# Two-circuit Limit Switch/Long-life Two-circuit Limit Switch WL/WLM

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

- 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.
- Meets EN/IEC standards (only Switches with ground terminals and prewired connectors with DC specifications).
- Switches with ground terminals and prewired connectors with DC specifications have the CE marking.



## **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, Heatresistant 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.

#### Waterproof to IP67

O-rings, cover seals, and other measures provide a waterproof, 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.

# High-precision Models Available in All Switch Types; Ideal for Position Control

High-precision models achieve a very small movement to operation (approx.  $5^{\circ}$ ) and a repeat accuracy that is twice that of basic models.

# Operation Indicators for Easier Daily Inspections (See note.)

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

Note: Specify the type of operation indicator for general-purpose models. Provided on standard models for spatter-prevention and longlife models.

Operation indicator —

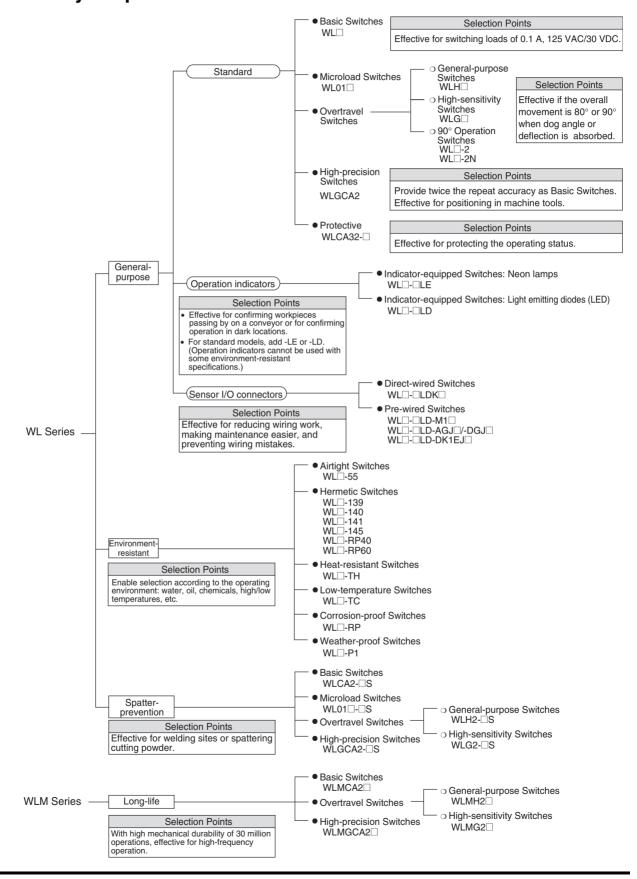


#### **Models with Connectors Provided with All Switch Types**

Reduced wiring with one-touch connection. Connectors that also make Switch replacement easier are provided with direct-wired and prewired models).

# **Product Configuration**

# **■** Selection by Purpose



## **■** Tables of Models

# General-purpose, Spatter-prevention, and Long-life Switches

#### **Actuators/Heads**

Туре	General- purpose		Actuators	3	Features	Head spec	ifications	Spatter- prevention	Long-life
	Model	Roller lever	Plunger	Flexible rod	Total travel (TT)	One-side operation	Head mounting	Model	Model
Basic	WL□	Possible	Possible	Possible	• With a Roller Lever	Possible (See note 1.) (Except for long-life models.)	Any of 4 di- rections	WLCA2-□S	WLMCA2□
General- purpose Overtravel	WLH□	Possible			Overtravel is large, making setting the dog easier.  Mounting is compatible with basic models.  80° 80° 80° 80° 80° 80° 80° 80° 80° 80	Not possible (See note 2.)	Any of 4 di- rections	WLH2-□S	WLH2□
High-sensitivity Over-travel	WLG□	Possible			Operation is highly sensitive with only 10° pretravel. Overtravel is large, making setting the dog easier. Mounting is compatible with basic models.	Not possible (See note 2.)		WLG2-□S	WLMG2□
Overtravel, 90° opera- tion	WL□-2	Possible			Overtravel is large, making setting the dog eas- ier.      Overtravel is large, making setting the dog eas- ier.	Not possible (See note 2.)	Any of 4 di- rections		
	WL□-2N	Possible			Mounting is compatible with basic models.	Possible (See note 1.)	Either of 2 directions		
High-precision	WLGCA2	Possible			<ul> <li>Repeat accuracy is twice that of basic models.</li> <li>Operation is highly sensitive with only 5° pretravel.</li> <li>Ideal for positioning, e.g., with machine tools.</li> </ul>	Not possible (See note 2.)	Any of 4 di- rections	WLGCA2-□S	WLMGCA2□
Protective	WLCA32-□	Possible			• 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 di- rections		

**Note 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.

#### **Connectors and Conduits**

Wiring type	General-purpose	Connector/conduit	Spatter-prevention	Long-life Model	
	Model	specifications	Model		
Direct-wired connector	WL□-□LDK□	SC-2F/-4F Connector built-in		WLM□-LDK□	
Pre-wired connector	WLD-DLD-M1D WLD-DLD-DGJD WLD-DLD-DK1EJD	XS2H-series Pre-wired Connector built-in	WL□-□S-M1□J-1 WL□-□S-DGJS03	WLM□-LD-□GJ□	
Conduit (screw terminal)	WLD-D WLD-DG1D WLD-DGD WLD-DYD WLD-DTSD	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   	

<sup>2.</sup> Those models for which one-side operation is impossible can only operate on both sides.

# **Environment-resistant Switches**

T a	Item		Environment-resistant	
Туре	Model	Application	Environment-resistant construction	Applicable models
Airtight seal	WL□-55	For uses in locations subject to cutting oil or water	Uses the W-10FB3-55 Airtight Built-in Switch.  Note: Use the SC Connector for the conduit	All models except the low-tem- perature and heat-resistant models
			opening.	Note: Models can be produced using standard actuators.
Hermetic seal (Molded terminals/ Anti-coolant)	WL□-139 WL□-140 WL□-141		Refer to page 57 for information on the envi- ronment-resistant construction of Switches with Hermetic Seals.	All models except the low-tem- perature and heat-resistant models
·	WL□-141 WL□-145 WL□-RP40 WL□-RP60			Note: Models can be produced using standard actuators. Only the WLCA2, WLGCA2, or WLH2 can be produced for the WL□-141 and WL□-145.
Low-temperature	WL□-TC	Can be used at a temperature of -40°C (operating temperature range: -40 to 40°C), but cannot withstand icing.	Uses a general-purpose built-in switch. Silicone rubber is used for rubber parts such as the O-ring, gasket, etc.	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).	Uses a special built-in switch made from heat-resistant resin. Silicone rubber is used for rubber parts such as the O-ring, gasket etc.	All models except airtight seal, hermetic seal, heat-resistant, corrosion-proof, and indicator- equipped, nylon roller (WLCA2- 26N), seal roller models, and resin rod (WLNJ-2) models
Corrosion-proof	WL□-RP	For use in locations subject to corrosive gases and chemicals.	Diecast parts, such as the switch box, are made of corrosion-proof aluminum. Rubber sealing parts are made of fluorine rubber which aids in resisting oil, chemicals and adverse weather conditions.	All models except overtravel (90° operation), fork lever lock (WLCA32-41 to -43), low-temperature, heat-resistant, and indicator-equipped models
			Exposed nuts and screws (except the actuator section) are made of stainless steel.	
			Moving and rotary parts such as rollers are made of sintered stainless steel or stainless steel.	
Weather-proof	WL□-P1	For use in parking lots and other outdoor locations.	which has a high-tolerance to deterioration over time and changes in temperature.	Only general-purpose overtravel (WLH2/12) and high-sensitivity overtravel (WLG2/12)
			Rollers are made of stainless steel to improve corrosion resistance.	models (excluding heat-resistant models).
			Exposed nuts and screws are made of stainless steel.	

## 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 Models Environment Key specifications -10°C 80°C Ambient operating temperature WL General-purpose Switches Normal WLM. Long-life Switches Water-resistant to IP67. 5°C 120°C WI □-TH Heat-resistant High-temperature Switches (See note.) To increase heat resistance, the rubber material (silicon rubber) and the material of the built-in switch have been changed. -40°C 40°C WL -TC Low-temperature Low-temperature Switches (See note.) To increase resistance to cold, silicon rubber and other measures are used Rubber parts are made from silicone rubber, which has a high-tolerance to WL<sub>-P1</sub> Weather-proof deterioration over time and changes in temperature. Outdoors Rollers are made of stainless steel to improve corrosion resistance. Switches (See note.) Exposed nuts and screws are made of stainless steel Corrosion-proof aluminum diecast has been used for the housing, WL□-RP Corrosion-proof fluorine rubber has been used for rubber parts, and stainless steel Chemicals and oil has been used for screws and nuts (except for actuator) to Switches (See note.) increase resistance to oils, chemicals, and weather. Water drops and mist Uses an airtight built-in switch. WL□-55 Airtight Switches (See note.) Cables attached. Uses a general-purpose built-in switch. WL□-139 The case cover and conduit opening are molded from epoxy Hermetic, Molded-terminal resin to increase the seal. The cover cannot be removed. Switches (See note.) Cables attached. Uses an airtight built-in switch. WI □-RP40 The case cover and box interior are molded from epoxy resin to Constant water Operating environment increase the seal. The cover cannot be removed Hermetic, Molded-terminal drops and mist The SC connector can be removed, so it is possible to use Switches (See note.) flexible conduits for the cable. Cables attached. Uses an airtight built-in switch. WL□-140 The cover screws, case cover, box interior, and conduit Hermetic, Molded-terminal opening are molded from epoxy resin to increase the seal. Switches (See note.) (The cover cannot be removed.) Cables attached. Uses an airtight built-in switch. The cover screws, case cover, box interior, conduit opening, Constant water box head, and head screws are molded from epoxy resin to WL□-141, -145 increase the seal. (The cover cannot be removed.) drops or Hermetic, Molded-terminal The Head opening is protected from cutting powder. splattering Switches (See note.) -141: The Head section is molded from epoxy resin; cutting powder Head direction cannot be changed. (Only the WLCA2, WLG2, WLGCA2, The Head section is molded from epoxy resin; and WLH2 can be produced.) Head can be in any of 4 directions. Cables attached. Uses an airtight built-in switch WL□-RP60 The case cover, box interior, conduit opening, and head screws are molded from epoxy resin to increase the seal. (The cover cannot be Coolant Hermetic, Anti-coolant removed.) Rubber parts are made from fluorine rubber to increase Switches (See note.) To prevent spatter during welding, a heat-resistant resin is used Spattering from WI D-S Spatter-prevention for the indicator cover and screws and rollers are all made from welding Switches stainless steel

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

# 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 or high-sensitivity models or flexible rod models)	WL□ WL□-S	General-purpose Switches Spatter-prevention Switches
Dura	Long-life	Mechanical: 30 million operation min.	WLM□	Long-life Switches

# According to Ease of Installation and Maintenance

	Conditions	Key specifications	Models
_	Daily inspections and maintenance	Switching light-ON between operating/not operating. (Switching not possible for models with molded terminals.) Neon lamp 125 VAC, 250 VAC	WL□-LE General-purpose, Indicator-equipped (Neon Lamp) Switches WL□-LES Spatter-prevention, Indicator-equipped (Neon Lamp) Switches
	checks	Switching light-ON between operating/not operating. (Switching not possible for models with molded terminals.) LED 10 to 115 VAC/DC	WL□-LD General-purpose, Indicator-equipped (LED) Switches WL□-LDS Spatter-prevention, Indicator-equipped (LED) Switches
	Screw tightening	Screw terminals. No ground terminal. Conduit size: G½	WL□ General-purpose Switches WLM□ Long-life Switches
	and installation	Screw terminals. Ground terminal. Conduit size: 4 sizes	WL□ General-purpose Switches
Wiring specification	One-touch connector attachment	Direct-wired connector, 2-core. Greatly reduces wiring work. Waterproof to IP67.	WL□-□LDK13 General-purpose, Direct-wired Connector Switches WLM□-LDK13 Long-life, Direct-wired Connector Switches
		Direct-wired connector, 4-core. Greatly reduces wiring work. Waterproof to IP67.	WL□-□LDK43 General-purpose, Direct-wired Connector Switches WLM□-LDK43 Long-life, Direct-wired Connector Switches
	Connector attachment	Pre-wired connector, 2-core. Greatly reduces wiring work. Waterproof to IP67.	WL□-□LD-M1J General-purpose, Pre-wired Connector Switches WL□-□S-M1J-1 Spatter-prevention, Pre-wired Connector Switches WLM□-LD-M1J Long-life, Pre-wired Connector Switches
	in control and relay boxes	Pre-wired connector, 4-core. Greatly reduces wiring work. Waterproof to IP67.	WL□-□LD-□GJO3 General-purpose, Pre-wired Connector Switches WL□-□S-□GJSO3 Spatter-prevention, Pre-wired Connector Switches WLM□-LD-□GJO3 Long-life, Pre-wired Connector Switches

