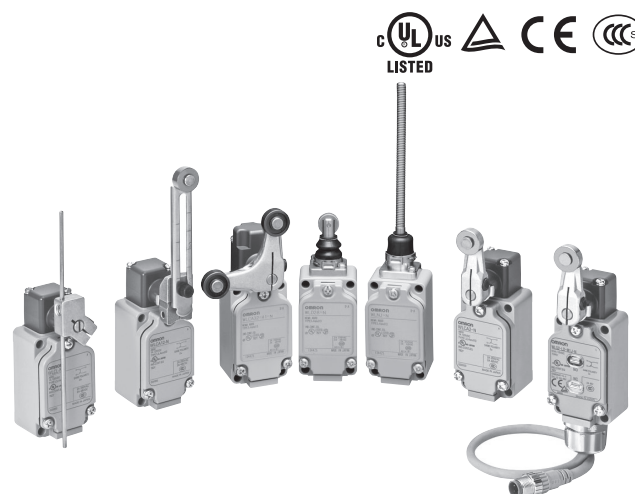


# Two-circuit Limit Switch WL-N/WL

## Two-circuit limit switches that can be selected to match the operating environment and application

- Wide variety of head shapes, including Roller Lever, Plunger, Flexible Rod, and Fork Lock Lever Switches.
- You can select the optimum actuator shape for the workpiece shape and movement from a variety of actuators.
- In addition to general detection, we also have environment resistant models for harsh environments, sputter resistant models for welding processes, and long-life models for high-frequency use.



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

**⚠ Be sure to read *Safety Precautions* on page 62 to 67 and *Safety Precautions for All Limit Switches*.**

## Features

### General-purpose Switches

#### A Wide Range of Models

You can select the optimum product for the workpiece shape and movement from a variety of actuators, including Roller Lever, Plunger, Flexible Rod, and Fork Lock Lever Switches.

### Environment-resistant Switches

#### Six environment resistant models are available

Airtight Switches, Hermetic Switches, Heat-resistant Switches, Low-temperature Switches, Corrosion-proof Switches, and Weather-proof Switches are available.

You can select the model based on the onsite environment.

### Spatter-prevention Switches

#### Ideal for Welding Sites

Uses stainless steel and plastic materials that prevent the adhesion of spatter.

They can be used to reduce problems caused by zinc power generated during welding.

### Long-life Switches

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

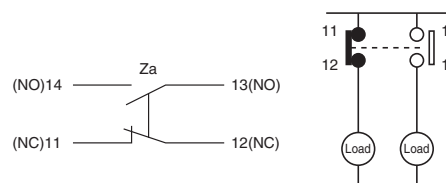
A mechanical durability of over 30 million cycles is achieved by improving slidability and the wear resistance of the head.

### Features Common

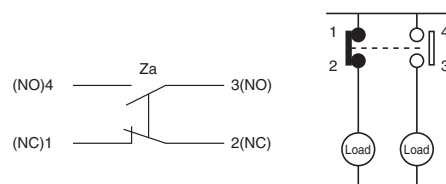
#### DPDB Operation

The two-circuit double-break structure ensures circuit braking.

- Basic/Retention type Switches (WL-N)



- High-sensitivity/High-precision Switches (WL)



#### Degree of Protection; IP67

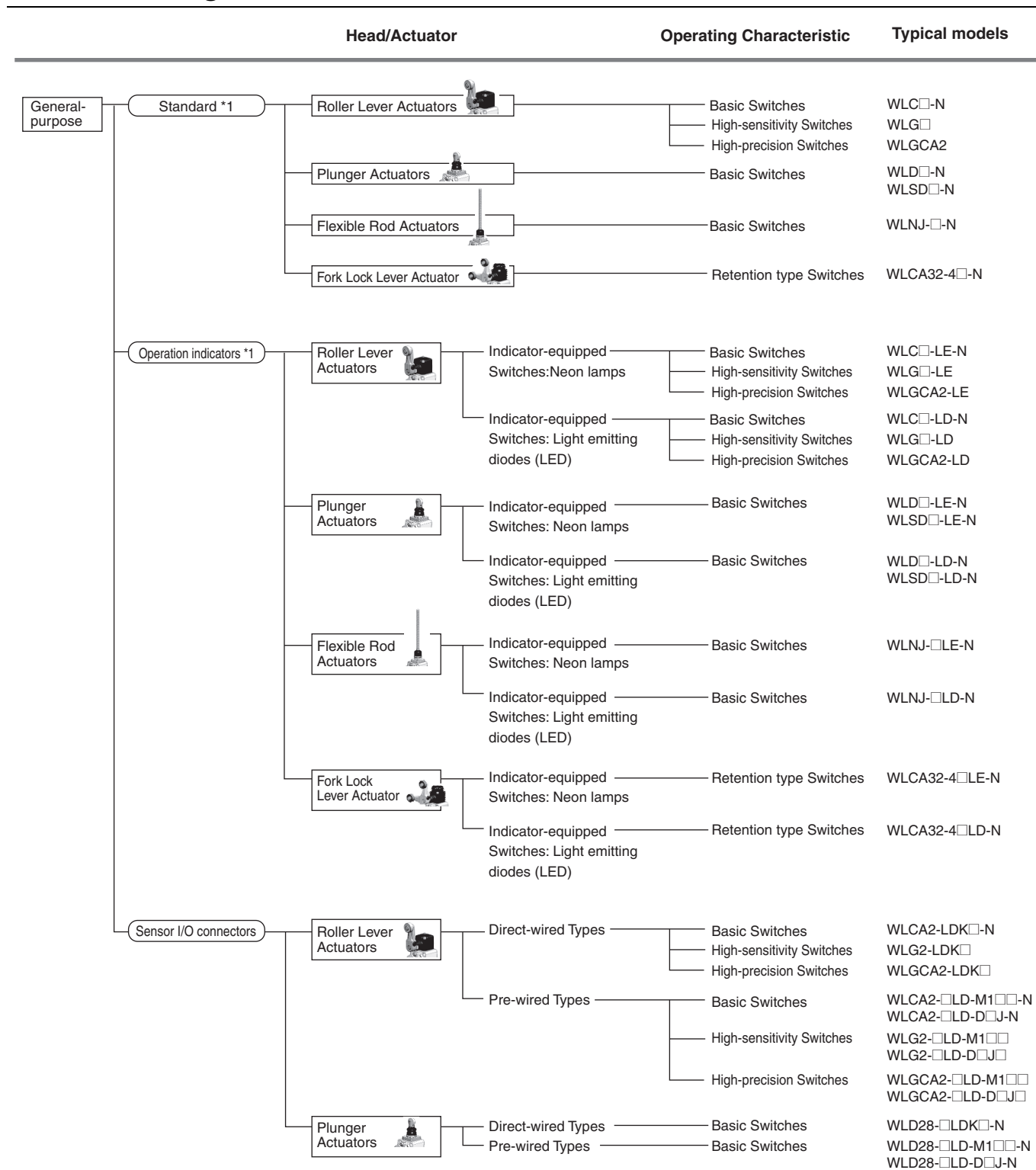
#### Models with Connectors to Reduce Wiring

A neon lamp or LED indicates the operating status. This makes startup checks and maintenance easy.

#### Sensor I/O Connector Models to Match Wiring Specifications

Direct-wire types and pre-wired types are available for easy replacement of limit switches.

## Product Configuration



\*1. The standard wiring specification is the Screw terminal type.

\*2. Wiring specification: Smart-click type is also available.

|                             | Head/Actuator                                                                                                 | Operating Characteristic                                                                                   | Typical models                                                         |
|-----------------------------|---------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------|
| Environment-resistant<br>*1 | Airtight seal *4                                                                                              | Roller Lever Actuators    | Basic Switches<br>High-sensitivity Switches<br>High-precision Switches |
|                             |                                                                                                               | Plunger Actuators         | Basic Switches                                                         |
|                             |                                                                                                               | Flexible Rod Actuators    | Basic Switches                                                         |
|                             | Hermetic seal *4                                                                                              | Roller Lever Actuators    | Basic Switches<br>High-sensitivity Switches<br>High-precision Switches |
|                             |                                                                                                               | Plunger Actuators         | Basic Switches                                                         |
|                             |                                                                                                               | Flexible Rod Actuators    | Basic Switches                                                         |
|                             | Heat-resistant                                                                                                | Roller Lever Actuators    | Basic Switches<br>High-sensitivity Switches<br>High-precision Switches |
|                             |                                                                                                               | Plunger Actuators         | Basic Switches                                                         |
|                             |                                                                                                               | Flexible Rod Actuators   | Basic Switches                                                         |
|                             | Low-temperature                                                                                               | Roller Lever Actuators  | Basic Switches<br>High-sensitivity Switches<br>High-precision Switches |
|                             |                                                                                                               | Plunger Actuators       | Basic Switches                                                         |
|                             |                                                                                                               | Flexible Rod Actuators  | Basic Switches                                                         |
|                             | Corrosion-proof                                                                                               | Roller Lever Actuators  | Basic Switches<br>High-sensitivity Switches<br>High-precision Switches |
|                             |                                                                                                               | Plunger Actuators       | Basic Switches                                                         |
|                             |                                                                                                               | Flexible Rod Actuators  | Basic Switches                                                         |
|                             | Weather-proof                                                                                                 | Roller Lever Actuators  | Basic Switches<br>High-sensitivity Switches                            |
| Spatter-prevention *1 *3    | Roller Lever Actuators     | Basic Switches<br>High-sensitivity Switches<br>High-precision Switches                                     | WLCA2-□S-N<br>WLG2-□S<br>WLGCA2-□S<br>WLD28-□S-N                       |
|                             | Plunger Actuators          | Basic Switches                                                                                             |                                                                        |
| Long-life *1 *2 *3          | Roller Lever Actuators *4  | Basic Switches<br>High-sensitivity Switches<br>High-precision Switches                                     | WLMCA2-□-N<br>WLMG2-□<br>WLMGCA2-□                                     |
|                             |                                                                                                               |                                                                                                            |                                                                        |

\*1. The standard wiring specification is the Screw terminal type.  
 \*2. Wiring specification: Direct-wire Connector type is also available. Contact your OMRON sales representative for further information.  
 \*3. Wiring specification: Pre-wired Connector type is also available. Contact your OMRON sales representative for further information.  
 \*4. A type with an operation indicator light is also available. For details, see Ordering Information.

## Selection

### WL-N/WL Actuator Types and Selection

| Head                                                                                                          | Appearance                                                                          | Classification          | Operating force (OF) | Repeat accuracy *1 | Shock and vibration resistance *1 | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|---------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------|----------------------|--------------------|-----------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Roller Lever Models<br>      |    | Roller Lever            | Medium               | ★★★<br>★★ *2       | ★★★                               | <ul style="list-style-type: none"> <li>Can be used over a wide range, from positioning to workpiece detection.</li> <li>Easy to use because the stroke in the direction of revolution can be set to an angle from 45° to 90° (varies by model), and the lever can be set to any angle over 360°.</li> <li>High-sensitivity Switches with minimal movement before activation (example: WLG2) and High-precision Switches with high repeatability (example: WLGCA2) are available.</li> </ul> |
|                                                                                                               |    | Adjustable Roller Lever | Medium               | ★★                 | ★★                                | <ul style="list-style-type: none"> <li>Adjustable length between dog and lever. (Consideration must be given to telegraphing.)</li> <li>Can be used over a wide range, from positioning to workpiece detection.</li> <li>High-sensitivity Switches with minimal movement before activation (example: WLG12) are also available.</li> </ul>                                                                                                                                                  |
|                                                                                                               |    | Adjustable Rod Lever    | Medium               | ★★                 | ★★                                | <ul style="list-style-type: none"> <li>Suitable for detection of a dog or workpiece with a large amount of play. (Consideration must be given to telegraphing.)</li> <li>Also good for detection of irregularly shaped workpieces.</li> <li>Lightest activation (WLCL-N) among rotating-type limit switches.</li> <li>Rod length is adjustable.</li> <li>High-sensitivity Switches with minimal movement before activation (example: WLG2) are also available.</li> </ul>                   |
| Plunger Models<br>         |    | Plunger                 | Large                | ★★★                | ★★★                               | <ul style="list-style-type: none"> <li>High repeatability, good for positioning detection.</li> <li>The workpiece movement direction and plunger movement direction must be matched so that an unbalanced load is not applied to the plunger.</li> </ul>                                                                                                                                                                                                                                    |
|                                                                                                               |  | Roller plunger          | Large                | ★★★                | ★★★                               | <ul style="list-style-type: none"> <li>A wide range of operation is possible by attaching an auxiliary actuator to a cam, dog, cylinder, or other part.</li> <li>High repeatability, good for positioning detection.</li> </ul>                                                                                                                                                                                                                                                             |
|                                                                                                               |  | Ball plunger            | Large                | ★★                 | ★★★                               | <ul style="list-style-type: none"> <li>The tip of the plunger is made of a steel ball, which can be operated in any direction with no limitations.</li> <li>The ball plunger is convenient when the mounting side is not aligned with the movement direction of the dog or the Limit Switch is actuated by two dogs in X and Y directions.</li> </ul>                                                                                                                                       |
| Flexible rod Models<br>    |  | Coil spring             | Small                | ★                  | ★                                 | <ul style="list-style-type: none"> <li>Operation from any direction over 360° is possible, excluding the axial direction.</li> <li>Lowest activation force of the limit switches. Effective for detection of non-uniform directions and shapes.</li> <li>Large tolerance for workpiece play because the actuator absorbs movement after activation.</li> </ul>                                                                                                                              |
|                                                                                                               |  | Resin rod               | Small                | ★                  | ★                                 | <ul style="list-style-type: none"> <li>The resin rod minimizes damage to the workpiece.</li> <li>Operation from any direction over 360° is possible, excluding the axial direction.</li> <li>Lowest activation force of the limit switches. Effective for detection of non-uniform directions and shapes.</li> <li>Large tolerance for workpiece play because the actuator absorbs movement after activation.</li> </ul>                                                                    |
|                                                                                                               |  | Steel wire              | Small                | ★                  | ★                                 | <ul style="list-style-type: none"> <li>The steel wire enables easy workpiece length adjustment, and easy bending is possible.</li> <li>Operation from any direction over 360° is possible, excluding the axial direction.</li> <li>Lowest activation force of the limit switches. Effective for detection of non-uniform directions and shapes.</li> <li>Large tolerance for workpiece play because the actuator absorbs movement after activation.</li> </ul>                              |
| Fork Lock Lever Models<br> |  | Fork Lock Lever         | Medium               | ★★                 | ★★★                               | <ul style="list-style-type: none"> <li>Self-rotates when operated to a position of 55°, holds state at the 90° position.</li> <li>Reciprocating motion can be detected with a single dog.</li> <li>To allow greater deviation in the roller position, two dogs can be used.</li> </ul>                                                                                                                                                                                                      |

\*1. Indications for repeat accuracy and shock and vibration resistance are as follows: ★: OK, ★★: Good, ★★★: Excellent

\*2. The top line shows High-precision Switches. The bottom line shows Basic Switches.

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

## According to Operating Environment

| Environment                   |                                                    | Key specifications                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                               | Models                                                                                                                                                      |                                                                   |  |
|-------------------------------|----------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------|--|
| Ambient operating temperature | Normal                                             | <div> <div> <div>–10°C</div> <div>+80°C</div> </div> </div> <p>Water-resistant to IP67.</p>                                                                                                                                                                                                                                                                                                                                                         | <p>General-purpose Switches</p> <p>Long-life Switches</p>                                                     | <p>Standard model</p> <p>High-sensitivity, High-precision model</p> <p>Standard model</p> <p>High-sensitivity, High-precision model</p>                     | <p>WL□-N</p> <p>WLG□</p> <p>WLM□-N</p> <p>WLMG□</p>               |  |
|                               | High-temperature                                   | <div> <div>+5°C</div> <div>+120°C</div> </div> <p>To increase heat resistance, the rubber material have been changed.</p>                                                                                                                                                                                                                                                                                                                           | <p>Environment-resistant, Heat-resistant Switches</p>                                                         | <p>Standard model *1</p> <p>High-sensitivity, High-precision model *1</p>                                                                                   | <p>WL□-TH-N</p> <p>WLG□-TH</p>                                    |  |
|                               | Low-temperature                                    | <div> <div>–40°C</div> <div>+40°C</div> </div> <p>To increase resistance to cold, epichlorhydrin rubber and other measures are used.</p>                                                                                                                                                                                                                                                                                                            | <p>Environment-resistant, Low-temperature Switches</p>                                                        | <p>Standard model *1</p> <p>High-sensitivity, High-precision model *1</p>                                                                                   | <p>WL□-TC-N</p> <p>WLG□-TC</p>                                    |  |
| Operating environment         | Outdoors                                           | <p>A rubber material resistant to temperature changes is used.</p> <p>Stainless steel is used for the screws.</p> <p>The roller is made of stainless steel with superior corrosion resistance.</p>                                                                                                                                                                                                                                                  | <p>Environment-resistant, Weather-proof Switches</p>                                                          | <p>Standard model *1</p> <p>High-sensitivity, High-precision model *1</p>                                                                                   | <p>WL□-P1-N</p> <p>WLG□-P1</p>                                    |  |
|                               | Chemicals and oil                                  | <p>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.</p>                                                                                                                                                                                       | <p>Environment-resistant, Corrosion-proof Switches</p>                                                        | <p>Standard model *1</p> <p>High-sensitivity, High-precision model *1</p>                                                                                   | <p>WL□-RP-N</p> <p>WLG□-RP</p>                                    |  |
|                               | Water drops and mist                               | <p>Uses an airtight built-in switch.</p>                                                                                                                                                                                                                                                                                                                                                                                                            | <p>Environment-resistant, Airtight Switches</p>                                                               | <p>Standard model *1</p> <p>High-sensitivity, High-precision model *1</p>                                                                                   | <p>WL□-55-N</p> <p>WLG□-55</p>                                    |  |
|                               | Constant water drops and mist                      | <p>Cables are attached. Uses a general-purpose built-in switch.</p> <p>The cover screws, case cover, and conduit opening are molded from epoxy resin to increase the seal. (The cover cannot be removed.)</p>                                                                                                                                                                                                                                       | <p>Environment-resistant, Molded-terminal Switches</p>                                                        | <p>Standard model *1*2</p> <p>High-sensitivity, High-precision model *1*2</p>                                                                               | <p>WL□-139-N</p> <p>WLG□-139</p>                                  |  |
|                               |                                                    | <p>Cables are attached. Uses an airtight built-in switch.</p> <p>The case cover and conduit opening are molded from epoxy resin to increase the seal. (The cover cannot be removed.)</p> <p>The SC connector can be removed, so it is possible to use flexible conduit for the cable.</p>                                                                                                                                                           | <p>Environment-resistant, Molded-terminal Switches</p>                                                        | <p>Standard model *1*2</p> <p>High-sensitivity, High-precision model *1*2</p>                                                                               | <p>WL□-RP40-N</p> <p>WLG□-RP40</p>                                |  |
|                               |                                                    | <p>Cables are attached. Uses an airtight built-in switch.</p> <p>The cover screws, case cover, and conduit opening are molded from epoxy resin to increase the seal. (The cover cannot be removed.)</p>                                                                                                                                                                                                                                             | <p>Environment-resistant, Molded-terminal Switches</p>                                                        | <p>Standard model *1*2</p> <p>High-sensitivity, High-precision model *1*2</p>                                                                               | <p>WL□-140-N</p> <p>WLG□-140</p>                                  |  |
|                               | Constant water drops or splattering cutting powder | <p>Cables are attached. Uses an airtight built-in switch.</p> <p>The cover screws, case cover, and conduit opening are molded from epoxy resin to increase the seal. (The cover cannot be removed.)</p> <p>Two-layer seal on actuator rotation shaft.</p> <p>-141: The Head section is molded from epoxy resin; Head direction cannot be changed.</p> <p>-145: The Head section is molded from epoxy resin; Head can be in any of 4 directions.</p> | <p>Environment-resistant, Molded-terminal Switches</p> <p>Environment-resistant, Molded-terminal Switches</p> | <p>Standard model *1*2</p> <p>High-sensitivity, High-precision model *1*2</p> <p>Standard model *1*2</p> <p>High-sensitivity, High-precision model *1*2</p> | <p>WL□-141-N</p> <p>WLG□-141</p> <p>WL□-145-N</p> <p>WLG□-145</p> |  |
|                               | Coolant                                            | <p>Cables are attached. Uses an airtight built-in switch.</p> <p>The cover screws, case cover, conduit opening, and head screws are molded from epoxy resin to increase the seal.</p> <p>(The cover and head cannot be removed.)</p> <p>Rubber parts are made from fluorine rubber to increase resistance to coolant.</p>                                                                                                                           | <p>Environment-resistant, Anti-coolant Switches</p>                                                           | <p>Standard model *1*2</p> <p>High-sensitivity, High-precision model *1*2</p>                                                                               | <p>WL□-RP60-N</p> <p>WLG□-RP60</p>                                |  |
|                               | Spattering from welding                            | <p>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.</p>                                                                                                                                                                                                                                                                                          | <p>Spatter-prevention Switches</p>                                                                            | <p>Standard model</p> <p>High-sensitivity, High-precision model</p>                                                                                         | <p>WL□-□S-N</p> <p>WLG2-□S</p> <p>WLGCA2-□S</p>                   |  |

\*1. Not all functions can be combined with environment-resistant models.

\*2. For details on the hermetic structure, see the hermetic mold specifications on pages 40 and 41.

## According to Application Conditions

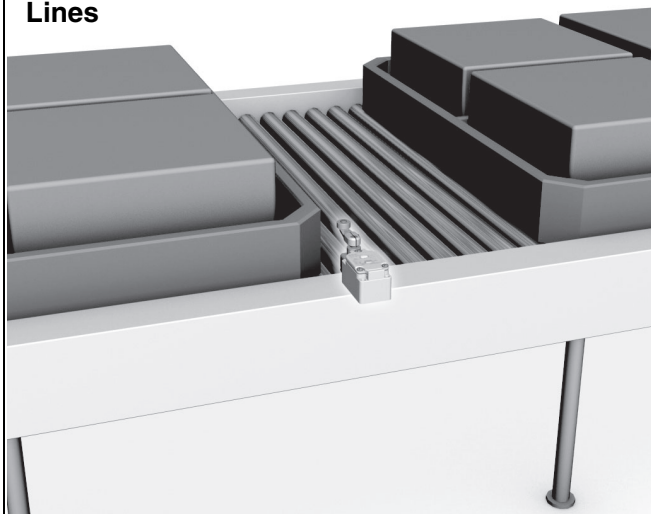
|            | Conditions               | Key specifications                                                                                                        | Models                                                                                                          |                                                                                                                                                                              |                                                               |
|------------|--------------------------|---------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------|
| 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                                                       | General-purpose Switches<br>Environment-resistant Switches<br>Spatter-prevention Switches<br>Long-life Switches | Basic/Retention type Switches<br>Basic Switches<br>Basic Switches<br>Basic Switches                                                                                          | WL□-□-N<br>Applicable to either standard loads or microloads. |
|            |                          |                                                                                                                           | General-purpose Switches<br>Environment-resistant Switches<br>Spatter-prevention Switches<br>Long-life Switches | High-sensitivity/High-precision Switches<br>High-sensitivity/High-precision Switches<br>High-sensitivity/High-precision Switches<br>High-sensitivity/High-precision Switches | WL<br>WLG□<br>WLG□-S<br>WLMG□                                 |
|            | Switching microloads     | 0.1 A at 125 VAC, resistive load<br>0.1 A at 30 VDC, resistive load                                                       | General-purpose Switches                                                                                        | Basic/Retention type Switches                                                                                                                                                | WL□-□-N<br>Applicable to either standard loads or microloads. |
|            |                          |                                                                                                                           | General-purpose Microload Switches                                                                              | High-sensitivity/High-precision Switches                                                                                                                                     | WL<br>WL01G□                                                  |
| Durability | Normal durability        | Mechanical: 15 million operation min.<br>(10 million operation min. for high-sensitivity models * or flexible rod models) | General-purpose Switches<br>Spatter-prevention Switches                                                         | Basic Switches<br>Basic Switches                                                                                                                                             | WL□-N<br>WL□-S-N                                              |
|            |                          |                                                                                                                           | General-purpose Switches<br>Spatter-prevention Switches                                                         | High-sensitivity/High-precision Switches<br>High-sensitivity/High-precision Switches                                                                                         | WL<br>WLG□<br>WLG□-S                                          |
|            | Long-life                | Mechanical: 30 million operation min.                                                                                     | Long-life Switches                                                                                              | Basic Switches                                                                                                                                                               | WLM□-N                                                        |
|            |                          |                                                                                                                           | Long-life Switches                                                                                              | High-sensitivity/High-precision Switches                                                                                                                                     | WL<br>WLMG□                                                   |

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

## Application Examples

**Detection of Passing Pallets on Production Lines**



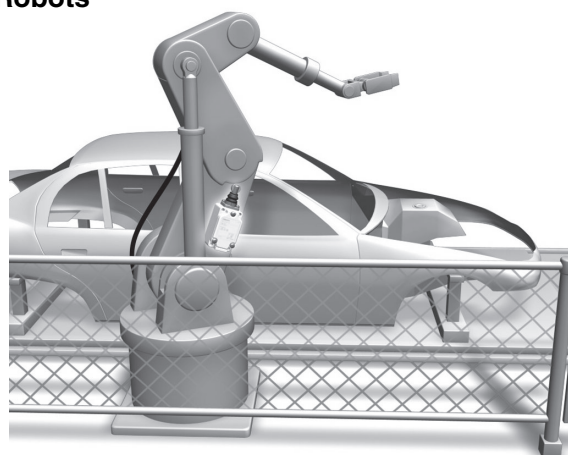
**Detection of Work Table Origins (X, Y, and Z) on Machine Tools**



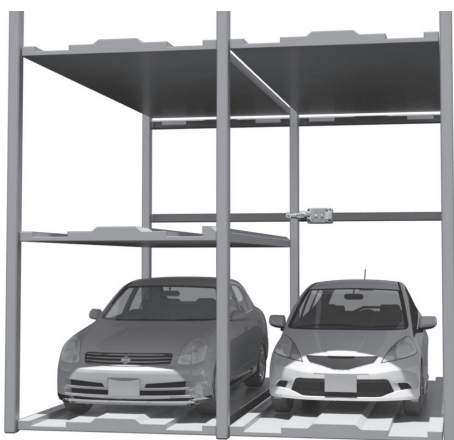
**Detection of Forward and Reverse Movement of Hydraulic Cylinders on Molding Machines**



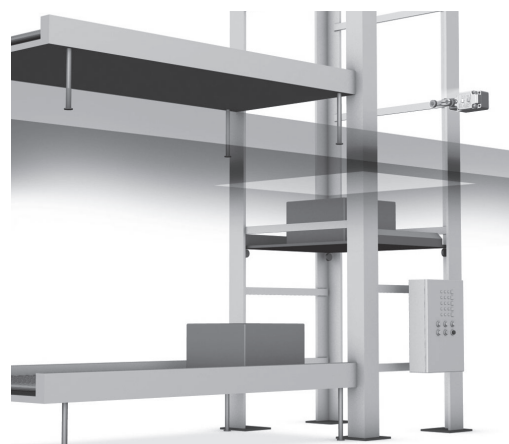
**Detection of Arm Movement on Welding Robots**



**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. Ask your OMRON representative for details.)

General-purpose Switches

Standard Switches      Operation indicator Switches

Basic and Retention type Switches

WL□ - □□□□ -N  
(1) (2) (3) (4) (5)

(1) Actuator and Property Specifications

| Code    | Actuator                              |
|---------|---------------------------------------|
| CA2     | Roller lever: R38 mm                  |
| 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                  |
| CA12-2  | Adjustable roller lever: R25 to 89 mm |
| CL-2    | Adjustable rod lever: 25 to 140 mm    |
| CA2-2N  | Roller lever: R38 mm                  |
| CA12-2N | Adjustable roller lever: R25 to 89 mm |
| CL-2N   | Adjustable rod lever: 25 to 140 mm    |
| CA32-41 | Fork lock lever                       |
| CA32-42 | Fork lock lever                       |
| CA32-43 | Fork lock lever                       |
| D18     | Sealed top plunger                    |
| D28     | Sealed top-roller plunger             |
| D38     | Sealed top-ball plunger               |
| D2      | Top-roller plunger                    |
| SD      | Horizontal plunger                    |
| SD2     | Horizontal-roller plunger             |
| SD3     | Horizontal-ball plunger               |
| NJ      | Flexible rod: Coil spring             |
| NJ-30   | Flexible rod: Coil spring, multi-wire |
| NJ-2    | Flexible rod: Resin rod               |
| NJ-S2   | Flexible rod: Steel wire              |

(2) Built-in Switch Specifications

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

(3) Conduit Size, Ground Terminal Specifications

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

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

(4) Indicator Specifications

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

(5) Lever Specifications

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

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

### General-purpose Switches

#### Standard Switches

#### Operation indicator Switches

#### High-sensitivity and High-precision Switches

WL   -

(1) (2) (3) (4) (5) (6) (7) (8) (9) (10)

### (1) Electrical Rating

| Code  | Specifications |
|-------|----------------|
| Blank | Standard load  |
| 01    | Microload      |

### (2) Actuator and Property Specifications

| Code | Actuator                                               |
|------|--------------------------------------------------------|
| G2   | Roller lever: R38 mm High-sensitivity                  |
| GCA2 | Roller lever: R38 mm High-precision                    |
| G12  | Adjustable roller lever: R25 to 89 mm High-sensitivity |
| GL   | Adjustable roller lever: 25 to 140 mm High-sensitivity |

### (3) Built-in Switch Specifications

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

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

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

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

### (5) Indicator Type

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

### (6) Lever Type

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

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

### General-purpose Switches

### Sensor I/O Connector Switches

### Basic and Retention type Switches

WL□ - □ LD□ -N  
(1) (2) (3) (4)

#### (1) Actuator and Property Specifications

| Code | Actuator                  |
|------|---------------------------|
| CA2  | Roller lever: R38 mm      |
| D28  | Sealed top-roller plunger |
| D2   | Top-roller plunger        |

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

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

#### (3) Indicator Specifications

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

#### (4) Connector Type Wiring Specifications

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

\*1. DC models are certified for EN/IEC (CE Marking).

