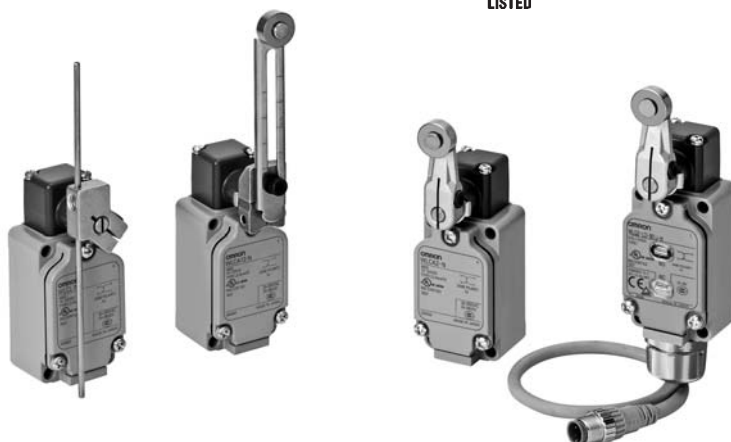


## Select the Best Two-circuit Switch for the Operating Environment and Application.

- Standard-feature crossbar contacts provide high contact reliability.  
Applicable to either standard loads or microloads.
- Standard features include 90° overtravel, one-side operation, and four-direction mounting.
- IP67 degree of protection.
- Approved standards: EN/IEC, UL, cUL, and CCC.  
Contact your OMRON representative for information on approved models.



**!** Be sure to read **Safety Precautions** on page 24 to 26 and **Safety Precautions for All Limit Switches**.

## Features

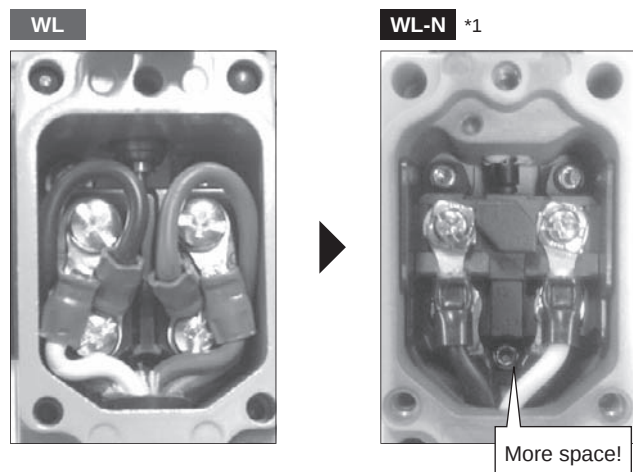
### Easy to Select

- The contacts can be used with either standard loads or microloads.
- Standard features include 90° overtravel, one-side operation, and four-direction mounting.

### Easy to Work With

- Downsizing of the built-in switch has increased the space to house the wiring.
- Steel screws that are attracted by magnetic screwdrivers have been used for the terminal screws inside the Switches.
- Resin and elastomer resistance has replaced the insulating paper.

### Internal Structure



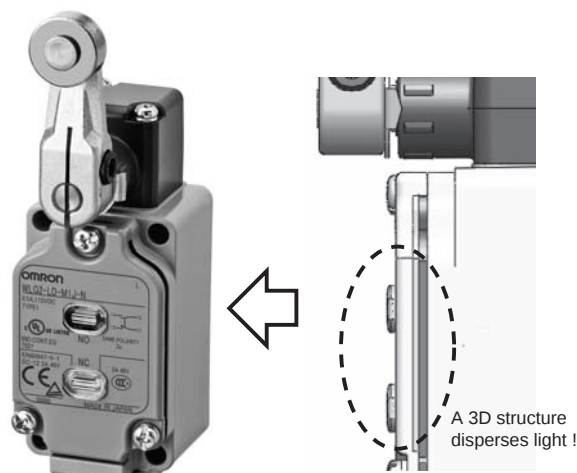
\*1. The wiring method is different for models with indicators.  
Refer to **Wiring** on page 25 under **Safety Precautions**.

Easy tightening  
with magnetized  
screwdrivers!



### Easy to See (Models with Operation Indicators)

- An indicator with a wide field of view has been used.

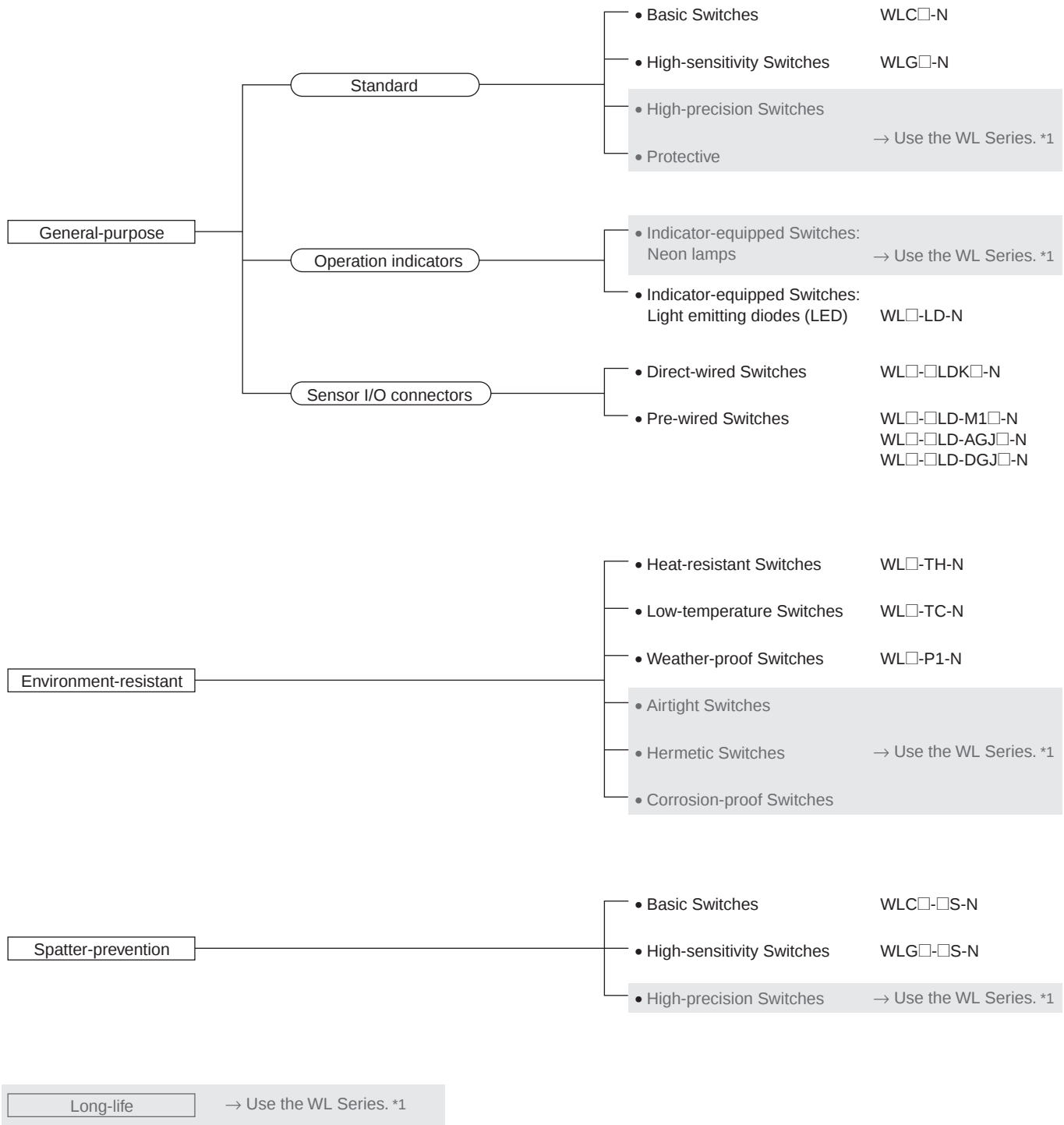


Whether the indicator is lit can be clearly seen from the side.

# WL-N

## Product Configuration

- Lineup of rotational lever models
- Additional series planned in the future: plunger models, fork lever lock models, and flexible rod models



\*1. Planned to be added to the WL-N Series in the future.

## Model Number Structure

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

#### General-purpose Switches

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

#### (1) Actuator and Property Specifications

| Symbol | Lever                                 | Pretravel (PT)                    |
|--------|---------------------------------------|-----------------------------------|
| RCA2   | Without Lever                         | 15±5°                             |
| CA2    | Roller lever: R38 mm                  |                                   |
| CA2-7  | Roller lever: R50 mm                  |                                   |
| CA2-8  | Roller lever: R63mm                   |                                   |
| CA12   | Adjustable roller lever: R25 to 89 mm |                                   |
| CL     | Adjustable rod lever: 25 to 140 mm    | 10° <sup>+2°</sup> <sub>-1°</sub> |
| RG2    | Without Lever                         |                                   |
| G2     | Roller lever: R38 mm                  |                                   |
| G12    | Adjustable roller lever: R25 to 89 mm |                                   |
| GL     | Adjustable rod lever: 25 to 140 mm    |                                   |

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

| Symbol | Specifications |
|--------|----------------|
| Blank  | Standard       |

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

| Symbol | Specifications |                                     |
|--------|----------------|-------------------------------------|
|        | Conduit Size   | Ground terminal presence or absence |
| Blank  | G1/2           | Without ground terminal             |
| G1     | G1/2           | With ground terminal *1             |
| G      | Pg13.5         |                                     |

\*1. Cannot be combined with Connector Type models.

