Two-circuit Limit Switch/Long-life Two-circuit Limit Switch

# WL-N/WLM-N

## Select the Best Two-circuit Switch for the Operating Environment and Application from a Wide Range of Models

- A wide selection of models is available, including general-purpose, environment-resistant, and spatter-prevention switches.
- Standard-feature gold-clad crossbar contacts provide high reliability.
- Applicable to either standard loads or microloads.
- Switches with lever actuators provide 90° overtravel, one-side operation, and four-direction head mounting.
- Approved standards: EN/IEC, UL, cUL, and CCC. Contact your OMRON representative for information on approved models.

⚠ Be sure to read ***Safety Precautions*** on page 44 to 48 and ***Safety Precautions for All Limit Switches***.

## Features

### Standard Switches

**Many Variations in Standard Limit Switches**

**A Wide Range of Models**

The series includes includes many different actuators that you select to match the workpiece shape and motion, and a wide range of Switch variations, such as models with operation indicators for easier working and maintenance and models with different types of connectors.

### Environment-resistant Switches

**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. You can select the model based on the onsite environment.

### Spatter-prevention Switches

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

**Ideal for Welding Sites**

These Switches use stainless steel or resin to prevent the adhesion of spatter.
They can be used to reduce problems caused by zinc power generated during welding.

### Long-life Switches

**Mechanical Endurance of 30 Million Operations**

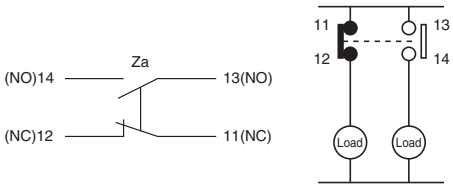
**Long-life Models for High-frequency Applications**

A mechanical durability of 30 million operations minimum is provided.
The head features a double-seal structure with a head cap and oil seal.

### Features Common to All Switches

**DPDB Operation**

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




**Degree of Protection; IP67**

**Approved Standards to Aid Export Machines**

The Switches are certified for EN/IEC, UL, cUL, and CCC making them ideal for export machines.

**Applicable to Either Standard Loads or Microloads**

Standard-feature gold-clad contacts provide high reliability.
The use of a high-contact-pressure crossbar structure also increases reliability.

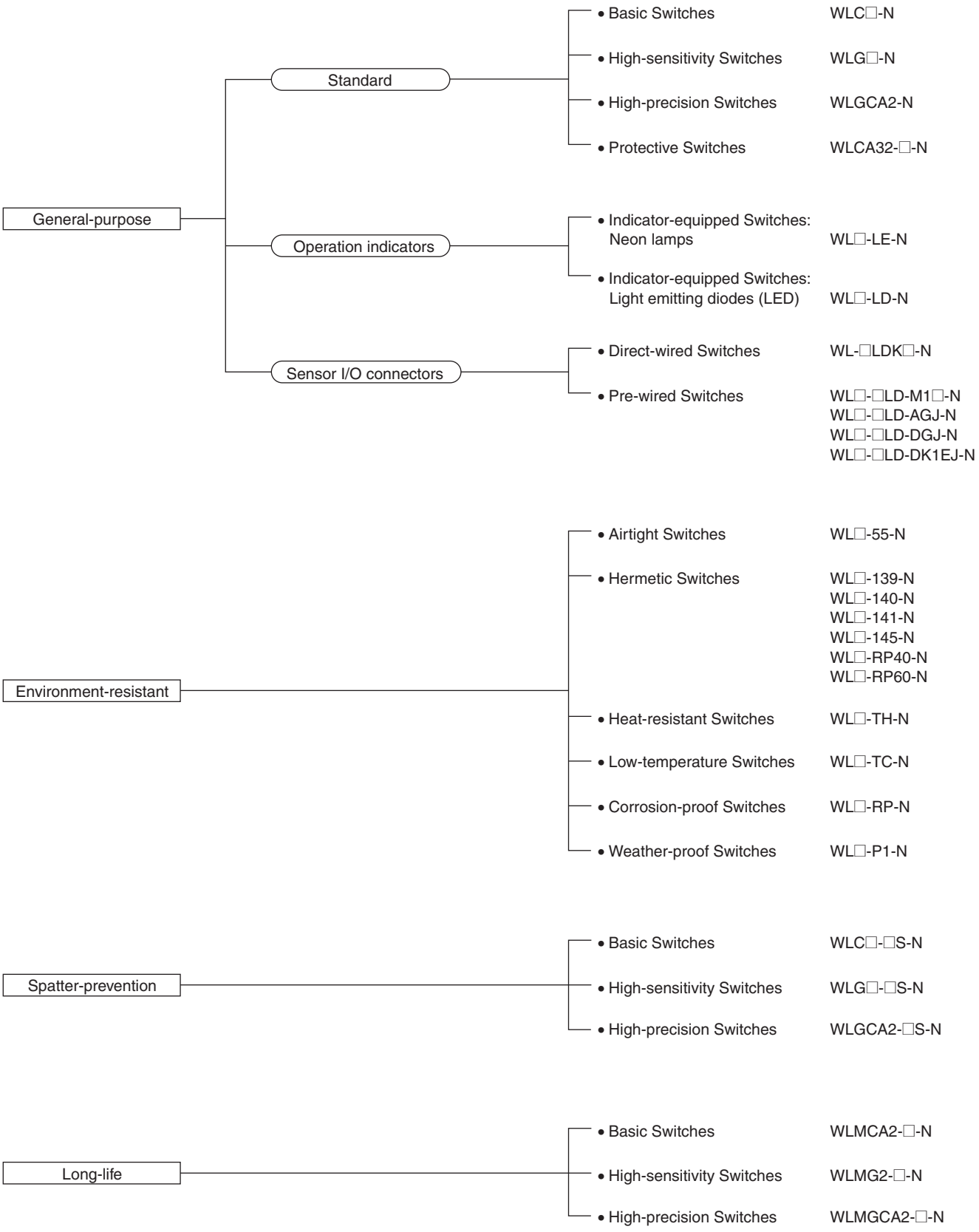
**Easy to Work With**

Downsizing of the built-in switch has increased the space to house the wiring.
The insulating paper that was often in the way when wiring has been eliminated.
Nickle-plated steel screws are used for the terminal screws.
The screws adhere to magnetized screwdrivers to prevent dropping and loosing them.

**Models with Connectors to Reduce Wiring**

A neon lamp or LED indicates the operating status.
The 3D structure of the lamp cover disperses light so you can check the operating status from the side.

# Product Configuration



## Environment-resistant Switches

| Item | | Environment-resistant | | |
|---|---|---|---|---|
| Type | Model | Application | Environment-resistant construction | Applicable models |
| **Airtight seal** | **WL□-55-N** | For use in locations subject to cutting oil or water. | Uses an airtight built-in switch.<br>Note: Use the SC Connector for the conduit opening. | All models except the low-temperature and heat-resistant models<br>Note: Models can be produced using standard actuators. |
| **Hermetic seal (Molded terminals/ Anti-coolant)** | **WL□-139-N** | | Refer to page 29 for information on the environment-resistant construction of Switches with Hermetic Seals. | All models except the low-temperature and heat-resistant models<br>Note: Models can be produced using standard actuators. Only the WLCA2-N, WLGCA2-N, or WLG2-N can be produced for the WL□-141-N and WL□-145-N. |
| | **WL□-140-N** | | | |
| | **WL□-141-N** | | | |
| | **WL□-145-N** | | | |
| | **WL□-RP40-N** | | | |
| | **WL□-RP60-N** | | | |
| **Low-temperature** | **WL□-TC-N** | 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.<br>• Epichlorhydrin 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-N** | Can be used in temperatures of 120°C (operating temperature range: 5 to 120°C). | • Fluorine 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-N), seal roller models, and resin rod (WLNJ-2-N) models |
| **Corrosion-proof** | **WL□-RP-N** | For use in locations subject to corrosive gases and chemicals. | • Diecast parts, such as the switch box, are made of corrosion-proof aluminum.<br>• Rubber sealing parts are made of fluorine rubber, which aids in resisting oils and chemicals.<br>• Exposed nuts and screws (except the actuator section) are made of stainless steel.<br>• Moving and rotary parts such as rollers are made of sintered stainless steel or stainless steel.<br>• The head, box, and cover are yellow. | All models except fork lever lock (WLCA32-41 to -44-N), low-temperature, heat-resistant, and indicator-equipped models |
| **Weather-proof** | **WL□-P1-N** | For use in parking lots and other outdoor locations. | • Rubber parts are made from epichlorhydrin rubber, which has a high-tolerance to changes in temperature.<br>• Rollers are made of stainless steel to improve corrosion resistance.<br>• Exposed nuts and screws are made of stainless steel. | Only basic (WLCA2-N/ CA12-N/CL-N), and high-sensitivity overtravel (WLG2-N/G12-N/GL-N) models (excluding heat-resistant models).<br>This does not apply to low-temperature or heat-resistant, or indicator-equipped switches. |

## Selection Guide

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

**The WL-N Series consists of four basic types: general-purpose, environment-resistant, spatter-protection, and long-life switches. WLCA2-N Switches can be used for the most common applications.**

### According to Operating Environment

| | Environment | Key specifications | Models | |
|---|---|---|---|---|
| Ambient operating temperature | Normal | −10°C +80°C<br>Water-resistant to IP67. | WL□-N<br>WLM□-N | General-purpose Switches<br>Long-life Switches |
| | High-temperature | +5°C +120°C<br>To increase heat resistance, the rubber material (fluorine rubber) and the plunger material (PEEK) have been changed. | WL□-TH-N | Heat-resistant Switches *1 |
| | Low-temperature | −40°C +40°C<br>To increase resistance to cold, epichlorhydrin rubber and other measures are used. | WL□-TC-N | Low-temperature Switches *1 |
| Operating environment | Outdoors | Rubber parts are made from epichlorhydrin rubber, which has a high-tolerance to changes in temperature.<br>Stainless steel is used for the screws.<br>Rollers are made of stainless steel to provide superior corrosion resistance. | WL□-P1-N | Weather-proof Switches *1 |
| | Chemicals and oil | Corrosion-proof specifications have 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 the actuator) to increase resistance to oils, chemicals, and weather. | WL□-RP-N | Corrosion-proof Switches *1 |
| | Water drops and mist | Uses an airtight built-in switch. | WL□-55-N | Airtight Switches *1 |
| | Constant water drops and mist | Cables are attached. Uses a general-purpose built-in switch.<br>The cover screws, case cover, and conduit opening are molded from epoxy resin to increase the seal.<br>(The cover cannot be removed.) | WL□-139-N<br>Hermetic, Molded-terminal Switches *1, *2 | |
| | | Cables are attached. Uses an airtight built-in switch.<br>The case cover and conduit opening are molded from epoxy resin to increase the seal. (The cover cannot be removed.)<br>The SC connector can be removed, so it is possible to use flexible conduit for the cable. | WL□-RP40-N<br>Hermetic, Molded-terminal Switches *1, *2 | |
| | | Cables are attached. Uses an airtight built-in switch.<br>The cover screws, case cover, and conduit opening are molded from epoxy resin to increase the seal.<br>(The cover cannot be removed.) | WL□-140-N<br>Hermetic, Molded-terminal Switches *1, *2 | |
| | Constant water drops or splattering cutting powder | Cables are attached. Uses an airtight built-in switch.<br>The cover screws, case cover, and conduit opening are molded from epoxy resin to increase the seal.<br>(The cover cannot be removed.)<br>Double seal against oil including head cap countermeasure for cutting chips and an oil seal.<br>-141: The Head section is molded from epoxy resin; Head direction cannot be changed.<br>-145: The Head section is molded from epoxy resin; Head can be in any of 4 directions. | WL□-141-N, -145-N<br>Hermetic, Molded-terminal Switches *1, *2<br>(Only the WLCA2-N, WLG2-N, and WLGCA2-N, can be produced.) | |
| | Coolant | Cables are attached. Uses an airtight built-in switch.<br>The cover screws, case cover, conduit opening, and head screws are molded from epoxy resin to increase the seal.<br>(The cover and head cannot be removed.)<br>Rubber parts are made from fluorine rubber to increase resistance to coolant. | WL□-RP60-N<br>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-N | 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 29 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<br>0.8 A at 125 VDC<br>0.4 A at 250 VDC | Entire WL□-□-N Series<br>Applicable to either standard loads or microloads. |
| | Switching microloads | 0.1 A at 125 VAC, resistive load<br>0.1 A at 30 VDC, resistive load | |
| Durability | Normal durability | Mechanical: 15 million operation min.<br>(10 million operation min. for high-sensitivity models or flexible rod models) | WL□-N General-purpose Switches<br>WL□-S-N Spatter-prevention Switches |
| | Long-life | Mechanical: 30 million operation min. | WLM□-N Long-life Switches |

## According to Ease of Installation and Maintenance

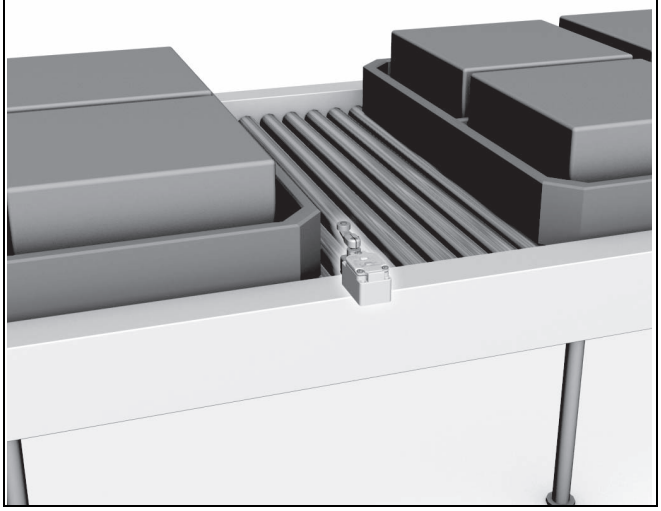
| | Conditions | Key specifications | Models |
|---|---|---|---|
| Operation indicator | Daily inspections and maintenance checks | Neon lamp<br>125 to 250 VAC<br>Switching light-ON between operating/not operating. (Switching is not possible for Switches with Molded Terminals.) | WL□-LE-N<br>General-purpose, Indicator-equipped (Neon Lamp) Switches<br>WL□-LES-N<br>Spatter-prevention, Indicator-equipped (Neon Lamp) Switches |
| | | LED<br>10 to 115 VAC/DC<br>Switching light-ON between operating/not operating. (Switching not possible for models with molded terminals.) | WL□-LD-N<br>General-purpose, Indicator-equipped (LED) Switches<br>WL□-LDS-N<br>Spatter-prevention, Indicator-equipped (LED) Switches |
| Wiring specification | Screw tightening and installation | Screw terminals. No ground terminal.<br>Conduit size: G1/2 | WL□-N General-purpose Switches<br>WLM□-N Long-life Switches |
| | | Screw terminals. Ground terminal.<br>Conduit size: 4 sizes | WL□-N General-purpose Switches |
| | One-touch connector attachment | Direct-wired connector, 2-conductor.<br>Greatly reduces wiring work. | WL□-□LDK13□-N<br>General-purpose, Direct-wired Connector Switches<br>WLM□-LDK13□-N<br>Long-life, Direct-wired Connector Switches |
| | | Direct-wired connector, 4-conductor.<br>Greatly reduces wiring work. | WL□-□LDK43□-N<br>General-purpose, Direct-wired Connector Switches<br>WLM□-LDK43□-N<br>Long-life, Direct-wired Connector Switches |
| | Connector attachment in control and relay boxes | Pre-wired connector, 2-conductor.<br>Greatly reduces wiring work.<br>Smartclick connectors for even easier maintenance. | WL□-□LD-M1□J-N<br>General-purpose, Pre-wired Connector Switches<br>WL□-□S-M1□J-1-N<br>Spatter-prevention, Pre-wired Connector Switches<br>WLM□-LD-M1□J-N<br>Long-life, Pre-wired Connector Switches |
| | | Pre-wired connector, 4-conductor.<br>Greatly reduces wiring work.<br>Smartclick connectors for even easier maintenance. | WL□-□LD-□GJ-N<br>General-purpose, Pre-wired Connector Switches<br>WL□-□S-□GJS-N<br>Spatter-prevention, Pre-wired Connector Switches<br>WLM□-LD-□GJ-N<br>Long-life, Pre-wired Connector Switches |

## According to Form of Operation

| | Detection object | Key specifications | Models | |
|---|---|---|---|---|
| Operation angles | General<br>Passing dogs | TT (total travel) 90° 90°<br>PT (pretravel) 15° 25° 20°<br>WLCA2-N WLCA2-2-N WLCA2-2N-N | WLCA2-N<br>WLCA2-2-N<br>WLCA2-2N-N<br>WLCA2-□S-N<br>WLMCA2-N | General-purpose Switches<br>General-purpose Switches<br>General-purpose Switches<br>Spatter-prevention Switches<br>Long-life Switches |
| | Passing dogs, high sensitivity | 90° 90° 10° | WLG2-N<br>WLG2-□S-N<br>WLMG2-N | General-purpose Switches<br>Spatter-prevention Switches<br>Long-life Switches |
| | High precision | 90° 90° 5° | WLGCA2-N<br>WLGCA2-□S-N<br>WLMGCA2-N | General-purpose Switches<br>Spatter-prevention Switches<br>Long-life Switches |
| Actuators | Dogs and workpieces (Mounts in any of 4 directions) | R38<br>● Short lever<br>● One-Horizontal operation possible.<br>● Head mounts in any of 4 directions. | WL□2-N<br>WL□2-□S-N<br>WLM□2-N | Roller Lever Actuators<br>Roller Lever Actuators<br>Roller Lever Actuators |
| | | R50<br>● Medium lever<br>● One-side operation possible.<br>● Head mounts in any of 4 directions. | WL□2-7-N | Roller Lever Actuators |
| | | R63<br>● Long lever<br>● One-side operation possible.<br>● Head mounts in any of 4 directions. | WL□2-8-N | Roller Lever Actuators |
| | Adjustable between dog and lever | R25 to 89<br>● One-Horizontal operation possible.<br>● Head mounts in any of 4 directions. | WL□12-N | Adjustable Roller Lever Actuators |
| | Dogs or workpieces with large deflection | 25 to 140<br>● One-Horizontal operation possible.<br>● Head mounts in any of 4 directions. | WLCL-N | Adjustable Rod Lever Actuators |
| | | 350 to 380<br>● One-side operation possible.<br>● Head mounts in any of 4 directions. | WLCAL4-N | Adjustable Rod Lever Actuator |
| | | 427.5<br>● One-side operation possible.<br>● Head mounts in any of 4 directions. | WLCAL5-N | Rod Spring Lever Actuator |
| | Round-trip operation of passing dogs | ● Head mounts in any of 4 directions. | WLCA32-41-N | Fork Lever Lock Actuator |
| | | ● Head mounts in any of 4 directions. | WLCA32-42-N | Fork Lever Lock Actuator |
| | | ● Head mounts in any of 4 directions. | WLCA32-43-N | Fork Lever Lock Actuator |
| | | ● Head mounts in any of 4 directions. | WLCA32-44-N | Fork Lever Lock Actuator |
| | Cams or workpieces with vertical movement | ● Equipped with sealing boot. | WLD18-N | Sealed Top Plunger Actuator |
| | | ● Head mounts in any of 4 directions. | WLSD-N | Horizontal Plunger Actuator |
| | | ● Equipped with sealing boot. | WLD38-N | Sealed Top-ball Plunger Actuator |
| | | ● Head mounts in any of 4 directions. | WLSD3-N | Horizontal-ball Plunger Actuator |
| | | ● Equipped with sealing boot. | WLD28-N | Sealed Top-roller Plunger Actuator |
| | | ● Head mounts in any of 4 directions. | WLSD2-N | Horizontal-roller Plunger Actuator |

## Application Examples

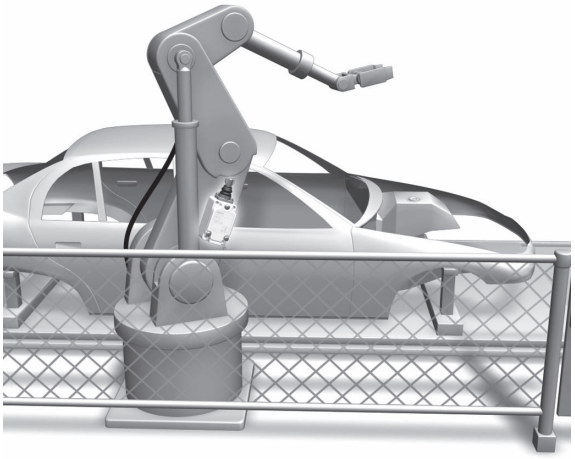
**Detection of Passing Pallets on Production Lines**



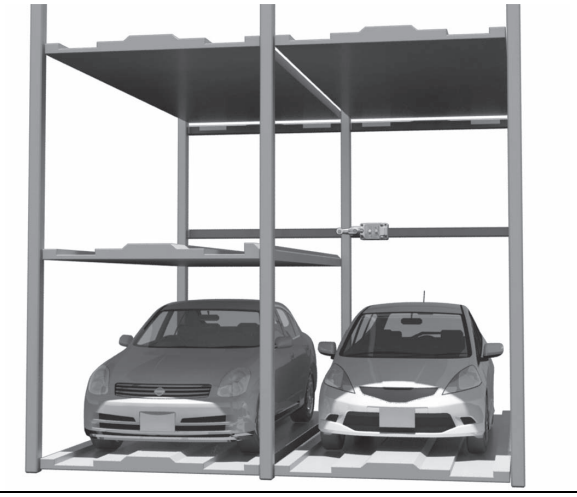
**Detection of Work Table Origins (X, Y, and Z) on Machine Tools**

**Detection of Forward and Reverse Movement of Hydraulic Cylinders on Molding Machines**

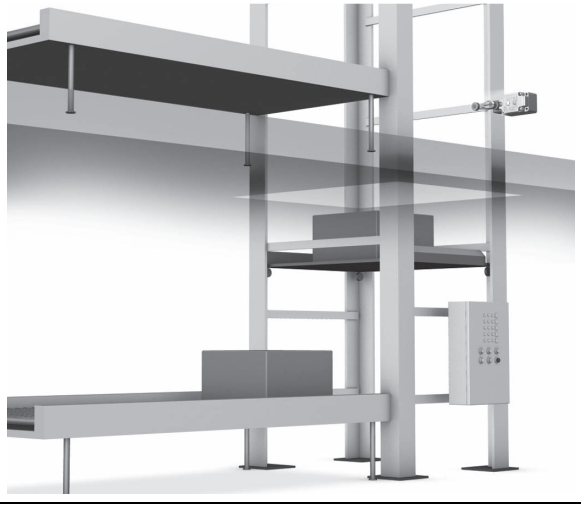
**Detection of Arm Movement on Welding Robots**



**Detection of Car Pallet Positions in Parking Towers**



**Detection of Vertical Limits on Conveyor Systems**



# Model Number Structure

## Model Number Legend (Not all combinations are possible. Contact your OMRON representative for details.)

**General-purpose Switches**

**WL□ - □ □ □ □ -N**
(1) (2) (3) (4) (5)

### (1) Actuator and Property Specifications

| Code | Lever | Pretravel (PT) |
|---|---|---|
| CA2 | Roller lever: R38 mm | 15±5° |
| CA2-7 | Roller lever: R50 mm | |
| CA2-8 | Roller lever: R63 mm | |
| CA12 | Adjustable roller lever: R25 to 89 mm | |
| CL | Adjustable rod lever: 25 to 140 mm | |
| CAL4 | Adjustable rod lever: 350 to 380 mm | |
| CAL5 | Rod spring lever | |
| CA2-2 | Roller lever: R38 mm | 25±5° |
| CA12-2 | Adjustable roller lever: R25 to 89 mm | |
| CL-2 | Adjustable rod lever: 25 to 140 mm | |
| CA2-2N | Roller lever: R38 mm | MAX 20° |
| CA12-2N | Adjustable roller lever: R25 to 89 mm | |
| CL-2N | Adjustable rod lever: 25 to 140 mm | |
| G2 | Roller lever, high sensitivity: R38 mm | 10° $^{+2°}_{-1°}$ |
| G12 | Adjustable roller lever, high sensitivity: R25 to 89 mm | |
| GL | Adjustable rod lever, high sensitivity: 25 to 140 mm | |
| GCA2 | Roller lever, high precision: R38 mm | 5° $^{+2°}_{0°}$ |
| CA32-41 | Fork lever lock | 50±5° |
| CA32-42 | Fork lever lock | |
| CA32-43 | Fork lever lock | |
| D18 | Sealed top plunger | 1.7 mm |
| D28 | Sealed top-roller plunger | |
| D38 | Sealed top-ball plunger | |
| SD | Horizontal plunger | 2.8 mm |
| SD2 | Horizontal-roller plunger | |
| SD3 | Horizontal-ball plunger | |
| NJ | Flexible rod: Coil spring | 20±10 mm |
| NJ-30 | Flexible rod: Coil spring, multi-wire | |
| NJ-2 | Flexible rod: Resin rod | 40±20 mm |
| NJ-S2 | Flexible rod: Steel wire | |

### (2) Built-in Switch Type

| Code | Specification |
|---|---|
| Blank | Standard built-in switch |
| 55 | Airtight built-in switch |

### (3) Conduit Size, Ground Terminal Specifications

| Code | Specifications | |
|---|---|---|
| | Conduit Size | Ground terminal |
| Blank | G1/2 | None |
| G1 | G1/2 | Provided * |
| G | Pg13.5 | |
| Y | M20 | |
| TS | 1/2-14NPT | |

* Models with ground terminals are certified for EN/IEC (CE Marking).

