Environment-resistant Limit Switches
WL-N/WLG

Wide range of available models to match your onsite environment

- Variety of head shapes, including Roller Lever, Plunger, and Flexible Rod Switches
- Select the optimum actuator model for the ambient operating temperature and operating environment for use in a wide range of applications
- Wiring specifications are available in Direct-wire cable types in addition to standard screw terminals types

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

⚠ Be sure to read *Safety Precautions* on pages 83 to 88 and *Safety Precautions for All Limit Switches*.

Features

Select based on the operating temperature

- Ambient operating temperature of 5°C to 120°C: Heat-resistant type (WL□-TH-N/WL□-TH)
- Ambient operating temperature of -40°C to 40°C: Cold-resistant type (WL□-TC-N/WL□-TC)

Select based on the operating environment

- Outdoor use: Weather-resistant type (WL□-P1-N/WL□-P1)
- Chemicals and oils: Corrosion-resistant type (WL□-RP-N/WL□-RP)
- Coolant drops and mist: Coolant-resistant type (WL□-RP60-N/WL-RP60)
- Mist
  - Molded terminal 139 type (WL□-139-N/WL□-139)
  - The SC connector can be removed, so it is possible to use flexible conduit for the cable. (WL□-RP40-N/WL-RP40)
- Constant water drops and mist Molded terminal 140 type (WL□-140-N/WL□-140)
- Constant water drops or splattering cutting powder
  - Molded terminal 141 type (WL□-141-N/WL□-141)
  - Molded terminal 145 type (WL□-145-N/WL□-145)

Model Number Structure

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

Basic models

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

(1) Actuator and Property Specifications

Code	Actuator		Pretravel (PT)
CA2	Roller lever	Roller lever: (R38 mm)	15±5°
CA2-2			25±5°
CA2-2N			20° max.
CA12		Adjustable Roller Lever (R25 to 89 mm)	15±5°
CA12-2			25±5°
CA12-2N			20° max.
D28	Plunger Actuators	Sealed top-roller plunger	1.7 mm max.
D2		Top-roller plunger	1.7 mm max.
SD		Horizontal plunger	2.8 mm max.
SD2		Horizontal-roller plunger	2.8 mm max.
CL	Flexible Rod Actuators	Adjustable rod lever (25 to 140mm)	15±5°
CL-2			25±5°
CL-2N			20° max.
NJ		Coil spring (6.5 dia.)	20±10mm
NJ-2		Flexible rod: Resin rod (8 dia.)	40±20mm

(2) Environment-resistant Specifications

Code	Specifications
None	Standard built-in switch
RP	Corrosion-resistant type
P1	Weather-resistant type

(3) Built-in Switch Specifications

Code	Specifications
None	Standard built-in switch
55	Airtight built-in switch

(4) Temperature Specifications

Code	Specifications
None	Ambient operating temperature (-10 to +80°C)
TH	Ambient operating temperature (5 to 120°C) (Heat-resistant type) *
TC	Ambient operating temperature (-40 to +40°C) (Cold-resistant type) *

* (2) Environment-resistant Specifications Cannot be combined with symbols RP or P1.

(5) Wiring and Built-in Switch Specifications

Code	Terminal shape	Internal switch Specifications	Mold specifications
None	Screw terminals (Conduit size: G1/2)	Standard	None
139	Direct-wire cable	Standard	Molded conduit opening and cover. (The cover cannot be removed.)
140		Airtight built-in switch	Molded conduit opening, cover, and cover mounting screws. (The cover cannot be removed.)
141			Molded conduit opening, cover, cover mounting screws, and head. (The cover cannot be removed, and head direction cannot be changed.)
145			Molded conduit opening, cover, and cover mounting screws. (The cover cannot be removed.)
RP40			Molded conduit opening and cover. (The cover cannot be removed.) SC Connector can be removed, so it is possible to use flexible conduits for the cable.
RP60			Molded conduit opening, cover, cover mounting screws, and head mounting screws. (The cover cannot be removed, and head direction cannot be changed.) Fluorine rubber is used for all rubber parts.

(6) Indicator Specifications

Code	Specifications
None	No indicator
LD	LED (10 to 115 V AC/DC) *
LE	Neon lamp (125 to 250 VAC) *

* (2) Environment-resistant Specifications Cannot be combined with symbols RP or P1.
(4) Temperature Specifications Cannot be combined with symbols TH or TC.

(7) Lamp Wiring

Code	Specifications
None	No indicator
2	NC wiring (Lit when operating)
3	NO wiring (Lit when not operating)

High-sensitivity and High-precision Models

WLG□ - □□□□□□□
(1) (2) (3) (4) (5) (6) (7)

(1) Actuator and Property Specifications

Code	Actuator		Pretravel (PT)
2	Roller lever	Roller lever: R38 mm High-sensitivity Models	$10^{\circ}{}^{+2^{\circ}}_{-1^{\circ}}$
CA2		Roller lever: R38 mm High-precision Models	$5^{\circ}{}^{-2^{\circ}}_{0^{\circ}}$
12		Adjustable Roller Lever (R25 to 89 mm) high-sensitivity model	$10^{\circ}{}^{+2^{\circ}}_{-1^{\circ}}$
L	Flexible rod	Adjustable rod lever (25 to 140 mm) high-sensitivity model	$10^{\circ}{}^{+2^{\circ}}_{-1^{\circ}}$

(2) Environment-resistant Specifications

Code	Specifications
None	Standard Built-in Switch
RP	Corrosion-resistant type
P1	Weather-resistant type

(3) Built-in Switch Specifications

Code	Specifications
None	Standard Built-in Switch
55	Airtight built-in switch

(4) Temperature Specifications

Code	Specifications
None	Ambient operating temperature -10 to +80°C
TH	Ambient operating temperature (5 to 120°C) (Heat-resistant type) *
TC	Ambient operating temperature (-40 to +40°C) (Cold-resistant type) *

* (2) Environment-resistant Specifications Cannot be combined with symbols RP or P1.

(5) Wiring and Built-in Switch Specifications

Code	Terminal shape	Built-in switch specification	Mold specifications
None	Screw terminals (Conduit size: G1/2)	Standard	None
139	Direct-wire cable		Molded conduit opening and cover. (The cover cannot be removed.)
140	Direct-wire cable	Airtight built-in switch	Molded conduit opening, cover, and cover mounting screws. (The cover cannot be removed.)
141			Molded conduit opening, cover, cover mounting screws, and head. (The cover cannot be removed, and head direction cannot be changed.)
RP60			Molded conduit opening, cover, cover mounting screws, and head mounting screws. (The cover cannot be removed, and head direction cannot be changed.) Fluorine rubber is used for all rubber parts.

(6) Indicator Specifications

Code	Specifications
None	No indicator
LD	LED (10 to 115 V AC/DC) *
LE	Neon lamp (125 to 250 V AC) *

* (2) Environment-resistant Specifications Symbols: RP, P1
(4) Temperature Specifications Cannot be combined with symbols TH or TC.

(7) Lamp Wiring

Code	Specifications
None	No indicator
2	NC wiring (Lit when operating)
3	NO wiring (Lit when not operating)

Ordering Information

Roller Lever

Apperance	Actuator	Terminal shape	Built-in switch specification/ Temperature Specifications	Pretravel (PT)	Without operation indicator	With operation indicator	
						Indicator	LED
					Model	Wiring Specifications	Model
	Roller lever: R38 mm	Screw terminals (Conduit size: G1/2)	Heat-resistant type	15±5°	WLCA2-TH-N	---	---
				25±5°	WLCA2-2TH-N	---	---
				20° max.	WLCA2-2NTH-N	---	---
				10°$^{+2°}_{-1°}$	WLG2-TH	---	---
				5°$^{+2°}_{0°}$	WLGCA2-TH	---	---
			Cold-resistant type	15±5°	WLCA2-TC-N	---	---
				25±5°	WLCA2-2TC-N	---	---
				20° max.	WLCA2-2NTC-N	---	---
				10°$^{+2°}_{-1°}$	WLG2-TC	---	---
				5°$^{+2°}_{0°}$	WLGCA2-TC	---	---
			Corrosion-resistant type	15±5°	WLCA2-RP-N	---	---
				10°$^{+2°}_{-1°}$	WLG2-RP	---	---
				5°$^{+2°}_{0°}$	WLGCA2-RP	---	---
			Weather-resistant type	15±5°	WLCA2-P1-N	---	---
				10°$^{+2°}_{-1°}$	WLG2-P1	---	---
		Direct-wire cable	Coolant-resistant type	15±5°	WLCA2-RP60-N	NC wiring	WLCA2-RP60LD2-N
						NO wiring	WLCA2-RP60LD3-N
				25±5°	WLCA2-2RP60-N	NC wiring	WLCA2-2RP60LD2-N
						NO wiring	WLCA2-2RP60LD3-N
				10°$^{+2°}_{-1°}$	WLG2-RP60	NC wiring	WLG2-RP60LD2
						NO wiring	WLG2-RP60LD3
				5°$^{+2°}_{0}$	WLGCA2-RP60	NC wiring	WLGCA2-RP60LD2
						NO wiring	WLGCA2-RP60LD3
			Corrosion-resistant type	15±5°	WLCA2-RP40-N	---	---
			Molded terminal -139	15±5°	WLCA2-139-N	NC wiring	WLCA2-139LD2-N
						NO wiring	WLCA2-139LD3-N
				25±5°	WLCA2-2139-N	NC wiring	WLCA2-2139LD2-N
						NO wiring	WLCA2-2139LD3-N
				20° max.	WLCA2-2N139-N	---	---
				10°$^{+2°}_{-1°}$	WLG2-139	NO wiring	WLG2-139LD3
				5°$^{+2°}_{0}$	WLGCA2-139	NC wiring	WLGCA2-139LD2
						NO wiring	WLGCA2-139LD3
			Molded terminal -140	15±5°	WLCA2-140-N	---	---
				20° max.	WLCA2-2N140-N	---	---
				10°$^{+2°}_{-1°}$	WLG2-140	NC wiring	WLG2-140LD2 *
						NO wiring	WLG2-140LD3 *
			Molded terminal -141	15±5°	WLCA2-141-N	NC wiring	WLCA2-141LD2-N
						NO wiring	WLCA2-141LD3-N
				10°$^{+2°}_{-1°}$	WLG2-141	NC wiring	WLG2-141LD2
						NO wiring	WLG2-141LD3
				5°$^{+2°}_{0}$	WLGCA2-141	NO wiring	WLGCA2-141LD3

* Ask your OMRON representative for details on Two-core switches.

Apperance	Actuator	Terminal shape	Built-in switch specification/ Temperature Specifications	Pretravel (PT)	Without operation indicator
					Model
	Adjustable roller lever (R25 to 89 mm)	Screw terminals (Conduit size: G1/2)	Heat-resistant type	15±5°	WLCA12-TH-N
				25±5°	WLCA12-2TH-N
				20° max.	WLCA12-2NTH-N
				10°$^{+2°}_{-1°}$	WLG12-TH
			Cold-resistant type	15±5°	WLCA12-TC-N
				25±5°	WLCA12-2TC-N
				20° max.	WLCA12-2NTC-N
				10°$^{+2°}_{-1°}$	WLG12-TC
			Corrosion-resistant type	15±5°	WLCA12-RP-N
				10°$^{+2°}_{-1°}$	WLG12-RP
			Weather-resistant type	15±5°	WLCA12-P1-N
				10°$^{+2°}_{-1°}$	WLG12-P1
		Direct-wire cable	Coolant-resistant type	15±5°	WLCA12-RP60-N
			Molded terminal -139	15±5°	WLCA12-139-N
			Molded terminal -140	15±5°	WLCA12-140-N

Plunger

Apperance	Actuator	Terminal shape	Built-in switch specification/ Temperature Specifications	Pretravel (PT)	Without operation indicator
					Model
	Sealed top-roller plunger	Screw terminals (Conduit size: G1/2)	Heat-resistant type	1.7 mm max.	WLD28-TH-N
			Cold-resistant type		WLD28-TC-N
			Corrosion-resistant type		WLD28-RP-N
		Direct-wire cable	Coolant-resistant type		WLD28-RP60-N
			Molded terminal -139		WLD28-139-N
			Molded terminal -140		WLD28-140-N
	Top-roller plunger	Screw terminals (Conduit size: G1/2)	Heat-resistant type		WLD2-TH-N
		Direct-wire cable	Coolant-resistant type		WLD2-RP60-N
			Molded terminal -139		WLD2-139-N
	Horizontal plunger	Screw terminals (Conduit size: G1/2)	Heat-resistant type	2.8 mm max.	WLSD-TH-N
			Cold-resistant type		WLSD-TC-N
			Corrosion-resistant type		WLSD-RP-N
		Direct-wire cable	Coolant-resistant type		WLSD-RP60-N
			Molded terminal -139		WLSD-139-N
	Horizontal-roller plunger	Screw terminals (Conduit size: G1/2)	Heat-resistant type		WLSD2-TH-N
			Cold-resistant type		WLSD2-TC-N
			Corrosion-resistant type		WLSD2-RP-N
		Direct-wire cable	Coolant-resistant type		WLSD2-RP60-N
			Molded terminal -139		WLSD2-139-N
			Molded terminal -140		WLSD2-140-N

