-conductor models.)

\*2. With 0.3-m cable attached.

## Connecting Cables

Straight Cable



Voltage specification		Number of conductors	Cable length	Model
AC	2	2 m		XS2F-A421-DB0-F
		5 m		XS2F-A421-GB0-F
	4	2 m		XS2F-A421-D90-F
		5 m		XS2F-A421-G90-F
DC	2	2 m		XS2F-D421-DD0
		5 m		XS2F-D421-GD0
	4	2 m		XS2F-D421-D80-F
		5 m		XS2F-D421-G80-F

## Individual Parts

### Heads

Actuator type	Set model	Head model (with Actuator)
Roller lever	WLCA2	WL-1H1100
	WLH2	WL-2H1100-1 *
	WLCA2-2	WL-3H1100
	WLCA2-2N	WL-6H1100
Adjustable roller lever	WLCA12	WL-1H2100
	WLH12	WL-2H2100-1 *
	WLCA12-2	WL-3H2100
	WLCA12-2N	WL-6H2100
Adjustable rod lever	WLCL	WL-4H4100
	WLCL-2	WL-3H4100
	WLCL-2N	WL-6H4100

Note: For details of The WL high-sensitivity, high-precision models, refer to *Limit Switch WL-N/WL Datasheet* (Cat. No. C151-E1).

\* The model number of Heads without levers are same as those of Heads with levers without the numbers at the end.

Example: WL-1H1100 becomes WL-1H without the lever.

However, the WLH2 and WLH12 become WL-2H-1 for the Heads without levers.

Other Heads are also available. Ask your OMRON representative.

Actuator type	Set model	Head model (with Actuator)
Top plunger	WLD	WL-7H100
	WLD2	WL-7H200
	WLD3	WL-7H300
	WLD28	WL-7H400
Horizontal plunger	WLSD	WL-8H100
	WLSD2	WL-8H200
	WLSD3	WL-8H300
Fork lever lock	WLCA32-41	WL-5H5100
	WLCA32-42	WL-5H5102
	WLCA32-43	WL-5H5104
	WLCA32-44	WL-5H5104
Coil spring	WLNJ	WL-9H100
	WLNJ-30	WL-9H200
	WLNJ-2	WL-9H300
	WLNJ-S2	WL-9H400

### Switches without levers

Actuator type	Switches without levers	
	Model	Icon
Switches for roller levers	WLRCA2	
	WLRH2	
	WLRCA2-2	
	WLRCA2-2N	
Switches for adjustable roller levers	WLRCA2	
	WLRH2	
	WLRCA2-2	
	WLRCA2-2N	
Switches for adjustable rod lever	WLRCL	
	WLRCA2-2	
	WLRCA2-2N	
Switches for top plungers	—	—
Switches for horizontal plungers	—	—
Switches for fork lever locks	Maintained, WL-5A100 Maintained, WL-5A102 Maintained, WL-5A104	WLRCA32
Switches for coil springs	—	—

Note: For details of The WL high-sensitivity, high-precision models, refer to *Limit Switch WL-N/WL Datasheet* (Cat. No. C151-E1).

### Covers with Operation Indicators

Item	Cover	Cover only with indicator	Model
	Model	Icon	
Neon lamp	WL-LE		
LED	WL-LD		

Note: The default setting is "light-ON when not operating."

Turn the lamp holder by 180° to change the setting to "light-ON when operating."

## Spatter-prevention Products

### Head (with actuator)

Complete Heads with allen-head levers	Double Nut Lever
Model	Model
WL-1H1100S (for WLCA2-□)	WL-2H1100S (for WLH2-□)

### Lever

Allen-head Lever	Double Nut Lever
Model	Model
WL-1A103S Roller lever	WL-1A105S Roller Lever

### Cover with indicator

Cover with Indicator
Model
Neon lamp WL-LES

Switches without levers
Model
WLRC2-LDS
WLRH2-LES
WLRH2-LDS

Note: For details of The WL high-sensitivity, high-precision models, refer to *Limit Switch WL-N/WL Datasheet* (Cat. No. C151-E1).

## WL Head Replacement

Heads can be replaced within the same model group. They cannot be replaced between different model groups.

Group No.	Set model number	Head model number (with Actuator)
1	WLCA2	WL-1H1100
	WLCA2-7	WL-1H1200
	WLCA2-8	WL-1H1300
	WLCA12	WL-1H2100
2	WLCL	WL-4H4100 *
3	WLH2	WL-2H1100-1
	WLH12	WL-2H2100-1
	WLHL	WL-2H4100
	WLHAL4	WL-2H4106
	WLHAL5	WL-2H4107
4	WLCA2-2N	WL-6H1100
	WLCA12-2N	WL-6H2100
	WLCL-2N	WL-6H4100
5	WLCA2-2	WL-3H1100
	WLCA12-2	WL-3H2100
	WLCL-2	WL-3H4100
6	WLCA32-41	WL-5H5100
	WLCA32-42	WL-5H5102
	WLCA32-43	WL-5H5104
	WLCA32-44	WL-5H5104
7	WLD	WL-7H100
	WLD2	WL-7H200
	WLD3	WL-7H300
8	WLD28	WL-7H400 *
9	WLSD	WL-8H100
	WLSD2	WL-8H200
	WLSD3	WL-8H300
10	WLNJ	WL-9H100
	WLNJ-30	WL-9H200
11	WLNJ-2	WL-9H300 *
12	WLNJ-S2	WL-9H400 *

\* This Heads are special and must be used. Do not use any other Head.

## Specifications

### Approved Standards

Agency	Standard	File No.	Approved models
UL	UL508	E76675	Contact your OMRON representative for information on approved models.
CSA	CSA C22.2 No.14	LR45746	
TÜV Rheinland	EN60947-5-1	J50022353, J9950023, J9950959	
CCC (CQC)	GB14048.5	2004010305128675	





## Long-life Switches

### Ratings

**General Ratings (Refer to these ratings before using the product.)**

#### Screw Terminal Switches

Model	Item	Rated voltage (V)	Non-inductive load (A)		Inductive load (A)			
			Resistive load		Lamp load		Inductive load	
			NC	NO	NC	NO	NC	NO
Basic models, overtravel mod- els	115 AC	115	10	3	1.5	10	5	2.5
	12 DC	12	10	6	3	10	6	
	24 DC	24	6	4	3	6	4	
	48 DC	48	3	2	1.5	3	2	
	115 DC	115	0.8	0.2	0.2	0.8	0.2	

Inrush current	NC	30 A max.
	NO	20 A max.

#### Direct-wired Connector and Pre-wired Connector Switches

Model	Rated voltage (V)	Non-inductive load (A)				Inductive load (A)			
		Resistive load		Lamp load		Inductive load		Motor load	
		NC	NO	NC	NO	NC	NO	NC	NO
DC	12 DC	3	3	3	3	3	3	3	3
	24 DC	3	3	3	3	3	3	3	3
	48 DC	3	3	3	3	3	3	3	3
	115 DC	0.8	0.8	0.2	0.2	0.8	0.8	0.2	0.2
AC	115 AC	3	3	3	1.5	3	3	3	2.5

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. A lamp load has an inrush current of 10 times the steady-state current.

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

### Characteristics

Degree of protection	IP67	
Durability *	Mechanical	30,000,000 operations min.
	Electrical	30,000,000 operations min. (10 mA at 24 VDC, resistive load) 750,000 operations min. (10 A at 115 VAC, resistive load)
Operating speed	1 mm/s to 1 m/s (in case of WLCA2)	
Operating frequency	Mechanical	120 operations/minute
	Electrical	30 operations/minute
Rated frequency	50/60 Hz	
Insulation resistance	100 MΩ min. (at 500 VDC)	
Contact resistance	25 mΩ max. (initial value for the built-in switch when tested alone)	
Dielectric strength (50/60 Hz for 1 min)	Between terminals of the same polarity	1,000 VAC (except connector models)
	Between current-carrying metal part and ground	2,200 VAC (1,500 V)
	Between each terminal and non-current-carrying metal part	2,200 VAC (1,500 V)
Vibration resistance	Malfunction	10 to 55 Hz, 1.5-mm double amplitude
Shock resistance	Destruction	1,000 m/s <sup>2</sup> max.
	Malfunction	300 m/s <sup>2</sup> max.
Ambient operating temperature	−10°C to +80°C (with no icing)	
Ambient operating humidity	35% to 95%RH	
Weight	Approx. 275 g (in case of WLCA2)	

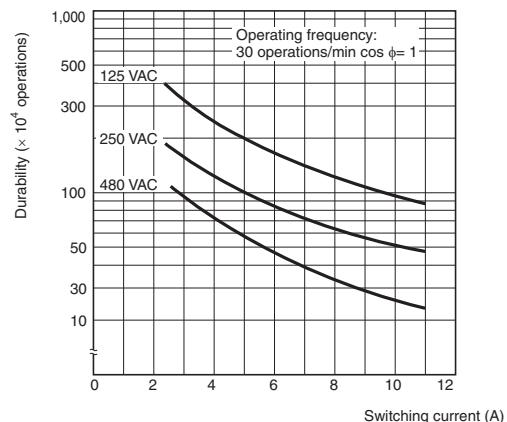
Note: The figures in parentheses for dielectric strength, are those for connector models.

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

### Engineering Data

#### Electrical Durability: cosφ= 1

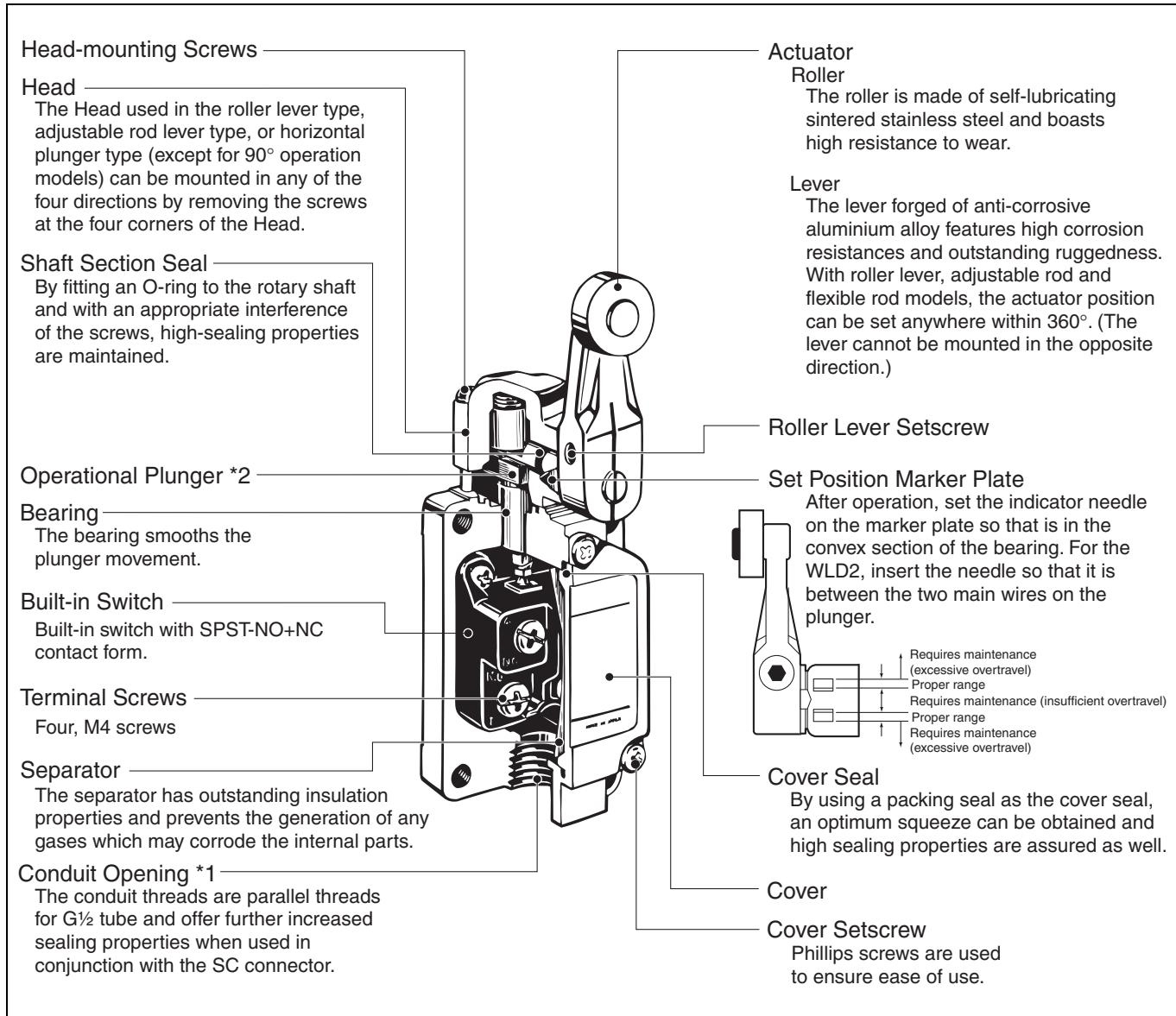
(Operating temperature: +5°C to +35°C, operating humidity: 40% to 70%RH)



## Structure and Nomenclature

### Structure

#### General-purpose Switches: WLCA2



\*1. The display for conduit threads has changed from PF $\frac{1}{2}$  to G $\frac{1}{2}$ , according to revisions of JIS B 0202. This is only a change in the display, so the thread size and pitch have not changed. (Conduit threads Pg 13.5 and  $\frac{1}{2}$ -14NPT are also available.)