#### (4) Indicator Type

| Symbol | Specifications      |
|--------|---------------------|
| Blank  | No indicator        |
| LD     | LED 10 to 115VAC/DC |

#### (5) Lever Type

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

#### (6) Connector Type

| Symbol | Specifications         |             |         |                  |                      |
|--------|------------------------|-------------|---------|------------------|----------------------|
|        | Shape                  |             | Voltage | Wiring locations | Connector pin No. *2 |
| Blank  | No Connector           | —           | —       | —                | —                    |
| K13A   | Direct-wired Connector | Screw (M12) | AC      | Only NO          | ③ ④                  |
| K13    |                        |             | DC      | Only NO          | ③ ④                  |
| K43A   |                        |             | AC      | NC+NO            | NC: ① ②, NO: ③ ④     |
| K43    |                        |             | DC      | NC+NO            | NC: ① ②, NO: ③ ④     |
| -M1J   | Pre-wired Connector *3 | Screw (M12) | DC      | Only NO          | ③ ④                  |
| -M1GJ  |                        |             | DC      | Only NO          | ① ④                  |
| -M1JB  |                        |             | DC      | Only NC          | ③ ②                  |
| -AGJ   |                        |             | AC      | NC+NO            | NC: ① ②, NO: ③ ④     |
| -M1TJ  |                        | Smart Click | DC      | Only NO          | ③ ④                  |
| -M1TJB |                        |             | DC      | Only NC          | ③ ②                  |
| -DTGJ  |                        |             | DC      | NC+NO            | NC: ① ②, NO: ③ ④     |
|        |                        |             |         |                  |                      |

\*2. Refer to **Contact Forms** on page 7 for details about connector pin numbers.

\*3. The standard cable length is 0.3 m. Contact your OMRON representative for information about other cable lengths.

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

### Environment-resistant Switches

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

#### (1) Actuator and Property Specifications

| Symbol | Lever                                 | Pretravel (PT)                    |
|--------|---------------------------------------|-----------------------------------|
| RCA2   | Without Lever                         | 15±5°                             |
| CA2    | Roller lever: R38 mm                  |                                   |
| CA2-7  | Roller lever: R50 mm                  |                                   |
| CA2-8  | Roller lever: R63mm                   |                                   |
| CA12   | Adjustable roller lever: R25 to 89 mm |                                   |
| CL     | Adjustable roller lever: 25 to 140 mm | 10° <sup>+2°</sup> <sub>-1°</sub> |
| RG2    | Without Lever                         |                                   |
| G2     | Roller lever: R38 mm                  |                                   |
| G12    | Adjustable roller lever: R25 to 89 mm |                                   |
| GL     | Adjustable rod lever: 25 to 140 mm    |                                   |

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

| Symbol | Specifications |
|--------|----------------|
| Blank  | Standard       |
| P1     | Weather-proof  |

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

| Symbol | Specifications |
|--------|----------------|
| Blank  | Standard       |

#### (4) Temperature Type

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

\*1. Cannot be combined with Weather-proof Switches.

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

| Symbol | Specifications |                                     |
|--------|----------------|-------------------------------------|
|        | Conduit Size   | Ground terminal presence or absence |
| Blank  | G1/2           | Without ground terminal             |
| G1     | G1/2           | With ground terminal                |
| G      | Pg13.5         |                                     |

#### (6) Lever Type

| Symbol | Specifications                                    |
|--------|---------------------------------------------------|
| Blank  | Standard lever (Allen-head bolt material: steel ) |
| A      | Double nut lever (bolt material: stainless)       |

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

### Spatter-prevention Switches

WL□ - □□□□ S□ -N  
 (1) (2) (3) (4) (5) (6)

#### (1) Actuator and Property Specifications

| Symbol | Lever                | Pretravel (PT)                    |
|--------|----------------------|-----------------------------------|
| RCA2   | Without Lever        | 15±5°                             |
| CA2    | Roller lever: R38 mm |                                   |
| RG2    | Without Lever        | 10° <sup>+2°</sup> <sub>-1°</sub> |
| G2     | Roller lever: R38 mm |                                   |

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

| Symbol | Specifications |
|--------|----------------|
| Blank  | Standard       |

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

| Symbol | Specifications |                                     |
|--------|----------------|-------------------------------------|
|        | Conduit Size   | Ground terminal presence or absence |
| Blank  | G1/2           | Without ground terminal             |

#### (4) Indicator Type

| Symbol | Specifications       |
|--------|----------------------|
| LD     | LED 10 to 115VAC/VDC |

#### (5) Lever Type

| Symbol | Specifications                                                            |
|--------|---------------------------------------------------------------------------|
| Blank  | Allen-head bolt lever (bolt material: stainless)                          |
| A      | Double nut lever (bolt material: stainless)                               |
| F      | Hexagonal head screw with hexagon socket lever (bolt material: stainless) |

#### (6) Connector Type

| Symbol | Specifications         |             |         |                  |                      |
|--------|------------------------|-------------|---------|------------------|----------------------|
|        | Shape                  |             | Voltage | Wiring locations | Connector pin No. *1 |
| Blank  | Without connector      | —           | —       | —                | —                    |
| -DGJS  | Pre-wired Connector *2 | Screw (M12) | DC      | NC+NO            | NC: ① ②, NO: ③ ④     |
| -DTGJS |                        | Smart Click | DC      | NC+NO            | NC: ① ②, NO: ③ ④     |

\*1. Refer to **Contact Forms** on page 7 for details about connector pin numbers.

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

## Ordering Information

### General-purpose Switches

#### Standard Switches

| Actuator                  |                                     | Roller lever R38  | Roller lever R50  | Roller lever R63  |
|---------------------------|-------------------------------------|----------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------|
| Item                      | Pretravel (PT)                      | Model                                                                                              | Model                                                                                              | Model                                                                                                |
| Basic Switches            | 15±5°                               | WLCA2-N                                                                                            | WLCA2-7-N                                                                                          | WLCA2-8-N                                                                                            |
| High-sensitivity Switches | 10° <sup>+2°</sup> / <sub>-1°</sub> | WLG2-N                                                                                             | —                                                                                                  | —                                                                                                    |

| Actuator                  |                                     | Adjustable roller lever  | Adjustable rod lever 25 to 140 mm  |
|---------------------------|-------------------------------------|-----------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|
| Item                      | Pretravel (PT)                      | Model                                                                                                     | Model                                                                                                               |
| Basic Switches            | 15±5°                               | WLCA12-N                                                                                                  | WLCL-N                                                                                                              |
| High-sensitivity Switches | 10° <sup>+2°</sup> / <sub>-1°</sub> | WLG12-N                                                                                                   | WLGL-N                                                                                                              |

#### Indicator-equipped Switches

| Actuator  |                           |                                     | Roller lever R38  | Roller lever R50  | Roller lever R63  |
|-----------|---------------------------|-------------------------------------|----------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------|
| Indicator | Item                      | Pretravel (PT)                      | Model                                                                                              | Model                                                                                              | Model                                                                                                |
| LED       | Basic Switches            | 15±5°                               | WLCA2-LD-N                                                                                         | WLCA2-7LD-N                                                                                        | WLCA2-8LD-N                                                                                          |
|           | High-sensitivity Switches | 10° <sup>+2°</sup> / <sub>-1°</sub> | WLG2-LD-N                                                                                          | —                                                                                                  | —                                                                                                    |

| Actuator  |                           |                                     | Adjustable roller lever  | Adjustable rod lever 25 to 140 mm  |
|-----------|---------------------------|-------------------------------------|-------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------|
| Indicator | Item                      | Pretravel (PT)                      | Model                                                                                                       | Model                                                                                                                 |
| LED       | Basic Switches            | 15±5°                               | WLCA12-LD-N                                                                                                 | WLCL-LD-N                                                                                                             |
|           | High-sensitivity Switches | 10° <sup>+2°</sup> / <sub>-1°</sub> | WLG12-LD-N                                                                                                  | WLGL-LD-N                                                                                                             |

## General-purpose Switches

## Sensor I/O Connector Switches

### Direct-wired Connectors

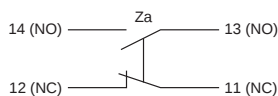
| Actuator |         |                  |                   | Roller lever R38  |                           |
|----------|---------|------------------|-------------------|------------------------------------------------------------------------------------------------------|---------------------------|
|          |         |                  |                   | Basic Switches                                                                                       | High-sensitivity Switches |
| Shape    | Voltage | Wiring locations | Connector pin No. | Model                                                                                                | Model                     |
| Screw    | AC      | NO               | ③ ④               | WLCA2-LDK13A-N                                                                                       | —                         |
|          |         | NC + NO          | NC ① ②, NO ③ ④    | WLCA2-LDK43A-N                                                                                       | —                         |
|          | DC      | NO               | ③ ④               | WLCA2-LDK13-N                                                                                        | WLG2-LDK13-N              |
|          |         | NC + NO          | NC ① ②, NO ③ ④    | WLCA2-LDK43-N                                                                                        | WLG2-LDK43-N              |