### (4) Indicator Type

| Code | Specifications |
|---|---|
| Blank | No indicator |
| LE | Neon lamp: 125 to 250 VAC |
| LD | LED (10 to 115 VAC/DC) |

### (5) Lever Type

| Code | Specifications |
|---|---|
| Blank | Standard lever (Allen-head bolt) |
| A | Double nut lever |

## Model Number Legend (Not all combinations are possible. Contact your OMRON representative for details.)

### General-purpose Switches

### Sensor I/O Connector Switches

**WL□ - □ L D □ -N**
(1) (2) (3) (4)

#### (1) Actuator and Property Specifications

| Code | Lever | Pretravel (PT) |
|---|---|---|
| CA2 | Roller lever: R38 mm | 15±5° |
| G2 | Roller lever, high sensitivity: R38 mm | 10° $^{+2°}_{-1°}$ |
| GCA2 | Roller lever, high precision: R38 mm | 5° $^{+2°}_{0°}$ |
| D28 | Sealed top-roller plunger | 1.7 mm |

#### (2) Built-in Switch Type

| Code | Specification |
|---|---|
| Blank | Standard built-in switch |
| 55 | Airtight built-in switch |

#### (3) Indicator Type

| Code | Specifications |
|---|---|
| LD | LED (10 to 115 VAC/DC) |

#### (4) Connector Type

| Code | Specification | | | | |
|---|---|---|---|---|---|
| | Shape | | Voltage used *1 | Wiring locations | Connector pin No. *2 |
| K13A | Direct-wired connector | Threaded (M12) | AC | NO only | NO: ③ ④ |
| K13 | | | DC | NO only | NO: ③ ④ |
| K43A | | | AC | NC+NO | NC: ① ②, NO: ③ ④ |
| K43 | | | DC | NC+NO | NC: ① ②, NO: ③ ④ |
| -M1J | Pre-wired connector *3 | Threaded (M12) | DC | NO only | NO: ③ ④ |
| -M1GJ | | | DC | NO only | NO: ① ④ |
| -M1JB | | | DC | NC only | NC: ② ③ |
| -AGJ | | | AC | NC+NO | NC: ① ②, NO: ③ ④ |
| -DGJ | | | DC | NC+NO | NC: ① ②, NO: ③ ④ |
| -DK1EJ | | | DC | NO only | NC: ②, NO: ③ ④ |
| -M1TJ | | Smartclick | DC | NO only | NO: ③ ④ |
| -M1TGJ | | | DC | NO only | NO: ① ④ |
| -M1TJB | | | DC | NC only | NC: ② ③ |
| -DTGJ | | | DC | NC+NO | NC: ① ②, NO: ③ ④ |
| -DTK1EJ | | | DC | NO only | NC: ②, NO: ③ ④ |

***1.** DC models are certified for EN/IEC (CE Marking).
***2.** Refer to *Contact Forms* on page 16 for details on connector pin numbers.
***3.** The standard cable length is 0.3 m. Contact your OMRON representative for information on other cable lengths.

## Model Number Legend (Not all combinations are possible. Contact your OMRON representative for details.)

**Environment-resistant Switches**

**WL□-□□□□□□□□-N**
(1) (2) (3) (4) (5) (6) (7) (8) (9)

### (1) Actuator and Property Specifications

| Code | Lever | Pretravel (PT) |
|---|---|---|
| CA2 | Roller lever: R38 mm | 15±5° |
| CA2-7 | Roller lever: R50 mm | |
| CA2-8 | Roller lever: R63 mm | |
| CA12 | Adjustable roller lever: R25 to 89 mm | |
| CL | Adjustable rod lever: 25 to 140 mm | |
| CAL4 | Adjustable rod lever: 350 to 380 mm | |
| CAL5 | Rod spring lever | |
| CA2-2 | Roller lever: R38 mm | 25±5° |
| CA12-2 | Adjustable roller lever: R25 to 89 mm | |
| CL-2 | Adjustable rod lever: 25 to 140 mm | |
| CA2-2N | Roller lever: R38 mm | MAX 20° |
| CA12-2N | Adjustable roller lever: R25 to 89 mm | |
| CL-2N | Adjustable rod lever: 25 to 140 mm | |
| G2 | Roller lever, high sensitivity: R38 mm | 10° $^{+2°}_{-1°}$ |
| G12 | Adjustable roller lever, high sensitivity: R25 to 89 mm | |
| GL | Adjustable rod lever, high sensitivity: 25 to 140 mm | |
| GCA2 | Roller lever, high precision: R38 mm | 5° $^{+2°}_{0°}$ |
| CA32-41 | Fork lever lock | 55° |
| CA32-42 | Fork lever lock | |
| CA32-43 | Fork lever lock | |
| D18 | Sealed top plunger | 1.7 mm |
| D28 | Sealed top-roller plunger | |
| D38 | Sealed top-ball plunger | |
| SD | Horizontal plunger | 2.8 mm |
| SD2 | Horizontal-roller plunger | |
| SD3 | Horizontal-ball plunger | |
| NJ | Flexible rod: Coil spring | 20±10 mm |
| NJ-30 | Flexible rod: Coil spring, multi-wire | |
| NJ-2 | Flexible rod: Resin rod | 40±20 mm |
| NJ-S2 | Flexible rod: Steel wire | |

### (2) Environment-resistant Model Specifications

| Code | Specifications |
|---|---|
| Blank | Standard |
| RP | Corrosion-proof |
| P1 | Weather-proof |

### (3) Built-in Switch Type

| Code | Specifications |
|---|---|
| Blank | Standard built-in switch |
| 55 | Airtight built-in switch |

### (4) Temperature Specifications

| Code | Specifications |
|---|---|
| Blank | Standard: −10°C to +80°C |
| TH | Heat-resistant: +5°C to +120°C *1 |
| TC | Low-temperature: −40°C to +40°C *1 |

***1.** Cannot be combined with Corrosion-proof (RP) or Weather-proof (P1) Switches.

### (5) Hermetic Specification

| Code | Specifications |
|---|---|
| Blank | No cable molding. |
| 139 | Standard built-in switch. Cable is attached.<br>Molded conduit opening and cover. (The cover cannot be removed.) |
| 140 | Airtight built-in switch. Cable is attached.<br>Molded conduit opening, cover, and cover screws. (The cover cannot be removed.) |
| 141 | Airtight built-in switch. Cable is attached.<br>Molded conduit opening, cover, head, cover screws, and head screws. (The cover cannot be removed and the head direction cannot be changed.)<br>Double seal against oil including head cap countermeasure for cutting chips and an oil seal. |
| 145 | Airtight built-in switch. Cable is attached.<br>Molded conduit opening, cover, and cover screws. (The cover cannot be removed. The head can be mounted in any of 4 directions.)<br>Double seal against oil including head cap countermeasure for cutting chips and an oil seal. |
| RP40 | Airtight built-in switch. Cable is attached.<br>Molded conduit opening and cover. (The cover cannot be removed.)<br>SC Connector can be removed, so it is possible to use flexible conduits for the cable. |
| RP60 | Airtight built-in switch. Cables are attached.<br>Molded conduit opening, cover, cover screws, and head screws. (The cover cannot be removed and the head direction cannot be changed.)<br>Fluorine rubber is used for all rubber parts. |

### (6) Conduit Size, Ground Terminal Specifications

| Code | Specifications | |
|---|---|---|
| | Conduit Size | Ground terminal |
| Blank | G1/2 | None |
| G1 | G1/2 | Provided *2 |
| G | Pg13.5 | |
| Y | M20 | |
| TS | 1/2-14NPT | |

***2.** Models with ground terminals are certified for EN/IEC (CE Marking).

### (7) Indicator Type

| Code | Specifications |
|---|---|
| Blank | No indicator |
| LE | Neon lamp: 125 to 250 VAC |
| LD | LED (10 to 115 VAC/DC) |

***3.** Cannot be combined with Corrosion-proof (RP), Weather-proof (P1), Heat-resistant (TC), or Low-temperature (TC) Switches.

### (8) Indicator Wiring Specification

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

***4.** Always include the indicator wiring specification if you specify a (5) hermetic structure and an (7) indicator.

### (9) Lever Type

| Code | Specifications |
|---|---|
| Blank | Standard lever (Allen-head bolt) |
| A | Double nut lever |

## Model Number Legend (Not all combinations are possible. Contact your OMRON representative for details.)

### Spatter-prevention Switches

**WL□ - □ □ S□ -N**
(1) (2) (3) (4)

#### (1) Actuator and Property Specifications

| Code | Lever | Pretravel (PT) |
|---|---|---|
| CA2 | Roller lever: R38 mm | 15±5° |
| G2 | Roller lever, high sensitivity: R38 mm | $10^{\circ}{}^{+2^{\circ}}_{-1^{\circ}}$ |
| GCA2 | Roller lever, high precision: R38 mm | $5^{\circ}{}^{+2^{\circ}}_{0^{\circ}}$ |
| D28 | Sealed top-roller plunger | 1.7 mm |

#### (2) Built-in Switch Type

| Code | Specifications |
|---|---|
| Blank | Standard built-in switch |
| 55 | Airtight built-in switch |

#### (3) Indicator Type

| Code | Specifications |
|---|---|
| LE | Neon lamp: 125 to 250 VAC *1 |
| LD | LED (10 to 115 VAC/DC) |

***1.** Cannot be combined with a Switch with a Connector.

#### (4) Connector Type

| Code | Specifications | | | | |
|---|---|---|---|---|---|
| | Shape | | Voltage *2 | Wiring locations | Connector pin No. *3 |
| Blank | No connector | — | — | — | — |
| -M1J-1 | Pre-wired Connector *4 | Threaded (M12) | DC | NO only | NO: ③④ |
| -M1GJ-1 | | | DC | NO only | NO: ①④ |
| -DGJS | | | DC | NC+NO | NC: ①②, NO: ③④ |
| -DTGJS | | Smartclick | DC | NC+NO | NC: ①②, NO: ③④ |

***2.** DC models are certified for EN/IEC (CE Marking).
***3.** Refer to *Contact Forms* on page 16 for details on connector pin numbers.
***4.** The standard cable length is 0.3 m. Contact your OMRON representative for information on other cable lengths.

## Model Number Legend (Not all combinations are possible. Contact your OMRON representative for details.)

**Long-life Switches**

**WLM□-LD□-N**
(1) (2) (3)

### (1) Actuator and Property Specifications

| Code | Lever | Pretravel (PT) |
|---|---|---|
| CA2 | Roller lever: R38 mm | 15±5° |
| G2 | Roller lever, high sensitivity: R38 mm | $10^{\circ}{}^{+2^{\circ}}_{-1^{\circ}}$ |
| GCA2 | Roller lever, high precision: R38 mm | $5^{\circ}{}^{+2^{\circ}}_{0^{\circ}}$ |

### (2) Indicator Type

| Code | Specifications |
|---|---|
| LD | LED (10 to 115 VAC/DC) |

### (3) Connector Type

| Code | Specifications | | | | |
|---|---|---|---|---|---|
| | Shape | | Voltage | Wiring locations | Connector pin No. |
| Blank | Screw terminals: G1/2 conduit | — | — | — | — |
| K13A | Direct-wired connector | Threaded (M12) | AC | NO only | NO: ③ ④ |
| K13 | | | DC | NO only | NO: ③ ④ |
| K43A | | | AC | NC+NO | NC: ① ②, NO: ③ ④ |
| K43 | | | DC | NC+NO | NC: ① ②, NO: ③ ④ |
| -M1J | Pre-wired connector *1 | Threaded (M12) | DC | NO only | NO: ③ ④ |
| -AGJ | | | AC | NC+NO | NC: ① ②, NO: ③ ④ |
| -DGJ | | | DC | NC+NO | NC: ① ②, NO: ③ ④ |
| -M1TJ | | Smartclick | DC | NO only | NO: ③ ④ |
| -ATGJ | | | AC | NC+NO | NC: ① ②, NO: ③ ④ |
| -DTGJ | | | DC | NC+NO | NC: ① ②, NO: ③ ④ |

***1.** The standard cable length is 0.3 m. Contact your OMRON representative for information on other cable lengths.

# Ordering Information

## General-purpose Switches

### Standard Switches

### Switches with Lever Actuators

| Actuator | | Roller lever R38  | Roller lever: R50  | Roller lever: R63  |
|---|---|---|---|---|
| Item | Pretravel (PT) | Model | Model | Model |
| Basic | 15±5° | WLCA2-N | WLCA2-7-N | WLCA2-8-N |
| | 25±5° | WLCA2-2-N | — | — |
| | MAX20° | WLCA2-2N-N | — | — |
| High-sensitivity | 10° $^{+2°}_{-1°}$ | WLG2-N | — | — |
| High-precision | 5° $^{+2°}_{0°}$ | WLGCA2-N | — | — |

| Actuator | | Adjustable roller lever  | Adjustable rod lever: 25 to 140mm  | Adjustable rod lever: 350 to 380mm  | Rod spring lever  |
|---|---|---|---|---|---|
| Item | Pretravel (PT) | Model | Model | Model | Model |
| Basic | 15±5° | WLCA12-N | WLCL-N | WLCAL4-N | WLCAL5-N |
| | 25±5° | WLCA12-2-N | WLCL-2-N | — | — |
| | MAX20° | WLCA12-2N-N | WLCL-2N-N | — | — |
| High-sensitivity | 10° $^{+2°}_{-1°}$ | WLG12-N | WLGL-N | — | — |

| Actuator | | Fork lever lock  | Fork lever lock  | Fork lever lock  | Fork lever lock  |
|---|---|---|---|---|---|
| Item | Movement until the lever reverses | Model | Model | Model | Model |
| Protective | 50±5° | WLCA32-41-N | WLCA32-42-N | WLCA32-43-N | WLCA32-44-N |

### Switches with Plunger Actuators

| Actuator | | Sealed top plunger  | Sealed top-roller plunger  | Sealed top-ball plunger  |
|---|---|---|---|---|
| Item | Pretravel (PT) | Model | Model | Model |
| Basic | 1.7 mm | WLD18-N | WLD28-N | WLD38-N |

| Actuator | | Horizontal plunger  | Horizontal-roller plunger  | Horizontal-ball plunger  |
|---|---|---|---|---|
| Item | Pretravel (PT) | Model | Model | Model |
| Basic | 2.8 mm | WLSD-N | WLSD2-N | WLSD3-N |

### Switches with Flexible Rod Actuators

| Actuator | | Coil spring (spring diameter: 6.5)  | Coil spring (spring diameter: 4.8)  |
|---|---|---|---|
| Item | Pretravel (PT) | Model | Model |
| Basic | 20±10 mm | WLNJ-N | WLNJ-30-N |

| Actuator | | Resin rod (rod diameter: 8)  | Steel wire (wire diameter: 1)  |
|---|---|---|---|
| Item | Pretravel (PT) | Model | Model |
| Basic | 40±20 mm | WLNJ-2-N | WLNJ-S2-N |

## General-purpose Switches

### Operation Indicator Switches

### Switches with Lever Actuators

| Actuator | | | Roller lever: R38 | Roller lever: R50 | Roller lever: R63 |
|---|---|---|---|---|---|
| Indicator | Item | Pretravel (PT) | Model | Model | Model |
| Neon lamp | Basic | 15±5° | WLCA2-LE-N | WLCA2-7LE-N | WLCA2-8LE-N |
| | | 25±5° | WLCA2-2LE-N | — | — |
| | | MAX20° | WLCA2-2NLE-N | — | — |
| | High-sensitivity | 10° +2° -1° | WLG2-LE-N | — | — |
| | High-precision | 5° +2° 0° | WLGCA2-LE-N | — | — |
| LED | Basic | 15±5° | WLCA2-LD-N | WLCA2-7LD-N | WLCA2-8LD-N |
| | | 25±5° | WLCA2-2LD-N | — | — |
| | | MAX20° | WLCA2-2NLD-N | — | — |
| | High-sensitivity | 10° +2° -1° | WLG2-LD-N | — | — |
| | High-precision | 5° +2° 0° | WLGCA2-LD-N | — | — |

| Actuator | | | Adjustable roller lever: | Adjustable rod lever: 25 to 140mm | Adjustable rod lever: 350 to 380mm | Rod spring lever |
|---|---|---|---|---|---|---|
| Indicator | Item | Pretravel (PT) | Model | Model | Model | Model |
| Neon lamp | Basic | 15±5° | WLCA12-LE-N | WLCL-LE-N | WLCAL4-LE-N | WLCAL5-LE-N |
| | | 25±5° | WLCA12-2LE-N | WLCL-2LE-N | — | — |
| | | MAX20° | WLCA12-2NLE-N | WLCL-2NLE-N | — | — |
| | High-sensitivity | 10° +2° -1° | WLG12-LE-N | WLGL-LE-N | — | — |
| LED | Basic | 15±5° | WLCA12-LD-N | WLCL-LD-N | WLCAL4-LD-N | WLCAL5-LD-N |
| | | 25±5° | WLCA12-2LD-N | WLCL-2LD-N | — | — |
| | | MAX20° | WLCA12-2NLD-N | WLCL-2NLD-N | — | — |
| | High-sensitivity | 10° +2° -1° | WLG12-LD-N | WLGL-LD-N | — | — |

| Actuator | | | Fork lever lock | Fork lever lock | Fork lever lock |
|---|---|---|---|---|---|
| Indicator | Item | Movement until the lever reverses | Model | Model | Model |
| Neon lamp | Basic | 50±5° | WLCA32-41LE-N | WLCA32-42LE-N | WLCA32-43LE-N |
| LED | Basic | 50±5° | WLCA32-41LD-N | — | WLCA32-43LD-N |

### Switches with Plunger Actuators

| Actuator | | | Sealed top plunger | Sealed top-roller plunger | Sealed top-ball plunger |
|---|---|---|---|---|---|
| Indicator | Item | Pretravel (PT) | Model | Model | Model |
| Neon lamp | Basic | 1.7 mm | WLD18-LE-N | WLD28-LE-N | WLD38-LE-N |
| LED | Basic | 1.7 mm | WLD18-LD-N | WLD28-LD-N | WLD38-LD-N |

| Actuator | | | Horizontal plunger | Horizontal-roller plunger | Horizontal-ball plunger |
|---|---|---|---|---|---|
| Indicator | Item | Pretravel (PT) | Model | Model | Model |
| Neon lamp | Basic | 2.8 mm | WLSD-LE-N | WLSD2-LE-N | WLSD3-LE-N |
| LED | Basic | 2.8 mm | WLSD-LD-N | WLSD2-LD-N | WLSD3-LD-N |

### Switches with Flexible Rod Actuators

| Actuator | | | Coil spring (spring diameter: 6.5) | Coil spring (spring diameter: 4.8) |
|---|---|---|---|---|
| Indicator | Item | Pretravel (PT) | Model | Model |
| Neon lamp | Basic | 20±10 mm | WLNJ-LE-N | WLNJ-30LE-N |
| LED | Basic | 20±10 mm | WLNJ-LD-N | WLNJ-30LD-N |

| Actuator | | | Resin rod (rod diameter: 8) | Steel wire (wire diameter: 1) |
|---|---|---|---|---|
| Indicator | Item | Pretravel (PT) | Model | Model |
| Neon lamp | Basic | 40±20 mm | WLNJ-2LE-N | WLNJ-S2LE-N |
| LED | Basic | 40±20 mm | WLNJ-2LD-N | WLNJ-S2LD-N |

## General-purpose Switches

### Sensor I/O Connector Switches

### Switches with Direct-wired Connectors

| | | | | Actuator | Roller lever: R38 | | |
|---|---|---|---|---|---|---|---|
| | | | | Item | Basic | High-sensitivity | High-precision |
| Connector shape | Built-in switch type | Voltage | Wiring locations | Connector pin No. | Model | Model | Model |
| Threaded (M12) | General-purpose | AC | NO only | NO ③ ④ | WLCA2-LDK13A-N | — | — |
| | | | NC + NO | NC ① ②<br>NO ③ ④ | WLCA2-LDK43A-N | — | — |
| | | DC | NO only | NO ③ ④ | WLCA2-LDK13-N | WLG2-LDK13-N | WLGCA2-LDK13-N |
| | | | NC + NO | NC ① ②<br>NO ③ ④ | WLCA2-LDK43-N | WLG2-LDK43-N | WLGCA2-LDK43-N |
| | Airtight | AC | NO only | NO ③ ④ | WLCA2-55LDK13-N | WLG2-55LDK13-N | WLGCA2-55LDK13-N |
| | | | NC + NO | NC ① ②<br>NO ③ ④ | WLCA2-55LDK43-N | WLG2-55LDK43-N | WLGCA2-55LDK43-N |

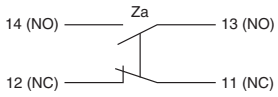
### Switches with Pre-wired Connectors

| | | | | Actuator | Roller lever R38 | | |
|---|---|---|---|---|---|---|---|
| | | | | Item | Basic | High-sensitivity | High-precision |
| Connector shape | Built-in switch type | Voltage | Wiring locations | Connector pin No. | Model | Model | Model |
| Threaded (M12) | General-purpose | DC | NO only | NO ③ ④ | WLCA2-LD-M1J-N | WLG2-LD-M1J-N | WLGCA2-LD-M1J-N |
| | | | | NO ① ④ | WLCA2-LD-M1GJ-N | WLG2-LD-M1GJ-N | WLGCA2-LD-M1GJ-N |
| | | | NC only | NC ② ③ | WLCA2-LD-M1JB-N | WLG2-LD-M1JB-N | — |
| | | | NC + NO | NC ① ②<br>NO ③ ④ | WLCA2-LD-DGJ-N | WLG2-LD-DGJ-N | WLGCA2-LD-DGJ-N |
| | | | NO only | NO ④ ③<br>NC ② | WLCA2-LD-DK1EJ-N | WLG2-LD-DK1EJ-N | — |
| | Airtight | | NO only | NO ③ ④ | WLCA2-55LD-M1J-N | — | WLGCA2-55LD-M1J-N |
| | | | | NO ① ④ | WLCA2-55LD-M1GJ-N | WLG2-55LD-M1GJ-N | WLGCA2-55LD-M1GJ-N |
| | | | NC only | NC ② ③ | WLCA2-55LD-M1JB-N | WLG2-55LD-M1JB-N | WLGCA2-55LD-M1JB-N |
| | | | NC + NO | NC ① ②<br>NO ③ ④ | WLCA2-55LD-DGJ-N | WLG2-55LD-DGJ-N | WLGCA2-55LD-DGJ-N |
| | | | NO only | NO ④ ③<br>NC ② | WLCA2-55LD-DK1EJ-N | WLG2-55LD-DK1EJ-N | — |
| Smartclick | General-purpose | | NO only | NO ③ ④ | — | WLG2-LD-M1TJ-N | — |
| | | | NO only | NC ② ③ | — | WLG2-LD-M1TJB-N | — |

**Note:** The standard cable length for a pre-wired connector is 0.3 m. Contact your OMRON representative for information on other cable lengths.

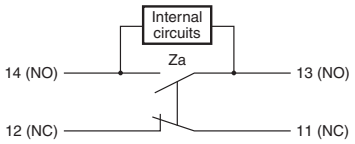
# Contact Forms

## Screw Terminal Switches




## Screw Terminal Switches

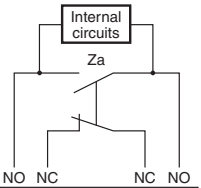
### Indicator-equipped (Light-ON when Not Operating) Switches *1




## Direct-wired Connectors/Pre-wired Connectors

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

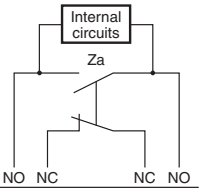
**AC**




| | | |
|---|---|---|
| WL□-□K13A-N | ④ | — — ③ |
| WL□-□K43A-N<br>WL□-□-AGJ-N | ④ ① | ② ③ |

①②③④ indicate the connector pin number.

**DC**

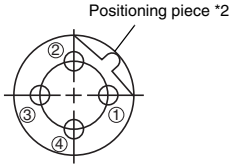



| | | |
|---|---|---|
| WL□-□K13-N<br>WL□-□-M1J-N<br>WL□-□-M1TJ-N | ④ | — — ③ |
| WL□-□-M1GJ-N<br>WL□-□-M1TGJ-N | ④ | — — ① |
| WL□-□-M1JB-N<br>WL□-□-M1TJB-N | — | ③ ② — |
| WL□-□K43-N<br>WL□-□DGJ-N<br>WL□-□DTGJ-N | ④ ① | ② ③ |

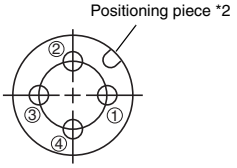
①②③④ indicate the connector pin number.

### Connector Pin Layout Diagram

**AC**




**DC**

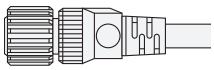
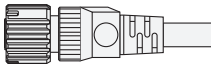



**Note:** Leakage current from indicator circuit may cause load malfunction (i.e., the load may remain ON). Make sure that the load operating current is higher than the leakage current. For countermeasures, refer to technical support on your OMRON website.

***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.

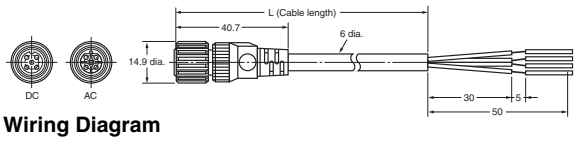
***2.** The position of the positioning piece is not always the same. If using an L-shaped connector causes problems in application, use a straight connector.