\*2. By changing the orientation of the operational plunger, any one of the three operational directions (both sides, left, or right) can be selected electrically.

## Indicators

### Indicator Covers

The indicator covered if outsert molded from diecast aluminum and has outstanding sealing properties.

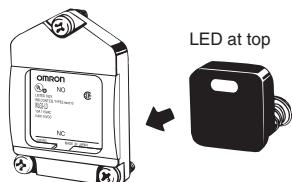
### Indicator Windows

Operation (i.e., light-ON when operating or light-ON when not operating) depends on whether a neon lamp or LED is used.

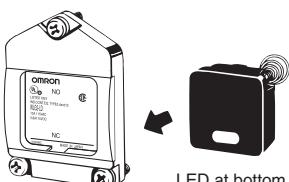
#### Light-ON when Operating/Not Operating

Indicators can be switched from light-ON when operating and light-ON when not operating, by simply rotating the indicator holder by 180°.  
(Molded terminals cannot be switched in this way.)

#### Light-ON when Operating



#### Light-ON when Not Operating

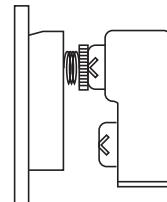


### Indicator

The indicator is either a neon lamp or an LED. Models with LED indicators have a built-in rectifier stack, so it is not necessary to change the polarity.

### Contact Spring

The built-in switch's terminal screws are used to connect the indicator terminal. Since the connection spring (coil spring) is used for this connection, it will not be necessary to connect the indicator terminal. When a ground terminal is provided however, a lead wire must be used.



### Operation

WL-LE WL-LD	Light-ON when operating *1	
	Light-ON when not operating *2	

### Internal Circuits

WL-LE	
WL-LD	

Note: 1. The indicator cover cannot be replaced on the molded terminals. In all cases the indicator does not light when the load is ON.

2. Leakage current from indicator circuit may cause load's malfunction. Please check the load's OFF current before use the indicator-equipped switch.

\*1. Light-ON when operating means that the lamp lights when the Limit Switch contacts (NC) release, or when the actuator rotates or is pushed down.

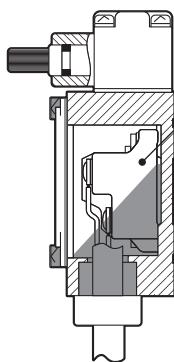
\*2. Light-ON when not operating means the lamp remains lit when the actuator is free, or when the Limit Switch contacts (NO) close when the actuator rotates or is pushed down.

## Environment-resistant Switches

### Mold Specifications for Hermetic Seal Switches

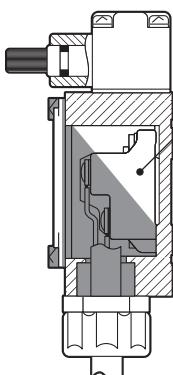
■ : Molded parts

WL□-139



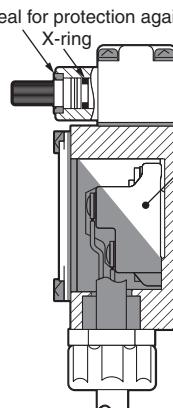
Standard  
built-in  
switch

WL□-140



Airtight  
built-in  
switch

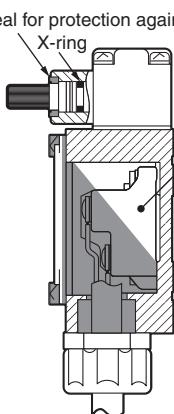
WL□-141



Oil seal for protection against cutting powder  
X-ring

Airtight  
built-in  
switch

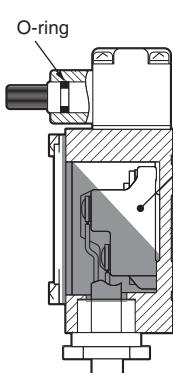
WL□-145



Oil seal for protection against cutting powder  
X-ring

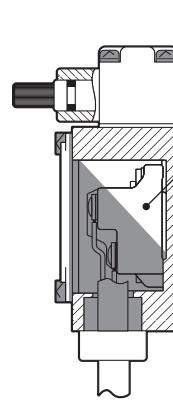
Airtight  
built-in  
switch

WL□-RP40



Airtight  
built-in  
switch

WL□-RP60



Airtight  
built-in  
switch

\* Fluorine rubber is used for all rubber parts.

Model	Cable specifications
WL□-139	Standard 5-m VCT (vinyl cabtire cable) cable attached. Finished diameter: 11.5 mm, 4-conductor.
WL□-140	
WL□-141	
WL□-145	Standard 5-m VCT cable, with high flexibility and good anti-oil properties attached. Finished diameter: 11.5 mm, 4-conductor.
WL□-RP40	
WL□-RP60	

## Spatter-prevention Switches: WLCA2-LEAS

### Actuator

#### Roller, Roller Axis

Using stainless steel prevents spatter from adhering.

#### Operating Lever

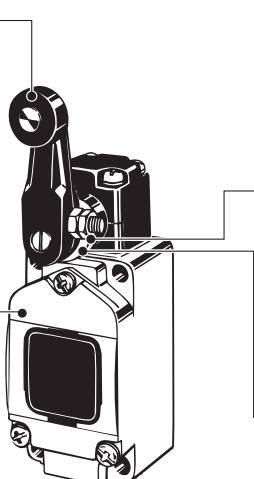
Melamine sinter-painted, it is easy to peel off the spatter.

#### Double Nut

SUS is used for double nut.

#### Lamp Cover

- Heat-resistant resin is used for the lamp cover.
- By using spherical surface for the display part, it disperses the direction of spatter.



### Screws

SUS is used, preventing spatter from adhering.

### Head Cap

Using fluororesin prevents spatter from adhering.

\* Spatter means the zinc powder produced when welding.

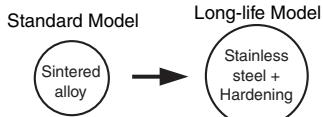
Adhering spatter to the Limit Switch may cause malfunction of lever or lamp cover.

The lack of gap prevents spatter powder from clogging.

## Long-life Switches: WLMCA2-LD

### Release Plunger

Hardening method changed for greater abrasion resistance.

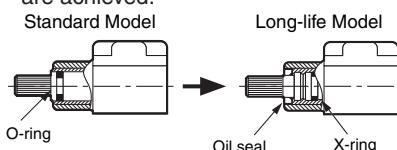


### Head

The Head can be mounted in any of the four directions by removing the screws at the four corners of the Head.

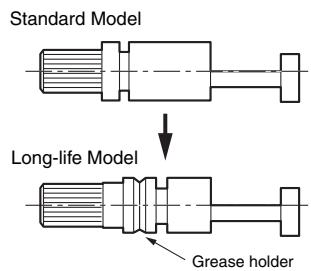
### Shaft Section Seal

By fitting a double seal consisting of an oil seal and an X-ring to the rotary shaft, even greater sealing properties are achieved.



### Smoother Movement

A grease holder is provided on the shaft to prevent the grease from running out.



Smooth movement is achieved using olefin grease. (Standard models use molybdenum disulfide grease.)

### Bearing

The bearing smooths the plunger movement.

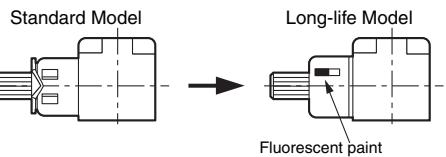
### Built-in Switch

Built-in switch with SPST-NO+NC contact form.

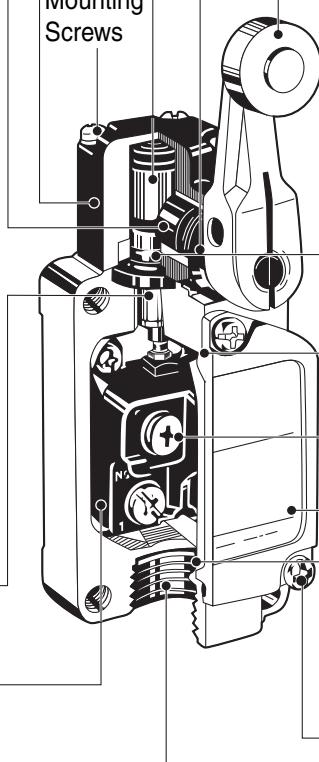
### Set Position Marker Plate

The set position is easy to view.

The stroke is indicated in fluorescent color that is visible from the slit in the rubber cap.



### Head Mounting Screws



### Actuator

#### Roller

The roller is made of self-lubricating stainless sintered and boasts high resistance to wear.

#### Lever

The lever forged of anti-corrosive aluminium alloy features high corrosion resistance and outstanding ruggedness. With roller lever models, the actuator position can be set anywhere within 360°. (The lever cannot be mounted in the opposite direction.)

### Operational Plunger \*

#### Cover Seal

By using a packing seal as the cover seal, an optimum squeeze can be obtained and high sealing properties are assured as well.

#### Terminal Screws

Four, M4 screws

#### Cover

#### Separator

The separator has outstanding insulation properties and prevents the generation of any gases which may corrode the internal parts.

#### Cover Mounting Screw

Phillips screws are used to ensure ease of use.

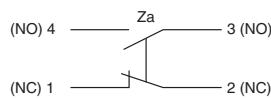
### Conduit Opening

In addition to level screws which use G $\frac{1}{2}$  tube, direct-wired and pre-wired connectors have been added to the Series.

\* By changing the direction of the operational plunger, any one of the three operational directions (both sides, left, or right) can be selected.