### Pre-wired Connectors

| Actuator    |         |                  |                   | Roller lever R38  |                           |
|-------------|---------|------------------|-------------------|------------------------------------------------------------------------------------------------------|---------------------------|
|             |         |                  |                   | Basic Switches                                                                                       | High-sensitivity Switches |
| Shape       | Voltage | Wiring locations | Connector pin No. | Model                                                                                                | Model                     |
| Screw       | AC      | NC + NO          | NC ① ②, NO ③ ④    | WLCA2-LD-AGJ-N                                                                                       | WLG2-LD-AGJ-N             |
|             |         | NO               | ③ ④               | WLCA2-LD-M1J-N                                                                                       | WLG2-LD-M1J-N             |
|             | DC      | NO               | ① ②               | WLCA2-LD-M1GJ-N                                                                                      | WLG2-LD-M1GJ-N            |
|             |         | NC               | ③ ②               | WLCA2-LD-M1JB-N                                                                                      | WLG2-LD-M1JB-N            |
| Smart Click |         | NO               | ③ ④               | —                                                                                                    | WLG2-LD-M1TJ-N            |
|             |         | NC               | ③ ②               | —                                                                                                    | WLG2-LD-M1TJB-N           |

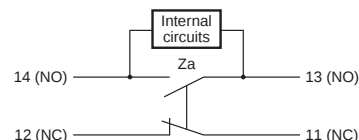
## Contact Forms

### Screw Terminal Switches



### Screw Terminal Switches

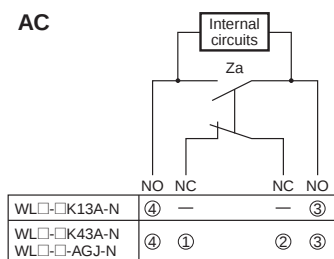
Indicator-equipped (Light-ON when Not Operating) Switches \*1



### Direct-wired Connectors/Pre-wired Connectors

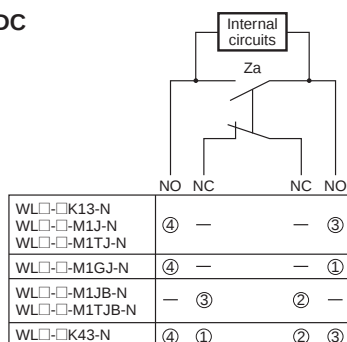
Indicator-equipped (Light-ON when Not Operating) Switches \*1

AC



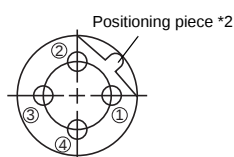
①②③④ indicate the connector pin number.

DC

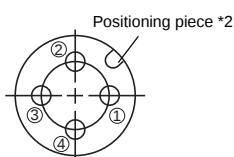


### Connector Pin Layout Diagram

AC



DC



**Note:** Leakage current from indicator circuit may cause load's malfunction. Please check the load's OFF current before use the indicator-equipped switch.  
**\*1.** Light-ON when not operating means the indicator is lit when the actuator is free and is not light when the Switch contacts (NO) close when the actuator rotates or is pushed down.

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

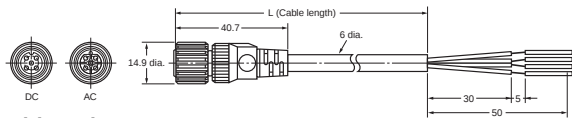
Connecting Sensor I/O connector cable (Socket)



| Type                                       | AC/DC Type | Number of cable cores | Cable length<br>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<br>WL□-□-AGJ-N     |
|                                            |            |                       | 5 m                   | XS2F-A421-G90-F |                                |
|                                            | DC         | 2                     | 2 m                   | XS2F-D421-DD0   | WL□-□K13-N<br>WL□-□-M1J-N      |
|                                            |            |                       | 5 m                   | XS2F-D421-GD0   |                                |
|                                            |            |                       | 2 m                   | XS2F-D421-DA0-F | WL□-□-M1GJ□-N                  |
|                                            |            |                       | 5 m                   | XS2F-D421-GA0-F |                                |
|                                            |            | 4                     | 2 m                   | XS2F-D421-D80-F | WL□-□K43-N<br>WL□-□-M1JB-N     |
|                                            |            |                       | 5 m                   | XS2F-D421-G80-F |                                |
| <div>M12 Smart click type (Straight)</div> | DC         | 4                     | 2 m                   | XS5F-D421-D80-F | WL□-□-M1TJ-N<br>WL□-□-M1TJB-N  |
|                                            |            |                       | 5 m                   | XS5F-D421-G80-F |                                |

Dimensions (Unit: mm)

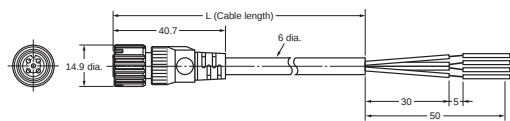
XS2F-□421-□□0-□  
XS2F-D421-□D0



Wiring Diagram

| AC/DC Type | Two-core model                     |                                                                                  | Four-core model                    |                                                                                                                  |  |
|------------|------------------------------------|----------------------------------------------------------------------------------|------------------------------------|------------------------------------------------------------------------------------------------------------------|--|
|            | Model                              | Wiring Diagram                                                                   | Model                              | Wiring Diagram                                                                                                   |  |
| AC         | XS2F-A421-DB0-F<br>XS2F-A421-GB0-F | <p>Terminal No. 1<br/>2</p> <p>Cable color of core sheath<br/>Brown<br/>Blue</p> | XS2F-A421-D90-F<br>XS2F-A421-G90-F | <p>Terminal No. 1<br/>2<br/>3<br/>4</p> <p>Cable color of core sheath<br/>Brown<br/>White<br/>Blue<br/>Black</p> |  |
| DC         | XS2F-D421-DD0<br>XS2F-D421-GD0     | <p>Terminal No. 1<br/>2</p> <p>Cable color of core sheath<br/>Blue<br/>Brown</p> | XS2F-D421-D80-F<br>XS2F-D421-G80-F |                                                                                                                  |  |
|            | XS2F-D421-DA0-F<br>XS2F-D421-GA0-F | <p>Terminal No. 1<br/>2</p> <p>Cable color of core sheath<br/>Brown<br/>Blue</p> |                                    |                                                                                                                  |  |

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

| Actuator                 |                           |                                   | Roller lever R38  | Adjustable roller lever  | Adjustable rod lever<br>25 to 140 mm  |
|--------------------------|---------------------------|-----------------------------------|------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------|
| Item                     |                           | Pretravel (PT)                    | Model                                                                                                | Model                                                                                                       | Model                                                                                                                    |
| Heat-resistant Switches  | Basic Switches            | 15±5°                             | WLCA2-TH-N                                                                                           | WLCA12-TH-N                                                                                                 | WLCL-TH-N                                                                                                                |
|                          | High-sensitivity Switches | 10° <sup>+2°</sup> <sub>-1°</sub> | WLG2-TH-N                                                                                            | WLG12-TH-N                                                                                                  | WLGL-TH-N                                                                                                                |
| Low-temperature Switches | Basic Switches            | 15±5°                             | WLCA2-TC-N                                                                                           | WLCA12-TC-N                                                                                                 | WLCL-TC-N                                                                                                                |
|                          | High-sensitivity Switches | 10° <sup>+2°</sup> <sub>-1°</sub> | WLG2-TC-N                                                                                            | WLG12-TC-N                                                                                                  | WLGL-TC-N                                                                                                                |
| Weather-proof Switches   | Basic Switches            | 15±5°                             | WLCA2-P1-N                                                                                           | WLCA12-P1-N                                                                                                 | WLCL-P1-N                                                                                                                |
|                          | High-sensitivity Switches | 10° <sup>+2°</sup> <sub>-1°</sub> | WLG2-P1-N                                                                                            | WLG12-P1-N                                                                                                  | WLGL-P1-N                                                                                                                |

### Spatter-prevention Selection Switches

| Actuator |                           |                            | Roller lever R38  |                                                                                                      |
|----------|---------------------------|----------------------------|------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------|
|          |                           |                            | Double Nut Lever    | Allen-head Lever  |
| Item     |                           | Pretravel (PT)             | Model                                                                                                | Model                                                                                                |
| LED      | Basic Switches            | 15±5°                      | WLCA2-LDAS-N                                                                                         | WLCA2-LDS-N                                                                                          |
|          | High-sensitivity Switches | 10° <sup>+2°<br/>-1°</sup> | WLG2-LDAS-N                                                                                          | WLG2-LDS-N                                                                                           |

## Individual Parts

### Switches without levers / Heads / Actuators

#### General-purpose

| Actuator type                                                                                             | Item                      | Pretravel (PT)                      | Set model | Switches without levers *1 | Heads *2<br>(with Actuators) | Actuators *3 |
|-----------------------------------------------------------------------------------------------------------|---------------------------|-------------------------------------|-----------|----------------------------|------------------------------|--------------|
|                                                                                                           |                           |                                     |           | Model                      | Model                        | Model        |
| Roller lever             | Basic Switches            | 15±5°                               | WLCA2-N   | WLRC2-N                    | WL-1H1100-N                  | WL-1A100     |
|                                                                                                           | High-sensitivity Switches | 10° <sup>+2°</sup> / <sub>-1°</sub> | WLG2-N    | WLRG2-N                    | WL-2H1100-N                  |              |
| Adjustable roller lever  | Basic Switches            | 15±5°                               | WLCA12-N  | WLRC2-N                    | WL-1H2100-N                  | WL-2A100     |
|                                                                                                           | High-sensitivity Switches | 10° <sup>+2°</sup> / <sub>-1°</sub> | WLG12-N   | WLRG2-N                    | WL-2H2100-N                  |              |
| Adjustable rod lever     | Basic Switches            | 15±5°                               | WLCL-N    | WLRC2-N                    | WL-1H4100-N                  | WL-4A100     |
|                                                                                                           | High-sensitivity Switches | 10° <sup>+2°</sup> / <sub>-1°</sub> | WLGL-N    | WLRG2-N                    | WL-2H4100-N                  |              |

\*1. The Switches without levers is not compatible with WL-series models.