	Detection object	Key specifications		Models
	General	TT (total travel) PT (pretravel)	WLCA2 WLCA2-□S WLMCA2	General-purpose Switches Spatter-prevention Switches Long-life Switches
dies	Passing dogs	80°	WLH2 WLH2-□S WLMH2	General-purpose Switches Spatter-prevention Switches Long-life Switches
Operation angles	Passing dogs, high sensitivity	80°	WLG2 WLG2-□S WLMG2	General-purpose Switches Spatter-prevention Switches Long-life Switches
Oper	Passing dogs	90° WLCA2-2 25° WLCA2-2N 20°	WLCA2-2 WLCA2-2N	General-purpose Switches General-purpose Switches
	High precision	45-45-	WLGCA2 WLGCA2-□S WLMGCA2	General-purpose Switches Spatter-prevention Switches Long-life Switches
	Dogo and	Short lever     One-Horizontal operation possible. (WLCA or     Head mounts in any of 4 directions.	WL□2 WL□2-□S WLM□2	Roller Lever Actuators Roller Lever Actuators Roller Lever Actuators
	Dogs and workpieces (Mounts in any of 4 directions)	Medium lever     One-Horizontal operation possible. (WLCA or Head mounts in any of 4 directions.	ly) WL□2-7	Roller Lever Actuators
	4 directions)	Long lever     One-Horizontal operation possible. (WLCA or Head mounts in any of 4 directions.)	ly) WL□2-8	Roller Lever Actuators
	Adjustable between dog and lever	One-Horizontal operation possible. (WLCA or head mounts in any of 4 directions.)	WL□12	Adjustable Roller Lever Actuators
	Dogs or workpieces with large deflection	One-Horizontal operation possible. (WLCL only Head mounts in any of 4 directions.	WL□L	Adjustable Rod Lever Actuators
ACIUAIOIS		One-Horizontal operation not possible. Head mounts in any of 4 directions.	WLHAL4	Adjustable Rod Lever Actuator
ξ		One-Horizontal operation not possible. Head mounts in any of 4 directions.	WLHAL5	Rod Spring Lever Actuator
		Head mounts in any of 4 directions.	WLCA32-41	Fork Lever Lock Actuator
	Round-trip operation of	Head mounts in any of 4 directions.	WLCA32-42	Fork Lever Lock Actuator
	passing dogs	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
			WLD	Top Plunger Actuator
ı	Cams or	Head mounts in any of 4 directions.	WLSD	Horizontal Plunger Actuator
	workpieces with vertical	A Head mounts in any of 4 directions	WLD3	Top-ball Plunger Actuator
	movement	Tread modifies in any or 4 directions.	WLSD3	Horizontal-ball Plunger Actuator
		● Available in sealed models. (WLD28□)	WLD2 WLD28	Top-roller Plunger Actuator Sealed Top-roller Plunger Actuator

# **Model Number Structure**

# **■** Model Number Legend

## **General-purpose and Environment-resistant Switches**



#### 1. Electrical Rating

Blank	Standard
01	Microload

Note: Dimensions are the same as the standard models.

#### 3. Environment-resistant Model Specifications

Blank	Standard
RP	Corrosion-proof (See note 2.)
P1	Weather-proof (See note 2.)

Note 1: Dimensions are the same as the standard environment-resistance models.

2. Refer to page 39 for applicable models.

#### 4. Built-in Switch Type

Blank	Standard
55	Hermetically sealed

**Note:** Dimensions are the same as the standard built-in switch models

#### 5. Temperature Specifications

Blank	Standard: -10°C to 80°C
TH	Heat-resistant: 5°C to 120°C (See note 2.)
TC	Low-temperature: -40°C to 40°C (See note
	2.)

Note 1: Dimensions are the same as the standard models.
2. Refer to page 39 for applicable models.

# 7. Conduit Size, Ground Terminal Specifications (See note 1.)

Blank	G¹/₂ without ground terminal
G1	G¹/₂ with ground terminal
G	Pg13.5 with ground terminal
Υ	M20 with ground terminal
TS	1/2-14NPT with ground terminal

Note 1: Models with ground terminals are approved by EN/IEC (CE marking).

2. Dimensions are the same as the standard models.

#### 2. Actuator and Head Specifications

Symbol	Actuator type	Switch without lever
CA	Roller lever: Standard model R38	WLRCA2
CA2-7	Roller lever: Standard model R50	WLRCA2
CA2-8	Roller lever: Standard model R63	WLRCA2
H2	Roller lever: General-purpose overtravel model, 80°	WLRH2
G2	Roller lever: High-sensitivity overtravel, 80°	WLRG2
CA2-2	Roller lever: Overtravel, 90°	WLRCA-2-2
CA2-2N	Roller lever: Overtravel, 90°	WLRCA2-2N
GCA2	Roller lever: High-precision R38	WLRGCA2
CA12	Adjustable roller lever: Standard	WLRCA2
H12	Adjustable roller lever: General-purpose overtravel model, 80°	WLRH2
G12	Adjustable roller lever: High-sensitivity overtravel, 80°	WLRG2
CA12-2	Adjustable roller lever: Overtravel, 90°	WLRCA-2-2
CA12-2N	Adjustable roller lever: Overtravel, 90°	WLRCA2-2N
CL	Adjustable rod lever: Standard, 25 to 140	WLRCL
HL	Adjustable rod lever: General-purpose overtravel model, 80°, 25 to 140 mm	WLRH2
HAL4	Adjustable rod lever: General-purpose overtravel model, 80°, 350 to 380 mm	WLRH2
GL	Adjustable rod lever: High-sensitivity overtravel, 80°, 25 to 140 mm	WLRG2
CL-2	Adjustable rod lever: Overtravel, 90°, 25 to 140 mm	WLRCA-2-2
CL-2N	Adjustable rod lever: Overtravel, 90°, 25 to 140 mm	WLRCA2-2N
HAL5	Rod spring lever: General-purpose overtravel model, 80°	WLRH2
CA32-41	Fork lever lock: Protective, WL-5A100	WLRCA32
CA32-42	Fork lever lock: Protective, WL-5A102	WLRCA32
CA32-43	Fork lever lock: Protective, WL-5A104	WLRCA32
D	Plunger: Top plunger	
D2	Plunger: Top-roller plunger	-
D28	Plunger: Sealed top-roller plunger	
D3	Plunger: Top-ball plunger	
SD	Plunger: Horizontal plunger	
SD2	Plunger: Horizontal-roller plunger	
SD3	Plunger: Horizontal-ball plunger	
NJ	Flexible rod: Coil spring	
NJ-30	Flexible rod: Coil spring, multi-wire	
NJ-2	Flexible rod: Coil spring, resin rod	
NJ-S2	Flexible rod: Steel wire	

#### 6. Hermetic Model Specifications

Blank	No cables or molding
139	General-purpose built-in switch with cables attached and molded conduit opening and cover (cover cannot be removed). (See note.)
140	Airtight built-in switch with cables attached and molded conduit opening, cover, and box interior cover screws (cover cannot be removed). (See note.)
141	Airtight built-in switch with cables attached and molded conduit opening, cover, head, box interior, cover screws, and head screws (cover cannot be removed, Head direction cannot be changed). The Head opening is created to protect it from cutting powder. (See note.)
145	Airtight built-in switch with cables attached and molded conduit opening, cover, box interior, and cover screws (cover cannot be removed, Head can be mounted in any of 4 directions). The Head opening is created to protect it from cutting powder. (See note.)
RP40	Airtight built-in switch with cables attached and molded cover and box interior (cover cannot be removed, Head direction can be changed). SC Connector can be removed, so it is possible to use flexible conduits for the cable. (See note.)
RP60	Airtight built-in switch with cables attached, fluorine rubber used, and molded conduit opening, cover, and box interior (cover cannot be removed. Head direction cannot be changed). (See note.)

Note: Refer to page 39 for applicable models.

#### 8. Indicator Type

Symbol	Element	Voltage	Leakage current
Blank	No indicator		
LE	Neon lamp	125 to 250 VAC	Approx. 0.6 to 1.9 mA
LD	LED	10 to 115 VAC/DC	Approx. 0.5 mA

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

#### 9. Indicator Wiring

2	NC connection: Light-ON when operating
3	NO connection: Light-ON when not operating

**Note:** Include the indicator wiring specification only when a (6) hermetic seal and (8) operation indicator have been selected.

#### 10. Lever Type

Blank	Standard lever
Α	Double nut lever

# General-purpose Sensor I/O Connector Switches



Direct-wired Connector

Pre-wired Connector



#### 1. Electrical Rating

Bla	nk	Standard
01		Microload

**Note:** Dimensions are the same as the standard models.

#### 2. Actuator Type

CA2	Roller lever: Standard model
GCA2	Roller lever: High-precision model
H2	Roller lever: General-purpose overtravel model
G2	Roller lever: High-sensitivity over-travel
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.

#### 4. Indicator Type

LD	LED, AC/DC (10 to 115 V)

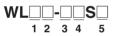
#### 5. Wiring Specifications

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

Note 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**



## 1. Electrical Rating

Blank	Standard
01	Microload

Note: Dimensions are the same as the standard models.

#### 2. Actuator Type

CA2	Roller lever: Standard model
GCA2	Roller lever: High-precision model
H2	Roller lever: General-purpose Overtravel model
G2	Roller lever: High-sensitivity 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 built-in switch 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

-M1J-1	Pre-wired Connector (See note.) (2-core: DC, NO wiring, connector pins No. 3, 4)
-M1GJ-1	Pre-wired Connector (See note.) (2-core: DC, NO wiring, connector pins No. 1, 4)
-DGJS03	Pre-wired Connector (See note.) (4-core: DC)

Note: With 0.3-m cable attached.

## **Long-life Switches**

WLM \_\_ - LD \_\_ 1 2 3

#### 1. Actuator

CA2	Roller lever: Standard model
GCA2	Roller lever: High-precision model
H2	Roller lever: General-purpose overtravel model
G2	Roller lever: High-sensitivity overtravel model

#### 2. indicator Type

LD	LED, AC/DC (10 to 115 V)

#### 3. Wiring Specifications

Blank	Screw terminal: G1/2 conduit				
K13A	Direct-wired Connector: 2-core, AC				
K13	Direct-wired Connector: 2-core, DC				
K43A	Direct-wired Connector: 4-core, AC				
K43	Direct-wired Connector: 4-core, DC				
-M1J	Pre-wired Connector: 2-core, DC (See note.)				
-AGJ03	Pre-wired Connector: 4-core, AC (See note.)				
-DGJ03	Pre-wired Connector: 4-core, DC (See note.)				

Note: With 0.3-m cable attached.