\*2. Refer to *Contact Forms* on page 21 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. Ask your OMRON representative for details.)

### General-purpose Switches

### Sensor I/O Connector Switches High-sensitivity and High-precision Switches

WL□□-□LD□-N  
(1) (2) (3) (4) (5)

#### (1) Electrical Rating

| Code  | Specifications |
|-------|----------------|
| Blank | Standard load  |
| 01    | Microload      |

#### (2) Actuator and Property Specifications

| Code | Actuator                              |
|------|---------------------------------------|
| G2   | Roller lever: R38 mm High-sensitivity |
| GCA2 | Roller lever: R38 mm High-precision   |

#### (3) Built-in Switch Specifications

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

#### (4) Indicator Specifications

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

#### (5) Connector Type Wiring Specifications

| Code        | Specifications              |                |            |                  |                      |
|-------------|-----------------------------|----------------|------------|------------------|----------------------|
|             | Shape                       |                | Voltage *1 | Wiring locations | Connector pin No. *2 |
| K13A        | Direct-wire Connector type  | 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 *1     | Pre-wired Connector type *3 |                | DC         | NO only          | NO: ③ ④              |
| -M1GJ *1    |                             |                | DC         | NO only          | NO: ① ④              |
| -M1JB       |                             |                | DC         | NC only          | NC: ③ ②              |
| -AGJ03      |                             |                | AC         | NC+NO            | NC: ① ②, NO: ③ ④     |
| -DGJ03 *1   |                             |                | DC         | NC+NO            | NC: ① ②, NO: ③ ④     |
| -DK1EJ03 *1 |                             |                | 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 21 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. Ask your OMRON representative for details.)

### Environment-resistant Switches

### Basic Switches

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

#### (1) Actuator and Property Specifications

| Code    | Actuator                              |
|---------|---------------------------------------|
| CA2     | Roller lever: R38 mm                  |
| 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                  |
| CA12-2  | Adjustable roller lever: R25 to 89 mm |
| CL-2    | Adjustable rod lever: 25 to 140 mm    |
| CA2-2N  | Roller lever: R38 mm                  |
| CA12-2N | Adjustable roller lever: R25 to 89 mm |
| CL-2N   | Adjustable rod lever: 25 to 140 mm    |
| CA32-41 | Fork lock lever                       |
| CA32-42 | Fork lock lever                       |
| CA32-43 | Fork lock lever                       |
| D18     | Sealed top plunger                    |
| D28     | Sealed top-roller plunger             |
| D38     | Sealed top-ball plunger               |
| D2      | Top-roller plunger                    |
| SD      | Horizontal plunger                    |
| SD2     | Horizontal-roller plunger             |
| SD3     | Horizontal-ball plunger               |
| NJ      | Flexible rod: Coil spring             |
| NJ-30   | Flexible rod: Coil spring, multi-wire |
| NJ-2    | Flexible rod: Resin rod               |
| NJ-S2   | Flexible rod: Steel wire              |

#### (2) Environment-resistant Model Specifications

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

#### (3) Built-in Switch Specifications

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

#### (4) Temperature Specifications

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

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

#### (5) Hermetic Specifications

| Code  | Specifications                                                                                                                                                                                                                                 |
|-------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Blank | No cable molding.                                                                                                                                                                                                                              |
| 139   | Standard built-in switch. Cable is attached. Molded conduit opening and cover. (The cover cannot be removed.)                                                                                                                                  |
| 140   | Airtight built-in switch. Cable is attached. Molded conduit opening, cover, and cover screws. (The cover cannot be removed.)                                                                                                                   |
| 141   | Conduit opening, cover, head, cover attachment screw part, airtight built-in switch. Cable is attached. Molded head screws. (The cover cannot be removed and the head direction cannot be changed.) Two-layer seal on actuator rotation shaft. |
| 145   | Airtight built-in switch. Cable is attached. Molded conduit opening, cover, and cover screws. (The cover cannot be removed. The head can be mounted in any of 4 directions.) Two-layer seal on actuator rotation shaft.                        |
| RP40  | Airtight built-in switch. Cable is attached. Molded conduit opening and cover. (The cover cannot be removed.) SC Connector can be removed, so it is possible to use flexible conduits for the cable.                                           |
| RP60  | Airtight built-in switch. Cable is attached. Molded conduit opening, cover, cover screws, and head screws. (The cover cannot be removed and the head direction cannot be changed.) Fluorine rubber is used for all rubber parts.               |

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

| Code  | Specifications                |                 |
|-------|-------------------------------|-----------------|
|       | Conduit Size                  | Ground terminal |
| Blank | G <sup>1</sup> / <sub>2</sub> | None            |
| G1    | G <sup>1</sup> / <sub>2</sub> | 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 Specifications

| Code  | Specifications               |
|-------|------------------------------|
| Blank | No indicator                 |
| LE    | Neon lamp: 125 to 250 VAC *3 |
| LD    | LED (10 to 115 VAC/DC) *3    |

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

#### (8) Indicator Wiring Specifications

| Code | Specifications                                |
|------|-----------------------------------------------|
| 2    | NC connection: Light-ON when operating *4     |
| 3    | NO connection: Light-ON when not operating *4 |

\*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. Ask your OMRON representative for details.)

### Environment-resistant Switches

### High-sensitivity and High-precision Switches

WL□□ - □□□□□□□□  
(1) (2) (3) (4) (5) (6) (7) (8) (9) (10)

#### (1) Electrical Rating

| Code  | Specifications |
|-------|----------------|
| Blank | Standard load  |
| 01    | Microload      |

#### (2) Actuator and Property Specifications

| Code | Actuator                                               |
|------|--------------------------------------------------------|
| G2   | Roller lever: R38 mm High sensitivity                  |
| GCA2 | Roller lever: R38 mm High-precision                    |
| G12  | Adjustable roller lever: R25 to 89 mm High sensitivity |
| GL   | Adjustable rod lever: 25 to 140 mm High sensitivity    |

#### (3) Environment-resistant Model Specifications

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

#### (4) Built-in Switch Specifications

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

#### (5) Temperature Specifications

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

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

#### (6) Hermetic Specification

| Code  | Specifications                                                                                                                                                                                                                                 |
|-------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Blank | No cable molding.                                                                                                                                                                                                                              |
| 139   | Standard built-in switch. Cable is attached. Molded conduit opening and cover. (The cover cannot be removed.)                                                                                                                                  |
| 140   | Airtight built-in switch. Cable is attached. Molded conduit opening, cover, and cover screws. (The cover cannot be removed.)                                                                                                                   |
| 141   | Conduit opening, cover, head, cover attachment screw part, airtight built-in switch. Cable is attached. Molded head screws. (The cover cannot be removed and the head direction cannot be changed.) Two-layer seal on actuator rotation shaft. |
| 145   | Airtight built-in switch. Cable is attached. Molded conduit opening, cover, and cover screws. (The cover cannot be removed. The head can be mounted in any of 4 directions.) Two-layer seal on actuator rotation shaft.                        |
| RP40  | Airtight built-in switch. Cable is attached. Molded conduit opening and cover. (The cover cannot be removed.) SC Connector can be removed, so it is possible to use flexible conduits for the cable.                                           |
| RP60  | Airtight built-in switch. Cable is attached. Molded conduit opening, cover, cover screws, and head screws. (The cover cannot be removed and the head direction cannot be changed.) Fluorine rubber is used for all rubber parts.               |

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

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

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

#### (8) Indicator Type

| Code  | Specifications               |
|-------|------------------------------|
| Blank | No indicator                 |
| LE    | Neon lamp: 125 to 250 VAC *3 |
| LD    | LED (10 to 115 VAC/DC) *3    |

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

#### (9) Indicator Wiring Specification

| Code | Specifications                                |
|------|-----------------------------------------------|
| 2    | NC connection: Light-ON when operating *4     |
| 3    | NO connection: Light-ON when not operating *4 |

\*4. Always include the indicator wiring specification if you specify a (6) hermetic structure and an (8) indicator.

#### (10) Lever Type

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

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

### Spatter-prevention Switches

### Basic Switches

WL□ - □□ S□ -N  
(1) (2) (3) (4)

#### (1) Actuator and Property Specifications

| Code | Actuator                  |
|------|---------------------------|
| CA2  | Roller lever: R38 mm      |
| D28  | Sealed top-roller plunger |

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

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

#### (3) Indicator Specifications

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

\*1. Cannot be combined with a (4) Connector Type Wiring Specifications.

#### (4) Connector Type Wiring Specifications

| Code    | Specifications                 |            |                  |                      |
|---------|--------------------------------|------------|------------------|----------------------|
|         | Shape                          | Voltage *2 | Wiring locations | Connector pin No. *3 |
| Blank   | Screw terminal type            | ---        | ---              | ---                  |
| -M1J-1  | Pre-wired Connector type<br>*4 | DC         | NO only          | NO: ③ ④              |
| -M1GJ-1 |                                | DC         | NO only          | NO: ① ④              |
| -DGJS   |                                | DC         | NC+NO            | NC: ① ②, NO: ③ ④     |
| -DTGJS  |                                | DC         | NC+NO            | NC: ① ②, NO: ③ ④     |

\*2. DC models are certified for EN/IEC (CE Marking).

\*3. Refer to *Contact Forms* on page 21 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.

### Spatter-prevention Switches

### High-sensitivity and High-precision Switches

WL□□ - □□ S□  
(1) (2) (3) (4) (5)

#### (1) Electrical Rating

| Code  | Specifications |
|-------|----------------|
| Blank | Standard load  |
| 01    | Microload      |

#### (2) Actuator and Property Specifications

| Code  | Actuator                           |
|-------|------------------------------------|
| Blank | Roller lever: R38 High-sensitivity |
| GCA2  | Roller lever: R38 High-precision   |

#### (3) Built-in Switch Specifications

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

#### (4) Indicator Specifications

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

\*1. Cannot be combined with a (5) Connector Type Wiring Specifications.

#### (5) Connector Type Wiring Specifications

| Code     | Specifications                 |            |                  |                      |
|----------|--------------------------------|------------|------------------|----------------------|
|          | Shape                          | Voltage *2 | Wiring locations | Connector pin No. *3 |
| Blank    | Screw terminal type            | ---        | ---              | ---                  |
| -M1J -1  | Pre-wired Connector type<br>*4 | DC         | NO only          | NO: ③ ④              |
| -M1GJ -1 |                                | DC         | NO only          | NO: ① ④              |
| -DGJS03  |                                | DC         | NC+NO            | NC: ① ②, NO: ③ ④     |

\*2. DC models are certified for EN/IEC (CE Marking).

\*3. Refer to *Contact Forms* on page 21 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. Ask your OMRON representative for details.)

### Long-life Switches

### Basic Switches

WLM□ - LD□ -N

(1) (2) (3)

#### (1) Actuator and Property Specifications

| Code | Actuator             |
|------|----------------------|
| CA2  | Roller lever: R38 mm |

#### (2) Indicator Type

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

#### (3) Connector Type Wiring Specifications

| Code  | Specifications              |                |         |                  |                      |
|-------|-----------------------------|----------------|---------|------------------|----------------------|
|       | Shape                       |                | Voltage | Wiring locations | Connector pin No. *1 |
| Blank | Screw terminal type         |                | ---     | ---              | ---                  |
| K13A  | Direct-wire Connector type  | 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 type *2 | 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              |
| -DTGJ |                             |                | DC      | NC+NO            | NC: ① ②, NO: ③ ④     |
|       |                             |                |         |                  |                      |

\*1. Refer to *Contact Forms* on page 21 for details on connector pin numbers.

\*2. The standard cable length is 0.3 m. Contact your OMRON representative for information on other cable lengths.

### Long-life Switches

### High-sensitivity and High-precision Switches

WLM□ - LD□

(1) (2) (3)

#### (1) Actuator and Property Specifications

| Code | Actuator                              |
|------|---------------------------------------|
| G2   | Roller lever: R38 mm High-sensitivity |
| GCA2 | Roller lever: R38 mm High-precision   |

#### (2) Indicator Type

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

#### (3) Connector Type Wiring Specifications

| Code   | Specifications              |                |         |                  |                      |
|--------|-----------------------------|----------------|---------|------------------|----------------------|
|        | Shape                       |                | Voltage | Wiring locations | Connector pin No. *1 |
| Blank  | Screw terminal type         |                | ---     | ---              | ---                  |
| K13A   | Direct-wire Connector type  | 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 type *2 |                | DC      | NO only          | NO: ③ ④              |
| -AGJ03 |                             |                | AC      | NC+NO            | NC: ① ②, NO: ③ ④     |
| -DGJ03 |                             |                | DC      | NC+NO            | NC: ① ②, NO: ③ ④     |

\*1. Refer to *Contact Forms* on page 21 for details on connector pin numbers.

\*2. 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 Roller Lever Actuators

## Basic Switches

| Actuator       | Roller lever: R38  | Roller lever: R50  | Roller lever: R63  |
|----------------|-----------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------|
| Pretravel (PT) | Model                                                                                               | Model                                                                                               | Model                                                                                                 |
| 15±5°          | WLCA2-N                                                                                             | WLCA2-7-N                                                                                           | WLCA2-8-N                                                                                             |
| 25±5°          | WLCA2-2-N                                                                                           | —                                                                                                   | —                                                                                                     |
| 20° max.       | WLCA2-2N-N                                                                                          | —                                                                                                   | —                                                                                                     |

| Actuator       | Adjustable roller lever  | Adjustable rod lever: 25 to 140 mm  | Adjustable rod lever: 350 to 380 mm  | Rod spring lever  |
|----------------|-----------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------|
| Pretravel (PT) | Model                                                                                                     | Model                                                                                                                | Model                                                                                                                   | Model                                                                                                |
| 15±5°          | WLCA12-N                                                                                                  | WLCL-N                                                                                                               | WLCAL4-N                                                                                                                | WLCAL5-N                                                                                             |
| 25±5°          | WLCA12-2-N                                                                                                | WLCL-2-N                                                                                                             | —                                                                                                                       | —                                                                                                    |
| 20° max.       | WLCA12-2N-N                                                                                               | WLCL-2N-N                                                                                                            | —                                                                                                                       | —                                                                                                    |

## High-sensitivity Switches

| Actuator      | Roller lever: R38  | Adjustable roller lever  | Adjustable rod lever: 25 to 140 mm  |
|---------------|-----------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------|
| Load          | Model                                                                                               | Model                                                                                                     | Model                                                                                                                  |
| Standard load | WLG2                                                                                                | WLG12                                                                                                     | WGL                                                                                                                    |
| Microload     | WL01G2                                                                                              | WL01G12                                                                                                   | WL01GL                                                                                                                 |

## High-precision Switches

| Actuator      | Roller lever: R38  |
|---------------|-------------------------------------------------------------------------------------------------------|
| Load          | Model                                                                                                 |
| Standard load | WLGCA2                                                                                                |
| Microload     | WL01GCA2                                                                                              |

## Switches with Plunger Actuators

## Basic Switches

| Actuator       | Sealed Top Plunger  | Sealed Top-roller plunger  | Sealed Top-ball plunger  | Top-roller plunger  |
|----------------|--------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------|
| Pretravel (PT) | Model                                                                                                  | Model                                                                                                         | Model                                                                                                         | Model                                                                                                    |
| 1.7 mm max.    | WLD18-N                                                                                                | WLD28-N                                                                                                       | WLD38-N                                                                                                       | WLD2-N                                                                                                   |

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

## Switches with Flexible Rod Actuators

## Basic Switches

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

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

## Switches with Fork Lock Lever Actuator

## Retention type Switches

| Actuator       | Fork lock lever  | Fork lock lever  | Fork lock lever  | Fork lock lever  |
|----------------|-----------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------|
| Pretravel (PT) | Model                                                                                               | Model                                                                                               | Model                                                                                                 | Model                                                                                                 |
| 55° max.       | WLCA32-41-N                                                                                         | WLCA32-42-N                                                                                         | WLCA32-43-N                                                                                           | WLCA32-44-N                                                                                           |

## General-purpose Switches

## Operation indicator Switches

## Switches with Roller Lever Actuators

## Basic Switches

| Actuator    |                | Roller lever: R38  | Roller lever: R50  | Roller lever: R63  |
|-------------|----------------|-----------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------|
| Indicator * | Pretravel (PT) | Model                                                                                               | Model                                                                                               | Model                                                                                                 |
| Neon lamp   | 15±5°          | WLCA2-LE-N                                                                                          | WLCA2-7LE-N                                                                                         | WLCA2-8LE-N                                                                                           |
|             | 25±5°          | WLCA2-2LE-N                                                                                         | —                                                                                                   | —                                                                                                     |
|             | 20° max.       | WLCA2-2NLE-N                                                                                        | —                                                                                                   | —                                                                                                     |
| LED         | 15±5°          | WLCA2-LD-N                                                                                          | WLCA2-7LD-N                                                                                         | WLCA2-8LD-N                                                                                           |
|             | 25±5°          | WLCA2-2LD-N                                                                                         | —                                                                                                   | —                                                                                                     |
|             | 20° max.       | WLCA2-2NLD-N                                                                                        | —                                                                                                   | —                                                                                                     |

| Actuator    |                | Adjustable roller lever  | Adjustable rod lever: 25 to 140 mm  | Adjustable rod lever: 350 to 380 mm  | Rod Spring Lever  |
|-------------|----------------|-----------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------|
| Indicator * | Pretravel (PT) | Model                                                                                                     | Model                                                                                                                | Model                                                                                                                   | Model                                                                                                |
| Neon lamp   | 15±5°          | WLCA12-LE-N                                                                                               | WLCL-LE-N                                                                                                            | WLCAL4-LE-N                                                                                                             | WLCAL5-LE-N                                                                                          |
|             | 25±5°          | WLCA12-2LE-N                                                                                              | WLCL-2LE-N                                                                                                           | —                                                                                                                       | —                                                                                                    |
|             | 20° max.       | WLCA12-2NLE-N                                                                                             | WLCL-2NLE-N                                                                                                          | —                                                                                                                       | —                                                                                                    |
| LED         | 15±5°          | WLCA12-LD-N                                                                                               | WLCL-LD-N                                                                                                            | WLCAL4-LD-N                                                                                                             | WLCAL5-LD-N                                                                                          |
|             | 25±5°          | WLCA12-2LD-N                                                                                              | WLCL-2LD-N                                                                                                           | —                                                                                                                       | —                                                                                                    |
|             | 20° max.       | WLCA12-2NLD-N                                                                                             | WLCL-2NLD-N                                                                                                          | —                                                                                                                       | —                                                                                                    |

## High-sensitivity Switches

| Actuator    |                                   | Roller lever R38  |
|-------------|-----------------------------------|------------------------------------------------------------------------------------------------------|
| Indicator * | Pretravel (PT)                    | Model                                                                                                |
| Neon lamp   | 10° <sup>+2°</sup> <sub>-1°</sub> | WLG2-LE                                                                                              |
| LED         |                                   | WLG2-LD                                                                                              |

| Actuator    |                                   | Adjustable roller lever  | Adjustable rod lever: 25 to 140 mm  |
|-------------|-----------------------------------|-------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------|
| Indicator * | Pretravel (PT)                    | Model                                                                                                       | Model                                                                                                                  |
| Neon lamp   | 10° <sup>+2°</sup> <sub>-1°</sub> | WLG12-LE                                                                                                    | WLGL-LE                                                                                                                |
| LED         |                                   | WLG12-LD                                                                                                    | WLGL-LD                                                                                                                |

## High-precision Switches

| Actuator    |                                 | Roller lever R38  |
|-------------|---------------------------------|------------------------------------------------------------------------------------------------------|
| Indicator * | Pretravel (PT)                  | Model                                                                                                |
| Neon lamp   | 5° <sup>+2°</sup> <sub>0°</sub> | WLGCA2-LE                                                                                            |
| LED         |                                 | WLGCA2-LD                                                                                            |

## Switches with Fork Lock Lever Actuator

## Retention type Switches

| Actuator    |                | Fork lock lever  | Fork lock lever  | Fork lock lever  |
|-------------|----------------|-----------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------|
| Indicator * | Pretravel (PT) | Model                                                                                               | Model                                                                                               | Model                                                                                                 |
| Neon lamp   | 55° max.       | WLCA32-41LE-N                                                                                       | WLCA32-42LE-N                                                                                       | WLCA32-43LE-N                                                                                         |
| LED         |                | WLCA32-41LD-N                                                                                       | —                                                                                                   | WLCA32-43LD-N                                                                                         |

\* 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).

## Switches with Plunger Actuators

### Basic Switches

| Actuator    |                | Sealed Top plunger  | Sealed Top-roller plunger  | Sealed Top-ball plunger  | Top-roller plunger  |
|-------------|----------------|------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------|
| Indicator * | Pretravel (PT) | Model                                                                                                | Model                                                                                                       | Model                                                                                                       | Model                                                                                                  |
| Neon lamp   | 1.7 mm max.    | WLD18-LE-N                                                                                           | WLD28-LE-N                                                                                                  | WLD38-LE-N                                                                                                  | WLD2-LE-N                                                                                              |
| LED         |                | WLD18-LD-N                                                                                           | WLD28-LD-N                                                                                                  | WLD38-LD-N                                                                                                  | WLD2-LD-N                                                                                              |

| Actuator    |                | Horizontal plunger  | Horizontal-roller plunger  | Horizontal-ball plunger  |
|-------------|----------------|------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------|
| Indicator * | Pretravel (PT) | Model                                                                                                | Model                                                                                                       | Model                                                                                                       |
| Neon lamp   | 2.8 mm max.    | WLS2-LE-N                                                                                            | WLS2-LE-N                                                                                                   | WLS2-LE-N                                                                                                   |
| LED         |                | WLS2-LD-N                                                                                            | WLS2-LD-N                                                                                                   | WLS2-LD-N                                                                                                   |

## Switches with Flexible Rod Actuators

### Basic Switches

| Actuator    |                | Coil spring<br>(spring diameter: 6.5)  | Coil spring<br>(spring diameter: 8)  |
|-------------|----------------|-------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------|
| Indicator * | Pretravel (PT) | Model                                                                                                                   | Model                                                                                                                 |
| Neon lamp   | 20±10 mm       | WLNJ-LE-N                                                                                                               | WLNJ-30LE-N                                                                                                           |
| LED         |                | WLNJ-LD-N                                                                                                               | WLNJ-30LD-N                                                                                                           |

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

\* 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).

General-purpose Switches

Sensor I/O Connector Switches

Switches with Direct-wired Connectors

Basic Switches

| Actuator        |                               |         |                       |                   |                | Roller lever: R38  | Sealed Top-roller plunger  |
|-----------------|-------------------------------|---------|-----------------------|-------------------|----------------|-------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------|
| Connector shape | Built-in switch specification | Voltage | Wiring Specifications | Connector pin No. | Pretravel (PT) | Model                                                                                                 | Model                                                                                                         |
| Threaded        | General-purpose               | AC      | NO only 2 core        | NO ③ ④            | 15±5°          | WLCA2-LDK13A-N                                                                                        | —                                                                                                             |
|                 |                               |         | NC + NO 4 core        | NC ① ②<br>NO ③ ④  |                | WLCA2-LDK43A-N                                                                                        | —                                                                                                             |
|                 |                               | DC      | NO only 2 core        | NO ③ ④            |                | WLCA2-LDK13-N                                                                                         | WLD28-LDK13-N                                                                                                 |
|                 |                               |         | NC + NO 4 core        | NC ① ②<br>NO ③ ④  |                | WLCA2-LDK43-N                                                                                         | WLD28-LDK43-N                                                                                                 |
|                 | Airtight                      | DC      | NO only 2 core        | NO ③ ④            |                | WLCA2-55LDK13-N                                                                                       | WLD28-55LDK13-N                                                                                               |
|                 |                               |         | NC + NO 4 core        | NC ① ②<br>NO ③ ④  |                | WLCA2-55LDK43-N                                                                                       | WLD28-55LDK43-N                                                                                               |

High-sensitivity Switches

| Actuator        |                               |         |                       |                   |                                   | Roller lever: R38  |
|-----------------|-------------------------------|---------|-----------------------|-------------------|-----------------------------------|-------------------------------------------------------------------------------------------------------|
| Connector shape | Built-in switch specification | Voltage | Wiring Specifications | Connector pin No. | Pretravel (PT)                    | Model                                                                                                 |
| Threaded        | General-purpose               | DC      | NO only 2 core        | NO ③ ④            | 10° <sup>+2°</sup> <sub>-1°</sub> | WLG2-LDK13                                                                                            |
|                 |                               |         | NC + NO 4 core        | NC ① ②<br>NO ③ ④  |                                   | WLG2-LDK43                                                                                            |
|                 | Airtight                      |         | NO only 2 core        | NO ③ ④            |                                   | WLG2-55LDK13                                                                                          |
|                 |                               |         | NC + NO 4 core        | NC ① ②<br>NO ③ ④  |                                   | WLG2-55LDK43                                                                                          |

High-precision Switches

| Actuator        |                               |         |                       |                   |                                 | Roller lever: R38  |
|-----------------|-------------------------------|---------|-----------------------|-------------------|---------------------------------|---------------------------------------------------------------------------------------------------------|
| Connector shape | Built-in switch specification | Voltage | Wiring Specifications | Connector pin No. | Pretravel (PT)                  | Model                                                                                                   |
| Threaded        | General-purpose               | DC      | NO only 2 core        | NO ③ ④            | 5° <sup>+2°</sup> <sub>0°</sub> | WLGCA2-LDK13                                                                                            |
|                 |                               |         | NC + NO 4 core        | NC ① ②<br>NO ③ ④  |                                 | WLGCA2-LDK43                                                                                            |
|                 | Airtight                      |         | NO only 2 core        | NO ③ ④            |                                 | WLGCA2-55LDK13                                                                                          |
|                 |                               |         | NC + NO 4 core        | NC ① ②<br>NO ③ ④  |                                 | WLGCA2-55LDK43                                                                                          |

**Note:** 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).  
 (However, Four-core Switches cannot be switched to light-ON when operating (NC wiring).)

## Switches with Pre-wired Connectors

## Basic Switches

| Actuator        |                               |         |                       |                   |                | Roller lever: R38  | Sealed Top-roller Plunger  |
|-----------------|-------------------------------|---------|-----------------------|-------------------|----------------|-------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------|
| Connector shape | Built-in switch specification | Voltage | Wiring Specifications | Connector pin No. | Pretravel (PT) | Model                                                                                                 | Model                                                                                                         |
| Threaded *      | General-purpose               | DC      | NO only 2 core        | NO ③ ④            | 15±5°          | WLCA2-LD-M1J-N                                                                                        | WLD28-LD-M1J-N                                                                                                |
|                 |                               |         |                       | NO ① ④            |                | WLCA2-LD-M1GJ-N                                                                                       | WLD28-LD-M1GJ-N                                                                                               |
|                 |                               |         | NC only 2 core        | NC ③ ②            |                | WLCA2-LD-M1JB-N                                                                                       | —                                                                                                             |
|                 |                               |         | NC + NO 4 core        | NC ① ②<br>NO ③ ④  |                | WLCA2-LD-DGJ-N                                                                                        | WLD28-LD-DGJ-N                                                                                                |
|                 |                               |         | NO only 3 core        | NO ③ ④<br>NC ②    |                | WLCA2-LD-DK1EJ-N                                                                                      | WLD28-LD-DK1EJ-N                                                                                              |
|                 | Airtight                      |         | NO only 2 core        | NO ③ ④<br>NO ① ④  |                | WLCA2-55LD-M1J-N                                                                                      | WLD28-55LD-M1J-N                                                                                              |
|                 |                               |         |                       | WLCA2-55LD-M1GJ-N |                | WLD28-55LD-M1GJ-N                                                                                     |                                                                                                               |
|                 |                               |         | NC only 2 core        | NC ③ ②            |                | WLCA2-55LD-M1JB-N                                                                                     | WLD28-55LD-M1JB-N                                                                                             |
|                 |                               |         | NC + NO 4 core        | NC ① ②<br>NO ③ ④  |                | WLCA2-55LD-DGJ-N                                                                                      | —                                                                                                             |
|                 |                               |         | NO only 3 core        | NO ③ ④<br>NC ②    |                | WLCA2-55LD-DK1EJ-N                                                                                    | WLD28-55LD-DK1EJ-N                                                                                            |

## High-sensitivity Switches

| Actuator        |                               |         |                       |                   |                                   | Roller lever: R38  |
|-----------------|-------------------------------|---------|-----------------------|-------------------|-----------------------------------|-------------------------------------------------------------------------------------------------------|
| Connector shape | Built-in switch specification | Voltage | Wiring Specifications | Connector pin No. | Pretravel (PT)                    | Model                                                                                                 |
| Threaded *      | General-purpose               | DC      | NO only 2 core        | NO ③ ④            | 10° <sup>+2°</sup> <sub>-1°</sub> | WLG2-LDK13                                                                                            |
|                 |                               |         | NC + NO 4 core        | NC ① ②<br>NO ③ ④  |                                   | WLG2-LDK43                                                                                            |
|                 | Airtight                      |         | NO only 2 core        | NO ③ ④            |                                   | WLG2-55LDK13                                                                                          |
|                 |                               |         | NC + NO 4 core        | NC ① ②<br>NO ③ ④  |                                   | WLG2-55LDK43                                                                                          |

## High-precision Switches

| Actuator        |                               |         |                       |                   |                                 | Roller lever: R38  |
|-----------------|-------------------------------|---------|-----------------------|-------------------|---------------------------------|---------------------------------------------------------------------------------------------------------|
| Connector shape | Built-in switch specification | Voltage | Wiring Specifications | Connector pin No. | Pretravel (PT)                  | Model                                                                                                   |
| Threaded *      | General-purpose               | DC      | NO only 2 core        | NO ③ ④            | 5° <sup>+2°</sup> <sub>0°</sub> | WLG2-LDK13                                                                                              |
|                 |                               |         | NC + NO 4 core        | NC ① ②<br>NO ③ ④  |                                 | WLG2-LDK43                                                                                              |
|                 | Airtight                      |         | NO only 2 core        | NO ③ ④            |                                 | WLG2-55LDK13                                                                                            |
|                 |                               |         | NC + NO 4 core        | NC ① ②<br>NO ③ ④  |                                 | WLG2-55LDK43                                                                                            |

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

**Note:** The default setting is light-ON when not operating (NO wiring).

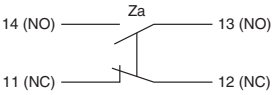
Turn the lamp holder by 180° to change the setting to light-ON when operating (NC wiring).