\*2. The Heads is not compatible with WL-series models.

\*3. The actuator is common use in WL and WL-N.

#### Spatter-prevention Switches

| Actuator type                                                                                  | Lever Type       | Item                      | Set model    | Switches without levers *1 | Heads *2<br>(with Actuators) | Actuators *3 |
|------------------------------------------------------------------------------------------------|------------------|---------------------------|--------------|----------------------------|------------------------------|--------------|
|                                                                                                |                  |                           |              | Model                      | Model                        | Model        |
| Roller lever  | Standard lever   | Basic Switches            | WLCA2-LDS-N  | WLRC2-LDS-N                | WL-1H1100S-N                 | WL-1A103S    |
|                                                                                                |                  | High-sensitivity Switches | WLG2-LDS-N   | WLRG2-LDS-N                |                              |              |
|                                                                                                | Double nut lever | Basic Switches            | WLCA2-LDAS-N | WLRC2-LDS-N                | WL-2H1100S-N                 | WL-1A105S    |
|                                                                                                |                  | High-sensitivity Switches | WLG2-LDAS-N  | WLRG2-LDS-N                |                              |              |

\*1. The Switches without levers is not compatible with WL-series models.

\*2. The Heads is not compatible with WL-series models.

\*3. The actuator is common use in WL and WL-N.

### Covers with Operation Indicators (See Note.)

#### General-purpose

| Cover | Covers *1 |
|-------|-----------|
| Item  | Model     |
| LED   | WL-LD-N   |

\*1. The cover is not compatible with WL-series models.

#### Spatter-prevention Switches

| Cover | Covers *1 |
|-------|-----------|
| Item  | Model     |
| LED   | WL-LDS-N  |

\*1. The cover is not compatible with WL-series models.

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

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

## Specifications

### General-purpose/Environment-resistant Switches

#### Ratings

##### Screw Terminals

| Item                      | Rated voltage (V)              | Non-inductive load (A) |     |           |     | Inductive load (A) |     |            |    |
|---------------------------|--------------------------------|------------------------|-----|-----------|-----|--------------------|-----|------------|----|
|                           |                                | Resistive load         |     | Lamp load |     | Inductive load     |     | Motor load |    |
|                           |                                | NC                     | NO  | NC        | NO  | NC                 | NO  | NC         | NO |
| Basic Switches            | 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                  |     |            |    |
|                           |                                | 10                     | 6   | 3         | 10  | 6                  |     |            |    |
|                           |                                | 6                      | 4   | 3         | 6   | 4                  |     |            |    |
| High-sensitivity Switches | AC 125<br>250                  | 0.8                    | 0.2 | 0.2       | 0.8 | 0.2                |     |            |    |
|                           |                                | 0.4                    | 0.1 | 0.1       | 0.4 | 0.1                |     |            |    |
|                           |                                | 5                      | —   | —         | —   | —                  |     |            |    |
|                           | DC 125<br>250                  | 5                      | —   | —         | —   | —                  |     |            |    |
|                           |                                | 0.4                    | —   | —         | —   | —                  |     |            |    |
|                           |                                | 0.2                    | —   | —         | —   | —                  |     |            |    |

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

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

\* For high-sensitivity overtravel.

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

#### Indicator-equipped Switches

| Model   | Item | Max. rated voltage | Leakage current (mA) |
|---------|------|--------------------|----------------------|
| WL-LD-N | LED  | 10 to 24 VAC/DC    | Approx. 0.4          |
|         |      | 115 VAC/DC         | Approx. 0.5          |

#### Characteristics

|                               |                                                          |                                                                      |
|-------------------------------|----------------------------------------------------------|----------------------------------------------------------------------|
| Degree of protection          |                                                          | IP67                                                                 |
| Durability *1                 | Mechanical                                               | 15,000,000 operations min. *2                                        |
|                               | Electrical                                               | 750,000 operations min. *3                                           |
| Operating speed               |                                                          | 1 mm/s to 1 m/s (in case of WLCA2-N)                                 |
| Operating frequency           | Mechanical                                               | 120 operations/minute min.                                           |
|                               | Electrical                                               | 30 operations/minute min.                                            |
| Rated frequency               |                                                          | 50/60 Hz                                                             |
| Insulation resistance         |                                                          | 100 MΩ min. (at 500 VDC)                                             |
| Contact resistance            |                                                          | 25 mΩ max. (initial value for the built-in switch when tested alone) |
| Dielectric strength           | Between terminals of the same polarity                   | 1,000 VAC (600 VAC), 50/60 Hz for 1 min                              |
|                               | Between currentcarrying metal part and ground            | 2,200 VAC (1,500 VAC), 50/60 Hz for 1 min                            |
|                               | Between each terminal and non-currentcarrying metal part | 2,200 VAC (1,500 VAC), 50/60 Hz for 1 min                            |
| Vibration resistance          | Malfuction                                               | 10 to 55 Hz, 1.5-mm double amplitude                                 |
| Shock resistance              | Destruction                                              | 1,000 m/s <sup>2</sup> max.                                          |
|                               | Malfuction                                               | 300 m/s <sup>2</sup>                                                 |
| Ambient operating temperature |                                                          | -10 to +80°C (with no icing) *4                                      |
| Ambient operating humidity    |                                                          | 35% to 95% RH                                                        |
| Weight                        |                                                          | Approx. 255 g (in case of WLCA2-N)                                   |

**Note:** 1. The above figures are initial values.

2. The figures in parentheses for dielectric strength are those for the highsensitivity overtravel models.

\*1. The values are calculated at an operating temperature of +5°C to +35°C and an operating humidity of 40% to 70% RH. Contact your OMRON sales representative for more detailed information on other operating environments.

\*2. Durability is 1,000,000 operations min. for high-sensitivity models.  
 500,000 operations min. for weather-proof models.

\*3. Durability is 500,000 operations min. for high-sensitivity models.  
 500,000 operations min. for weather-proof models.

\*4. For low-temperature models this is -40°C to +40°C (with no icing). For heatresistant models the range is +5°C to +120°C.

## Spatter-prevention Switches

### Ratings

#### Screw Terminals

| Item                                                      | Rated voltage (V) | Non-inductive load (A) |    |           |     | Inductive load (A) |    |            |     |
|-----------------------------------------------------------|-------------------|------------------------|----|-----------|-----|--------------------|----|------------|-----|
|                                                           |                   | Resistive load         |    | Lamp load |     | Inductive load     |    | Motor load |     |
|                                                           |                   | NC                     | NO | NC        | NO  | NC                 | NO | NC         | NO  |
| WL□-LDS-N<br>(Without high-sensitivity overtravel models) | 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        |     |

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

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

|                                                                |                                |           |
|----------------------------------------------------------------|--------------------------------|-----------|
| Inrush current<br>(Without high-sensitivity overtravel models) | NC                             | 30 A max. |
|                                                                | NO                             | 20 A max. |
| Operating temperature                                          | -10°C to +80°C (with no icing) |           |
| Operating humidity                                             | 35 to 95% RH                   |           |

### Characteristics

|                               |                                                          |                                                                      |
|-------------------------------|----------------------------------------------------------|----------------------------------------------------------------------|
| Degree of protection          |                                                          | IP67                                                                 |
| Durability *1                 | Mechanical                                               | 15,000,000 operations min. *2                                        |
|                               | Electrical                                               | 750,000 operations min. *3                                           |
| Operating speed               |                                                          | 1 mm/s to 1 m/s (in case of WLCA2-□S-N)                              |
| Operating frequency           | Mechanical                                               | 120 operations/minute min.                                           |
|                               | Electrical                                               | 30 operations/minute min.                                            |
| Rated frequency               |                                                          | 50/60 Hz                                                             |
| Insulation resistance         |                                                          | 100 MΩ min. (at 500 VDC)                                             |
| Contact resistance            |                                                          | 25 mΩ max. (initial value for the built-in switch when tested alone) |
| Dielectric strength           | Between terminals of the same polarity                   | 1,000 VAC (600 VAC), 50/60 Hz for 1 min                              |
|                               | Between currentcarrying metal part and ground            | 2,200 VAC (1,500 VAC), 50/60 Hz for 1 min                            |
|                               | Between each terminal and non-currentcarrying metal part | 2,200 VAC (1,500 VAC), 50/60 Hz for 1 min                            |
| 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>                                                 |
| 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-□S-N)                                |

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

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

### Approved Standards

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

### Approved Standard Ratings

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

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

#### A600 Authentication conditions

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

#### B600 Authentication conditions

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

#### A150 Authentication conditions

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

#### B150 Authentication conditions

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

#### C150 Authentication conditions

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

## TUV (EN60947-5-1)

(Authenticated for ground terminal models and DC connector models only.)

| Authentication conditions                | Specification         |       |       |       |                   |
|------------------------------------------|-----------------------|-------|-------|-------|-------------------|
|                                          | With ground terminals |       |       |       | With DC Connector |
|                                          | No indicator          |       | LED   |       |                   |
| Working load category                    | AC-15                 | DC-12 | AC-15 | DC-12 | DC-12             |
| Rated working voltage (Ue)               | 250 V                 | 48 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         |