Flexible Rod

Apperance	Actuator	Terminal shape	Built-in switch specification/ Temperature Specifications	Pretravel (PT)	Without operation indicator
					Model
	Coil spring (6.5 dia.)	Screw terminals (Conduit size: G1/2)	Heat-resistant type	20±10 mm	WLNJ-TH-N
			Cold-resistant type		WLNJ-TC-N
			Corrosion-resistant type		WLNJ-RP-N
		Direct-wire cable	Coolant-resistant type		WLNJ-RP60-N
			Molded terminal -139		WLNJ-139-N
			Molded terminal -140		WLNJ-140-N
	Resin rod (8 dia.)	Screw terminals (Conduit size: G1/2)	Corrosion-resistant type	40±20 mm	WLNJ-2RP-N
		Direct-wire cable	Coolant-resistant type	40±20 mm	WLNJ-2RP60-N
			Molded terminal -139		WLNJ-2139-N
			Molded terminal -140		WLNJ-2140-N
	Adjustable rod lever (25 to 140 mm)	Screw terminals (Conduit size: G1/2)	Heat-resistant type	15±5°	WLCL-TH-N
				25±5°	WLCL-2TH-N
				20° max.	WLCL-2NTH-N
				$10^{\circ}{}^{+2^{\circ}}_{-1^{\circ}}$	WLGL-TH
			Cold-resistant type	15±5°	WLCL-TC-N
				25±5°	WLCL-2TC-N
				20° max.	WLCL-2NTC-N
				$10^{\circ}{}^{+2^{\circ}}_{-1^{\circ}}$	WLGL-TC
			Corrosion-resistant type	15±5°	WLCL-RP-N
				$10^{\circ}{}^{+2^{\circ}}_{-1^{\circ}}$	WLGL-RP
			Weather-resistant type	15±5°	WLCL-P1-N
				$10^{\circ}{}^{+2^{\circ}}_{-1^{\circ}}$	WLGL-P1
		Direct-wire cable	Coolant-resistant type	15±5°	WLCL-RP60-N
			Molded terminal -139	15±5°	WLCL-139-N
			Molded terminal -140	15±5°	WLCL-140-N

Specifications

Ratings

Screw terminals/Direct-wire cable

Without Operation Indicator

Basic models (WL-N)

Ratings		Non-inductive load (A)				Inductive load (A)			
		Basic models (WL-N)				Basic models (WL-N)			
		Resistive load		Lamp load		Inductive load		Motor load	
Voltage (V)		NC	NO	NC	NO	NC	NO	NC	NO
AC	125	10		3	1.5	10		5	2.5
	250	10		2	1	10		3	1.5
	500	10		1.5	0.8	3		1.5	0.8
DC	8	10		6	3	10		6	
	14	10		6	3	10		6	
	30	6		4	3	6		4	
	125	0.8		0.2	0.2	0.8		0.2	
	250	0.4		0.1	0.1	0.4		0.1	

High-sensitivity and High-precision models (WLG)

Ratings		Non-inductive load (A)	
		High-sensitivity and High-precision models (WLG)	
		Resistive load	
Voltage (V)		NC	NO
AC	125	5	
	250	5	
DC	125	0.4	
	250	0.2	

With Operation Indicator (LED)

Basic models (WL-N)

Ratings		Non-inductive load (A)				Inductive load (A)			
		Basic models (WL-N)				Basic models (WL-N)			
		Resistive load		Lamp load		Inductive load		Motor load	
Voltage (V)		NC	NO	NC	NO	NC	NO	NC	NO
AC	115	10		3	1.5	10		5	2.5
DC	12	10		6	3	10		6	
	24	6		4	3	6		4	
	48	3		2	1.5	3		0.2	
	115	0.8		0.2		0.8		0.1	

High-sensitivity and High-precision models (WLG)

Ratings		Non-inductive load (A)	
		High-sensitivity and High-precision models (WLG)	
		Resistive load	
Voltage (V)		NC	NO
AC	115	5	
DC	115	0.4	

With Operation Indicators (Neon Lamps)

Basic models (WL-N)

Ratings		Non-inductive load (A)				Inductive load (A)			
		Basic models (WL-N)				Basic models (WL-N)			
		Resistive load		Lamp load		Inductive load		Motor load	
Voltage (V)		NC	NO	NC	NO	NC	NO	NC	NO
AC	125	10		3	1.5	10		5	2.5
	250	10		2	1	10		3	1.5

High-sensitivity and High-precision models (WLG)

Ratings		Non-inductive load (A)	
		High-sensitivity and High-precision models (WLG)	
		Resistive load	
Voltage (V)		NC	NO
AC	125	5	
	250	5	

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

Allowable Inrush Current/ Minimum applicable load

Operating characteristics type		Basic models (WL-N)	High-sensitivity and High-precision models (WLG)
Inrush current	NC	30 A max.	15 A max.
	NO	20 A max.	10 A max.
Minimum applicable load		5 VDC 1 mA, resistive load, P level	5 VDC 1 mA, resistive load, P level

Operation Indicator

Operation indicator type	LED	Neon lamp
Rated voltage	10 to 115 VAC/DC	125 to 250 VAC
Leakage current (Reference value)	Approx. 0.4 mA at 10 VAC/DC Approx. 0.5 mA at 115 VAC/DC	Approx. 0.6 mA at 125 VAC Approx. 1.9 mA at 250 VAC

Characteristics

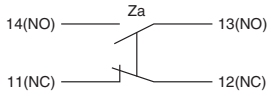
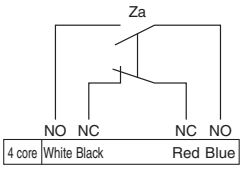
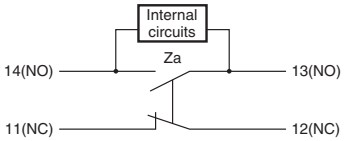
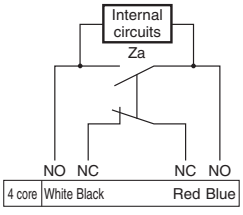
Operating characteristics type		Basic models (WL-N)	High-sensitivity and High-precision models (WLG)
Permissible operating frequency	Mechanical	120 operations/minute	
	Electrical	30 operations/minute	
Rated frequency		50/60 Hz	
Permissible operating speed		1 mm/s to 1 m/s (in case of WLCA2-N)	
Insulation resistance		100 MΩ min. (at 500 VDC)	
Contact resistance		25 mΩ or less (default value, built-in switch only)	
Vibration resistance	Malfunction	10 to 55 Hz, 1.5-mm double amplitude *2	
Shock	Destruction	1,000 m/s² max.	
	Malfunction	300m/s² max. *2	
Durability *1	Mechanical	15,000,000 operations min.	10,000,000 operations min. *3
	Electrical	750,000 operations min. (3 A at 250 VAC, resistive load) *4	500,000 operations min. (3 A at 250 VAC, resistive load) *4
Ambient operating temperature		-10 to +80°C (with no icing) *5	
Ambient operating humidity		35 to 95%RH	
Degree of protection		IP67	
Weight		Approx. 250 g (for WLCL-TH-N)	Approx. 250 g (for WLCL-TH-N)

Note: The above figures are initial values.
*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. Except Switches with Flexible Rod Actuators.
*3. 500,000 operations min. for Weather-resistant models.
*4. In case of models without operation indicators.
*5. For low-temperature models this is -40°C to +40°C (with no icing). For heat-resistant models the range is +5°C to 120°C.

Operating characteristics type		Basic models (WL-N)	High-sensitivity and High-precision models (WLG)
Wiring Specifications		Screw terminals/Direct-wire cable models	Screw terminals/Direct-wire cable models
Dielectric strength	Between terminals of the same polarity	1,000 VAC, 50/60 Hz for 1 min *	600 VAC, 50/60 Hz for 1 min *
	Between currentcarrying metal part and ground	2,200 VAC, 50/60 Hz for 1 min	1,500 VAC, 50/60 Hz for 1 min
	Between each terminal and non-current-carrying metal part	2,200 VAC, 50/60 Hz for 1 min	1,500 VAC, 50/60 Hz for 1 min

* Except models with operation indicators.

Circuit Configuration/Terminal Connection Diagram

Operating characteristics type	Basic models (WL-N)/High-sensitivity and high-precision models (WLG)	
Wiring Specifications	Screw terminals	Direct-wire cable
Without operation indicator		
Operation indicator (Light-ON when Not Operating *)		

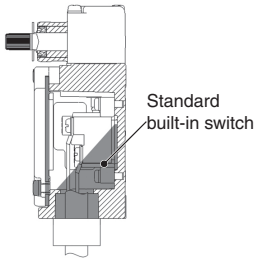
Note: Leakage current from indicator circuit may cause load malfunction (i.e., the load may remain ON). Make sure that the load operating current is higher than the leakage current.
For countermeasures, refer to technical support on your OMRON website.
* Light-ON when not operating means the operation indicator is lit when the actuator is free and is not lit when the actuator rotates or is pushed down, and the Switch contacts contact to NO.
The above shows details of the switch interior. External wires (external resistances) are not shown. For details, refer to *Operation* on page 18.

Structure and Nomenclature

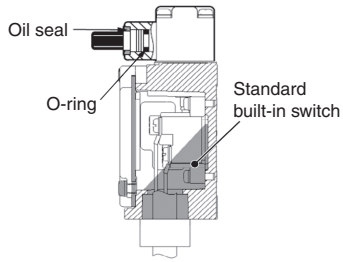
Mold Specifications

: Molded parts

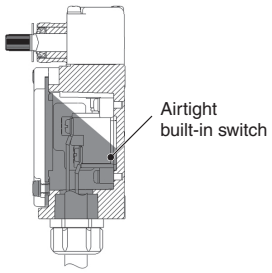
Prevent entry of foreign objects from conduit
WL□-139-N



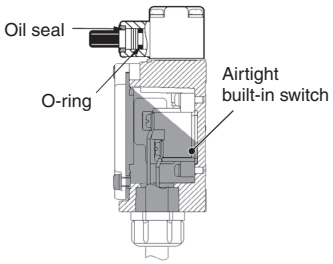
WLG□-139



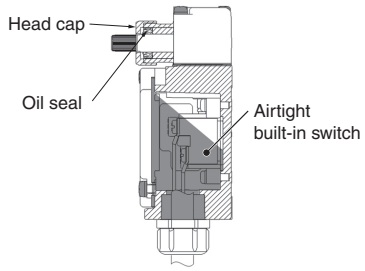
Prevent entry of foreign objects from conduit cover
WL□-140-N



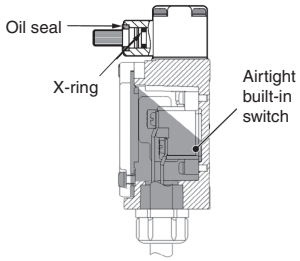
WLG□-140



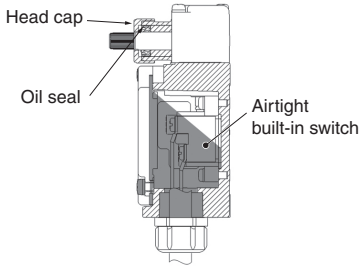
Prevent entry of foreign objects from head and conduit cover
WL□-141-N



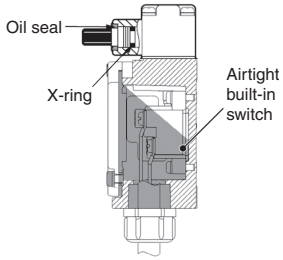
WLG□-141



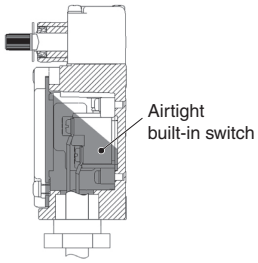
Prevent entry of metal powder from head and conduit
WL□-145-N



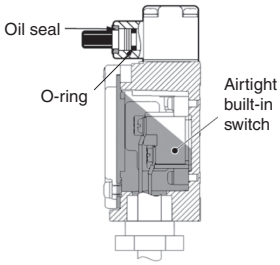
WLG□-145



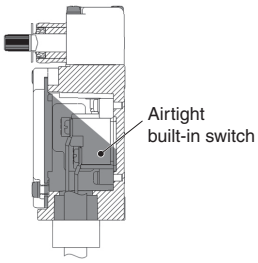
Prevent entry of metal powder from conduit cover
WL□-RP40-N



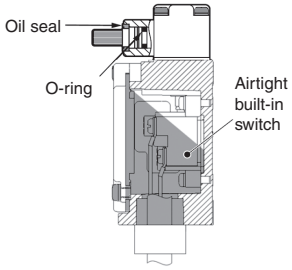
WLG□-RP40



Prevent entry of metal powder from head and conduit cover
WL□-RP60-N *1



WLG□-RP60 *1



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

*1. Fluorine rubber is used for all rubber parts.
*2. The connector can be removed, so it is possible to use flexible conduit for the cable.