## Connecting Sensor I/O connector cable (Socket)

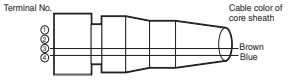
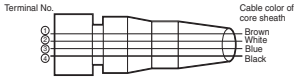
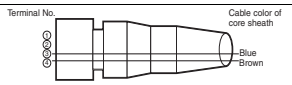
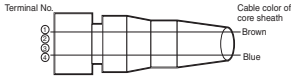
| Type | AC/DC Type | Number of cable cores | Cable length L (m) | Model | Applicable limit switch models |
|---|---|---|---|---|---|
| M12 Screw (Straight)  | AC | 2 | 2 m | **XS2F-A421-DB0-F** | **WL□-□K13A-N** |
| | | | 5 m | **XS2F-A421-GB0-F** | |
| | | 4 | 2 m | **XS2F-A421-D90-F** | **WL□-□K43A-N**<br>**WL□-□-AGJ-N** |
| | | | 5 m | **XS2F-A421-G90-F** | |
| | DC | 2 | 2 m | **XS2F-D421-DD0** | **WL□-□K13-N**<br>**WL□-□-M1J-N** |
| | | | 5 m | **XS2F-D421-GD0** | |
| | | | 2 m | **XS2F-D421-DA0-F** | **WL□-□-M1GJ□-N** |
| | | | 5 m | **XS2F-D421-GA0-F** | |
| | | 4 | 2 m | **XS2F-D421-D80-F** | **WL□-□K43-N**<br>**WL□-□-M1JB-N**<br>**WL□-□DGJ-N** |
| | | | 5 m | **XS2F-D421-G80-F** | |
| M12 Smart click type (Straight)  | DC | 4 | 2 m | **XS5F-D421-D80-F** | **WL□-□-M1TJ-N**<br>**WL□-□-M1TJB-N** |
| | | | 5 m | **XS5F-D421-G80-F** | |

## Dimensions (Unit: mm)

**XS2F-□421-□□0-□**
**XS2F-D421-□D0**

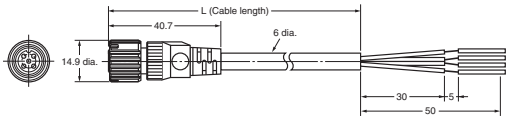



### Wiring Diagram

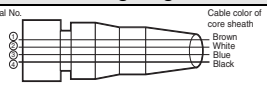
| AC/DC Type | Two-core model | | Four-core model | |
|---|---|---|---|---|
| | Model | Wiring Diagram | Model | Wiring Diagram |
| AC | XS2F-A421-DB0-F<br>XS2F-A421-GB0-F |  | XS2F-A421-D90-F<br>XS2F-A421-G90-F |  |
| DC | XS2F-D421-DD0<br>XS2F-D421-GD0 |  | XS2F-D421-D80-F<br>XS2F-D421-G80-F | |
| | XS2F-D421-DA0-F<br>XS2F-D421-GA0-F |  | | |



**XS5F-D421-□80-F**




### Wiring Diagram

| AC/DC Type | Four-core model | |
|---|---|---|
| | Model | Wiring Diagram |
| DC | XS5F-D421-D80-F<br>XS5F-D421-G80-F |  |

## Environment-resistant Switches

### Standard Switches

| Item | | | Actuator | Roller lever R38 | Adjustable roller lever | Adjustable rod lever 25 to 140mm |
|---|---|---|---|---|---|---|
| | | | Pretravel (PT) | Model | Model | Model |
| Airtight seal | | Basic | 15±5° | WLCA2-55-N | WLCA12-55-N | WLCL-55-N |
| | | | 25±5° | WLCA2-255-N | — | — |
| | | | MAX20° | WLCA2-2N55-N | — | — |
| | | High-sensitivity | 10° +2° | WLG2-55-N | — | — |
| | | High-precision | 5° +2° 0° | WLGCA2-55-N | — | — |
| Hermetic seal | Molded terminals, -139 models | Basic | 15±5° | WLCA2-139-N | WLCA12-139-N | WLCL-139-N |
| | | | 25±5° | WLCA2-2139-N | — | — |
| | | | MAX20° | WLCA2-2N139-N | — | — |
| | | High-sensitivity | 10° +2° | WLG2-139-N | — | — |
| | | High-precision | 5° +2° 0° | WLGCA2-139-N | — | — |
| | Molded terminals, -140 models | Basic | 15±5° | WLCA2-140-N | WLCA12-140-N | WLCL-140-N |
| | | | 25±5° | — | — | — |
| | | | MAX20° | WLCA2-2N140-N | — | — |
| | | High-sensitivity | 10° +2° | WLG2-140-N | — | — |
| | | High-precision | 5° +2° 0° | — | — | — |
| | Molded terminals, -141 models | Basic | 15±5° | WLCA2-141-N | WLCA12-141-N | — |
| | | | 25±5° | — | — | — |
| | | | MAX20° | — | — | — |
| | | High-sensitivity | 10° +2° | WLG2-141-N | — | — |
| | | High-precision | 5° +2° 0° | WLGCA2-141-N | — | — |
| | Anti-coolant | Basic | 15±5° | WLCA2-RP60-N | WLCA12-RP60-N | WLCL-RP60-N |
| | | | 25±5° | WLCA2-2RP60-N | — | — |
| | | | MAX20° | — | — | — |
| | | High-sensitivity | 10° +2° | WLG2-RP60-N | — | — |
| | | High-precision | 5° +2° 0° | WLGCA2-RP60-N | — | — |
| Heat-resistant | | Basic | 15±5° | WLCA2-TH-N | WLCA12-TH-N | WLCL-TH-N |
| | | | 25±5° | WLCA2-2TH-N | WLCA12-2TH-N | WLCL-2TH-N |
| | | | MAX20° | WLCA2-2NTH-N | WLCA12-2NTH-N | WLCL-2NTH-N |
| | | High-sensitivity | 10° +2° | WLG2-TH-N | WLG12-TH-N | WLGL-TH-N |
| | | High-precision | 5° +2° 0° | WLGCA2-TH-N | — | — |
| Low-temperature | | Basic | 15±5° | WLCA2-TC-N | WLCA12-TC-N | WLCL-TC-N |
| | | | 25±5° | WLCA2-2TC-N | WLCA12-2TC-N | WLCL-2TC-N |
| | | | MAX20° | WLCA2-2NTC-N | WLCA12-2NTC-N | WLCL-2NTC-N |
| | | High-sensitivity | 10° +2° | WLG2-TC-N | WLG12-TC-N | WLGL-TC-N |
| | | High-precision | 5° +2° 0° | WLGCA2-TC-N | — | — |
| Corrosion-proof | | Basic | 15±5° | WLCA2-RP-N | WLCA12-RP-N | WLCL-RP-N |
| | | | 25±5° | — | — | — |
| | | | MAX20° | — | — | — |
| | | High-sensitivity | 10° +2° | WLG2-RP-N | — | — |
| | | High-precision | 5° +2° 0° | WLGCA2-RP-N | — | — |
| Weather-proof | | Basic | 15±5° | WLCA2-P1-N | WLCA12-P1-N | WLCL-P1-N |
| | | | 25±5° | — | | — |
| | | | MAX20° | — | | — |
| | | High-sensitivity | 10° +2° | WLG2-P1-N | WLG12-P1-N | WLGL-P1-N |

**Note:** The maximum cable length for a Hermetic Switch is 5 m.

| Actuator | | Sealed top-roller plunger | Horizontal plunger | Horizontal-roller plunger | Coil spring (spring diameter: 6.5) | Resin rod (rod diameter: 8) |
|---|---|---|---|---|---|---|
| | | Model | Model | Model | Model | Model |
| Airtight | | WLD28-55-N | WLSD-55-N | WLSD2-55-N | WLNJ-55-N | WLNJ-255-N |
| Hermetic | Molded terminals, -139 models | WLD28-139-N | WLSD-139-N | WLSD2-139-N | WLNJ-139-N | WLNJ-2139-N |
| | Molded terminals, -140 models | WLD28-140-N | — | WLSD2-140-N | WLNJ-140-N | WLNJ-2140-N |
| | Anti-coolant | WLD28-RP60-N | WLSD-RP60-N | WLSD2-RP60-N | WLNJ-RP60-N | WLNJ-2RP60-N |
| Heat-resistant | | WLD28-TH-N | WLSD-TH-N | WLSD2-TH-N | WLNJ-TH-N | — |
| Low-temperature | | — | WLSD-TC-N | WLSD2-TC-N | WLNJ-TC-N | — |
| Corrosion-proof | | WLD28-RP-N | WLSD-RP-N | WLSD2-RP-N | WLNJ-RP-N | WLNJ-2RP-N |

**Note:** The maximum cable length for a Hermetic Switch is 5 m.

## Environment-resistant Switches

### Operation indicator Switches

### Airtight Switches

| Actuator | | | Roller lever: R38  | Adjustable roller lever  | Adjustable rod lever: 25 to 140mm  |
|---|---|---|---|---|---|
| Indicator | Item | Pretravel (PT) | Model | Model | Model |
| Neon lamp | Basic | 15±5° | WLCA2-55LE-N | WLCA12-55LE-N | — |
| | | 25±5° | WLCA2-255LE-N | — | — |
| | | MAX20° | WLCA2-2N55LE-N | — | — |
| | High-sensitivity | 10° $^{+2°}_{-1°}$ | WLG2-55LE-N | — | — |
| | High-precision | 5° $^{+2°}_{0°}$ | WLGCA2-55LE-N | — | — |
| LED | Basic | 15±5° | WLCA2-55LD-N | WLCA12-55LD-N | WLCL-55LD-N |
| | | 25±5° | WLCA2-255LD-N | — | — |
| | | MAX20° | WLCA2-2N55LD-N | — | — |
| | High-sensitivity | 10° $^{+2°}_{-1°}$ | WLG2-55LD-N | — | — |
| | High-precision | 5° $^{+2°}_{0°}$ | WLGCA2-55LD-N | — | — |

| Actuator | | Sealed top-roller plunger  | Horizontal plunger  | Horizontal-roller plunger  | Coil spring (spring diameter: 6.5)  | Resin rod (rod diameter: 8)  |
|---|---|---|---|---|---|---|
| Indicator | Item | Model | Model | Model | Model | Model |
| Neon lamp | Basic | WLD28-55LE-N | — | — | — | — |
| LED | Basic | WLD28-55LD-N | WLSD-55LD-N | WLSD2-55LD-N | WLNJ-55LD-N | WLNJ-255LD-N |

### Hermetic Switches

| Actuator | | | Roller lever: R38  | |
|---|---|---|---|---|
| | | Wiring specification | NC wiring | NO wiring |
| Item | | Pretravel (PT) | Model | Model |
| Molded terminals, -139 models | Basic | 15±5° | WLCA2-139LD2-N | WLCA2-139LD3-N |
| | | 25±5° | WLCA2-2139LD2-N | WLCA2-2139LD3-N |
| | | MAX20° | — | — |
| | High-sensitivity | 10° $^{+2°}_{-1°}$ | — | WLG2-139LD3-N |
| | High-precision | 5° $^{+2°}_{0°}$ | WLGCA2-139LD2-N | WLGCA2-139LD3-N |
| Molded terminals, -141 models | Basic | 15±5° | WLCA2-141LD2-N | WLCA2-141LD3-N |
| | | 25±5° | — | — |
| | | MAX20° | — | — |
| | High-sensitivity | 10° $^{+2°}_{-1°}$ | WLG2-141LD2-N | WLG2-141LD3-N |
| | High-precision | 5° $^{+2°}_{0°}$ | — | — |
| Anti-coolant | Basic | 15±5° | WLCA2-RP60LD2-N | WLCA2-RP60LD3-N |
| | | 25±5° | WLCA2-2RP60LD2-N | WLCA2-2RP60LD3-N |
| | | MAX20° | — | — |
| | High-sensitivity | 10° $^{+2°}_{-1°}$ | WLG2-RP60LD2-N | WLG2-RP60LD3-N |
| | High-precision | 5° $^{+2°}_{0°}$ | WLGCA2-RP60LD2-N | WLGCA2-RP60LD3-N |

**Note:** The maximum cable length for a Hermetic Switch is 5 m.

## Spatter-prevention Switches

| Actuator | | | Roller lever: R38 | | Sealed top-roller plunger |
|---|---|---|---|---|---|
| | | | Double Nut Lever | Allen-head Lever | |
| Indicator | Item | Pretravel (PT) | Model | Model | Model |
| Neon lamp | Basic | 15±5° | WLCA2-LEAS-N | WLCA2-LES-N | WLD28-LES-N |
| | High-sensitivity | 10° $^{+2°}_{-1°}$ | WLG2-LEAS-N | WLG2-LES-N | — |
| | High-precision | 5° $^{+2°}_{0°}$ | — | WLGCA2-LES-N | — |
| LED | Basic | 15±5° | WLCA2-LDAS-N | WLCA2-LDS-N | WLD28-LDS-N |
| | High-sensitivity | 10° $^{+2°}_{-1°}$ | WLG2-LDAS-N | WLG2-LDS-N | — |
| | High-precision | 5° $^{+2°}_{0°}$ | — | WLGCA2-LDS-N | — |

## Long-life Switches

| Item | | | Operation indicator (LED) *1 | | |
|---|---|---|---|---|---|
| | | | Basic 15±5° | High-sensitivity 10° $^{+2°}_{-1°}$ | High-precision 5° $^{+2°}_{0°}$ |
| Actuator | | | Model | Model | Model |
|  Roller lever: R38, screw terminals | | | WLMCA2-LD-N | WLMG2-LD-N | WLMGCA2-LD-N |
|  Roller lever, direct-wired connector | 2 conductors | AC | WLMCA2-LDK13A-N | WLMG2-LDK13A-N | WLMGCA2-LDK13A-N |
| | | DC | WLMCA2-LDK13-N | WLMG2-LDK13-N | WLMGCA2-LDK13-N |
| | 4 conductors | AC | WLMCA2-LDK43A-N | WLMG2-LDK43A-N | — |
| | | DC | WLMCA2-LDK43-N | WLMG2-LDK43-N | WLMGCA2-LDK43-N |
|  Roller lever, pre-wired connector *2 | 2 conductors | DC | WLMCA2-LD-M1J-N | WLMG2-LD-M1J-N | WLMGCA2-LD-M1J-N |
| | 4 conductors | DC | WLMCA2-LD-DGJ-N | WLMG2-LD-DGJ-N | — |

***1.** The default setting is light-ON when not operating (NO wiring).
Turn the lamp holder by 180° to change the setting to light-ON when operating (NC wiring).
(Ask your OMRON representative for information on 2-conductor models.)

***2.** With 0.3-m cable.

# Individual Parts

## Switches without Levers, Heads, and Actuators

### General-purpose Parts

| Actuator | Item | Pretravel (PT) | Set | Switch without levers | Head *1 (with Actuators) | Actuator only *2 |
|---|---|---|---|---|---|---|
| | | | | Model | Model | Model |
| Roller lever  | Basic | 15±5° | WLCA2-N | WLRCA2-N | WL-1H1100-N | WL-1A100 |
| | | 25±5° | WLCA2-2-N | WLRCA2-2-N | WL-3H1100-N | |
| | | MAX20° | WLCA2-2N-N | WLRCA2-2N-N | WL-1H1100-N | |
| | High-sensitivity | 10° +2° -1° | WLG2-N | WLRG2-N | WL-2H1100-N | |
| Adjustable roller lever  | Basic | 15±5° | WLCA12-N | WLRCA2-N | WL-1H2100-N | WL-2A100 |
| | | 25±5° | WLCA12-2-N | WLRCA2-2-N | WL-3H2100-N | |
| | | MAX20° | WLCA12-2N-N | WLRCA2-2N-N | WL-1H2100-N | |
| | High-sensitivity | 10° +2° -1° | WLG12-N | WLRG2-N | WL-2H2100-N | |
| Variable rod lever  | Basic | 15±5° | WLCL-N | WLRCA2-N | WL-1H4100-N | WL-4A100 |
| | | 25±5° | WLCL-2-N | WLRCA2-2-N | WL-3H4100-N | |
| | | MAX20° | WLCL-2N-N | WLRCA2-2N-N | WL-1H4100-N | |
| | High-sensitivity | 10° +2° -1° | WLGL-N | WLRG2-N | WL-2H4100-N | |
| Fork lever lock  | Basic | MAX55° | WLCA32-41-N | WLRCA32-N | WL-5H5100-N | WL-5A100 |
| | | | WLCA32-42-N | | WL-5H5102-N | WL-5A102 |
| | | | WLCA32-43-N | | WL-5H5104-N | WL-5A104 |
| | | | WLCA32-44-N | | WL-5H5104-N | WL-5A104 |
| Top plunger  | Basic | MAX 1.7 mm | WLD18-N | — | WL-7H100-N | — |
| | | | WLD28-N | | WL-7H400-N | — |
| | | | WLD38-N | | WL-7H300-N | — |
| Horizontal plunger  | Basic | MAX 2.8 mm | WLSD-N | — | WL-8H100-N | — |
| | | | WLSD2-N | | WL-8H200-N | — |
| | | | WLSD3-N | | WL-8H300-N | — |
| Flexible rod  | Basic | 20±10 mm | WLNJ-N | — | WL-9H100-N | — |
| | | | WLNJ-30-N | | WL-9H200-N | — |
| | | 40±20 mm | WLNJ-2-N | | WL-9H300-N | — |
| | | | WLNJ-S2-N | | WL-9H400-N | — |

***1.** The heads are not compatible with WL-series switches.
***2.** The same actuators can be used for both WL and WL-N switches.

### Spatter-prevention Parts

| Actuator | Lever Type | Item | Set | Switch without levers | Head *1 (with Actuators) | Actuator only *2 |
|---|---|---|---|---|---|---|
| | | | | Model | Model | Model |
| Roller lever  | Allen-head bolt lever | Basic | WLCA2-LES-N | WLRCA2-LES-N | WL-1H1100S-N | WL-1A103S |
| | | | WLCA2-LDS-N | WLRCA2-LDS-N | | |
| | | High-sensitivity | WLG2-LDS-N | WLRG2-LDS-N | | |
| | Double nut lever | Basic | WLCA2-LEAS-N | WLRCA2-LES-N | WL-2H1100S-N | WL-1A105S |
| | | | WLCA2-LDAS-N | WLRCA2-LDS-N | | |
| | | High-sensitivity | WLG2-LDAS-N | WLRG2-LDS-N | | |

***1.** The heads are not compatible with WL-series switches.
***2.** The same actuators can be used for both WL and WL-N switches.

## Covers with Indicators (See Note.)

### General-purpose Parts

| Cover / Item | Cover only * |
|---|---|
| | Model |
| Neon lamp | WL-LE-N |
| LED | WL-LD-N |

### Spatter-prevention Parts

| Cover / Item | Cover only * |
|---|---|
| | Model |
| Neon lamp | WL-LES-N |
| LED | WL-LDS-N |

* The covers are not compatible with WL-series switches.

**Note:** The default setting is for light-ON when not operating.
Turn the lamp holder by 180° to change the setting to light-ON when operating.

# Specifications

## General-purpose/ Environment-resistant Switches

## Ratings

### Screw Terminals

| Item | 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 |
| Basic or high-precision | AC | 125 | 10 | | 3 | 1.5 | 10 | | 5 | 2.5 |
| | | 250 | 10 | | 2 | 1 | 10 | | 3 | 1.5 |
| | | 500 | 10 | | 1.5 | 0.8 | 3 | | 1.5 | 0.8 |
| | DC | 8 | 10 | | 6 | 3 | 10 | | 6 | |
| | | 14 | 10 | | 6 | 3 | 10 | | 6 | |
| | | 30 | 6 | | 4 | 3 | 6 | | 4 | |
| | | 125 | 0.8 | | 0.2 | 0.2 | 0.8 | | 0.2 | |
| | | 250 | 0.4 | | 0.1 | 0.1 | 0.4 | | 0.1 | |
| High-sensitivity Switches | AC | 125 | 5 | | — | | — | | — | |
| | | 250 | 5 | | | | | | | |
| | DC | 125 | 0.4 | | — | | — | | — | |
| | | 250 | 0.2 | | | | | | | |

**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.
**5.** For PC loads, use the microload models.

| | | |
|---|---|---|
| Inrush current | NC | 30 A max.(15 A max. *) |
| | NO | 20 A max.(10 A max. *) |

* For high-sensitivity switches.

| | |
|---|---|
| Minimum applicable load | 5 VDC 1 mA, resistive load, P level |

### Operation indicator Switches

| Model | Item | Max. rated voltage | Leakage current (mA) |
|---|---|---|---|
| WL-LE-N | Neon lamp | 125 AC | Approx. 0.6 |
| | | 250 AC | Approx. 1.9 |
| WL-LD-N | LED | 10 to 24 VAC/DC | Approx. 0.4 |
| | | 115 VAC/DC | Approx. 0.5 |

## Characteristics

| | | |
|---|---|---|
| Degree of protection | | IP67 |
| Durability *1 | Mechanical | 15,000,000 operations min. *2 |
| | Electrical | 750,000 operations min. *3 |
| Operating speed | | 1 mm/s to 1 m/s (in case of WLCA2-N) |
| 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 mΩ max. (initial value for the built-in switch when tested alone) |
| Dielectric strength | Between terminals of the same polarity | 1,000 VAC (600 VAC), 50/60 Hz for 1 min |
| | Between currentcarrying metal part and ground | 2,200 VAC (1,500 VAC), 50/60 Hz for 1 min *4 |
| | Between each terminal and non-currentcarrying metal part | 2,200 VAC (1,500 VAC), 50/60 Hz for 1 min *4 |
| Vibration resistance | Malfunction | 10 to 55 Hz, 1.5-mm double amplitude *5 |
| Shock resistance | Destruction | 1,000 $m/s^2$ max. |
| | Malfunction | 300 $m/s^2$ *5 |
| Ambient operating temperature | | -10 to +80°C (with no icing) *6 |
| Ambient operating humidity | | 35% to 95% RH |
| Weight | | Approx. 255 g (in case of WLCA2-N) |

**Note: 1.** The above figures are initial values.
**2.** The figures in parentheses for dielectric strength are those for the high-sensitivity switches models.

***1.** 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.
***2.** High-sensitivity switches and switches with flexible rod actuators: 10 million operations min.
500,000 operations min. for weather-proof models.
***3.** Durability is 500,000 operations min. for high-sensitivity models.
500,000 operations min. for weather-proof models.
Contact your OMRON representative for information on environment-resistant switches.
***4.** Switches with Connectors: 1,500 V.
***5.** Except switches with flexible rod actuators.
***6.** For low-temperature models this is -40°C to +40°C (with no icing). For heat-resistant models the range is +5°C to +120°C.

**Spatter-prevention Switches**

# Ratings

## Screw Terminals

| Item | 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 |
| WL□-LES-N (Without high-sensitivity overtravel models) | AC 125 | 10 | | 3 | 1.5 | 10 | | 5 | 2.5 |
| | AC 250 | 10 | | 2 | 1 | 10 | | 3 | 1.5 |
| WL□-LDS-N (Without high-sensitivity overtravel models) | AC 115 | 10 | | 3 | 1.5 | 10 | | 5 | 2.5 |
| | DC 12 | 10 | | 6 | 3 | 10 | | 6 | |
| | DC 24 | 6 | | 4 | 3 | 6 | | 4 | |
| | DC 115 | 0.8 | | 0.2 | 0.2 | 0.8 | | 0.2 | |

**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.

***** Refer to the rating of a General-purpose / Weather-proof Switches type for the rating of a high-sensitivity overtravel type.

| | | |
|---|---|---|
| Inrush current | NC | 30 A max.(15 A max. *) |
| | NO | 20 A max.(10 A max. *) |

***** For high-sensitivity switches.

| | |
|---|---|
| Minimum applicable load | 5 VDC 1 mA, resistive load, P level |

# Characteristics

| | | |
|---|---|---|
| Degree of protection | | IP67 |
| Durability *1 | Mechanical | 15,000,000 operations min. *2 |
| | Electrical | 750,000 operations min. (3 A at 250 VAC, resistive load) *3 |
| Operating speed | | 1 mm/s to 1 m/s (in case of WLCA2-LDS-N) |
| 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 mΩ max. (initial value for the built-in switch when tested alone) |
| Dielectric strength | Between terminals of the same polarity | 1,000 VAC (600 VAC), 50/60 Hz for 1 min |
| | Between currentcarrying metal part and ground | 2,200 VAC (1,500 VAC), 50/60 Hz for 1 min *4 |
| | Between each terminal and non-currentcarrying metal part | 2,200 VAC (1,500 VAC), 50/60 Hz for 1 min *4 |
| Vibration resistance | Malfunction | 10 to 55 Hz, 1.5-mm double amplitude |
| Shock resistance | Destruction | 1,000 $m/s^2$ max. |
| | Malfunction | 300 $m/s^2$ |
| Ambient operating temperature | | -10 to +80°C (with no icing) |
| Ambient operating humidity | | 35% to 95% RH |
| Weight | | Approx. 255 g (in case of WLCA2-LDS-N) |

**Note: 1.** The above figures are initial values.
**2.** The figures in parentheses for dielectric strength are those for the highsensitivity overtravel models.

***1.** 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.
***2.** Durability is 10,000,000 operations min. for high-sensitivity models.
***3.** Durability is 500,000 operations min. for high-sensitivity models.
500,000 operations min. for weather-proof models.
Contact your OMRON representative for information on Airtight Switches.
***4.** Switches with Connectors: 1,500 V.