# **Ordering Information**

# **■** List of Models

# **General-purpose Switches**

Microload

WL01NJ

		Lever type	Roller lever R38	Roller lever R50	Roller lever R63		
Item			Model	Model	Model	11	
Basic		Standard load	WLCA2	WLCA2-7	WLCA2-8	1	
		Microload	WL01CA2	WL01CA2-7	WL01CA2-8	1	
Overtravel	General-	Standard load	WLH2			1	
	purpose	Microload	WL01H2			1	
	High-sensi-	Standard load	WLG2			1	
	tivity	Microload	WL01G2			1	
	90°	Standard load	WLCA2-2			1	
	operation	Microload	WL01CA2-2			1	
		Standard load	WLCA2-2N			1	
		Microload	WL01CA2-2N			1	
High-precis	ion	Standard load	WLGCA2				
		Microload	WL01GCA2				
		l					
		Lever type	Adjustable roller lever	25 to 140mm	Adjustable rod lever 350 to 380mm	Rod spring lever	
Item			Model	Model	Model	Model	
Basic		Standard load	WLCA12	WLCL			
		Microload	WL01CA12	WL01CL			
Overtravel	General-	Standard load	WLH12	WLHL	WLHAL4	WLHAL5	
	purpose	Microload	WL01H12	WL01HL			
	High-sensi- tivity	Standard load	WLG12	WLGL			
		Microload	WL01G12	WL01GL			
	90°	Standard load	WLCA12-2	WLCL-2			
	operation	Microload	WL01CA12-2	WL01CL-2			
		Standard load	WLCA12-2N	WLCL-2N			
		Microload	WL01CA12-2N	WL01CL-2N			
		Lever type	Fork lever lock (with WL-5A100 Plastic Roller Lever)	Fork lever lock (with WL-5A102 Plastic Roller Lever)	Fork lever lock (with WL-5A104 Plastic Roller Lever)		
Item			Model	Model	Model		
Protective		Standard load	WLCA32-41	WLCA32-42	WLCA32-43		
		Microload	WL01CA32-41	WL01CA32-42	WL01CA32-43	]	
		Lever type	Top plunger		Sealed top-roller plunger	Top-ball plunger	Å
Item			Model	Model	Model	Model	
		Standard load	WLD	WLD2	WLD28	WLD3	
Basic		Microload	WL01D	WL01D2	WL01D28	WL01D3	
Basic							
Basic		Lever type	Horizontal plunger	Horizontal-roller plunger	Horizontal-ball plunger		
Item			Horizontal plunger  Model	Horizontal-roller plunger Model	Horizontal-ball plunger Model		
				plunger	plunger		
Item		Lever type	Model	plunger Model	plunger T		
Item		Lever type	Model WLSD	plunger Model WLSD2 WL01SD2  Coil spring (spring diameter: 4.8)	plunger Model WLSD3	Steel wire (wire diameter: 1)	
Item		Lever type Standard load Microload	Model WLSD WL01SD  Coil spring (spring diameter: 6.5)	plunger Model WLSD2 WL01SD2  Coil spring (spring diameter: 4.8)	plunger  Model  WLSD3  WL01SD3  Coil spring (spring		

WL01NJ-2

WL01NJ-30

WL01NJ-S2

## **General-purpose Switches**

## **Indicator-equipped Switches**

		Lever type	Roller lever R38	Roller lever R50	Roller lever R63	Adjustable roller lever
Item			Model	Model	Model	Model
Basic		Neon lamp	WLCA2-LE	WLCA2-7LE	WLCA2-8LE	WLCA12-LE
		LED	WLCA2-LD	WLCA2-7LD	WLCA2-8LD	WLCA12-LD
Overtravel	General-purpose	Neon lamp	WLH2-LE			WLH12-LE
		LED	WLH2-LD			WLH12-LD
	High-sensitivity	Neon lamp	WLG2-LE			WLG12-LE
		LED	WLG2-LD			WLG12-LD
	90°	Neon lamp	WLCA2-2LE			WLCA12-2LE
	operation	LED	WLCA2-2LD			WLCA12-2LD
		Neon lamp	WLCA2-2NLE			WLCA12-2NLE
		LED	WLCA2-2NLD			WLCA12-2NLD
High-precision	High-precision Neon lamp		WLGCA2-LE			
		LED	WLGCA2-LD			

		Lever type	Adjustable rod lever 25 to 140 mm	Adjustable rod lever 350 to 380 mm	Rod spring lever
Item			Model	Model	Model
Basic		Neon lamp	WLCL-LE		
		LED	WLCL-LD		
Overtravel	General-purpose	Neon lamp	WLHL-LE	WLHAL4-LE	WLHAL5-LE
		LED	WLHL-LD	WLHAL4-LD	WLHAL5-LD
	High-sensitivity	Neon lamp	WLGL-LE		
		LED	WLGL-LD		
	90°	Neon lamp	WLCL-2LE		
	operation	LED	WLCL-2LD		
		Neon lamp	WLCL-2NLE		
ĺ		LED	WLCL-2NLD		

Lever type		Fork lever lock (with WL-5A100 Plastic Roller Lever)	Fork lever lock (with WL-5A102 Plastic Roller Lever)	Fork lever lock (with WL-5A104 Plastic Roller Lever)
Item		Model	Model	Model
Protective	Protective Neon lamp		WLCA32-42LE	WLCA32-43LE
	LED	WLCA32-41LD	WLCA32-42LD	WLCA32-43LD

	Lever type	Top plunger	Top-roller plunger	Sealed top-roller plunger	Top-ball plunger
Item		Model	Model	Model	Model
Basic	Neon lamp	WLD-LE	WLD2-LE	WLD28-LE	WLD3-LE
	LED	WLD-LD	WLD2-LD	WLD28-LD	WLD3-LD

Lever type		Horizontal plunger	Horizontal-roller plunger	Horizontal-ball Plunger	Coil spring (spring diameter: 6.5)
Item		Model	Model	Model	Model
Basic	Neon lamp	WLSD-LE	WLSD2-LE	WLSD3-LE	WLNJ-LE
	LED	WLSD-LD	WLSD2-LD	WLSD3-LD	WLNJ-LD

	Lever type	Coil spring (spring diameter: 4.8)	Coil spring (spring diameter: 8)	Steel wire (wire diameter: 1)
Item	_	Model	Model	Model
Basic	Neon lamp	WLNJ-30LE	WLNJ-2LE	WLNJ-S2LE
	LED	WLNJ-30LD	WLNJ-2LD	WLNJ-S2LD

## **Covers with Operation Indicators**

	Lever type	Cover only with indicator	No
Item		Model	
Neon lamp		WL-LE	
LED		WL-LD	

The default setting is "light-ON when not operating." Turn the lamp holder by  $180^\circ$  to change the setting to "light-ON when operating."

# **General-purpose Switches**

## Sensor I/O Connector Switches

## Direct-wired Connectors

			Item	Basic	Over	travel	High-precision
					General-purpose	High-sensitivity	Ī
Lever type	Wi	ring	Built-in switch specification	Model	Model	Model	Model
Roller lever	2-core	DC	Standard	WLCA2-LDK13	WLH2-LDK13	WLG2-LDK13	WLGCA2-LDK13
			Airtight seal	WLCA2-55LDK13	WLH2-55LDK13	WLG2-55LDK13	WLGCA2-55LDK13
	4-core DC		Standard	WLCA2-LDK43	WLH2-LDK43	WLG2-LDK43	WLGCA2-LDK43
			Airtight seal	WLCA2-55LDK43	WLH2-55LDK43	WLG2-55LDK43	WLGCA2-55LDK43
Top-roller plung-	2-core	DC	Standard	WLD2-LDK13			
er			Airtight seal	WLD2-55LDK13			
	4-core	DC	Standard	WLD2-LDK43			
			Airtight seal	WLD2-55LDK43			
Sealed top-roller	2-core	DC	Standard	WLD28-LDK13			
plunger			Airtight seal				
<u>Д</u>	4-core	DC	Standard				
			Airtight seal				

## Pre-wired Connectors

					Item	Basic	Over	travel	High-precision
							General-purpose	High-sensitivity	=
Lever type		Wi	ring		Built-in switch specification	Model	Model	Model	Model
Roller lever	2-core	DC	NO	No. 3, 4	Standard	WLCA2-LD-M1J	WLH2-LD-M1J	WLG2-LD-M1J	WLGCA2-LD-M1J
<u>@</u>					Airtight seal	WLCA2-55LD-M1J			WLGCA2-55LD-M1J
<u>(1)</u>				No. 1, 4	Standard	WLCA2-LD-M1GJ	WLH2-LD-M1GJ	WLG2-LD-M1GJ	WLGCA2-LD-M1GJ
					Airtight seal	WLCA2-55LD-M1GJ		WLG2-55LD-M1GJ	
			NC	No. 3, 2	Standard			WLG2-LD-M1JB	
					Airtight seal	WLCA2-55LD-M1JB		WLG2-55LD-M1JB	WLGCA2-55LD-M1JE
	4-core	DC			Standard	WLCA2-LD-DGJ03	WLH2-LD-DGJ03	WLG2-LD-DGJ03	-
					Airtight seal	WLCA2-55LD-DGJ03	WLH2-55LD-DGJ03	WLG2-55LD-DGJ03	WLGCA2-55LD- DGJ03
	3-core	DC		No. 2,	Standard	WLCA2-LD-DK1EJ03	WLH2-LD-DK1EJ03	WLG2-LD-DK1EJ03	
				3, 4	Airtight seal	WLCA2-55LD-DK1EJ03	WLH2-55LD-DK1EJ03	WLG2-55LD-DK1EJ03	
Top-roller plung-	2-core	DC	NO		Standard	WLD2-LD-M1J			
er					Airtight seal	WLD2-55LD-M1J			
Ä					Standard	WLD2-LD-M1GJ			
					Airtight seal	WLD2-55LD-M1GJ			
			NC	No. 3, 2	Standard				
					Airtight seal	WLD2-55LD-M1JB			
	4-core	DC			Standard	WLD2-LD-DGJ03			
					Airtight seal				
	3-core	DC		No. 2,	Standard	WLD2-LD-DK1EJ03			
				3, 4	Airtight seal	WLD2-55LD-DK1EJ03			
Sealed top-roller	2-core	DC	NO	No. 3, 4	Standard				
olunger					Airtight seal				
<u>#</u>				No. 1, 4	Standard				
					Airtight seal				
			NC	No. 3, 2	Standard				
					Airtight seal				
	4-core	DC			Standard	WLD28-LD-DGJ03			
					Airtight seal	WLD28-55LD-DGJ03			
	3-core	DC		No. 2,	Standard	WLD28-LD-DK1EJ03			
				3, 4	Airtight seal				

## **Environment-resistant Switches**

Note: Models are also available with ground terminals.

				Lever type		Roller lever R38			
					Basic Overtravel				
						General-purpose	High-sensitivity		
ltem					Model	Model	Model		
Airtight seal			No indicator	r	WLCA2-55	WLH2-55	WLG2-55		
			Indicator	LED	WLCA2-55LD	WLH2-55LD	WLG2-55LD		
				Neon	WLCA2-55LE	WLH2-55LE	WLG2-55LE		
lermetic seal	Molded terminals	-139	No indicator	r	WLCA2-139	WLH2-139	WLG2-139		
			Indicator	NC wiring	WLCA2-139LD2				
				NO wiring	WLCA2-139LD3		WLG2-139LD3		
		-140	No indicator	r	WLCA2-140	WLH2-140	WLG2-140		
			Indicator	NC wiring	WLCA2-140LD2		WLG2-140LD2		
				NO wiring	WLCA2-140LD3		WLG2-140LD3		
		-141	No indicator	r	WLCA2-141	WLH2-141	WLG2-141		
			Indicator	NC wiring	WLCA2-141LD2		WLG2-141LD2		
				NO wiring	WLCA2-141LD3	WLH2-141LD3	WLG2-141LD3		
	Anti-coolant	•	No indicator	r	WLCA2-RP60	WLH2-RP60	WLG2-RP60		
			Indicator	NC wiring	WLCA2-RP60LD2		WLG2-RP60LD2		
				NO wiring	WLCA2-RP60LD3	WLH2-RP60LD3	WLG2-RP60LD3		
leat-resistant			No indicator	r	WLCA2-TH	WLH2-TH	WLG2-TH		
			Indicator						
.ow-temperatu	re		No indicator	r	WLCA2-TC	WLH2-TC	WLG2-TC		
Corrosion-proof		Indicator							
		No indicator	r	WLCA2-RP	WLH2-RP	WLG2-RP			
			Indicator						
Weather-proof			No indicator	r		WLH2-P1	WLG2-P1		
			Indicator						