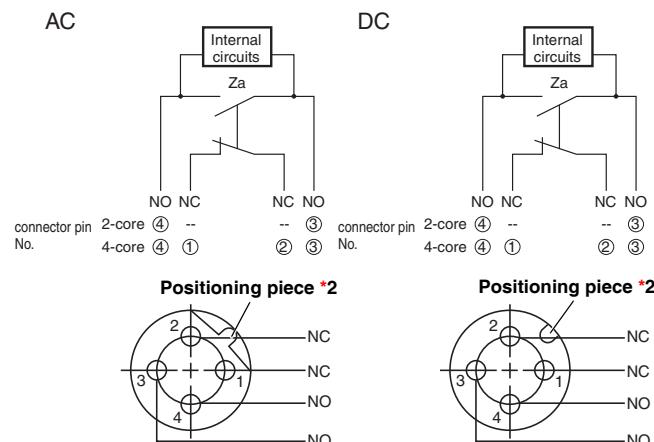
## Contact Forms

### Screw Terminal Switches



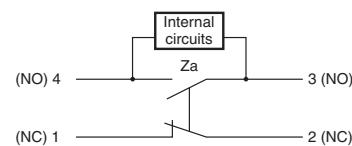
### Direct-wired Connector Switches

#### Indicator-equipped (Light-ON when Not Operating) Switches \*1



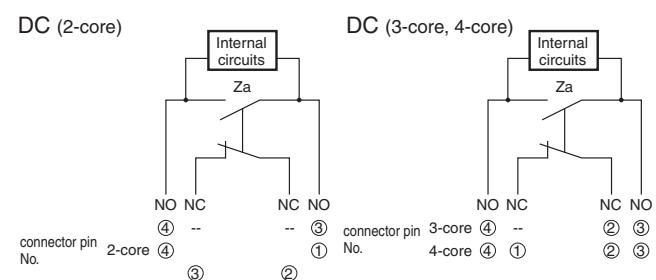
### Screw Terminal Switches

#### Indicator-equipped (Light-ON when Not Operating) Switches \*1



### Pre-wired Connector Switches

#### Indicator-equipped (Light-ON when Not Operating) Switches \*1



Note: Leakage current from indicator circuit may cause load's malfunction. Please check the load's OFF current before use the indicator-equipped switch.

\*1. Light-ON when not operating means the indicator is lit when the actuator is free and is not light when the Switch contacts (NO) close when the actuator rotates or is pushed down.

\*2. The position of the positioning piece is not always the same. If using an L-shaped connector causes problems in application, use a straight connector.

## Dimensions and Operating Characteristics

(Unit: mm)

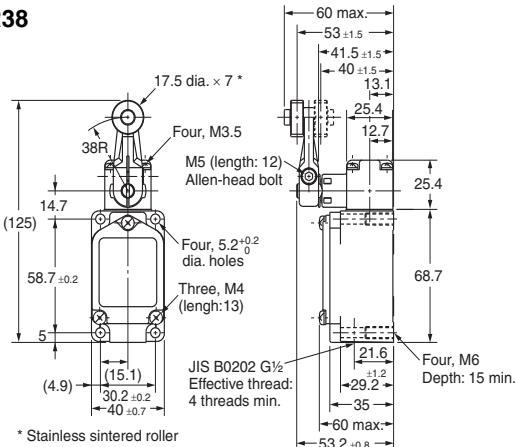
### General-purpose Models

#### Standard Models

##### Basic

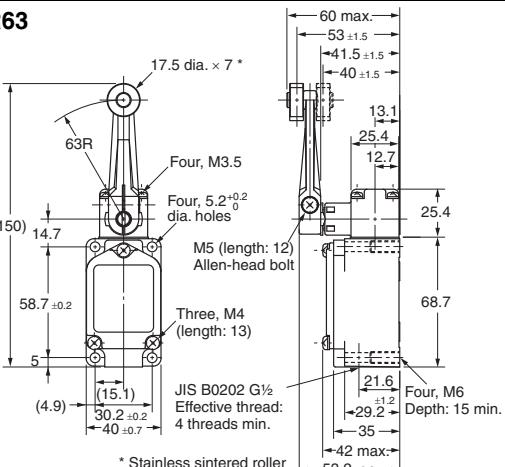
**Rotating Lever** ..... For all models WL□ indicates a standard-load model and WL01□ indicates a microload model.

##### Roller lever R38

**WLCA2****WL01CA2**

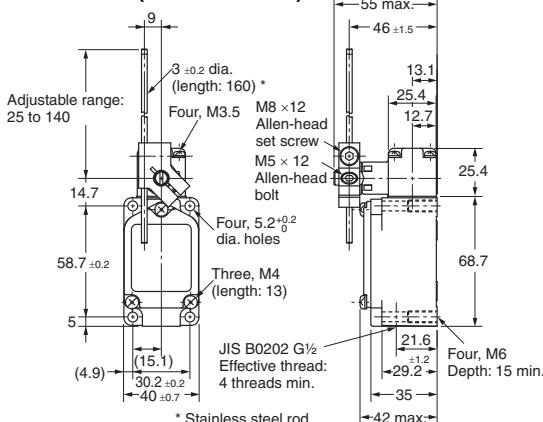
\* Stainless sintered roller

##### Roller lever R63

**WLCA2-8****WL01CA2-8**

\* Stainless sintered roller

##### Adjustable Rod Lever (25 to 140 mm)

**WLCL****WL01CL**

\* Stainless steel rod

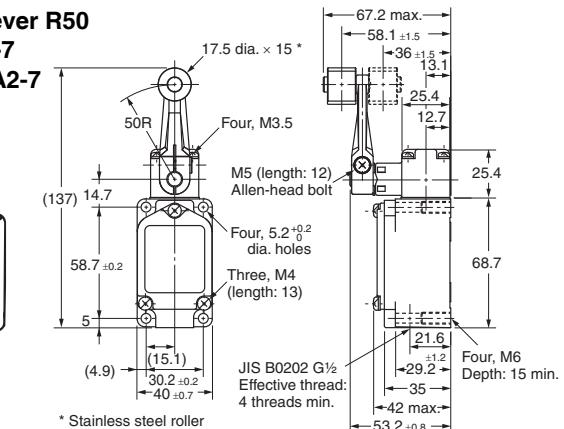
Note: Unless otherwise indicated, a tolerance of  $\pm 0.4$  mm applies to all dimensions.

Operating characteristics	Model WLCA2 WL01CA2	Model WLCA2-7 WL01CA2-7	Model WLCA2-8 WL01CA2-8	Model WLCA12 *1 WL01CA12 *1	Model WLCL *2 WL01CL *2
Operating force	OF max. RF min.	13.34 N 2.23 N	10.2 N 1.67 N	8.04 N 1.34 N	13.34 N 2.23 N
Release force	PT	$15^\circ \pm 5^\circ$	$15^\circ \pm 5^\circ$	$15^\circ \pm 5^\circ$	$15^\circ \pm 5^\circ$
Pretravel	PT	$15^\circ \pm 5^\circ$	$15^\circ \pm 5^\circ$	$15^\circ \pm 5^\circ$	$15^\circ \pm 5^\circ$
Overtravel	OT min.	$30^\circ$	$30^\circ$	$30^\circ$	$30^\circ$
Movement Differential	MD max.	$12^\circ$	$12^\circ$	$12^\circ$	$12^\circ$

\*1. The operating characteristics for WLCA12 and WL01CA12 are measured at the lever length of 38 mm.

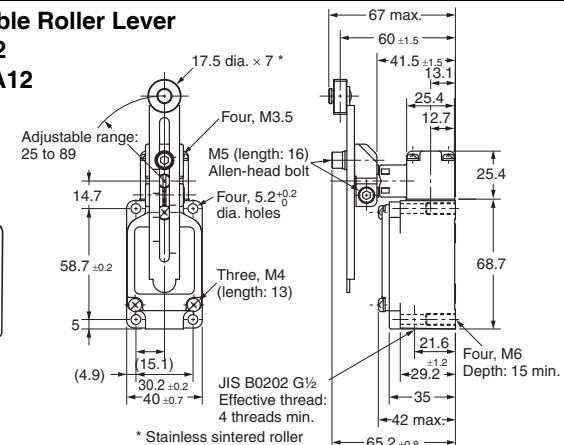
\*2. The operating characteristics for WLCL and WL01CL are measured at the rod length of 140 mm.

##### Roller lever R50

**WLCA2-7****WL01CA2-7**

\* Stainless steel roller

##### Adjustable Roller Lever

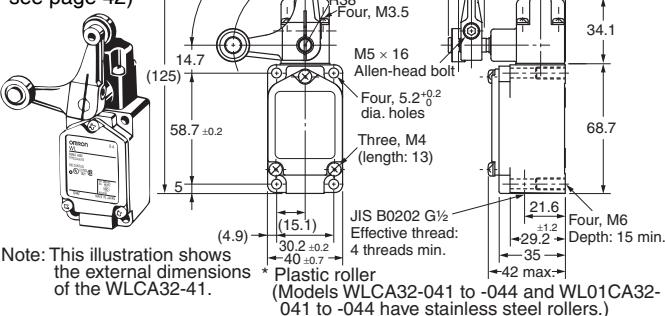
**WLCA12****WL01CA12**

\* Stainless sintered roller

##### Fork Lever Lock

**WLCA32-41 to 44****WL01CA32-41 to 44**

(For details see page 42)

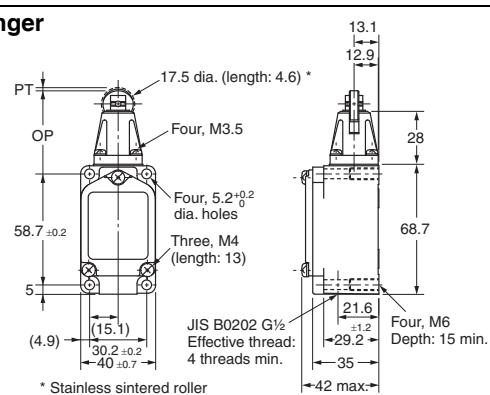
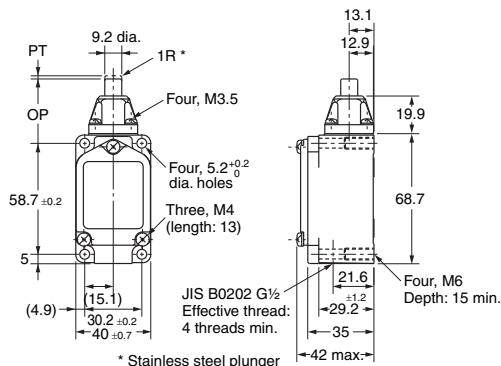
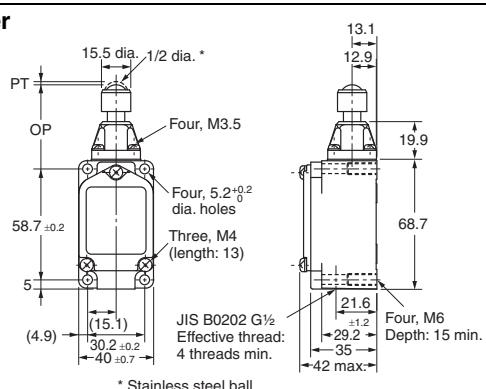
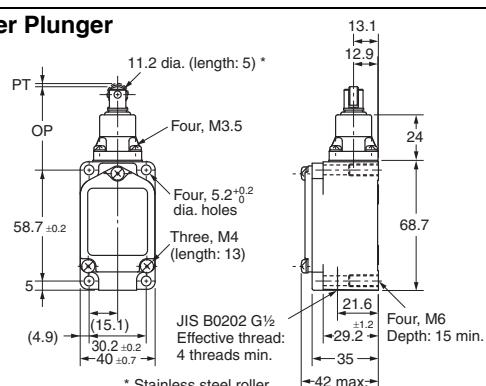
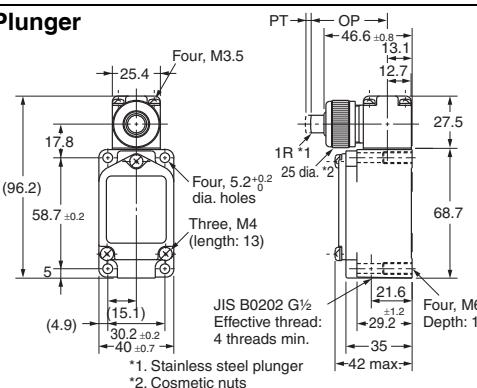
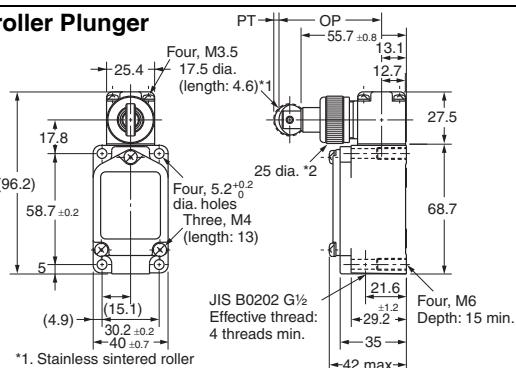
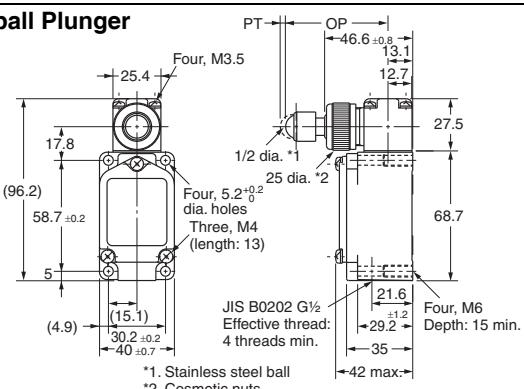


Note: This illustration shows the external dimensions of the WLCA32-41. \* Plastic roller (Models WLCA32-041 to -044 and WL01CA32-041 to -044 have stainless steel rollers.)