(However, Three-core and Four-core Switches cannot be switched to light-ON when operating (NC wiring).)

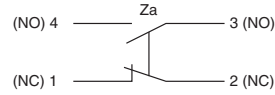
# Contact Forms

Wiring specification  
Screw terminal types  
No indicator

## Basic Switches

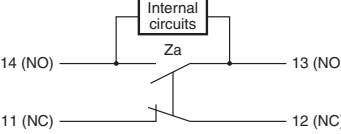


## High-sensitivity/ High-precision Switches

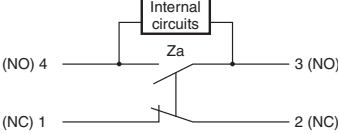


## Operation indicator (Light-ON when Not Operating) Switches

### Basic Switches



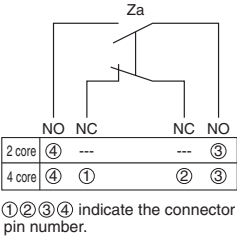
### High-sensitivity/ High-precision Switches



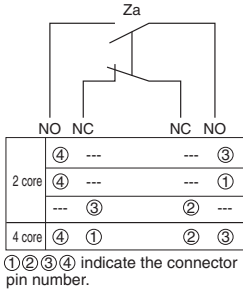
# Direct-wire Connector and Pre-wired Connector types

## Basic

### AC

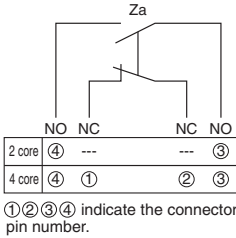


### DC

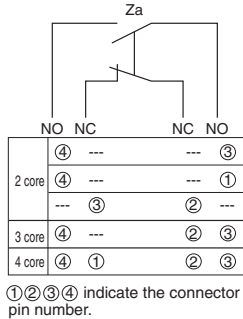


## High-sensitivity/High-precision Switches

### AC



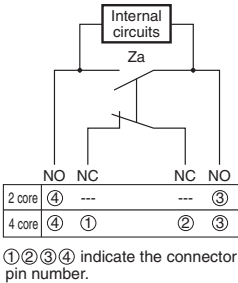
### DC



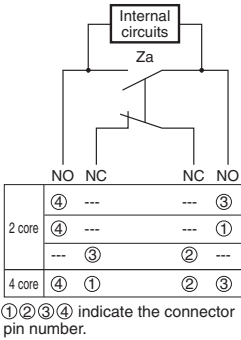
# Operation indicator (Light-ON when Not Operating) Switches

## Basic

### AC

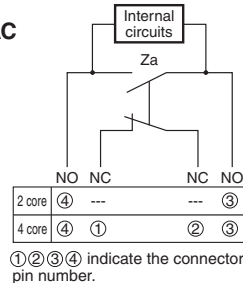


### DC

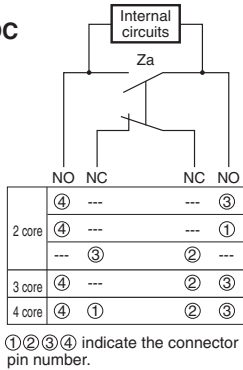


## High-sensitivity/High-precision Switches

### AC



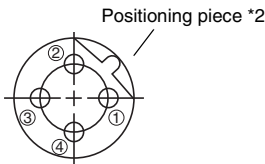
### DC



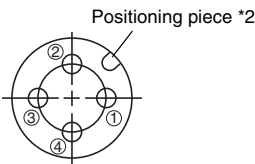
# Connector Pin Layout Diagram

## Basic/High-sensitivity/High-precision Switches

### 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 operation indicator is lit when the actuator is free and is not lit 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.

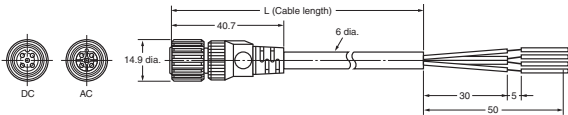
Connecting Sensor I/O connector cable (Socket)



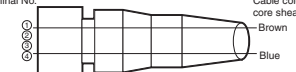
| Type                                       | AC/DC Type | Number of cable cores | Cable length L (m) | Model           | Applicable limit switch models |
|--------------------------------------------|------------|-----------------------|--------------------|-----------------|--------------------------------|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

Dimensions (Unit: mm)

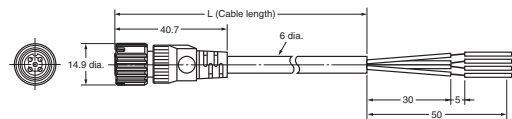
XS2F-□421-□□0-□  
XS2F-D421-□D0



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 | <div>Terminal No.</div> <div></div> | XS2F-A421-D90-F<br>XS2F-A421-G90-F | <div>Terminal No.</div> <div></div> |
|            | XS2F-D421-DD0<br>XS2F-D421-GD0     | <div>Terminal No.</div> <div></div> | XS2F-D421-D80-F<br>XS2F-D421-G80-F |                                                                                                                          |
| DC         | XS2F-D421-DA0-F<br>XS2F-D421-GA0-F | <div>Terminal No.</div> <div></div> |                                    |                                                                                                                          |

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

### Switches with Roller Lever Actuators Basic Switches

| Actuator                      |                               | Roller lever: R38  | Adjustable roller lever  | Adjustable rod lever: 25 to 140 mm  |
|-------------------------------|-------------------------------|-----------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------|
| Built-in switch specification |                               | Model                                                                                               | Model                                                                                                       | Model                                                                                                                  |
| Airtight seal                 |                               | WLCA2-55-N                                                                                          | WLCA12-55-N                                                                                                 | WLCL-55-N                                                                                                              |
|                               |                               | WLCA2-255-N                                                                                         | —                                                                                                           | —                                                                                                                      |
|                               |                               | WLCA2-2N55-N                                                                                        | —                                                                                                           | —                                                                                                                      |
| Hermetic seal *               | Molded terminals, -139 models | WLCA2-139-N                                                                                         | WLCA12-139-N                                                                                                | WLCL-139-N                                                                                                             |
|                               |                               | WLCA2-2139-N                                                                                        | —                                                                                                           | —                                                                                                                      |
|                               |                               | WLCA2-2N139-N                                                                                       | —                                                                                                           | —                                                                                                                      |
|                               | Molded terminals, -140 models | WLCA2-140-N                                                                                         | WLCA12-140-N                                                                                                | WLCL-140-N                                                                                                             |
|                               |                               | —                                                                                                   | —                                                                                                           | —                                                                                                                      |
|                               |                               | WLCA2-2N140-N                                                                                       | —                                                                                                           | —                                                                                                                      |
|                               | Molded terminals, -141 models | WLCA2-141-N                                                                                         | WLCA12-141-N                                                                                                | —                                                                                                                      |
|                               |                               | —                                                                                                   | —                                                                                                           | —                                                                                                                      |
|                               |                               | —                                                                                                   | —                                                                                                           | —                                                                                                                      |
|                               | Anti-coolant                  | WLCA2-RP60-N                                                                                        | WLCA12-RP60-N                                                                                               | WLCL-RP60-N                                                                                                            |
|                               |                               | WLCA2-2RP60-N                                                                                       | —                                                                                                           | —                                                                                                                      |
| —                             |                               | —                                                                                                   | —                                                                                                           |                                                                                                                        |
| Heat-resistant                |                               | WLCA2-TH-N                                                                                          | WLCA12-TH-N                                                                                                 | WLCL-TH-N                                                                                                              |
|                               |                               | WLCA2-2TH-N                                                                                         | WLCA12-2TH-N                                                                                                | WLCL-2TH-N                                                                                                             |
|                               |                               | WLCA2-2NTH-N                                                                                        | WLCA12-2NTH-N                                                                                               | WLCL-2NTH-N                                                                                                            |
| Low-temperature               |                               | WLCA2-TC-N                                                                                          | WLCA12-TC-N                                                                                                 | WLCL-TC-N                                                                                                              |
|                               |                               | WLCA2-2TC-N                                                                                         | WLCA12-2TC-N                                                                                                | WLCL-2TC-N                                                                                                             |
|                               |                               | WLCA2-2NTC-N                                                                                        | WLCA12-2NTC-N                                                                                               | WLCL-2NTC-N                                                                                                            |
| Corrosion-proof               |                               | WLCA2-RP-N                                                                                          | WLCA12-RP-N                                                                                                 | WLCL-RP-N                                                                                                              |
| Weather-proof                 |                               | WLCA2-P1-N                                                                                          | WLCA12-P1-N                                                                                                 | WLCL-P1-N                                                                                                              |

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

### High-sensitivity Switches

| Actuator                      |                               | Roller lever: R38  | Adjustable roller lever  | Adjustable rod lever: 25 to 140 mm  |
|-------------------------------|-------------------------------|-------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------|
| Built-in switch specification |                               | Model                                                                                                 | Model                                                                                                         | Model                                                                                                                    |
| Airtight seal                 |                               | WLG2-55                                                                                               | —                                                                                                             | —                                                                                                                        |
| Hermetic seal *               | Molded terminals, -139 models | WLG2-139                                                                                              | —                                                                                                             | —                                                                                                                        |
|                               | Molded terminals, -140 models | WLG2-140                                                                                              | —                                                                                                             | —                                                                                                                        |
|                               | Molded terminals, -141 models | WLG2-141                                                                                              | —                                                                                                             | —                                                                                                                        |
|                               | Anti-coolant                  | WLG2-RP60                                                                                             | —                                                                                                             | —                                                                                                                        |
| Heat-resistant                |                               | WLG2-TH                                                                                               | WLG12-TH                                                                                                      | WLGL-TH                                                                                                                  |
| Low-temperature               |                               | WLG2-TC                                                                                               | WLG12-TC                                                                                                      | WLGL-TC                                                                                                                  |
| Corrosion-proof               |                               | WLG2-RP                                                                                               | WLG12-RP                                                                                                      | WLGL-RP                                                                                                                  |
| Weather-proof                 |                               | WLG2-P1                                                                                               | WLG12-P1                                                                                                      | WLGL-P1                                                                                                                  |

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

### High-precision Switches

| Actuator                      |                               | Roller lever: R38  |
|-------------------------------|-------------------------------|-------------------------------------------------------------------------------------------------------|
| Built-in switch specification |                               | Model                                                                                                 |
| Airtight seal                 |                               | WLGCA2-55                                                                                             |
| Hermetic seal *               | Molded terminals, -139 models | WLGCA2-139                                                                                            |
|                               | Molded terminals, -140 models | WLGCA2-140                                                                                            |
|                               | Molded terminals, -141 models | WLGCA2-141                                                                                            |
|                               | Anti-coolant                  | WLGCA2-RP60                                                                                           |
| Heat-resistant                |                               | WLGCA2-TH                                                                                             |
| Low-temperature               |                               | WLGCA2-TC                                                                                             |
| Corrosion-proof               |                               | WLGCA2-RP                                                                                             |
| Weather-proof                 |                               | —                                                                                                     |

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

## Switches with Plunger Actuators

### Basic Switches

| Actuator                      |                               | Sealed Top-roller plunger  | Top-roller plunger  | Horizontal plunger  | Horizontal-roller plunger  |
|-------------------------------|-------------------------------|-------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------|
| Built-in switch specification |                               | Model                                                                                                       | Model                                                                                                | Model                                                                                                  | Model                                                                                                         |
| Airtight seal                 |                               | WLD28-55-N                                                                                                  | WLD2-55-N                                                                                            | WLS2-55-N                                                                                              | WLS2-55-N                                                                                                     |
| Hermetic seal *               | Molded terminals, -139 models | WLD28-139-N                                                                                                 | WLD2-139-N                                                                                           | WLS2-139-N                                                                                             | WLS2-139-N                                                                                                    |
|                               | Molded terminals, -140 models | WLD28-140-N                                                                                                 | —                                                                                                    | —                                                                                                      | WLS2-140-N                                                                                                    |
|                               | Anti-coolant                  | WLD28-RP60-N                                                                                                | WLD2-RP60-N                                                                                          | WLS2-RP60-N                                                                                            | WLS2-RP60-N                                                                                                   |
| Heat-resistant                |                               | WLD28-TH-N                                                                                                  | WLD2-TH-N                                                                                            | WLS2-TH-N                                                                                              | WLS2-TH-N                                                                                                     |
| Low-temperature               |                               | —                                                                                                           | —                                                                                                    | WLS2-TC-N                                                                                              | WLS2-TC-N                                                                                                     |
| Corrosion-proof               |                               | WLD28-RP-N                                                                                                  | —                                                                                                    | WLS2-RP-N                                                                                              | WLS2-RP-N                                                                                                     |

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

## Switches with Flexible Rod Actuators

### Basic Switches

| Actuator                      |                               | Coil spring (spring diameter: 6.5)  | Resin rod (rod diameter: 8)  |
|-------------------------------|-------------------------------|----------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------|
| Built-in switch specification |                               | Model                                                                                                                | Model                                                                                                         |
| Airtight seal                 |                               | WLNJ-55-N                                                                                                            | WLNJ-255-N                                                                                                    |
| Hermetic seal *               | Molded terminals, -139 models | WLNJ-139-N                                                                                                           | WLNJ-2139-N                                                                                                   |
|                               | Molded terminals, -140 models | WLNJ-140-N                                                                                                           | WLNJ-2140-N                                                                                                   |
|                               | Anti-coolant                  | WLNJ-RP60-N                                                                                                          | WLNJ-2RP60-N                                                                                                  |
| Heat-resistant                |                               | WLNJ-TH-N                                                                                                            | —                                                                                                             |
| Low-temperature               |                               | WLNJ-TC-N                                                                                                            | —                                                                                                             |
| Corrosion-proof               |                               | WLNJ-RP-N                                                                                                            | WLNJ-2RP-N                                                                                                    |

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

## Environment-resistant Switches

### Operation indicator Switches

#### Switches with Roller Lever Actuators Basic Switches

| Actuator                      |                               |                       | Roller lever: R38  | Adjustable roller lever  | Adjustable rod lever: 25 to 140 mm  |
|-------------------------------|-------------------------------|-----------------------|-----------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------|
| Built-in switch specification | Indicator *                   | Wiring Specifications | Model                                                                                               | Model                                                                                                       | Model                                                                                                                  |
| Airtight seal                 | Neon lamp                     | NO wiring             | WLCA2-55LE-N                                                                                        | WLCA12-55LE-N                                                                                               | —                                                                                                                      |
|                               |                               | NO wiring             | WLCA2-255LE-N                                                                                       | —                                                                                                           | —                                                                                                                      |
|                               |                               | NO wiring             | WLCA2-2N55LE-N                                                                                      | —                                                                                                           | —                                                                                                                      |
|                               | LED                           | NO wiring             | WLCA2-55LD-N                                                                                        | WLCA12-55LD-N                                                                                               | WLCL-55LD-N                                                                                                            |
|                               |                               | NO wiring             | WLCA2-255LD-N                                                                                       | —                                                                                                           | —                                                                                                                      |
|                               |                               | NO wiring             | WLCA2-2N55LD-N                                                                                      | —                                                                                                           | —                                                                                                                      |
| Hermetic seal                 | Molded terminals, -139 models | NC wiring             | WLCA2-139LD2-N                                                                                      | —                                                                                                           | —                                                                                                                      |
|                               |                               | NO wiring             | WLCA2-139LD3-N                                                                                      | —                                                                                                           | —                                                                                                                      |
|                               | Molded terminals, -140 models | NC wiring             | WLCA2-2139LD2-N                                                                                     | —                                                                                                           | —                                                                                                                      |
|                               |                               | NO wiring             | WLCA2-2139LD3-N                                                                                     | —                                                                                                           | —                                                                                                                      |
|                               | Anti-coolant                  | NC wiring             | WLCA2-141LD2-N                                                                                      | —                                                                                                           | —                                                                                                                      |
|                               |                               | NO wiring             | WLCA2-141LD3-N                                                                                      | —                                                                                                           | —                                                                                                                      |
|                               |                               | NC wiring             | WLCA2-RP60LD2-N                                                                                     | —                                                                                                           | —                                                                                                                      |
|                               |                               | NO wiring             | WLCA2-RP60LD3-N                                                                                     | —                                                                                                           | —                                                                                                                      |
|                               |                               | NC wiring             | WLCA2-2RP60LD2-N                                                                                    | —                                                                                                           | —                                                                                                                      |
|                               |                               | NO wiring             | WLCA2-2RP60LD3-N                                                                                    | —                                                                                                           | —                                                                                                                      |

#### High-sensitivity Switches

| Actuator                      |             |                       | Roller lever: R38  |
|-------------------------------|-------------|-----------------------|-------------------------------------------------------------------------------------------------------|
| Built-in switch specification | Indicator * | Wiring Specifications | Model                                                                                                 |
| Airtight seal                 | Neon lamp   | NO wiring             | WLG2-55LE                                                                                             |
|                               | LED         | NO wiring             | WLG2-55LD                                                                                             |
| Hermetic seal                 | LED         | NC wiring             | —                                                                                                     |
|                               |             | NO wiring             | WLG2-139LD3                                                                                           |
|                               |             | NC wiring             | WLG2-140LD2                                                                                           |
|                               |             | NO wiring             | WLG2-140LD3                                                                                           |
|                               |             | NC wiring             | WLG2-141LD2                                                                                           |
|                               |             | NO wiring             | WLG2-141LD3                                                                                           |
|                               |             | NC wiring             | WLG2-RP60LD2                                                                                          |
|                               |             | NO wiring             | WLG2-RP60LD3                                                                                          |

#### High-precision Switches

| Actuator                      |             |                       | Roller lever: R38  |
|-------------------------------|-------------|-----------------------|-------------------------------------------------------------------------------------------------------|
| Built-in switch specification | Indicator * | Wiring Specifications | Model                                                                                                 |
| Airtight seal                 | Neon lamp   | NO wiring             | WLGCA2-55LE                                                                                           |
|                               | LED         | NO wiring             | WLGCA2-55LD                                                                                           |
| Hermetic seal                 | LED         | NC wiring             | WLGCA2-139LD2                                                                                         |
|                               |             | NO wiring             | WLGCA2-139LD3                                                                                         |
|                               |             | NC wiring             | WLGCA2-140LD2                                                                                         |
|                               |             | NO wiring             | WLGCA2-140LD3                                                                                         |
|                               |             | NC wiring             | —                                                                                                     |
|                               |             | NO wiring             | WLGCA2-141LD3                                                                                         |
|                               |             | NC wiring             | WLGCA2-RP60LD2                                                                                        |
|                               |             | NO wiring             | WLGCA2-RP60LD3                                                                                        |

\* 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).  
(Note that the lamp holder cannot be replaced on hermetic models.)

## Switches with Plunger Actuators

### Basic Switches

| Actuator                       |             |                       | Sealed top-roller plunger  | Top-roller plunger  | Horizontal plunger  | Horizontal-roller plunger  |
|--------------------------------|-------------|-----------------------|-------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------|
| Internal switch Specifications | Indicator * | Wiring Specifications | Model                                                                                                       | Model                                                                                                | Model                                                                                                  | Model                                                                                                         |
| Airtight seal                  | Neon lamp   | NO wiring             | WLD28-55LE-N                                                                                                | WLD2-55LE-N                                                                                          | —                                                                                                      | —                                                                                                             |
|                                | LED         | NO wiring             | WLD28-55LD-N                                                                                                | WLD2-55LD-N                                                                                          | WLSD-55LD-N                                                                                            | WLSD2-55LD-N                                                                                                  |

\* 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).

## Switches with Flexible Rod Actuators

### Basic Switches

| Actuator                       |             |                       | Coil spring (spring diameter: 6.5)  | Resin rod (rod diameter: 8)  |
|--------------------------------|-------------|-----------------------|----------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------|
| Internal switch Specifications | Indicator * | Wiring Specifications | Model                                                                                                                | Model                                                                                                         |
| Airtight seal                  | Neon lamp   | NO wiring             | —                                                                                                                    | —                                                                                                             |
|                                | LED         | NO wiring             | WLNJ-55LD-N                                                                                                          | WLNJ-255LD-N                                                                                                  |

\* 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).

## Spatter-prevention Switches

### Basic Switches

| Actuator    | Roller lever: R38  |                                                                                                    | Sealed Top-roller plunger  |
|-------------|-----------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------|
|             | Double nut lever   | Allen-head lever  |                                                                                                               |
| Indicator * | Model                                                                                               | Model                                                                                              | Model                                                                                                         |
| Neon lamp   | WLCA2-LEAS-N                                                                                        | WLCA2-LES-N                                                                                        | WLD28-LES-N                                                                                                   |
| LED         | WLCA2-LDAS-N                                                                                        | WLCA2-LDS-N                                                                                        | WLD28-LDS-N                                                                                                   |

### High-sensitivity Switches

| Actuator    | Roller lever: R38  |                                                                                                    |
|-------------|-----------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------|
|             | Double nut lever   | Allen-head lever  |
| Indicator * | Model                                                                                               | Model                                                                                              |
| Neon lamp   | WLG2-LEAS                                                                                           | WLG2-LES                                                                                           |
| LED         | WLG2-LDAS                                                                                           | WLG2-LDS                                                                                           |

### High-precision Switches

| Actuator    | Roller lever: R38  |                                                                                                     |
|-------------|-----------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------|
|             | Double nut lever  | Allen-head lever  |
| Indicator * | Model                                                                                               | Model                                                                                               |
| Neon lamp   | —                                                                                                   | WLGCA2-LES                                                                                          |
| LED         | —                                                                                                   | WLGCA2-LDS                                                                                          |

\* 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).

## Long-life Switches

### Basic Switches

| Actuator                                                                                                                        | Indicator<br>*1 | AC/DC<br>Type | Wiring<br>Specifications | Connectors<br>pin No. | Model           |
|---------------------------------------------------------------------------------------------------------------------------------|-----------------|---------------|--------------------------|-----------------------|-----------------|
|  Roller lever<br>Screw terminal type            | LED             | AC/DC         | —                        | —                     | WLMCA2-LD-N     |
|  Roller lever<br>Direct-wire Connector<br>type  |                 | AC            | 2-conductor              | NO ③ ④                | WLMCA2-LDK13A-N |
|                                                                                                                                 |                 |               | 4-conductor              | NC ① ②<br>NO ③ ④      | WLMCA2-LDK43A-N |
|                                                                                                                                 |                 | DC            | 2-conductor              | NO ③ ④                | WLMCA2-LDK13-N  |
|                                                                                                                                 |                 |               | 4-conductor              | NC ① ②<br>NO ③ ④      | WLMCA2-LDK43-N  |
|  Roller lever<br>Pre-wired Connector<br>type *2 |                 | DC            | 2-conductor              | NO ③ ④                | WLMCA2-LD-M1J-N |
|                                                                                                                                 |                 |               | 4-conductor              | NC ① ②<br>NO ③ ④      | WLMCA2-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).  
(However, Four-core Switches cannot be switched to light-ON when operating (NC wiring).)

\*2. With 0.3-m cable.

### High-sensitivity/High-precision Switches

| Actuator                                                                                                                          | Indicator<br>*1 | AC/DC<br>Type | Wiring<br>Specifications | Connectors<br>pin No. | High-sensitivity | High-precision Models |
|-----------------------------------------------------------------------------------------------------------------------------------|-----------------|---------------|--------------------------|-----------------------|------------------|-----------------------|
|                                                                                                                                   |                 |               |                          |                       | Model            | Model                 |
|  Roller lever<br>Screw terminal type            | LED             | AC/DC         | —                        | —                     | WLMG2-LD         | WLMGCA2-LD            |
|  Roller lever<br>Direct-wire Connector<br>type  |                 | AC            | 2-conductor              | NO ③ ④                | WLMG2-LDK13A     | WLMGCA2-LDK13A        |
|                                                                                                                                   |                 |               | 4-conductor              | NC ① ②<br>NO ③ ④      | WLMG2-LDK43A     | WLMGCA2-LDK43A        |
|                                                                                                                                   |                 | DC            | 2-conductor              | NO ③ ④                | WLMG2-LDK13      | WLMGCA2-LDK13         |
|                                                                                                                                   |                 |               | 4-conductor              | NC ① ②<br>NO ③ ④      | WLMG2-LDK43      | WLMGCA2-LDK43         |
|  Roller lever<br>Pre-wired Connector<br>type *2 |                 | DC            | 2-conductor              | NO ③ ④                | WLMG2-LD-M1J     | WLMGCA2-LD-M1J        |
|                                                                                                                                   |                 |               | 4-conductor              | NC ① ②<br>NO ③ ④      | WLMG2-LD-DGJ03   | —                     |

\*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).  
(However, Four-core Switches cannot be switched to light-ON when operating (NC wiring).)

\*2. With 0.3-m cable.

## Individual Parts

### Switches without Levers, Heads, and Actuators

#### General-purpose Parts

| Actuator                                                                                                  | Operating characteristics | Set         | Switches without levers | Heads (with Actuators) | Actuator only * |
|-----------------------------------------------------------------------------------------------------------|---------------------------|-------------|-------------------------|------------------------|-----------------|
|                                                                                                           |                           |             | Model                   | Model                  | Model           |
| Roller lever             | Basic                     | WLCA2-N     | WLRCa2-N                | WL-1H1100-N            | WL-1A100        |
|                                                                                                           |                           | WLCA2-2-N   | WLRCa2-2-N              | WL-3H1100-N            |                 |
|                                                                                                           | High-sensitivity          | WLCA2-2N-N  | WLRCa2-2N-N             | WL-1H1100-N            |                 |
| Adjustable roller lever  | Basic                     | WLCA12-N    | WLRCa12-N               | WL-1H2100-N            | WL-2A100        |
|                                                                                                           |                           | WLCA12-2-N  | WLRCa12-2-N             | WL-3H2100-N            |                 |
|                                                                                                           | High-sensitivity          | WLCA12-2N-N | WLRCa12-2N-N            | WL-1H2100-N            |                 |
| Variable rod lever       | Basic                     | WLCL-N      | WLRCa12-N               | WL-4H4100-N            | WL-4A100        |
|                                                                                                           |                           | WLCL-2-N    | WLRCa2-2-N              | WL-3H4100-N            |                 |
|                                                                                                           | High-sensitivity          | WLCL-2N-N   | WLRCa2-2N-N             | WL-1H4100-N            |                 |
| Fork lock lever          | Basic                     | WLGL        | WLRG2                   | WL-2H4100              | WL-5A100        |
|                                                                                                           |                           | WLCA32-41-N | WLRCa32-N               | WL-5H5100-N            |                 |
|                                                                                                           | High-sensitivity          | WLCA32-42-N |                         | WL-5H5102-N            |                 |
| Top plunger              | Basic                     | WLCA32-43-N |                         | WL-5H5104-N            | WL-5A102        |
|                                                                                                           |                           | WLCA32-44-N |                         | WL-5H5104-N            | WL-5A104        |
| Horizontal plunger     | Basic                     | WLD18-N     | —                       | WL-7H100-N             | —               |
|                                                                                                           |                           | WLD28-N     |                         | WL-7H400-N             | —               |
|                                                                                                           | High-sensitivity          | WLD38-N     |                         | WL-7H300-N             | —               |
| Flexible rod           | Basic                     | WLS-D-N     | —                       | WL-8H100-N             | —               |
|                                                                                                           |                           | WLS-D2-N    |                         | WL-8H200-N             | —               |
|                                                                                                           | High-sensitivity          | WLS-D3-N    |                         | WL-8H300-N             | —               |
| Roller lever           | Basic                     | WLNJ-N      | —                       | WL-9H100-N             | —               |
|                                                                                                           |                           | WLNJ-30-N   |                         | WL-9H200-N             | —               |
|                                                                                                           | High-sensitivity          | WLNJ-2-N    |                         | WL-9H300-N             | —               |
| Double nut lever       | Basic                     | WLNJ-S2-N   |                         | WL-9H400-N             | —               |
|                                                                                                           |                           |             |                         |                        |                 |
|                                                                                                           | High-sensitivity          |             |                         |                        |                 |

\* The same Actuators can be used for both WL and WL-N Switches.