## Long-life Switches

# Ratings

## Screw Terminal Switches

| Item | 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 |
| Basic or high-precision | 115 AC | 10 | | 3 | 1.5 | 10 | | 5 | 2.5 |
| | 12 DC<br>24 DC<br>115 DC | 10<br>6<br>0.8 | | 6<br>4<br>0.2 | 3<br>3<br>0.2 | 10<br>6<br>0.8 | | 6<br>4<br>0.2 | |
| High-sensitivity | 115 AC | 5 | | — | | — | | — | |
| | 115 DC | 0.4 | | — | | — | | — | |

| | | |
|---|---|---|
| Inrush current | NC | 30 A max. (15 A max. *) |
| | NO | 20 A max. (10 A max. *) |

* For high-sensitivity overtravel models.

| | |
|---|---|
| Minimum applicable load | 5 VDC 1 mA, resistive load, P level |

## 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 |
| Basic or high-precision | 115 AC | 3 | | 3 | 1.5 | 3 | | 3 | 2.5 |
| | 12 DC<br>24 DC<br>115 DC | 3<br>3<br>0.8 | | 3<br>3<br>0.2 | | 3<br>3<br>0.8 | | 3<br>3<br>0.2 | |
| High-sensitivity | 115 AC | 3 | | — | | — | | — | |
| | 115 DC | 0.4 | | — | | — | | — | |

**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 *1 | Mechanical | 30,000,000 operations min. |
| | Electrical | 30,000,000 operations min. (10 mA at 24 VDC, resistive load)<br>750,000 operations min. (3 A at 115 VAC, resistive load)<br>High-sensitivity Switches: 500,000 operations min. (3 A at 115 VAC, resistive load) |
| Operating speed | | 1 mm/s to 1 m/s (for WLMCA2-LD-N) |
| 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 (600 VAC), 50/60 Hz for 1 min |
| | Between current-carrying metal part and ground | 2,200 VAC (1,500 VAC), 50/60 Hz for 1 min *2 |
| | Between each terminal and non-current-carrying metal part | 2,200 VAC (1,500 VAC), 50/60 Hz for 1 min *2 |
| Vibration resistance | Malfunction | 10 to 55 Hz, 1.5-mm double amplitude |
| Shock resistance | Destruction | 1,000 m/s$^2$ max. |
| | Malfunction | 300 m/s$^2$ max. |
| Ambient operating temperature | | –10°C to +80°C (with no icing) |
| Ambient operating humidity | | 35% to 95%RH |
| Weight | | Approx. 255 g (for WLMCA2-LD-N) |

**Note: 1.** The above figures are initial values.
**2.** The figures in parentheses for dielectric strength are for the High-sensitivity Switches.

***1.** 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.
***2.** Switches with Connectors: 1,500 V.

**General-purpose/ Environment-resistant/ Spatter-prevention Switches**

## Approved Standards

| Agency | Standard | File No. | Approved models |
|---|---|---|---|
| UL | UL508 | Contact your OMRON representative for information | Contact your OMRON representative for information |
| | CSA C22.2 No.14 | | |
| TÜV Rheinland | EN60947-5-1 | | |
| CCC (CQC) | GB14048.5 | | |

## Approved Standard Ratings

### UL/cUL (UL508, CSA C22.2 No.14)

| Specifications | | | Approved Standards |
|---|---|---|---|
| Indicator | Sensor I/O connectors | Item | |
| No indicator | No Connector | Basic Switches | A600<br>1 A, 125 VDC |
| | | High-sensitivity or high-precision | B600<br>0.5 A, 125 VDC |
| | Pre-wired Connector (AC) | Basic, high-sensitivity, or high-precision | C300<br>3 A, 250 VAC |
| | Pre-wired Connector (DC)<br>Direct-wired Connector (DC) | Basic Switches | 1 A, 125 VDC |
| | | High-sensitivity or high-precision | 0.5 A, 125 VDC |
| Neon lamp | No Connector | Basic Switches | A300<br>10 A, 250 VAC |
| | | High-sensitivity or high-precision | B300<br>5 A, 250 VAC |
| | Pre-wired Connector (AC) | Basic, high-sensitivity, or high-precision | C300<br>3 A, 250 VAC |
| LED | No Connector | Basic Switches | A150<br>10 A, 115 VAC<br>1 A, 115 VDC |
| | | High-sensitivity or high-precision | B150<br>5 A, 115 VAC<br>0.5 A, 115 VDC |
| | Pre-wired Connector (AC) | Basic, high-sensitivity, or high-precision | C150<br>3 A, 115 VAC |
| | Pre-wired Connector (DC)<br>Direct-wired Connector (DC) | Basic Switches | 1 A, 115 VDC |
| | | High-sensitivity or high-precision | 0.5 A, 115 VDC |

#### A600 Authentication conditions

| Rated voltage | Energizing current | Current (A) | | Volt-ampere (VA) | |
|---|---|---|---|---|---|
| | | Make | Break | Make | Break |
| 120 VAC<br>240 VAC<br>480 VAC<br>600 VAC | 10 A | 60<br>30<br>15<br>12 | 6<br>3<br>1.5<br>1.2 | 7,200 | 720 |

#### B600 Authentication conditions

| Rated voltage | Energizing current | Current (A) | | Volt-ampere (VA) | |
|---|---|---|---|---|---|
| | | Make | Break | Make | Break |
| 120 VAC<br>240 VAC<br>480 VAC<br>600 VAC | 5 A | 30<br>15<br>7.5<br>6 | 3<br>1.5<br>0.75<br>0.6 | 3,600 | 360 |

#### C300 Authentication conditions

| Rated voltage | Energizing current | Current (A) | | Volt-ampere (VA) | |
|---|---|---|---|---|---|
| | | Make | Break | Make | Break |
| 120 VAC<br>240 VAC | 2.5 A | 15<br>7.5 | 1.5<br>0.75 | 1,800 | 180 |

#### A300 Authentication conditions

| Rated voltage | Energizing current | Current (A) | | Volt-ampere (VA) | |
|---|---|---|---|---|---|
| | | Make | Break | Make | Break |
| 120 VAC<br>240 VAC | 10 A | 60<br>30 | 6<br>3 | 7,200 | 720 |

### B300 Authentication conditions

| Rated voltage | Energizing current | Current (A) | | Volt-ampere (VA) | |
|---|---|---|---|---|---|
| | | Make | Break | Make | Break |
| 120 VAC<br>240 VAC | 5 A | 30<br>15 | 3<br>1.5 | 3,600 | 360 |

### A150 Authentication conditions

| Rated voltage | Energizing current | Current (A) | | Volt-ampere (VA) | |
|---|---|---|---|---|---|
| | | Make | Break | Make | Break |
| 120 VAC | 10 A | 60 | 6 | 7,200 | 720 |

### B150 Authentication conditions

| Rated voltage | Energizing current | Current (A) | | Volt-ampere (VA) | |
|---|---|---|---|---|---|
| | | Make | Break | Make | Break |
| 120 VAC | 5 A | 30 | 3 | 3,600 | 360 |

### C150 Authentication conditions

| Rated voltage | Energizing current | Current (A) | | Volt-ampere (VA) | |
|---|---|---|---|---|---|
| | | Make | Break | Make | Break |
| 120 VAC | 2.5 A | 15 | 1.5 | 1,800 | 180 |

## TÜV (EN 60947-5-1)

(Certification Only for Switches with Ground Terminals and DC Switches with Connectors)

| Authentication conditions | Specification | | | | | |
|---|---|---|---|---|---|---|
| | With ground terminals | | | | | With DC Connector |
| | No indicator | | Neon lamp | LED | | |
| Working load category | AC-15 | DC-12 | AC-15 | AC-15 | DC-12 | DC-12 |
| Rated working voltage (Ue) | 250 V | 48 V | 250 V | 115 V | 48 V | 48 V |
| Rated working current (Ie) | 2 A | | | | | |
| Conditional short-circuit current | 100 A | | | | | |
| Short-circuit protective device (SCPD) | 10 A, fuse type gG | | | | | |
| Rated insulation voltage (Ui) | 250 V | | | | | 48 V |
| Rated impulse dielectric strength (Uimp) | 4 kV | | | | | 800 V |
| Pollution degree | 3 | | | | | |
| Electric shock protection class | Class I | | | | | Class III |

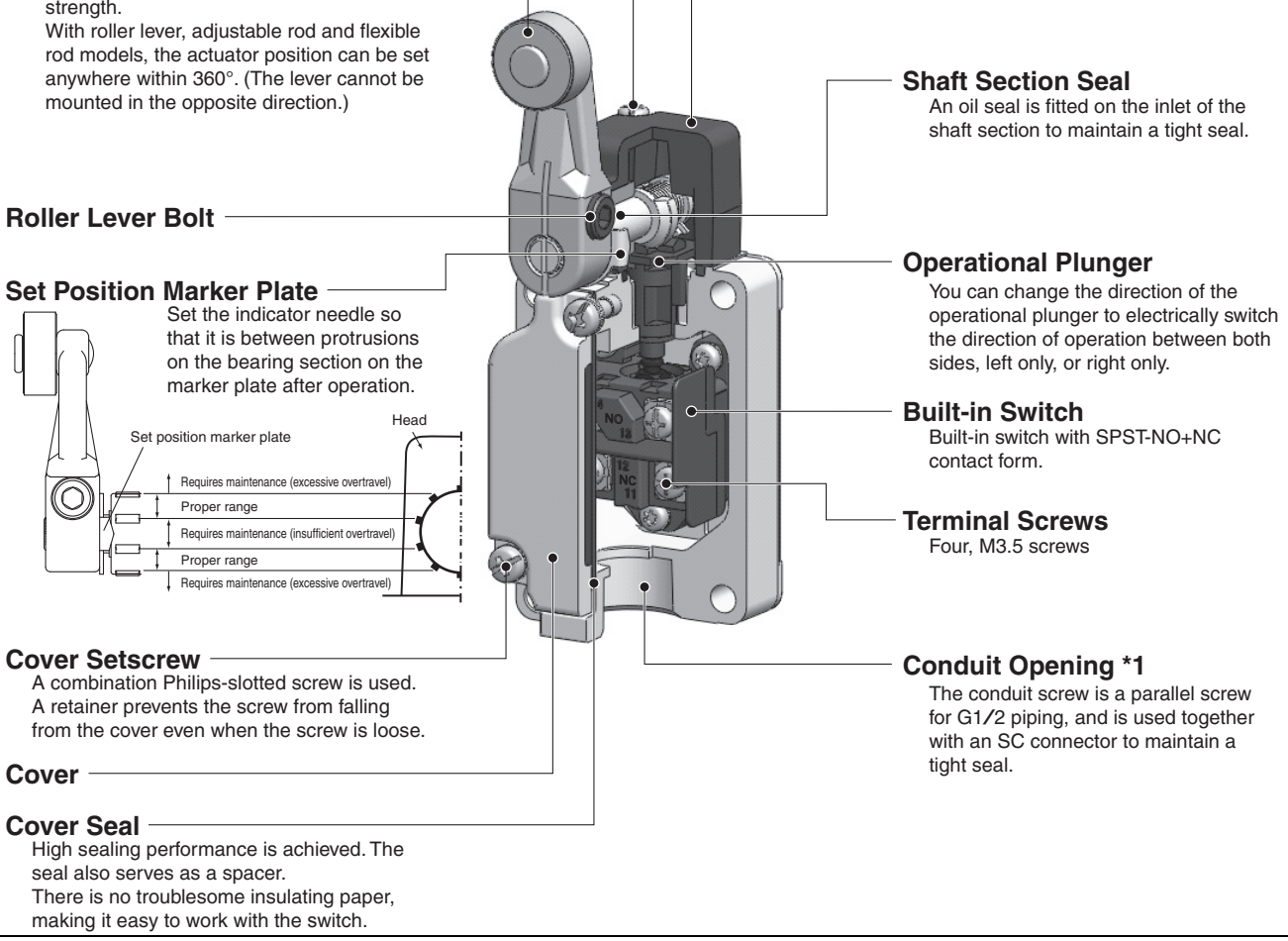
## CCC (GB14048.5)

| Authentication conditions | Specification | | | | | | |
|---|---|---|---|---|---|---|---|
| | No indicator | | Neon lamp | LED | | With DC Connector | With AC Connector |
| Working load category | AC-15 | DC-13 | AC-15 | AC-15 | DC-13 | DC-13 | AC-15 |
| Rated working voltage (Ue) | 250 V | 48 V | 250 V | 250 V | 48 V | 48 V | 250 V |
| Rated working current (Ie) | 2 A | | | | | | |
| Conditional short-circuit current | 1000 A | | | | | | |
| Short-circuit protective device (SCPD) | 10 A, fuse type gG | | | | | | |
| Rated insulation voltage (Ui) | 250 V | | | | | | |

# Structure and Nomenclature

## Structure

**General-purpose Switches: WLCA2-N**




***1.** The available conduit screws are Pg 13.5, M20 and 1/2-14 NPT.

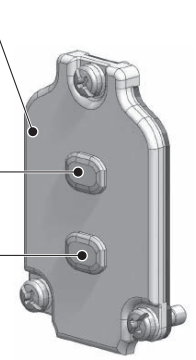
## Indicators

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

### Indicator Windows
Operating status (i.e., light-ON when operating or light-ON when not operating) depends on whether a neon lamp or an 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°.

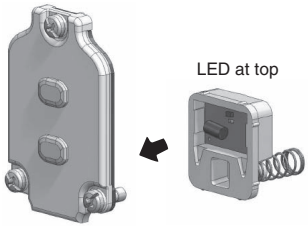


Lamp Holder

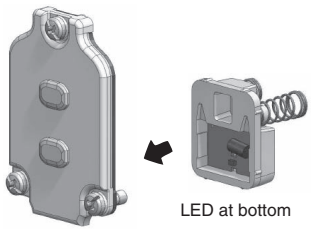
### Indicator
The indicator is either a neon lamp or an LED. Switches with LED indicators have a built-in rectifier stack, so there is no connection polarity.

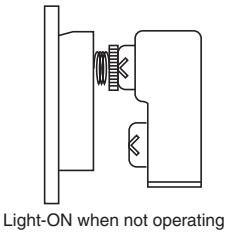
### Contact Spring
Use the terminal screws on the built-in switch to connect to the lamp terminals. A coil spring is used to make contact, so connecting to the lamp terminals is not necessary.

**Light-ON when Operating**



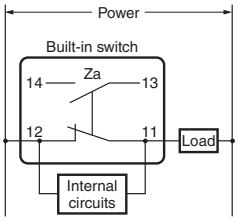
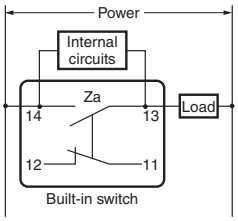

**Light-ON when Not Operating**



Light-ON when not operating

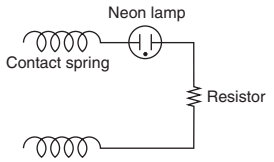
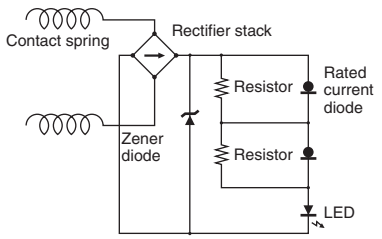
### Operation

| | | |
|---|---|---|
| WL-LE-N<br>WL-LD-N | **Light-ON when operating *1** |  |
| | **Light-ON when not operating *2** |  |





### Internal Circuits

| | |
|---|---|
| **WL-LE-N** |  |
| **WL-LD-N** |  |





**Note: 1.** Leakage current from indicator circuit may cause load malfunction (i.e., the load may remain ON). Make sure that the load operating current is higher than the leakage current.
For countermeasures, refer to technical support on your OMRON website.

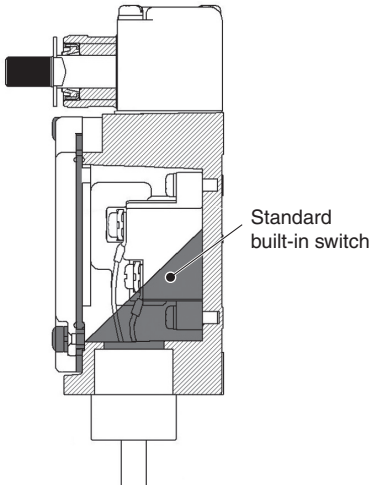
***1.** Light-ON when operating means that the lamp lights when the limit switch contacts (NC) release, or when the actuator rotates or is pushed down.

***2.** Light-ON when not in operation means that 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.

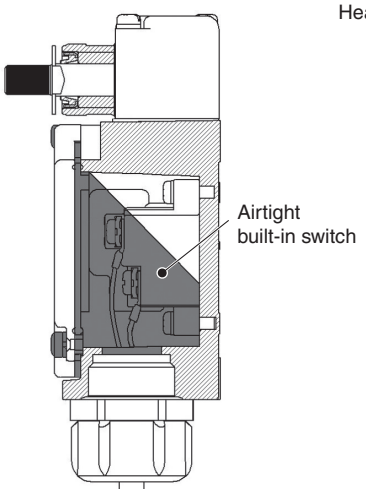
## Environment-resistant Switches

**Molding Specifications for Hermetic Switches** : Molded parts

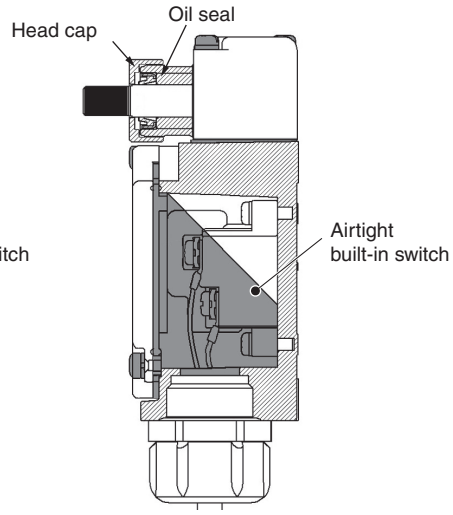
**WL□-139-N**



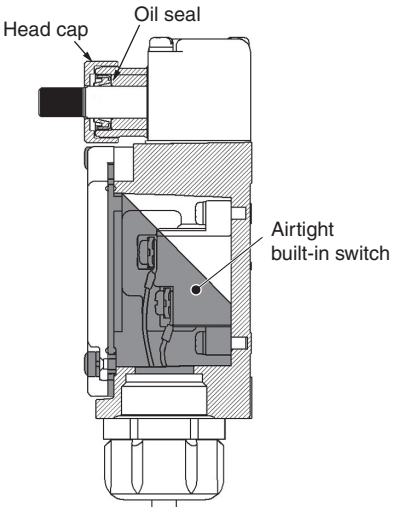

**WL□-140-N**



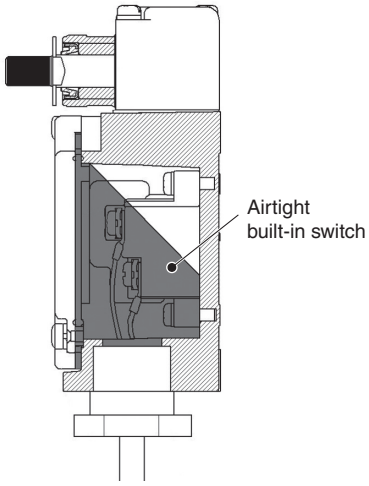

**WL□-141-N**



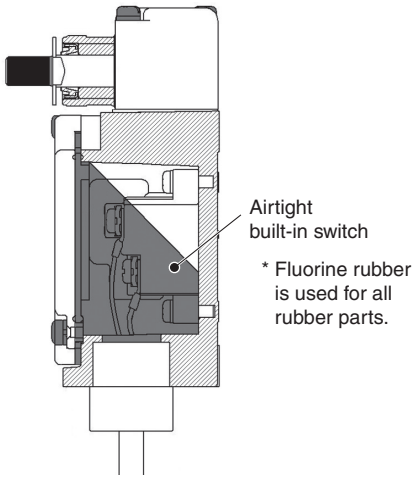

**WL□-145-N**




**WL□-RP40-N**




**WL□-RP60-N**




* Fluorine rubber is used for all rubber parts.

| Model | Cable specifications | Connector type |
|---|---|---|
| WL□-139-N | Standard 5-m VCT cable, with high flexibility and good anti-oil properties attached. Finished outer diameter: 11.5 mm, 4 conductors. | Resin cap |
| WL□-140-N<br>WL□-141-N<br>WL□-145-N | | Metal connector |
| WL□-RP40-N | | Resin connector * |
| WL□-RP60-N | | Resin cap |

* The connector can be removed, so it is possible to use flexible conduit for the cable.

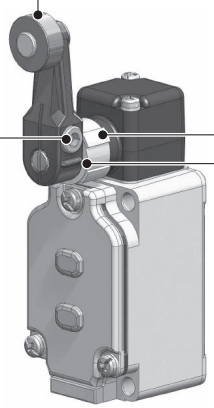
## Spatter-prevention Switches: WLCA2-LES-N

**Actuator**

**Roller, Roller Axis**
Using stainless steel prevents spatter from adhering.

**Operating Lever**
A baking finish is applied to the surface so that any adhering spatter is easily removed.

**Roller Lever Bolt**
Stainless steel construction to prevent spatter adherence.
Double nut models are also available.



**Screws**
Externally visible screws on the head and cover are made of stainless steel to prevent spatter adherence.

**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.

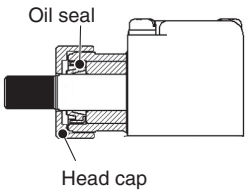
## Long-life Switches

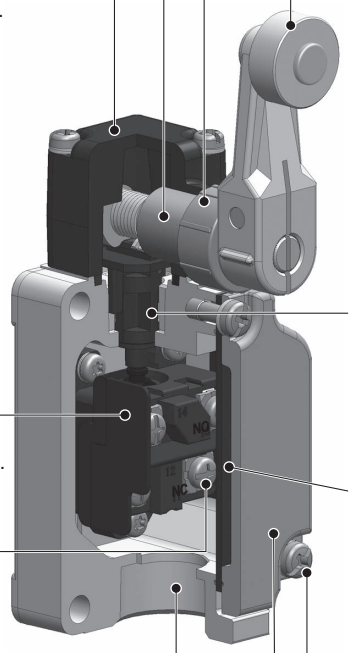
**Head**

You can remove the two screws to mount the head in any of the four possible directions.

**Shield Structure**

A head cap and oil seal form a double-seal structure. Excellent durability and reliability are ensured.



**Built-in Switch**

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

**Terminal Screws**

Four, M3.5 screws.

**Conduit Opening**

In addition to parallel threads for G1/2 tubing, direct-wired and pre-wired connectors have been added to the series.

**Head Cap**

The head cap helps prevent the entry of cutting chips. You can use the protrusion on the cap to confirm the set position.

**Actuator**

**Roller**

The roller is made of self-lubricating sintered stainless steel.
It provides superior resistance to wear.

**Lever**

The lever is forged from anti-corrosive aluminum alloy. It provides superior corrosion resistance and outstanding strength. With a roller lever actuator, the actuator position can be set anywhere within 360°. (The lever cannot be mounted in the opposite direction.)

**Operating Plunger**

PEEK resin is used. It provides superior resistance to wear. You can change the mounting direction to use any one of the three operating directions (both sides, left side, or right side).

**Cover Seal**

High sealing performance is achieved. The seal also serves as a spacer.
There is no troublesome insulating paper, making it easy to work with the Switch.

**Cover Setscrew**

A combination Philips-slotted screw is used. A retainer prevents the screw from falling from the cover even when the screw is loose.

**Cover**

# Dimensions and Operating Characteristics

(Unit: mm)

## General-purpose Switches

### Standard Switches

### Switches with Roller Lever Actuators

**Basic, High-sensitivity, and High-precision Switches**

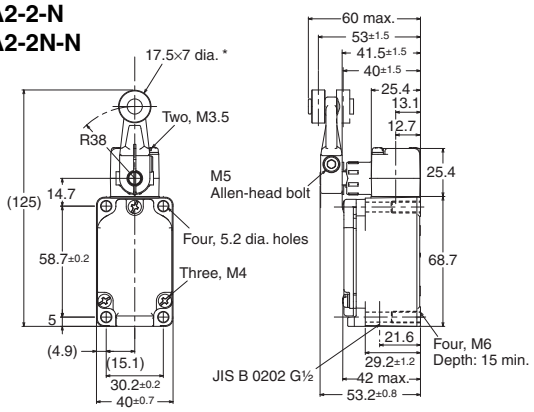
**Roller lever R38**

**Basic** **High-sensitivity** **High-precision**

**WLCA2-N** **WLG2-N** **WLGCA2-N**

**WLCA2-2-N**

**WLCA2-2N-N**



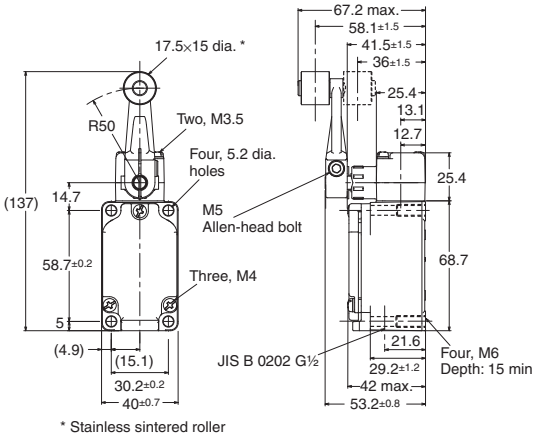

* Stainless sintered roller

The only difference in the shape for High-sensitivity and High-precision Switches is the set position marker plate.