Operating characteristics	Model WLCA32-41 to 44 *1 WL01CA32-41 to 44 *1
Force necessary to reverse the direction of the lever: Max.	11.77 N
Movement until the lever reverses	$50^\circ \pm 5^\circ$
Movement until switch operation: Min.	$55^\circ$
Movement after switch operation: Max.	$35^\circ$
OF and RF for WLCA12, with a lever length of 89 mm.	WLCA12, WL01CA12
OF	5.68 N
RF	0.95 N

**Basic**

**Plunger** ..... For all models WL□ indicates a standard-load model and WL01□ indicates a microload model.

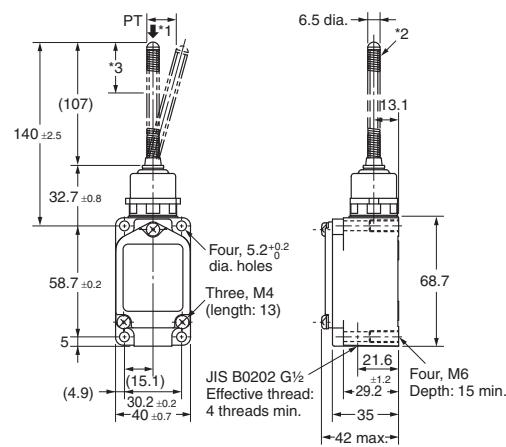
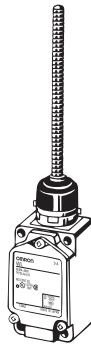
**Top Plunger****WLD****WL01D****Top-roller Plunger****WLD2****WL01D2****Top-ball Plunger****WLD3****WL01D3****Sealed Top-roller Plunger****WLD28****WL01D28****Horizontal Plunger****WLSD****WL01SD****Horizontal-roller Plunger****WLSD2****WL01SD2****Horizontal-ball Plunger****WLSD3****WL01SD3**

Note: Unless otherwise indicated, a tolerance of  $\pm 0.4$  mm applies to all dimensions.

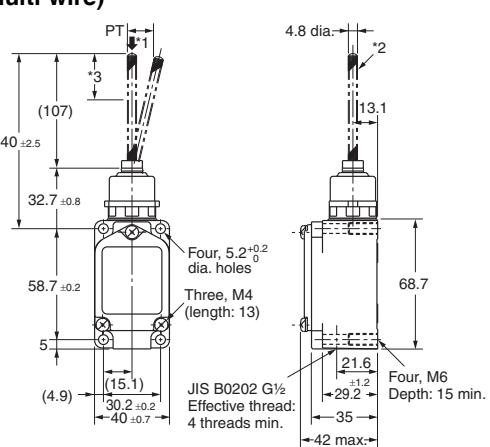
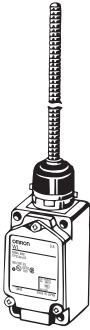
Operating characteristics	Model	WLD WL01D	WLD2 WL01D2	WLD3 WL01D3	WLD28 WL01D28	WLSD2 WL01SD2	WLSD3 WL01SD3	WLSD WL01SD
<b>Operating force</b>	OF max.	26.67 N	26.67 N	26.67 N	16.67 N	40.03 N	40.03 N	40.03 N
Release force	RF min.	8.92 N	8.92 N	8.92 N	4.41 N	8.89 N	8.89 N	8.89 N
Pretravel	PT max.	1.7 mm	1.7 mm	1.7 mm	1.7 mm	2.8 mm	2.8 mm	2.8 mm
Overtravel	OT min.	6.4 mm	5.6 mm	4 mm	5.6 mm	5.6 mm	4 mm	6.4 mm
Movement Differential	MD max.	1 mm	1 mm	1 mm	1 mm	1 mm	1 mm	1 mm
<b>Operating Position</b>	OP	34 ± 0.8 mm	44 ± 0.8 mm	44.5 ± 0.8 mm	44 ± 0.8 mm	54.2 ± 0.8 mm	54.1 ± 0.8 mm	40.6 ± 0.8 mm
Total travel Position	TTP max.	29.5 mm	39.5 mm	41 mm	39.5 mm	—	—	—

**Basic**

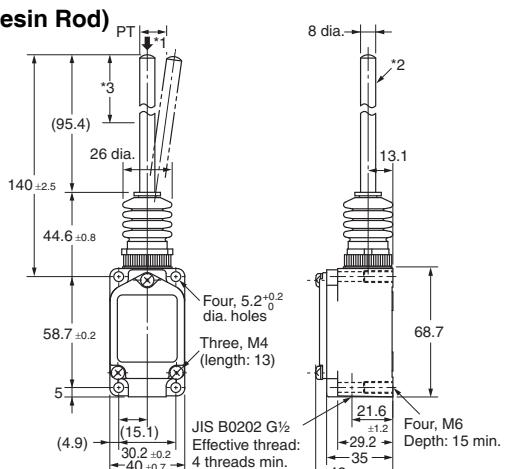
**Flexible Rod** ..... For all models WL□ indicates a standard-load model and WL01□ indicates a microload model.

**Coil Spring****WLNJ****WL01NJ**

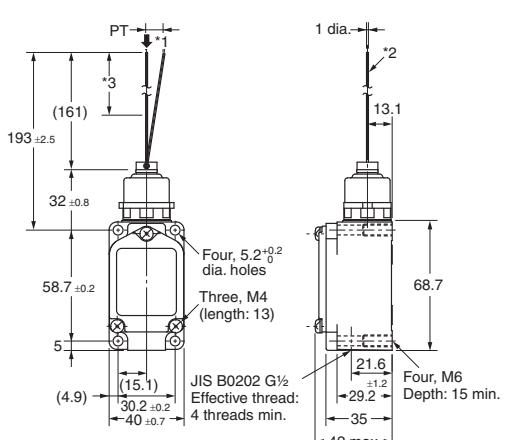
- \*1. The coil spring may be operated from any direction except the axial direction (↓).
- \*2. Stainless steel coil spring
- \*3. Optimum operating range of the coil spring is within 1/3 of the entire length from the top end.

**Coil Spring (Multi-wire)****WLNJ-30****WL01NJ-30**

- \*1. The coil spring may be operated from any direction except the axial direction (↓).
- \*2. Piano wire coil
- \*3. Optimum operating range of the coil spring is within 1/3 of the entire length from the top end.

**Coil Spring (Resin Rod)****WLNJ-2****WL01NJ-2**

- \*1. The resin rod may be operated from any direction except the axial direction (↓).
- \*2. Polyamide resin rod
- \*3. Optimum operating range of the resin rod is within 1/3 of the entire length from the top end.

**Steel Wire****WLNJ-S2****WL01NJ-S2**

- \*1. The steel wire may be operated from any direction except the axial direction (↓).
- \*2. Stainless steel wire
- \*3. Optimum operating range of the steel wire is within 1/3 of the entire length from the top end.

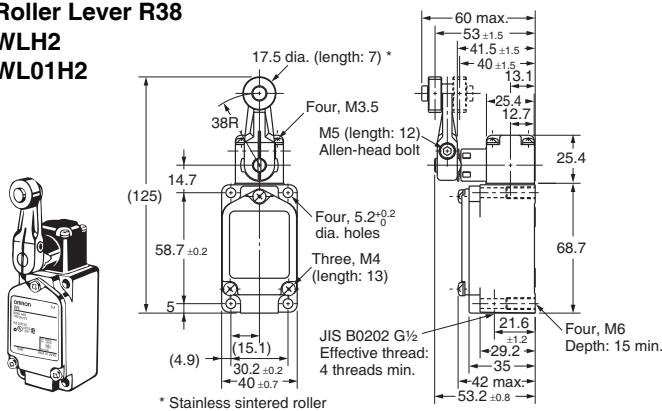
Note: Unless otherwise indicated, a tolerance of  $\pm 0.4$  mm applies to all dimensions.

Operating characteristics	Model	WLNJ * WL01NJ *	WLNJ-30 * WL01NJ-30 *	WLNJ-2 * WL01NJ-2 *	WLNJ-S2 * WL01NJ-S2 *
Operating force Pretravel	OF max. PT	1.47 N $20 \pm 10$ mm	1.47 N $20 \pm 10$ mm	1.47 N $40 \pm 20$ mm	0.28 N $40 \pm 20$ mm

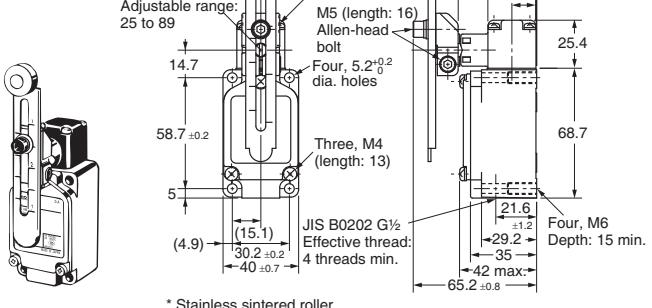
\* These values are taken from the top end of the wire or spring.

**Overtravel**

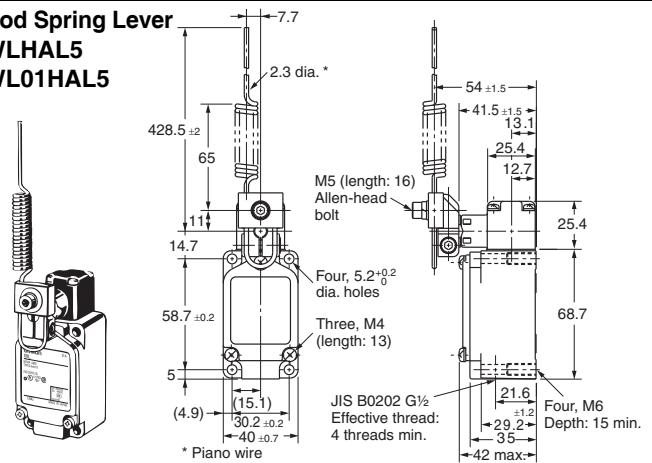
**General-purpose Models** ..... For all models WL□ indicates a standard-load model and WL01□ indicates a microload model.

**Roller Lever R38****WLH2****WL01H2**

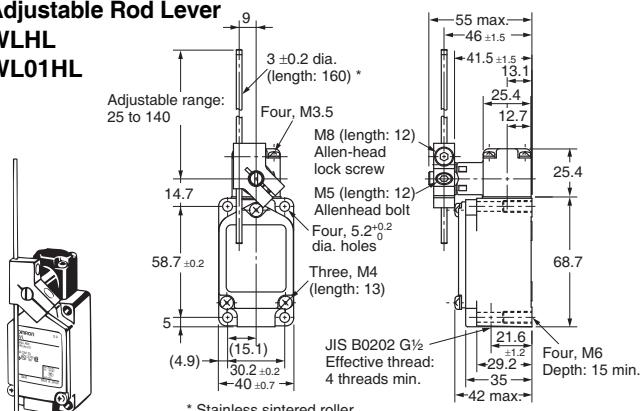
Note: The built-in switch for WLH2 is W-10FB3.