#### Spatter-prevention Parts

| Actuator                                                                                         | Lever Specifications  | Item             | Set Model Numbers | Switches without levers | Heads (with Actuators) | Actuator only * |
|--------------------------------------------------------------------------------------------------|-----------------------|------------------|-------------------|-------------------------|------------------------|-----------------|
|                                                                                                  |                       |                  |                   | Model                   | Model                  | Model           |
| Roller lever  | Allen-head bolt lever | Basic            | WLCA2-LES-N       | WLRCa2-LES-N            | —                      | WL-1A103S       |
|                                                                                                  |                       | High-sensitivity | WLCA2-LDS-N       | WLRCa2-LDS-N            |                        |                 |
|                                                                                                  | Double nut lever      | Basic            | WLG2-LDS          | WLRG2-LDS               | —                      | WL-1A105S       |
|                                                                                                  |                       | High-sensitivity | WLG2-LDS          | WLRG2-LDS               |                        |                 |

\* The same Actuators can be used for both WL and WL-N Switches.

## Covers with Indicators (See Note.)

### General-purpose/Long-life Parts

#### Basic Parts

| Cover        |        | Cover only *1 |
|--------------|--------|---------------|
| Indicator *2 | Color  | Model         |
| Neon lamp    | Orange | WL-LE-N *3    |
| LED          | Red    | WL-LD-N       |
|              | Yellow | WL-LW-N *3    |

#### High-sensitivity/High-precision Parts

| Cover        |        | Cover only *1 |
|--------------|--------|---------------|
| Indicator *2 | Color  | Model         |
| Neon lamp    | Orange | WL-LE         |
| LED          | Red    | WL-LD         |

\*1. The Covers are not compatible with Basic Switches (WL-N), or High-sensitivity/High-precision Switches (WL).

\*2. 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).

\*3. The Color Universal Design structure is certified by an NPO.  
Certification conditions: Ambient illumination of 500 lx max. (JIS Z 9110)



Color Universal Design was developed in consideration of people with various types of color vision to allow information to be accurately conveyed to as many individuals as possible.

### Spatter-prevention Parts

#### Basic Parts

| Cover       |        | Cover only |
|-------------|--------|------------|
| Indicator * | Color  | Model      |
| Neon lamp   | Orange | WL-LES-N   |
| LED         | Red    | WL-LDS-N   |

\* 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).

## Specifications

### General-purpose/Environment-resistant Switches

#### Ratings

#### Wiring Specifications

#### Screw terminal types

#### Standard-load Switches (excluding micro-load 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                                 | AC 125<br>250<br>500           | 10                     | 3   | 1.5       |    | 10                 | 5   | 2.5        |    |
|                                       |                                | 10                     | 2   | 1         |    | 10                 | 3   | 1.5        |    |
|                                       |                                | 10                     | 1.5 | 0.8       |    | 3                  | 1.5 | 0.8        |    |
|                                       | DC 8<br>14<br>30<br>125<br>250 | 10                     | 6   | 3         |    | 10                 | 6   | 6          |    |
|                                       |                                | 10                     | 6   | 3         |    | 10                 | 6   | 6          |    |
|                                       |                                | 6                      | 4   | 3         |    | 6                  | 4   | 4          |    |
| High-sensitivity<br>High-precision *1 | AC 125<br>250                  | 0.8                    | 0.2 | 0.2       |    | 0.8                | 0.2 | 0.2        |    |
|                                       |                                | 0.4                    | 0.1 | 0.1       |    | 0.4                | 0.1 | 0.1        |    |
|                                       |                                |                        |     |           |    |                    |     |            |    |
|                                       | DC 125<br>250                  | 5                      |     |           |    |                    |     |            |    |
|                                       |                                | 5                      |     |           |    |                    |     |            |    |
|                                       |                                |                        |     |           |    |                    |     |            |    |

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

|                |    |                          |
|----------------|----|--------------------------|
| Inrush current | NC | 30 A max. (15 A max. *1) |
|                | NO | 20 A max. (10 A max. *1) |

\*1. For High-sensitivity and High-precision Switches.

| Operating characteristics        | Minimum applicable load                               |
|----------------------------------|-------------------------------------------------------|
| Basic                            | 5 VDC 1 mA, resistive load, P level                   |
| High-sensitivity, High-precision | 5 VDC 160 mA, resistive load, N level reference value |

#### Direct-wired connector and Pre-wired Connector type

| 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                                 | AC 115             | 3                      | 3   | 1.5       |    | 3                  | 3   | 2.5        |    |
|                                       |                    |                        |     |           |    |                    |     |            |    |
|                                       | DC 12<br>24<br>115 | 3                      | 3   |           |    | 3                  | 3   | 3          |    |
|                                       |                    | 0.8                    | 0.2 |           |    | 0.8                | 0.2 | 0.2        |    |
| High-sensitivity<br>High-precision *1 | AC 115             | 3                      |     |           |    |                    |     |            |    |
|                                       | DC 115             | 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.

|                |    |          |
|----------------|----|----------|
| Inrush current | NC | 3 A max. |
|                | NO | 3 A max. |

| Operating characteristics        | Minimum applicable load                               |
|----------------------------------|-------------------------------------------------------|
| Basic                            | 5 VDC 1 mA, resistive load, P level                   |
| High-sensitivity, High-precision | 5 VDC 160 mA, RESISTIVE Load, N level reference value |

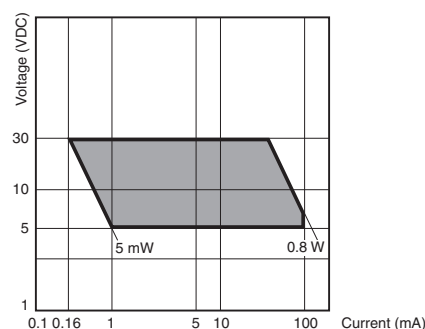
#### Micro-load Switches (Refer to these ratings before using the product.)

| Rated voltage (V) | Rated current (A) - Resistive load |
|-------------------|------------------------------------|
| AC125             | 0.1                                |
| DC 30             |                                    |

**Note:** The load is a resistive load.

Operation in the following ranges will produce optimum performance.

| Recommended load range | 5 to 30 VDC<br>0.16 to 100 mA |
|------------------------|-------------------------------|
|------------------------|-------------------------------|



| Operating characteristics        | Minimum applicable load            |
|----------------------------------|------------------------------------|
| High-sensitivity, High-precision | 5 VDC 1 mA N level reference value |

### Operation indicator Switches

#### Operation Indicator

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

## Characteristics

|                                      |                                                                  |                                                                      |
|--------------------------------------|------------------------------------------------------------------|----------------------------------------------------------------------|
| <b>Degree of protection</b>          |                                                                  | IP67                                                                 |
| <b>Durability *1</b>                 | <b>Mechanical</b>                                                | 15,000,000 operations min. *2                                        |
|                                      | <b>Electrical</b>                                                | 750,000 operations min.<br>(3 A at 250 VAC, resistive load) *3       |
| <b>Operating speed</b>               |                                                                  | 1 mm to 1 m/s (for WLCA2-N)                                          |
| <b>Operating frequency</b>           | <b>Mechanical</b>                                                | 120 operations/minute min.                                           |
|                                      | <b>Electrical</b>                                                | 30 operations/minute min.                                            |
| <b>Rated frequency</b>               |                                                                  | 50/60 Hz                                                             |
| <b>Insulation resistance</b>         |                                                                  | 100 MΩ min. (at 500 VDC)                                             |
| <b>Contact resistance</b>            |                                                                  | 25 mΩ max. (initial value for the built-in switch when tested alone) |
| <b>Dielectric strength</b>           | <b>Between terminals of the same polarity</b>                    | 1,000 VAC (600 VAC) 50/60 Hz<br>1 min                                |
|                                      | <b>Between current-carrying metal part and ground</b>            | 2,200 VAC (1,500 VAC) 50/60 Hz<br>1 min *5                           |
|                                      | <b>Between each terminal and non-current-carrying metal part</b> | 2,200 VAC (1,500 VAC) 50/60 Hz<br>1 min *5                           |
| <b>Vibration resistance</b>          | <b>Malfunction</b>                                               | 10 to 55 hz, 1.5-mm double amplitude *6                              |
| <b>Shock resistance</b>              | <b>Destruction</b>                                               | 1,000 m/s <sup>2</sup> max.                                          |
|                                      | <b>Malfunction</b>                                               | 300 m/s <sup>2</sup> *6                                              |
| <b>Ambient operating temperature</b> |                                                                  | -10 to +80°C (with no icing) *7                                      |
| <b>Ambient operating humidity</b>    |                                                                  | 35% to 95% RH                                                        |
| <b>Weight</b>                        |                                                                  | Approx. 255 g (for WLCA2-N)                                          |

- Note:** 1. The above figures are initial values.  
2. The figures in parentheses for dielectric strength are those for the high-sensitivity and high-precision 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 models and Flexible Rod models: 10 million operations min.  
500,000 operations min. for Weather-resistant models.
- \*3. High-sensitivity models, High-precision models, and Weather-proof models are 500,000 operations min.  
Micro-load models are 1 million operations min.  
Contact your OMRON representative for information on Airtight models and Hermetic models.
- \*4. Micro-load models and Weather-proof models are 50 mΩ or less (default value, built-in switch only).
- \*5. Sensor I/O connector type is 1,500 V.
- \*6. Except Flexible Rod models. Micro-load models are 200 m/s<sup>2</sup> max.
- \*7. 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

### Wiring Specifications

#### Screw terminal types

| 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 | AC 125<br>250      | 10 (5)<br>10 (5)       | 3<br>2        | 1.5<br>1      |    | 10<br>10           |    | 5<br>3        | 2.5<br>1.5 |
| WL□-LDS-N | AC 115             | 10 (5)                 | 3             | 1.5           |    | 10                 |    | 5             | 2.5        |
|           | DC 12<br>24<br>115 | 10<br>6<br>0.8 (0.4)   | 6<br>4<br>0.2 | 3<br>3<br>0.2 |    | 10<br>6<br>0.8     |    | 6<br>4<br>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. The figures in parentheses for resistive load are those for the high-sensitivity and high-precision switches models.

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

\* For High-sensitivity and High-precision Switches.

| Operating characteristics        | Minimum applicable load                               |
|----------------------------------|-------------------------------------------------------|
| Basic                            | 5 VDC 1 mA, resistive load, P level                   |
| High-sensitivity, High-precision | 5 VDC 160 mA, Resistive load, N level reference value |

#### Direct-wired connector and Pre-wired Connector type

| 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                              | AC 115            | 3                      | 3  | 1.5       |    | 3                  |    | 3          | 2.5 |
|                                    | DC 12             | 3                      |    | 3         |    | 3                  |    | 3          |     |
|                                    | 24                | 3                      |    | 3         |    | 3                  |    | 3          |     |
|                                    | 115               | 0.8                    |    | 0.2       |    | 0.8                |    | 0.2        |     |
| High-sensitivity High-precision *1 | AC 115            | 3                      |    | —         |    | —                  |    | —          |     |
|                                    | DC 115            | 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.

|                |    |          |
|----------------|----|----------|
| Inrush current | NC | 3 A max. |
|                | NO | 3 A max. |

| Operating characteristics        | Minimum applicable load                               |
|----------------------------------|-------------------------------------------------------|
| Basic                            | 5 VDC 1 mA, resistive load, P level                   |
| High-sensitivity, High-precision | 5 VDC 160 mA, Resistive load, N level reference value |

## Operation indicator Switches

### Operation Indicator

| Model             |           | Max. rated voltage (V) | Leakage current (mA) |
|-------------------|-----------|------------------------|----------------------|
| WL-LES-N<br>WL-LE | Neon lamp | 125 VAC                | Approx. 0.6          |
|                   |           | 250 VAC                | Approx. 1.9          |
| WL-LDS-N<br>WL-LD | 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.<br>(3 A at 250 VAC, resistive load) *3 |
| Operating speed               |                                                           | 1 mm to 1 m/s (in case of WLCA2-LDS-N)                         |
| Operating frequency           | Mechanical                                                | 120 operations/minute min.                                     |
|                               | Electrical                                                | 30 operations/minute min.                                      |
| Rated frequency               |                                                           | 50/60Hz                                                        |
| Insulation resistance         |                                                           | 100 MΩ min. (at 500 VDC)                                       |
| Contact resistance            |                                                           | 25 mΩ max. (initial value for the built-in switch)             |
| Dielectric strength           | Between terminals of the same polarity                    | 1,000 VAC (600 VAC) 50/60 Hz 1 min                             |
|                               | Between current-carrying metal part and ground            | 2,200 VAC (1,500 VAC) 50/60 Hz 1 min *4                        |
|                               | Between each terminal and non-current-carrying metal part | 2,200 VAC (1,500 VAC) 50/60 Hz 1 min *4                        |
| Vibration resistance          | Malfunction                                               | 10 to 55 hz, 1.5-mm double amplitude                           |
| Shock resistance              | Destruction                                               | 1,000 m/s <sup>2</sup> max.                                    |
|                               | Malfunction                                               | 300 m/s <sup>2</sup> max.                                      |
| Ambient operating temperature |                                                           | -10 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 high-sensitivity and high-precision 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 models are 10 million operations min.

\*3. High-sensitivity models and High-precision models are 500,000 operations min.  
 Micro-load models are 10 million operations min.  
 Contact your OMRON representative for information on Airtight switches.

\*4. Sensor I/O connector type is 1,500 V.

## Long-life Switches

## Ratings

## Wiring Specifications

## Screw terminal type

| 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                             | AC 115            | 10                     | 3   | 1.5       |    | 10                 | 5   | 2.5        |    |
|                                   | DC 12             | 10                     | 6   | 3         |    | 10                 | 6   |            |    |
|                                   | 24                | 6                      | 4   | 3         |    | 6                  | 4   |            |    |
|                                   | 115               | 0.8                    | 0.2 | 0.2       |    | 0.8                | 0.2 |            |    |
| High-sensitivity High-precision * | AC 115            | 5                      | —   | —         |    | —                  | —   | —          |    |
|                                   | DC 115            | 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.  
 A motor load has an inrush current of 6 times the steady-state current.

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

\* For High-sensitivity and High-precision Switches.

| Operating characteristics        | Minimum applicable load                               |
|----------------------------------|-------------------------------------------------------|
| Basic                            | 5 VDC 1 mA, resistive load, P level                   |
| High-sensitivity, High-precision | 5 VDC 160 mA, Resistive load, N level reference value |

## Direct-wired connector and Pre-wired Connector type

| 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                              | AC 115            | 3                      | 3   | 1.5       |    | 3                  | 3   | 2.5        |    |
|                                    | DC 12             | 3                      | 3   | 3         |    | 3                  | 3   |            |    |
|                                    | 24                | 3                      | 3   | 3         |    | 3                  | 3   |            |    |
|                                    | 115               | 0.8                    | 0.2 | 0.2       |    | 0.8                | 0.2 |            |    |
| High-sensitivity High-precision *1 | AC 115            | 3                      | —   | —         |    | —                  | —   | —          |    |
|                                    | DC 115            | 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.

|                |    |          |
|----------------|----|----------|
| Inrush current | NC | 3 A max. |
|                | NO | 3 A max. |

| Operating characteristics        | Minimum applicable load                               |
|----------------------------------|-------------------------------------------------------|
| Basic                            | 5 VDC 1 mA, resistive load, P level                   |
| High-sensitivity, High-precision | 5 VDC 160 mA, Resistive load, N level reference value |

## Operation indicator Switches

## Operation Indicator

| Model                       | Max. rated voltage (V) | Leakage current (mA) |
|-----------------------------|------------------------|----------------------|
| WL-LD-N<br>WL-LW-N<br>WL-LD | 10 to 24 VAC/DC        | Approx. 0.4          |
|                             | 115 VAC/DC             | Approx. 0.5          |

## 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), but for high-precision models:<br>High-sensitivity and High-precision Switches: 500,000 operations min. |
| Operating speed                       |                                                           | 1 mm to 1 m/s<br>(in case of WLMCA2-LD-N)                                                                                                                                                                                         |
| Operating frequency                   | Mechanical                                                | 120 operations/min.                                                                                                                                                                                                               |
|                                       | Electrical                                                | 30 operations/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) *2                                                                                                                                                           |
| Dielectric strength (50/60 Hz 1 min.) | Between terminals of the same polarity                    | 1,000 VAC (600 VAC), 50/60 Hz 1 min                                                                                                                                                                                               |
|                                       | Between current-carrying metal part and ground            | 2,200 VAC (1,500 VAC) 50/60 Hz 1 min *3                                                                                                                                                                                           |
|                                       | Between each terminal and non-current-carrying metal part | 2,200 VAC (1,500 VAC) 50/60 Hz 1 min *3                                                                                                                                                                                           |
| Vibration resistance                  | Malfunction                                               | 10 to 55 Hz, 1.5-mm double amplitude                                                                                                                                                                                              |
| Shock resistance                      | Destruction                                               | 1,000 m/s <sup>2</sup> max.                                                                                                                                                                                                       |
|                                       | Malfunction                                               | 300 m/s <sup>2</sup> max. *4                                                                                                                                                                                                      |
| Ambient operating temperature         |                                                           | -10 to +80°C (with no icing)                                                                                                                                                                                                      |
| Ambient operating humidity            |                                                           | 35% to 95% RH                                                                                                                                                                                                                     |
| Weight                                |                                                           | Approx. 255 g<br>(in case of WLMCA2-LD-N)                                                                                                                                                                                         |

- Note:** 1. The above figures are initial values.  
 2. The figures in parentheses for dielectric strength are those for the high-sensitivity and high-precision 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. For microload models, the contact resistance is 50 mΩ max. (initial value for built-in switch).  
 \*3. Sensor I/O connector models are 1,500 V.  
 \*4. Micro-load models are 200 m/s<sup>2</sup> max.

## General-purpose/Environment-resistant/Spatter-prevention/Long-life Switches

### Approved Standards

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

### Approved Standard Ratings

UL/cUL, CSA (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        | A600                                    |
|                | Pre-wired Connector (AC)                                | Basic, high-sensitivity or high-precision | C300<br>3 A, 250 VAC                    |
|                |                                                         | Basic Switches                            | 1 A, 125 VDC                            |
|                | Pre-wired Connector (DC)<br>Direct-wired Connector (DC) | High-sensitivity or high-precision        | 0.8 A, 125 VDC                          |
|                |                                                         | Basic Switches                            |                                         |
| Neon lamp      | No Connector                                            | High-sensitivity or high-precision        | A300<br>10 A, 250 VAC                   |
|                |                                                         | 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        | A150<br>10 A, 115 VAC<br>0.8 A, 115 VDC |
|                | Pre-wired Connector (AC)                                | Basic, high-sensitivity or high-precision | C150<br>3 A, 115 VAC                    |
|                |                                                         | Basic Switches                            | 1 A, 115 VDC                            |
|                | Pre-wired Connector (DC)<br>Direct-wired Connector (DC) | High-sensitivity or high-precision        | 0.8 A,<br>115 VDC                       |
|                |                                                         | Basic Switches                            |                                         |

#### 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   |

#### 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   |

#### 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   |

#### 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

### General-purpose Switches: WLCA2-N

### Standard Switches

### Basic Switches

#### Actuator

##### Roller

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

##### Lever

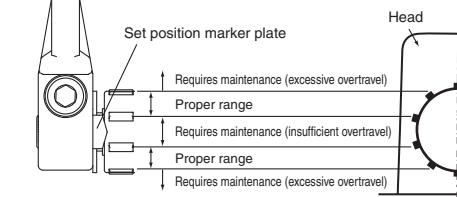
The lever is forged from corrosion-resistant aluminum alloy. It provides superior corrosion resistance and outstanding strength.

With roller lever, adjustable rod and flexible rod models, the actuator position can be set anywhere within 360°. (The lever cannot be mounted in the opposite direction.)

#### Roller Lever Bolt

#### Set Position Marker Plate

Set the indicator needle so that it is between protrusions on the bearing section on the marker plate after operation.



#### Cover Setscrew

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

#### Cover

#### 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.

#### Head-mounting Screws

#### Head

You can remove the two screws to mount the switch in any of the four possible orientations.

#### Shaft Section Seal

An oil seal is fitted on the inlet of the shaft section to maintain a tight seal.

#### Operational Plunger

You can change the direction of the operational plunger to electrically switch the direction of operation between both sides, left only, or right only.

#### Built-in Switch

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

#### Terminal Screws

Four, M3.5 screws

#### Conduit Opening

The conduit screw is a parallel screw for G1/2 piping, and is used together with an SC connector to maintain a tight seal.

**General-purpose Switches:  
WLG2**

**Standard Switches**

**High-sensitivity and High-precision Switches**

**Head-mounting Screws**

**Head**

By removing the four corner screws, the head can be mounted in any of four orientations.

**Shaft Section Seal**

By fitting an O-ring to the rotary shaft and with an appropriate interference of the screws, high-sealing properties are maintained.

**Operational Plunger**

**Bearing**

The bearing smooths the plunger movement.

**Built-in Switch**

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

**Terminal Screws**

Four, M4 screws

**Separator**

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

**Conduit Opening**

The conduit screw is a parallel screw for G1/2 piping, and is used together with an SC connector to maintain a tight seal.

**Actuator**

**Roller**

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

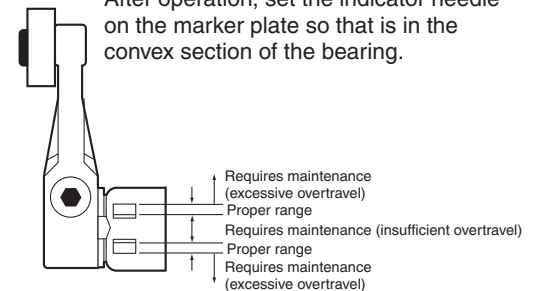
**Lever**

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

**Roller Lever Setscrew**

**Set Position Marker Plate**

After operation, set the indicator needle on the marker plate so that is in the convex section of the bearing.



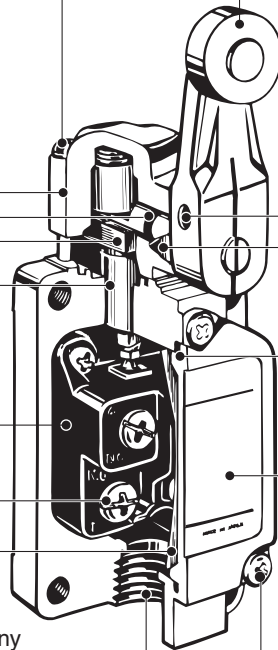
**Cover Seal**

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

**Cover**

**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.



Operation indicator Switches

Basic Switches

Indicator Covers

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

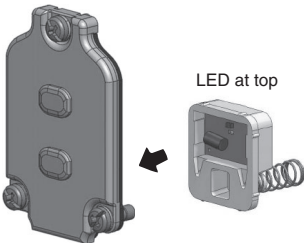
Indicator Windows

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.

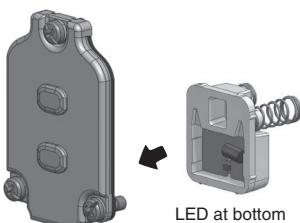
Light-ON when Operating/Not Operating

Indicators can be switched from light-ON when operating and light-ON when not operating, by simply rotating the indicator holder by 180°. (However, Direct-wired Connector, Pre-wired Connector, Three-core, and Four-core Switches cannot be switched to light-ON when operating (NC wiring).)

Light-ON when Operating



Light-ON when Not Operating

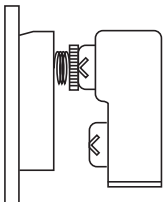


Indicator

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

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



Light-ON when Not Operating

Operation

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

Internal Circuits

|                      |  |
|----------------------|--|
| WL□-LE-N             |  |
| WL□-LD-N<br>WL□-LW-N |  |

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

Operation indicator Switches

High-sensitivity and High-precision Switches

Indicator Covers

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

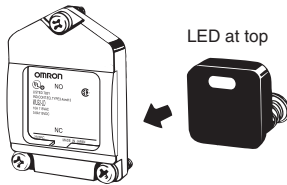
Indicator Windows

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

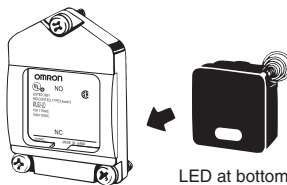
Light-ON when Operating/Not Operating

Indicators can be switched from light-ON when operating and light-ON when not operating, by simply rotating the indicator holder by 180°. (However, Direct-wired Connector, Pre-wired Connector, Three-core, and Four-core Switches cannot be switched to light-ON when operating (NC wiring).)

Light-ON when Operating



Light-ON when Not Operating

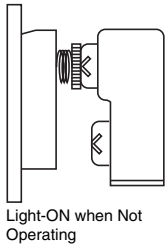


Indicator

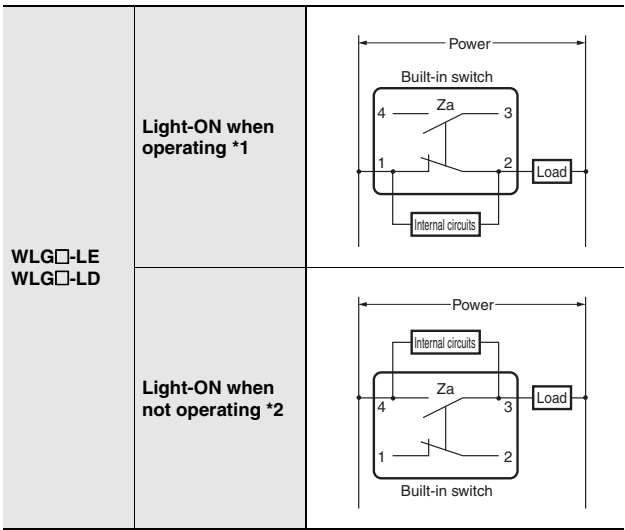
The indicator is either a neon lamp or an LED. Switches with LED indicators have a built-in rectifier stack, so there is no connection polarity.

Contact Spring

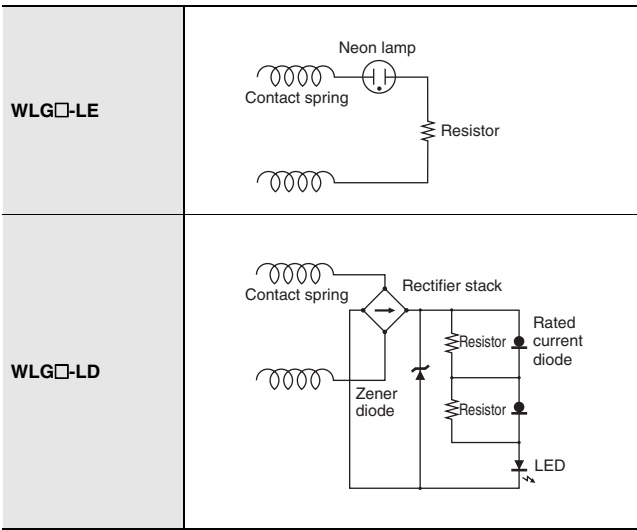
The built-in switch's terminal screws are used to connect the indicator terminal. Since the connection spring (coil spring) is used for this connection, it will not be necessary to connect the indicator terminal. When a ground terminal is provided however, a lead wire must be used.



Operation



Internal Circuits



**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.

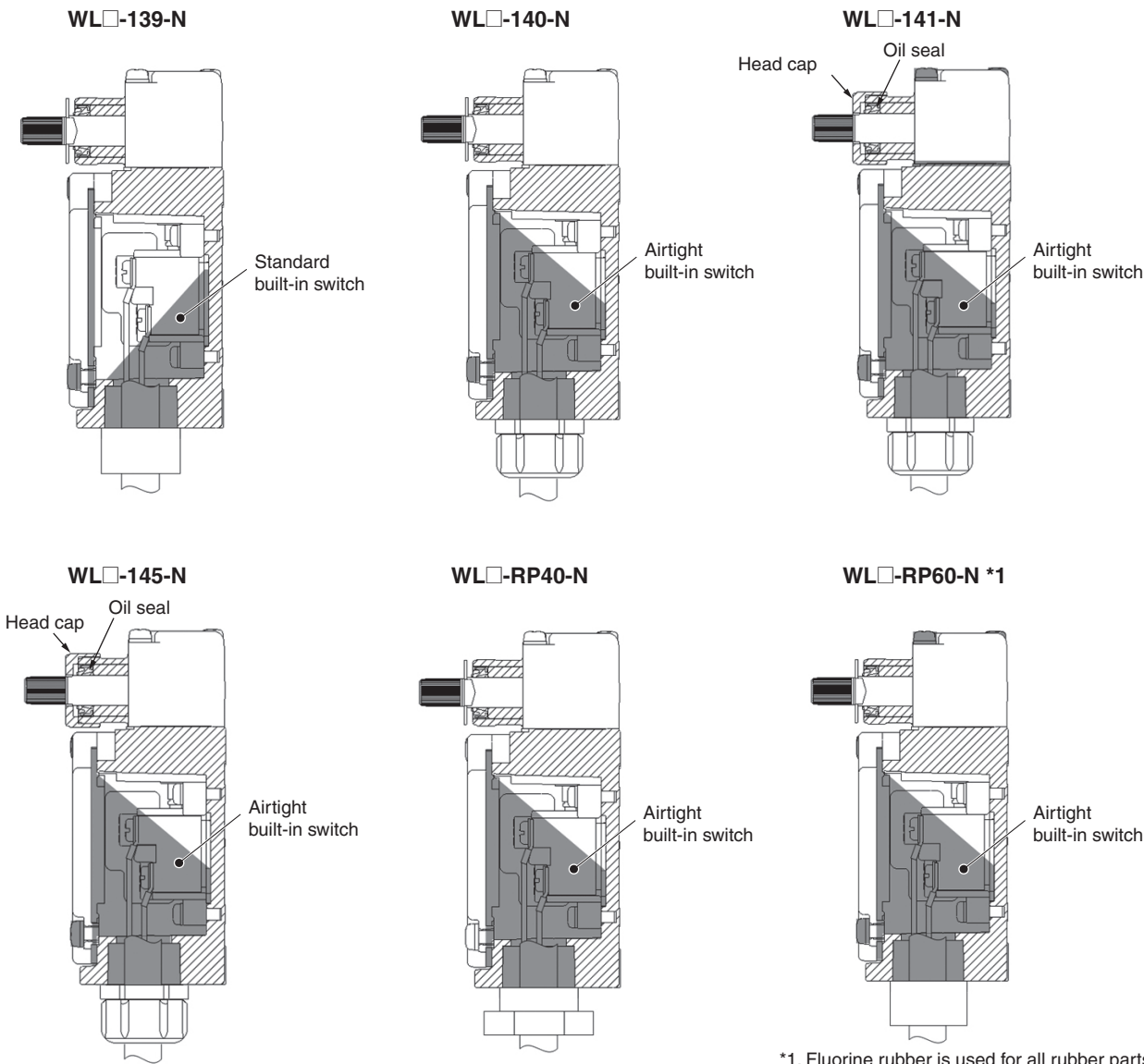
For countermeasures, refer to technical support on your OMRON website.