**Roller lever R50**

**Basic**

**WLCA2-7-N**

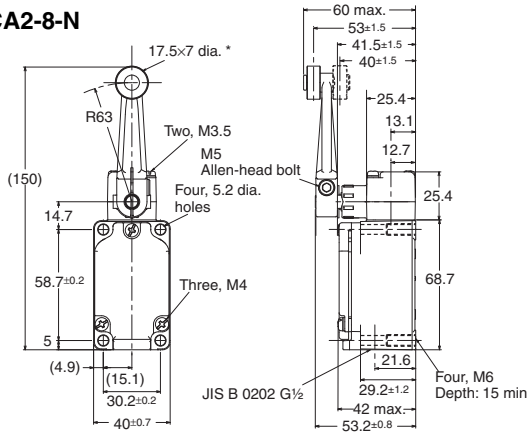



* Stainless sintered roller

**Roller lever R63**

**Basic**

**WLCA2-8-N**




* Stainless sintered roller

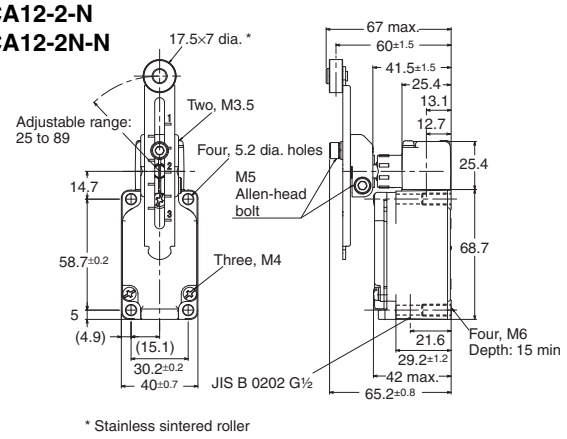
**Adjustable roller lever**

**Basic** **High-sensitivity**

**WLCA12-N** **WLG12-N**

**WLCA12-2-N**

**WLCA12-2N-N**




* Stainless sintered roller

Only the external appearance of the set position indicator plate varies on high-sensitivity models.

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

| Operating characteristics | Model | | WLCA2-N | WLCA2-2-N | WLCA2-2N-N | WLG2-N | WLCA2-7-N | WLCA2-8-N | WLGCA2-N |
|---|---|---|---|---|---|---|---|---|---|
| Operating force | OF | max. | 13.34 N | 13.34 N | 13.34 N | 13.34 N | 10.2 N | 8.04 N | 13.34 N |
| Release force | RF | min. | 1.18 N | 1.18 N | 1.18 N | 1.18 N | 0.9 N | 0.71 N | 1.18 N |
| Pretravel | PT | | 15±5° | 25±5° | 20° max. | $10^{\circ}{}^{+2^{\circ}}_{-1^{\circ}}$ | 15±5° | 15±5° | $5^{\circ}{}^{+2^{\circ}}_{0^{\circ}}$ |
| Overtravel | OT | min. | 70° | 60° | 70° | 80° | 70° | 70° | 85° |
| Movement Differential | MD | max. | 12° | 16° | 10° | 7° | 12° | 12° | 3° |

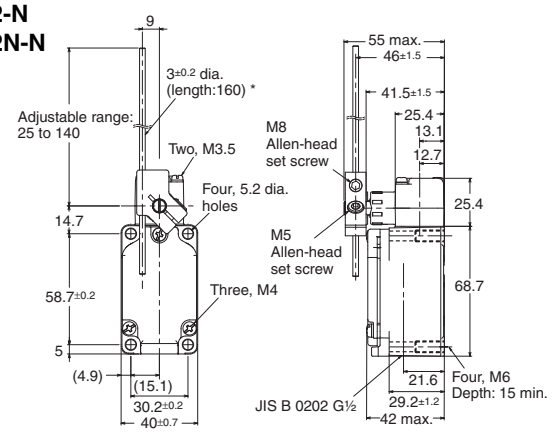
| Operating characteristics | Model | | WLCA12-N *1 | WLCA12-2-N *1 | WLG12-2N-N *1 | WLG12-N *1 |
|---|---|---|---|---|---|---|
| Operating force | OF | max. | 13.34 N | 13.34 N | 13.34 N | 13.34 N |
| Release force | RF | min. | 1.18 N | 1.18 N | 1.18 N | 1.18 N |
| Pretravel | PT | | 15±5° | 25±5° | 20° max. | $10^{\circ}{}^{+2^{\circ}}_{-1^{\circ}}$ |
| Overtravel | OT | min. | 70° | 60° | 70° | 80° |
| Movement Differential | MD | max. | 12° | 16° | 10° | 7° |

***1.** The operating characteristics for WLCA12-N, WLCA12-2-N, WLCA12-2N-N, and WLG12-N are measured at the lever length of 38 mm.

## Switches with Roller Lever Actuators

### Basic, High-sensitivity, and Protective Switches

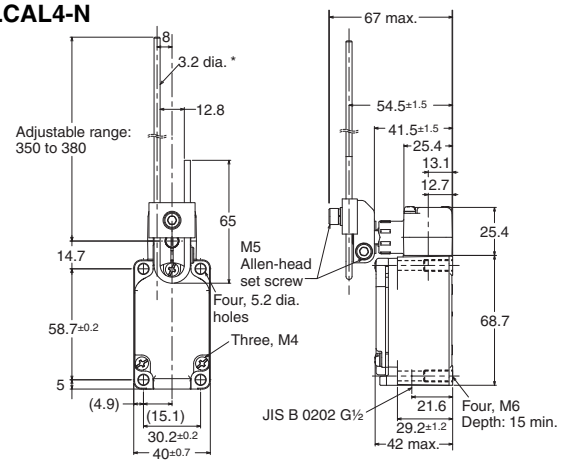
**Adjustable rod lever 25 to 140 mm**
**Basic** **High-sensitivity**
**WLCL-N** **WLGL-N**
**WLCL-2-N**
**WLCL-2N-N**




* Stainless steel rod

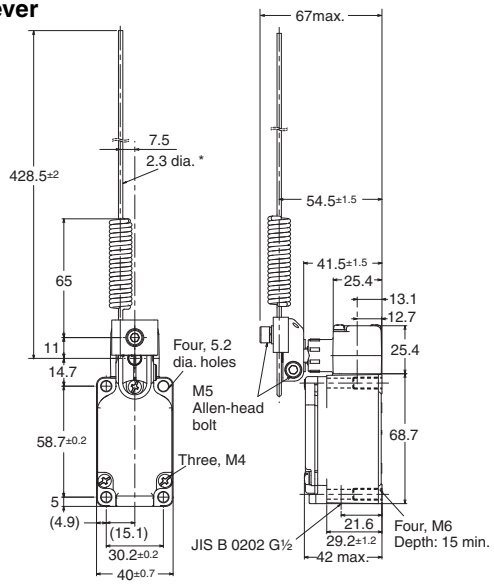
Only the external appearance of the set position indicator plate varies on high-sensitivity models.

**Adjustable rod lever**
**Basic**
**WLCAL4-N**




* Stainless steel rod

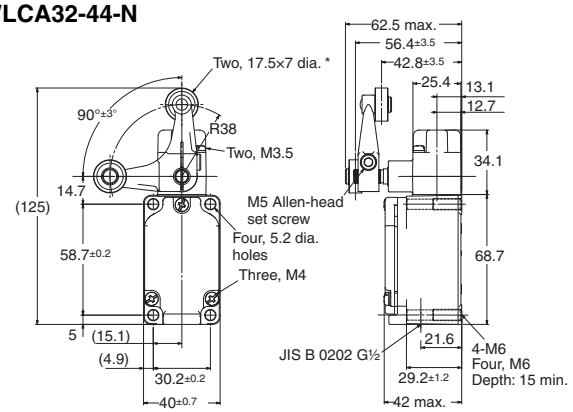
**Rod spring lever**
**Basic**
**WLCAL5-N**




* Piano wire

**Fork lever lock**
**Protective Switches**
**WLCA32-41-N**
**WLCA32-42-N**
**WLCA32-43-N**
**WLCA32-44-N**

The WLCA32-41-N is shown in the following diagram.




* Plastic Roller
(The WLCA32-041-N to WLCA32-044-N have stainless steel rollers.)

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

| Operating characteristics | Model | WLCL-N *1 | WLCL-2-N *1 | WLCL-2N-N *1 | WLGL-N *1 | WLCAL4-N *2 | WLCAL5-N |
|---|---|---|---|---|---|---|---|
| Operating force | OF max. | 1.39 N | 1.39 N | 1.39 N | 2.84 N | 0.98 N | 0.9 N |
| Release force | RF min. | 0.27 N | 0.27 N | 0.27 N | 0.25 N | 0.15 N | 0.09 N |
| Pretravel | PT | 15±5° | 25±5° | 20° max. | $10^{\circ}{}^{+2^{\circ}}_{-1^{\circ}}$ | 15±5° | 15±5° |
| Overtravel | OT min. | 70° | 60° | 70° | 80° | 70° | 70° |
| Movement Differential | MD max. | 12° | 16° | 10° | 7° | 12° | 12° |

**Note:** The actuator on the WLCAL4-N and WLCAL5-N is heavy, which may result in resetting problems depending on the direction the Switch is mounted. Mount the Switch so that the actuator is facing downwards to prevent this problem from occurring.
***1.** The operating characteristics for WLCL-N, WLCL-2-N, WLCL-2N-N, and WLGL-N are measured at the lever length of 140 mm.
***2.** The operating characteristics of WLCAL4-N are measured at a rod length of 380 mm.

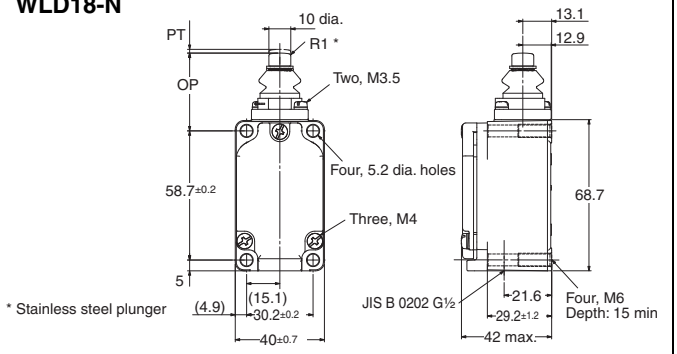
| Operating characteristics | Model | WLCA32-41 to 44-N |
|---|---|---|
| Force necessary to reverse the direction of the lever | max. | 11.77 N |
| Movement until the lever reverses | | 50±5° |
| Movement until switch operation | max. | 55° |
| Movement after switch operation | min. | 35° |

## Switches with Plunger Actuators

### Basic Switches

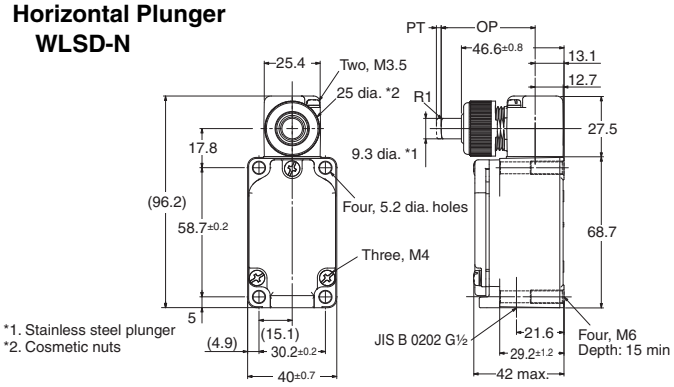
#### Sealed Top Plunger

**WLD18-N**



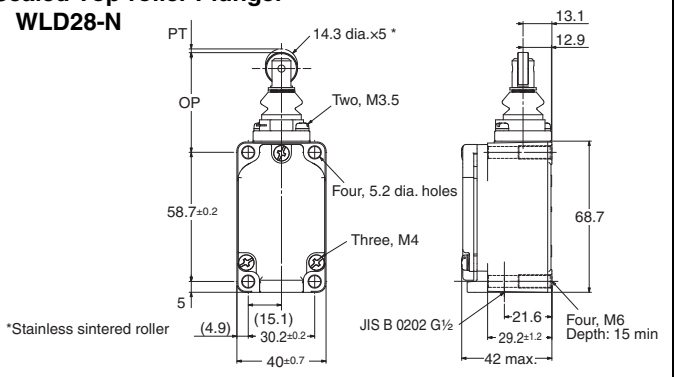

#### Horizontal Plunger

**WLSD-N**



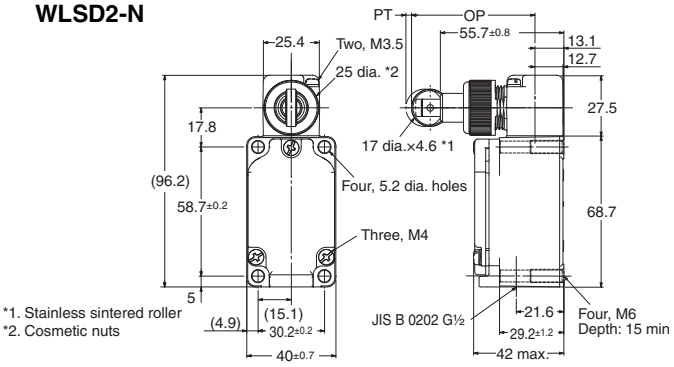

#### Sealed Top-roller Plunger

**WLD28-N**



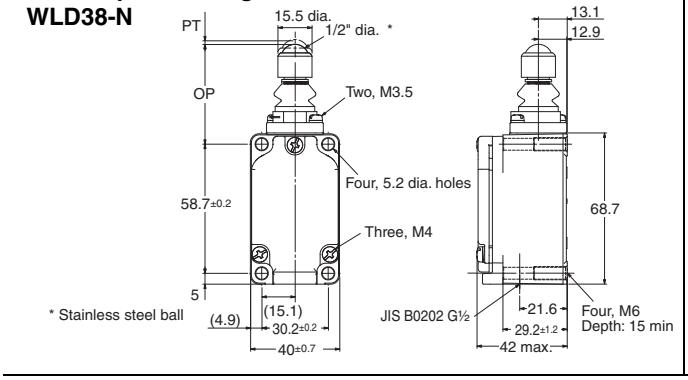

#### Horizontal-roller Plunger

**WLSD2-N**



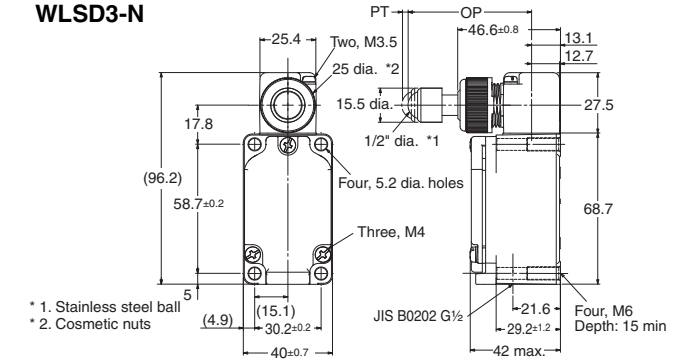

#### Sealed Top-ball Plunger

**WLD38-N**




#### Horizontal-ball Plunger

**WLSD3-N**




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

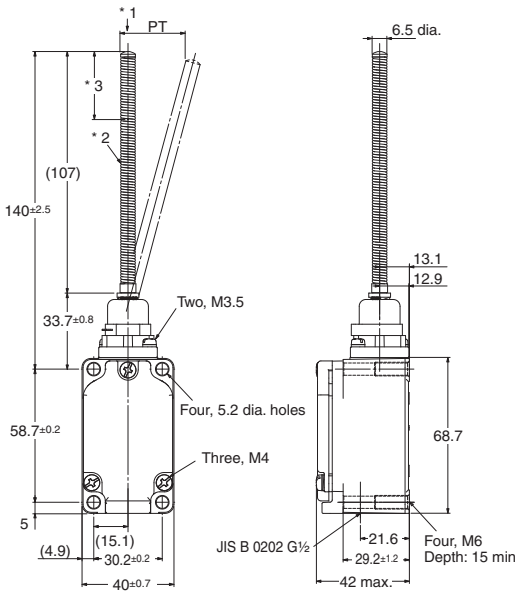
| Operating characteristics | | Model | WLD18-N | WLD28-N | WLD38-N | WLSD-N | WLSD2-N | WLSD3-N |
|---|---|---|---|---|---|---|---|---|
| Operating force | OF | max. | 26.67 N | 16.67 N | 16.67 N | 40.03 N | 40.03 N | 40.03 N |
| Release force | RF | min. | 8.92 N | 4.41 N | 4.41 N | 8.89 N | 8.89 N | 8.89 N |
| Pretravel | PT | max. | 1.7 mm | 1.7 mm | 1.7 mm | 2.8 mm | 2.8 mm | 2.8 mm |
| Overtravel | OT | min. | 6.4 mm | 5.6 mm | 5.6 mm | 6.4 mm | 5.6 mm | 4 mm |
| Movement Differential | MD | max. | 1 mm | 1 mm | 1 mm | 1 mm | 1 mm | 1 mm |
| Operating position | OP | | 34±0.8 mm | 44±0.8 mm | 44.5±0.8 mm | 40.6±0.8 mm | 54.2±0.8 mm | 54.1±0.8 mm |
| Total travel position | TTP | max. | 29.5 mm | 39.5 mm | 41 mm | — | — | — |

## Switches with Flexible Rod Actuators

### Basic Switches

#### Coil Spring

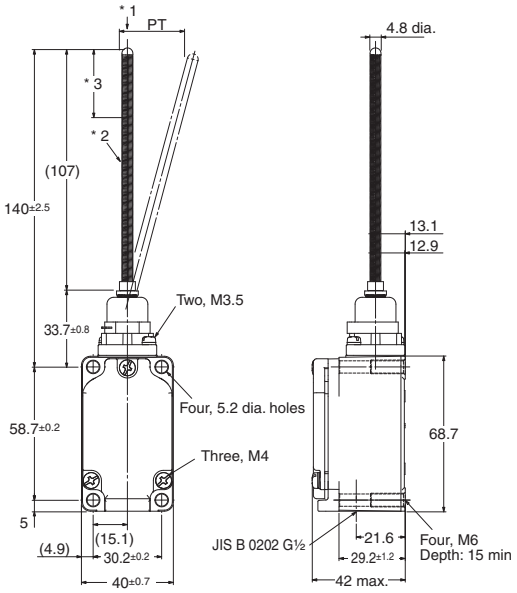
**WLNJ-N**




*1. Do not operate the Switch in the direction of the axial center.
*2. Stainless steel coil spring.
*3. The range for operation is 1/3rd of the overall spring length from the end of the spring.

#### Coil Spring (Multi-wire)

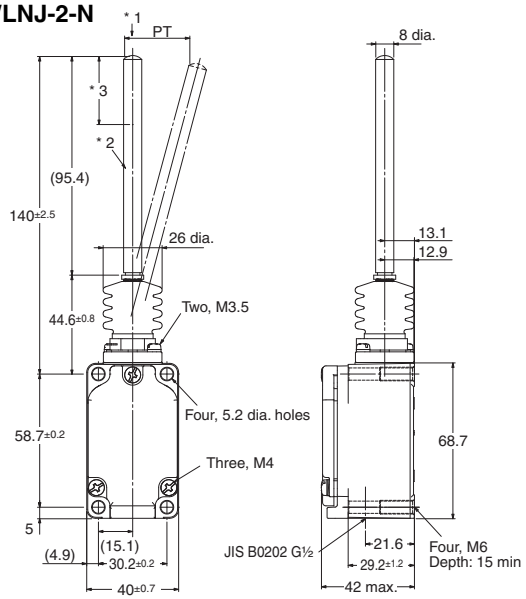
**WLNJ-30-N**




*1. Do not operate the Switch in the direction of the axial center.
*2. Piano wire coil spring.
*3. The range for operation is 1/3rd of the overall spring length from the end of the spring.

#### Resin Rod

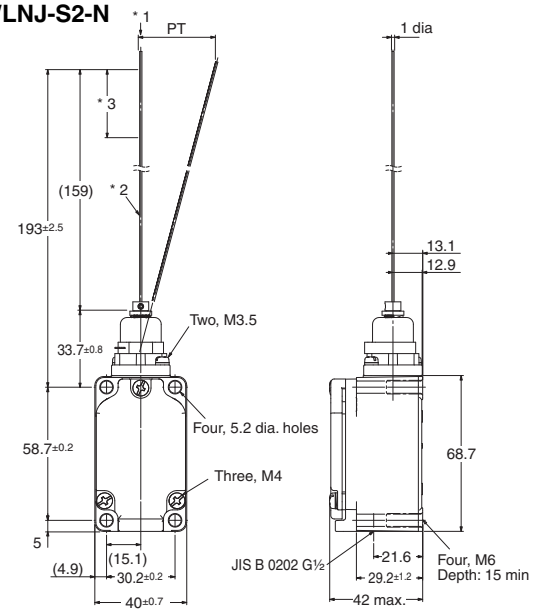
**WLNJ-2-N**




*1. Do not operate the Switch in the direction of the axial center.
*2. Polyamide Resin Rod
*3. The range for operation is 1/3rd of the overall rod length from the end of the rod.

#### Steel Wire

**WLNJ-S2-N**




*1. Do not operate the Switch in the direction of the axial center.
*2. Stainless steel wire.
*3. The range for operation is 1/3rd of the overall wire length from the end of the wire.

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

| Operating characteristics | Model | WLNJ-N | WLNJ-30-N | WLNJ-2-N | WLNJ-S2-N |
|---|---|---|---|---|---|
| **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 |

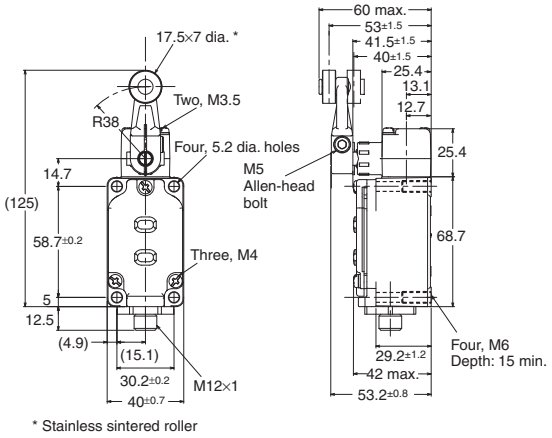
***** These values are for the top end of the spring, rod, or wire.

## Sensor I/O connector Switches

(For details about applicable cables, refer to ***Connecting Sensor I/O Connectors Cable and Socket*** on page 16.)

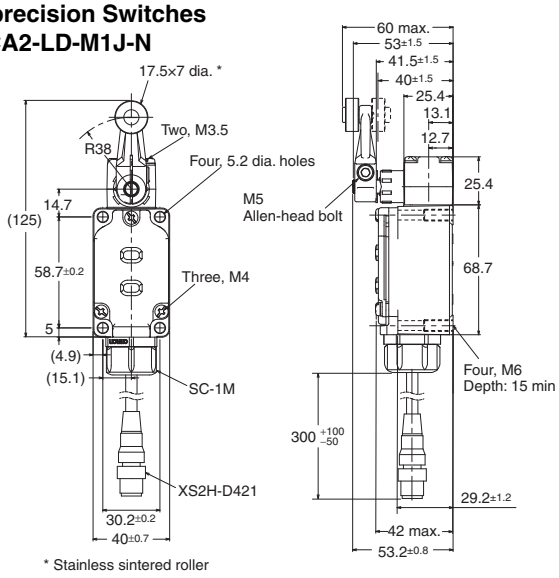
### Switches with Roller Lever Actuators

**Switches with Direct-wired Connectors**
**Basic Switches**
**WLCA2-LDK13-N**
**High-sensitivity Switches**
**WLG2-LDK13-N**
**High-precision Switches**
**WLGCA2-LDK13-N**




The only difference in the shape for High-sensitivity and High-precision Switches is the set position marker plate.

**Switches with Pre-wired Connectors**
**Basic Switches**
**WLCA2-LD-M1J-N**
**High-sensitivity Switches**
**WLG2-LD-M1J-N**
**High-precision Switches**
**WLGCA2-LD-M1J-N**



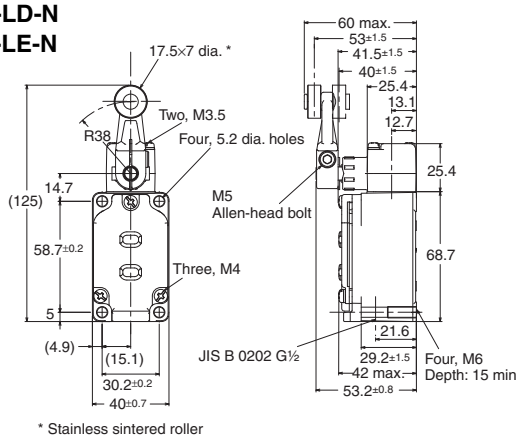

The only difference in the shape for High-sensitivity and High-precision Switches is the set position marker plate.

**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.

| Operating characteristics | Model | Basic Switches | High-sensitivity Switches | High-precision Switches |
|---|---|---|---|---|
| Operating force | OF max. | 13.34 N | 13.34 N | 13.34 N |
| Release force | RF min. | 1.18 N | 1.18 N | 1.18 N |
| Pretravel | PT | 15±5° | 10° +2° −1° | 5° +2° −0° |
| Overtravel | OT min. | 70° | 80° | 80° |
| Movement Differential | MD max. | 12° | 7° | 3° |

## Operation indicator Switches

**Roller lever**
**WLCA2-LD-N**
**WLCA2-LE-N**




| Operating characteristics | Model | WLCA2-LD-N WLCA2-LE-N |
|---|---|---|
| Operating force | OF max. | 13.34 N |
| Release force | RF min. | 1.18 N |
| Pretravel | PT | 15±5° |
| Overtravel | OT min. | 70° |
| Movement Differential | MD max. | 12° |

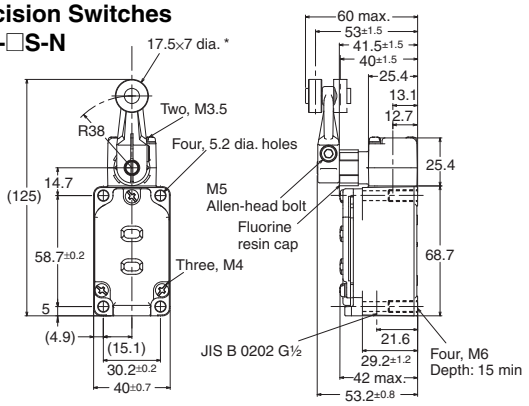
**Note: 1.** Unless otherwise indicated, a tolerance of ±0.4 mm applies to all dimensions.