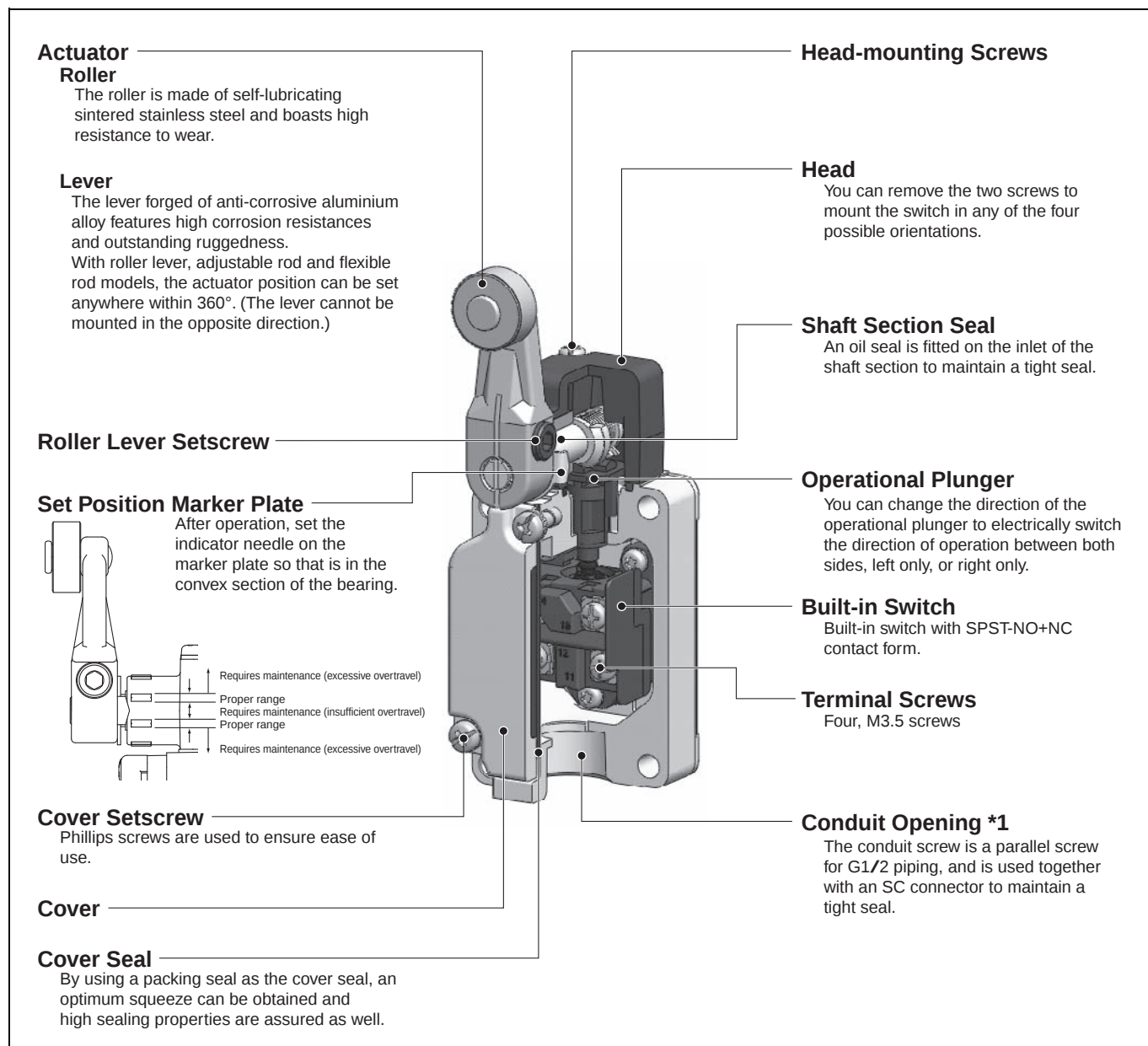
## CCC (GB14048.5)

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

## Structure and Nomenclature

### Structure

#### General-purpose Switches: WLCA2-N



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

Indicators

Indicator Covers

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

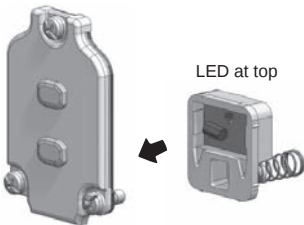
Indicator Windows

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

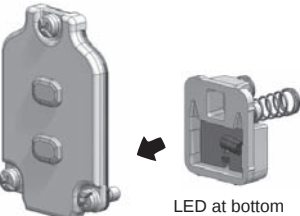
Light-ON when Operating/Not Operating

Indicators can be switched from light-ON when operating and light-ON when not operating, by simply rotating the indicator holder by 180°.

Light-ON when Operating



Light-ON when Not Operating

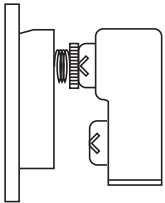


Indicator

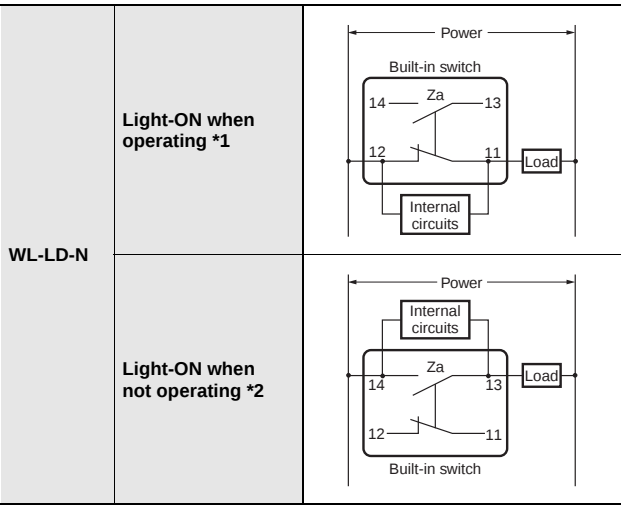
The indicator is an LED. Models with LED indicators have a built-in rectifier stack, so it is not necessary to change the polarity.

Contact Spring

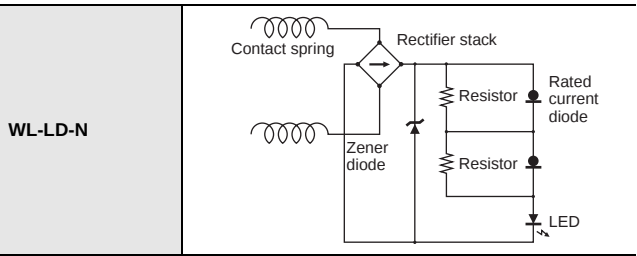
The built-in switch's terminal screws are used to connect the indicator terminal. Since the connection spring (coil spring) is used for this connection, it will not be necessary to connect the indicator terminal. When a ground terminal is provided however, a lead wire must be used.



Operation



Internal Circuits



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

**\*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.

**Spatter-prevention Switches: WLCA2-LDS-N****Actuator****Roller, Roller Axis**

Using stainless steel prevents spatter from adhering.

**Operating Lever**

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

**Roller Lever Setscrew**

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.

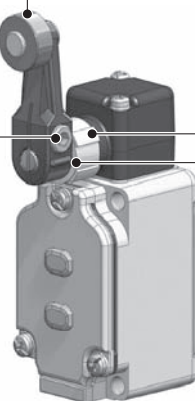
**Head Cap**

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.