**Adjustable Roller Lever****WLH12****WL01H12**

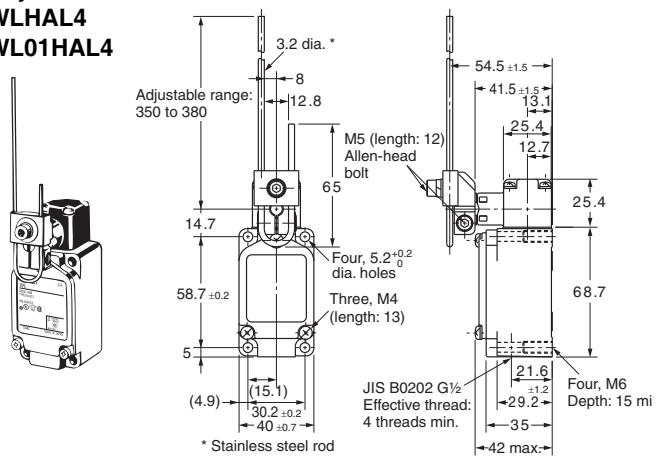
Note: The built-in switch for WLH12 is W-10FB3.

**Rod Spring Lever****WLHAL5****WL01HAL5**

\* Piano wire

**Adjustable Rod Lever****WLHL****WL01HL**

Note: The built-in switch for WLHL is W-10FB3.

**Adjustable Rod Lever****WLHAL4****WL01HAL4**

Note: Unless otherwise indicated, a tolerance of  $\pm 0.4$  mm applies to all dimensions.

**OF and RF for WLH12 and WL01H12, with a lever length of 89 mm.**

	WLH12, WLA01H12
<b>OF</b>	4.18 N
<b>RF</b>	0.42 N

Model Operating characteristics	WLH2 WL01H2	WLH12 *1 WL01H12 *1	WLHL *2 WL01HL *2	WLHAL4 *3 WL01HAL4 *3	WLHAL5 WL01HAL5
<b>Operating force</b>	<b>OF max.</b>	9.81 N	9.81 N	2.84 N	0.98 N
<b>Release force</b>	<b>RF min.</b>	0.98 N	0.98 N	0.25 N	0.15 N
<b>Pretravel</b>	<b>PT</b>	$15^\circ \pm 5^\circ$	$15^\circ \pm 5^\circ$	$15^\circ \pm 5^\circ$	$15^\circ \pm 5^\circ$
<b>Overtravel</b>	<b>OT min.</b>	55°	55°	55°	55°
<b>Movement Differential</b>	<b>MD max.</b>	12°	12°	12°	12°

Note: With WLHAL4, WL01HAL4, WLHAL5, and WL01HAL5, the actuator's tare is large, so depending on the installation direction, they may not be properly reset.  
Always install so that the actuator is facing downwards.

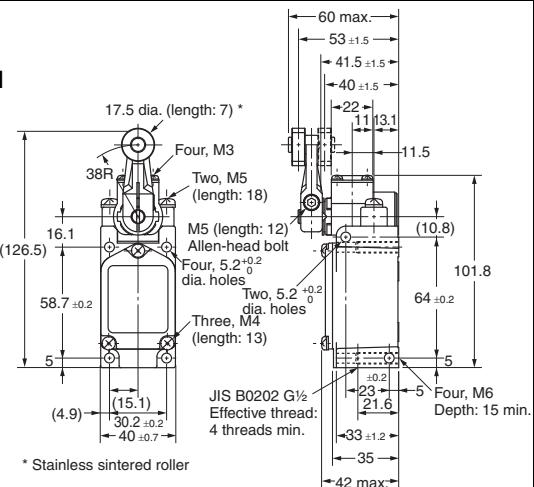
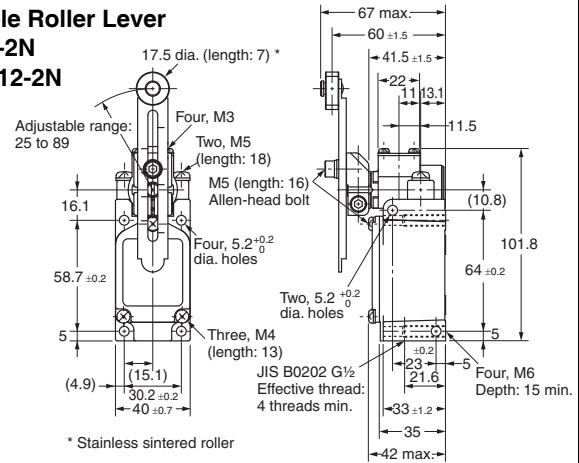
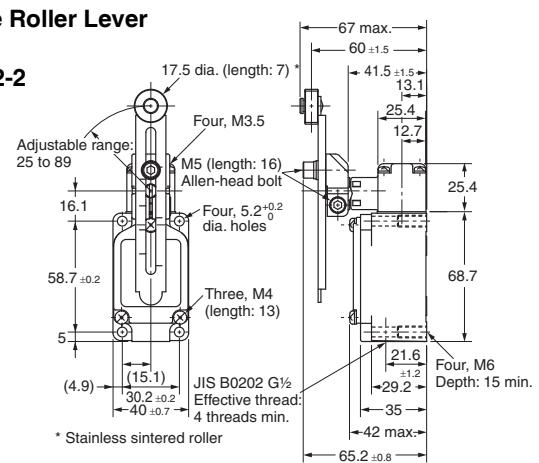
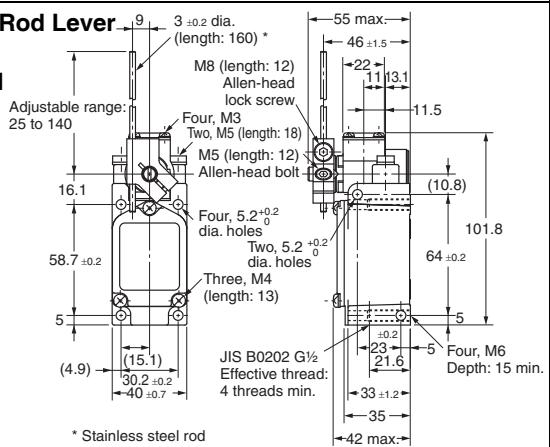
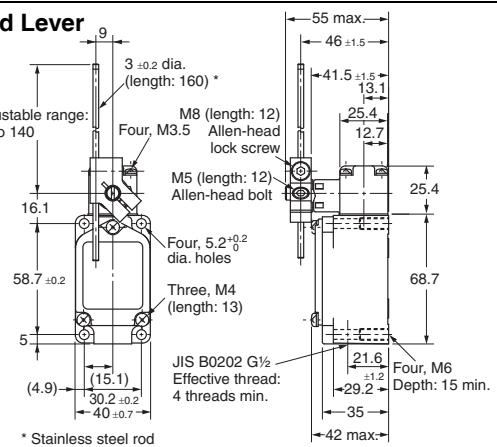
\*1. The operating characteristics of WLH12, and WL01H12 are measured at the lever length of 38 mm.

\*2. The operating characteristics of WLHL, and WL01HL are measured at the rod length of 140 mm.

\*3. The operating characteristics of WLHAL4, and WL01HAL4 are measured at the rod length of 380 mm.

**Overtravel**

**Side-installation Models** ... For all models WL□ indicates a standard-load model and WL01□ indicates a microload model.

**Roller Lever****WLCA2-2N****WL01CA2-2N****Roller Lever****WLCA2-2****WL01CA2-2****Adjustable Roller Lever****WLCA12-2N****WL01CA12-2N****Adjustable Roller Lever****WLCA12-2****WL01CA12-2****Adjustable Rod Lever****WLCL-2N****WL01CL-2N****Adjustable Rod Lever****WLCL-2****WL01CL-2**

Note: Unless otherwise indicated, a tolerance of  $\pm 0.4$  mm applies to all dimensions.

Operating characteristics	Model	WLCA2-2N WL01CA2-2N	WLCA12-2N *1 WL01CA12-2N *1	WLCL-2N *2 WL01CL-2N *2	WLCA2-2 WL01CA2-2	WLCA12-2 *1 WL01CA12-2 *1	WLCL-2 *2 WL01CL-2 *2
Operating force	OF max.	9.61 N	9.61 N	2.84 N	8.83 N	8.83 N	2.55 N
Release force	RF min.	1.18 N	1.18 N	0.25 N	0.49 N	0.49 N	0.1 N
Pretravel	PT	20° max.	20° max.	20° max.	25° $\pm 5^\circ$	25° $\pm 5^\circ$	25° $\pm 5^\circ$
Overtravel	OT min.	70°	70°	70°	60°	60°	60°
Movement Differential	MD max.	10°	10°	10°	16°	16°	16°

**OF and RF for WLCA12-2N and WL01CA12-2N, with a lever length of 89 mm.**

	WLCA12-2N, WL01CA12-2N
OF	4.10 N
RF	0.50 N

\*1. The operating characteristics of WLCA12-2N and WL01CA12-2N are measured at the lever length of 38 mm.

\*2. The operating characteristics of WLCL-2N and WL01CL-2N are measured at the rod length of 140 mm.

## Sensor I/O Connector Switches

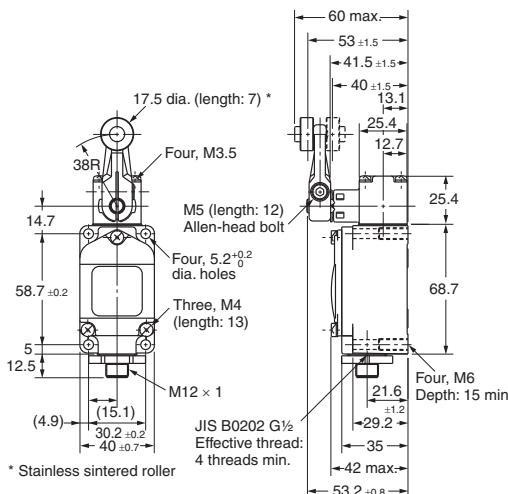
### Direct-wired Connector/Pre-wired Connector Models

Refer to page 17 for the connecting cable.

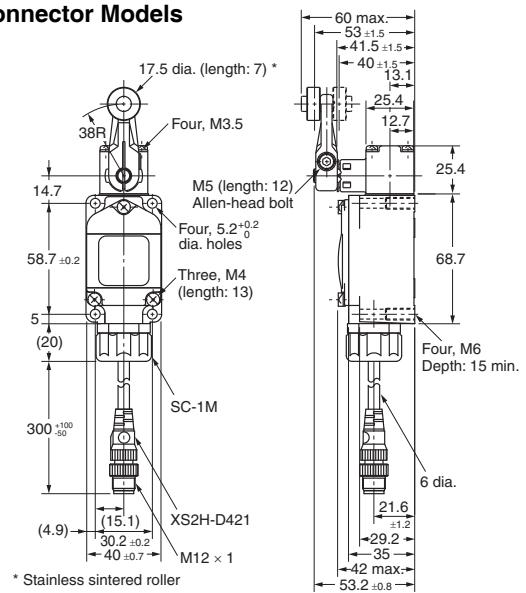
**Roller Lever Plungers** ..... WL□ are Standard Models and WL01□ are Microload Models.

### Standard Models (WLCA2), Overtravel General-purpose Models (WLH2)

#### Connector Models



#### Pre-wired Connector Models



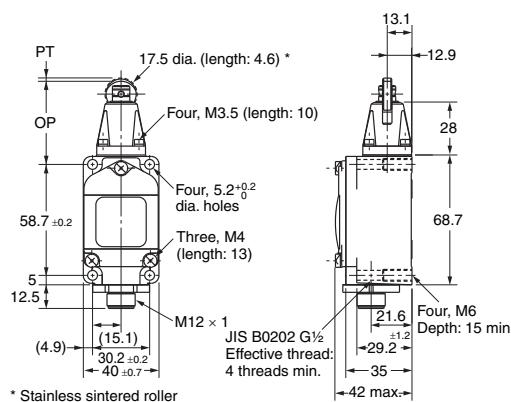
Note: 1. Unless otherwise indicated, a tolerance of  $\pm 0.4$  mm applies to all dimensions.