## Spatter-prevention Switches

### Switches with Roller Lever Actuators

#### Switches with Screw Terminals

**Basic Switches**
**WLCA2-□S-N**
**High-sensitivity Switches**
**WLG2-□S-N**
**High-precision Switches**
**WLGCA2-□S-N**

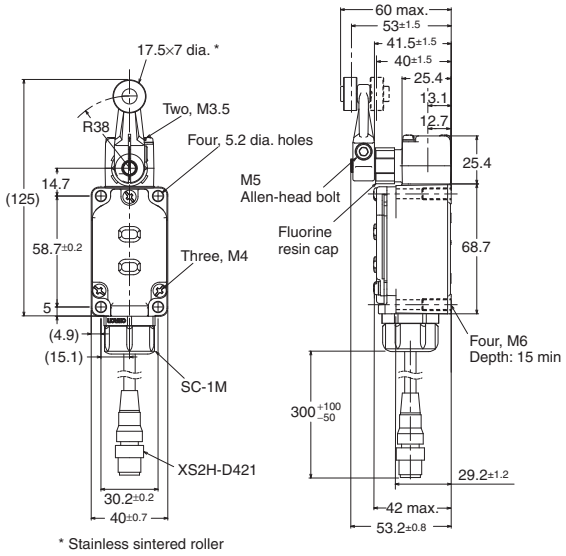



* Stainless sintered roller

The only difference in the shape for High-sensitivity and High-precision Switches is the set position marker plate.

#### Switches with Pre-wired Connectors

**WLCA2-□S-M1J-N**

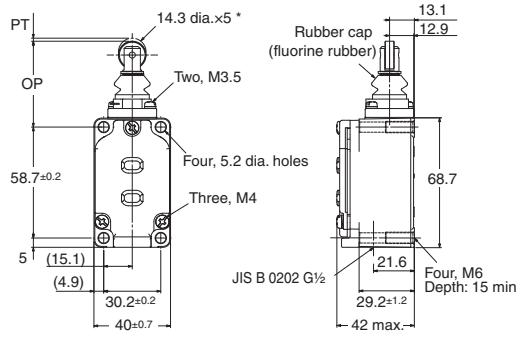



* Stainless sintered roller

### Switches with Sealed Top-roller Plungers

#### Switches with Screw Terminals

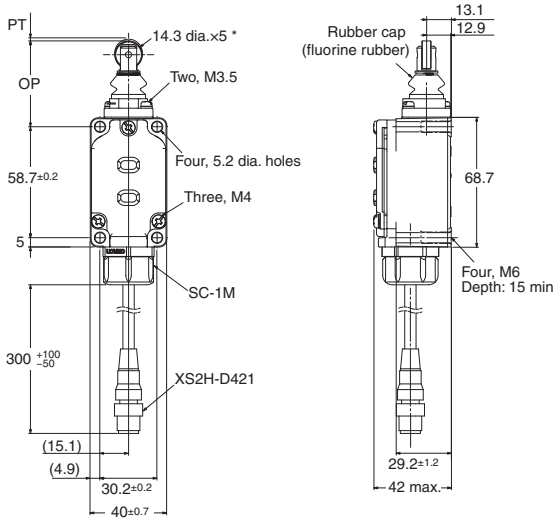
**WLD28-□S-N**




*Stainless sintered roller

#### Switches with Pre-wired Connectors

**WLD28-□S-M1J-N**




*Stainless sintered roller

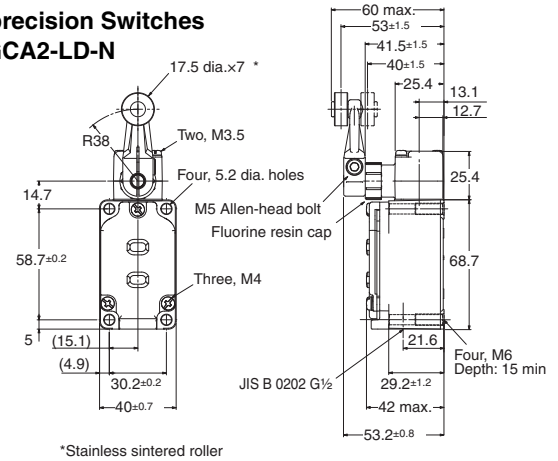
**Note: 1.** Unless otherwise indicated, a tolerance of ±0.4 mm applies to all dimensions.
**2.** The above diagrams are for Indicator-equipped Switches.

| Operating characteristics | Actuator | Switches with Roller Lever Actuators | | | Switches with Sealed Top-roller Plungers |
|---|---|---|---|---|---|
| | | Basic Switches | High-sensitivity Switches | High-precision Switches | |
| **Operating force** | **OF max.** | 13.34 N | 13.34 N | 13.34 N | 16.67 N |
| **Release force** | **RF min.** | 1.18 N | 1.18 N | 1.18 N | 4.41 N |
| **Pretravel** | **PT** | 15±5° | 10° +2° −1° | 5° +2° 0° | Max.1.7 mm |
| **Overtravel** | **OT min.** | 70° | 80° | 80° | 5.6 mm |
| **Movement Differential** | **MD max.** | 12° | 7° | 3° | 1 mm |
| **Operating position** | **OT** | — | — | — | 44±0.8 mm |
| **Total travel position** | **TTP max.** | — | — | — | 39.5 mm |

## Long-life Switches

### Switches with Roller Lever Actuators

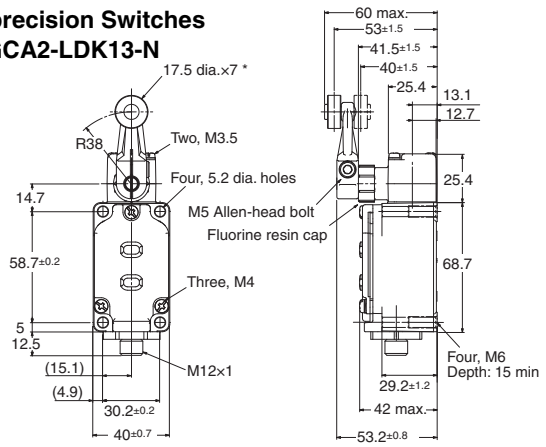
**Switches with Screw Terminals**
**Basic Switches**
**WLMCA2-LD-N**
**High-sensitivity Switches**
**WLMG2-LD-N**
**High-precision Switches**
**WLMGCA2-LD-N**




*Stainless sintered roller

The only difference in the shape for High-sensitivity and High-precision Switches is the set position marker plate.

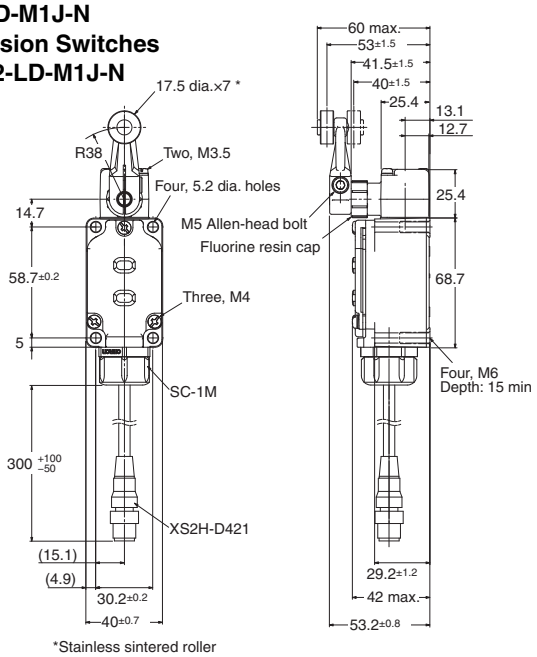
**Switches with Direct-wired Connectors**
**Basic Switches**
**WLMCA2-LDK13-N**
**High-sensitivity Switches**
**WLMG2-LDK13-N**
**High-precision Switches**
**WLMGCA2-LDK13-N**




*Stainless sintered roller

The only difference in the shape for High-sensitivity and High-precision Switches is the set position marker plate.

**Switches with Pre-wired Connectors**
**Basic Switches**
**WLMCA2-LD-M1J-N**
**High-sensitivity Switches**
**WLMG2-LD-M1J-N**
**High-precision Switches**
**WLMGCA2-LD-M1J-N**




*Stainless sintered roller

The only difference in the shape for High-sensitivity and High-precision Switches is the set position marker plate.

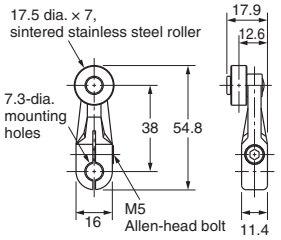
**Note: 1.** Unless otherwise indicated, a tolerance of ±0.4 mm applies to all dimensions.
**2.** The above diagrams are for Indicator-equipped Switches.

| Operating characteristics | Actuator | | Switches with Roller Lever Actuators | | |
|---|---|---|---|---|---|
| | | | Basic Switches | High-sensitivity Switches | High-precision Switches |
| Operating force | OF | max. | 13.34 N | 13.34 N | 13.34 N |
| Release force | RF | min. | 1.18 N | 1.18 N | 1.18 N |
| Pretravel | PT | | 15±5° | 10° +2° −1° | 5° +2° 0° |
| Overtravel | OT | min. | 70° | 80° | 80° |
| Movement Differential | MD | max. | 12° | 7° | 3° |

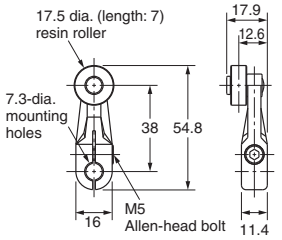
## Actuators (Levers Only)

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

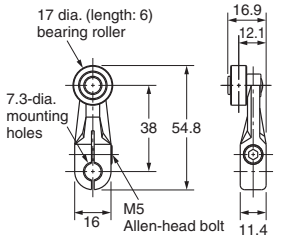
### WL-1A100
**Standard Lever**



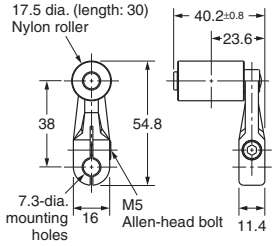

### WL-1A115
**Resin Roller**



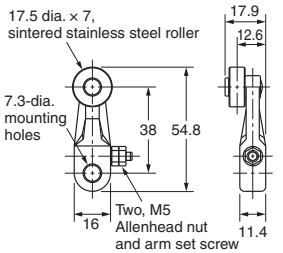

### WL-1A400
**Bearing Roller**



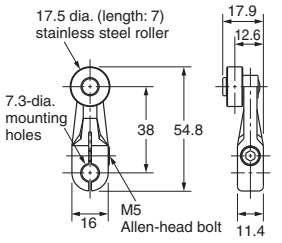

### WL-1A118
**Nylon Roller:**
**Roller Width: 30 mm**



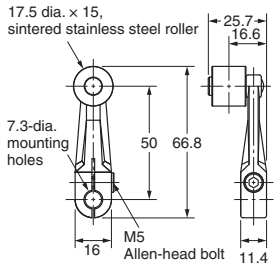

### WL-1A105
**Double Nuts**



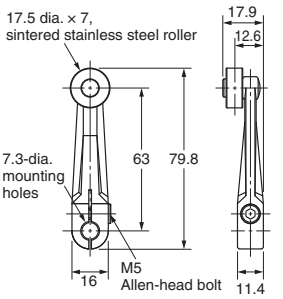

### WL-1A103S
**Spatter**



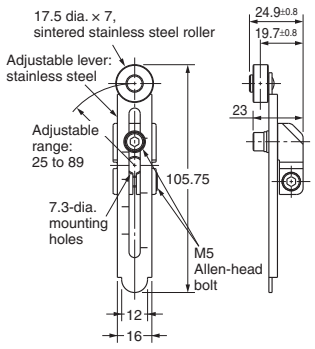

### WL-1A200
**Lever Length: 50**
**Roller Width: 15**



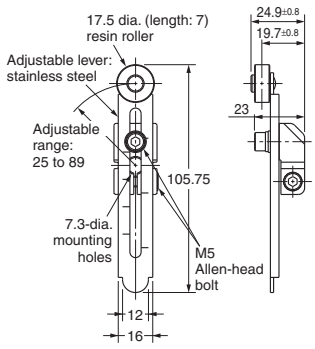

### WL-1A300
**Lever Length: 63**



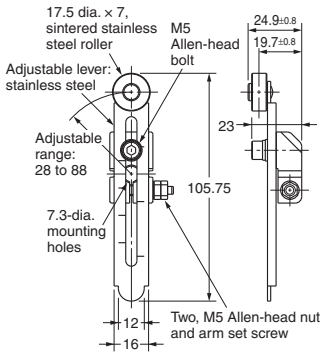

### WL-2A100



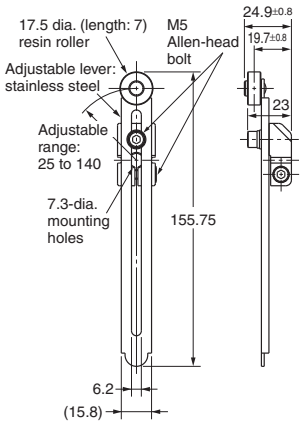

### WL-2A111
**Resin Roller**



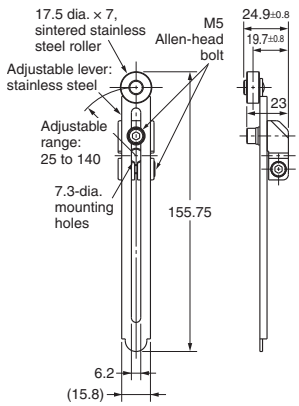

### WL-2A107
**Double Nuts**



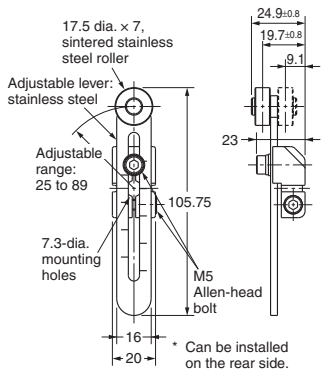

### WL-2A108
**Resin Roller**



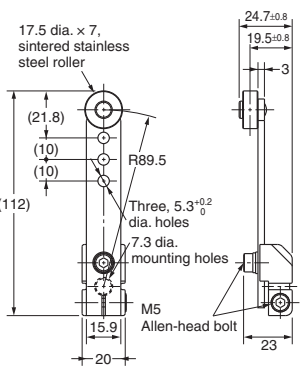

### WL-2A122



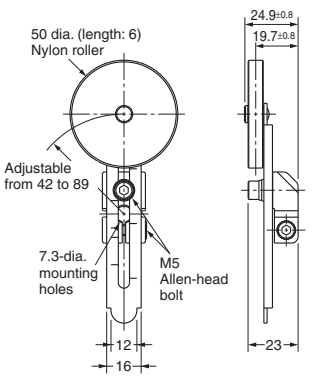

### WL-2A106




### WL-2A130

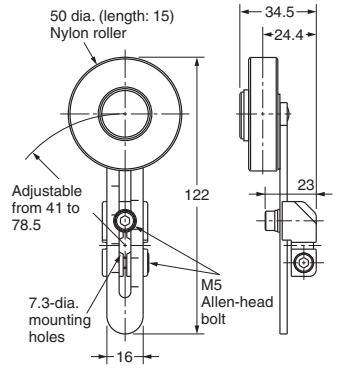



### WL-2A104

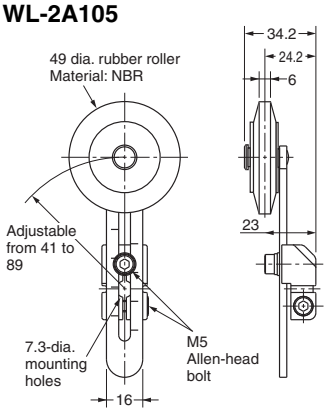



**Note: 1.** Unless otherwise indicated, a tolerance of ±0.4 mm applies to all dimensions.
**Lever: Only rotating lever models are illustrated.**

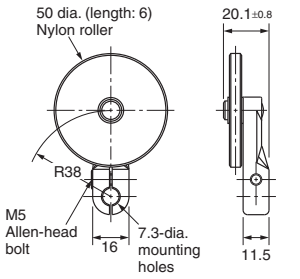
### WL-2A110



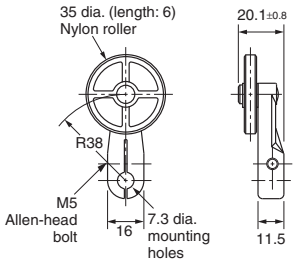

### WL-2A105



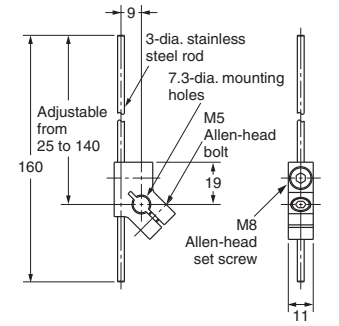

### WL-1A106



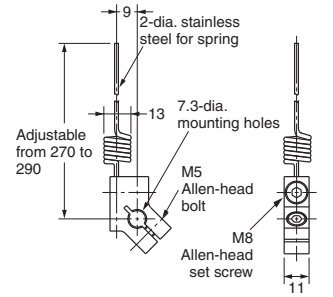

### WL-1A110



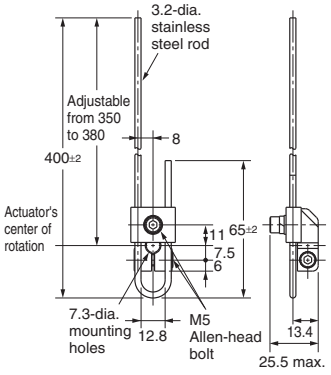

### WL-4A100



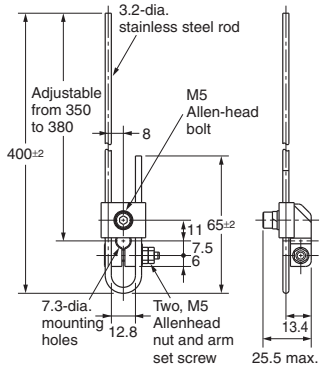

### WL-4A201



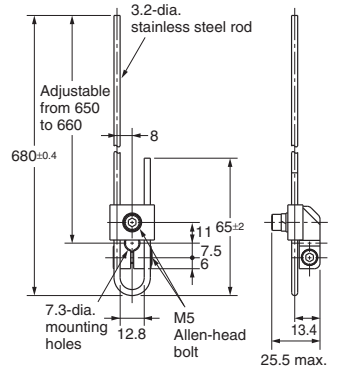

### WL-3A100



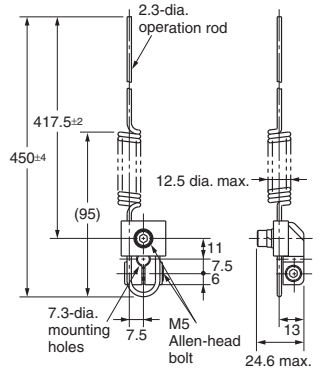

### WL-3A106
### Double Nut



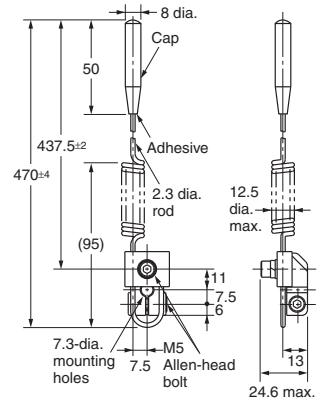

### WL-3A108



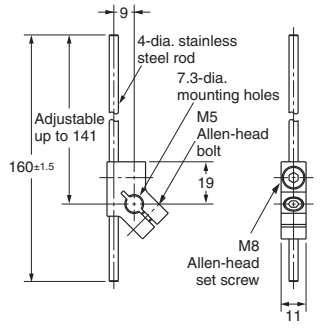

### WL-3A200



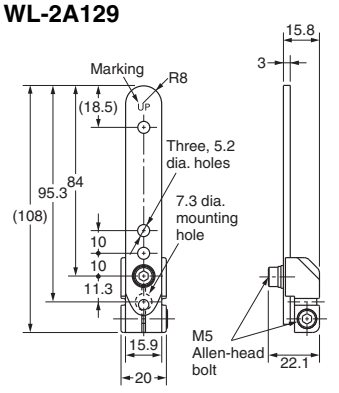

### WL-3A203



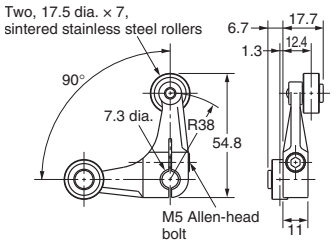

### WL-4A112




### WL-2A129

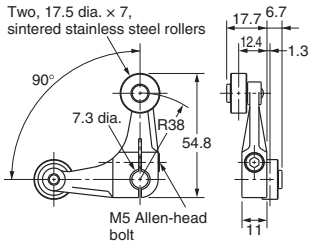



### WL-5A101



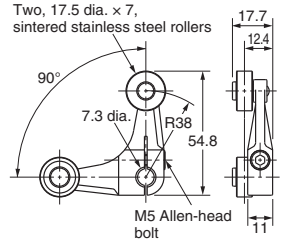

WL-5A100 has a plastic roller

### WL-5A103




WL-5A102 has a plastic roller

### WL-5A105




WL-5A104 has a plastic roller

**Note: 1.** Unless otherwise indicated, a tolerance of ±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.

# Model Replacement Table

| WL | WL-N |
|---|---|
| WLCA2 | WLCA2-N |
| WL01CA2 | WLCA2-N |
| WLH2 | WLCA2-N |
| WL01H2 | WLCA2-N |
| WLG2 | WLG2-N |
| WL01G2 | WLG2-N |
| WLCA2-2 | WLCA2-2-N |
| WL01CA2-2 | WLCA2-2-N |
| WLCA2-2N | WLCA2-2N-N |
| WL01CA2-2N | WLCA2-2N-N |
| WLGCA2 | WLGCA2-N |
| WL01GCA2 | WLGCA2-N |
| WLCA2-7 | WLCA2-7-N |
| WL01CA2-7 | WLCA2-7-N |
| WLCA2-8 | WLCA2-8-N |
| WL01CA2-8 | WLCA2-8-N |
| WLCA12 | WLCA12-N |
| WL01CA12 | WLCA12-N |
| WLH12 | WLCA12-N |
| WL01H12 | WLCA12-N |
| WLG12 | WLG12-N |
| WL01G12 | WLG12-N |
| WLCA12-2 | WLCA12-2-N |
| WL01CA12-2 | WLCA12-2-N |
| WLCA12-2N | WLCA12-2N-N |
| WL01CA12-2N | WLCA12-2N-N |
| WLCL | WLCL-N |
| WL01CL | WLCL-N |
| WLHL | WLCL-N |
| WL01HL | WLCL-N |
| WLGL | WLGL-N |
| WL01GL | WLGL-N |
| WLCL-2 | WLCL-2-N |
| WLCL-2N | WLCL-2N-N |
| WL01CL-2N | WLCL-2N-N |
| WLHAL4 | WLCAL4-N |
| WLHAL5 | WLCAL5-N |
| WLCA32-41 | WLCA32-41-N |
| WL01CA32-41 | WLCA32-41-N |
| WLCA32-42 | WLCA32-42-N |
| WLCA32-43 | WLCA32-43-N |
| WL01CA32-43 | WLCA32-43-N |
| WLCA32-44 | WLCA32-44-N |
| WL01CA32-44 | WLCA32-44-N |
| WLD | WLD18-N |
| WL01D | WLD18-N |
| WLD2 | WLD28-N |
| WL01D2 | WLD28-N |
| WLD3 | WLD38-N |
| WL01D3 | WLD38-N |
| WLD28 | WLD28-N |
| WL01D28 | WLD28-N |

| WL | WL-N |
|---|---|
| WLSD | WLSD-N |
| WL01SD | WLSD-N |
| WLSD2 | WLSD2-N |
| WL01SD2 | WLSD2-N |
| WLSD3 | WLSD3-N |
| WL01SD3 | WLSD3-N |
| WLNJ | WLNJ-N |
| WL01NJ | WLNJ-N |
| WLNJ-30 | WLNJ-30-N |
| WL01NJ-30 | WLNJ-30-N |
| WLNJ-2 | WLNJ-2-N |
| WL01NJ-2 | WLNJ-2-N |
| WLNJ-S2 | WLNJ-S2-N |
| WL01NJ-S2 | WLNJ-S2-N |
| WLCA2-LE | WLCA2-LE-N |
| WLCA2-LD | WLCA2-LD-N |
| WLH2-LE | WLCA2-LE-N |
| WLH2-LD | WLCA2-LD-N |
| WLG2-LE | WLG2-LE-N |
| WLG2-LD | WLG2-LD-N |
| WLCA2-2LE | WLCA2-2LE-N |
| WLCA2-2LD | WLCA2-2LD-N |
| WLCA2-2NLE | WLCA2-2NLE-N |
| WLCA2-2NLD | WLCA2-2NLD-N |
| WLGCA2-LE | WLGCA2-LE-N |
| WLGCA2-LD | WLGCA2-LD-N |
| WLCA2-7LE | WLCA2-7LE-N |
| WLCA2-7LD | WLCA2-7LD-N |
| WLCA2-8LE | WLCA2-8LE-N |
| WLCA2-8LD | WLCA2-8LD-N |
| WLCA12-LE | WLCA12-LE-N |
| WLCA12-LD | WLCA12-LD-N |
| WLH12-LE | WLCA12-LE-N |
| WLH12-LD | WLCA12-LD-N |
| WLG12-LE | WLG12-LE-N |
| WLG12-LD | WLG12-LD-N |
| WLCA12-2LE | WLCA12-2LE-N |
| WLCA12-2LD | WLCA12-2LD-N |
| WLCA12-2NLE | WLCA12-2NLE-N |
| WLCA12-2NLD | WLCA12-2NLD-N |
| WLCL-LE | WLCL-LE-N |
| WLCL-LD | WLCL-LD-N |
| WLHL-LE | WLCL-LE-N |
| WLHL-LD | WLCL-LD-N |
| WLGL-LE | WLGL-LE-N |
| WLGL-LD | WLGL-LD-N |
| WLCL-2LE | WLCL-2LE-N |
| WLCL-2LD | WLCL-2LD-N |
| WLCL-2NLE | WLCL-2NLE-N |
| WLCL-2NLD | WLCL-2NLD-N |
| WLHAL4-LE | WLCAL4-LE-N |
| WLHAL4-LD | WLCAL4-LD-N |