### General-purpose Models

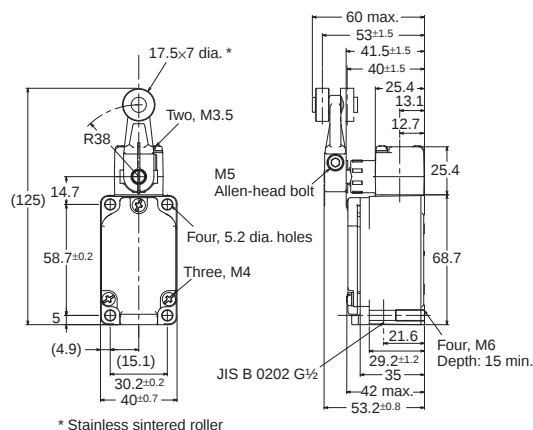
### Standard Models

#### Basic / High-sensitivity

#### Roller lever R38

Basic  
WLCA2-N

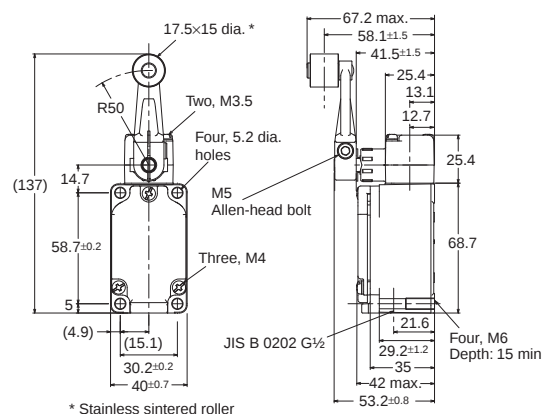
High-sensitivity  
WLG2-N



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

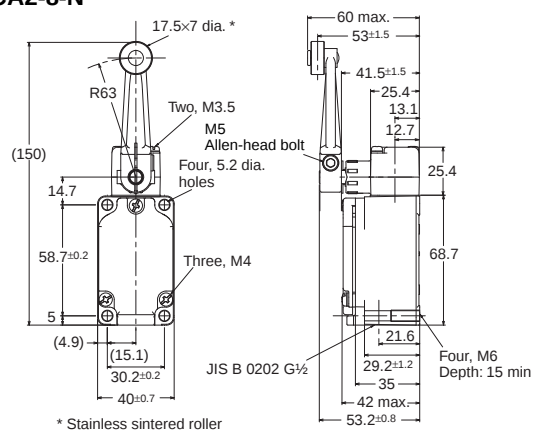
#### Roller lever R50

Basic  
WLCA2-7-N



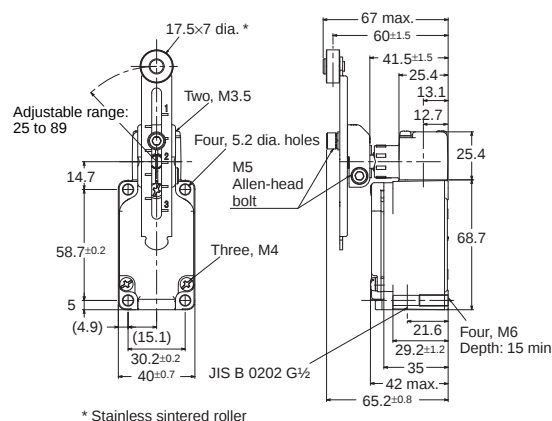
#### Roller lever R63

Basic  
WLCA2-8-N



#### Adjustable roller lever

Basic  
WLCA12-N High-sensitivity  
WLG12-N



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

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

| Model                     |    |      | WLCA2-N | WLG2-N                | WLCA2-7-N | WLCA2-8-N |
|---------------------------|----|------|---------|-----------------------|-----------|-----------|
| Operating characteristics |    |      |         |                       |           |           |
| Operating force           | OF | max. | 13.34 N | 13.34 N               | 10.2 N    | 8.04 N    |
| Release force             | RF | min. | 1.18 N  | 1.18 N                | 0.9 N     | 0.71 N    |
| Pretravel                 | PT |      | 15±5°   | 10° $\pm \frac{2}{1}$ | 15±5°     | 15±5°     |
| Overtravel                | OT | min. | 70°     | 80°                   | 70°       | 70°       |
| Movement Differential     | MD | max. | 12°     | 7°                    | 12°       | 12°       |

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

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

## Basic / High-sensitivity

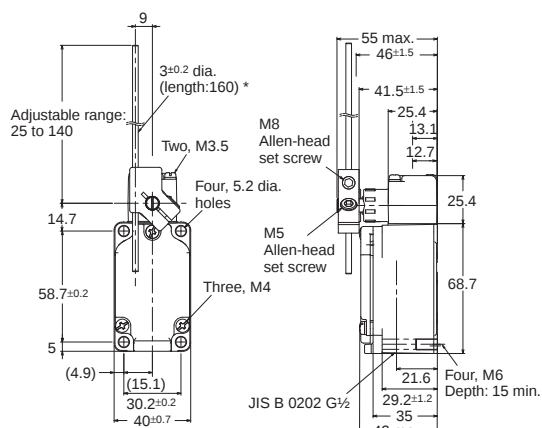
### Adjustable rod lever 25 to 140 mm

#### Basic

#### WLCL-N

#### High-sensitivity

#### WLGL-N



\* Stainless steel rod

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

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

| Operating characteristics |    | Model | WLCL-N *1 | WLGL-N *1                        |
|---------------------------|----|-------|-----------|----------------------------------|
| Operating force           | OF | max.  | 1.39 N    | 2.84 N                           |
| Release force             | RF | min.  | 0.27 N    | 0.25 N                           |
| Pretravel                 | PT |       | 15±5°     | 10° <sup>-2°<sub>-1°</sub></sup> |
| Overtravel                | OT | min.  | 70°       | 80°                              |
| Movement Differential     | MD | max.  | 12°       | 7°                               |

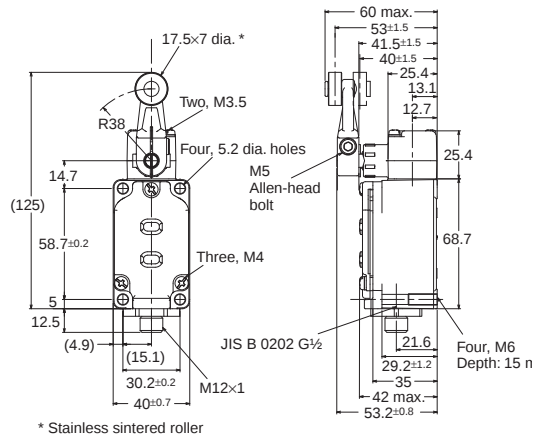
\*1. The operating characteristics for WLCL-N and WLGL-N are measured at the lever length of 140 mm.

Sensor I/O connector Models

(For details about applicable cables, refer to *Connecting Sensor I/O Connectors Cable and Socket* on page 8.)

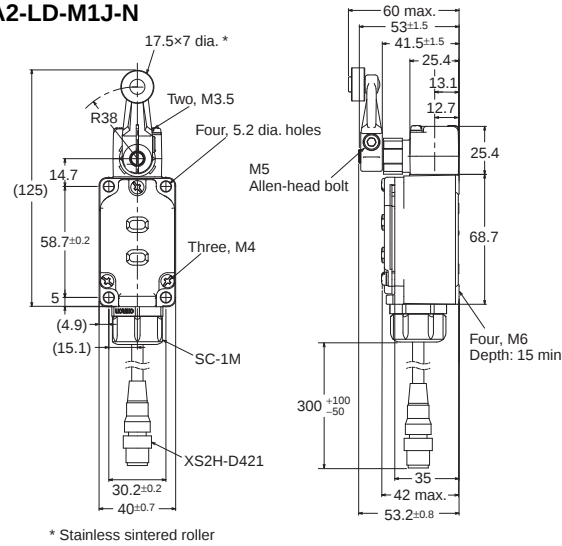
Direct-wired Connector

Roller lever  
WLCA2-LDK13-N



Pre-wired

Roller lever  
WLCA2-LD-M1J-N

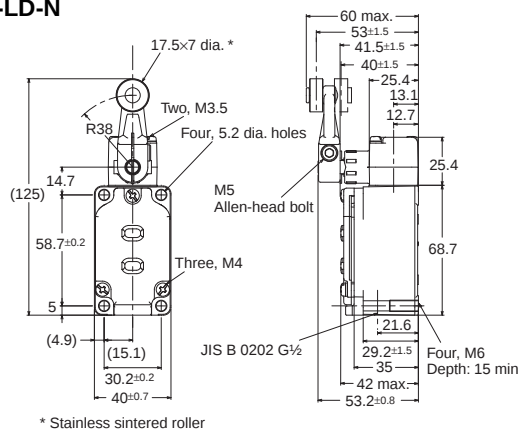


**Note:** 1. Unless otherwise indicated, a tolerance of  $\pm 0.4$  mm applies to all dimensions.  
2. The following diagrams are for a indicator-equipped models.

| Operating characteristics |    | Model | WLCA2-LDK13-N<br>WLCA2-LD-M1J-N |
|---------------------------|----|-------|---------------------------------|
| 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.  | $12^\circ$                      |

Operation indicator Models

Roller lever  
WLCA2-LD-N

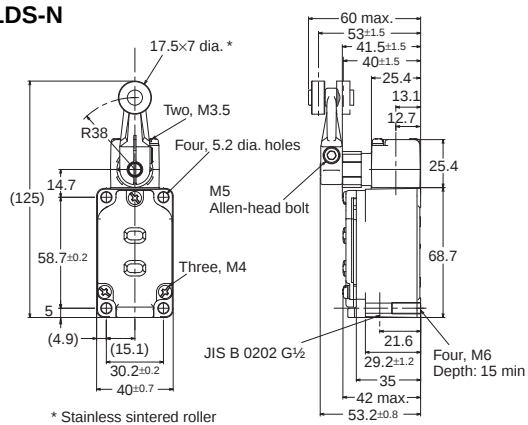


**Note:** 1. Unless otherwise indicated, a tolerance of  $\pm 0.4$  mm applies to all dimensions.

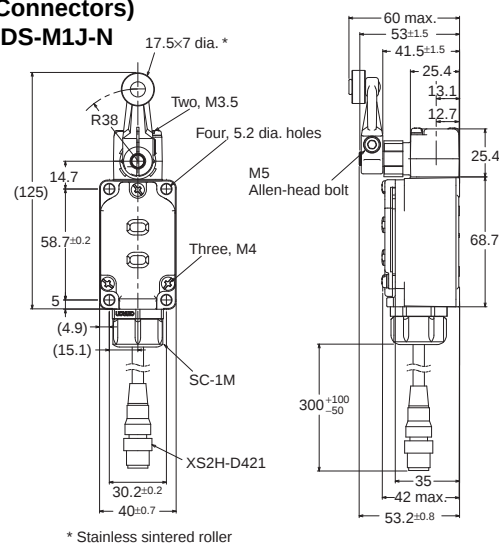
| Operating characteristics |    | Model | WLCA2-LD-N       |
|---------------------------|----|-------|------------------|
| Operating force           | OF | max.  | 13.34 N          |
| Release force             | RF | min.  | 1.18 N           |
| Pretravel                 | PT |       | $15 \pm 5^\circ$ |
| Overtravel                | OT | min.  | $70^\circ$       |
| Movement Differential     | MD | max.  | $12^\circ$       |

## Spatter-prevention Models

### Roller lever (Screw terminals) WLCA2-LDS-N



### Roller lever (Pre-wired Connectors) WLCA2-LDS-M1J-N



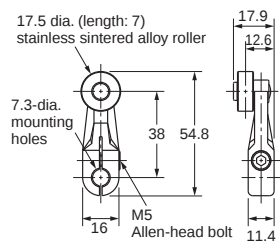
**Note: 1.** Unless otherwise indicated, a tolerance of  $\pm 0.4$  mm applies to all dimensions.

| Operating characteristics |    | Model | WLCA2-LDS-N<br>WLCA2-LDS-M1J-N |
|---------------------------|----|-------|--------------------------------|
| 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.  | $12^\circ$                     |

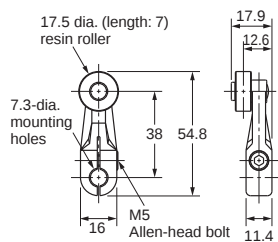
## Actuators (Levers Only)

Lever: Only rotating lever models are illustrated.