Dimensions

(Unit: mm)

Roller Lever

Screw terminals

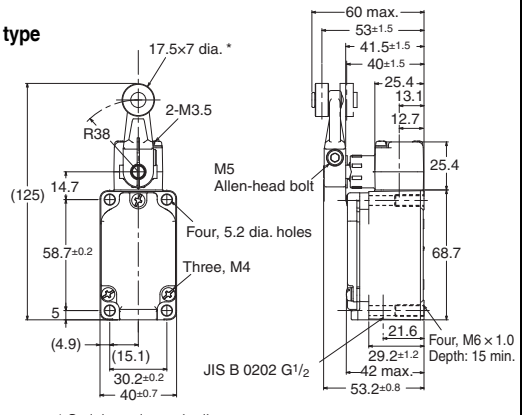
Roller lever R38

Heat-resistant type
WLCA2-TH-N
WLCA2-2TH-N
WLCA2-2NTH-N

Cold-resistant type
WLCA2-TC-N
WLCA2-2TC-N
WLCA2-2NTC-N

Corrosion-resistant type
WLCA2-RP-N

Weather-resistant type
WLCA2-P1-N



* Stainless sintered roller

Note: The photo shows the WLCA2-TH-N model.

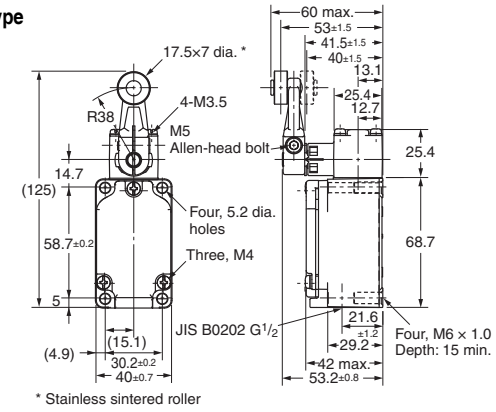
Roller lever R38

Heat-resistant type
WLG2-TH
WLGCA2-TH

Cold-resistant type
WLG2-TC
WLGCA2-TC

Corrosion-resistant type
WLG2-RP
WLGCA2-RP

Weather-resistant type
WLG2-P1



* Stainless sintered roller

Note: The photo shows the WLG2-TH model.

Operating characteristics

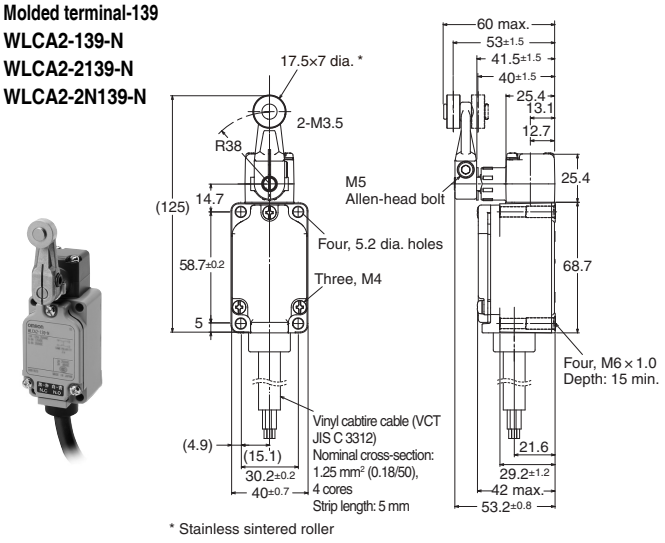
Model			WLCA2-TH-N WLCA2-TC-N WLCA2-RP-N WLCA2-P1-N	WLCA2-2TH-N WLCA2-2TC-N	WLCA2-2NTH-N WLCA2-2NTC-N	WLG2-TH WLG2-TC WLG2-RP WLG2-P1	WLGCA2-TH WLGCA2-TC WLGCA2-RP
Operating force	**OF**	**max.**	13.34 N	13.34 N	13.34 N	9.81 N	13.34 N
Release force	**RF**	**min.**	1.18 N	1.18 N	1.18 N	0.98 N	1.47 N
Pretravel	**PT**		15±5°	25±5°	20° max.	$10°^{+2°}_{-1°}$	$5°^{+2°}_{0°}$
Overtravel	**OT**	**min.**	70°	60°	70°	65°	40°
Movement Differential	**MD**	**max.**	12°	16°	10°	7°	3°

Direct-wire cable

Roller lever R38

Coolant-resistant type
WLCA2-RP60-N
WLCA2-2RP60-N

Molded terminal-139
WLCA2-139-N
WLCA2-2139-N
WLCA2-2N139-N



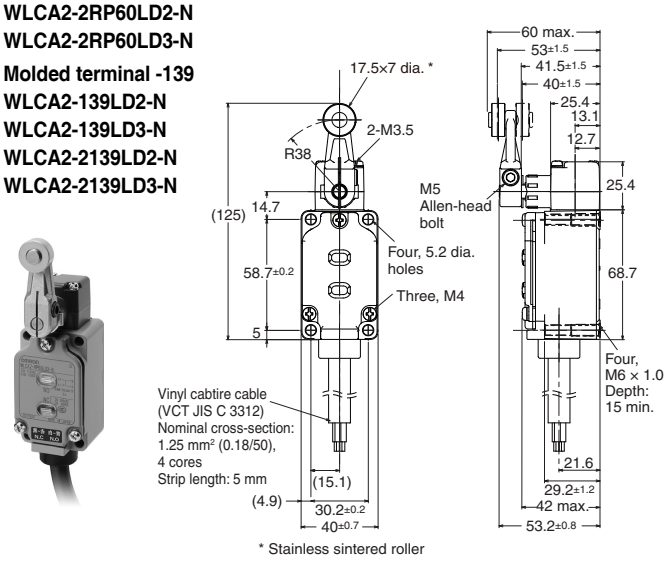
* Stainless sintered roller

Note: The photo shows the WLCA2-139-N model.

Roller lever R38 With operation indicator

Coolant-resistant specifications
WLCA2-RP60LD2-N
WLCA2-RP60LD3-N
WLCA2-2RP60LD2-N
WLCA2-2RP60LD3-N

Molded terminal -139
WLCA2-139LD2-N
WLCA2-139LD3-N
WLCA2-2139LD2-N
WLCA2-2139LD3-N



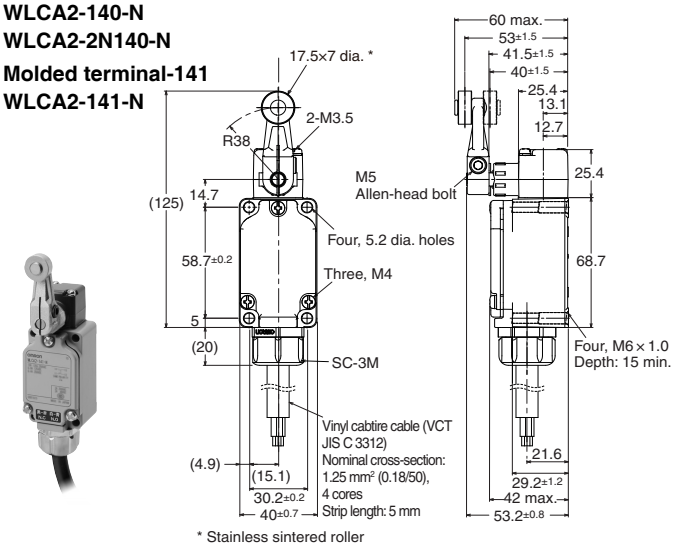
* Stainless sintered roller

Note: The photo shows the WLCA2-RP60LD3-N model.

Roller lever R38

Molded terminal-140
WLCA2-140-N
WLCA2-2N140-N

Molded terminal-141
WLCA2-141-N

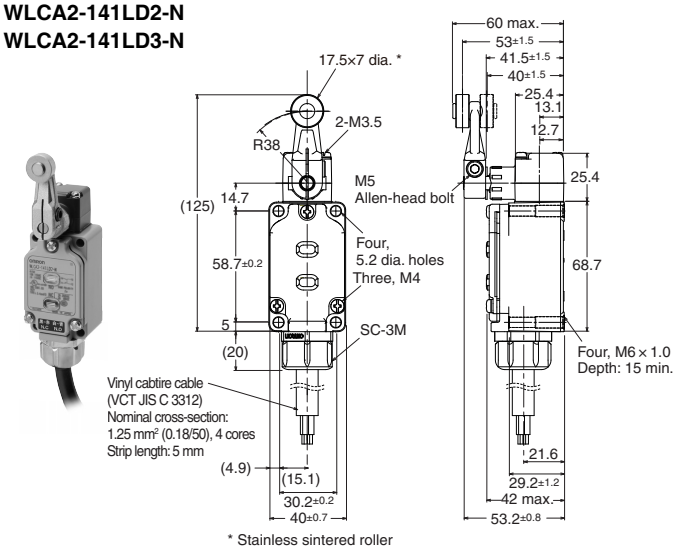


* Stainless sintered roller

Note: The photo shows the WLCA2-141-N model.

Roller lever R38 With operation indicator

Molded terminal -141
WLCA2-141LD2-N
WLCA2-141LD3-N



* Stainless sintered roller

Note: The photo shows the WLCA2-141LD2-N model.

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

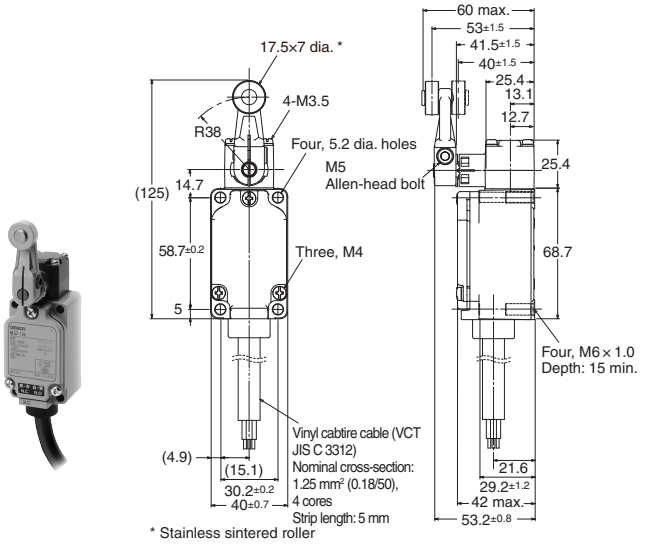
Operating characteristics

			Model		
			WLCA2-RP60-N WLCA2-RP60LD2-N WLCA2-RP60LD3-N WLCA2-139-N WLCA2-139LD2-N WLCA2-139LD3-N WLCA2-140-N WLCA2-141-N WLCA2-141LD2-N WLCA2-141LD3-N	**WLCA2-2N139-N WLCA2-2N140-N**	**WLCA2-2RP60-N WLCA2-2RP60LD2-N WLCA2-2RP60LD3-N WLCA2-2139-N WLCA2-2139LD2-N WLCA2-2139LD3-N**
Operating force	**OF**	**max.**	13.34 N	13.34 N	13.34 N
Release force	**RF**	**min.**	1.18 N	1.18 N	1.18 N
Pretravel	**PT**		15±5°	20° max.	25±5°
Overtravel	**OT**	**min.**	70°	70°	60°
Movement Differential	**MD**	**max.**	12°	10°	16°

Roller lever R38

Coolant-resistant type
WLG2-RP60

Molded terminal -139
WLG2-139

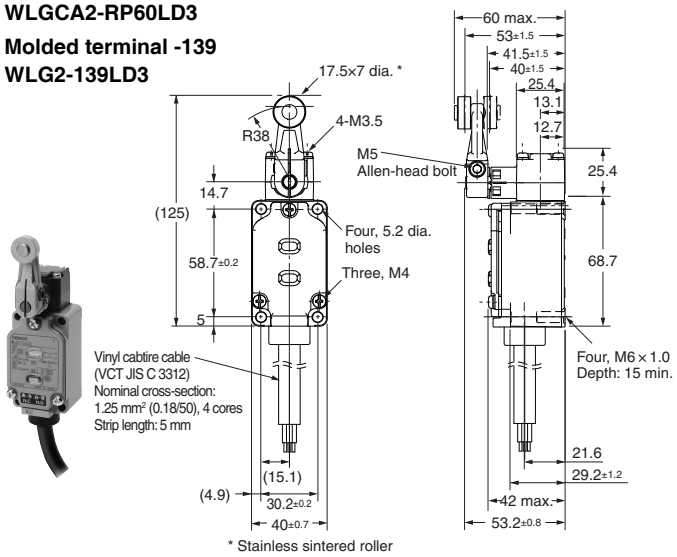


Note: The photo shows the WLG2-139 model.

Roller lever R38 With operation indicator

Coolant-resistant specifications
WLG2-RP60LD2
WLG2-RP60LD3
WLGCA2-RP60LD2
WLGCA2-RP60LD3

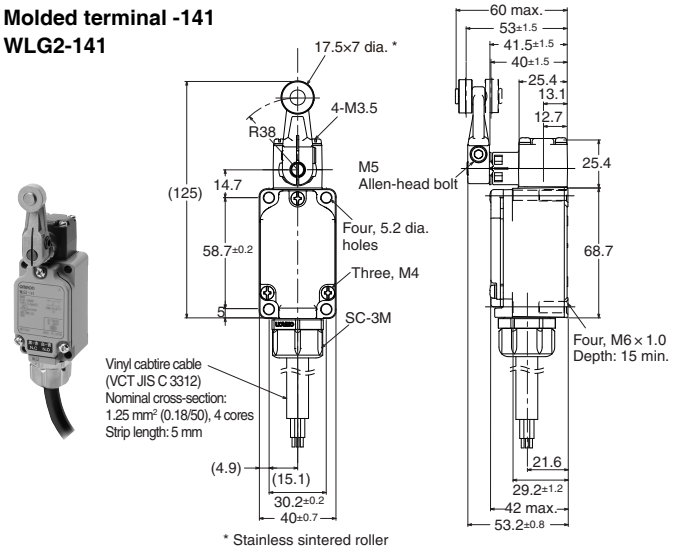
Molded terminal -139
WLG2-139LD3



Note: The photo shows the WLG2-139LD3 model.