				Lever type	Adjustable roller lever	Adjustable rod lever 25 to 140 mm
					Basic	Basic
Item					Model	Model
Airtight seal			No indicator		WLCA12-55	WLCL-55
			Indicator	LED	WLCA12-55LD	WLCL-55LD
				Neon	WLCA12-55LE	
Hermetic seal	Molded terminals	-139	No indicator		WLCA12-139	WLCL-139
		-140			WLCA12-140	WLCL-140
		-141			WLCA12-141	
	Anti-coolant				WLCA12-RP60	WLCL-RP60
Heat-resistant			No indicator		WLCA12-TH	WLCL-TH
			Indicator			
Low-temperatu	ıre		No indicator		WLCA12-TC	WLCL-TC
			Indicator			
Corrosion-pro	of		No indicator		WLCA12-RP	WLCL-RP
			Indicator			
Weather-proof			No indicator		WLCA12-P1	
			Indicator			

				Lever type	Top-roller plunger	Sealed top-roller plunger	Coil spring (spring diameter: 6.5)
Item					Model	Model	Model
Airtight seal			No indicator		WLD2-55	WLD28-55	WLNJ-55
			Indicator	LED	WLD2-55LD	WLD28-55LD	WLNJ-55LD
				Neon	WLD2-55LE	WLD28-55LE	
Hermetic seal	Molded terminals	-139	No indicator		WLD2-139	WLD28-139	WLNJ-139
		-140				WLD28-140	WLNJ-140
	Anti-coolant				WLD2-RP60	WLD28-RP60	WLNJ-RP60
Heat-resistant			No indicator		WLD2-TH	WLD28-TH	WLNJ-TH
			Indicator				
Low-temperatu	re		No indicator		WLD2-TC	WLD28-TC	WLNJ-TC
			Indicator				
Corrosion-proc	f		No indicator		WLD2-RP	WLD28-RP	WLNJ-RP
			Indicator				

## **Spatter-prevention Switches**

		Lever type	Roller le	Sealed top-roller plunger	
			Double nut lever	Allen-head lever	
Item			Model	Model	Model
Neon lamp	Basic		WLCA2-LEAS	WLCA2-LES	WLD28-LES
operation indicator	Overtravel	General-purpose	WLH2-LEAS	WLH2-LES	
		High-sensitivity	WLG2-LEAS	WLG2-LES	
	High-precis	sion		WLGCA2-LES	
LED	Basic		WLCA2-LDAS	WLCA2-LDS	WLD28-LDS
operation indicator	Overtravel General-purpose		WLH2-LDAS	WLH2-LDS	
		High-sensitivity	WLG2-LDAS	WLG2-LDS	
	High-precis	sion		WLGCA2-LDS	

**Note:** Ask your OMRON representative about WL01□-□S Microload Switches.

## **Long-life Switches**

			Item		LED operation in	dicator (See note 1.)	
	ļ		Basic	Ove	ertravel	High-precision	
					General-purpose	High-sensitivity	
Lev	er type			Model	Model	Model	Model
	Roller lever, screw terminal			WLMCA2-LD	WLMH2-LD	WLMG2-LD	WLMGCA2-LD
0	Roller lever,	2-core	AC	WLMCA2-LDK13A	WLMH2-LDK13A	WLMG2-LDK13A	WLMGCA2-LDK13A
A	direct-wired		DC	WLMCA2-LDK13	WLMH2-LDK13	WLMG2-LDK13	WLMGCA2-LDK13
	connector	4-core	AC	WLMCA2-LDK43A	WLMH2-LDK43A	WLMG2-LDK43A	WLMGCA2-LDK43A
			DC	WLMCA2-LDK43	WLMH2-LDK43	WLMG2-LDK43	WLMGCA2-LDK43
	Roller lever,	2-core	DC	WLMCA2-LD-M1J	WLMH2-LD-M1J	WLMG2-LD-M1J	WLMGCA2-LD-M1J
	connector (See note 2.)	4-core	AC	WLMCA2-LD-AGJ03	WLMH2-LD-AGJ03	WLMG2-LD-AGJ03	WLMGCA2-LD-AGJ03
(IBM)			DC	WLMCA2-LD-DGJ03	WLMH2-LD-DGJ03	WLMG2-LD-DGJ03	WLMGCA2-LD-DGJ03

Note 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-core models.)

<sup>2.</sup> With 0.3-m cable attached.

## **Individual Parts**

### Heads

Actuator type		Set model	Head model (with Actuator)
Roller lever	0	WLCA2	WL-1H1100
		WLG2	WL-2H1100
		WLH2	WL-2H1100-1 (See note.)
		WLCA2-2	WL-3H1100
		WLCA2-2N	WL-6H1100
Adjustable roller	0	WLCA12	WL-1H2100
lever	Į.	WLG12	WL-2H2100
		WLH12	WL-2H2100-1 (See note.)
		WLCA12-2	WL-3H2100
		WLCA12-2N	WL-6H2100
Adjustable rod le-	1	WLCL	WL-4H4100
ver	Ш	WLGL	WL-2H4100
		WLCL-2	WL-3H4100
	r—ì	WLCL-2N	WL-6H4100

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

Note: 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 and the WLGCA2 becomes WL-1H-1 for the Heads without levers. Other Heads are also available. Ask your OMRON representative.

#### **Switches without Levers**

Switches without levers								
	Switch model							
Switches for roller levers	0	Basic R38	WLRCA2					
		High-precision R38	WLRGCA2					
		High-sensitivity overtravel, 80°	WLRG2					
		General-purpose overtravel, 80°	WLRH2					
		Overtravel, 90° operation	WLRCA2-2					
		Overtravel, 90° operation	WLRCA2-2N					
Switches for adjustable roller le-	0	Basic	WLRCA2					
vers	Ī	High-sensitivity overtravel, 80°	WLRG2					
		General-purpose overtravel, 80°	WLRH2					
		Overtravel, 90° operation	WLRCA2-2					
		Overtravel, 90° operation	WLRCA2-2N					
Switches for adjustable rod lever	1	Basic, 25 to 140 mm	WLRCL					
	İı	High-sensitivity overtravel, 80°, 25 to 140 mm	WLRG2					
		Overtravel, 90° operation, 25 to 140 mm	WLRCA2-2					
	K—N	Overtravel, 90° operation, 25 to 140 mm	WLRCA2-2N					
Switches for top plungers	A							
Switches for horizontal plung- ers		-	-					
Switches for fork lever locks		Protective, WL-5A100 Protective, WL-5A102 Protective, WL-5A104	WLRCA32					
Switches for coil springs								

## **Spatter-prevention Products**

#### Levers and Covers with Indicators

Complete Heads with allen-head levers	Double Nut Lever	Allen-head Lever	Cover with Indicator
WL-1H1100S (for WLCA2-□ or WLGCA2-□)	WL-1A105S Roller Lever (forward and backward lever)	EWL-1A103S Roller lever (forward and backward lever)	Neon lamp WL-LES
WL-2H1100S (for WLH2-□ or WLG2-□)			LED (LED) WL-LDS

#### Switches without I evers

<ul> <li>Switches without Levers</li> </ul>			
Switches without levers			
WLRCA2-LDS			
WLRH2-LES WLRH2-LDS WLRG2-LES			
WLRG2-LDS			
WLRGCA2-LES			

# Specifications, Ratings, and Characteristics

## **General-purpose Switches**

# **■** Approved Standards

Agency	Standard	File No.	Approved models
UL	UL508	E76675	All modes with direct-wired connectors or pre-
CSA	CSA C22.2 No. 14	LR45746	wired connectors except for hermetically sealed models
TÜV	EN60947-5-1	R9551016	Only models with ground terminals
Rheinland		J9950959	Only models with pre-wired connectors and DC specifications
CCC (CQC)	GB14048.5	2003010305032365	Contact your OMRON representative for information on approved models.

Note: Contact your OMRON representative for more information on approved models.

# ■ Approved Standard Ratings **UL/CSA**

Standard-load Switches: A600, NEMA

Rated	Carry current	Curre	nt (A)	Volt-amp	eres (VA)
voltage		Make	Break	Make	Break
120 VAC	10 A	60	6	7,200	720
240 VAC		30	3		
480 VAC		15	1.5		
600 VAC		12	1.2		

#### **Switches without Indicators**

LE Switches (Neon lamp): A300

Rated	Carry	Curre	nt (A)	Volt-amp	eres (VA)
voltage	current	Make	Break	Make	Break
120 VAC 240 VAC	10 A	60 30	6 3	7,200	720

#### LD Switches (LED)

Rated voltage	Carry current
115 VAC	10 A
115 VDC	0.8 A

#### **Microload Switches**

0.1 A at 125 VAC, 0.1 A at 30 VDC

# TÜV (EN60947-5-1) (Only models with ground terminals are approved.), CCC (GB14048.5)

Model	Application category and ratings	Thermal current (I <sub>the</sub> )	Indicator
WL□	AC-15: 2 A/250 V DC-12: 2 A/48 V	10 A	
WL01□	AC-14: 0.1 A/125V DC-12: 0.1 A/48 V	0.5 A	
WL□-LE	AC-15: 2 A/250 V	10 A	Neon lamp
WL01□-LE	AC-14: 0.1 A/125 V	0.5 A	Neon lamp
WL□-LD	AC-15: 2 A/115 V DC-12: 2 A/48 V	10 A	LED
WL01□-LD	AC-14: 0.1 A/115 V DC-12: 0.1 A/48 V	0.5 A	LED

Note: As an example, AC-15: 2 A/250 V means the following:

Application category	AC-15
Rated operating current (le)	2 A
Rated operating voltage (Ue)	250 V

# **■** General Ratings

#### Standard-load Switches

Item	Rated	Non-	induct	ive loa	id (A)	Inc	luctive	e load	(A)	
	voltage (V)	Resistive load		Lamp	load		Inductive load		Motor load	
Model		NC	NO	NC	NO	NC	NO	NC	NO	
Basic mod- els, overtravel	AC 125 250 500	1	0 0 0	3 2 1.5	1.5 1 0.8	1	0 0 3	5 3 1.5	2.5 1.5 0.8	
models (ex- cept for high- sensitivity models), and high-preci- sion models	DC 8 14 30 125 250	1 6 0	0 0 6 .8 .4	6 6 4 0.2 0.1	3 3 0.2 0.1	1	.8	4	6 6 4 .2 .1	
High-sensitiv- ity overtravel	AC 125 250	į	5 5	-			-			
models	DC 125 250		.4 .2	-		-	-			

Inrush NC current		30 A max. (15 A max. (See note.))		
		20 A max. (10 A max. (See note.))		

Note: For high-sensitivity overtravel models.

- 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.

  - A motor load has an inrush current of 6 times the steady-state current. For PC loads, use the microload

# **Indicator-equipped Switches**

Model	Item	Max. rated voltage (V)	Leakage current (mA)
WL-LE	Neon lamp	125 AC	Approx. 0.6
		250 AC	Approx. 1.9
WL-LD	LED	10 to 115 AC/DC	Approx. 0.5

## ■ Characteristics

Degree of protection	IP67				
Durability (See note	-	15,000,000 operations min.			
3.)		(See note 4.)			
	Electrical:	750,000 operations min.			
		(See note 5.)			
Operating speed		/s (for WLCA2)			
Operating frequency	Mechanical: Electrical:	120 operations/minute min. 30 operations/minute min.			
Rated frequency	50/60 Hz				
Insulation resistance	100 MΩ min. (at 500 VDC)				
Contact resistance	$25~\text{m}\Omega$ max.	(initial value)			
Dielectric strength	1,000 VAC (600 VAC), 50/60 Hz for 1 min between terminals of the same polarity 2,200 VAC (1,500 VAC), 50/60 Hz for 1 min/ Uimp 2.5 kV between current-carrying met- al part and ground 2,200 VAC (1,500 VAC), 50/60 Hz for 1 min Uimp 2.5 kV between each terminal and non-current-carrying metal part				
Rated insulation voltage (U <sub>i</sub> )	,				
Switching overvolt- age	1,000 V max	. (EN60947-5-1)			
Pollution degree (operating environme nt)	e Level 3 (EN60947-5-1)				
Short-circuit protective device (SCPD)	10 A, fuse type gG or gI (IEC269)				
Conditional short-cir- cuit current	100 A (EN60	947-5-1)			
Conventional en- closed thermal cur- rent (I <sub>the</sub> )	10 A, 0.5 A (	EN60947-5-1)			
Protection against electric shock	Class I				
Vibration resistance	Malfunction: 10 to 55 Hz, 1.5-mm double amplitude (See note 6.)				
Shock resistance	Destruction:	1,000 m/s <sup>2</sup> min.			
	Malfunction:	300 m/s² min. (See note 6.)			
Ambient temperature	Operating: – (See note 7.)	10°C to 80°C (with no icing)			
Ambient humidity	Operating: 9	5% max.			
Weight	Approx. 275	g (in the case of WLCA2)			

- Note 1: The above figures are initial values.
  - 2. The figures in parentheses for dielectric strength are those for the high-sensitivity overtravel models.
  - 3. The values are calculated at an operating temperature of 5°C to 35°C and an operating humidity of 40% to 70%. Contact your OMRON sales representative for more detailed information on other operating environments.
  - Durability is 10,000,000 operations min. for general-purpose or high-sensitivity overtravel models, and for flexible rod models
  - Durability is 500,000 operations min. for high-sensitivity models. All microload models however, are 1,000,000 operations min.
  - Except flexible rod models. The shock resistance (malfunction) for microload models is 200 m/s<sup>2</sup> min.
  - For low-temperature models this is -40°C to 40°C (no icing).
     For heat-resistant models the range is 5°C to 120°C.