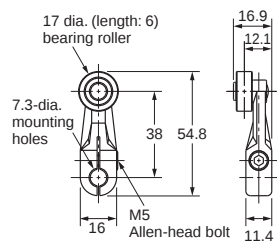
### WL-1A100 Standard Lever



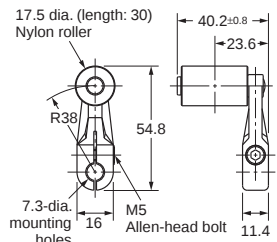
### WL-1A115 Resin Roller



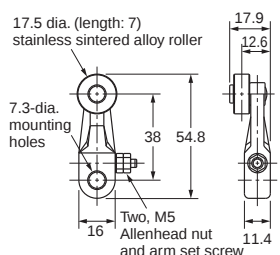
### WL-1A400 Bearing Roller



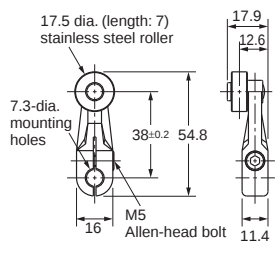
### WL-1A118 Nylon Roller: Roller Width: 30 mm



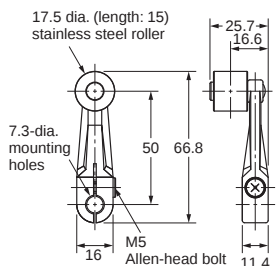
### WL-1A105 Double Nuts



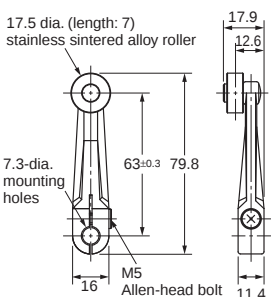
### WL-1A103S Spatter



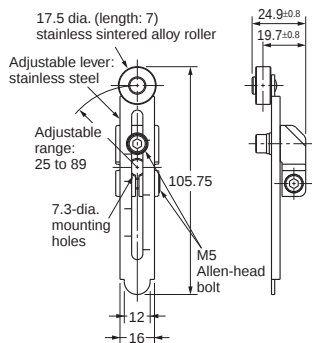
### WL-1A200 Lever Length: 50 Roller Width: 15



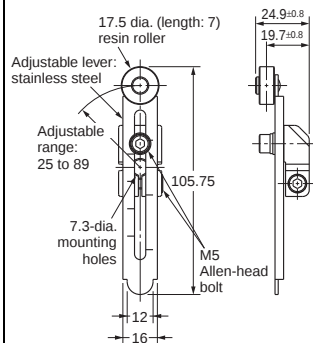
### WL-1A300 Lever Length: 63



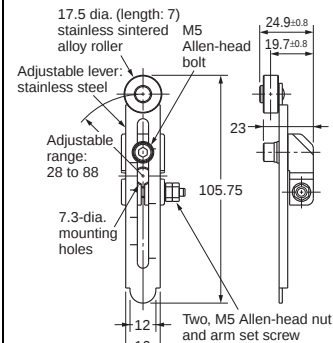
### WL-2A100



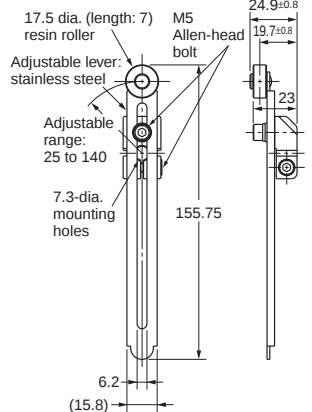
### WL-2A111 Resin Roller



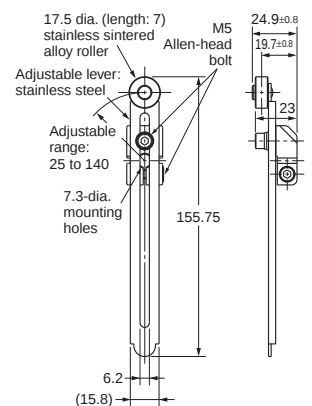
### WL-2A107 Double Nuts



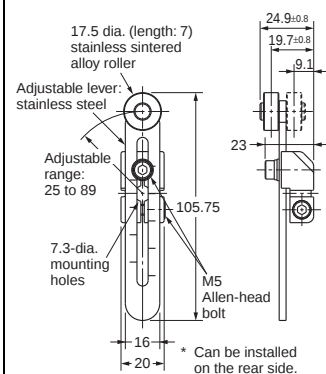
### WL-2A108 Resin Roller



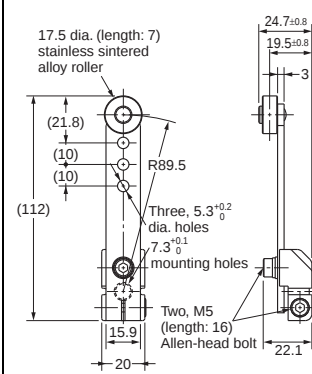
### WL-2A122



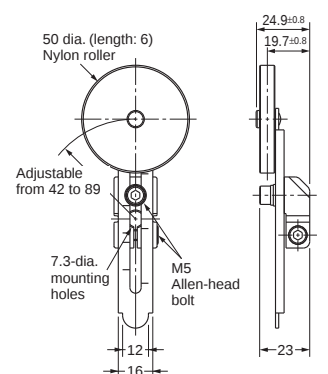
### WL-2A106



### WL-2A130



### WL-2A104



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

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

|                        |                                                             |                                                             |                                                             |
|------------------------|-------------------------------------------------------------|-------------------------------------------------------------|-------------------------------------------------------------|
| <p><b>WL-2A110</b></p> | <p><b>WL-2A105</b></p>                                      | <p><b>WL-1A106</b></p>                                      | <p><b>WL-1A110</b></p>                                      |
| <p><b>WL-4A100</b></p> | <p><b>WL-4A201</b></p>                                      | <p><b>WL-3A100</b></p>                                      | <p><b>WL-3A106 Double Nut</b></p>                           |
| <p><b>WL-3A108</b></p> | <p><b>WL-3A200</b></p>                                      | <p><b>WL-3A203</b></p>                                      | <p><b>WL-4A112</b></p>                                      |
| <p><b>WL-2A129</b></p> | <p><b>WL-5A101</b></p> <p>WL-5A100 has a plastic roller</p> | <p><b>WL-5A103</b></p> <p>WL-5A102 has a plastic roller</p> | <p><b>WL-5A105</b></p> <p>WL-5A104 has a plastic roller</p> |

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

## Safety Precautions

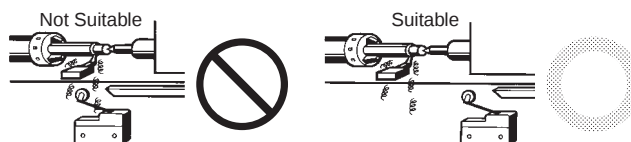
### Precautions for Safe Use

- Be sure to ground. If not, there is the possibility that electrical shock occurs.
- Do not touch charged switch terminals while the switch has carry current, otherwise there is the possibility that electrical shock occurs.
- Do not disassemble the limit switch or touch inside of it under supplying power, otherwise there is the possibility that electrical shock occurs.
- Do not touch the wire or rod type actuator in order to prevent injury.
- Connect a fuse which has 1.5 to 2 times higher breaking current than the switch rated current to the switch in series in order to prevent the switch from short-circuit damage.  
On the occasion when using the switch with GB ratings, use a 10A fuse that complies IEC60269, either type gG.
- The durability of switch is depends on the operating condition. Be sure to check the condition with actual using condition before using, and use with the number of times of operating without a performance problem.
- Do not drop the switch. Otherwise, there is the possibility that the switch functions may be spoiled.
- Do not connect a Single Limit Switch to two power supplies that are different in polarity or type.
- Be sure to keep the load current less than the rated value. Otherwise, there is the possibility that the switch may be damage and/or burnout.
- Do not use the Switch by itself in atmospheres containing flammable or explosive gases. Arcs and heating resulting from switching may cause fire or explosion.
- Be sure to prevent the foreign materials such like a scrapped cable intrusion in to the switch when wiring. Otherwise, there is the possibility of spoiling the normal operation.
- Never wire to the wrong terminals.
- Do not store or use the switch with following place.
  - Where the temperature fluctuates greatly
  - Where the humidity is very high and condensation may occur.
  - Where the vibration is too much
  - Where receiving direct sunshine.
  - Where receiving salty wind.
- Do not disassemble and/or modify the switch at anytime. Otherwise, there is the possibility of spoiling the normal operation.
- Do not apply the force such like deformation and/or degeneration to the switch. Otherwise, there is the possibility that the switch functions may be spoiled.