- \*1. Light-ON when operating means that the lamp lights when the Limit Switch contacts (NC) release, or when the actuator rotates or is pushed down.
- \*2. Light-ON when not operating means the lamp remains lit when the actuator is free, or when the Limit Switch contacts (NO) close when the actuator rotates or is pushed down.

Environment-resistant Switches

Basic Switches

Molding Specifications for Hermetic Switches  : Molded parts



\*1. Fluorine rubber is used for all rubber parts.

| Model                            | Cable specifications                                                                                                                 | Connector specifications |
|----------------------------------|--------------------------------------------------------------------------------------------------------------------------------------|--------------------------|
| WL-139-N                         | Standard 5-m VCT cable.<br>Finished outer diameter: 11.5 mm, 4 conductors.                                                           | Resin cap                |
| WL-140-N<br>WL-141-N<br>WL-145-N | Standard 5-m VCT cable, with high flexibility and good anti-oil properties attached. Finished outer diameter: 11.5 mm, 4 conductors. | Metal connector          |
| WL-RP40-N                        |                                                                                                                                      | Resin connector *2       |
| WL-RP60-N                        |                                                                                                                                      | Resin cap                |

\*2. The connector can be removed, so it is possible to use flexible conduit for the cable.

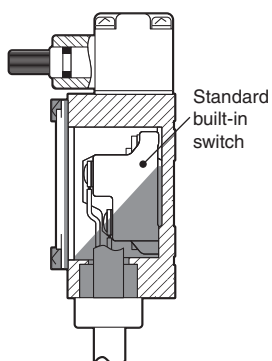
Environment-resistant Switches

High-sensitivity and High-precision Switches

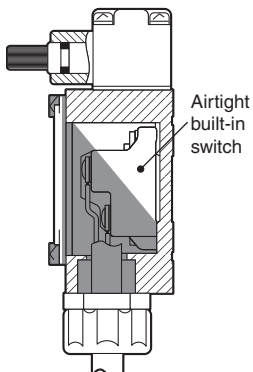
Mold Specifications for Hermetic Seal Switches

■ : Molded parts

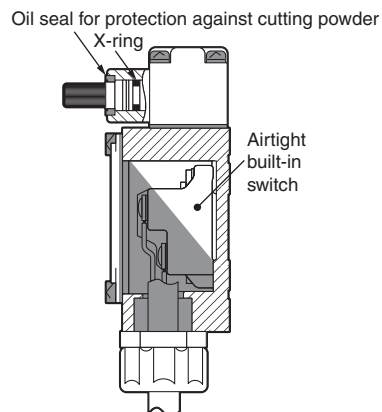
WLG□-139



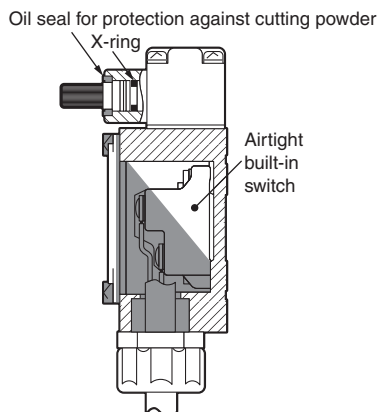
WLG□-140



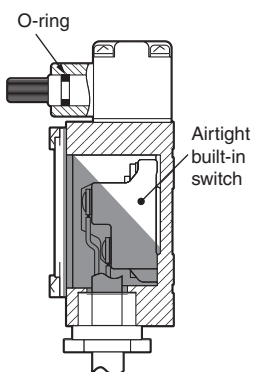
WLG□-141



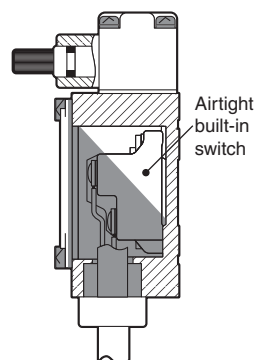
WLG□-145



WLG□-RP40



WLG□-RP60 \*1



\*1. Fluorine rubber is used for all rubber parts.

| Model                            | Cable specifications                                                                                                                 | Connector specifications |
|----------------------------------|--------------------------------------------------------------------------------------------------------------------------------------|--------------------------|
| WLG□-139                         | Standard 5-m VCT cable.<br>Finished outer diameter: 11.5 mm, 4 conductors.                                                           | Resin cap                |
| WLG□-140<br>WLG□-141<br>WLG□-145 | Standard 5-m VCT cable, with high flexibility and good anti-oil properties attached. Finished outer diameter: 11.5 mm, 4 conductors. | Metal connector          |
| WLG□-RP40                        |                                                                                                                                      | Resin connector *2       |
| WLG□-RP60                        |                                                                                                                                      | Resin cap                |

\*2. The connector can be removed, so it is possible to use flexible conduit for the cable.

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

**Basic Switches**

**Actuator**

**Roller, Roller Axis**

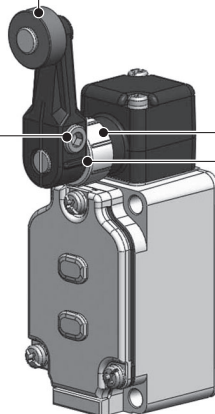
Using stainless steel prevents spatter from adhering.

**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.

**Spatter-prevention Switches: WLG2-LEAS**

**High-sensitivity and High-precision Switches**

**Actuator**

**Roller, Roller Axis**

Using stainless steel prevents spatter from adhering.

**Operating Lever**

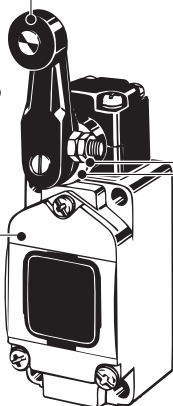
A baking finish is applied to the surface so that any adhering spatter is easily removed.

**Double Nut**

SUS is used for double nut.

**Lamp Cover**

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



**Screws**

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: WLMCA2-N

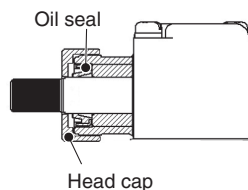
## Basic Switches

**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 connector types are available.

**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**

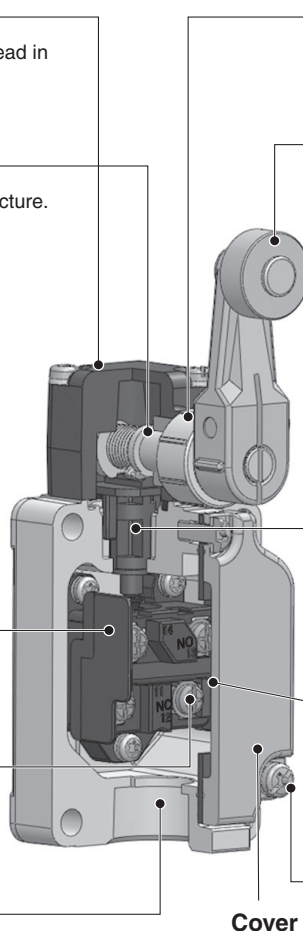
PEEK resin is used. It provides superior resistance to wear. You can change the mounting direction to use any one of the three operating directions (both sides, left side, or right side).

**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.

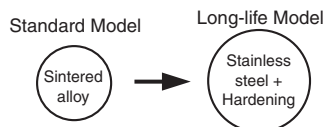


## Long-life Switches: WLMG2

## High-sensitivity/High-precision Switches

### Release Plunger

Hardening method changed for greater abrasion resistance.

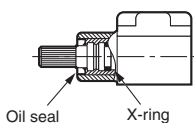


### Head

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

### Shaft Section Seal

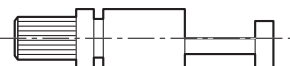
By fitting a double seal consisting of an oil seal and an X-ring to the rotary shaft, even greater sealing properties are achieved.



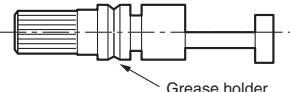
### Smoother Movement

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

#### Standard Model



#### Long-life Model



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

### Bearing

The bearing smooths the plunger movement.

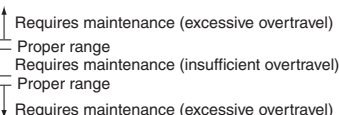
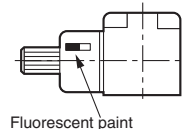
### Built-in Switch

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

### Set Position Marker Plate

The set position is easy to view.

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



### Actuator

#### Roller

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

#### Lever

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

Head Mounting Screws

### Operational Plunger \*

#### Cover Seal

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

#### Terminal Screws

Four, M4 screws

#### Cover

#### Separator

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

#### Cover Mounting Screw

Phillips screws are used to ensure ease of use.

### Conduit Opening

In addition to parallel threads for G $\frac{1}{2}$  tubing, direct-wired and pre-wired connector types are available.

# Dimensions and Operating Characteristics

(Unit: mm)

## General-purpose and Environment-resistant Switches

### Standard Switches

#### Switches with Roller Lever Actuators

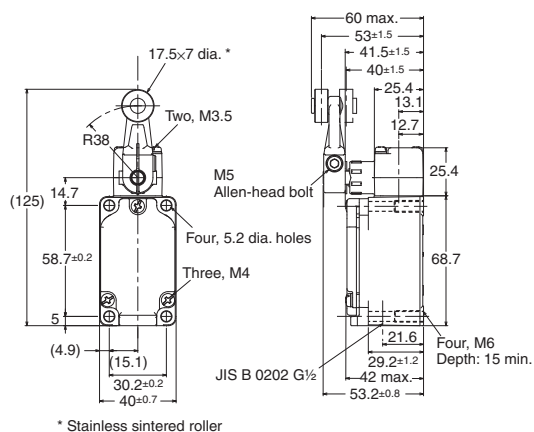
##### Basic Switches

##### Roller lever R38

WLCA2-N

WLCA2-2-N

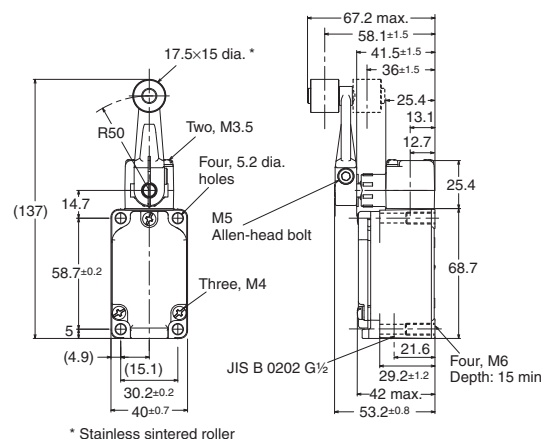
WLCA2-2N-N



\* Stainless sintered roller

##### Roller lever R50

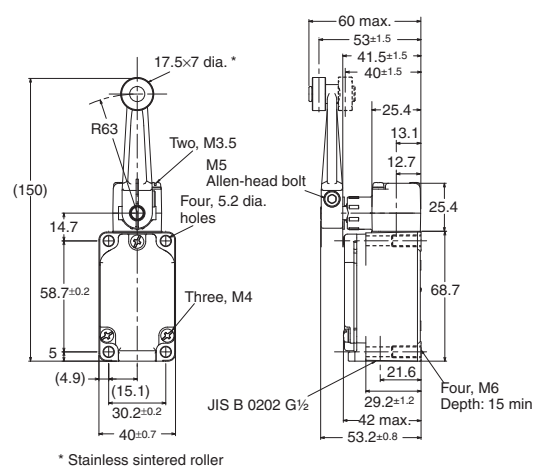
WLCA2-7-N



\* Stainless sintered roller

##### Roller lever R63

WLCA2-8-N



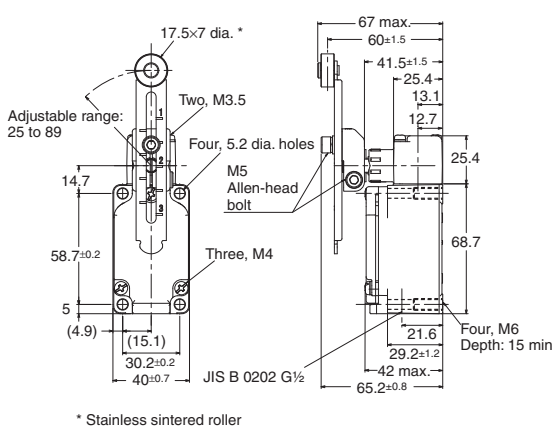
\* Stainless sintered roller

##### Adjustable roller lever

WLCA12-N

WLCA12-2-N

WLCA12-2N-N



\* Stainless sintered roller

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

| Operating characteristics |    | Model | WLCA2-N     | WLCA2-2-N   | WLCA2-2N-N | WLCA2-7-N   | WLCA2-8-N   |
|---------------------------|----|-------|-------------|-------------|------------|-------------|-------------|
| Operating force           | OF | max.  | 13.34 N     | 13.34 N     | 13.34 N    | 10.2 N      | 8.04 N      |
| Release force             | RF | min.  | 1.18 N      | 1.18 N      | 1.18 N     | 0.9 N       | 0.71 N      |
| Pretravel                 | PT |       | 15 $\pm$ 5° | 25 $\pm$ 5° | 20° max.   | 15 $\pm$ 5° | 15 $\pm$ 5° |
| Overtravel                | OT | min.  | 70°         | 60°         | 70°        | 70°         | 70°         |
| Movement Differential     | MD | max.  | 12°         | 16°         | 10°        | 12°         | 12°         |

| Operating characteristics |    | Model | WLCA12-N *1 | WLCA12-2-N *1 | WLCA12-2N-N *1 |
|---------------------------|----|-------|-------------|---------------|----------------|
| 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 $\pm$ 5° | 25 $\pm$ 5°   | 20° max        |
| Overtravel                | OT | min.  | 70°         | 60°           | 70°            |
| Movement Differential     | MD | max.  | 12°         | 16°           | 10°            |

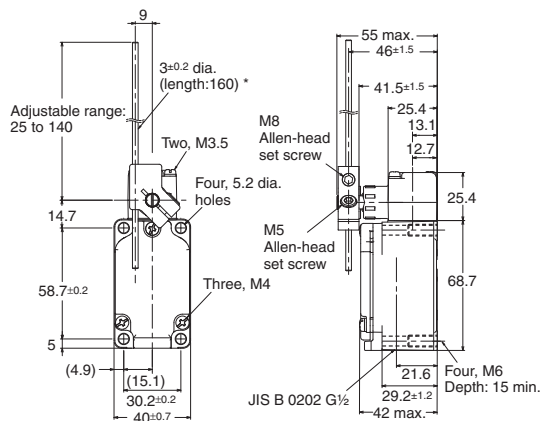
\* The operating characteristics are measured at the lever length of 38 mm.

## Switches with Roller Lever Actuators

### Basic Switches

#### Adjustable rod lever 25 to 140 mm

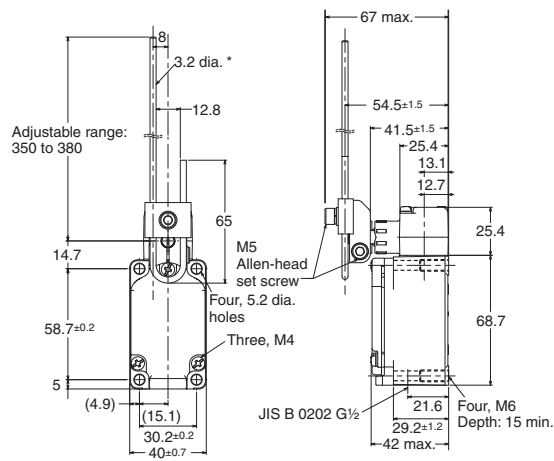
WLCL-N  
WLCL-2-N  
WLCL-2N-N



\* Stainless steel rod

#### Adjustable rod lever

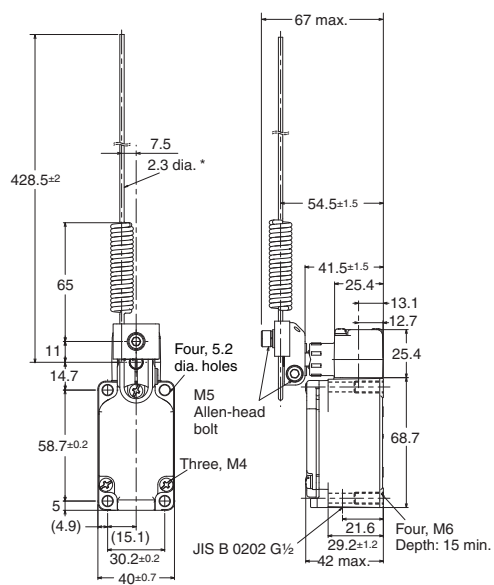
WLCAL4-N



\* Stainless steel rod

#### Rod spring lever

WLCAL5-N



\* Piano wire

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

| Operating characteristics |    | Model | WLCL-N *1 | WLCL-2-N *1 | WLCL-2N-N *1 | WLCAL4-N *2 | WLCAL5-N |
|---------------------------|----|-------|-----------|-------------|--------------|-------------|----------|
| Operating force           | OF | max.  | 1.39 N    | 1.39 N      | 1.39 N       | 0.98 N      | 0.9 N    |
| Release force             | RF | min.  | 0.27 N    | 0.27 N      | 0.27 N       | 0.15 N      | 0.09 N   |
| Pretravel                 | PT |       | 15±5°     | 25±5°       | 20° max      | 15±5°       | 15±5°    |
| Overtravel                | OT | min.  | 70°       | 60°         | 70°          | 70°         | 70°      |
| Movement Differential     | MD | max.  | 12°       | 16°         | 10°          | 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 are measured at the lever length of 140 mm.

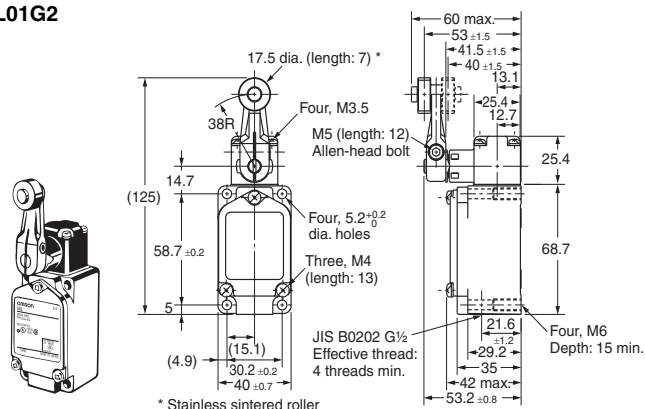
\*2. The operating characteristics are measured at a rod length of 380 mm.

## Switches with Roller Lever Actuators

### High-sensitivity Switches

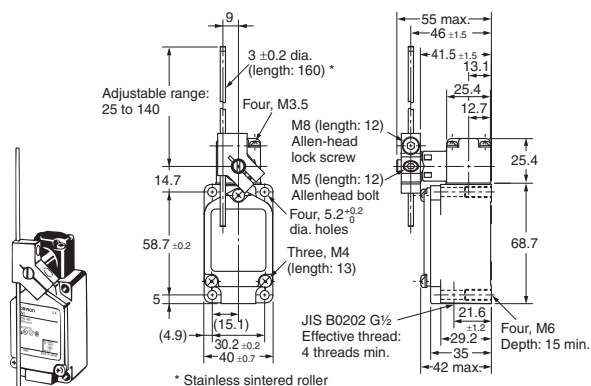
#### Roller lever R38

WLG2  
WL01G2



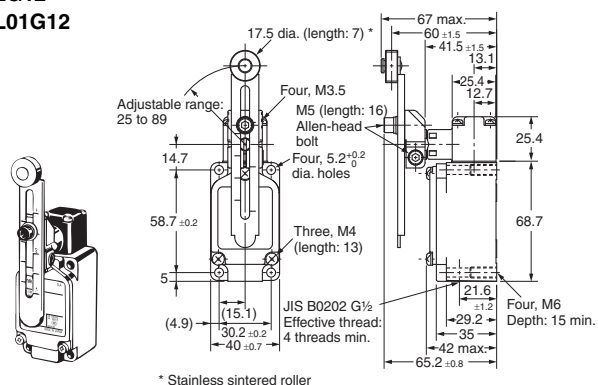
#### Adjustable rod lever 25 to 140 mm

WLGL  
WL01GL



#### Adjustable Roller Lever R38

WLG12  
WL01G12

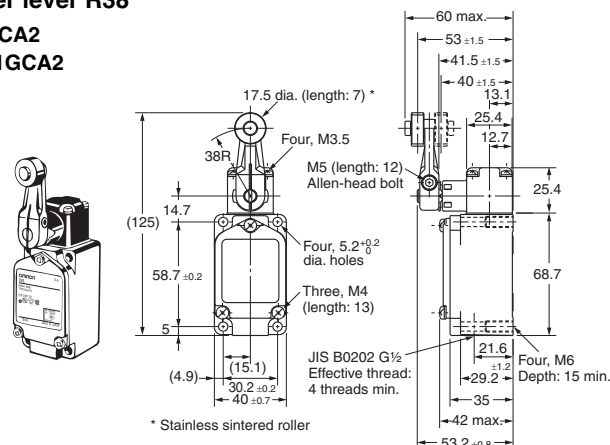


**Note:** 1. Unless otherwise indicated, a tolerance of  $\pm 0.4$  mm applies to all dimensions.

## Switches with High-precision Actuators

#### Roller lever R38

WLGCA2  
WL01GCA2



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

| Model                     |         | WLG2<br>WL01G2              | WLG12 *1<br>WL01G12 *1      | WLGL *2<br>WL01GL *2        | WLGCA2<br>WL01GCA2         |
|---------------------------|---------|-----------------------------|-----------------------------|-----------------------------|----------------------------|
| Operating characteristics |         |                             |                             |                             |                            |
| Operating force           | OF max. | 9.81 N                      | 9.81 N                      | 2.84 N                      | 13.34 N                    |
| Release force             | RF min. | 0.98 N                      | 0.98 N                      | 0.25 N                      | 1.47 N                     |
| Pretravel                 | PT      | 10° $\pm \frac{1}{2}^\circ$ | 10° $\pm \frac{1}{2}^\circ$ | 10° $\pm \frac{1}{2}^\circ$ | 5° $\pm \frac{1}{2}^\circ$ |
| Overtravel                | OT min. | 65°                         | 65°                         | 65°                         | 40°                        |
| Movement Differential     | MD max. | 7°                          | 7°                          | 7°                          | 3°                         |

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

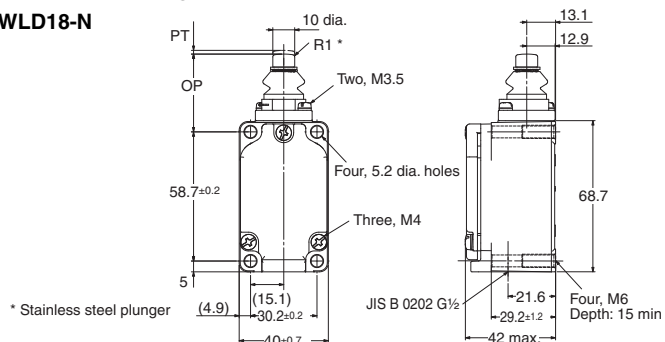
\*2. The operating characteristics are measured at a rod length of 140 mm.

## Switches with Plunger Actuators

### Basic Switches

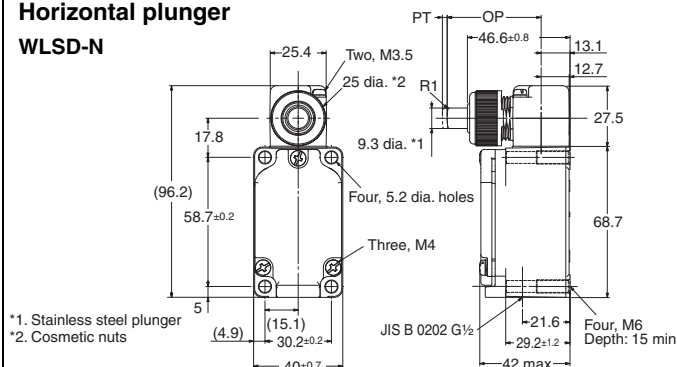
#### Sealed top plunger

##### WLD18-N



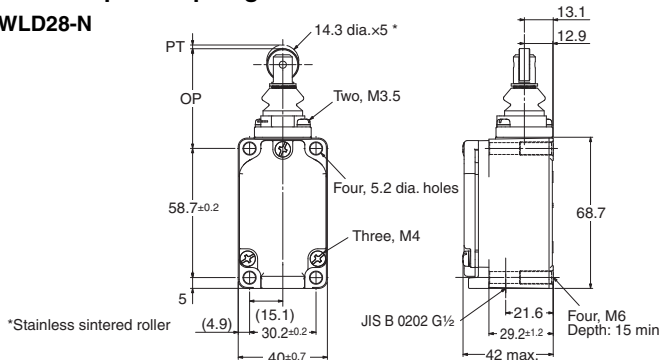
#### Horizontal plunger

##### WLSD-N



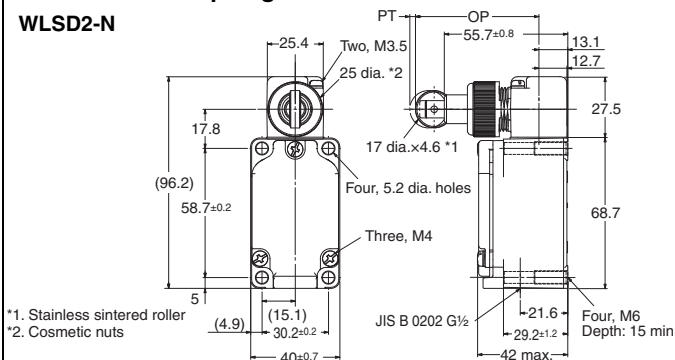
#### Sealed top-roller plunger

##### WLD28-N



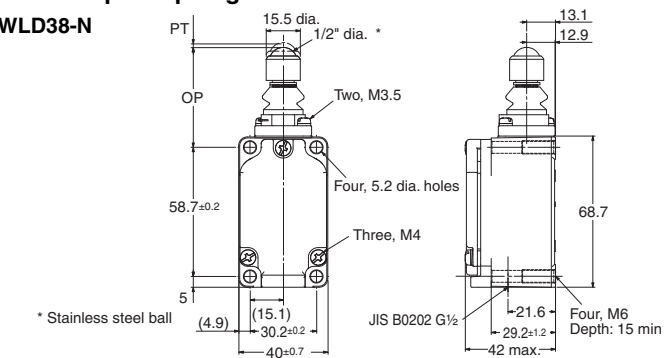
#### Horizontal-roller plunger

##### WLSD2-N



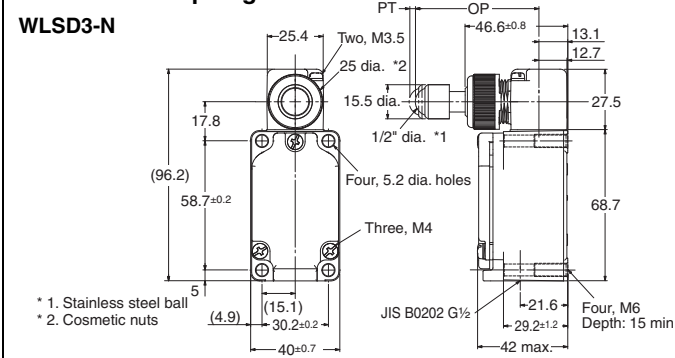
#### Sealed top-ball plunger

##### WLD38-N



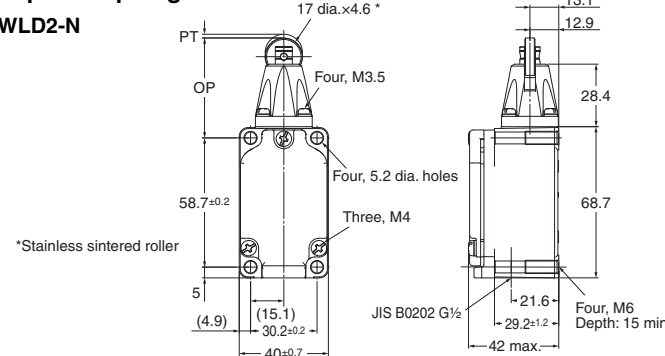
#### Horizontal-ball plunger

##### WLSD3-N



#### Top-roller plunger

##### WLD2-N



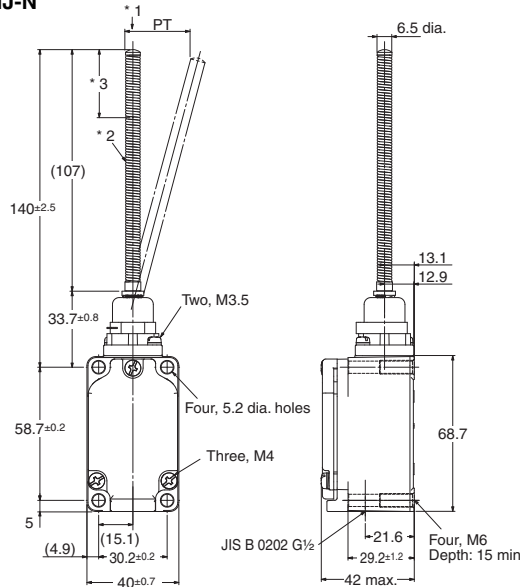
**Note:** Unless otherwise indicated, a tolerance of  $\pm 0.4$  mm applies to all dimensions.