Roller lever R38

Molded terminal -140
WLG2-140
Molded terminal -141
WLG2-141

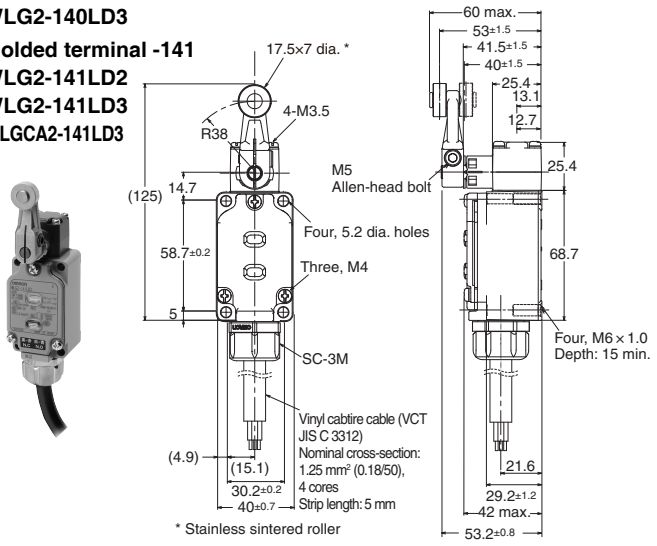


Note: The photo shows the WLG2-141 model.

Roller lever R38 With operation indicator

Molded terminal -140
WLG2-140LD2
WLG2-140LD3

Molded terminal -141
WLG2-141LD2
WLG2-141LD3
WLGCA2-141LD3



Note: The photo shows the WLG2-141LD2 model.

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

Operating characteristics

			Model	
			WLG2-139 WLG2-140 WLG2-141 WLG2-RP60 WLG2-RP60LD2 WLG2-RP60LD3 WLG2-139LD3 WLG2-140LD2 WLG2-140LD3 WLG2-141LD2 WLG2-141LD3	**WLGCA2-RP60LD2 WLGCA2-RP60LD3 WLGCA2-141LD3**
Operating force	**OF**	**max.**	9.81 N	13.34 N
Release force	**RF**	**min.**	0.98 N	1.47 N
Pretravel	**PT**		$10^{\circ}{}^{+2^{\circ}}_{-1^{\circ}}$	$5^{\circ}{}^{+2^{\circ}}_{0^{\circ}}$
Overtravel	**OT**	**min.**	65°	40°
Movement Differential	**MD**	**max.**	7°	3°

Screw terminals

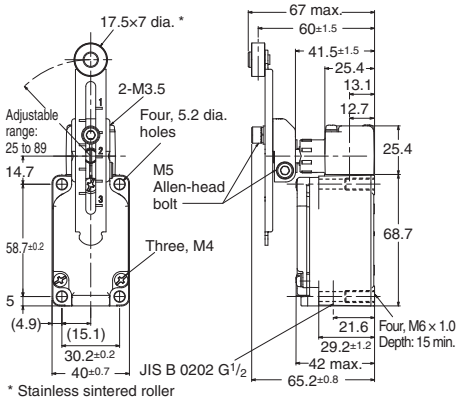
Adjustable Roller Lever (R25 to 89 mm)

Heat-resistant type
WLCA12-TH-N
WLCA12-2TH-N
WLCA12-2NTH-N

Cold-resistant type
WLCA12-TC-N
WLCA12-2TC-N
WLCA12-2NTC-N

Weather-resistant type
WLCA12-P1-N

Corrosion-resistant type
WLCA12-RP-N



Note: The photo shows the WLCA12-TH-N model.

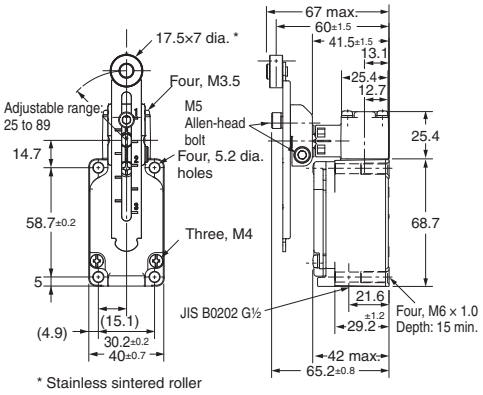
Adjustable Roller Lever (R25 to 89 mm)

Heat-resistant type
WLG12-TH

Cold-resistant type
WLG12-TC

Weather-resistant type
WLG12-P1

Corrosion-resistant type
WLG12-RP



Note: The photo shows the WLG12-TH model.

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

Operating characteristics

Model			WLCA12-TH-N WLCA12-TC-N WLCA12-P1-N WLCA12-RP-N	WLCA12-2TH-N WLCA12-2TC-N	WLCA12-2NTH-N WLCA12-2NTC-N	WLG12-TH WLG12-TC WLG12-P1 WLG12-RP
Operating force	**OF**	**max.**	13.34 N	13.34 N	13.34 N	9.81 N
Release force	**RF**	**min.**	1.18 N	1.18 N	1.18 N	0.98 N
Pretravel	**PT**		15±5°	25±5°	20° max.	$10^{\circ}{}^{+2^{\circ}}_{-1^{\circ}}$
Overtravel	**OT**	**min.**	70°	60°	70°	65°
Movement Differential	**MD**	**max.**	12°	16°	10°	7°

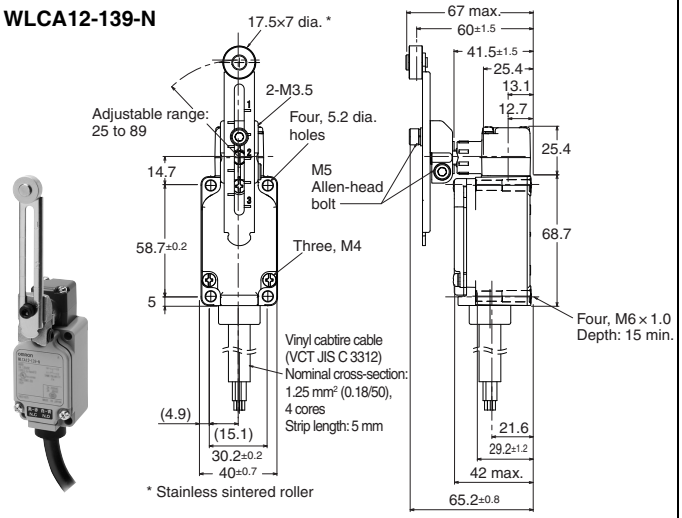
Note: The operating characteristics are measured at the lever length of 38 mm.

Direct-wire cable

Adjustable Roller Lever (R25 to 89 mm)

Coolant-resistant specifications
WLCA12-RP60-N

Molded terminal -139
WLCA12-139-N

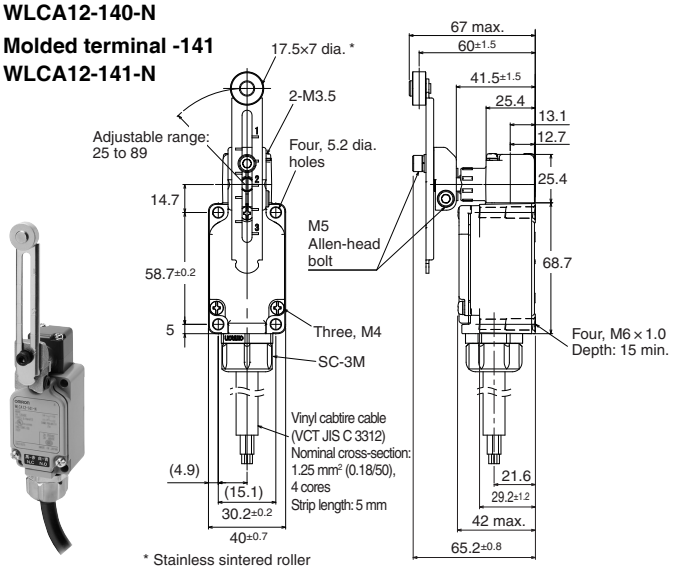


Note: The photo shows the WLCA12-139-N model.

Adjustable Roller Lever (R25 to 89 mm)

Molded terminal -140
WLCA12-140-N

Molded terminal -141
WLCA12-141-N



Note: The photo shows the WLCA12-141-N model.

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

Operating characteristics

			Model
			WLCA12-RP60-N WLCA12-139-N WLCA12-140-N WLCA12-141-N
Operating force	**OF**	**max.**	13.34 N
Release force	**RF**	**min.**	1.18 N
Pretravel	**PT**		15±5°
Overtravel	**OT**	**min.**	70°
Movement Differential	**MD**	**max.**	12°

Note: The operating characteristics are measured at the lever length of 38 mm.

Plunger Actuators

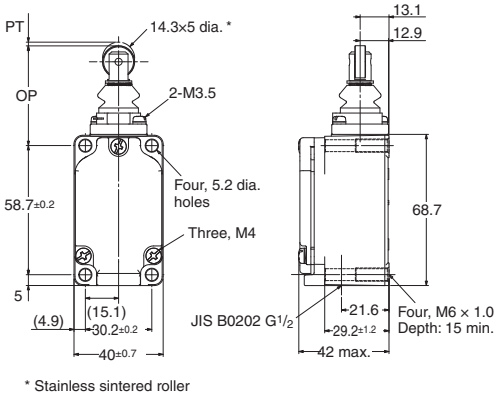
Screw terminals

Sealed top-roller plunger

Heat-resistant specifications
WLD28-TH-N

Cold-resistant specifications
WLD28-TC-N

Corrosion-resistant specifications
WLD28-RP-N

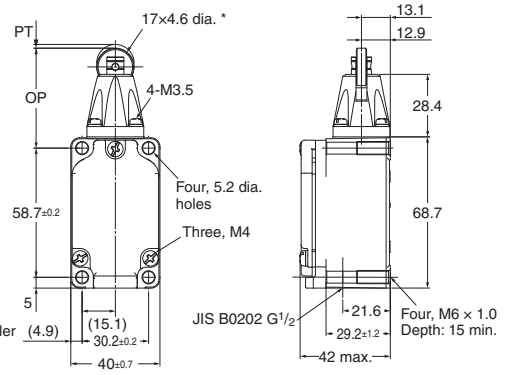


* Stainless sintered roller

Note: The photo shows the WLD28-TH-N model.

Top-roller plunger

Heat-resistant specifications
WLD2-TH-N



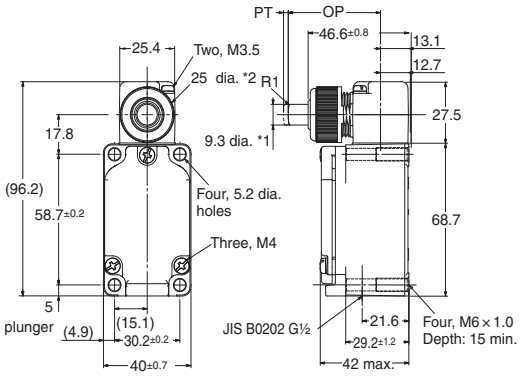
* Stainless sintered roller

Horizontal plunger

Heat-resistant specifications
WLSD-TH-N

Cold-resistant specifications
WLSD-TC-N

Corrosion-resistant specifications
WLSD-RP-N



*1. Stainless steel plunger
*2. Cosmetic nuts

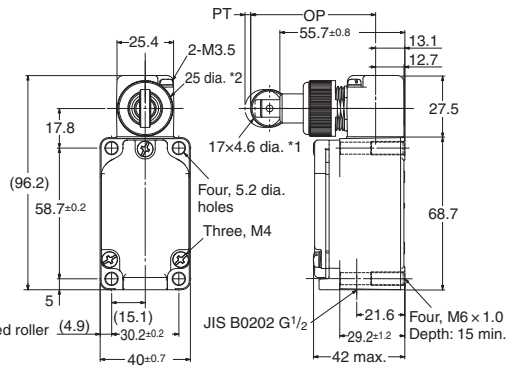
Note: The photo shows the WLSD-TH-N model.

Horizontal-roller plunger

Heat-resistant specifications
WLSD2-TH-N

Cold-resistant specifications
WLSD2-TC-N

Corrosion-resistant specifications
WLSD2-RP-N



*1. Stainless sintered roller
*2. Cosmetic nuts

Note: The photo shows the WLSD2-TH-N model.