### Precautions for Correct Use

#### Environment

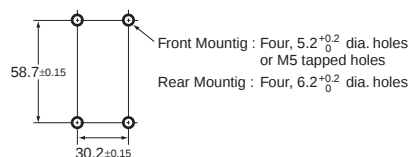
- Take special care to use where there is fine powder, mud and/or foreign materials stacking. And check the condition with actual using condition before using. Then use without a performance problem.
- This switch is only for indoor use. If it is used in outdoor, it may be cause of switch failure.
- Do not keep the Switch in locations with corrosive gas, such as sulfuric gas ( $\text{H}_2\text{S}$  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 killers) or remove the source of silicon gas.

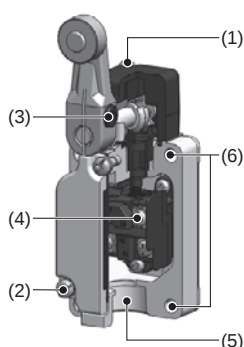
#### Installing the Switch

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



## Tightening Torque

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

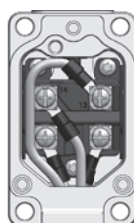


| No. | Type                                                    | Torque           | Screw type                       |
|-----|---------------------------------------------------------|------------------|----------------------------------|
| (1) | Head mounting screw                                     | 0.78 to 0.88 N•m | M3.5 screw                       |
| (2) | Cover mounting screw                                    | 1.18 to 1.37 N•m | M4 screw                         |
| (3) | Allen-head bolt (for securing the roller lever)         | 4.90 to 5.88 N•m | M5 hexagon socket head cap screw |
| (3) | Allen-head bolt (for securing the adjustable rod lever) | 0.88 to 1.08 N•m | M8 hexagon socket set screw      |
| (4) | Terminal screw                                          | 0.59 to 0.78 N•m | M3.5 screw                       |
| (5) | Connector                                               | 1.77 to 2.16 N•m | G1/2orPg13.5orM20or 1/2-14NPT    |
| (6) | Unit mounting screw                                     | 4.90 to 5.88 N•m | M5 hexagon socket head cap screw |

## Wiring

### In the case of mounting screw

- Use M3.5-nylon insulation covered crimp terminals (round type) for wiring.  
Ex.) V1.25-M3.5(RAP1.25-3.5) (J.S.T. Mfg. Co.,Ltd.)
- Appropriate wire size is AWG16 (1.25mm<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 lump unit, to avoid interference between lump unit and crimp terminals, wire according to right wiring figure. Attach the lump unit spring to terminal screw certainly otherwise it's possible to be destroyed or shorted.
- 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

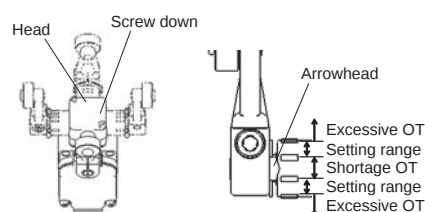
- By removing the screws in the two corners of the head, the head can be set any of four directions. Be sure to change the plunger for internal operations at the same time.

### Built-in Switch

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

## Overtravel Markers

- To allow the roller lever type actuator to travel properly, set the roller lever according to the dog or cam stroke so that the arrowhead of the lever is positioned within overtravel markers as shown.



## Connectors

- Tighten the connector with the appropriate torque to prevent deformation.
- Use the OMRON type SC connector series, which is prepared separately, suitable for outer diameter of cable and inner diameter of seal rubber.
- Make sure to wrap the connector with the seal tape, except the connector which has O-ring, to keep the sealability.
- To conform to CSA, use a CSA certified water tight treated conduit hub.
- Even when the connector is assembled and set correctly, the end of the cable and the inside of the Switch may come in contact. This can lead to malfunction, leakage current, or fire, so be sure to protect the end of the cable from splashes of oil or water and corrosive gases.

## Microload Applications

- The switch contacts can be used both for standard loads and microloads, but once a contact has been used to open and close a load it can no longer be used for lower loads. Doing so will damage the contact surface and reduce contact reliability.
- If an inrush current or other sudden load occurs during a switch operation, the switch will begin to degrade severely which can result in reduced durability. Use a contact protection circuit if required.
- Minimum operating load: 5 VDC 1 mA, resistive load, P level

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

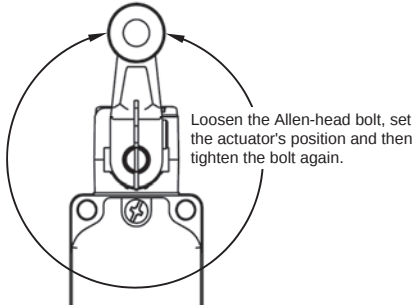
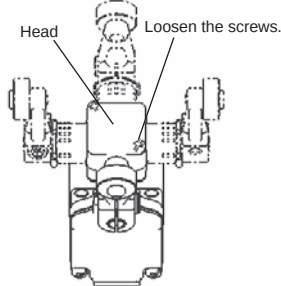
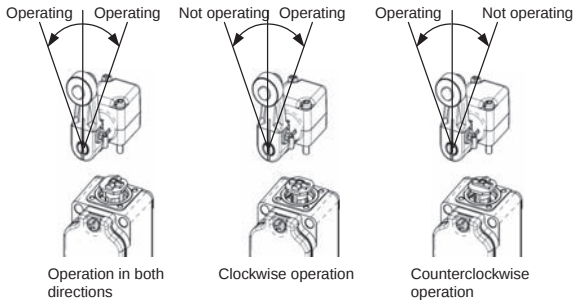
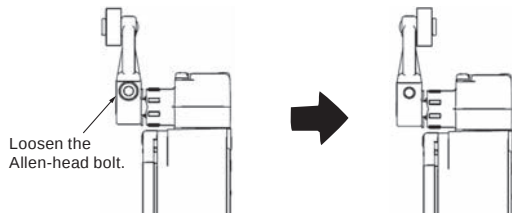
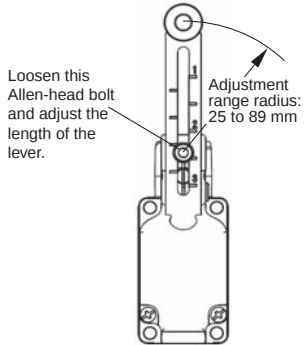
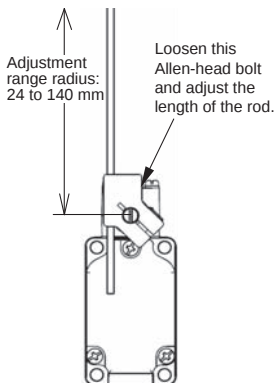
## Indicator

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

## 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.

## Using the Switches

| Item                                                                                                                                                                                                                                                                                                                                                                                                                                              | Applicable models and Actuators                                                                                                 | Details                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Changing the Installation Position of the Actuator</b><br>By loosening the Allen-head bolt on the actuator lever, the position of the actuator can be set anywhere within the 360°.<br>With Indicator-equipped Switches, the actuator lever comes in contact with the top of the indicator cover, so use caution when rotating and setting the lever.<br>When the lever only moves forwards and backwards, it will not contact the lamp cover. | Roller Levers:<br>WLCA2-N, WLG2-N<br>Adjustable Roller Levers:<br>WLCA12-N, WLG12-N<br>Adjustable Rod Levers:<br>WLCL-N, WLGL-N |                                                                                                                                                                                                                                                                                                                                                                                                        |
| <b>Changing the Orientation of the Head</b><br>By removing the two screws of the Head, the Head can be set in any of the four directions.<br>Be sure to change the plunger for internal operations at the same time.                                                                                                                                                                                                                              | Roller Levers:<br>WLCA2-N, WLG2-N<br>Adjustable Roller Levers:<br>WLCA12-N, WLG12-N<br>Adjustable Rod Levers:<br>WLCL-N, WLGL-N |                                                                                                                                                                                                                                                                                                                                                                                                        |
| <b>Changing the Operating Direction</b><br>By removing the Head on models which can operate on one-side only, and then changing the direction of the operational plunger, one of three operating directions can be selected.                                                                                                                                                                                                                      | Roller Levers:<br>WLCA2-N, WLG2-N<br>Adjustable Roller Levers:<br>WLCA12-N, WLG12-N<br>Adjustable Rod Levers:<br>WLCL-N, WLGL-N | <div> <p>The output of the Switch will be changed, regardless of which direction the lever is pushed.</p> <p>Operating    Operating    Not operating    Operating    Operating    Not operating</p>  <p>Operation in both directions    Clockwise operation    Counterclockwise operation</p> </div> <p>The output of the Switch will only be changed when the lever is pushed in one direction.</p> |
| <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.<br>(Set so that operation can be completed within a 180° level range.)                                                                                                                                                                                                                         | Roller Levers:<br>WLCA2-N, WLG2-N                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                      |
| <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 Levers:<br>WLCA12-N, WLG12-N<br>Adjustable Rod Levers:<br>WLCL-N, WLGL-N                                      | <div>  <p>Adjustable Roller Levers:</p> </div> <div>  <p>Adjustable Rod Levers:</p> </div>                                                                                                                                                                                                                      |

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