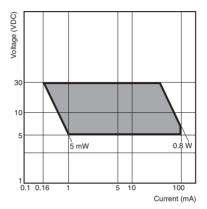
#### **Microload Switches**

Refer to these ratings before using the product.

Rated voltage (V)	Resistive load (A)
AC 125	0.1
DC 30	

Operation in the following ranges will produce optimum performance.

Recommended load range	5 to 30 VDC
	0.5 to 100 mA



## **Spatter-prevention Switches**

## **■** Approved Standards

Agency	Standard	File No.	Approved models
UL	UL508	E76675	All modes with direct-wired connectors or pre-
CSA	CSA C22.2 No. 14	LR45746	wired connectors except for hermetically sealed models
ŢÜV.			Only models with ground terminals
Rheinland		J9950959	Only models with pre-wired connectors and DC specifications
CCC (CQC)	GB14048.5	2003010305032365	Contact your OMRON representative for information on approved models.

Note: Contact your OMRON representative for more information on approved models.

# ■ Approved Standard Ratings

## **UL/CSA**

#### LE Switches (Neon lamp): A300

Rated	Carry	Curre	nt (A)	Volt-amp	eres (VA)
voltage	current	Make	Break	Make	Break
120 VAC 240 VAC	10 A	60 30	6 3	7,200	720

#### LD Switches (LED)

Rated voltage	Carry current			
115 VAC	10 A			
115 VDC	0.8 A			

# ■ General Ratings

Item	Rated	Non-i	induct	ive loa	ıd (A)	Inductive load (A)			
	voltage (V)	Resistive load		Lamp load		Inductive load		Motor load	
Model		NC NO		NC	NO	NC	NO	NC	NO
WL□-LES	AC 125 250		10 10		1.5 1	10 10		5 3	2.5 1.5
WL□-LDS	AC 115	1	10		1.5	10		5	2.5
	DC 12 24 48		10 10 6 3		3 1.5	10 6 3		6 4 2	

Inrush .	NC	30 A max.		
current	NO	20 A max.		
Operatin temperat	g ure	-10°C to 80°C (with no icing)		
Operatin humidity	g	95% max.		

- **Note 1:** The above figures are for steady-state currents.
  - 2. Inductive loads have a power factor of 0.4 min. (AC) and a time constant of 7 ms max. (DC).
  - 3. A lamp load has an inrush current of 10 times the steady-state current.
  - A motor load has an inrush current of 6 times the steady-state current.

## **■** Characteristics

Degree of protection	IP67
Durability (See note 3.)	Mechanical: 15,000,000 operations min. (See note 4.)
	Electrical: 750,000 operations min. (See note 5.)
Operating speed	1 mm to 1 m/s (for WLCA2)
Operating frequency	Mechanical: 120 operations/minute min. Electrical: 30 operations/minute min.
Rated frequency	50/60 Hz
Insulation resistance	100 MΩ min. (at 500 VDC)
Contact resistance	25 m $\Omega$ max. (initial value)
Dielectric strength	1,000 VAC (600 VAC), 50/60 Hz for 1 min between terminals of the same polarity 2,200 VAC (1,500 VAC), 50/60 Hz for 1 min/Uimp 2.5 kV between current-carry- ing metal part and ground 2,200 VAC (1,500 VAC), 50/60 Hz for 1 min Uimp 2.5 kV between each terminal and non-current-carrying metal part
Rated insulation voltage (U <sub>i</sub> )	250 V (EN60947-5-1)
Switching overvoltage	1,000 V max. (EN60947-5-1)
Pollution degree (operating environment)	Level 3 (EN60947-5-1)
Short-circuit protective device (SCPD)	10 A, fuse type gG or gl (IEC269)
Conditional short-circuit current	100 A (EN60947-5-1)
Conventional enclosed thermal current (I <sub>the</sub> )	10 A, 0.5 A (EN60947-5-1)
Protection against electric shock	Class I
Vibration resistance	Malfunction: 10 to 55 Hz, 1.5-mm double amplitude
Shock resistance	Destruction: 1,000 m/s² min. Malfunction: 300 m/s² min.
Ambient temperature	Operating: -10°C to 80°C (with no icing)
Ambient humidity	Operating: 95% max.
Weight	Approx. 275 g (in the case of WLCA2)

- Note 1: The above figures are initial values.
  - 2. The figures in parentheses for dielectric strength are those for the high-sensitivity overtravel models.
  - 3. The values are calculated at an operating temperature of 5°C to 35°C and an operating humidity of 40% to 70%. Contact your OMRON sales representative for more detailed information on other operating environments.
  - Durability is 10,000,000 operations min. for general-purpose or high-sensitivity overtravel models.
  - Durability is 500,000 operations min. for high-precision models. All microload models however, are 1,000,000 operations min.

## Long-life Switches

# **■** Approved Standards

Agency	Standard	Standard File No. Approved models					
UL	UL508	E76675	All modes with direct-wired connectors or pre-wired connec-				
CSA	CSA C22.2 No. 14	LR45746	tors except for hermetically sealed models				
TÜV Rheinland	EN60947-5-1	R9551016	Only models with ground terminals				
		R9551016 Only models with ground terminals  J9950959 Only models with pre-wired connectors and DC specificat					
CCC (CQC)	GB14048.5	2003010305032365	Contact your OMRON representative for information on approved models.				

Contact your OMRON representative for more information on approved models.

# ■ Approved Standard Ratings **UL/CSA**

#### LE Switches (Neon lamp): A300

Rated	Carry	Curre	nt (A)	Volt-amperes (VA)		
voltage	current	Make	Break	Make	Break	
120 VAC 240 VAC	10 A	60 30	6 3	7,200	720	

#### LD Switches (LED)

	Rated voltage	Carry current				
Г	115 VAC	10 A				
Г	115 VDC	0.8 A				

# TÜV (EN60947-5-1) (Only models with ground terminals are approved.), CCC (GB14048.5)

Model	Application category and ratings	Thermal current (I <sub>the</sub> )	Indicator	
WL□	AC-15: 2 A/250 V DC-12: 2 A/48 V	10 A		
WL01□	AC-14: 0.1 A/125 V DC-12: 0.1 A/48 V	0.5 A		
WL□-LE	AC-15: 2 A/250 V	10 A	Neon lamp	
WL01□-LE	AC-14: 0.1 A/125 V	0.5 A	Neon lamp	
WL□-LD	AC-15: 2 A/115 V DC-12: 2 A/48 V	10 A	LED	
WL01□-LD	AC-14: 0.1 A/115 V DC-12: 0.1 A/48 V	0.5 A	LED	

## ■ General Ratings

Refer to these ratings before using the product.

#### **Screw Terminal Switches**

Item	Rated					Inductive load (A)			
	voltage (V)	Resistive load		Lampload		Inductive load		Motor load	
Model		NC NO		NC	NO	NC	NO	NC	NO
Basic models,	115 AC	AC 10		3	1.5	10		5	2.5
overtravel models, (except for high-sensitivity mod- els), and high-precision models	12 DC 24 DC 48 DC 115 DC		0 6 3 .8	6 4 2 0.2	3 1.5 0.2	10 6 3 0.8		2	6 4 2 .2
High-sensitivity overtravel	115 AC 5						-		
models	115 DC	0	.4	-	-				

	NC	30 A max. (15 A max. (See note.))
current	NO	20 A max. (10 A max. (See note.))

Note: For high-sensitivity overtravel models.

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

Model	Rated	Non-inductive load (A)				Inductive load (A)			
	voltage (V)	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	8.0	0.2	0.2	0.8	8.0	0.2	0.2
AC	115 AC	3	3	3	1.5	3	3	3	2.5

- The above figures are for steady-state currents. Inductive loads have a power factor of 0.4 min. (AC) and a time constant of 7 ms
- max. (DC).

  A lamp load has an inrush current of 10 times the steady-state current. A motor load has an inrush current of 6 times the steady-state current.

## ■ Characteristics

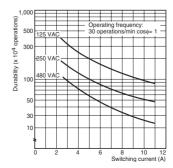
D	IDO7				
Degree of protection	IP67				
Durability (See note 2.)	Mechanical: 30,000,000 operations min. (10 mA at 24 VDC, resistive load)  Electrical: 750,000 operations min. (10 A at 115 VAC, resistive load), but for high-precision models: 500,000 operations min. (10 A at 115 VAC, resistive load)				
Operating speed	1 mm to 1 m/s (for WLCA2)				
Operating frequency	Mechanical: 120 operations/minute Electrical: 30 operations/minute				
Rated frequency	50/60 Hz				
Insulation resistance	100 M $\Omega$ min. (at 500 VDC)				
Contact resistance	$25 \text{ m}\Omega$ max. (initial value)				
Dielectric strength	1,000 VAC, 50/60 Hz for 1 min between terminals of the same polarity. (Except connector models.) 2,200 VAC (1,500 V), 50/60 Hz for 1 min between current-carrying metal part and ground. 2,200 VAC (1,500 V), 50/60 Hz for 1 min between each terminal and non-current-carrying metal part.				
Vibration resistance	10 to 55 Hz, 1.5-mm double amplitude				
Shock resistance	$ \begin{array}{ll} \mbox{Destruction:} & 1,000 \mbox{ m/s}^2 \mbox{ min.} \\ \mbox{Malfunction:} & 300 \mbox{ m/s}^2 \mbox{ min.} \\ \end{array} $				
Ambient temperature	Operating: -10°C to 80°C (with no icing)				
Ambient humidity	Operating: 95% max.				
Weight	Approx. 275 g (for WLCA2)				

Note 1: The figures in parentheses for dielectric strength, are those for overtravel (high-sensitivity) or connector models.
 2. The values are calculated at an operating temperature of 5°C to 35°C, and an operating humidity of 40% to 70%. Contact your OMRON sales representative for more detailed information on other operating environments.

# ■ Engineering Data

#### 

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



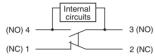
## **Connections**

## ■ Contact Forms

## **Screw Terminal Switches**

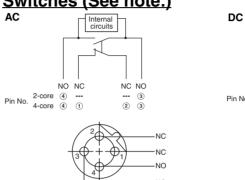


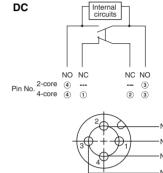
# Screw Terminal and when Not Operating) Switches (See note.)



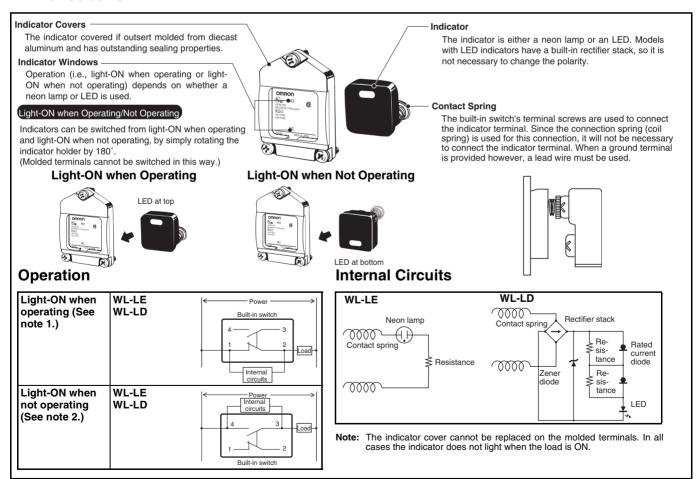
Note: Light-ON when not operating means the indicator is lit when the actuator is free and is not light when the Switch contacts (NO) close when the actuator rotates or is pushed down.