| WL | WL-N |
|---|---|
| WLHAL5-LE | WLCAL5-LE-N |
| WLHAL5-LD | WLCAL5-LD-N |
| WLCA32-41LE | WLCA32-41LE-N |
| WLCA32-41LD | WLCA32-41LD-N |
| WLCA32-42LE | WLCA32-42LE-N |
| WLCA32-43LE | WLCA32-43LE-N |
| WLCA32-43LD | WLCA32-43LD-N |
| WLD-LE | WLD18-LE-N |
| WLD-LD | WLD18-LD-N |
| WLD2-LE | WLD28-LE-N |
| WLD2-LD | WLD28-LD-N |
| WLD3-LE | WLD38-LE-N |
| WLD3-LD | WLD38-LD-N |
| WLD28-LE | WLD28-LE-N |
| WLD28-LD | WLD28-LD-N |
| WLSD-LE | WLSD-LE-N |
| WLSD-LD | WLSD-LD-N |
| WLSD2-LE | WLSD2-LE-N |
| WLSD2-LD | WLSD2-LD-N |
| WLSD3-LE | WLSD3-LE-N |
| WLSD3-LD | WLSD3-LD-N |
| WLNJ-LE | WLNJ-LE-N |
| WLNJ-LD | WLNJ-LD-N |
| WLNJ-30LE | WLNJ-30LE-N |
| WLNJ-30LD | WLNJ-30LD-N |
| WLNJ-2LE | WLNJ-2LE-N |
| WLNJ-2LD | WLNJ-2LD-N |
| WLNJ-S2LE | WLNJ-S2LE-N |
| WLNJ-S2LD | WLNJ-S2LD-N |
| WLCA2-LDK13 | WLCA2-LDK13-N |
| WLCA2-55LDK13 | WLCA2-55LDK13-N |
| WLCA2-LDK43 | WLCA2-LDK43-N |
| WLCA2-55LDK43 | WLCA2-55LDK43-N |
| WLD2-LDK13 | WLD28-LDK13-N |
| WLD2-55LDK13 | WLD28-55LDK13-N |
| WLD2-LDK43 | WLD28-LDK43-N |
| WLD2-55LDK43 | WLD28-55LDK43-N |
| WLH2-LDK13 | WLCA2-LDK13-N |
| WLH2-55LDK13 | WLCA2-55LDK13-N |
| WLH2-LDK43 | WLCA2-LDK43-N |
| WLH2-55LDK43 | WLCA2-55LDK43-N |
| WLG2-LDK13 | WLG2-LDK13-N |
| WLG2-55LDK13 | WLG2-55LDK13-N |
| WLG2-LDK43 | WLG2-LDK43-N |
| WLG2-55LDK43 | WLG2-55LDK43-N |
| WLGCA2-LDK13 | WLGCA2-LDK13-N |
| WLGCA2-55LDK13 | WLGCA2-55LDK13-N |
| WLGCA2-LDK43 | WLGCA2-LDK43-N |
| WLGCA2-55LDK43 | WLGCA2-55LDK43-N |
| WLCA2-LD-M1J | WLCA2-LD-M1J-N |
| WLCA2-55LD-M1J | WLCA2-55LD-M1J-N |
| WLCA2-LD-M1GJ | WLCA2-LD-M1GJ-N |

| WL | WL-N |
|---|---|
| WLCA2-55LD-M1GJ | WLCA2-55LD-M1GJ-N |
| WLCA2-55LD-M1JB | WLCA2-55LD-M1JB-N |
| WLCA2-LD-DGJ03 | WLCA2-LD-DGJ-N |
| WLCA2-55LD-DGJ03 | WLCA2-55LD-DGJ-N |
| WLCA2-LD-DK1EJ03 | WLCA2-LD-DK1EJ-N |
| WLCA2-55LD-DK1EJ03 | WLCA2-55LD-DK1EJ-N |
| WLD2-LD-M1J | WLD28-LD-M1J-N |
| WLD2-55LD-M1J | WLD28-55LD-M1J-N |
| WLD2-LD-M1GJ | WLD28-LD-M1GJ-N |
| WLD2-55LD-M1GJ | WLD28-55LD-M1GJ-N |
| WLD2-55LD-M1JB | WLD28-55LD-M1JB-N |
| WLD2-LD-DGJ03 | WLD28-LD-DGJ-N |
| WLD2-LD-DK1EJ03 | WLD28-LD-DK1EJ-N |
| WLD2-55LD-DK1EJ03 | WLD28-55LD-DK1EJ-N |
| WLH2-LD-M1J | WLCA2-LD-M1J-N |
| WLH2-LD-M1GJ | WLCA2-LD-M1GJ-N |
| WLH2-LD-DGJ03 | WLCA2-LD-DGJ-N |
| WLG2-LD-M1J | WLG2-LD-M1J-N |
| WLG2-LD-M1GJ | WLG2-LD-M1GJ-N |
| WLG2-55LD-M1GJ | WLG2-55LD-M1GJ-N |
| WLG2-LD-M1JB | WLG2-LD-M1JB-N |
| WLG2-55LD-M1JB | WLG2-55LD-M1JB-N |
| WLG2-LD-DGJ03 | WLG2-LD-DGJ-N |
| WLG2-55LD-DGJ03 | WLG2-55LD-DGJ-N |
| WLG2-LD-DK1EJ03 | WLG2-LD-DK1EJ-N |
| WLG2-55LD-DK1EJ03 | WLG2-55LD-DK1EJ-N |
| WLGCA2-LD-M1J | WLGCA2-LD-M1J-N |
| WLGCA2-55LD-M1J | WLGCA2-55LD-M1J-N |
| WLGCA2-LD-M1GJ | WLGCA2-LD-M1GJ-N |
| WLGCA2-55LD-M1JB | WLGCA2-55LD-M1JB-N |
| WLGCA2-55LD-DGJ03 | WLGCA2-55LD-DGJ-N |
| WLCA2-55 | WLCA2-55-N |
| WLCA2-55LD | WLCA2-55LD-N |
| WLCA2-55LE | WLCA2-55LE-N |
| WLCA2-139 | WLCA2-139-N |
| WLCA2-139LD2 | WLCA2-139LD2-N |
| WLCA2-139LD3 | WLCA2-139LD3-N |
| WLCA2-140 | WLCA2-140-N |
| WLCA2-140LD2 | Ask your OMRON representative. |
| WLCA2-140LD3 | Ask your OMRON representative. |
| WLCA2-141 | WLCA2-141-N |
| WLCA2-141LD2 | WLCA2-141LD2-N |
| WLCA2-141LD3 | WLCA2-141LD3-N |
| WLCA2-RP60 | WLCA2-RP60-N |
| WLCA2-RP60LD2 | WLCA2-RP60LD2-N |
| WLCA2-RP60LD3 | WLCA2-RP60LD3-N |
| WLCA2-TH | WLCA2-TH-N |
| WLCA2-TC | WLCA2-TC-N |
| WLCA2-RP | WLCA2-RP-N |
| WLCA2-P1 | WLCA2-P1-N |
| WLH2-55 | WLCA2-55-N |
| WLH2-55LD | WLCA2-55LD-N |

| WL | WL-N |
|---|---|
| WLH2-55LE | WLCA2-55LE-N |
| WLH2-139 | WLCA2-139-N |
| WLH2-140 | WLCA2-140-N |
| WLH2-141 | WLCA2-141-N |
| WLH2-141LD3 | WLCA2-141LD3-N |
| WLH2-RP60 | WLCA2-RP60-N |
| WLH2-RP60LD3 | WLCA2-RP60LD3-N |
| WLH2-TH | WLCA2-TH-N |
| WLH2-TC | WLCA2-TC-N |
| WLH2-RP | WLCA2-RP-N |
| WLH2-P1 | WLCA2-P1-N |
| WLG2-55 | WLG2-55-N |
| WLG2-55LD | WLG2-55LD-N |
| WLG2-55LE | WLG2-55LE-N |
| WLG2-139 | WLG2-139-N |
| WLG2-139LD3 | WLG2-139LD3-N |
| WLG2-140 | WLG2-140-N |
| WLG2-140LD2 | Ask your OMRON representative. |
| WLG2-140LD3 | Ask your OMRON representative. |
| WLG2-141 | WLG2-141-N |
| WLG2-141LD2 | WLG2-141LD2-N |
| WLG2-141LD3 | WLG2-141LD3-N |
| WLG2-RP60 | WLG2-RP60-N |
| WLG2-RP60LD2 | WLG2-RP60LD2-N |
| WLG2-RP60LD3 | WLG2-RP60LD3-N |
| WLG2-TH | WLG2-TH-N |
| WLG2-TC | WLG2-TC-N |
| WLG2-RP | WLG2-RP-N |
| WLG2-P1 | WLG2-P1-N |
| WLCA2-255 | WLCA2-255-N |
| WLCA2-255LD | WLCA2-255LD-N |
| WLCA2-255LE | WLCA2-255LE-N |
| WLCA2-2139 | WLCA2-2139-N |
| WLCA2-2139LD2 | WLCA2-2139LD2-N |
| WLCA2-2139LD3 | WLCA2-2139LD3-N |
| WLCA2-2RP60 | WLCA2-2RP60-N |
| WLCA2-2RP60LD2 | WLCA2-2RP60LD2-N |
| WLCA2-2RP60LD3 | WLCA2-2RP60LD3-N |
| WLCA2-2TH | WLCA2-2TH-N |
| WLCA2-2TC | WLCA2-2TC-N |
| WLCA2-2N55 | WLCA2-2N55-N |
| WLCA2-2N55LD | WLCA2-2N55LD-N |
| WLCA2-2N55LE | WLCA2-2N55LE-N |
| WLCA2-2N139 | WLCA2-2N139-N |
| WLCA2-2N140 | WLCA2-2N140-N |
| WLCA2-2NTH | WLCA2-2NTH-N |
| WLCA2-2NTC | WLCA2-2NTC-N |
| WLGCA2-55 | WLGCA2-55-N |
| WLGCA2-55LD | WLGCA2-55LD-N |
| WLGCA2-55LE | WLGCA2-55LE-N |
| WLGCA2-139 | WLGCA2-139-N |
| WLGCA2-139LD2 | WLGCA2-139LD2-N |

| WL | WL-N |
|---|---|
| WLGCA2-139LD3 | WLGCA2-139LD3-N |
| WLGCA2-140 | Ask your OMRON representative. |
| WLGCA2-140LD2 | Ask your OMRON representative. |
| WLGCA2-140LD3 | Ask your OMRON representative. |
| WLGCA2-141 | WLGCA2-141-N |
| WLGCA2-141LD3 | WLGCA2-141LD3-N |
| WLGCA2-RP60 | WLGCA2-RP60-N |
| WLGCA2-RP60LD2 | WLGCA2-RP60LD2-N |
| WLGCA2-RP60LD3 | WLGCA2-RP60LD3-N |
| WLGCA2-TH | WLGCA2-TH-N |
| WLGCA2-TC | WLGCA2-TC-N |
| WLGCA2-RP | WLGCA2-RP-N |
| WLCA12-55 | WLCA12-55-N |
| WLCA12-55LD | WLCA12-55LD-N |
| WLCA12-55LE | WLCA12-55LE-N |
| WLCA12-139 | WLCA12-139-N |
| WLCA12-140 | WLCA12-140-N |
| WLCA12-141 | WLCA12-141-N |
| WLCA12-RP60 | WLCA12-RP60-N |
| WLCA12-TH | WLCA12-TH-N |
| WLCA12-TC | WLCA12-TC-N |
| WLCA12-RP | WLCA12-RP-N |
| WLCA12-P1 | WLCA12-P1-N |
| WLH12-TH | WLCA12-TH-N |
| WLH12-TC | WLCA12-TC-N |
| WLH12-RP | WLCA12-RP-N |
| WLH12-P1 | WLCA12-P1-N |
| WLG12-TH | WLG12-TH-N |
| WLG12-TC | WLG12-TC-N |
| WLG12-RP | WLG12-RP-N |
| WLG12-P1 | WLG12-P1-N |
| WLCA12-2TH | WLCA12-2TH-N |
| WLCA12-2TC | WLCA12-2TC-N |
| WLCA12-2NTH | WLCA12-2NTH-N |
| WLCA12-2NTC | WLCA12-2NTC-N |
| WLCL-55 | WLCL-55-N |
| WLCL-55LD | WLCL-55LD-N |
| WLCL-139 | WLCL-139-N |
| WLCL-140 | WLCL-140-N |
| WLCL-RP60 | WLCL-RP60-N |
| WLCL-TH | WLCL-TH-N |
| WLCL-TC | WLCL-TC-N |
| WLCL-RP | WLCL-RP-N |
| WLCL-P1 | WLCL-P1-N |
| WLHL-TH | WLCL-TH-N |
| WLHL-TC | WLCL-TC-N |
| WLHL-RP | WLCL-RP-N |
| WLHL-P1 | WLCL-P1-N |
| WLGL-TH | WLGL-TH-N |
| WLGL-TC | WLGL-TC-N |
| WLGL-RP | WLGL-RP-N |
| WLGL-P1 | WLGL-P1-N |

| WL | WL-N |
|---|---|
| WLCL-2TH | WLCL-2TH-N |
| WLCL-2TC | WLCL-2TC-N |
| WLCL-2RP | WLCL-2RP-N |
| WLCL-2NTH | WLCL-2NTH-N |
| WLCL-2NTC | WLCL-2NTC-N |
| WLD2-55 | WLD28-55-N |
| WLD2-55LD | WLD28-55LD-N |
| WLD2-55LE | WLD28-55LE-N |
| WLD2-139 | WLD28-139-N |
| WLD2-RP60 | WLD28-RP60-N |
| WLD2-TH | WLD28-TH-N |
| WLD2-TC | WLD28-TC-N |
| WLD2-RP | WLD28-RP-N |
| WLD28-55 | WLD28-55-N |
| WLD28-55LD | WLD28-55LD-N |
| WLD28-55LE | WLD28-55LE-N |
| WLD28-139 | WLD28-139-N |
| WLD28-140 | WLD28-140-N |
| WLD28-RP60 | WLD28-RP60-N |
| WLD28-TH | WLD28-TH-N |
| WLD28-RP | WLD28-RP-N |
| WLSD-55 | WLSD-55-N |
| WLSD-55LD | WLSD-55LD-N |
| WLSD-139 | WLSD-139-N |
| WLSD-RP60 | WLSD-RP60-N |
| WLSD-TH | WLSD-TH-N |
| WLSD-TC | WLSD-TC-N |
| WLSD-RP | WLSD-RP-N |
| WLSD2-55 | WLSD2-55-N |
| WLSD2-55LD | WLSD2-55LD-N |
| WLSD2-139 | WLSD2-139-N |
| WLSD2-140 | WLSD2-140-N |
| WLSD2-RP60 | WLSD2-RP60-N |
| WLSD2-TH | WLSD2-TH-N |
| WLSD2-TC | WLSD2-TC-N |
| WLSD2-RP | WLSD2-RP-N |
| WLNJ-55 | WLNJ-55-N |
| WLNJ-55LD | WLNJ-55LD-N |
| WLNJ-139 | WLNJ-139-N |
| WLNJ-140 | WLNJ-140-N |
| WLNJ-RP60 | WLNJ-RP60-N |
| WLNJ-TH | WLNJ-TH-N |
| WLNJ-TC | WLNJ-TC-N |
| WLNJ-RP | WLNJ-RP-N |
| WLNJ-255 | WLNJ-255-N |
| WLNJ-255LD | WLNJ-255LD-N |
| WLNJ-2140 | WLNJ-2140-N |
| WLNJ-2RP60 | WLNJ-2RP60-N |
| WLNJ-2TC | Ask your OMRON representative. |
| WLNJ-2RP | WLNJ-2RP-N |
| WLCA2-LEAS | WLCA2-LEAS-N |
| WLH2-LEAS | WLCA2-LEAS-N |

| WL | WL-N |
|---|---|
| WLG2-LEAS | WLG2-LEAS-N |
| WLCA2-LDAS | WLCA2-LDAS-N |
| WLH2-LDAS | WLCA2-LDAS-N |
| WLG2-LDAS | WLG2-LDAS-N |
| WLCA2-LES | WLCA2-LES-N |
| WLH2-LES | WLCA2-LES-N |
| WLG2-LES | WLG2-LES-N |
| WLGCA2-LES | WLGCA2-LES-N |
| WLCA2-LDS | WLCA2-LDS-N |
| WLH2-LDS | WLCA2-LDS-N |
| WLG2-LDS | WLG2-LDS-N |
| WLGCA2-LDS | WLGCA2-LDS-N |
| WLD28-LES | WLD28-LES-N |
| WLD28-LDS | WLD28-LDS-N |
| WLMCA2-LD | WLMCA2-LD-N |
| WLMCA2-LDK13A | WLMCA2-LDK13A-N |
| WLMCA2-LDK13 | WLMCA2-LDK13-N |
| WLMCA2-LDK43A | WLMCA2-LDK43A-N |
| WLMCA2-LDK43 | WLMCA2-LDK43-N |
| WLMCA2-LD-M1J | WLMCA2-LD-M1J-N |
| WLMCA2-LD-DGJ03 | WLMCA2-LD-DGJ-N |
| WLMGCA2-LD | WLMGCA2-LD-N |
| WLMGCA2-LDK13A | WLMGCA2-LDK13A-N |
| WLMGCA2-LDK13 | WLMGCA2-LDK13-N |
| WLMGCA2-LDK43A | WLMGCA2-LDK43A-N |
| WLMGCA2-LDK43 | WLMGCA2-LDK43-N |
| WLMGCA2-LD-M1J | WLMGCA2-LD-M1J-N |
| WLMH2-LD | WLMCA2-LD-N |
| WLMH2-LDK13A | WLMCA2-LDK13A-N |
| WLMH2-LDK13 | WLMCA2-LDK13-N |
| WLMH2-LDK43A | WLMCA2-LDK43A-N |
| WLMH2-LDK43 | WLMCA2-LDK43-N |
| WLMH2-LD-M1J | WLMCA2-LD-M1J-N |
| WLMH2-LD-DGJ03 | WLMCA2-LD-DGJ-N |
| WLMG2-LD | WLMG2-LD-N |
| WLMG2-LDK13A | WLMG2-LDK13A-N |
| WLMG2-LDK13 | WLMG2-LDK13-N |
| WLMG2-LDK43A | Ask your OMRON representative. |
| WLMG2-LDK43 | WLMG2-LDK43-N |
| WLMG2-LD-M1J | WLMG2-LD-M1J-N |
| WLMG2-LD-DGJ03 | WLMG2-LD-DGJ-N |
| WLRCA2 | WLRCA2-N |
| WLRGCA2 | WLRGCA2-N |
| WLRG2 | WLRG2-N |
| WLRH2 | WLRCA2-N |
| WLRCA2-2 | WLRCA2-2-N |
| WLRCA2-2N | WLRCA2-2N-N |
| WLRCA2 | WLRCA2-N |
| WLRG2 | WLRG2-N |
| WLRH2 | WLRCA2-N |
| WLRCA2-2 | WLRCA2-2-N |
| WLRCA2-2N | WLRCA2-2N-N |

| WL | WL-N |
|---|---|
| WLRCL | WLRCA2-N |
| WLRG2 | WLRG2-N |
| WLRCA2-2 | WLRCA2-2-N |
| WLRCA2-2N | WLRCA2-2N-N |
| WLRCA32 | WLRCA32-N |
| WLRCA2-LDS | WLRCA2-LDS-N |
| WLRH2-LES | WLRCA2-LES-N |
| WLRH2-LDS | WLRCA2-LDS-N |
| WLRG2-LDS | WLRG2-LDS-N |
| WLRGCA2-LES | WLRGCA2-LES-N |

# Safety Precautions

## Precautions for Safe Use

- Be sure to ground. If not, there is the possibility that electrical shock occurs.
- Do not touch charged switch terminals while the switch has carry current, otherwise there is the possibility that electrical shock occurs.
- Do not disassemble the limit switch or touch inside of it under supplying power, otherwise there is the possibility that electrical shock occurs.
- Do not touch the wire or rod type actuator in order to prevent injury.
- Connect a fuse which has 1.5 to 2 times higher breaking current than the switch rated current to the switch in series in order to prevent the switch from short-circuit damage.
  On the occasion when using the switch with GB ratings, use a 10A fuse that complies IEC60269, either type gG.
- The durability of switch is depends on the operating condition. Be sure to check the condition with actual using condition before using, and use with the number of times of operating without a performance problem.
- Do not drop the switch. Otherwise, there is the possibility that the switch functions may be spoiled.
- Do not connect a Single Limit Switch to two power supplies that are different in polarity or type.
- Be sure to keep the load current less than the rated value. Otherwise, there is the possibility that the switch may be damage and/or burnout.
- Minimum operating load: 5 VDC 1 mA, resistive load, P level

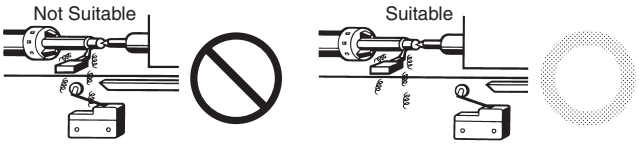
**Note:** The P level indicates the standard malfunction level at a reliability level of 60% ($\lambda 60$).
($JISC5003$) $\lambda 60 = 0.1 \times 10^{-6}$ per operation, which indicates an estimated malfunction of 1 out of every 10,000,000 operations at a reliability level of 60%.

- Do not use the Switch by itself in atmospheres containing flammable or explosive gases. Arcs and heating resulting from switching may cause fire or explosion.
- Be sure to prevent the foreign materials such like a scrapped cable intrusion in to the switch when wiring. Otherwise, there is the possibility of spoiling the normal operation.
- Never wire to the wrong terminals.
- Do not store or use the switch with following place.
  Where the temperature fluctuates greatly
  Where the humidity is very high and condensation may occur.
  Where the vibration is too much
  Where receiving direct sunshine.
  Where receiving salty wind.
- Do not disassemble and/or modify the switch at anytime. Otherwise, there is the possibility of spoiling the normal operation.
- Do not apply the force such like deformation and/or degeneration to the switch. Otherwise, there is the possibility that the switch functions may be spoiled.

## Precautions for Correct Use

### Environment

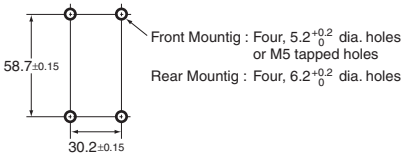
- Take special care to use where there is fine powder, mud and/or foreign materials stacking. And check the condition with actual using condition before using. Then use without a performance problem.
- This switch is only for indoor use. If it is used in outdoor, it may be cause of switch failure.
- Do not keep the Switch in locations with corrosive gas, such as sulfuric gas ($H_2S$ or $SO_2$), ammonium gas ($NH_3$), nitric gas ($HNO_3$), or chlorine gas ($Cl_2$), or high temperature and humidity. Otherwise, contact failure or corrosion damage may result.
- Seal material may deteriorate if a Switch is used outdoor or where subject to special cutting oils, solvents, or chemicals. Always appraise performance under actual application conditions and set suitable maintenance and replacement periods.
- Install Switches where they will not be directly subject to cutting chips, dust, or dirt. The Actuator and Switch must also be protected from the accumulation of cutting chips or sludge.




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

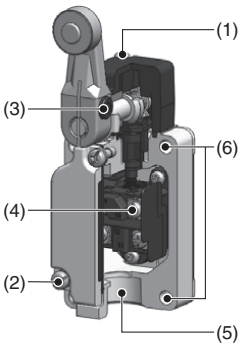
### Installing the Switch

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



## 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 | Torque | Screw type |
|---|---|---|---|
| (1) | Head mounting screw | 0.78 to 0.88 N•m | M3.5 screw |
| (2) | Cover mounting screw | 1.18 to 1.37 N•m | M4 screw |
| (3) | Allen-head bolt (for securing the roller lever) | 4.90 to 5.88 N•m | M5 hexagon socket head cap screw |
| (3) | Allen-head bolt (for securing the adjustable rod lever) | 0.88 to 1.08 N•m | M8 hexagon socket set screw |
| (4) | Terminal screw | 0.59 to 0.78 N•m | M3.5 screw |
| (5) | Connector | 1.77 to 2.16 N•m | G1/2orPg13.5orM20or 1/2-14NPT |
| (6) | Unit mounting screw | 4.90 to 5.88 N•m | M5 hexagon socket head cap screw |

## Wring

### In the case of mounting screw

- Use M3.5-nylon insulation covered crimp terminals (round type) for wiring.
  Ex.) V1.25-M3.5(RAP1.25-3.5) (J.S.T. Mfg. Co.,Ltd.)
- Appropriate wire size is AWG16 (1.25mm$^2$).
- Do not supply electric power when wiring.
  Otherwise electric shock may result.
- Do not pull out the wires with excessive force.
  It may cause of coming off the wire.
- Use crimp terminals for wiring.
- In the case of lump unit, to avoid interference between lump unit and crimp terminals, wire according to right wiring figure.
  Attach the lump unit spring to terminal screw certainly otherwise itÅfs possible to be destroyed or shorted.
- The ground terminal is only installed on models with ground terminals.