| Model                     |     |      | WLD18-N   | WLD28-N   | WLD38-N     | WLD2-N    | WLSD-N      | WLSD2-N     | WLSD3-N     |
|---------------------------|-----|------|-----------|-----------|-------------|-----------|-------------|-------------|-------------|
| Operating characteristics |     |      |           |           |             |           |             |             |             |
| Operating force           | OF  | max. | 26.67 N   | 16.67 N   | 16.67 N     | 26.67 N   | 40.03 N     | 40.03 N     | 40.03 N     |
| Release force             | RF  | min. | 8.92 N    | 4.41 N    | 4.41 N      | 8.92 N    | 8.89 N      | 8.89 N      | 8.89 N      |
| Pretravel                 | PT  | max. | 1.7 mm    | 1.7 mm    | 1.7 mm      | 1.7 mm    | 2.8 mm      | 2.8 mm      | 2.8 mm      |
| Overtravel                | OT  | min. | 6.4 mm    | 5.6 mm    | 5.6 mm      | 5.6 mm    | 5.6 mm      | 5.6 mm      | 4 mm        |
| Movement Differential     | MD  | max. | 1 mm      | 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 | 44±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       | 39.5 mm   | ---         | ---         | ---         |

Switches with Flexible Rod Actuators  
Basic Switches

Coil spring

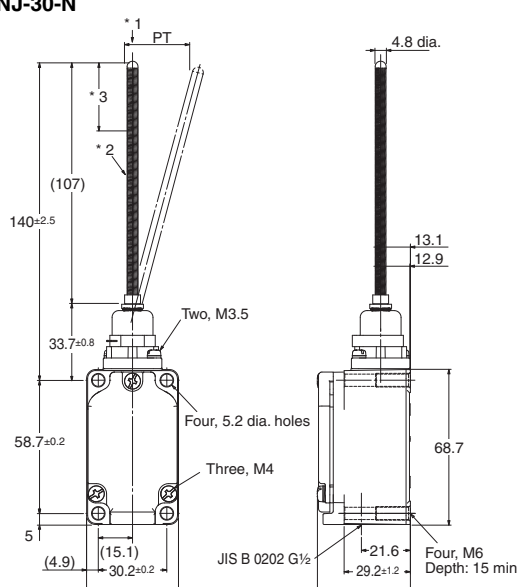
WLNJ-N



- \*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)

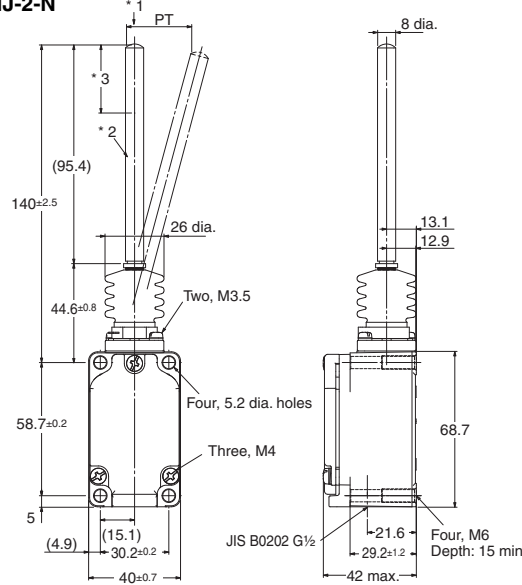
WLNJ-30-N



- \*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

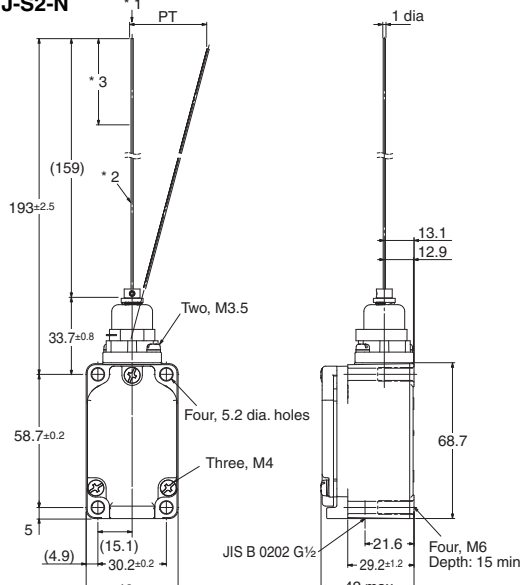
WLNJ-2-N



- \*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  $\pm 0.4$  mm applies to all dimensions.

| Operating characteristics |    | Model | WLNJ-N   | WLNJ-30-N | WLNJ-2-N | WLNJ-S2-N |
|---------------------------|----|-------|----------|-----------|----------|-----------|
| Operating force           | OF |       | 1.47 N   | 1.47 N    | 1.47 N   | 0.28 N    |
|                           | PT | max.  | 20±10 mm | 20±10 mm  | 40±20 mm | 40±20 mm  |

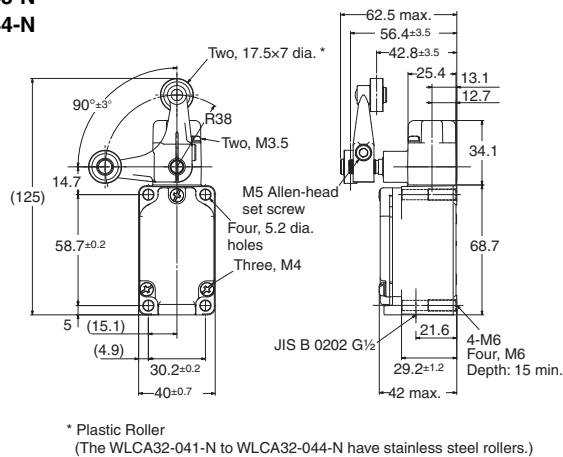
\* These values are for the top end of the spring, rod, or wire.

Switches with Fork Lock Lever Actuators  
Retention Switches

General-purpose

WLCA32-41-N  
WLCA32-42-N  
WLCA32-43-N  
WLCA32-44-N

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



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

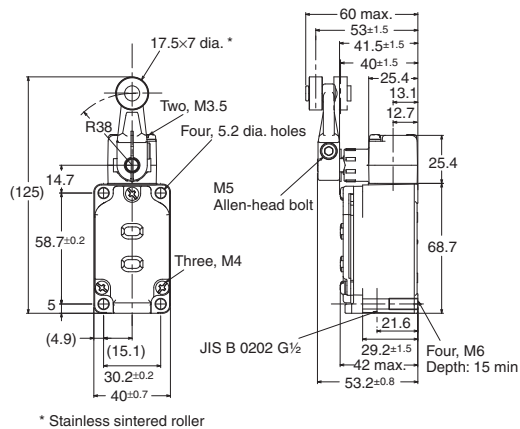
| Operating characteristics                             | Model | WLCA32-41 to 44-N |
|-------------------------------------------------------|-------|-------------------|
| Force necessary to reverse the direction of the lever | max.  | 11.77N            |
| Movement until the lever reverses       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

Operation indicator Switches

Switches with Roller Lever Actuators  
Basic Switches

Roller lever R38

General-purpose Models  
WLCA2-LD-N  
WLCA2-LE-N



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

| Operating characteristics | Basic models    |
|---------------------------|-----------------|
| 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°     |

# Sensor I/O Connector Switches

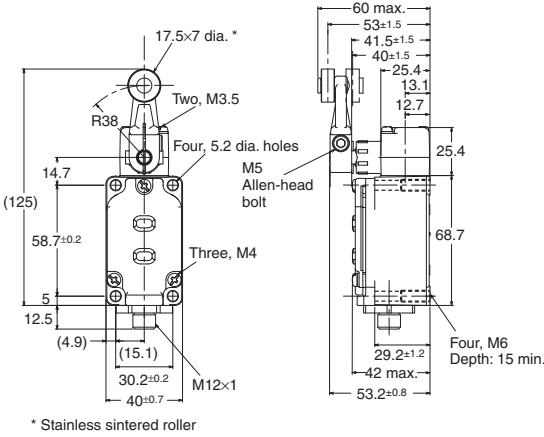
(For details about applicable cables, refer to *Connecting Sensor I/O Connectors Cable and Socket* on page 22.)

## Switches with Roller Lever Actuators

### Basic Switches

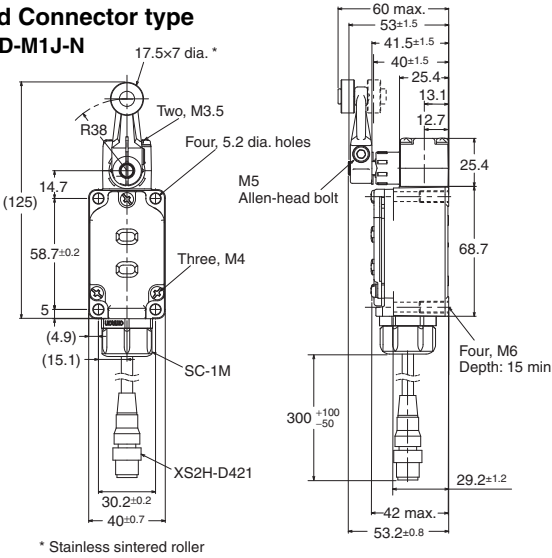
#### Roller lever R38

##### Direct-wire Connector type WLCA2-LDK13-N



#### Roller lever R38

##### Pre-wired Connector type WLCA2-LD-M1J-N



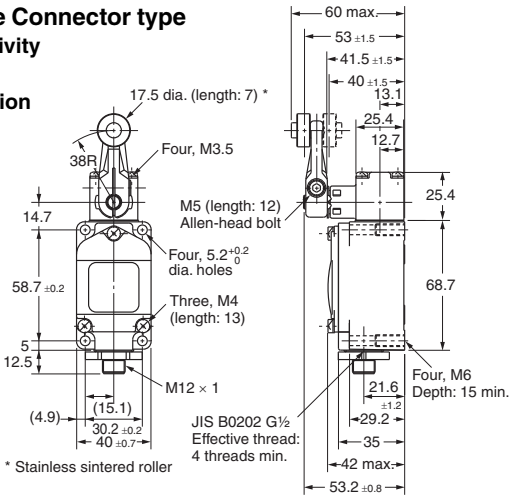
**Note:** 1. Unless otherwise indicated, a tolerance of  $\pm 0.4$  mm applies to all dimensions.  
2. The models with operation indicators are shown in the above diagrams.

| Operating characteristics |         | Basic models     |
|---------------------------|---------|------------------|
| Operating force           | OF max. | 13.34 N          |
| Release force             | RF min. | 1.18 N           |
| Pretravel                 | PT      | $15 \pm 5^\circ$ |
| Overtravel                | OT min. | $70^\circ$       |
| Movement Differential     | MD max. | $12^\circ$       |

## High-sensitivity and High-precision Switches

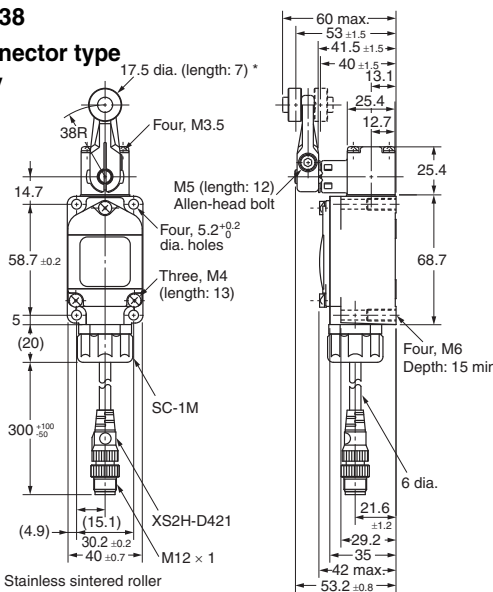
#### Roller lever R38

##### Direct-wire Connector type High-sensitivity WLG2 High-precision WLGCA2



#### Roller lever R38

##### Pre-wired Connector type High-sensitivity WLG2 High-precision WLGCA2



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

| Operating characteristics |         | High-sensitivity       | High-precision Models |
|---------------------------|---------|------------------------|-----------------------|
| Operating force           | OF max. | 9.81 N                 | 13.34 N               |
| Release force             | RF min. | 0.98 N                 | 1.47 N                |
| Pretravel                 | PT      | $10^\circ \pm 5^\circ$ | $5^\circ \pm 5^\circ$ |
| Overtravel                | OT min. | $65^\circ$             | $40^\circ$            |
| Movement Differential     | MD max. | $7^\circ$              | $3^\circ$             |

Spatter-prevention Switches

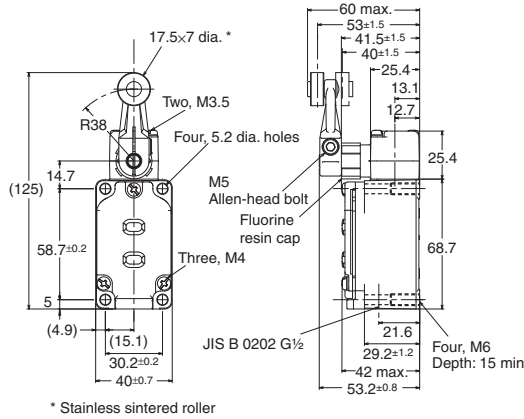
Switches with Roller Lever Actuators

Basic Switches

Roller lever R38

Screw terminal type

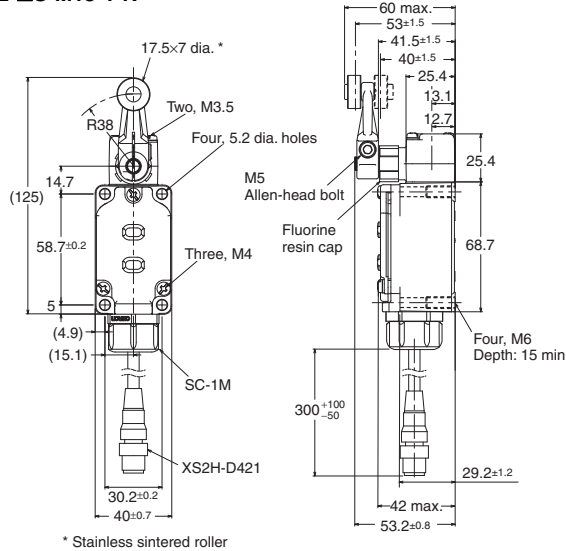
WLCA2-□S-N



Roller lever R38

Pre-wired Connector type

WLCA2-□S-M1J-1-N



**Note:** 1. Unless otherwise indicated, a tolerance of  $\pm 0.4$  mm applies to all dimensions.  
2. The models with operation indicators are shown in the above diagrams.

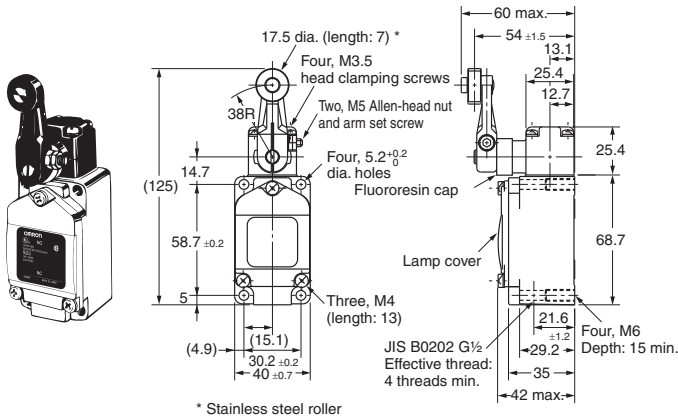
High-sensitivity/High-precision Switches

Roller lever R38

Screw terminal type

WLG2-□S

WLGCA2-□S



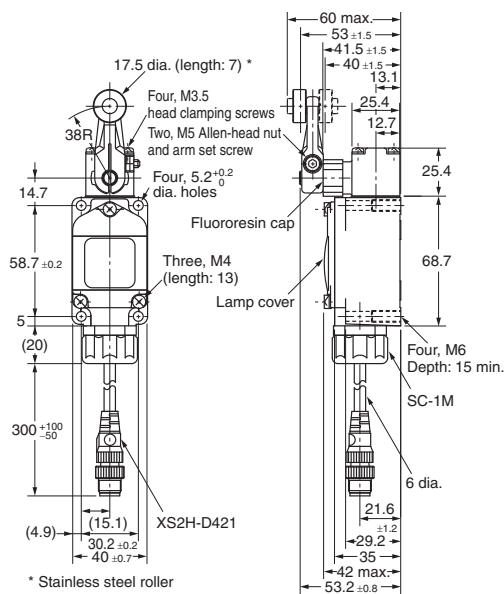
Roller lever R38

Pre-wired Connector type

WLG2-□S-M1J \*

WLGCA2-□S-M1J \*

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



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

| Operating characteristics |    |      | Basic models | High-sensitivity                  | High-precision Models           |
|---------------------------|----|------|--------------|-----------------------------------|---------------------------------|
| Operating force           | OF | max. | 13.34 N      | 9.81 N                            | 13.34 N                         |
| Release force             | RF | min. | 1.18 N       | 0.98 N                            | 1.47 N                          |
| Pretravel                 | PT |      | 15±5°        | 10° <sup>+2°</sup> <sub>-1°</sub> | 5° <sup>+2°</sup> <sub>0°</sub> |
| Overtravel                | OT | min. | 70°          | 65°                               | 40°                             |
| Movement Differential     | MD | max. | 12°          | 7°                                | 3°                              |

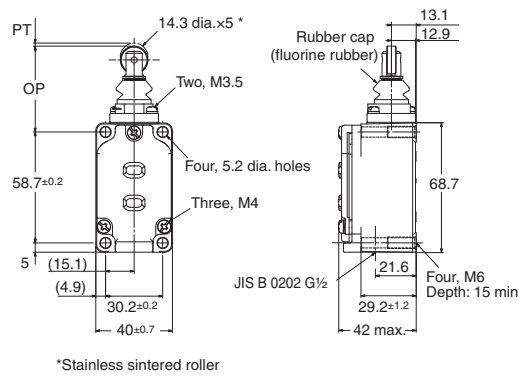
Switches with Plunger Actuators

Basic Switches

Sealed top-roller plunger

Screw terminal type

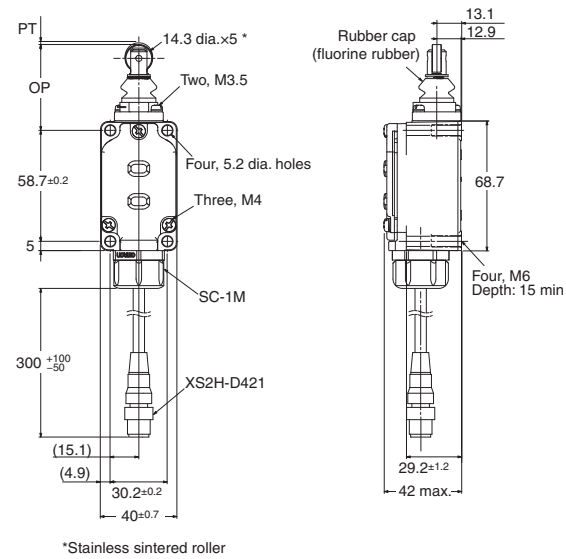
WLD28-□S-N



Sealed top-roller plunger

Pre-wired Connector type

WLD28-□S-M1J-1-N



**Note:** 1. Unless otherwise indicated, a tolerance of  $\pm 0.4$  mm applies to all dimensions.  
2. The models with operation indicators are shown in the above diagrams.

| Operating characteristics |         | Basic models |
|---------------------------|---------|--------------|
| Operating force           | OF max. | 16.67 N      |
| Release force             | RF min. | 4.41 N       |
| Pretravel                 | PT      | 1.7 mm max.  |
| Overtravel                | OT min. | 5.6 mm       |
| Movement Differential     | MD max. | 1 mm         |
| Operating force           | OF max. | 44±0.8 mm    |
| Pretravel                 | PT      | 39.5 mm      |

Long-life Switches

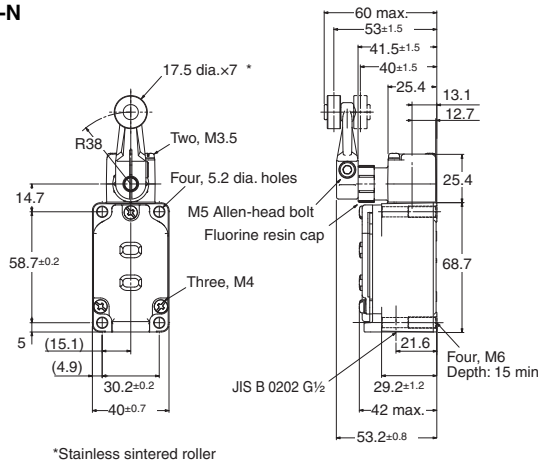
Switches with Roller Lever Actuators

Basic Switches

Roller lever R38

Screw terminal type

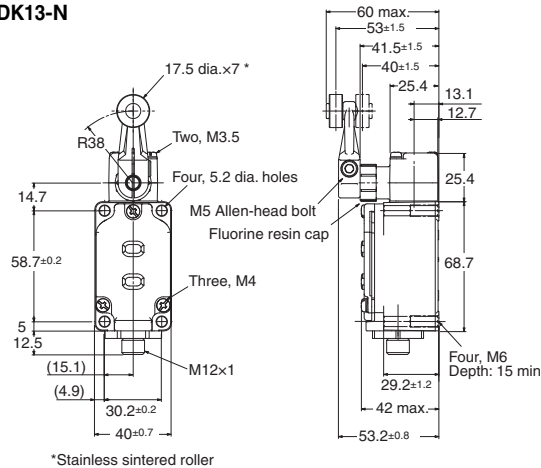
WLMCA2-LD-N



Roller lever R38

Direct-wire Connector type

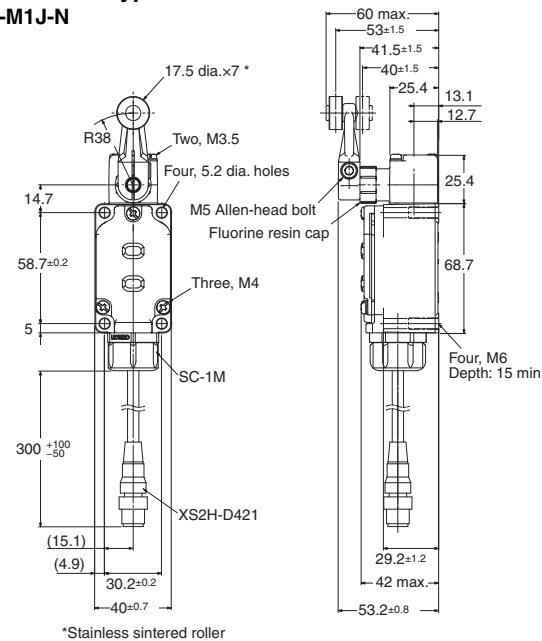
WLMCA2-LDK13-N



Roller lever R38

Pre-wired Connector type

WLMCA2-LD-M1J-N



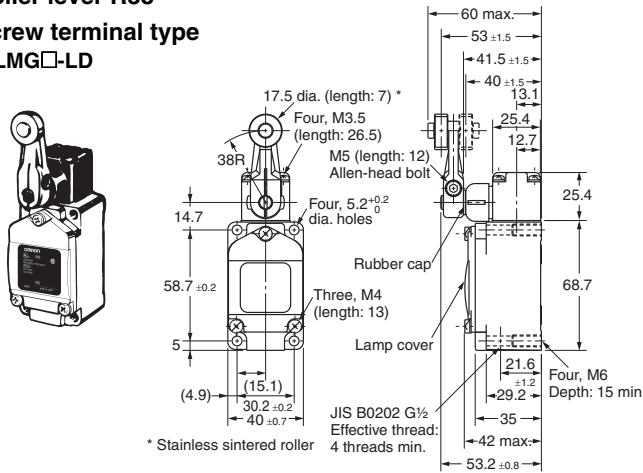
**Note:** 1. Unless otherwise indicated, a tolerance of  $\pm 0.4$  mm applies to all dimensions.  
2. The models with operation indicators are shown in the above diagrams.

| Operating characteristics |    |      | Basic models |
|---------------------------|----|------|--------------|
| 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°          |

# Switches with Roller Lever Actuators High-sensitivity and High-precision Switches

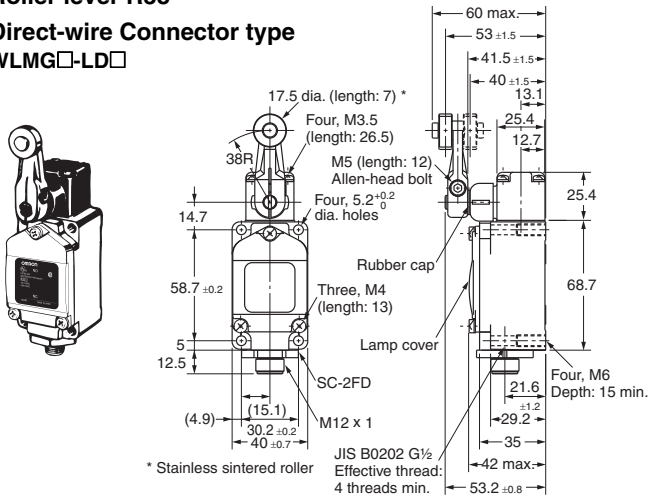
## Roller lever R38

### Screw terminal type WLMG□-LD



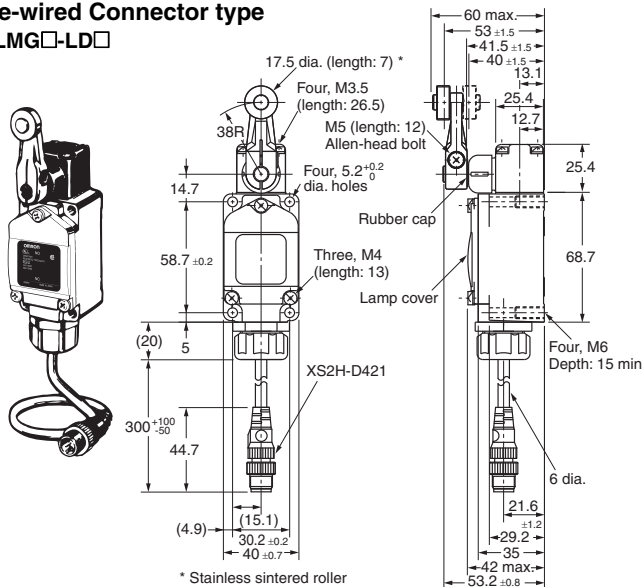
## Roller lever R38

### Direct-wire Connector type WLMG□-LD□



## Roller lever R38

### Pre-wired Connector type WLMG□-LD□



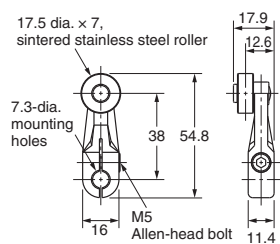
**Note:** Unless otherwise indicated, a tolerance of  $\pm 0.4$  mm applies to all dimensions.

| Operating characteristics |         | High-sensitivity             | High-precision Models       |
|---------------------------|---------|------------------------------|-----------------------------|
| Operating force           | OF max. | 9.81 N                       | 13.34 N                     |
| Release force             | RF min. | 0.98 N                       | 1.47 N                      |
| Pretravel                 | PT      | $10^{\circ \pm \frac{2}{1}}$ | $5^{\circ \pm \frac{2}{0}}$ |
| Overtravel                | OT min. | 65°                          | 40°                         |
| Movement Differential     | MD max. | 7°                           | 3°                          |

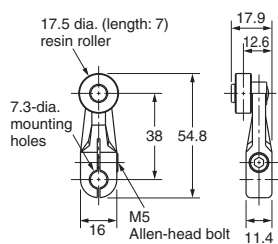
## Actuators (Levers Only)

Lever: Only rotating lever models are illustrated.