# **Direct-wired Connector, Pre-wired Connector, and** Switches (See note.)





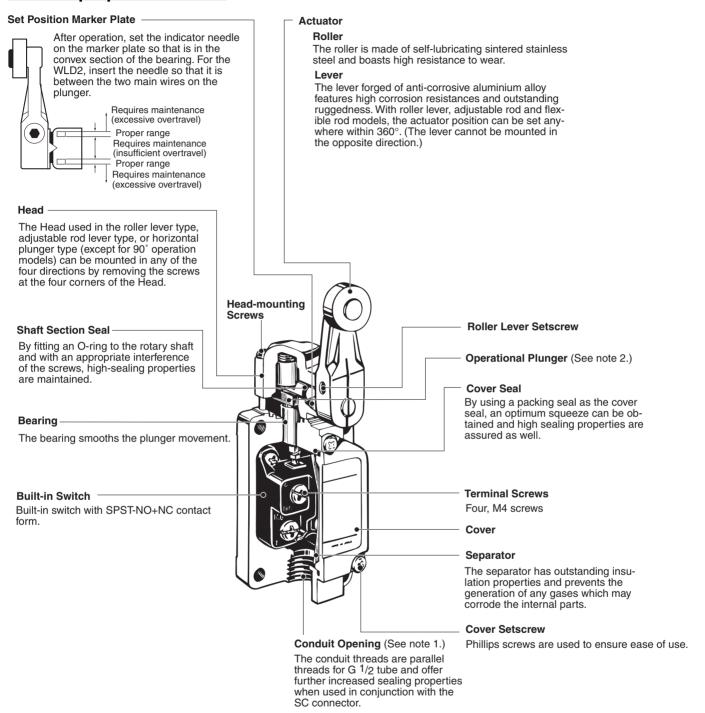
## ■ Indicators



- Note 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.

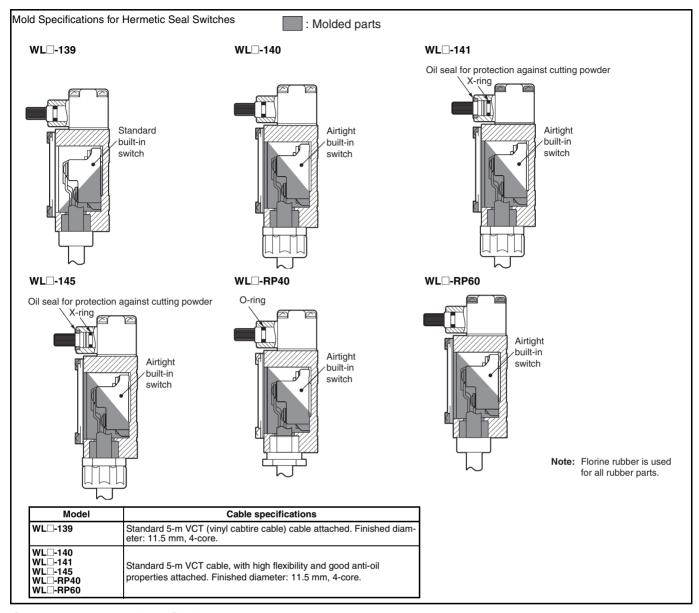
## **Nomenclature**

## **General-purpose Switches**

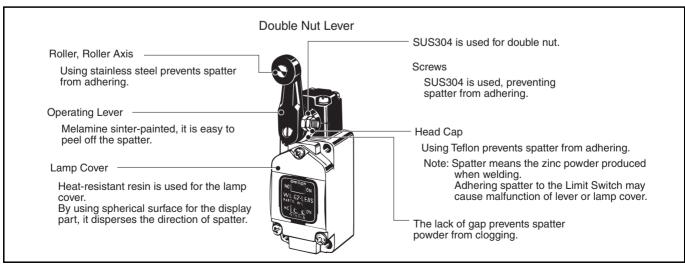


- Note 1. The display for conduit threads has changed from  $PF^{1}/_{2}$  to  $G^{1}/_{2}$ , according to revisions of JIS B 0202. This is only a change in the display, so the thread size and pitch have not changed. (Conduit threads Pg 13.5 and  $^{1}/_{2}$ -14NPT are also available.)
  - 2. By changing the orientation of the operational plunger, three operational directions can be selected electrically. (This is possible only with standard roller lever, adjustable roller lever, and adjustable rod lever models. For the overtravel models, only 90° operation models have this function.)

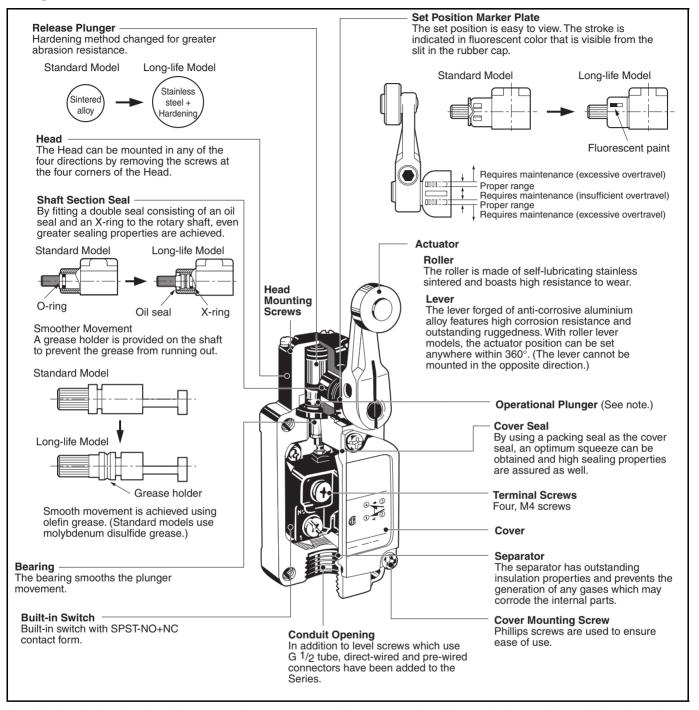
## **Environment-resistant Switches**



# **Spatter-prevention Switches**



## **Long-life Switches**



Note: By changing the direction of the operational plunger, any one of the three operational directions (both sides, left, or right) can be selected. (Applicable only to the WLMGCA2-\(\sigma\).)

## **Dimensions**

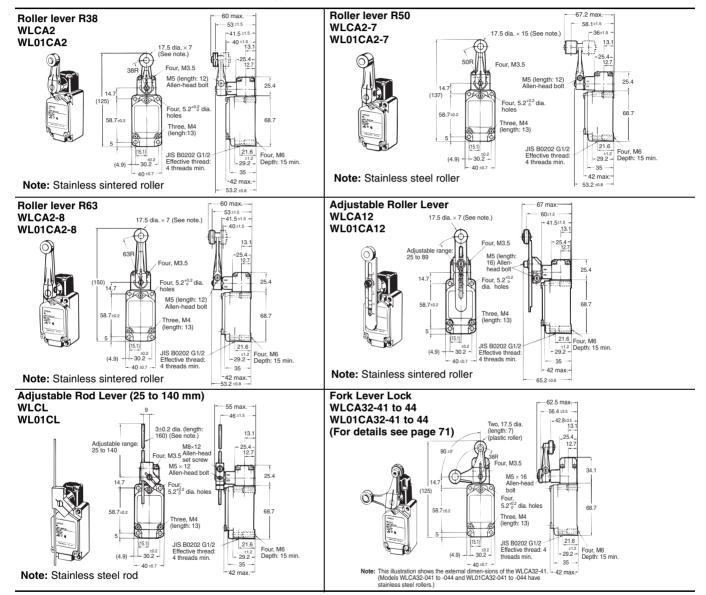
## **General-purpose Models**

## **■** Standard Models

### **Basic**

#### **Rotating Lever**

- Note 1. Rotating Lever Models: For all models WL□ indicates a standard-load model and WL01□ indicates a microload model.
  - 2. Unless otherwise indicated, a tolerance of  $\pm 0.4$  mm applies to all dimensions.



Operating characteristics	WLCA2 WL01CA2	WLCA2-7 WL01CA2-7	WLCA2-8 WL01CA2-8	WLCA12 WL01CA12 (See note 1.)	WLCL, WL01CL (See note 2.)
Operating force: OF max.	13.34 N	10.2 N	8.04 N	13.34 N	1.39 N
Release force: RF min.	2.23 N	1.67 N	1.34 N	2.23 N	0.27 N
Pretravel: PT	15±5°	15±5°	15±5°	15±5°	15±5°
Overtravel: OT min.	30°	30°	30°	30°	30°
Movement differential: MD max.	12°	12°	12°	12°	12°

Note 1:	The operating characteristics for WLCA12 and WL01CA12 are measured at the	е
	ever length of 38 mm.	

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

Operating characteristics	WLCA32-41 to 44, WL01CA32- 41 to 44
Force necessary to reverse the direction of the lever: Max.	11.77 N
Movement until the lever reverses Movement until switch operation: Min. Movement after switch operation: Max.	50±5° 55° 35°

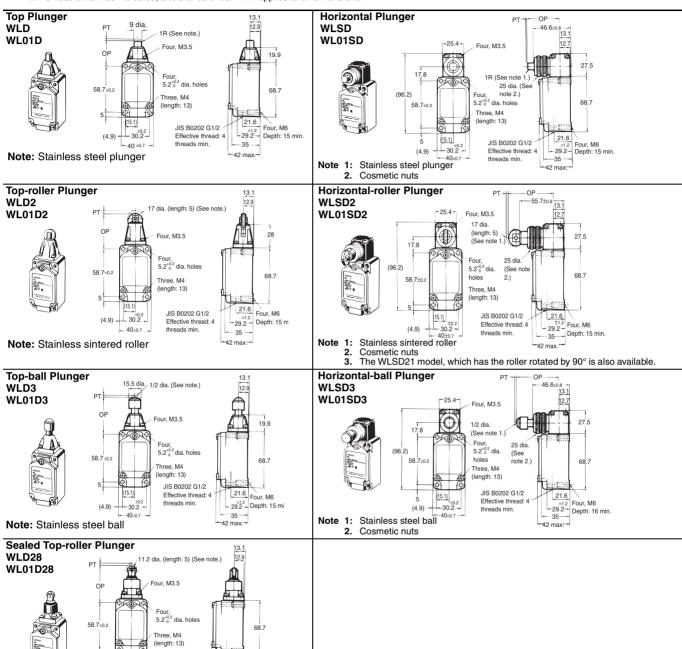
OF and RF for WLCA12, with a lever length of 89 mm.

Operating characteristics	WLCA12, WL01CA12
OF	5.68 N
RF	0.95 N

#### **Basic**

#### **Plunger**

- Note 1. For all models WL□ indicates a standard-load model and WL01□ indicates a microload model.
  - **2.** Unless otherwise indicated, a tolerance of  $\pm 0.4$  mm applies to all dimensions.



Operating characteristics	WLD	WLD2	WLD3	WLD28	WLSD2	WLSD3	WLSD
	WL01D	WL01D2	WL01D3	WL01D28	WL01SD2	WL01SD3	WL01SD
Operating force: 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
Operating position: OP Total travel position: TTP max.	34±0.8 mm 29.5 mm	44±0.8 mm 39.5 mm	44.5±0.8 mm 41 mm	44±0.8 mm 39.5 mm	54.2±0.8 mm	54.1±0.8 mm	40.6±0.8 mm

JIS B0202 G1/2

Effective thread: 4

threads min.

(15.1)

-30.2 <del>-</del>

- 40±0.7

Note: Stainless steel roller

21.6 ±1.2 -29.2 --35 --42 max-

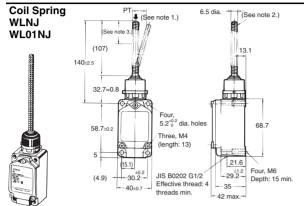
Four, M6

Depth: 15 m

## **Basic**

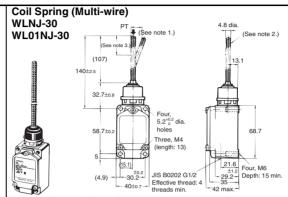
#### Flexible Rod

- Note 1. For all models WL□ indicates a standard-load model and WL01□ indicates a microload model.
  - 2. Unless otherwise indicated, a tolerance of  $\pm 0.4$  mm applies to all dimensions.