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

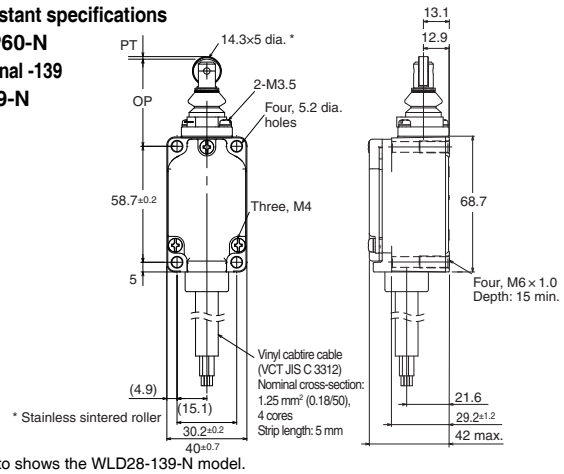
Operating characteristics

		Model	WLD28-TH-N WLD28-TC-N WLD28-RP-N	WLD2-TH-N	WLSD-TH-N WLSD-TC-N WLSD-RP-N	WLSD2-TH-N WLSD2-TC-N WLSD2-RP-N
Operating force	**OF**	**max.**	16.67 N	26.67 N	40.03 N	40.03 N
Release force	**RF**	**min.**	4.41 N	8.92 N	8.89 N	8.89 N
Pretravel	**PT**	**max.**	1.7 mm	1.7 mm	2.8 mm	2.8 mm
Overtravel	**OT**	**min.**	5.6 mm	5.6 mm	5.6 mm	5.6 mm
Movement Differential	**MD**	**max.**	1 mm	1 mm	1 mm	1 mm
Operating position	**OP**		44±0.8 mm	44±0.8 mm	40.6±0.8 mm	54.2±0.8 mm
Total travel position	**TTP**	**max.**	39.5 mm	39.5 mm	---	---

Direct-wire cable

Sealed top-roller plunger

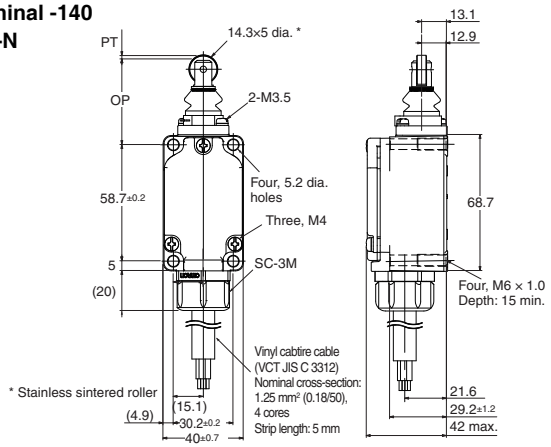
Coolant-resistant specifications
WLD28-RP60-N
Molded terminal -139
WLD28-139-N



Note: The photo shows the WLD28-139-N model.

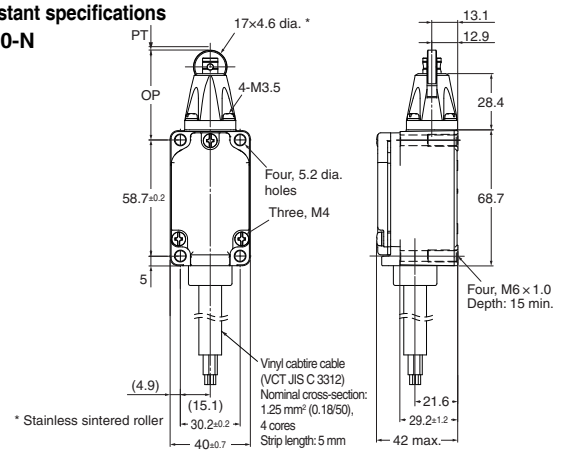
Sealed top-roller plunger

Molded terminal -140
WLD28-140-N



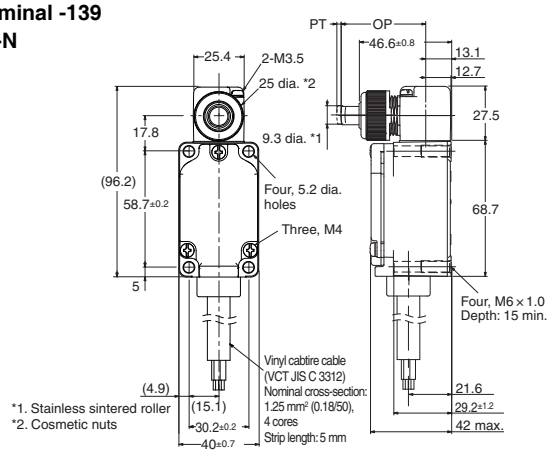
Top-roller plunger

Coolant-resistant specifications
WLD2-RP60-N



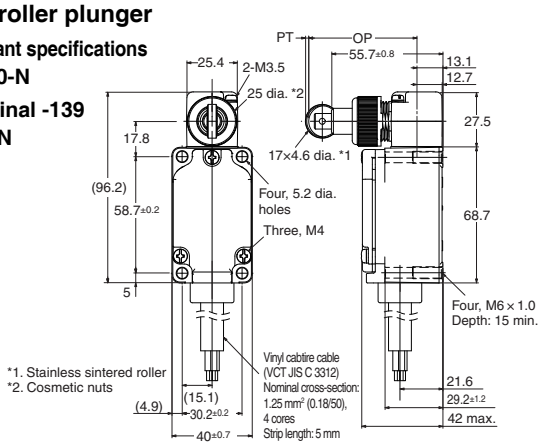
Horizontal plunger

Molded terminal -139
WLSD-139-N



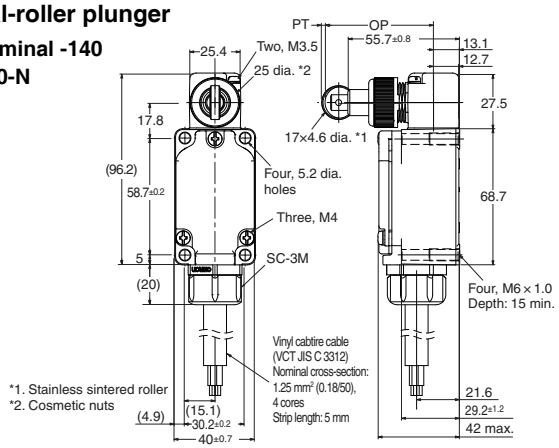
Horizontal-roller plunger

Coolant-resistant specifications
WLSD2-RP60-N
Molded terminal -139
WLSD2-139-N



Horizontal-roller plunger

Molded terminal -140
WLSD2-140-N



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

Operating characteristics

		Model	WLD28-RP60-N WLD28-139-N WLD28-140-N	WLD2-RP60-N	WLSD-139-N	WLSD2-RP60-N WLSD2-139-N WLSD2-140-N
Operating force	OF	max.	16.67 N	26.67 N	40.03 N	40.03 N
Release force	RF	min.	4.41 N	8.92 N	8.89 N	8.89 N
Pretravel	PT	max.	1.7 mm	1.7 mm	2.8 mm	2.8 mm
Overtravel	OT	min.	5.6 mm	5.6 mm	5.6 mm	5.6 mm
Movement Differential	MD	max.	1 mm	1 mm	1 mm	1mm
Operating position	OP		44±0.8 mm	44±0.8 mm	40.6±0.8 mm	54.2±0.8 mm
Total travel position	TTP	max.	39.5 mm	39.5 mm	---	---

Flexible Rod

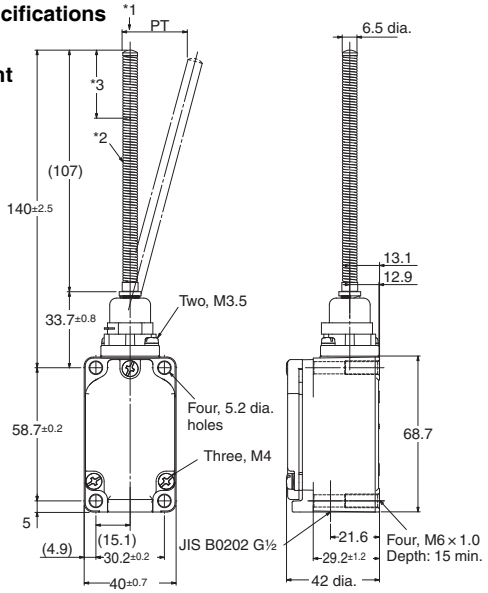
Screw terminals

Coil spring

Heat-resistant specifications
WLNJ-TH-N

Cold-resistant specifications
WLNJ-TC-N

Corrosion-resistant specifications
WLNJ-RP-N

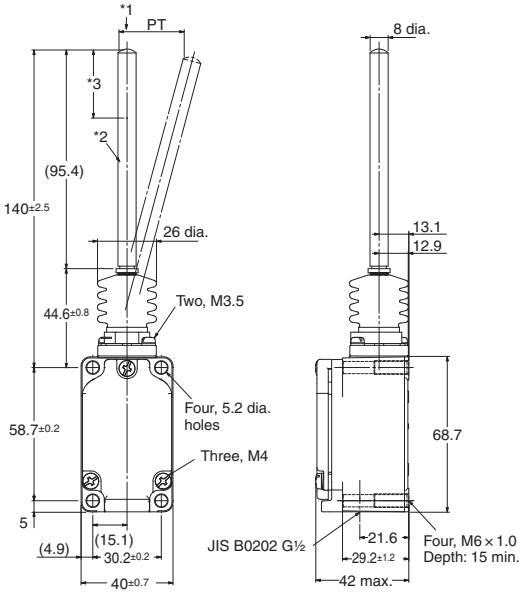


Note: The photo shows the WLNJ-TH-N model.

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

Resin rod

Corrosion-resistant specifications
WLNJ-2RP-N



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

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

Operating characteristics

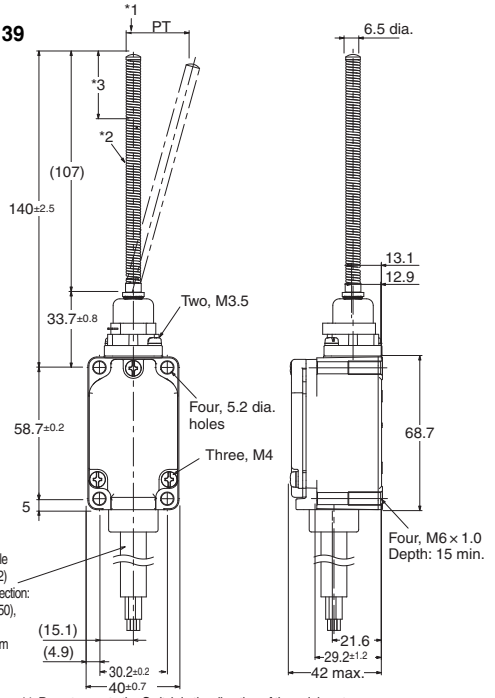
	Model	WLNJ-TH-N * WLNJ-TC-N * WLNJ-RP-N *	WLNJ-2RP-N *
Operating force	**OF max.**	1.47 N	1.47 N
Pretravel	**PT**	20±10 mm	40±20 mm

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

Direct-wire cable

Coil spring

Coolant-resistant specifications
WLNJ-RP60-N
Molded terminal -139
WLNJ-139-N

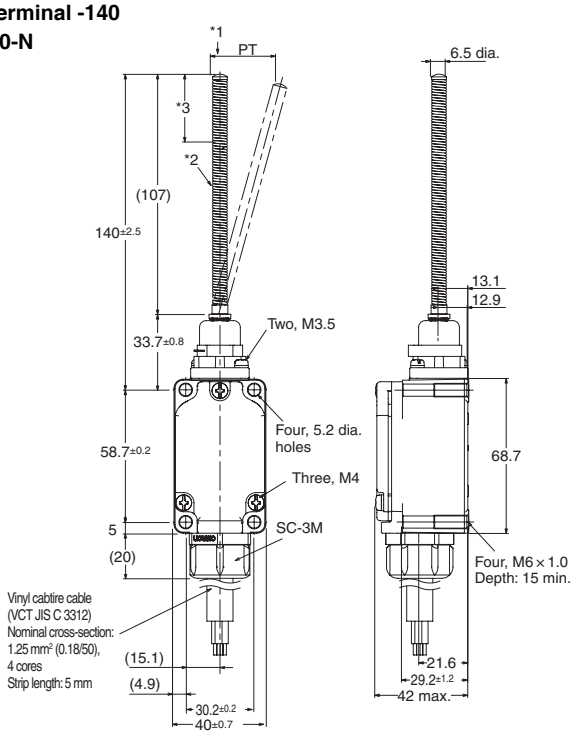


Note: The photo shows the WLNJ-RP60-N model.