2. The models with operation indicators are shown in the above diagrams.

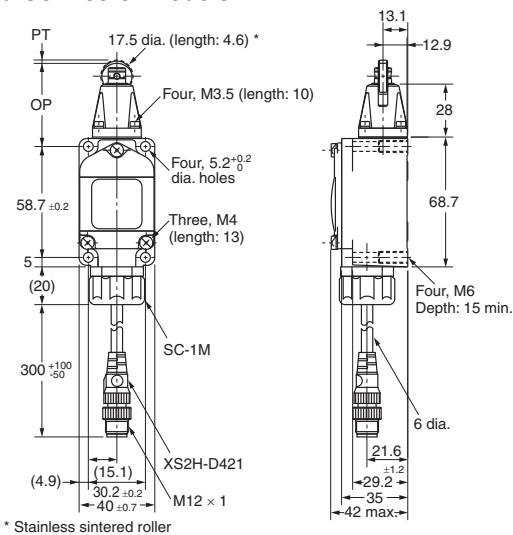
Actuator Operating characteristics	Standard roller lever actuator	Overdrive general- purpose actuator
Operating force OF max.	13.34 N	9.81 N
Release force RF min.	2.23 N	0.98 N
Pretravel PT	$15^\circ \pm 5^\circ$	$15^\circ \pm 5^\circ$
Overtravel OT min.	$30^\circ$	$55^\circ$
Movement Differential MD max.	$12^\circ$	$12^\circ$

## Top-roller Plunger (WLD2)

### Direct-wired Connector Models



### Pre-wired Connector Models



Note: 1. Unless otherwise indicated, a tolerance of ±0.4 mm applies to all dimensions.

2. The following diagrams are for a indicator-equipped models.

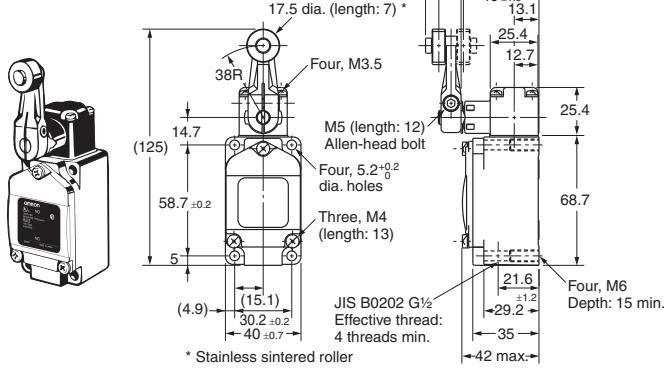
Actuator Operating characteristics	Top-roller plunger
Operating force	OF max.
Release force	RF min.
Pretravel	PT max.
Overtravel	OT min.
Movement Differential	MD max.
Operating Position	OP
Total travel Position	TTP max.
	44 ±0.8mm
	39.5 mm

### Indicator-equipped Models

#### Roller Lever

#### WLCA2-LE/LD

#### WL01CA2-LE/LD



Note: Unless otherwise indicated, a tolerance of ±0.4 mm applies to all dimensions.

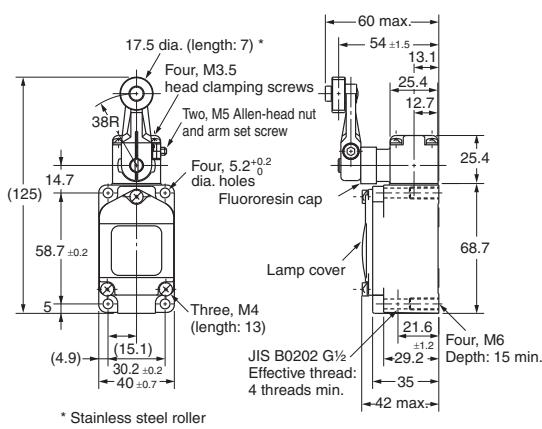
Actuator Operating characteristics	WLCA2-LE/LD WL01CA2-LE/LD
Operating force	OF max.
Release force	RF min.
Pretravel	PT
Overtravel	OT min.
Movement Differential	MD max.
	13.34 N
	2.23 N
	15° ±5°
	30°
	12°

## Spatter-prevention Models

### Roller Lever (Screw Terminals)

WLCA2-□S/WL01□-□S

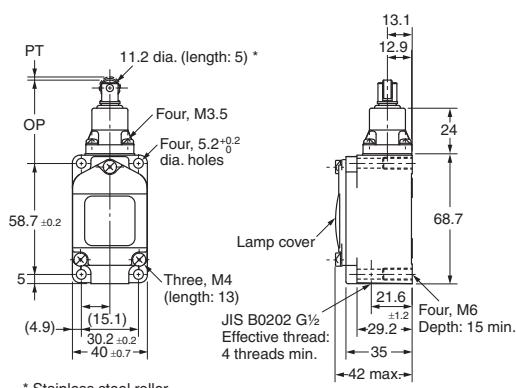
WLH2-□S



\* Stainless steel roller

### Sealed Top-roller Plunger (Screw Terminals)

WLD28-□S



\* Stainless steel roller

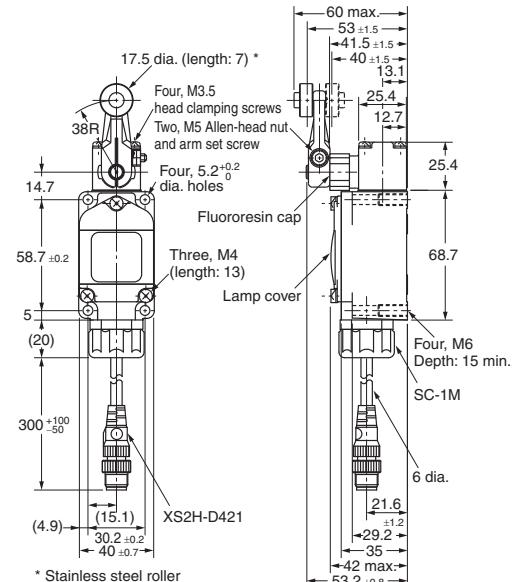
Note: Unless otherwise indicated, a tolerance of  $\pm 0.4$  mm applies to all dimensions.

### Roller Lever (Pre-wired connectors)

WLCA2-□S-M1J\*/WL01□-□S-M1J\*

WLH2-□S-M1J\*

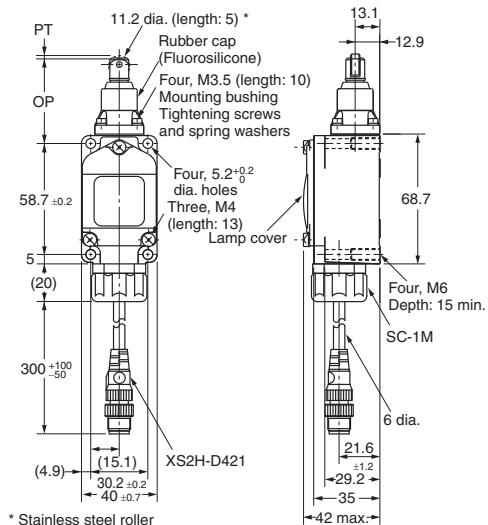
\* External dimensions are the same even for different core wires.



### Sealed Top-roller Plunger (Pre-wired connectors)

WLD28-□S-M1J\*

\* External dimensions are the same even for different core wires.



\* Stainless steel roller

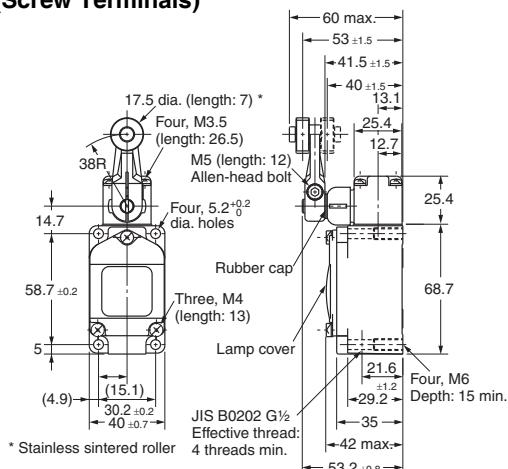
Operating characteristics	Actuator	Roller Lever		Sealed Top-roller Plunger
		Basic	Overtavel models	
			General-purpose	
Operating force	OF max.	13.34 N	9.81 N	16.67 N
Release force	RF min.	2.23 N	0.98 N	4.41 N
Pretravel	PT	15° ±5°	15° ±5°	1.7 mm max.
Overtavel	OT min.	30°	55°	5.6 mm
Movement Differential	MD max.	12°	12°	1 mm
Operating Position	OP	—	—	44 ±0.8 mm
Total travel Position	TPP max.	—	—	39.5 mm

## Long-life Models

### Rotating Lever Models

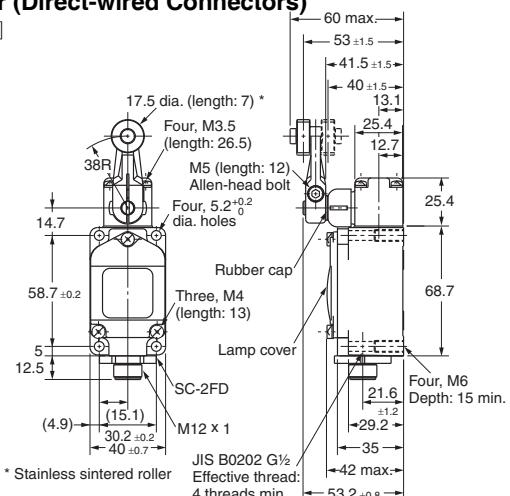
#### Roller Lever (Screw Terminals)

WLM□-LD



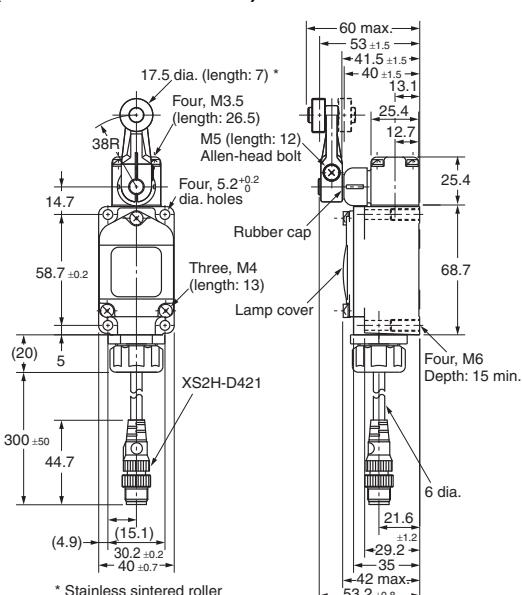
#### Roller Lever (Direct-wired Connectors)

WLM□-LD□



#### Roller Lever (Pre-wired Connectors)

WLM□-LD□



Note: Unless otherwise indicated, a tolerance of ±0.4 mm applies to all dimensions.

Model	WLMCA2-LD□ Basic models	WLMH2-LD□ General-purpose overtravel models
<b>Operating characteristics</b>		
Operating force	OF max.	9.81 N
Release force	RF min.	0.98 N
Pretravel	PT	15° ±5°
Overtravel	OT min.	30°
Movement Differential	MD max.	12°

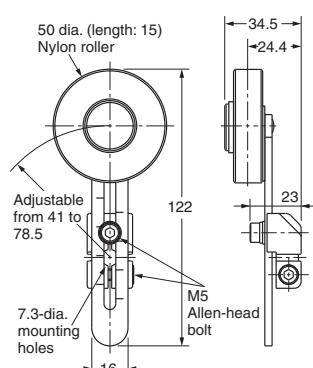
**Actuators (Levers Only)****Lever:** Only rotating lever models are illustrated.