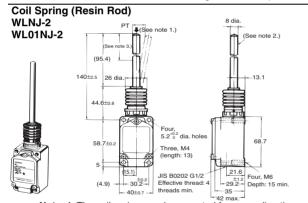
**Note: 1.** The coil spring may be operated from any direction except the axial direction  $(\downarrow)$ .

- 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.



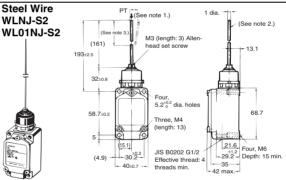
**Note: 1.** The coil spring may be operated from any direction except the axial direction  $(\downarrow)$ .

- 2. Piano wire coil
- 3. Optimum operating range of the coil spring is within 1/3 of the entire length from the top end.



Note: 1. The coil spring may be operated from any direction except the axial direction  $(\downarrow)$ .

- 2. Polyamide resin rod
- 3. Optimum operating range of the rod is within 1/3 of the entire length from the top end.



Note: 1. The coil spring may be operated from any direction except the axial direction  $(\downarrow)$ .

- 2. Stainless steel wire
- Optimum operating range of the wire is within 1/3 of the entire length from the top end.

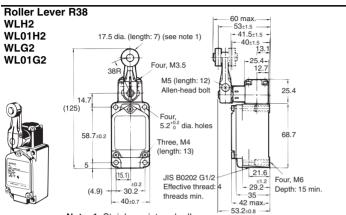
Operating characteristics	WLNJ	WLNJ30	WLNJ-2	WLNJ-S2
	WL01NJ	WL01NJ30	WL01NJ-2	WL01NJ-S2
	(See note.)	(See note.)	(See note.)	(See note.)
Operating force: OF max.	1.47 N	1.47 N	1.47 N	0.28 N
Pretravel: PT	20±10 mm	20±10 mm	40±20 mm	40±20 mm

Note: These values are taken from the top end of the wire or spring.

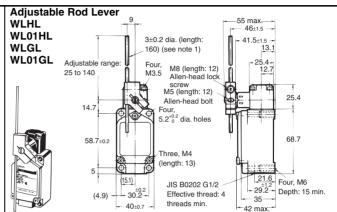
## **Overtravel**

## General-purpose/High-sensitivity Models

- Note 1. For all models WL□ indicates a standard-load model and WL01□ indicates a microload model.
  - 2. One-side operation is not possible with the general-purpose and high-sensitivity models.
  - 3. Unless otherwise indicated, a tolerance of  $\pm 0.4$  mm applies to all dimensions.

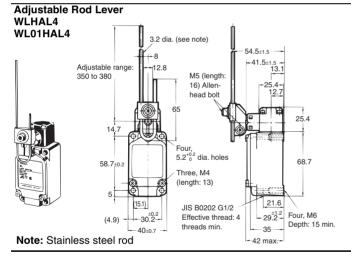


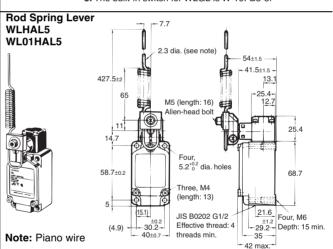
- Note: 1. Stainless sintered roller
  - WL\(\sigma\)G2 is identical to other models except in the shape of the set position marker plate.
  - 3. The built-in switch for WLH2 is W-10FB3.
  - 4. The built-in switch for WLG2 is W-10FB3-8



- Note: 1. WL□GL is identical to other models except in the shape
  - of the set position marker plate.

    2. The built-in switch for WLHL is W-10FB3.
  - 3. The built-in switch for WLGL is W-10FB3-8.





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

Operating characteristics	WLH12, WL01H12	WLG12, WL01G12
OF	4.18 N	4.18 N
RF	0.42 N	0.42 N

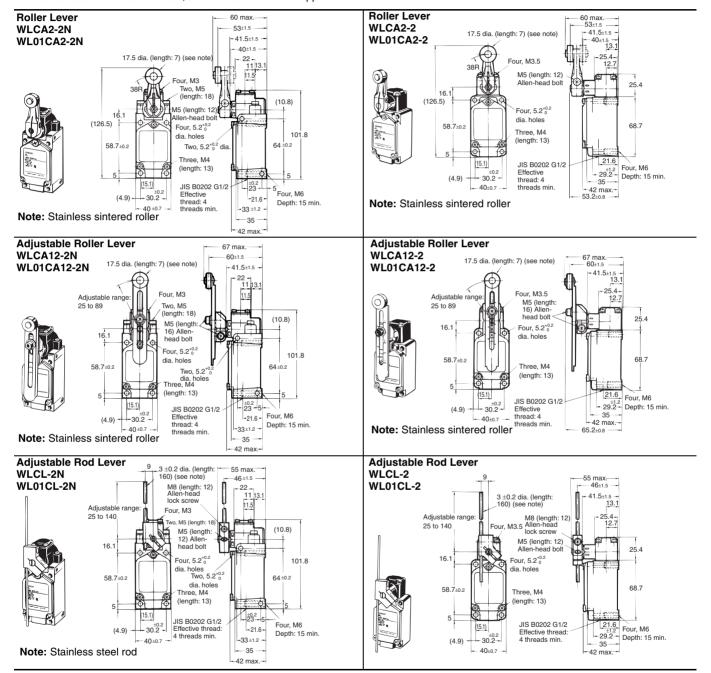
Operating characteristics	WLH2 WL01H2	WLG2 WL01G2	WLHL WL01HL (See note 3.)	WLGL WL01GL (See note 3.)	WLHAL4 WL01HAL4 (See note 4.)	WLHAL5 WL01HAL5
Operating force: OF max.	9.81 N	9.81 N	2.84 N	2.84 N	0.98 N	0.90 N
Release force: RF min.	0.98 N	0.98 N	0.25 N	0.25 N	0.15 N	0.09 N
Pretravel: PT	15±5°	10°+2°	15±5°	10°+2°	15±5°	15±5°
Overtravel: OT min.	55°		55°		55°	55°
Movement differential: MD max.	12°	7°	12°		12°	12°

- Note 1. 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.
  - 2. The operating characteristics of WLH12, WL01HL12, WLG12, and WL01G12 are measured at the lever length of 38 mm.
  - 3. The operating characteristics of WLHL, WL01HL, WLGL, and WL01GL are measured at the rod length of 140 mm.
  - 4. The operating characteristics of WLHAL4, and WL01HAL4 are measured at the rod length of 380 mm.

#### **Overtravel**

#### **Side-installation Models**

- Note 1. For all models WL□ indicates a standard-load model and WL01□ indicates a microload model.
  - 2. With the side-installation models, 90° operation on one side is possible by simply changing the direction of the cam.
  - 3. Unless otherwise indicated, a tolerance of  $\pm 0.4$  mm applies to all dimensions.



Operating characteristics	WLCA2-2N WL01CA2-2N	WLCA12-2N WL01CA12-2N (See note 1.)	WLCL-2N WL01CL-2N (See note 2.)	WLCA2-2 WL01CA2-2	WLCA12-2 WL01CA12-2 (See note 1.)	WLCL-2 WL01CL-2 (See note 2.)
Overtravel: OT min.	1.18 N 20° 70°	9.61 N 1.18 N 20° 70°	2.84 N 0.25 N 20° 70°	0.49 N 25°±5° 60°	0.49 N 25°±5° 60°	2.55 N 0.1 N 25°±5° 60°
	-		-			

OF and RF for WLCA12-2N and WL01CA12-2N, with a lever length of

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

- Note 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

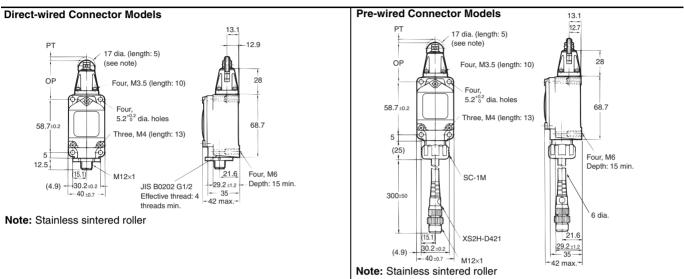
## **Direct-wired Connector/Prewired Connector Models**

Note: Refer to page 186 for applicable Cables.

### **Top-roller Plunger**

#### WLD2

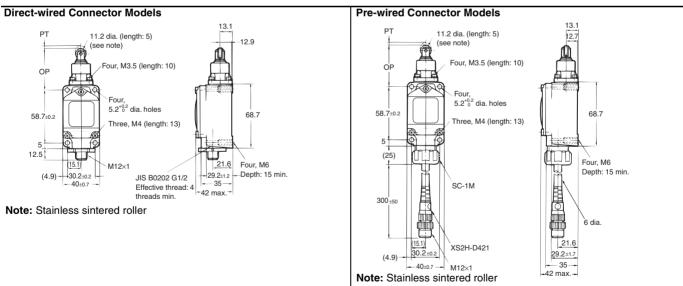
- **Note 1.** Unless otherwise indicated, a tolerance of  $\pm 0.4$  mm applies to all dimensions.
  - 2. The following diagrams are for a indicator-equipped models.



## **Sealed Top-roller Plunger**

#### WLD28

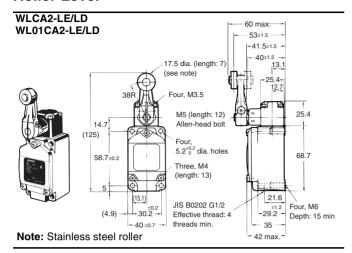
- **Note 1.** Unless otherwise indicated, a tolerance of  $\pm 0.4$  mm applies to all dimensions.
  - 2. The following diagrams are for a indicator-equipped model.



Operating characteristics	Top-roller plunger actuator	Sealed top-roller plunger actuator
Operating force: OF max. Release force: RF min. Pretravel: PT max. Overtravel: OT min. Movement differential: MD max.	26.67 N 8.92 N 1.7 mm 5.6 mm 1 mm	16.67 N 4.41 N 1.7 mm 5.6 mm 1 mm
Operating position: OP Total travel position: TTP max.	44±0.8 mm 39.5 mm	44±0.8 mm 39.5 mm

# **■** Indicator-equipped Models

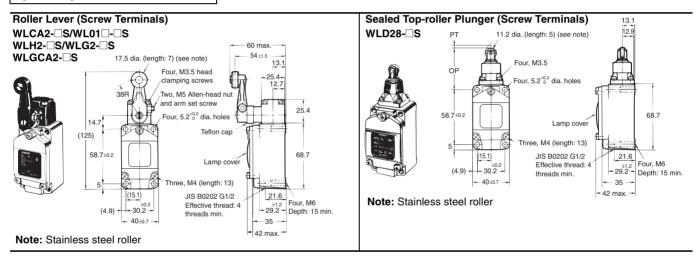
## **Roller Lever**



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

Operating characteristics	WLCA2-LE/LD WL01CA2-LE/LD
OF max.	13.34 N
RF min.	2.23 N
PT	15±5°
OT min.	30°
MD max.	12°

## **Spatter-prevention Models**

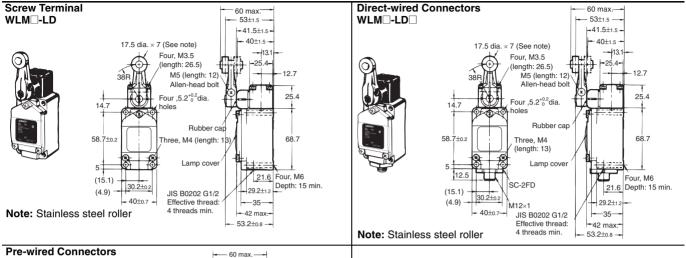


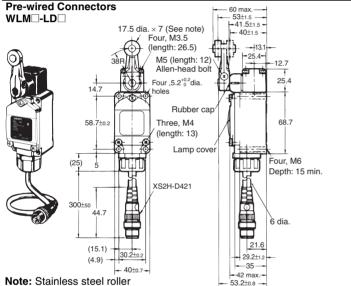
**Note:** Unless otherwise indicated, a tolerance of  $\pm 0.4$  mm applies to all dimensions.