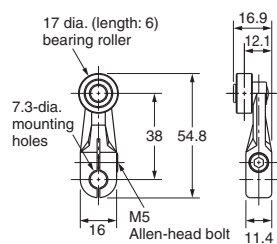
**WL-1A100**  
Standard Lever



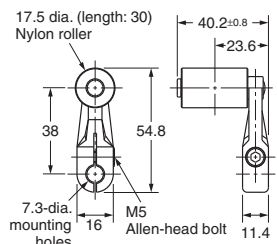
**WL-1A115**  
Resin Roller



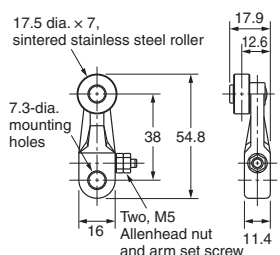
**WL-1A400**  
Bearing Roller



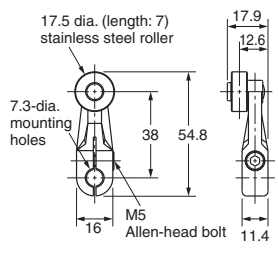
**WL-1A118**  
Nylon Roller:  
Roller Width: 30 mm



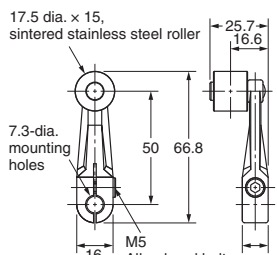
**WL-1A105**  
Double Nuts



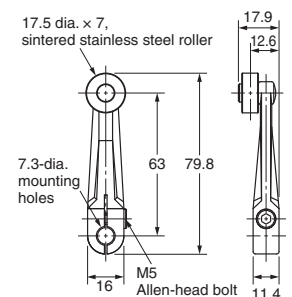
**WL-1A103S**  
Spatter Prevention



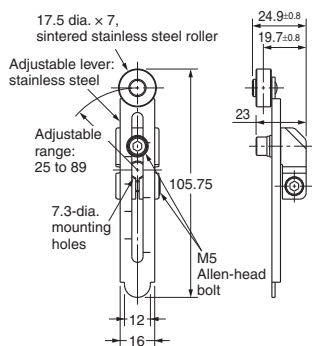
**WL-1A200**  
Lever Length: 50  
Roller Width: 15



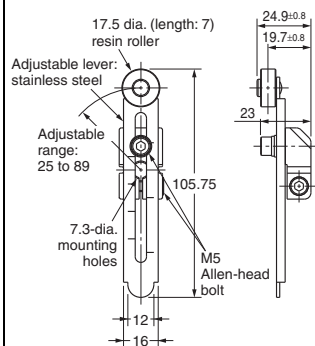
**WL-1A300**  
Lever Length: 63



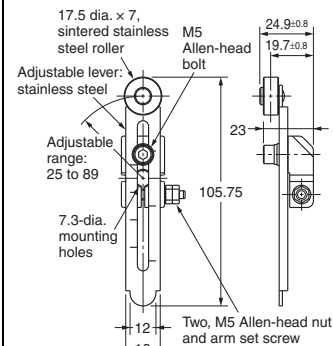
**WL-2A100**



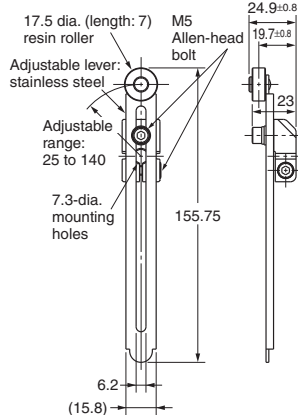
**WL-2A111**  
Resin Roller



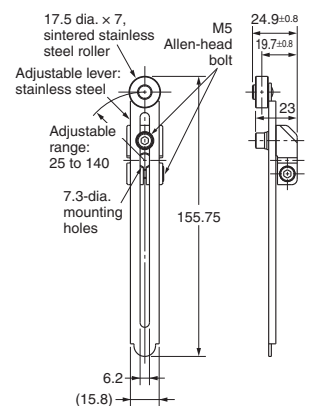
**WL-2A107**  
Double Nuts



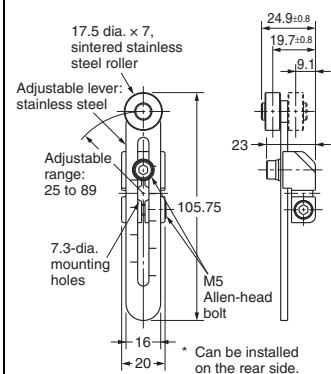
**WL-2A108**  
Resin Roller



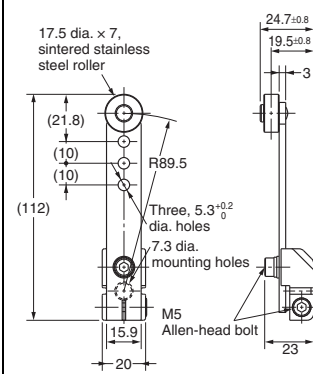
**WL-2A122**



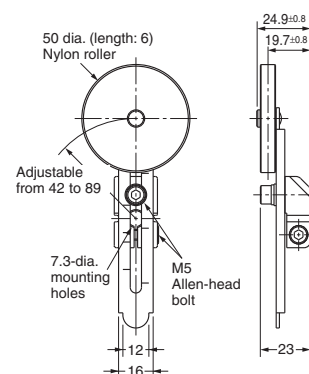
**WL-2A106**



**WL-2A130**



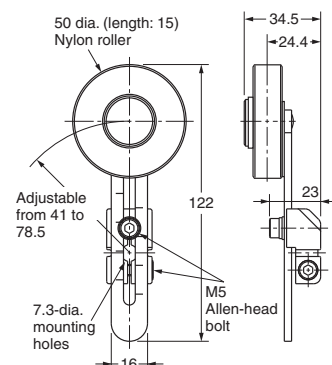
**WL-2A104**



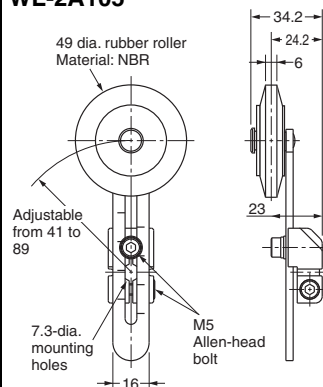
**Note:** Unless otherwise indicated, a tolerance of  $\pm 0.4$  mm applies to all dimensions.

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

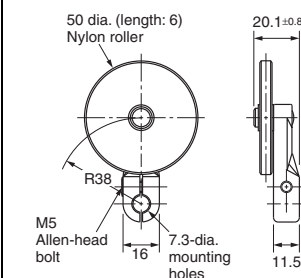
**WL-2A110**



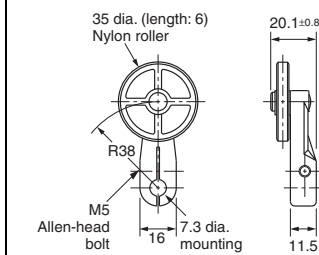
**WL-2A105**



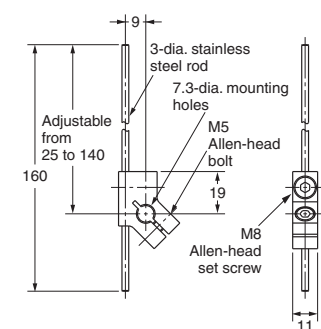
**WL-1A106**



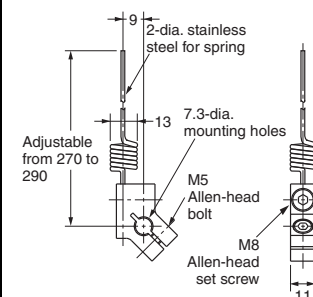
**WL-1A110**



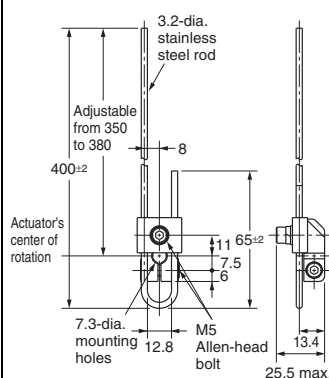
**WL-4A100**



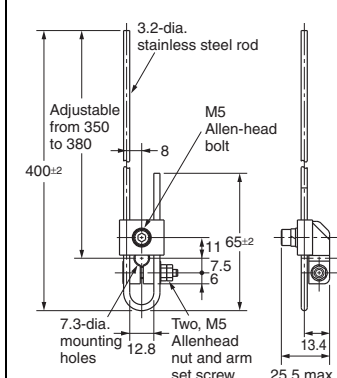
**WL-4A201**



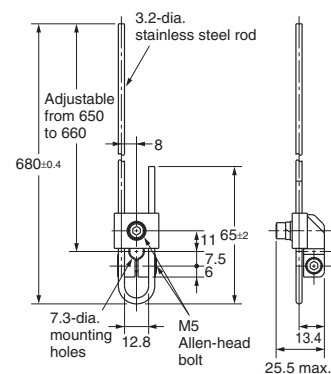
**WL-3A100**



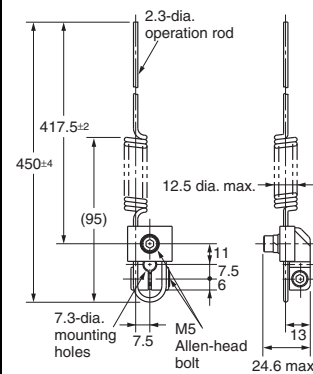
**WL-3A106  
Double Nut**



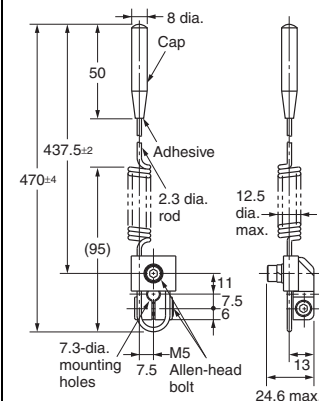
**WL-3A108**



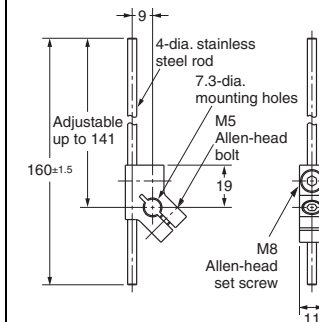
**WL-3A200**



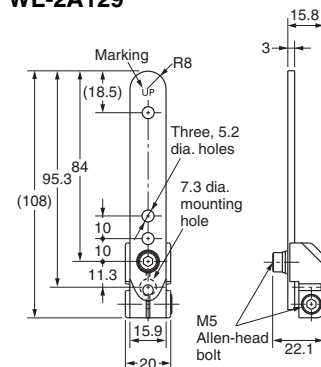
**WL-3A203**



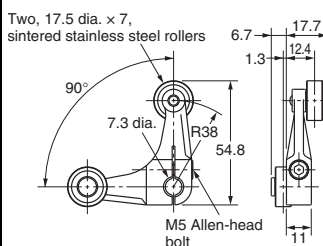
**WL-4A112**



**WL-2A129**

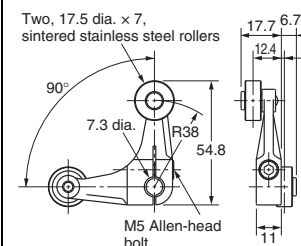


**WL-5A101**



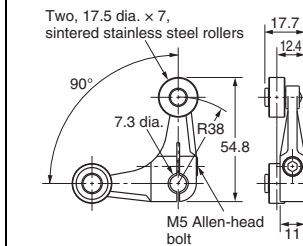
WL-5A100 has a plastic roller

**WL-5A103**



WL-5A102 has a plastic roller

**WL-5A105**



WL-5A104 has a plastic roller

**Note:** 1. Unless otherwise indicated, a tolerance of  $\pm 0.4$  mm applies to all dimensions.  
2. When using the adjustable roller (rod) lever, make sure that the lever is facing downwards.  
Use caution, as telegraphing (the Switch turns ON and OFF repeatedly due to inertia) may occur.

## Model Replacement Table (Replacing WL Basic Models with WL-N Basic Models)

Manufacturing of the basic WL models is scheduled to be discontinued. Use the following table to find the corresponding WL-N-series models and order them instead.

| WL          | WL-N        |
|-------------|-------------|
| WLCA2       | WLCA2-N     |
| WL01CA2     | WLCA2-N     |
| WLH2        | WLCA2-N     |
| WL01H2      | WLCA2-N     |
| WLCA2-2     | WLCA2-2-N   |
| WL01CA2-2   | WLCA2-2-N   |
| WLCA2-2N    | WLCA2-2N-N  |
| WL01CA2-2N  | WLCA2-2N-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    |
| 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-2N-N   |
| WL01HL      | WLCL-2N-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     |
| WLSL        | WLSL-N      |
| WL01SL      | WLSL-N      |
| WLSL2       | WLSL2-N     |
| WL01SL2     | WLSL2-N     |
| WLSL3       | WLSL3-N     |
| WL01SL3     | WLSL3-N     |

| WL          | WL-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    |
| WLCA2-2LE   | WLCA2-2LE-N   |
| WLCA2-2LD   | WLCA2-2LD-N   |
| WLCA2-2NLE  | WLCA2-2NLE-N  |
| WLCA2-2NLD  | WLCA2-2NLD-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   |
| 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-2NLE-N   |
| WLHL-LD     | WLCL-2NLD-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   |
| 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    |

| WL                 | WL-N               |
|--------------------|--------------------|
| WLD3-LD            | WLD38-LD-N         |
| WLD28-LE           | WLD28-LE-N         |
| WLD28-LD           | WLD28-LD-N         |
| WLSL-LE            | WLSL-LE-N          |
| WLSL-LD            | WLSL-LD-N          |
| WLSL2-LE           | WLSL2-LE-N         |
| WLSL2-LD           | WLSL2-LD-N         |
| WLSL3-LE           | WLSL3-LE-N         |
| WLSL3-LD           | WLSL3-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    |
| WLCA2-55LD-M1J     | WLCA2-55LD-M1J-N   |
| WLCA2-LD-M1GJ      | WLCA2-LD-M1GJ-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     |
| WLCA2-55           | WLCA2-55-N         |
| WLCA2-55LD         | WLCA2-55LD-N       |

| WL             | WL-N             | WL          | WL-N          | WL              | WL-N            |
|----------------|------------------|-------------|---------------|-----------------|-----------------|
| WLCA2-55LE     | WLCA2-55LE-N     | WLCA12-RP60 | WLCA12-RP60-N | WLSD-TH         | WLSD-TH-N       |
| WLCA2-139      | WLCA2-139-N      | WLCA12-TH   | WLCA12-TH-N   | WLSD-TC         | WLSD-TC-N       |
| WLCA2-139LD2   | WLCA2-139LD2-N   | WLCA12-TC   | WLCA12-TC-N   | WLSD-RP         | WLSD-RP-N       |
| WLCA2-139LD3   | WLCA2-139LD3-N   | WLCA12-RP   | WLCA12-RP-N   | WLSD2-55        | WLSD2-55-N      |
| WLCA2-140      | WLCA2-140-N      | WLCA12-P1   | WLCA12-P1-N   | WLSD2-55LD      | WLSD2-55LD-N    |
| WLCA2-141      | WLCA2-141-N      | WLH12-TH    | WLCA12-TH-N   | WLSD2-139       | WLSD2-139-N     |
| WLCA2-141LD2   | WLCA2-141LD2-N   | WLH12-TC    | WLCA12-TC-N   | WLSD2-140       | WLSD2-140-N     |
| WLCA2-141LD3   | WLCA2-141LD3-N   | WLH12-RP    | WLCA12-RP-N   | WLSD2-RP60      | WLSD2-RP60-N    |
| WLCA2-RP60     | WLCA2-RP60-N     | WLH12-P1    | WLCA12-P1-N   | WLSD2-TH        | WLSD2-TH-N      |
| WLCA2-RP60LD2  | WLCA2-RP60LD2-N  | WLCA12-2TH  | WLCA12-2TH-N  | WLSD2-TC        | WLSD2-TC-N      |
| WLCA2-RP60LD3  | WLCA2-RP60LD3-N  | WLCA12-2TC  | WLCA12-2TC-N  | WLSD2-RP        | WLSD2-RP-N      |
| WLCA2-TH       | WLCA2-TH-N       | WLCA12-2NTH | WLCA12-2NTH-N | WLNJ-55         | WLNJ-55-N       |
| WLCA2-TC       | WLCA2-TC-N       | WLCA12-2NTC | WLCA12-2NTC-N | WLNJ-55LD       | WLNJ-55LD-N     |
| WLCA2-RP       | WLCA2-RP-N       | WLCL-55     | WLCL-55-N     | WLNJ-139        | WLNJ-139-N      |
| WLCA2-P1       | WLCA2-P1-N       | WLCL-55LD   | WLCL-55LD-N   | WLNJ-140        | WLNJ-140-N      |
| WLH2-55        | WLCA2-55-N       | WLCL-139    | WLCL-139-N    | WLNJ-RP60       | WLNJ-RP60-N     |
| WLH2-55LD      | WLCA2-55LD-N     | WLCL-140    | WLCL-140-N    | WLNJ-TH         | WLNJ-TH-N       |
| WLH2-55LE      | WLCA2-55LE-N     | WLCL-RP60   | WLCL-RP60-N   | WLNJ-TC         | WLNJ-TC-N       |
| WLH2-139       | WLCA2-139-N      | WLCL-TH     | WLCL-TH-N     | WLNJ-RP         | WLNJ-RP-N       |
| WLH2-140       | WLCA2-140-N      | WLCL-TC     | WLCL-TC-N     | WLNJ-255        | WLNJ-255-N      |
| WLH2-141       | WLCA2-141-N      | WLCL-RP     | WLCL-RP-N     | WLNJ-255LD      | WLNJ-255LD-N    |
| WLH2-141LD3    | WLCA2-141LD3-N   | WLCL-P1     | WLCL-P1-N     | WLNJ-2140       | WLNJ-2140-N     |
| WLH2-RP60      | WLCA2-RP60-N     | WLHL-TH     | WLCL-2NTH-N   | WLNJ-2RP60      | WLNJ-2RP60-N    |
| WLH2-RP60LD3   | WLCA2-RP60LD3-N  | WLHL-TC     | WLCL-2NTC-N   | WLNJ-2RP        | WLNJ-2RP-N      |
| WLH2-TH        | WLCA2-TH-N       | WLHL-RP     | WLCL-2NRP-N   | WLCA2-LEAS      | WLCA2-LEAS-N    |
| WLH2-TC        | WLCA2-TC-N       | WLHL-P1     | WLCL-2NP1-N   | WLH2-LEAS       | WLCA2-LEAS-N    |
| WLH2-RP        | WLCA2-RP-N       | WLGL-TH     | WLGL-TH-N     | WLCA2-LDAS      | WLCA2-LDAS-N    |
| WLH2-P1        | WLCA2-P1-N       | WLCL-2TH    | WLCL-2TH-N    | WLH2-LDAS       | WLCA2-LDAS-N    |
| WLCA2-255      | WLCA2-255-N      | WLCL-2TC    | WLCL-2TC-N    | WLCA2-LES       | WLCA2-LES-N     |
| WLCA2-255LD    | WLCA2-255LD-N    | WLCL-2RP    | WLCL-2RP-N    | WLH2-LES        | WLCA2-LES-N     |
| WLCA2-255LE    | WLCA2-255LE-N    | WLCL-2NTH   | WLCL-2NTH-N   | WLCA2-LDS       | WLCA2-LDS-N     |
| WLCA2-2139     | WLCA2-2139-N     | WLCL-2NTC   | WLCL-2NTC-N   | WLH2-LDS        | WLCA2-LDS-N     |
| WLCA2-2139LD2  | WLCA2-2139LD2-N  | WLD2-55     | WLD28-55-N    | WLD28-LES       | WLD28-LES-N     |
| WLCA2-2139LD3  | WLCA2-2139LD3-N  | WLD2-55LD   | WLD28-55LD-N  | WLD28-LDS       | WLD28-LDS-N     |
| WLCA2-2RP60    | WLCA2-2RP60-N    | WLD2-55LE   | WLD28-55LE-N  | WLMCA2-LD       | WLMCA2-LD-N     |
| WLCA2-2RP60LD2 | WLCA2-2RP60LD2-N | WLD2-139    | WLD28-139-N   | WLMCA2-LDK13A   | WLMCA2-LDK13A-N |
| WLCA2-2RP60LD3 | WLCA2-2RP60LD3-N | WLD2-RP60   | WLD28-RP60-N  | WLMCA2-LDK13    | WLMCA2-LDK13-N  |
| WLCA2-2TH      | WLCA2-2TH-N      | WLD2-TH     | WLD28-TH-N    | WLMCA2-LDK43A   | WLMCA2-LDK43A-N |
| WLCA2-2TC      | WLCA2-2TC-N      | WLD2-TC     | WLD28-TC-N    | WLMCA2-LDK43    | WLMCA2-LDK43-N  |
| WLCA2-2N55     | WLCA2-2N55-N     | WLD2-RP     | WLD28-RP-N    | WLMCA2-LD-M1J   | WLMCA2-LD-M1J-N |
| WLCA2-2N55LD   | WLCA2-2N55LD-N   | WLD28-55    | WLD28-55-N    | WLMCA2-LD-DGJ03 | WLMCA2-LD-DGJ-N |
| WLCA2-2N55LE   | WLCA2-2N55LE-N   | WLD28-55LD  | WLD28-55LD-N  | WLMH2-LD        | WLMCA2-LD-N     |
| WLCA2-2N139    | WLCA2-2N139-N    | WLD28-55LE  | WLD28-55LE-N  | WLMH2-LDK13A    | WLMCA2-LDK13A-N |
| WLCA2-2N140    | WLCA2-2N140-N    | WLD28-139   | WLD28-139-N   | WLMH2-LDK13     | WLMCA2-LDK13-N  |
| WLCA2-2NTH     | WLCA2-2NTH-N     | WLD28-140   | WLD28-140-N   | WLMH2-LDK43A    | WLMCA2-LDK43A-N |
| WLCA2-2NTC     | WLCA2-2NTC-N     | WLD28-RP60  | WLD28-RP60-N  | WLMH2-LDK43     | WLMCA2-LDK43-N  |
| WLCA12-55      | WLCA12-55-N      | WLD28-TH    | WLD28-TH-N    | WLMH2-LD-M1J    | WLMCA2-LD-M1J-N |
| WLCA12-55LD    | WLCA12-55LD-N    | WLD28-RP    | WLD28-RP-N    | WLMH2-LD-DGJ03  | WLMCA2-LD-DGJ-N |
| WLCA12-55LE    | WLCA12-55LE-N    | WLSD-55     | WLSD-55-N     | WLRC2           | WLRC2-N         |
| WLCA12-139     | WLCA12-139-N     | WLSD-55LD   | WLSD-55LD-N   | WLRH2           | WLRC2-N         |
| WLCA12-140     | WLCA12-140-N     | WLSD-139    | WLSD-139-N    | WLRC2-2         | WLRC2-2-N       |
| WLCA12-141     | WLCA12-141-N     | WLSD-RP60   | WLSD-RP60-N   | WLRC2-2N        | WLRC2-2N-N      |

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| WL         | WL-N         |
|------------|--------------|
| WLRCA2     | WLRCA2-N     |
| WLRH2      | WLRCA2-N     |
| WLRCA2-2   | WLRCA2-2-N   |
| WLRCA2-2N  | WLRCA2-2N-N  |
| WLRCL      | WLRCA2-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 |

## Model Replacement Table (Replacing WL-N High-sensitivity and High-precision Models with WL High-sensitivity and High-precision Models)

The WL-N high-sensitivity and high-precision models have been integrated into the WL Series. To use a WL-N high-sensitivity or high-precision model, find the corresponding WL high-sensitivity or high-precision model in the following model replacement table, and order the switch with the WL model number.

| WL-N                | WL                | WL-N                | WL                    | WL-N                          | WL                  |
|---------------------|-------------------|---------------------|-----------------------|-------------------------------|---------------------|
| WLG2-TH-N           | WL01G2-TH-F       | WLGCA2-LDS-N        | WLGCA2-LDS            | WLG2-55LD-M1JB-N              | WLG2-55LD-M1JB      |
|                     | WLG2-TH-F         | WLGCA2-LDS-M1J-1-N  | WLGCA2-LDS-M1J-1      | WLG2-55LD-M1GJ-N              | WLG2-55LD-M1GJ 0.3M |
|                     | WLG2-TH           | WLGCA2-LDS-M1GJ-1-N | WLGCA2-LDS-M1GJ-1     | WLG2-55LDK43-N                | WL01G2-55LDK43      |
| WLG2-N              | WL01G2            | WLGCA2-LD-N         | WL01GCA2-LD           | WLG2-55LDK13-N                | WLG2-55LDK43        |
|                     | WLG2              |                     | WLGCA2-LD             |                               | WL01G2-55LDK13      |
| WLG2-LDS-N          | WL01G2-LDS        | WLGCA2-LD-M1J-N     | WLGCA2-LD-M1J         | WLG2-55LDK13-N                | WLG2-55LDK13        |
|                     | WLG2-LDS          | WLGCA2-LD-M1GJ-N    | WLGCA2-LD-M1GJ 0.3M   |                               | WLG2-55LDK13CE      |
| WLG2-LD-N           | WL01G2-LD         | WLGCA2-LDK43-N      | WL01GCA2-LDK43        | WLG2-55LD-DTK1EJ-N            | WLG2-55LD-DTK1EJ03  |
|                     | WLG2-LD           |                     | WLGCA2-LDK43          | WLG2-55LD-DK1EJ-N             | WLG2-55LD-DK1EJ03   |
| WLG2-LD-M1J-N       | WL01G2-LD-M1J     | WLGCA2-LDK13-N      | WLGCA2-LDK13          | WLG2-55LD-DGJ-N               | WL01G2-55LD-DGJ03   |
|                     | WLG2-LD-M1J       | WLGCA2-LD-DGJ-N     | WLGCA2-LD-DGJ03       |                               | WLG2-55LD-DGJ03     |
| WLG2-LD-M1JB-N      | WLG2-LD-M1JB 0.3M | WLGCA2-55-N         | WLGCA2-55             | WLG2-141-N 5M                 | WLG2-141 5M         |
| WLG2-LD-M1GJ-N      | WLG2-LD-M1GJ 0.3M | WLGCA2-55LE-N       | WLGCA2-55LE           | WLG2-141-N 2M                 | WLG2-141 2M         |
| WLG2-LD-DGJ-N       | WL01G2-LD-DGJ03   | WLGCA2-55LD-N       | WL01GCA2-55LD         | WLG2-141LD3-N 5M              | WL01G2-141LD3 5M    |
|                     | WLG2-LD-DGJ03     |                     | WLGCA2-55LD           |                               | WLG2-141LD3 5M      |
| WLG12-TH-N          | WL01G12-TH        | WLGCA2-55LD-M1J-N   | WLGCA2-55LD-M1J 0.3M  | WLG2-141LD2-N 5M              | WLG2-141LD2 5M      |
|                     | WLG12-TH          | WLGCA2-55LD-M1JB-N  | WLGCA2-55LD-M1JB 0.3M | WLG2-140-N 5M                 | WLG2-140 5M         |
| WLG12-N             | WL01G12           | WLGCA2-55LD-M1GJ-N  | WLGCA2-55LD-M1GJ 0.3M | WLG2-139-N 5M                 | WLG2-139 5M         |
|                     | WLG12             | WLGCA2-55LDK43-N    | WL01GCA2-55LDK43      | WLG2-139-N 3M                 | WLG2-139 3M         |
| WLRG2-N             | WLR01G2           |                     | WLGCA2-55LDK43        | WLG2-139LD3-N 5M              | WLG2-139LD3 5M      |
|                     | WLRG2             | WLGCA2-55LDK13-N    | WL01GCA2-55LDK13      | WLG12-TC-N                    | WLG12-TC            |
| WLRG2-LDS-N         | WLRG2-LDS         |                     | WLGCA2-55LDK13        | WLG12-P1-N                    | WLG12-P1            |
| WLMGCA2-LD-N        | WLMGCA2-LD        |                     | WLGCA2-55LDK13CE      | WLG12-LE-N                    | WLG12-LE            |
| WLMGCA2-LD-M1J-N    | WLMGCA2-LD-M1J    | WLGCA2-55LD-DGJ-N   | WLGCA2-55LD-DGJ03     | WLG12-LD-N                    | WLG12-LD            |
| WLMGCA2-LDK43-N     | WLMGCA2-LDK43     | WLGCA2-139-N 5M     | WLGCA2-139 5M         | WL-2H4100-N (FOR WLG1-N)      | None                |
| WLMGCA2-LDK13-N     | WLMGCA2-LDK13     | WLGCA2-139-N 3M     | WLGCA2-139 3M         | WL-2H2100-N (FOR WLG12-N)     | None                |
| WLMGCA2-LDK13A-N    | WLMGCA2-LDK13A    | WLGCA2-139-N 2M     | WLGCA2-139 2M         | WL-2H1100W-N (FOR WLG2-141-N) | None                |
| WLMG2-LD-N          | WLMG2-LD          | WLGCA2-139LD3-N 5M  | WLGCA2-139LD3 5M      | WL-2H1100S-N (FOR WLG2-S-N)   | None                |
| WLMG2-LD-M1J-N      | WLMG2-LD-M1J      | WLGCA2-139LD2-N 5M  | WLGCA2-139LD2 5M      | WL-2H1100-N (FOR WLG2-N)      | None                |
| WLMG2-LDK43-N       | WLMG2-LDK43       | WLG2-TC-N           | WLG2-TC               |                               |                     |
| WLMG2-LDK13-N       | WLMG2-LDK13       | WLG2-RP-N           | WLG2-RP               |                               |                     |
| WLMG2-LDK13A-N      | WLMG2-LDK13A      | WLG2-RP60-N 5M      | WLG2-RP60             |                               |                     |
| WLMG2-LD-DGJ-N      | WLMG2-LD-DGJ03    | WLG2-RP60-N 10M     | WLG2-RP60 10M         |                               |                     |
| WLGL-TH-N           | WLGL-TH           | WLG2-RP60LD3-N 5M   | WLG2-RP60LD3          |                               |                     |
| WLGL-TC-N           | WLGL-TC           | WLG2-RP60LD2-N 5M   | WLG2-RP60LD2          |                               |                     |
| WLGL-P1-N           | WLGL-P1           | WLG2-P1-N           | WLG2-P1               |                               |                     |
| WLGL-N              | WL01GL            | WLG2-LES-N          | WLG2-LES              |                               |                     |
|                     | WLGL              | WLG2-LE-N           | WL01G2-LE             |                               |                     |
| WLGL-LE-N           | WLGL-LE           |                     | WLG2-LE               |                               |                     |
| WLGL-LD-N           | WLGL-LD           | WLG2-LEAS-N         | WLG2-LEAS             |                               |                     |
| WLGCA2-TH-N         | WL01GCA2-TH       | WLG2-LDK43-N        | WLG2-LDK43            |                               |                     |
|                     | WLGCA2-2TH        | WLG2-LDK13-N        | WL01G2-LDK13          |                               |                     |
|                     | WLGCA2-TH         |                     | WLG2-LDK13            |                               |                     |
| WLGCA2-TC-N         | WLGCA2-TC         | WLG2-LD-DK1EJ-N     | WLG2-LD-DK1EJ03       |                               |                     |
| WLGCA2-RP-N         | WLGCA2-RP         | WLG2-LDAS-N         | WLG2-LDAS             |                               |                     |
| WLGCA2-RP60-N 5M    | WLGCA2-RP60       | WLG2-55-N           | WL01G2-55             |                               |                     |
| WLGCA2-RP60LD3-N 5M | WLGCA2-RP60LD3    |                     | WLG2-55               |                               |                     |
| WLGCA2-RP60LD2-N 5M | WLGCA2-RP60LD2    | WLG2-55LE-N         | WLG2-55LE             |                               |                     |
| WLGCA2-N            | WL01GCA2          | WLG2-55LD-N         | WL01G2-55LD           |                               |                     |
|                     | WLGCA2            |                     | WLG2-55LD             |                               |                     |
| WLGCA2-LES-N        | WLGCA2-LES        | WLG2-55LD-M1TJ-N    | WLG2-55LD-M1TJ        |                               |                     |
| WLGCA2-LE-N         | WL01GCA2-LE       | WLG2-55LD-M1TJB-N   | WLG2-55LD-M1TJB       |                               |                     |
|                     | WLGCA2-LE         |                     |                       |                               |                     |

## Safety Precautions

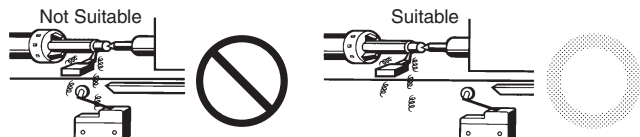
### Precautions for Safe Use

- Be sure to ground. Otherwise electric shock may result.
- Do not touch charged switch terminals while the switch has carry current. Otherwise electric shock may result.
- Do not disassemble the limit switch or touch inside of it under supplying power, Otherwise electric shock may result.
- 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.
- Otherwise, there is the possibility of spoiling the normal operation. Do not drop the switch.
- Do not connect a Single Limit Switch to two power supplies that are different in polarity or type. Risk of interference.
- 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.
- 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.