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

Coil spring

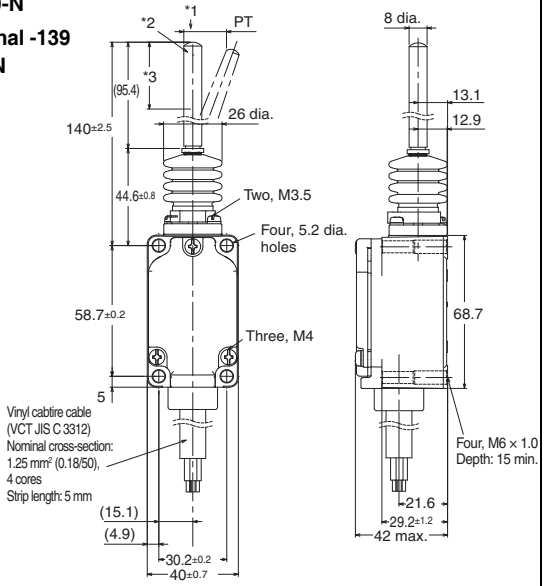
Molded terminal -140
WLNJ-140-N



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

Resin rod

Coolant-resistant specifications
WLNJ-2RP60-N
Molded terminal -139
WLNJ-2139-N

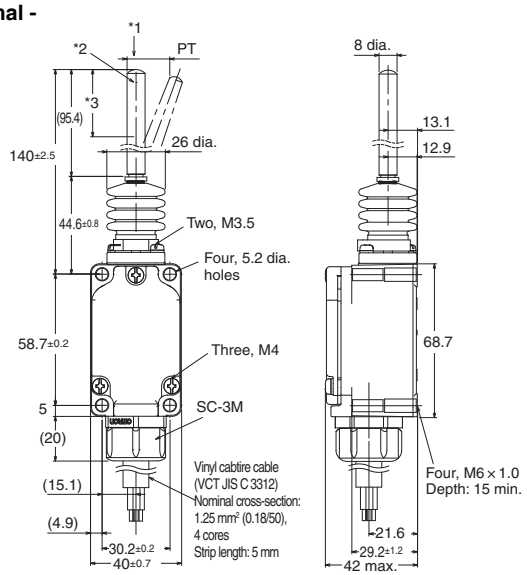


Note: The photo shows the WLNJ-2RP60-N model.

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

Resin rod

Molded terminal -140
WLNJ-2140-N



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

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

Operating characteristics

Model		WLNJ-RP60-N * WLNJ-139-N * WLNJ-140-N *	WLNJ-2RP60-N * WLNJ-2139-N * WLNJ-2140-N *
Operating force	**OF max.**	1.47 N	1.47 N
Pretravel	**PT**	20±10 mm	40±20 mm

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

Common Accessories (Sold Separately)

Ordering Information

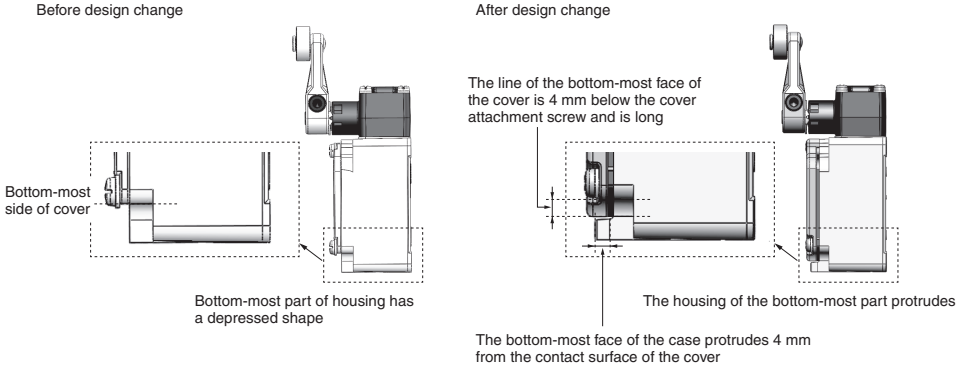
Single-item ordering models

. . . . . Switches without levers, heads, and actuators can be ordered separately. Use by combining with models that are not available as a set. You can also use them as maintenance parts for inventory management.

General-purpose Models

Actuator	Pretravel (PT)	Set Model Numbers	Switches without levers	Heads (with Actuators)	Actuator *
			Model	Model	Model
Roller lever: R38 mm	15±5°	WLCA2-N	WLRCA2-N	WL-1H1100-N	WL-1A100
	25±5°	WLCA2-2-N	WLRCA2-2-N	WL-3H1100-N	
	20° max.	WLCA2-2N-N	WLRCA2-2N-N	WL-1H1100-N	
	$10^{\circ}{}^{+2^{\circ}}_{-1^{\circ}}$	WLG2	---	WL-2H1100-K *	
Adjustable roller lever (R25 to 89 mm)	15±5°	WLCA12-N	WLRCA2-N	WL-1H2100-N	WL-2A100
	25±5°	WLCA12-2-N	WLRCA2-2-N	WL-3H2100-N	
	20° max.	WLCA12-2N-N	WLRCA2-2N-N	WL-1H2100-N	
	$10^{\circ}{}^{+2^{\circ}}_{-1^{\circ}}$	WLG12	WLRG2	WL-2H2100-K *	
Adjustable rod lever: (25 to 140mm)	15±5°	WLCL-N	WLRCL-N	WL-4H4100-N	WL-4A100
	25±5°	WLCL-2-N	WLRCA2-2-N	WL-3H4100-N	
	20° max.	WLCL-2N-N	WLRCA2-2N-N	WL-1H4100-N	
	$10^{\circ}{}^{+2^{\circ}}_{-1^{\circ}}$	WLGL	WLRG2	WL-2H4100-K *	
Sealed top plunger	1.7 mm max.	WLD18-N	---	WL-7H100-N	---
Sealed top-roller plunger	1.7 mm max.	WLD28-N	---	WL-7H400-N	---
Sealed top-ball plunger	1.7 mm max.	WLD38-N	---	WL-7H300-N	---
Horizontal plunger	2.8 mm max.	WLSD-N	---	WL-8H100-N	---
Horizontal-roller plunger	2.8 mm max.	WLSD2-N	---	WL-8H200-N	---
Horizontal-ball plunger	2.8 mm max.	WLSD3-N	---	WL-8H300-N	---
Coil spring (6.5 dia.)	20±10 mm	WLNJ-N	---	WL-9H100-N	---
Coil spring (4.8 dia.)	20±10 mm	WLNJ-30-N	---	WL-9H200-N	---
Flexible rod: Resin rod (8 dia.)	40±20 mm	WLNJ-2-N	---	WL-9H300-N	---
Flexible rod: Steel wire (1 dia.)	40±20 mm	WLNJ-S2-N	---	WL-9H400-N	---
Fork Lock Lever A	55° max.	WLCA32-41-N	WLRCA32-N	WL-5H5100-N	WL-5A100
Fork Lock Lever B	55° max.	WLCA32-42-N		WL-5H5102-N	WL-5A102
Fork Lock Lever C	55° max.	WLCA32-43-N		WL-5H5104-N	WL-5A104
Fork Lock Lever D	55° max.	WLCA32-44-N		WL-5H5104-N	WL-5A104

* The WL-2H1100-K, WL-2H2100-K, and WL-2H4100-K correspond with each set model WLG□, the design of which was changed in April 2019. Please inquire if you desire a single-item head manufactured before the design change. On products that underwent the design change in April 2019, the front of the switch box cover at the bottom front has a protruding shape, and on earlier products has a depressed shape.

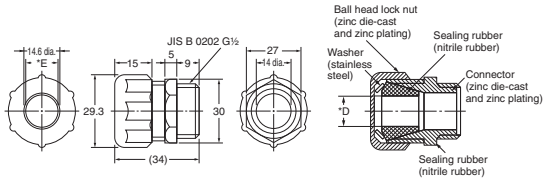
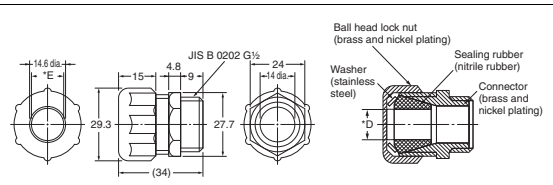
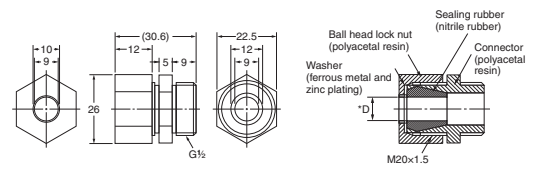
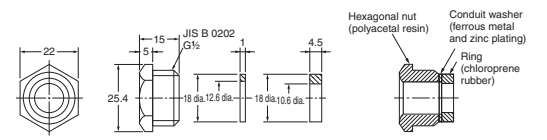


Spatter-prevention Models

Actuator	Lever type	Indicator	Pretravel (PT)	Set Model Numbers	Switches without levers	Actuator *
					Model	Model
Roller lever: R38 mm	Double nut lever	LED	15±5°	WLCA2-LDAS-N	WLRCA2-LDS-N	WL-1A105S
		Neon lamp		WLCA2-LEAS-N	WLRCA2-LES-N	
		LED	10°$^{+2°}_{-1°}$	WLG2-LDAS	WLRG2-LDS	
	Allen-head lever	LED	15±5°	WLCA2-LDS-N	WLRCA2-LDS-N	WL-1A103S
		Neon lamp		WLCA2-LES-N	WLRCA2-LES-N	
		LED	10°$^{+2°}_{-1°}$	WLG2-LDS	WLRG2-LDS	

* The actuator is identical for the WL and WL-N models.

Connector (Conduit size: JIS B0202G1/2)

Appearance	Dimensions (Unless otherwise indicated, a tolerance of ±0.4 mm applies to all dimensions.)	Application/ Specifications	Inner diameter (D) of seal rubber	External diameter of cable		Model	Applicable limit switch models
				min.	max.		
		Cabtire cable (Metal, with O-ring)	7 dia.	5.5 dia.	7.5 dia.	SC-1M	WL□-N WLG□ Wiring Specifications: Screw terminals
			9 dia.	7.5 dia.	9.5 dia.	SC-2M	
			12.5 dia.	11 dia.	13 dia.	SC-3M	
			14 dia.	12 dia.	14 dia.	SC-4M	
			11 dia.	9 dia.	11 dia.	SC-5M	
		Cabtire cable (Metal)	7 dia.	5.5 dia.	7.5 dia.	SC-21	
			9 dia.	7.5 dia.	9.5 dia.	SC-22	
			12.5 dia.	11 dia.	13 dia.	SC-23	
			14 dia.	12 dia.	14 dia.	SC-24	
			11 dia.	9 dia.	11 dia.	SC-25	
		Cabtire cable (Resin)	9 dia.	7.5 dia.	9 dia.	SC-6	
			10.6 dia.	8.5 dia.	10.5 dia.	SC-P2	

Note: 1. Please use sealling tape with SC Connectors. SC-1M to SC-5M, however, are provided with an O-ring (NBR) and therefore sealing tape is not necessary to ensure a proper seal. The SC-6 and SC-P2 models are made of resin. If higher sealing performance is required, use one of SC-1M to SC-5M, which have metal connectors.

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

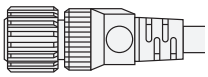
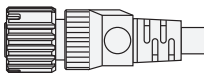
* mark dimensional table

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

FA Connectors

Model	Number of conductors	Voltage specification	Size of conduit	Size of crimp terminal	Applicable model
SC-2F	2	125 VDC	JIS B0202G1/2	M4	WL-N, WLG
SC-2FAD	2	250 VDC			
SC-4F4D	4	125 VDC			
SC-4F4AD	4	250 VDC			

Sensor I/O connectors

Appearance	AC/DC type	Number of cable cores	Cable length (m)	Cable model	Compatible model
M12 Screw (Straight) 	for AC	2	2	XS2F-A421-DB0-F	WL□-□K13A-N WLG□-□K13A
			5	XS2F-A421-GB0-F	
		4	2	XS2F-A421-D90-F	WL□-□K43A-N WL□-□-AGJ-N WLG□-□K43A WLG□-□-AGJ03
			5	XS2F-A421-G90-F	
	for DC	2	2	XS2F-D421-DD0	WL□-□K13-N WL□-□-M1J-N WLG□-□K13 WLG□-□-M1J
			5	XS2F-D421-GD0	
			2	XS2F-D421-DA0-F	WL□-□-M1GJ□-N WLG□-□-M1GJ□
			5	XS2F-D421-GA0-F	
		4	2	XS2F-D421-D80-F	WL□-□K43-N WL□-□-M1JB-N WL□-□-DGJ-N WL□-□-DK1EJ-N WLG□-□K43 WLG□-□-M1JB WLG□-□-DGJ03 WLG□-□-DK1EJ03
			5	XS2F-D421-G80-F	
M12 Smartclick (Straight) 	for DC	4	2	XS5F-D421-D80-F	WL□-□-M1TJ-N WL□-□-M1TGJ-N WL□-□-M1TJB-N WL□-□-DTGJ-N WL□-□-DTK1EJ-N WLG□-□-M1TJ WLG□-□-M1TGJ WLG□-□-M1TJB WLG□-□-DTGJ03 WLG□-□-DTK1EJ03
			5	XS5F-D421-G80-F	

Note: For details, refer to the data sheet for XS2 Round Water-resistant Connectors (M12 Threads) or XS5 Round Water-resistant Connectors (M12 Smartclick).