Operating characteristics	Roller Lever				Sealed Top-roller
	Basic	Overtravel models		High-	Plunger
		General-purpose	High-sensitivity	precision	
Operating force: OF max.	13.34 N	9.81 N	9.81 N	13.34 N	16.67 N
Release force: RF min.	2.23 N	0.98 N	0.98 N	1.47 N	4.41 N
Pretravel: PT	15°±5°	15°±5°	10° +2°	10° +2°	1.7 mm max.
Overtravel: OT min.	30°	55°	65°	40°	5.6 mm
Movement differential: MD max.	12°	12°	<b>7</b> °	3°	1 mm
Operating position: OP					4±0.8 mm
Total travel position: TTP max.					39.5 mm

## Long-life Models

### **Rotating Lever Models**



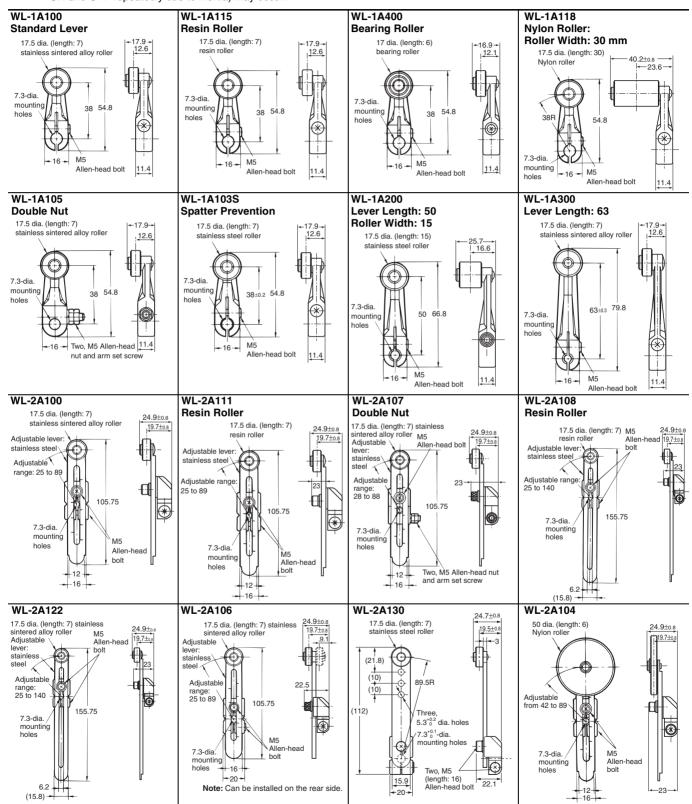


**Note:** Unless otherwise indicated, a tolerance of  $\pm 0.4$  mm applies to all dimensions.

Operating characteristics	WLMCA2-LD□ Basic models	WLMH2-LD□ General-purpose overtravel models	WLMG2-LD□ High-sensitivity overtravel models	WLMGCA2-LD□ High-precision models
Operating force: OF max.	9.81 N	9.81 N	9.81 N	13.34 N
Release force: RF min.	0.98 N	0.98 N	0.98 N	1.47 N
Pretravel: PT max.	15±5°	15±5°	10° +2°	5°+2° 0°
Overtravel: OT min.	30°	55°	65°	40°
Movement differential: MD max.	12°	12°	7°	3°

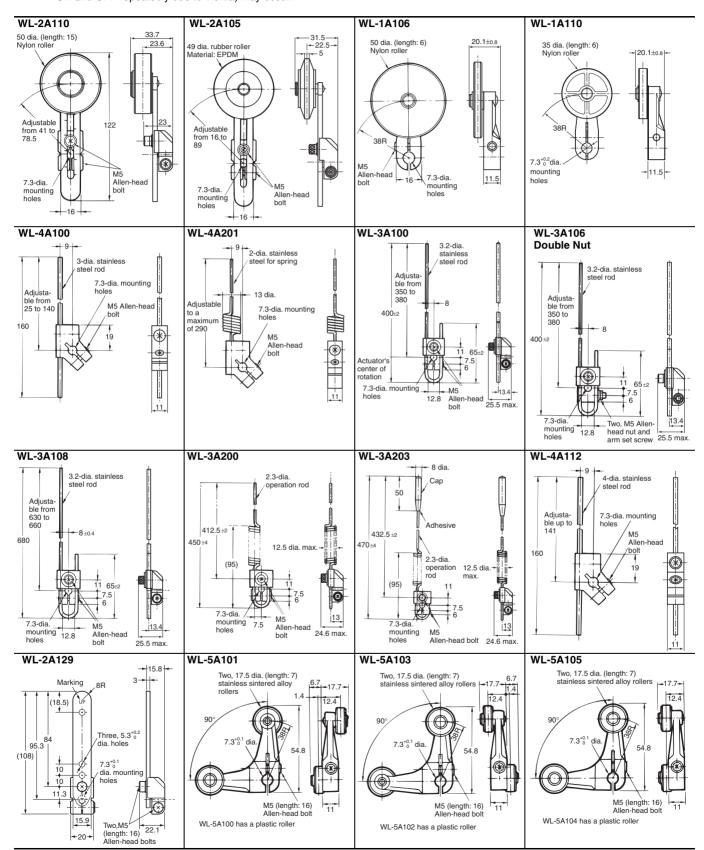
# ■ Actuators (Levers Only)

- Note 1. Lever: Only rotating lever models are illustrated.
  - 2. Unless otherwise indicated, a tolerance of  $\pm 0.4$  mm applies to all dimensions.
  - 3. 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.



# ■ Actuators (Levers Only)

- 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.



## **Precautions**

Refer to the "Precautions for All Switches" on page 17 and "Precautions for General-purpose Limit Switches (Including Multiple Limit Switches, Mechanical Touch Switches, High-precision Switches, Touch Switches, On-site Flexible Switches; Not Including Safety Switches)" on page 23.

## ■ Correct 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 IEC269, either a gl 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.

#### **Environmental Precautions**

When the Switch is used in locations subject to splashes of water or oil, the material of the seal, which ensures the sealing properties of the Switch, may undergo changes in shape and quality. This is due to deterioration (including expansion and contraction), and may result in reduced performance, ineffective return, and ineffective sealing (leading to ineffective contact, insulation, leakage current, and fire). Confirm the possible effects of the operating environment on the Switch before use.

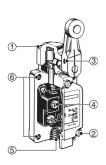
#### **Built-in Switch**

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.

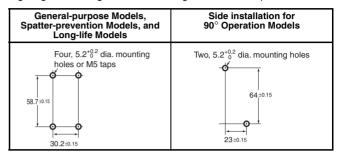
In particular, when changing the direction of the Head, make sure that all screws are tightened again to the correct torque. Do not allow foreign objects to fall into the Switch.



No.	Туре	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	
6	Main Unit screws	4.90 to 5.88 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.



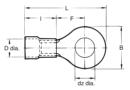
#### **Connectors**

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. Consult your OMRON representative for details.

#### Wiring

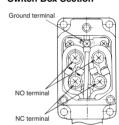
Use 1.25-mm lead wires and M4-insulation covered crimp terminals for wiring.

#### Crimp Terminal External Dimensions



dz dia.: 4.3 D dia.: 4.5 B: 8.5 L: 21.0 F: 7.8

#### Wiring Method Switch Box Section



Note: The ground terminal is only installed on models with ground terminals.

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

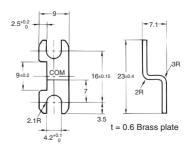
All rotating lever models, except the fork lever lock models, have a set position marker plate. (See page 56.) After operation, set the indicator needle on the marker plate so that is in the convex section of the bearing.

#### 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).



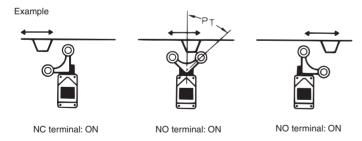
## Installation

#### **Applicable models and Actuators Details** Changing the Installation Position of Roller Levers: WLCA2, WL01CA2, 0 the Actuator WLCA2-2, WL01CA2-2. WLH2,WL01H2, WLG2, WL01G2, WLMCA2□, WLMH2□, WLMG2□, WLMGCA2□ By loosening the Allen-head bolt on the Loosen the M5 × 12 bolt, set the actuator lever, the position of the actuaactuator's position and then tor can be set anywhere within the 360° tighten the bolt again. With Indicator-equipped Switches, the Adjustable Roller Levers: WLCA12 actuator lever comes in contact with the WL01CA12, WLCA12-2, WL01CA12top of the indicator cover, so use caution 2, WLH12, WL01H12, WLG12, when rotating and setting the lever. WL01G12, When the lever only moves forwards and Adjustable Rod Levers: WLCL WL01CL, WLCL-2, WL01CL-2, WLHL, WL01HL, WLGL, WL01GL backwards, it will not contact the lamp cover (except for long-life models). Roller Levers: WLCA , WL01CA , WLCA , WLCA , WLGCA , WL01CA , WLGCA , WLMCA2 , WLMG2 , WLMG2 , **Changing the Orientation of the Head** By removing the screws in the four corners of the Head, the Head can be set in Loosen the screws WLMGCA2☐ any of the four directions. Be sure to change the plunger for internal opera-Adiustable Rod Levers: WLCL WL01CL, WLCL-2, WL01CL-2 tions at the same time. (The operational plunger does not need to be changed on Horizontal Plungers: WLSD□, general-purpose and high-sensitivity WL01SD overtravel models.) The roller plunger Top-roller Plungers: WLD2, WL01D2 can be set in either two positions at 90° Sealed Top-roller Plungers: WLD28, WLCA2-2N and WL01CA2-2N can be WL01D28 set only in either the forward or backward Note: Does not include -RP60 direction. Series or -141 Series. Roller Levers: WLCA2, WL01CA2, **Changing the Operating Direction** One-side Operation for General-purpose and WLGCA2, WLMGCA2 By removing the Head on models which High-precision Switches can operate on one-side only, and then Adjustable Roller Levers: WLCA12, The output of the Switch The output of the Switch will changing the direction of the operational WL01CA12 will only be changed when the lever is pushed be changed, regardless of plunger, one of three operating direcwhich direction the lever is Adjustable Rod Levers: WLCL. in one direction. pushed. tions can be selected. For overtravel 90° WĹ01CL operation models, one of three operating Overtravel Models: WLCA□-2N, directions can be selected by loosening WL01CA□-2N the rubber holder using either a coin or a flat-blade screwdriver and changing the direction of the internal rubber section. Operational plunger The tightening torque for the screws on the Head is 0.78 to 0.88 N·m. Operation in Counterclockwise Clockwise operation Cam Direction Changing Procedure for Overtravel. 90° Operation Switches Change the direction of the Loosen the cam holder with cam as required by your intended operation and then reinstall the cam. a coin or screwdriver. Take out the cam from the Switch. Relationship of cam to operation as observed from the rear of Switch Operation on one side Operates Does not operate Operation on one side Avoid this combination Does not

u	A	D. J. II.
Item	Applicable models and Actuators	Details
Installing the Roller on the Inside 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 , WL01CA , WLMCA2 , WLMH2 , WLMG2 , WLMGCA2 , WLMGCA2 , WLG , except for the adjustable roller levers.  Fork Lever Locks: WLCA32-4 , WL01CA32-4	Loosen the Allen-head bolt.
Selecting the Roller Position There are four types of fork lever lock for use depending on the roller position.	Fork Lever Locks: WLCA32-4□, WL01CA32-4□	WLCA32-41  WLCA32-42  WLCA32-44  WLCA32-44  WLCA32-44  WLCA32-44  Note: An explanation of the operation of fork lever locks is provided after this table.
Adjusting the Length of the Rod or Lever 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.	WLCA12 etc.  Loosen this Allen-head bolt and adjust the length of the lever.  Loosen this Allen-head bolt and adjust the length of the lever.

# **■** 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.



ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.

To convert millimeters into inches, multiply by 0.03937. To convert grams into ounces, multiply by 0.03527.

Cat. No. C133-E1-01

In the interest of product improvement, specifications are subject to change without notice.