### Precautions for Correct Use

#### Environment

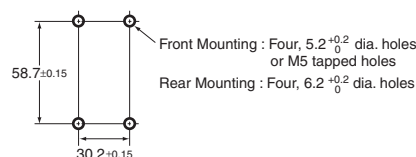
- Take special care to use where there is fine powder, mud and/or foreign materials stacking. And check the condition with actual using condition before using. Then use without a performance problem.
- Do not keep the Switch in locations with corrosive gas, such as sulfuric gas ( $\text{H}_2\text{S}$  or  $\text{SO}_2$ ), ammonium gas ( $\text{NH}_3$ ), nitric gas ( $\text{HNO}_3$ ), or chlorine gas ( $\text{Cl}_2$ ), 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 ( $\text{SiO}_2$ ) due to arc energy. If silicon oxide accumulates on the contacts, contact interference can occur. If silicon oil, silicon filling agents, silicon cables, or other silicon products are present near the Switch, suppress arcing with contact protective circuits (surge suppressor) 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 appropriate tightening torque.



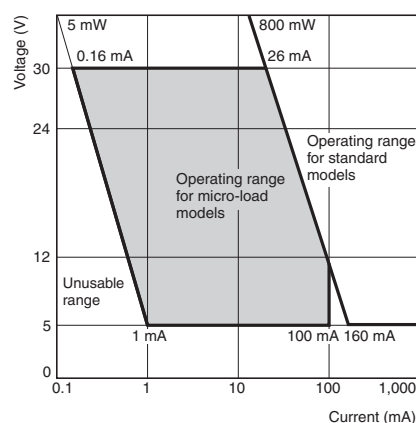
### Using Switches for Micro Loads

Contact faults may occur if a Switch for a general-load is used to switch a micro load circuit. Use switches in the ranges shown in the diagram below. However, even when using microload models within the operating range shown here, if inrush current occurs when the contact is opened or closed, it may increase contact wear and so decrease durability. Therefore, insert a contact protection circuit where necessary.

For the WL-N, the P level is at the min. operating load of 5 VDC and 1 mA resistive load.

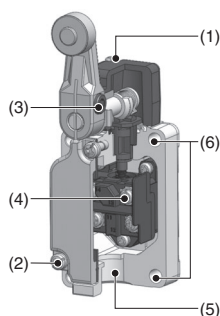
**Note:** The P level indicates the standard malfunction level at a reliability level of 60% ( $\lambda_{60}$ ). (JISC5003)  $\lambda_{60} = 0.1 \times 10^{-6}/\text{operations}$  indicates that the estimated malfunction rate is less than 1/10,000,000 operations with a reliability level of 60%.

For the WL01G□, the N level is a reference value at the min. operating load of 5 VDC and 1 mA resistive load. An estimated malfunction rate of 1/2,000,000 operations at a reliability level of 60% is indicated as a reference value.



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



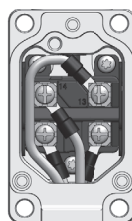
| No. | Type                                                    | Torque           | Screw type                       |
|-----|---------------------------------------------------------|------------------|----------------------------------|
| (1) | Head mounting screw                                     | 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 screw                         |
|     | Back mounting screws                                    | 4.90 to 5.88 N•m | M6 screw                         |

## Wiring

### In the case of mounting screw

#### Basic Switches

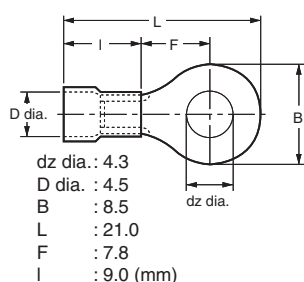
- Use M3.5-nylon insulation covered crimp terminals (round type) for wiring.  
Ex.) V1.25-M3.5(RAP1.25-3.5) (J.S.T. Mfg. Co.,Ltd.)
- Appropriate wire size is AWG16 (1.25 mm<sup>2</sup>).
- Do not supply electric power when wiring. Otherwise electric shock may result.
- Do not pull out the wires with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



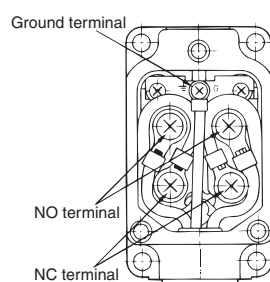
#### High-sensitivity and High-precision Switches

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

#### Crimp Terminal External Dimensions



#### Wiring Method Switch Box Section



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

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

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

## How to handle

### Changing direction of the head

- By removing two head screws or four head screws, mounting in any of four orientations is possible. 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. Risk of malfunctioning.

### Overtravel Markers

- All Switches with Roller Lever Actuators except for Switches with Fork Lock Levers 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 the overtravel markers (pages 36, 37).

## 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 WL-N Basic Models 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.

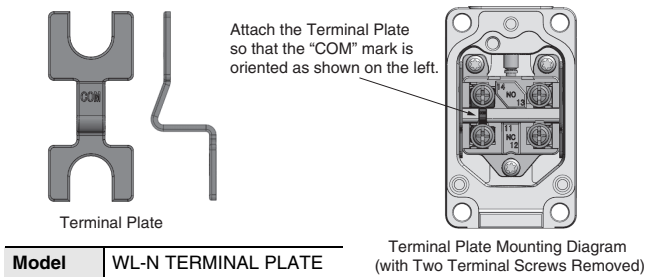
## Indicator

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. 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

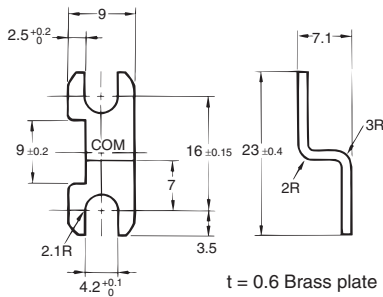
Basic Switches

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.



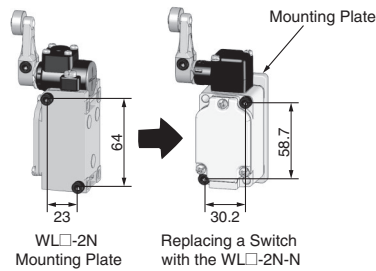
High-sensitivity/High-precision Switches

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



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

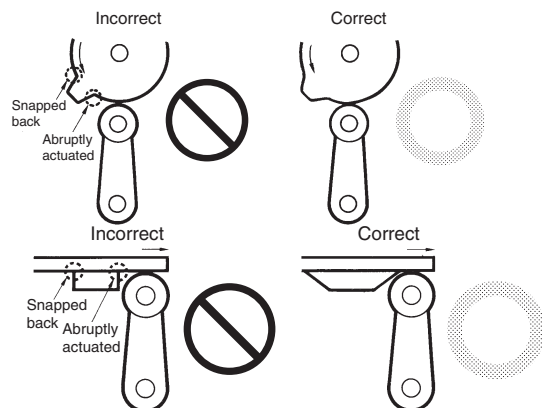
If you replace a previous Switch with a WL□-2N-N Switch, a Mounting Plate (sold separately) is available to maintain mounting compatibility. If you use the Mounting Plate, the Switch mounting holes and actuator position will be compatible. (The position of the dog remains unchanged.)



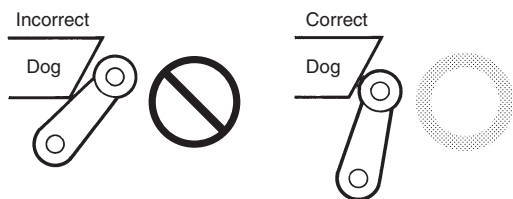
|              |                                                                            |
|--------------|----------------------------------------------------------------------------|
| Set contents | <br>Plate mounting bolts (2)<br><br>Switch mounting bolts (2)<br>Plate (1) |
| Model        | WLN-P001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

## Operation

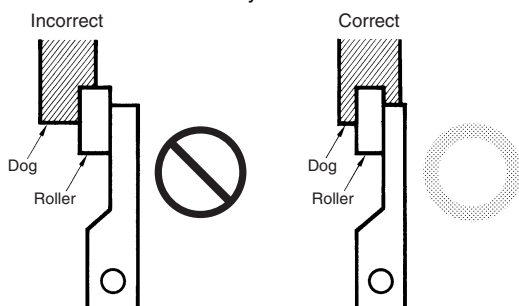
- Carefully determine the position and shape of the dog or cam so that the actuator will not abruptly snap back, thus causing shock. In order to operate the Limit Switch at a comparatively high speed, use a dog or cam that keeps the Limit Switch turned ON for a sufficient time so that the relay or valve 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.



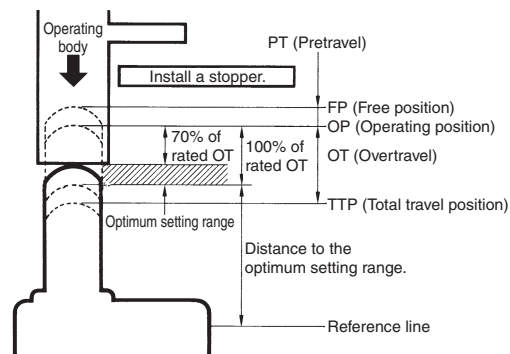
- Unbalanced force must not be imposed on the actuator. Otherwise, wear and tear on the actuator may result.



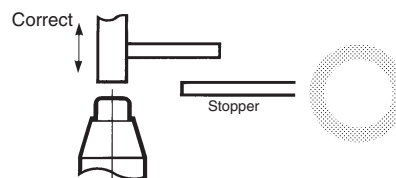
- With a roller actuator, the dog must touch the actuator at a right angle. The actuator or shaft may deform or break if the dog touches the actuator (roller) at an oblique angle.



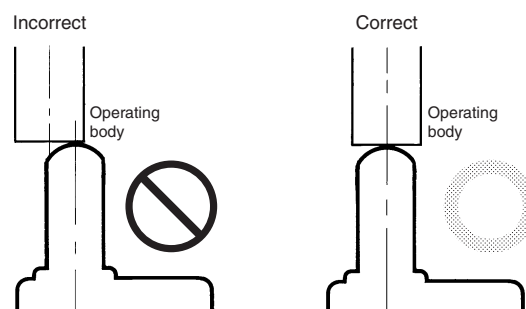
- Make sure that the actuator does not exceed the OT (overtravel) range, otherwise the Limit Switch may malfunction. When mounting the Limit Switch, be sure to adjust the Limit Switch carefully while considering the whole movement of the actuator.



- 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.



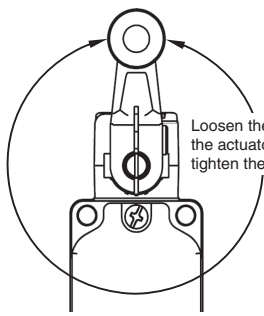
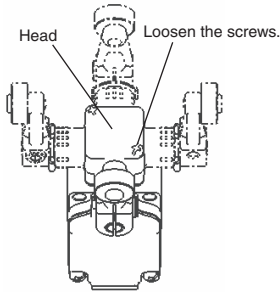
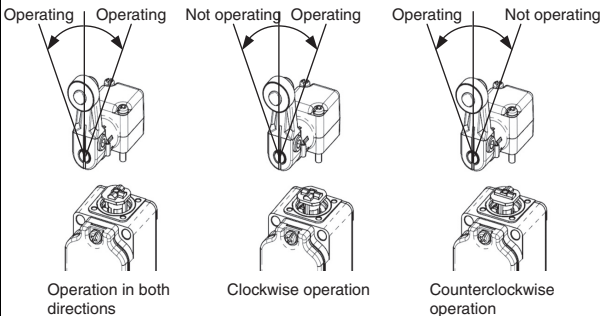
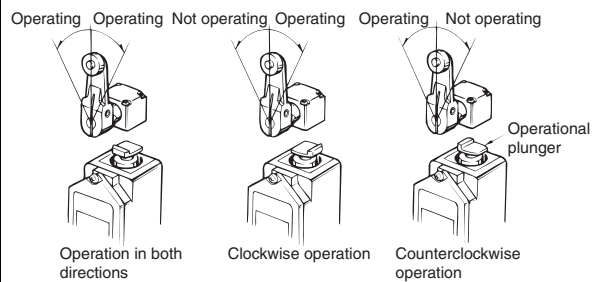
- When using a pin-plunger actuator, make sure that the stroke of the actuator and the movement of the dog are located along a single straight line.

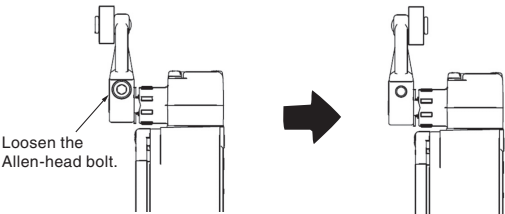
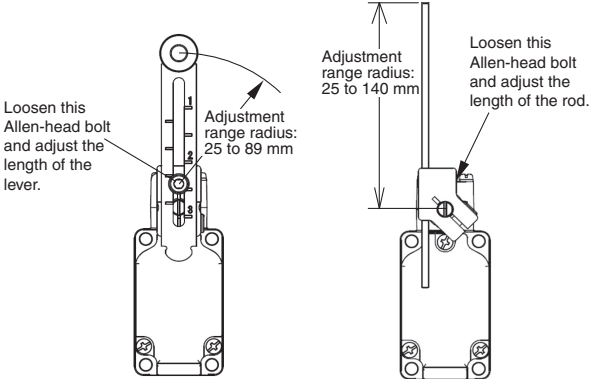
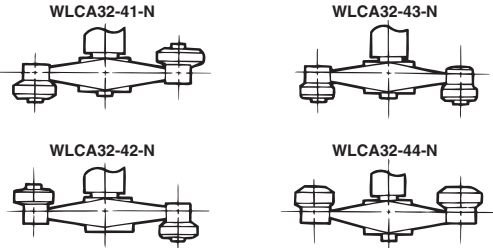


## Others

- 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 Switch's performance.

## Using the Switches

| Item                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Applicable models and Actuators                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Details                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p><b>Changing the Installation Position of the Actuator</b></p> <p>By loosening the Allen-head bolt on the actuator lever, the position of the actuator can be set anywhere within the 360°.</p> <p>With Operation Indicator-equipped Switches, the actuator lever comes in contact with the top of the indicator cover, so use caution when rotating and setting the lever. When the lever only moves forwards and backwards, it will not contact the lamp cover. (This does not apply to Long-life Models.)</p> | <p>Roller lever:<br/>(WLCA2-N, WLCA2-2-N, WLCA2-2N-N, WLG2, WLCA2-7-N, WLCA2-8-N, WLGCA2, WLMCA2-N, WLMG2, WLMGCA2)</p> <p>Adjustable Roller Lever:<br/>(WLCA12-N, WLCA12-2-N, WLCA12-2N-N, WLG12)</p> <p>Adjustable Rod Lever:<br/>(WLCL-N, WLCL-2-N, WLCL-2N-N, WLGL, WLCAL4-N, WLCAL5-N)</p>                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <p><b>Changing the Orientation of the Head</b></p> <p>By removing the head screws (two or four screws), mounting in any of four orientations is possible. Be sure to change the plunger for internal operations at the same time. The roller plunger can be set in either of two positions at 90°.</p>                                                                                                                                                                                                             | <p>Roller lever:<br/>(WLCA2-N, WLCA2-2-N, WLCA2-2N-N, WLG2, WLCA2-7-N, WLCA2-8-N, WLGCA2, WLMCA2-N, WLMG2, WLMGCA2)</p> <p>Adjustable Roller Lever:<br/>(WLCA12-N, WLCA12-2-N, WLCA12-2N-N, WLG12)</p> <p>Adjustable Rod Lever:<br/>(WLCL-N, WLCL-2-N, WLCL-2N-N, WLGL, WLCAL4-N, WLCAL5-N)</p> <p>Horizontal plunger:<br/>(WLS□-N)</p> <p>Top-roller plunger:<br/>(WLD2-N)</p> <p>Sealed top-roller plunger:<br/>(WLD28-N)</p> <p>Fork lock lever:<br/>(WLCA32-4□-N)</p> <p><b>Note:</b> Excludes the -RP60-series and -141-series.</p> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <p><b>Changing the Operating Direction</b></p> <p>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. The tightening torque for the screws on the Head is 0.78 to 0.88 N-m.</p>                                                                                                                                                                                                      | <p>Roller lever:<br/>(WLCA2-N, WLCA2-2-N, WLCA2-2N-N, WLCA2-7-N, WLCA2-8-N, WLMCA2-N)</p> <p>Adjustable Roller Lever:<br/>(WLCA12-N, WLCA12-2-N, WLCA12-2N-N)</p> <p>Adjustable Rod Lever:<br/>(WLCL-N, WLCL-2-N, WLCL-2N-N, WLCAL4-N, WLCAL5-N)</p>                                                                                                                                                                                                                                                                                     | <p><b>One-side Operation</b></p> <p>The output of the Switch will be changed, regardless of which direction the lever is pushed.</p> <p>The output of the Switch will only be changed when the lever is pushed in one direction.</p>  <p>Operating Operating Not operating Operating Operating Not operating</p> <p>Operation in both directions Clockwise operation Counterclockwise operation</p> <p><b>One-side Operation for High-sensitivity and High-precision Switches</b></p> <p>The output of the Switch will be changed, regardless of which direction the lever is pushed.</p> <p>The output of the Switch will only be changed when the lever is pushed in one direction.</p>  <p>Operating Operating Not operating Operating Operating Not operating</p> <p>Operation in both directions Clockwise operation Counterclockwise operation</p> |
| <p>Roller lever:<br/>(WLGCA2, WLMGCA2)</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |

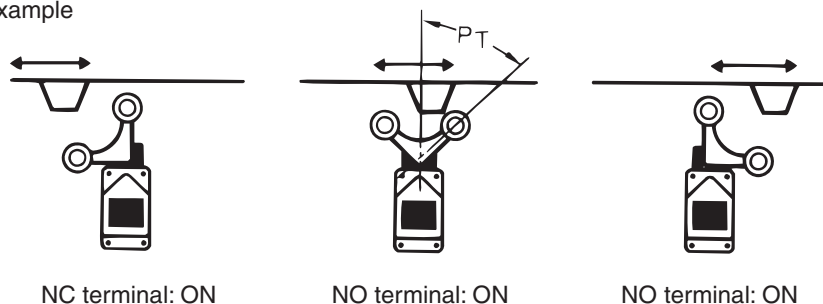
| Item                                                                                                                                                                                                                   | Applicable models and Actuators                                                                                                                     | Details                                                                                                                                                                                                                                                                                                                                                                                            |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Installing the Roller on the Inside</b><br>By installing the roller lever in the opposite direction, the roller can be installed on the inside. (Set so that operation can be completed within a 180° level range.) | Roller lever:<br>(WLCA2-N, WLCA2-2-N, WLCA2-2N-N, WLG2, WLCA2-7-N, WLCA2-8-N, WLGA2, WLMCA2-N, WLMG2, WLMGCA2)<br>Fork Lock Lever:<br>(WLCA32-4□-N) |  <p>Loosen the Allen-head bolt.</p>                                                                                                                                                                                                                                                                              |
| <b>Adjusting the Length of the Rod or Lever</b><br>The length of the rod or lever can be adjusted by loosening the Allen-head bolt.                                                                                    | Adjustable Roller Lever:<br>(WLCA12-N, WLCA12-2-N, WLCA12-2N-N, WLG12)<br>Adjustable Rod Lever:<br>(WLCL-N, WLCL-2-N, WLCL-2N-N, WLGL, WLCAL4-N)    |  <p>Loosen this Allen-head bolt and adjust the length of the lever.</p> <p>Adjustment range radius: 25 to 89 mm</p> <p>Adjustment range radius: 25 to 140 mm</p> <p>Loosen this Allen-head bolt and adjust the length of the rod.</p> <p><b>Adjustable Roller Levers:</b>      <b>Adjustable Rod Levers:</b></p> |
| <b>Selecting the Roller Position</b><br>There are four types of Switches with Fork Lock Levers for use depending on the roller position.                                                                               | Fork Lock Lever:<br>(WLCA32-4□-N)                                                                                                                   |  <p>WLCA32-41-N      WLCA32-43-N</p> <p>WLCA32-42-N      WLCA32-44-N</p> <p>An explanation of the operation of fork lock levers is provided after this table.</p>                                                                                                                                               |

## Operation of Fork Lock Levers

A Switch with a Fork Lock Lever 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



## 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, WL, 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 sealing 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, WL, 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, WL, 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)

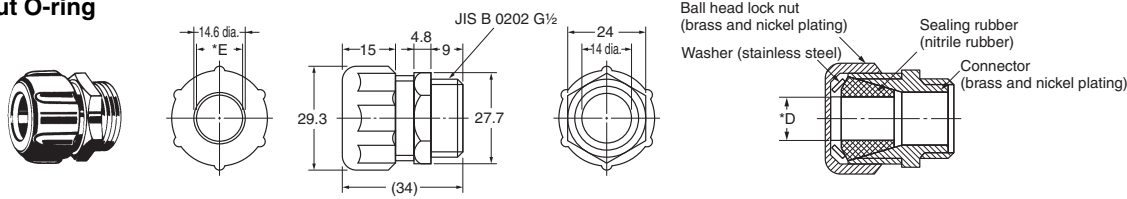
## Connectors for Cabtire Cable

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

### Metal Models without O-ring

G $\frac{1}{2}$

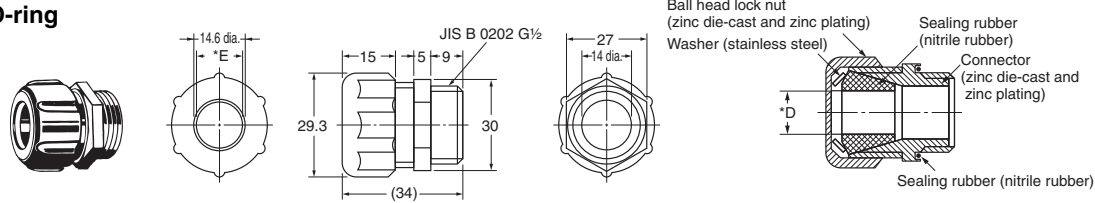
SC-21 to 25



### Metal Models with O-ring

G $\frac{1}{2}$

SC-1M to 5M

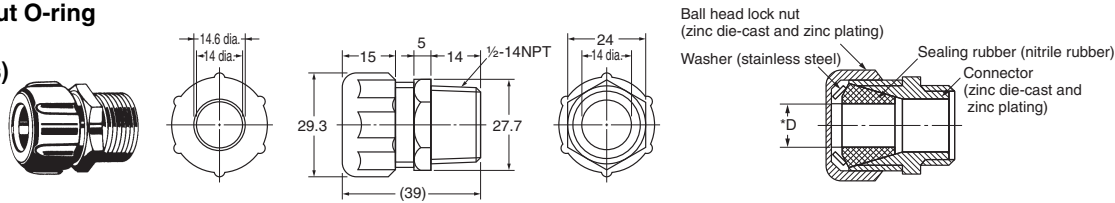


### Metal Models without O-ring

$\frac{1}{2}$ -14NPT

(U.S.-standard screws)

SC-1PT to 5PT



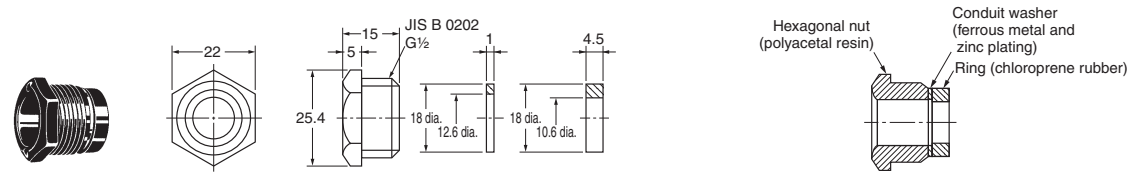
**Note:** Dimensions not shown in the above diagrams have a variation of  $\pm 0.4$  mm.

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

### Resin Models

G $\frac{1}{2}$

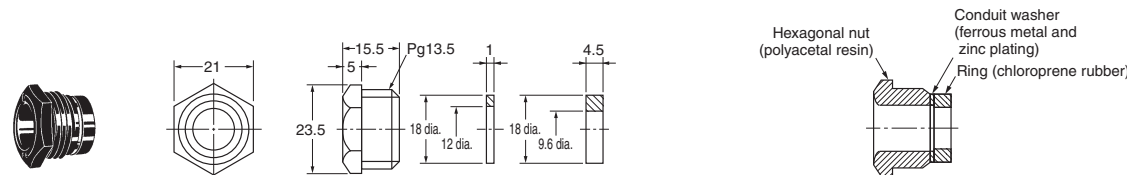
SC-P2



### Resin Models

Pg13.5

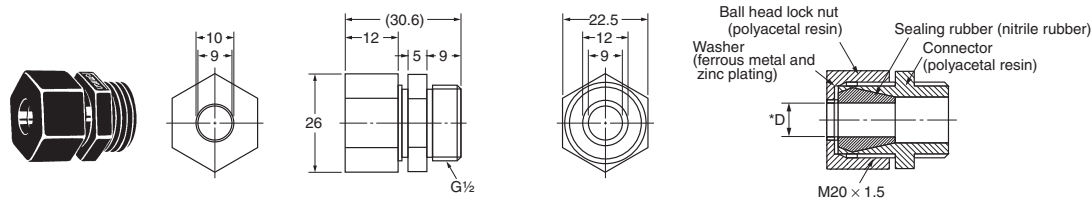
SC-P3



### Resin Models

G $\frac{1}{2}$

SC-6



**Note:** Dimensions not shown in the above diagrams have a variation of  $\pm 0.4$  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.   |

[illegible]

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- Формирование склада под заказчика.
- Сертификаты соответствия на поставляемую продукцию (по желанию клиента).
- Тестирование поставляемой продукции.
- Поставку компонентов, требующих военную и космическую приемку.
- Входной контроль качества.
- Наличие сертификата ISO.

В составе нашей компании организован Конструкторский отдел, призванный помогать разработчикам, и инженерам.

Конструкторский отдел помогает осуществить:

- Регистрацию проекта у производителя компонентов.
- Техническую поддержку проекта.
- Защиту от снятия компонента с производства.
- Оценку стоимости проекта по компонентам.
- Изготовление тестовой платы монтаж и пусконаладочные работы.



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