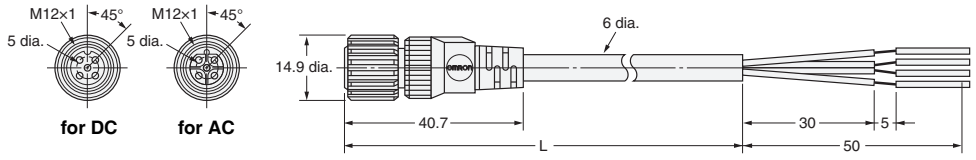
Type	Compatible model		Remarks			Model
Cover with indicator lamps *1	WL-N	General-purpose models Long-life models (Basic models, High-sensitivity Switches)	Indicator *1	LED	Color: Red	WL-LD-N
				Neon lamp	Color: Orange	WL-LE-N
		Spatter Prevention models		LED	Color: Red	WL-LDS-N
				Neon lamp	Color: Orange	WL-LES-N
	WLG	General-purpose models	Indicator	LED	Color: Red	WL-LD-K *2
		Long-life models		Neon lamp	Color: Orange	WL-LE-K *2
		Spatter Prevention models		LED	Color: Red	WL-LDS-K *2
				Neon lamp	Color: Orange	WL-LES-K *2
Terminal Plate	WL□-N		Change from bipolar to monopolar (contact C).			WL-N TERMINAL PLATE
Side mounting plate	WL□-2N-N		---			WLN-P001

*1. The default setting is for light-ON when not operating. Turn the lamp holder by 180° to change the setting to light-ON when operating.
*2. The WL-LD-K, WL-LE-K, WL-LDS-K, and WL-LES-K correspond with each set model WLG□, the design of which was changed in April 2019. Refer to the notes on page 75 for details.

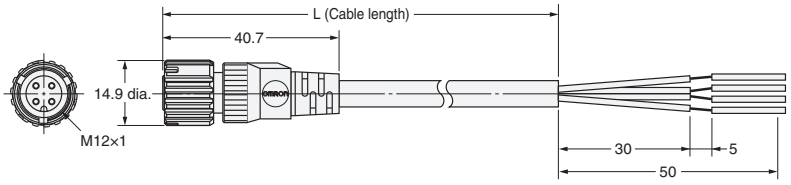
Dimensions

(Unit: mm)

Sensor I/O connectors
XS2F-A421-□□0-F
XS2F-D421-□D0
XS2F-D421-□□0-F

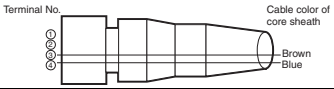
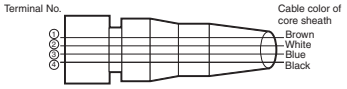
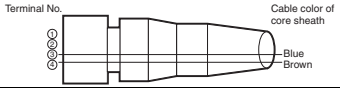
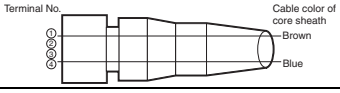


XS5F-D421-□80-F

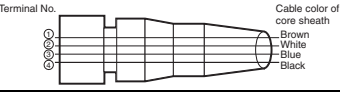


Wiring Diagram

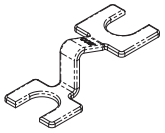
XS2F

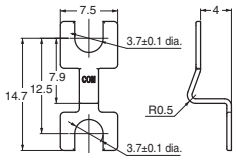
AC/DC Type	Two-core model		Four-core model	
	Model	Wiring Diagram	Model	Wiring Diagram
AC	XS2F-A421-DB0-F XS2F-A421-GB0-F		XS2F-A421-D90-F XS2F-A421-G90-F	
DC	XS2F-D421-DD0 XS2F-D421-GD0		XS2F-D421-D80-F XS2F-D421-G80-F	
	XS2F-D421-DA0-F XS2F-D421-GA0-F			

XS5F

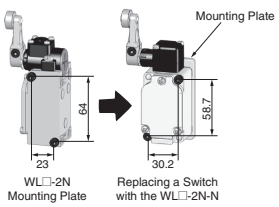
AC/DC Type	Four-core model	
	Model	Wiring Diagram
DC	XS5F-D421-D80-F XS5F-D421-G80-F	

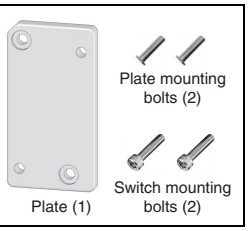
Terminal Plate
WL-N TERMINAL PLATE





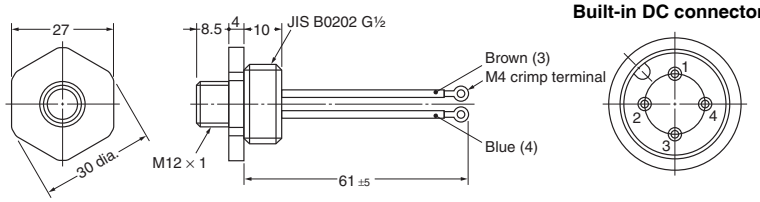
Side mounting plate
WLN-P001



Set contents	
	 Plate (1) Plate mounting bolts (2) Switch mounting bolts (2)

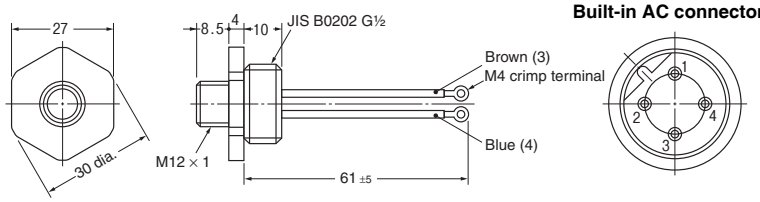
SC-2F

Built-in DC connector



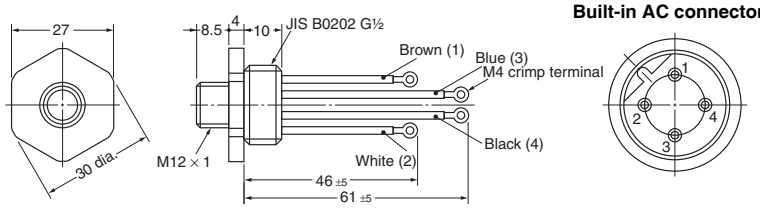
SC-2FAD

Built-in AC connector



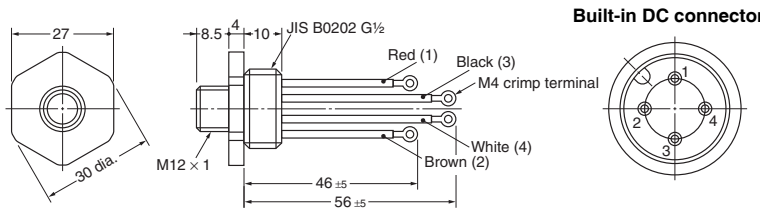
SC-4F4AD

Built-in AC connector



SC-4F4D

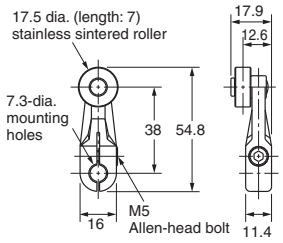
Built-in DC connector



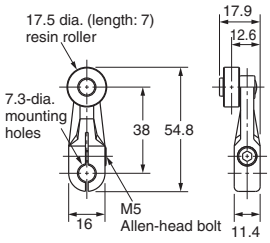
Note: 1. Each dimension has a tolerance of ±0.4 mm unless otherwise specified.
2. Figures in parentheses are connector pin numbers.

Actuators

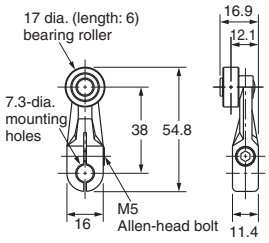
WL-1A100
Standard Lever



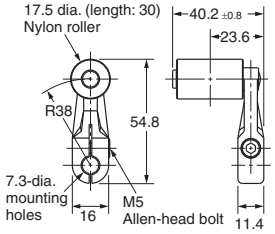
WL-1A115
Resin Roller



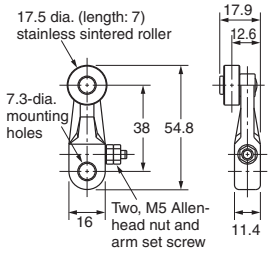
WL-1A400
Bearing Roller



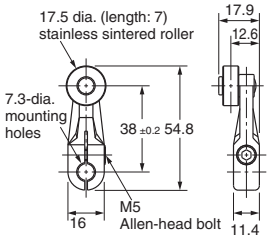
WL-1A118
Nylon Roller:
Roller Width: 30 mm



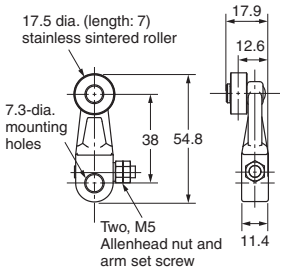
WL-1A105
Double Nuts



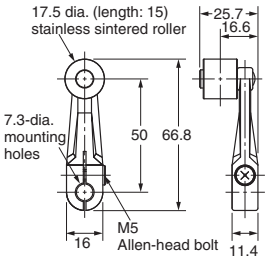
WL-1A103S
Spatter Prevention



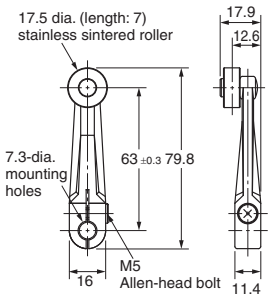
WL-105S
Spatter Prevention



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

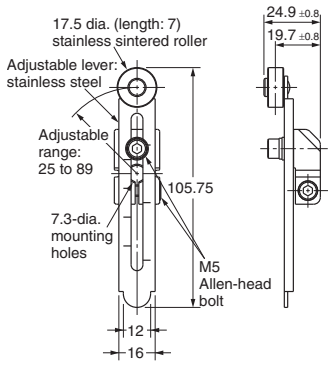


WL-1A300
Lever Length: 63

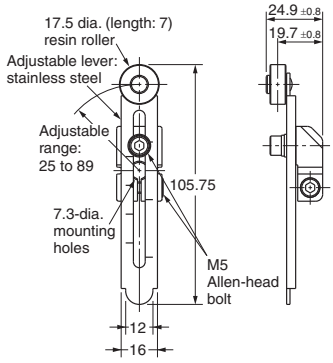


Note: Unless otherwise indicated, a tolerance of ±0.4 mm applies to all dimensions.

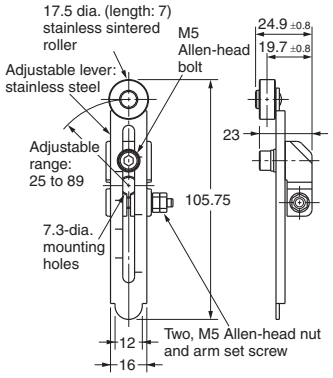
WL-2A100



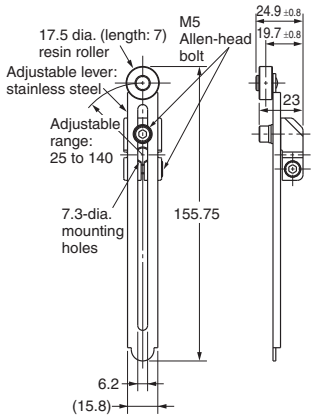
WL-2A111
Resin Roller



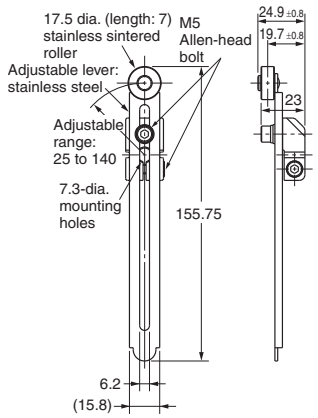
WL-2A107
Double Nuts



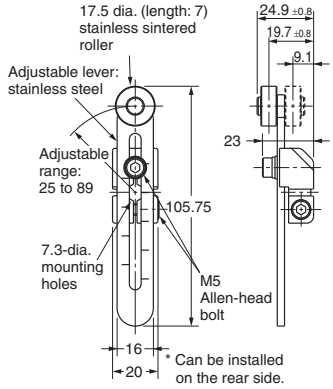
WL-2A108
Resin Roller



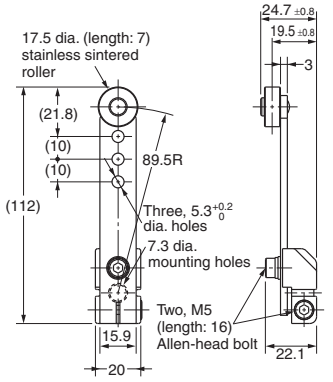
WL-2A122



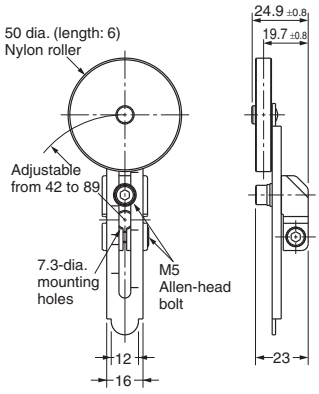
WL-2A106



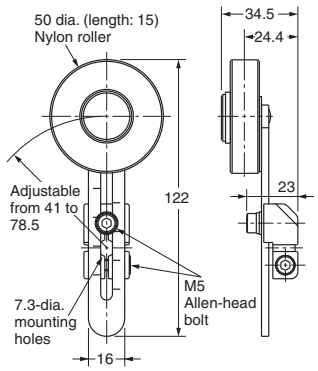
WL-2A130



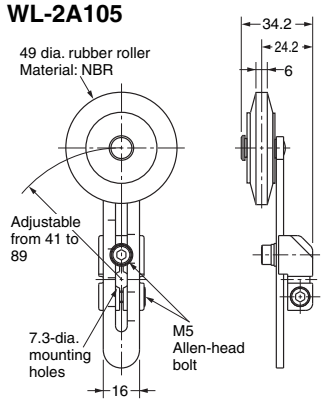
WL-2A104



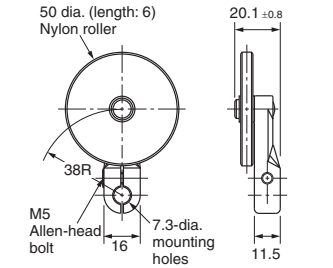
WL-2A110



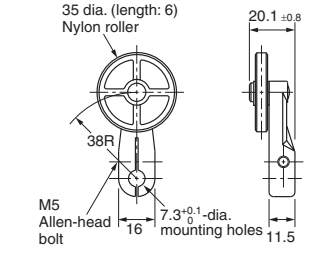
WL-2A105



WL-1A106

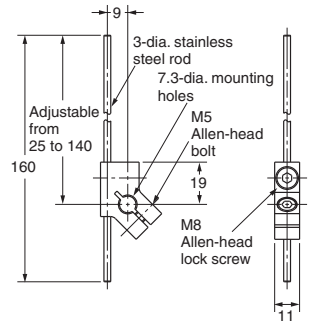


WL-1A110

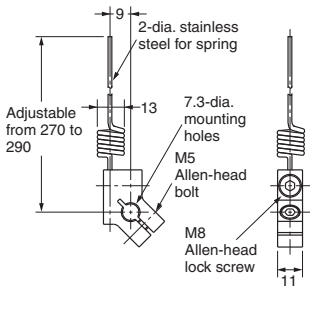


Note: Unless otherwise indicated, a tolerance of ±0.4 mm applies to all dimensions.