<b>WL-1A100 Standard Lever</b>	<b>WL-1A115 Resin Roller</b>	<b>WL-1A400 Bearing Roller</b>	<b>WL-1A118 Nylon Roller: Roller Width: 30 mm</b>
<b>WL-1A105 Double Nuts</b>	<b>WL-1A103S Spatter Prevention</b>	<b>WL-1A200 Lever Length: 50 Roller Width: 15</b>	<b>WL-1A300 Lever Length: 63</b>
<b>WL-2A100</b>	<b>WL-2A111 Resin Roller</b>	<b>WL-2A107 Double Nuts</b>	<b>WL-2A108 Resin Roller</b>
<b>WL-2A122</b>	<b>WL-2A106</b>	<b>WL-2A130</b>	<b>WL-2A104</b>

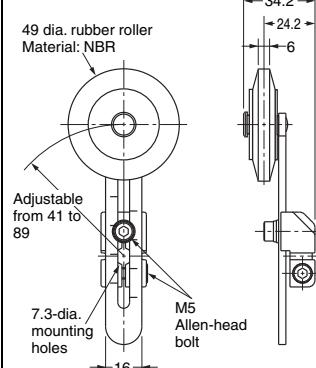
Note: Unless otherwise indicated, a tolerance of  $\pm 0.4$  mm applies to all dimensions.

**Lever:** Only rotating lever models are illustrated.

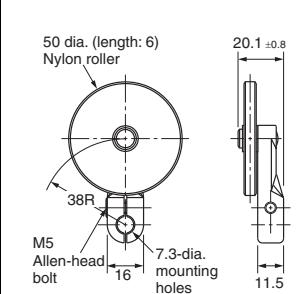
WL-2A110



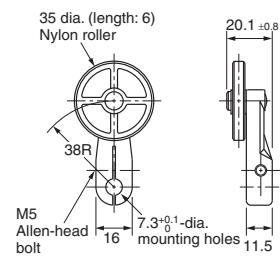
WL-2A105



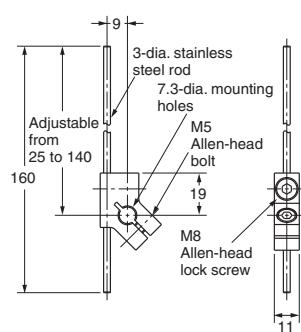
WL-1A106



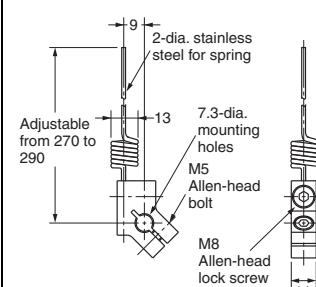
WL-1A110



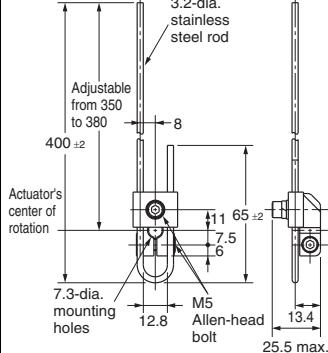
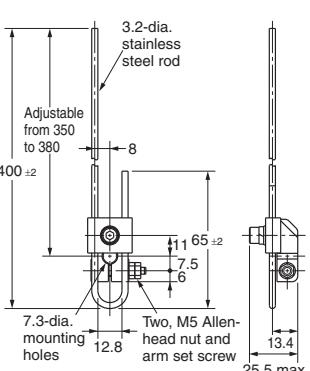
WL-4A100



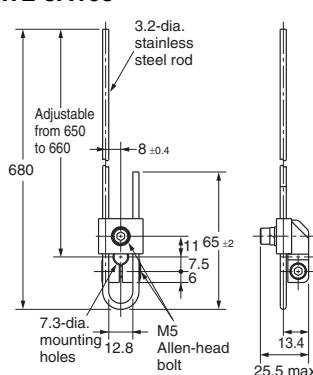
WL-4A201



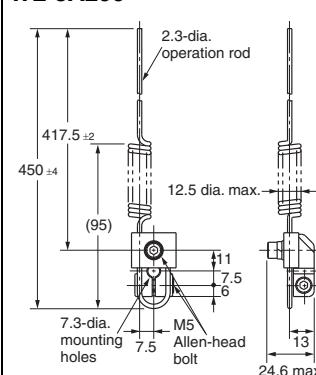
WL-3A100

WL-3A106  
Double Nut

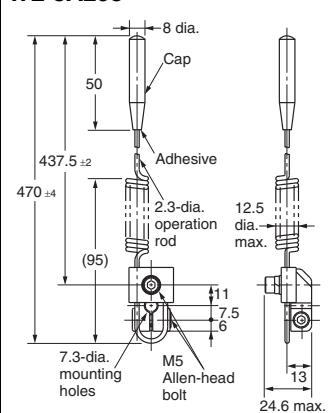
WL-3A108



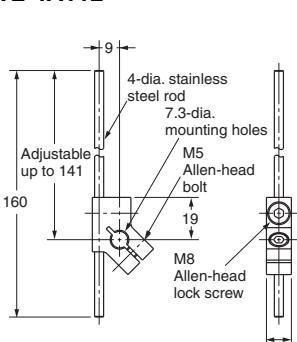
WL-3A200



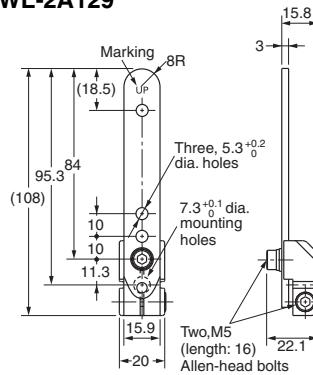
WL-3A203



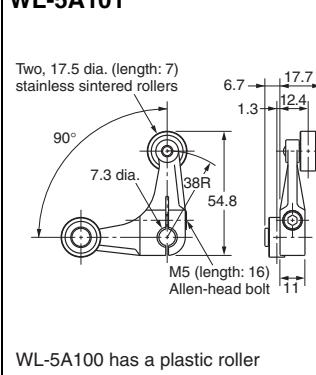
WL-4A112



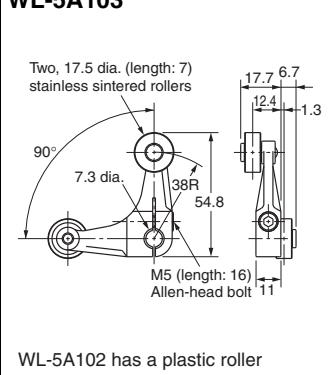
WL-2A129



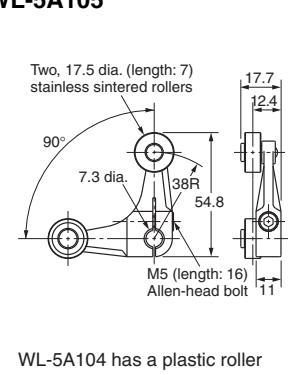
WL-5A101



WL-5A103



WL-5A105



Note: 1. Unless otherwise indicated, a tolerance of  $\pm 0.4$  mm applies to all dimensions.

2. When using the adjustable roller (rod) lever, make sure that the lever is facing downwards. Use caution, as telegraphing (the Switch turns ON and OFF repeatedly due to inertia) may occur.

## Safety Precautions

Refer to **Safety Precautions for All Limit Switches**.

### Precautions for Safe Use

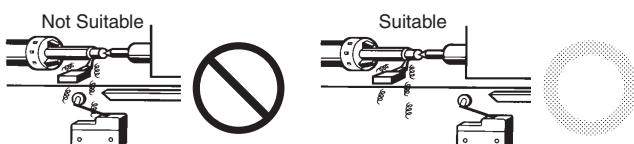
- When a rod or wired-type actuator is used, do not touch the top end of the actuator. Doing so may result in injury.  
(Applicable models)  
WLHAL5 and WL01HAL5 Rod Spring Levers and WLNJ-S2 and WL01NJ-S2 Steel-wire Actuators.
- A short-circuit may cause damage to the Switch, so insert a circuit breaker fuse, of 1.5 to 2 times the rated current, in series with the Switch.
- In order to meet EN approval ratings, use a 10-A fuse that corresponds to IEC60269, either a gI or gG for general-purpose types and spatter-prevention models only.

### Precautions for Correct Use

- When wiring terminal screws, use M4 round crimp terminals and tighten screws to the recommended torque. Wiring with bare wires, or incorrect crimp terminals, or not tightening screws to the recommended torque can lead to short-circuits, leakage current, and fire.
- When performing internal wiring there is a chance of short-circuit, leakage current, or fire, so be sure to protect the inside of the Switch from splashes of oil or water, corrosive gases, and cutting powder.
- Using an inappropriate connector or assembling Switches incorrectly (assembly, tightening torque) can result in malfunction, leakage current, or fire, so be sure to read the instruction manual thoroughly beforehand.
- Even when the connector is assembled and set correctly, the end of the cable and the inside of the Switch may come in contact. This can lead to malfunction, leakage current, or fire, so be sure to protect the end of the cable from splashes of oil or water and corrosive gases.

### 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.

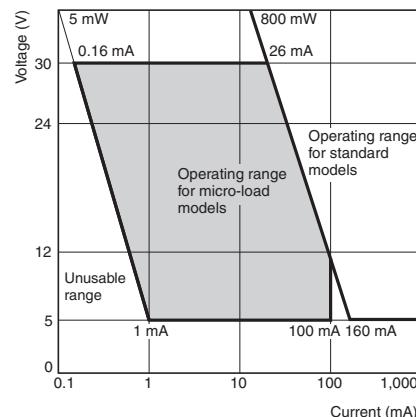


- Constantly subjecting a Switch to vibration or shock can result in wear, which can lead to contact interference with contacts, operation failure, reduced durability, and other problems. Excessive vibration or shock can lead to false contact operation or damage. Install Switches in locations not subject 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 ( $\text{SiO}_2$ ) 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.

### Using Switches for Micro Loads

Contact faults may occur if a Switch for a general-load is used to switch a micro load circuit. Use switches in the ranges shown in the diagram below. However, even when using micro load models within the operating range shown here, if inrush current occurs when the contact is opened or closed, it may increase contact wear and so decrease durability. Therefore, insert a contact protection circuit where necessary. The minimum applicable load is the N-level reference value. This value indicates the malfunction reference level for the reliability level of 60% ( $\lambda_{60}$ ).

The equation,  $\lambda_{60} = 0.5 \times 10^{-6}/\text{operations}$  indicates that the estimated malfunction rate is less than 1/2,000,000 operations with a reliability level of 60%.

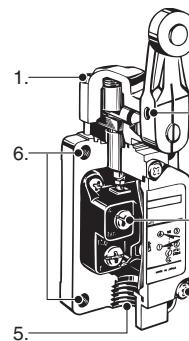


## Built-in Switch

Do not remove or replace the built-in switch. If the position of the built-in switch moves, it can cause reduced performance, and if the insulation sheet moves (separator), the insulation may become ineffective.

## Tightening Torque

- If screws are too loose they can lead to an early malfunction of the Switch, so ensure that all screws are tightened using the correct torque.
- In particular, when changing the direction of the Head, make sure that all screws are tightened again to the correct torque. Do not allow foreign objects to fall into the Switch.

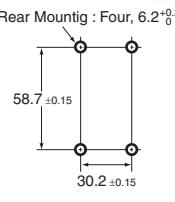
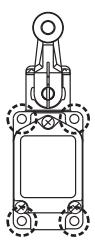
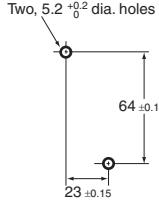
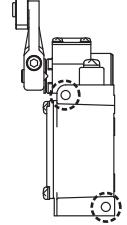


No.	Type	Appropriate tightening torque
1.	Head mounting screw	0.78 to 0.88 N·m
2.	Cover mounting screw	1.18 to 1.37 N·m
3.	Allen-head bolt (for securing the lever)	4.90 to 5.88 N·m
4.	Terminal screw	0.59 to 0.78 N·m
5.	Connector	1.77 to 2.16 N·m

## Installing the Switch

To install the Switch, make a mounting panel, as shown in the following diagram, and tighten screws using the correct torque.