### In the case of prewired connecter and direct connecter

- Holding the connecter certainly when pulling connecter.
- Don't pull the cable holding it.

## How to handle

### Changing direction of the head

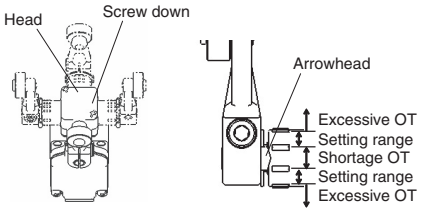
- By removing the screws in the two corners of the head, the head can be set any of four directions. Be sure to change the plunger for internal operations at the same time.

### Built-in Switch

- Do not remove or replace the built-in switch.

### Overtravel Markers

- All Switches with Roller Lever Actuators except for Switches with Fork Lever Locks and Low-temperature Switches have a set position marker plate.
- To allow the roller lever type actuator to travel properly, set the roller lever according to the dog or cam stroke so that the arrowhead of the lever is positioned within overtravel markers as shown.




### Connectors

- Tighten the connector with the appropriate torque to prevent deformation.
- Use the OMRON type SC connector series, which is prepared separately, suitable for outer diameter of cable and inner diameter of seal rubber.
- Make sure to wrap the connector with the seal tape, except the connector which has O-ring, to keep the sealability.
- To conform to CSA, use a CSA certified water tight treated conduit hub.
- 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.

### Microload Applications

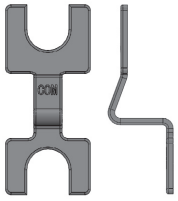
- The switch contacts can be used both for standard loads and microloads, but once a contact has been used to open and close a load it can no longer be used for lower loads. Doing so will damage the contact surface and reduce contact reliability.
- If an inrush current or other sudden load occurs during a switch operation, the switch will begin to degrade severely which can result in reduced durability.
  Use a contact protection circuit if required.

### 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 indicatorequipped switch. Leakage current may cause load malfunction (i.e., the load may remain ON). Make sure that the load operating current is higher than the leakage current.
For countermeasures, refer to technical support on your OMRON website.

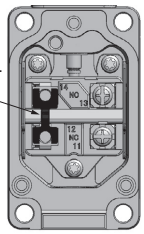
### Terminal Plate

- By using the Terminal Plate (sold separately), as shown in the following diagram, the Switch can be used as a single-polarity double-break switch.




Terminal Plate

Attach the Terminal Plate so that the "COM" mark is oriented as shown on the left.

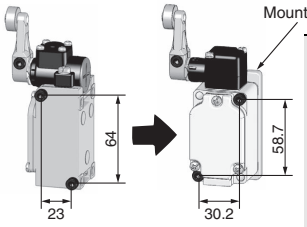



Terminal Plate Mounting Diagram (with Two Terminal Screws Removed)

| Model | WL-N TERMINAL PLATE |
|---|---|

### Using a WL□-2N Switch Mounted from the Side

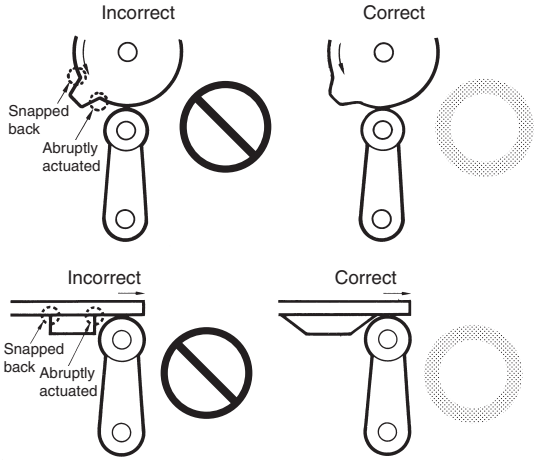
If you replace a previous Switch with a WL□-2N-N Switch, a Mounting Plate (sold separately) is available to maintain mounting compatibility. If you use the Mounting Plate, the Switch mounting holes and actuator position will be compatible. (The position of the dog will not need to be changed.)



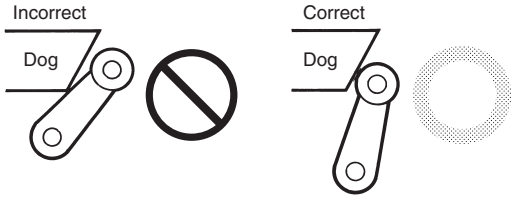

| | | |
|---|---|---|
| **Set contents** | Plate (1) | Plate mounting bolts (2)<br>Switch mounting bolts (2) |
| **Model** | WLN-P001 | |

## Operation

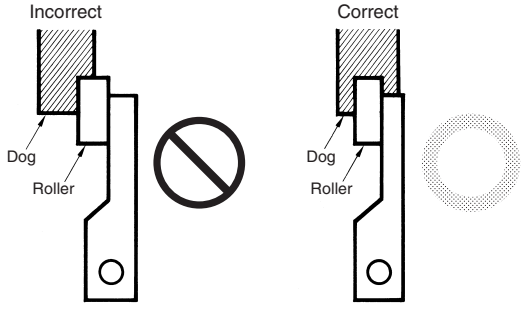
- Carefully determine the position and shape of the dog or cam so that the actuator will not abruptly snap back, thus causing shock. In order to operate the Limit Switch at a comparatively high speed, use a dog or cam that keeps the Limit Switch turned ON for a sufficient time so that the relay or valve will be sufficiently energized.
- The method of operation, the shape of the cam or dog, the operating frequency, and the travel after operation have a large influence on the durability and operating accuracy of the Limit Switch. The cam or dog must be smooth in shape.




- Appropriate force must be imposed on the actuator by the cam or dog in both rotary operation and linear operation.
  If the dog touches the lever as shown below, the operating position will not be stable.

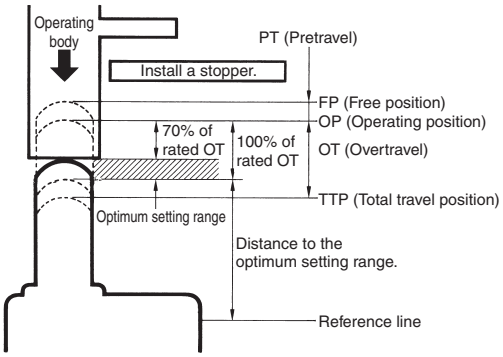



- Unbalanced force must not be imposed on the actuator. Otherwise, wear and tear on the actuator may result.

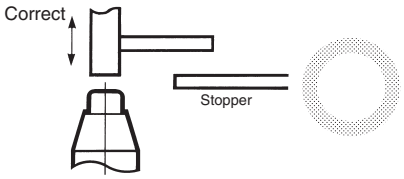



- With a roller actuator, the dog must touch the actuator at a right angle. The actuator or shaft may deform or break if the dog touches the actuator (roller) at an oblique angle.

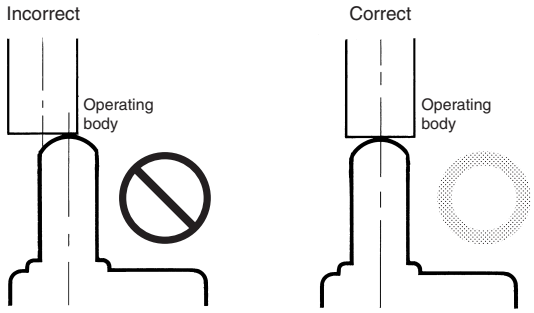

- Make sure that the actuator does not exceed the OT (overtravel) range, otherwise the Limit Switch may malfunction. When mounting the Limit Switch, be sure to adjust the Limit Switch carefully while considering the whole movement of the actuator.




- The Limit Switch may soon malfunction if the OT is excessive. Therefore, adjustments and careful consideration of the position of the Limit Switch and the expected OT of the operating body are necessary when mounting the Limit Switch.



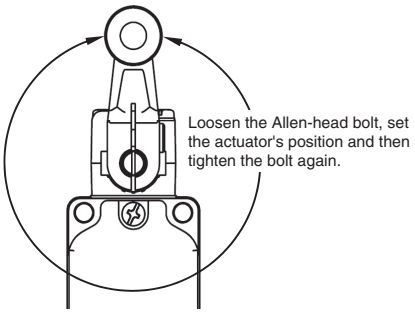
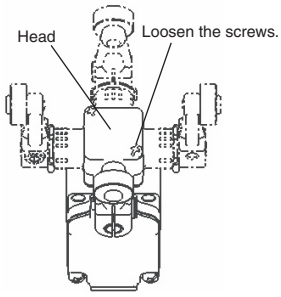
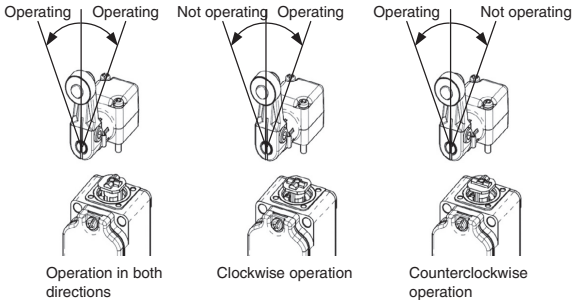
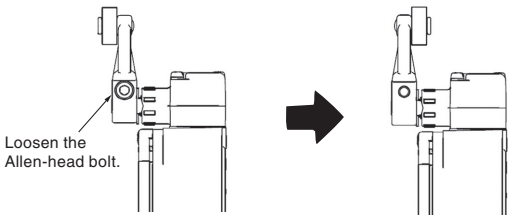

- When using a pin-plunger actuator, make sure that the stroke of the actuator and the movement of the dog are located along a single straight line.

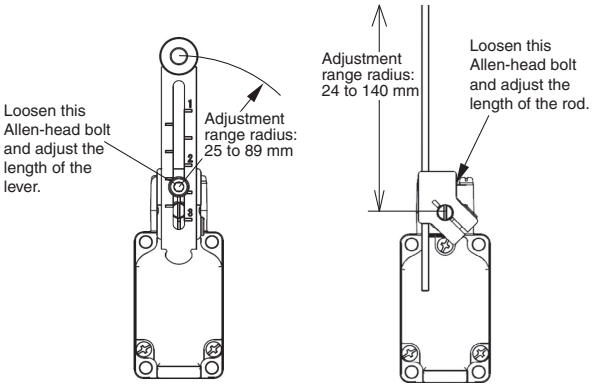
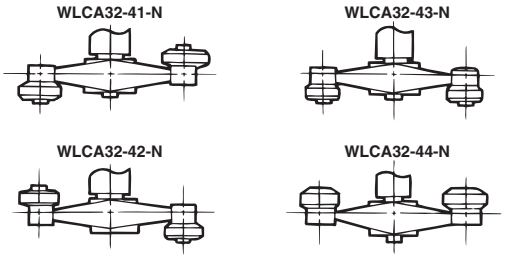



## Others

- For long term (over a year) storage, check according to Operating characteristics, Contact resistance and Dielectric strength at least. And check with using condition.
- The durability of the Switch is greatly affected by operating conditions.
  Evaluate the Switch under actual working conditions before permanent installation and use the Switch within a number of switching operations that will not adversely affect the SwitchÅfs performance.

## Using the Switches

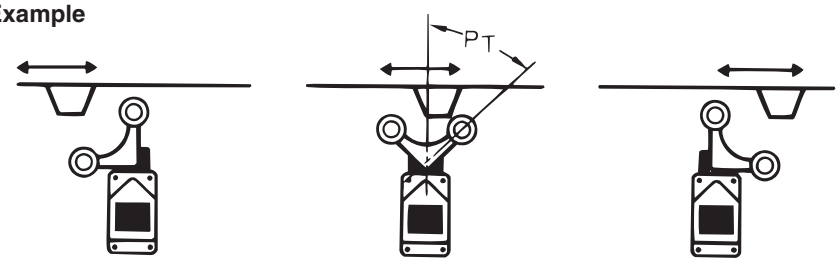
| Item | Applicable models and Actuators | Details |
|---|---|---|
| **Changing the Installation Position of the Actuator**<br>By loosening the Allen-head bolt on the actuator lever, the position of the actuator can be set anywhere within the 360°.<br>With Indicator-equipped Switches, the actuator lever comes in contact with the top of the indicator cover, so use caution when rotating and setting the lever.<br>When the lever only moves forwards and backwards, it will not contact the lamp cover.<br>(This does not apply to Long-life Switches.) | Roller Levers:<br>(WLCA2-N, WLCA2-2-N, WLCA2-2N-N, WLG2-N, WLCA2-7-N, WLCA2-8-N, WLGCA2-N, WLMCA2-N, WLMG2-N, WLMGCA2-N)<br>Adjustable Roller Levers:<br>(WLCA12-N, WLCA12-2-N, WLCA12-2N-N, WLG12-N)<br>Adjustable rod lever:<br>(WLCL-N, WLCL-2-N, WLCL-2N-N, WLGL-N, WLCAL4-N, WLCAL5-N) |  |
| **Changing the Orientation of the Head**<br>By removing the two screws of the Head, the Head can be set in any of the four directions.<br>Be sure to change the plunger for internal operations at the same time.<br>The roller plunger can be set in either of two positions at 90° | Roller Levers:<br>(WLCA2-N, WLCA2-2-N, WLCA2-2N-N, WLG2-N, WLCA2-7-N, WLCA2-8-N, WLGCA2-N, WLMCA2-N, WLMG2-N, WLMGCA2-N)<br>Adjustable Roller Levers:<br>(WLCA12-N, WLCA12-2-N, WLCA12-2N-N, WLG12-N)<br>Adjustable rod lever:<br>(WLCL-N, WLCL-2-N, WLCL-2N-N, WLGL-N, WLCAL4-N, WLCAL5-N)<br>Horizontal plunger<br>(WLSD□-N)<br>Sealed top-roller plunger<br>(WLD28-N)<br>**Note:** Does not include the -RP60 Series or -141 Series. |  |
| **Changing the Operating Direction**<br>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. | Roller Levers:<br>(WLCA2-N, WLCA2-2-N, WLCA2-2N-N, WLG2-N, WLCA2-7-N, WLCA2-8-N, WLGCA2-N, WLMCA2-N, WLMG2-N, WLMGCA2-N)<br>Adjustable Roller Levers:<br>(WLCA12-N, WLCA12-2-N, WLCA12-2N-N, WLG12-N)<br>Adjustable rod lever:<br>(WLCL-N, WLCL-2-N, WLCL-2N-N, WLGL-N, WLCAL4-N, WLCAL5-N) | The output of the Switch will be changed, regardless of which direction the lever is pushed.<br>The output of the Switch will only be changed when the lever is pushed in one direction.<br>  |
| **Installing the Roller on the Inside**<br>By installing the roller lever in the opposite direction, the roller can be installed on the inside.<br>(Set so that operation can be completed within a 180° level range.) | Roller Levers:<br>(WLCA2-N, WLCA2-2-N, WLCA2-2N-N, WLG2-N, WLCA2-7-N, WLCA2-8-N, WLGCA2-N, WLMCA2-N, WLMG2-N, WLMGCA2-N)<br>Fork lever lock:<br>(WLCA32-4□-N)<br>**Note:** Except for Switches with variable roller levers. |  |

| Item | Applicable models and Actuators | Details |
|---|---|---|
| **Adjusting the Length of the Rod or Lever**<br>The length of the rod or lever can be adjusted by loosening the Allen-head bolt. | Adjustable Roller Levers:<br>(WLCA12-N, WLCA12-2-N, WLCA12-2N-N, WLG12-N)<br>Adjustable rod lever:<br>(WLCL-N, WLCL-2-N, WLCL-2N-N, WLGL-N, WLCAL4-N) |  <br>**Adjustable Roller Levers:** **Adjustable Rod Levers:** |
| **Selecting the Roller Position**<br>There are four types of Switches with Fork Lever Locks for use depending on the roller position. | Fork lever lock:<br>(WLCA32-4□-N) |  <br>An explanation of the operation of fork lever locks is provided after this table. |

## Operation of Fork Lever Locks

A Switch with a Fork Lever Lock is constructed so that the dog pushes the lever to invert the output and this inverted state is maintained even after the dog moves 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**

# Limit Switch Connectors

### Connectors (SC Series)

Cabtire cables and flexible tubes with various diameters are used to connect machine tools and controllers with Limit Switches. To ensure the watertightness of the edges of the conduits, use an SC Connector that is suitable for the external diameter of cable and model of Limit Switch.

## Ordering Information

### Connector for Cabtire Cable

| Conduit | Applicable cable | Inner diameter (D) of seal rubber | External diameter of cable | | Model | Applicable model |
|---|---|---|---|---|---|---|
| | | | Min. | Max. | | |
| JIS B 0202 G½ | Cabtire cable (general-purpose) | 7 mm | 5.5 mm | 7.5 mm | **SC-1M** | WL-N, D4A-□N, D4B-□N, ZE, ZV, ZV2, XE, XV, XV2 |
| | | 9 mm | 7.5 mm | 9.5 mm | **SC-2M** | |
| | | 12.5 mm | 11 mm | 13 mm | **SC-3M** | |
| | | 14 mm | 12 mm | 14 mm | **SC-4M** | |
| | | 11 mm | 9 mm | 11 mm | **SC-5M** | |
| | Cabtire cable (anti-corrosive) | 7 mm | 5.5 mm | 7.5 mm | **SC-21** | |
| | | 9 mm | 7.5 mm | 9.5 mm | **SC-22** | |
| | | 12.5 mm | 11 mm | 13 mm | **SC-23** | |
| | | 14 mm | 12 mm | 14 mm | **SC-24** | |
| | | 11 mm | 9 mm | 11 mm | **SC-25** | |
| ½-14NPT | Cabtire cable | 7 mm | 5.5 mm | 7.5 mm | **SC-1PT** | D4A-□N |
| | | 9 mm | 7.5 mm | 9.5 mm | **SC-2PT** | |
| | | 12.5 mm | 11 mm | 13 mm | **SC-3PT** | |
| | | 14 mm | 12 mm | 14 mm | **SC-4PT** | |
| | | 11 mm | 9 mm | 11 mm | **SC-5PT** | |

Note: Please use sealling tape with SC Connectors. SC-1M to SC-5M, however, are provided with an O-ring (NBR) and therefore sealing tape is not necessary to ensure a proper seal.

**Simple Connectors** (Not Suitable for Locations Subject to Oil or Water)

| Conduit | Applicable cable | Inner diameter (D) of seal rubber | External diameter of cable | | Model | Applicable model |
|---|---|---|---|---|---|---|
| | | | Min. | Max. | | |
| JIS B 0202 G½ | Cabtire cable | 10.6 mm | 8.5 mm | 10.5 mm | **SC-P2** | WL-N, D4A-□N, D4B-□N, ZE, ZV, ZV2, XE, XV, XV2 |
| Pg13.5 | | 9.6 mm | 7.5 mm | 9.5 mm | **SC-P3** | WL□-G-N |
| JIS B 0202 G½ | | 9 mm | 7.5 mm | 9 mm | **SC-6** | WL-N, D4A-□N, D4N *, D4N-□R *, D4B-□N, ZE, ZV, ZV2, XE, XV, XV2 |

Note: Simple connector are made of resin. If more sealing capability is required, use one of SC-1M to SC-5M, which have metal casings. Models marked with an asterisk (*) however, can only be used with resin connectors.

## Dimensions and Structure

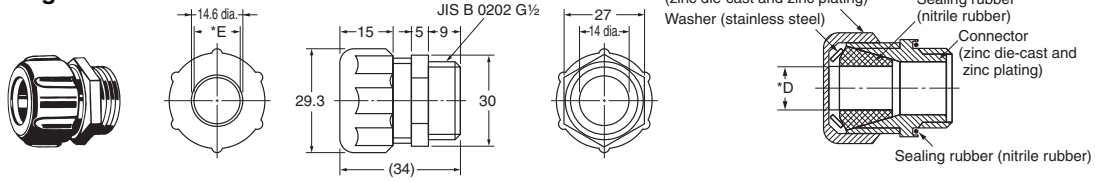
(Unit: mm)

### Connectors for Cabtire Cable

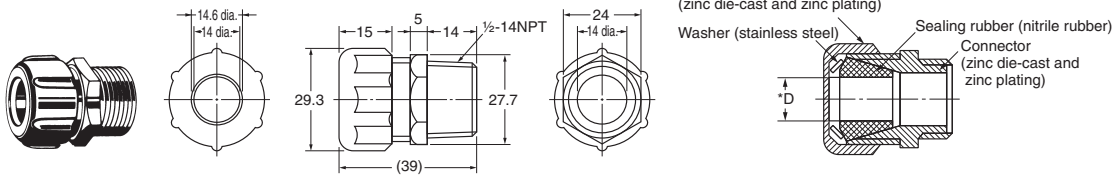
As for models without an O-ring, please use sealing tape with SC Connectors.

**Metal Models without O-ring**
**G½**
**SC-21 to 25**


**Metal Models with O-ring**
**G½**
**SC-1M to 5M**



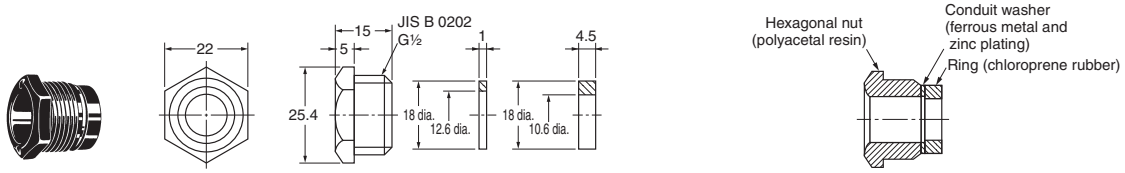

**Metal Models without O-ring**
**½-14NPT**
**(U.S.-standard screws)**
**SC-1PT to 5PT**



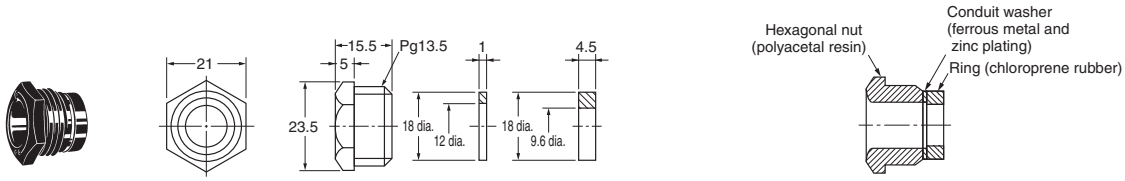

Note: Dimensions not shown in the above diagrams have a variation of ±0.4 mm.

### Simple Connectors (Not Suitable for Locations Subject to Oil or Water)

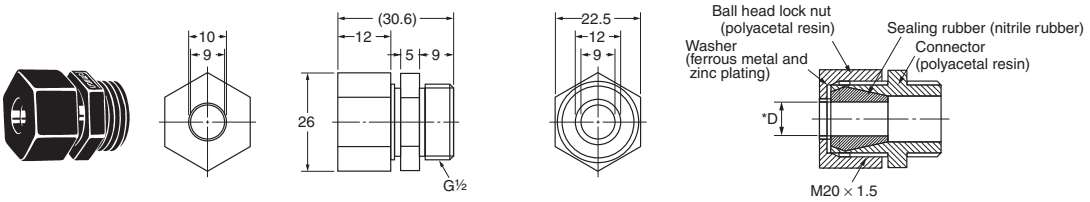
**Resin Models**
**G½**
**SC-P2**




**Resin Models**
**Pg13.5**
**SC-P3**




**Resin Models**
**G½**
**SC-6**




Note: Dimensions not shown in the above diagrams have a variation of ±0.4 mm.

* Diameter of Part Marked with Asterisk

| Model | Inner diameter (D) of sealed rubber | Internal diameter (E) of washer | Applicable cable |
|---|---|---|---|
| **SC-21, -1M, -1PT** | 7 mm | 10.4 mm | 5.5 to 7.5-mm dia. |
| **SC-22, -2M, -2PT** | 9 mm | 13.2 mm | 7.5 to 9.5-mm dia. |
| **SC-23, -3M, -3PT** | 12.5 mm | 14.6 mm | 11 to 13-mm dia. |
| **SC-24, -4M, 4PT** | 14 mm | 14.6 mm | 12 to 14-mm dia. |
| **SC-25, -5M, -5PT** | 11 mm | 13.2 mm | 9 to 11-mm dia. |
| **SC-6** | 9 mm | 10 mm | 7.5 to 9-mm dia. |

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• Ultrasonic Sensors • Vision Sensors

**Industrial Components**
• RFID/Code Readers • Relays • Pushbuttons & Indicators
• Limit and Basic Switches • Timers • Counters • Metering Devices
• Power Supplies

**Safety**
• Laser Scanners • Safety Mats • Edges and Bumpers • Programmable Safety Controllers • Light Curtains • Safety Relays • Safety Interlock Switches

A/25+C/]1]/ 07/14 Note: Specifications are subject to change.  Printed in U.S.A.

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