### Mounting

WL		Mounting locations
Front Mounting/ Rear Mounting	<p>Front Mounting : Four, <math>5.2^{+0.2}_0</math> dia. holes or M5 tapped holes Rear Mounting : Four, <math>6.2^{+0.2}_0</math> dia. holes</p> 	
<b>In case of side mounting for overtravel, 90° WL□-□□2N</b>		Mounting locations
Side Mounting	<p>Two, <math>5.2^{+0.2}_0</math> dia. holes</p> 	

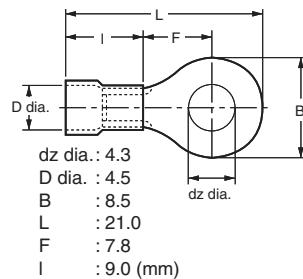
## Connectors

Either the easy-to-use Allen-head nut or the SC Connector can be used as connectors. To ensure high-sealing properties, use the SC Connector. Refer to *Limit Switch Connectors* for details on SC Connectors.

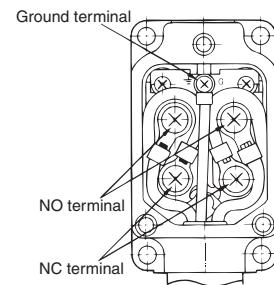
## Wiring

- Use 1.25-mm<sup>2</sup> lead wires and M4-insulation covered crimp terminals for wiring.

### Crimp Terminal External Dimensions



### Wiring Method Switch Box Section



- The ground terminal is only installed on models with ground terminals.

## Rotating Lever Set Position (General-purpose or Spatter-prevention Switches Only)

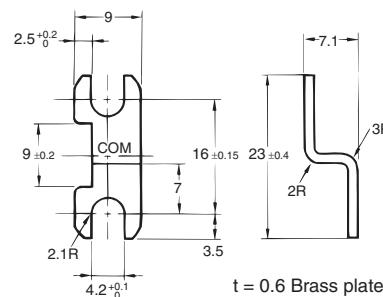
All rotating lever models, except the fork lever lock models, have a set position marker plate. (See page 23.) After operation, set the indicator needle on the marker plate so that is in the convex section of the bearing.

## Operation Set Position (Long-life Switches Only)

For all Long-life Switching, there is a set position marker slit on the rubber cap of the head. After operation, set the slit on the rubber cap so that the fluorescent color on the shaft section can be seen.

## Terminal Plate

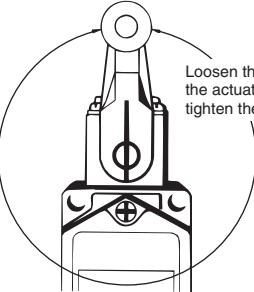
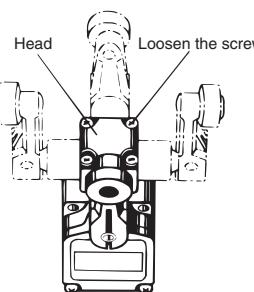
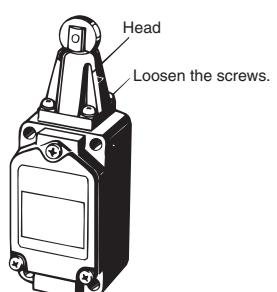
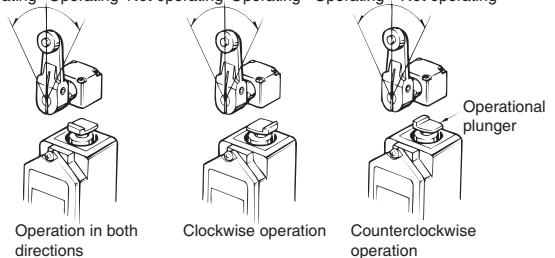
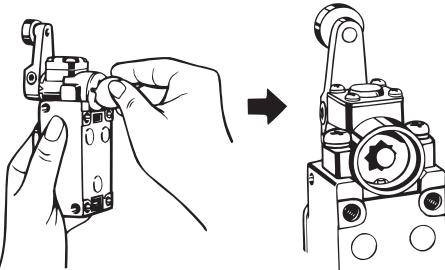
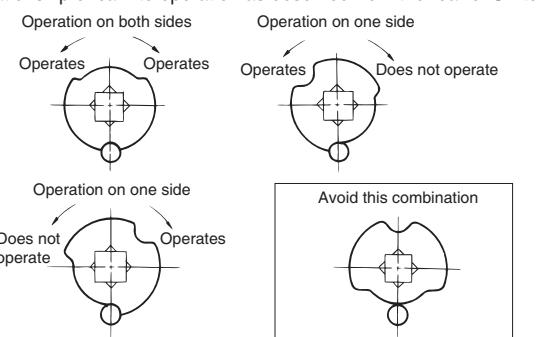
By using a short circuit plate, as shown in the following diagram, the Switch can be fabricated into a single-polarity double-break switch. When ordering, specify WL Terminal Plate (product code: WL-9662F).

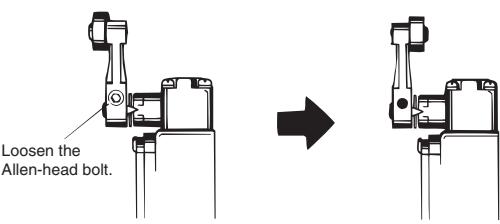
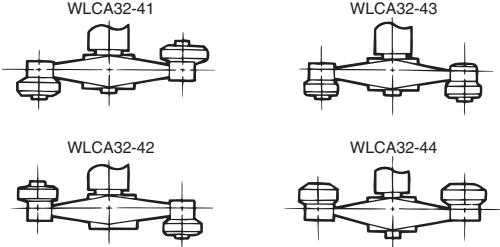
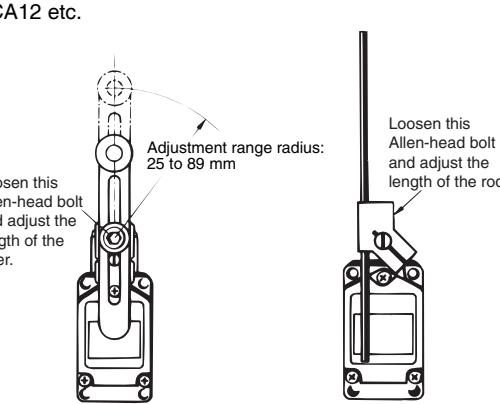


## Indicator

Indicator-equipped switch has contacts and indicator in parallel. When contacts are open, leakage current flows through the indicator circuit and may cause load's malfunction. Please check the load's OFF current before use the indicator-equipped switch.

## Using the Switches

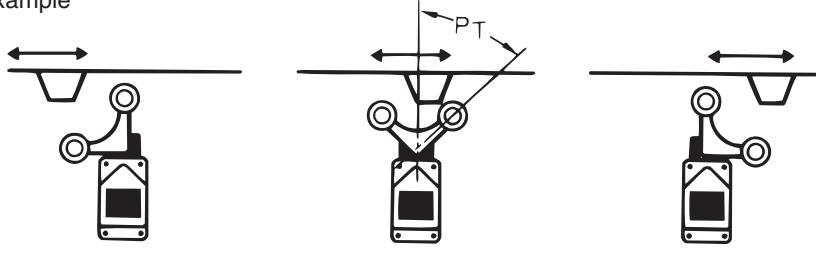
Item	Applicable models and Actuators	Details
<b>Changing the Installation Position of the Actuator</b> By loosening the Allen-head bolt on the actuator lever, the position of the actuator can be set anywhere within the 360°. With Indicator-equipped Switches, the actuator lever comes in contact with the top of the indicator cover, so use caution when rotating and setting the lever. When the lever only moves forwards and backwards, it will not contact the lamp cover (except for long-life models).	Roller Levers: WLCA2, WL01CA2, WLCA2-2, WL01CA2-2, WLH2, WL01H2, WLMCA2□, WLMH2□ Adjustable Roller Levers: WLCA12, WL01CA12, WLCA12-2, WL01CA12-2, WLH12, WL01H12 Adjustable Rod Levers: WLCL, WL01CL, WLCL-2, WL01CL-2, WLHL, WL01HL	 <p>Loosen the M5 × 12 bolt, set the actuator's position and then tighten the bolt again.</p>
<b>Changing the Orientation of the Head</b> By removing the screws in the four corners of the Head, the Head can be set in any of the four directions. Be sure to change the plunger for internal operations at the same time. (The operational plunger does not need to be changed on general-purpose overtravel models.) The roller plunger can be set in either two positions at 90°. WLCA2-2N and WL01CA2-2N can be set only in either the forward or backward direction.	Roller Levers: WLCA□, WL01CA□, WLCA□-2, WL01CA□-2, WLH□, WL01H□, WLMCA2□, WLMH2□ Adjustable Rod Levers: WLCL, WL01CL, WLCL-2, WL01CL-2 Horizontal Plungers: WLSD□, WL01SD□ Top-roller Plungers: WLD2, WL01D2 Sealed Top-roller Plungers: WLD28, WL01D28 Does not include -RP60 Series or -141 Series.	 <p>Head Loosen the screws.</p>  <p>Head Loosen the screws.</p>
<b>Changing the Operating Direction</b> By removing the Head on models which can operate on one-side only, and then changing the direction of the operational plunger, one of three operating directions can be selected. For overtravel 90° operation models, one of three operating directions can be selected by loosening the rubber holder using either a coin or a flat-blade screwdriver and changing the direction of the internal rubber section. The tightening torque for the screws on the Head is 0.78 to 0.88 N·m.	Roller Levers: WLCA2, WL01CA2 Adjustable Roller Levers: WLCA12, WL01CA12 Adjustable Rod Levers: WLCL, WL01CL Overtravel Models: WLCA□-2N, WL01CA□-2N	<p><b>One-side Operation for General-purpose Switches</b></p> <p>The output of the Switch will be changed, regardless of which direction the lever is pushed.</p> <p>The output of the Switch will only be changed when the lever is pushed in one direction.</p>  <p>Operating   Operating   Not operating   Operating   Operating   Not operating</p> <p>Operation in both directions   Clockwise operation   Counterclockwise operation   Operational plunger</p> <p><b>Cam Direction Changing Procedure for Overtravel, 90° Operation Switches</b></p> <p>Loosen the cam holder with a coin or screwdriver. Take out the cam from the Switch.</p> <p>Change the direction of the cam as required by your intended operation and then reinstall the cam.</p>  <p><b>Relationship of cam to operation as observed from the rear of Switch</b></p>  <p>Operation on both sides   Operation on one side</p> <p>Operates   Operates   Operates   Does not operate</p> <p>Operation on one side   Does not operate   Operates</p> <p>Avoid this combination</p>

Item	Applicable models and Actuators	Details
<b>Installing the Roller on the Inside</b> By installing the roller lever in the opposite direction, the roller can be installed on the inside. (Set so that operation can be completed within a 180° level range.)	Roller Levers: WLCA□, WL01CA□, WLH□, WLCA□-2, WL01CA□-2, WLMCA2□, WLMH2□ except for the adjustable roller levers. Fork Lever Locks: WLCA32-4□, WL01CA32-4□	 <p>Loosen the Allen-head bolt.</p>
<b>Selecting the Roller Position</b> There are four types of fork lever lock for use depending on the roller position.	Fork Lever Locks: WLCA32-4□, WL01CA32-4□	 <p>Note: An explanation of the operation of fork lever locks is provided after this table.</p>
<b>Adjusting the Length of the Rod or Lever</b> The length of the rod or lever can be adjusted by loosening the Allen-head bolt.	Adjustable Roller Levers: WLCA12, WL01CA12 etc. Adjustable Rod Levers: WLCL, WL01CL, etc.	 <p>WLCA12 etc.</p> <p>Loosen this Allen-head bolt and adjust the length of the lever.</p> <p>Adjustment range radius: 25 to 89 mm</p> <p>Loosen this Allen-head bolt and adjust the length of the rod.</p>

### Operation of Fork Lever Locks

The fork lever lock is configured so that the dog pushes the lever to reverse the output and this reversed state is maintained even after the dog continues on. If the dog then pushes the lever from the opposite direction, the lever will return to its original position.

Example



NC terminal: ON

NO terminal: ON

NO terminal: ON

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