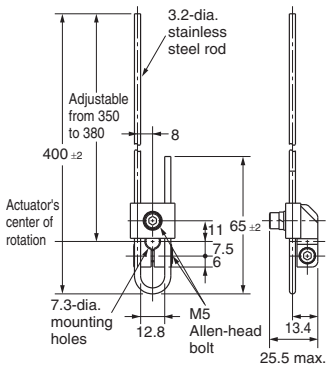
WL-4A100



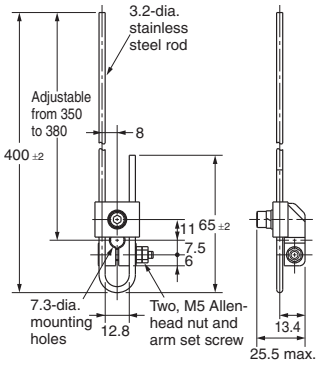
WL-4A201



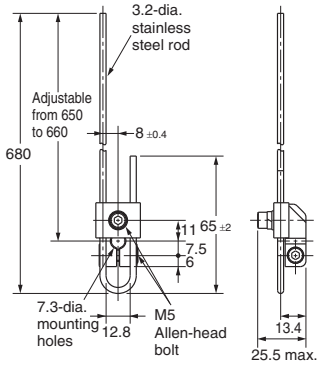
WL-3A100



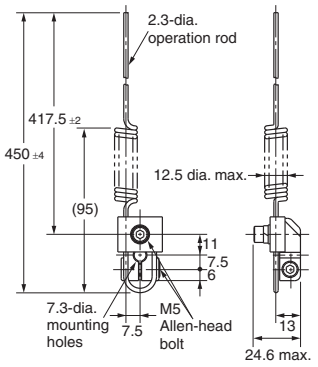
WL-3A106 Double Nut



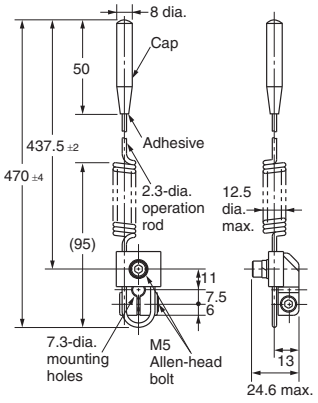
WL-3A108



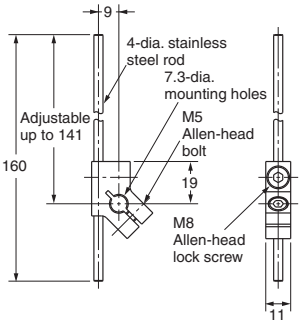
WL-3A200



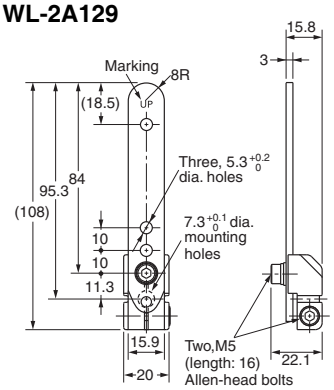
WL-3A203



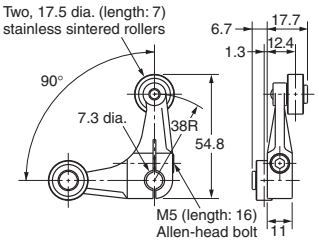
WL-4A112



WL-2A129

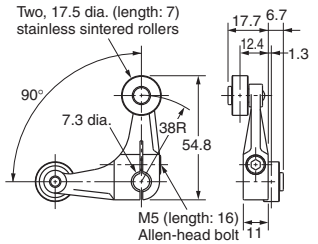


WL-5A101



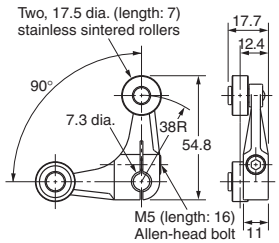
WL-5A100 has a plastic roller

WL-5A103



WL-5A102 has a plastic roller

WL-5A105



WL-5A104 has a plastic roller

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

Safety Precautions

For the Safety Precautions for All Limit Switches, refer to the OMRON website.

Meanings of Warning Signal Text

Precautions for Safe Use	Indicates an action that must be performed or avoided for safe use of this product.
Precautions for Correct Use	Indicates an action that must be performed or avoided for preventing operation failure or malfunction of the product or adverse impact on performance or functionality.

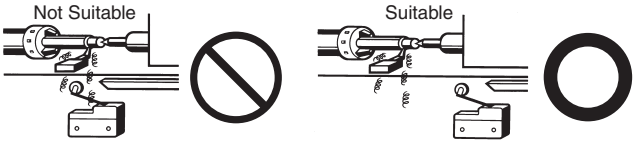
Precautions for Safe Use

- Be sure to ground. Otherwise electric shock may result.
- Do not touch charged switch terminals while the switch has carry current, Otherwise electric shock may result.
- Do not disassemble the limit switch or touch inside of it under supplying power, Otherwise electric shock may result.
- Do not disassemble or touch the inside while the power is turned on. Otherwise electric shock may result.
- Do not touch the wire or rod type actuator in order to prevent injury. Doing so may result in 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 EN/IEC/GB ratings, use a 10 A fuse that complies IEC60269, either type gG.
- The durability of switch is depends on the operating condition Be sure to check the condition with actual using condition before using, and use with the number of times of operating without a performance problem.
- Otherwise, there is the possibility of spoiling the normal operation. Do not drop the switch.
- Do not connect a Single Limit Switch to two power supplies that are different in polarity or type. Risk of interference.
- Be sure to keep the load current less than the rated value. Otherwise, there is the possibility that the switch may be damage and/or burnout.
- Do not use the Switch by itself in atmospheres containing flammable or explosive gases. Arcs and heating resulting from switching may cause fire or explosion.
- Be sure to prevent the foreign materials such like a scrapped cable intrusion in to the switch when wiring. Otherwise, there is the possibility of spoiling the normal operation.
- Never wire to the wrong terminals.
- Using the Switch in a pressed-in state for an extended period of time can accelerate part deterioration and also lead to failure to return to the original position. Check the Switch beforehand, and perform periodic inspection and replacement.
- 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.
  Where exposed to cutting powder, machining chips, oil, and chemicals inside the protective doors.
  Where exposed to cleansers, thinners, and other solvents
- Do not use or store the Switch in locations with corrosive gas, such as sulfuric gas (H_2S or SO_2), ammonium gas (NH_3), nitric gas (HNO_3), or chlorine gas (Cl_2), or high temperature and humidity. Otherwise, contact failure or corrosion damage may result.
- 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.
- If the Switch will not be switched ON or OFF for an extended period of time, contact reliability may degrade due to oxidation of the contact points, resulting in inadequate conductivity, which could lead to an accident.

Precautions for Correct Use

Operating Environment

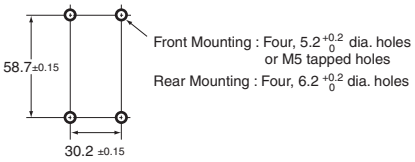
- This switch is only for indoor use. If it is used in outdoor, it may be cause of switch failure.
- Take special care to use where there is fine powder, mud and/or foreign materials stacking. And check the condition with actual using condition before using. Then use without a performance problem.
- Seal material may deteriorate if a Switch is used outdoor or where subject to special cutting oils, solvents, or chemicals. Always appraise performance under actual application conditions and set suitable maintenance and replacement periods.
- Install Switches where they will not be directly subject to cutting chips, dust, or dirt. The Actuator and Switch must also be protected from the accumulation of cutting chips or sludge.



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

Installing the Switch

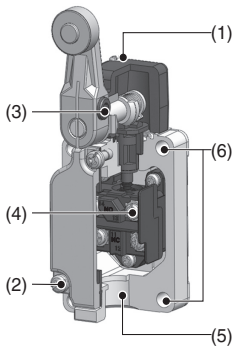
- To install the Switch, make a mounting panel, as shown in the following diagram, and tighten screws using the appropriate tightening torque.



* If the conduit size and ground terminal specifications are “with TS 1/2-14NPT ground terminal”, the back mounting hole is 4-6.2 dia. $^{+0.2}_{0}$.

Appropriate Tightening Torque

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



No.	Item	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 Allen-head bolt
(3)	Allen-head bolt (for securing the roller 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)	Connectors	1.77 to 2.16 N·m	G1/2 or Pg13.5 or M20 or 1/2-14NPT
(6)	Unit mounting screw	4.90 to 5.88 N·m	M5 screw
	Back mounting screws	4.90 to 5.88 N·m	M6 screw

Using Switches for Micro Loads

- 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.

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

Note: The P level indicates the standard malfunction level at a reliability level of 60% (λ_{60}). (JISC5003) $\lambda_{60} = 0.1\times10^{-6}$/ operations indicates that the estimated malfunction rate is less than 1/10,000,000 operations with a reliability level of 60%.

Wiring

In the case of mounting screw

Basic models

- Use M3.5-nylon insulation covered crimp terminals (round type) for wiring. Ex.) N1.25-M3.5 (RAP1.25-3.5) (J.S.T. Mfg. Co.,Ltd.)
- Appropriate wire size is AWG16 (1.25 mm^2).
- Do not supply electric power when wiring. Otherwise electric shock may result.
- Do not pull out the wires with excessive force. It may cause of coming off the wire.
- Avoid connecting the wires directly to the terminal. Instead, attach using a crimp terminal.
- In the case of indicator unit, to avoid interference between lump unit and crimp terminals, wire according to right wiring figure.
- Attach the indicator unit spring to terminal screw certainly, otherwise it's possible to be destroyed or shorted.
- The ground terminal is only installed on models with ground terminals.

In the case of prewired connector and direct connector

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

How to handle

Changing direction of the head

- By removing two head screws or four head screws, mounting in any of four orientations is possible. Be sure to change the plunger for internal operations at the same time.

Built-in Switch

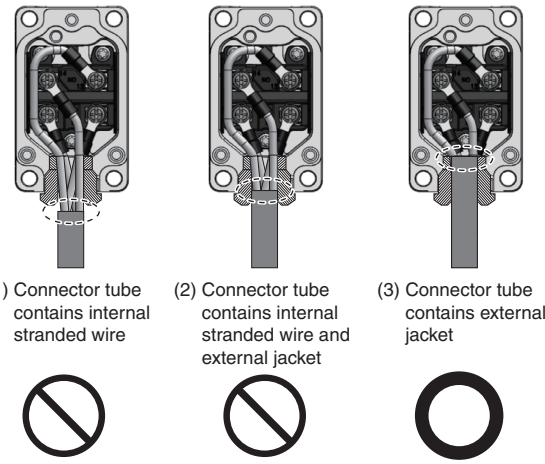
- Do not remove or replace the built-in switch. Risk of malfunctioning.

Overtravel Markers

- All Switches with Roller Lever Actuators except for Switches with Fork Lock Levers and Low-temperature Switches have a set position marker plate.
- To allow the roller lever type actuator to travel properly, set the roller lever according to the dog or cam stroke so that the arrowhead of the lever is positioned within the overtravel markers (pages 15, 16). This enables usage in the optimum state.

Conduit opening preparation

- The connector must be tightened at a suitable tightening torque (1.77 to 2.16 N). Tightening with excessive torque could damage the case.
- Select the connector based on the sealed rubber inner diameter for matching the cable outer diameter. For details, refer to Accessories (Sold Separately) - *Connector (Conduit size: JIS B0202G1/2)* on page 76.
- When mounting the connector, use seal tape (not needed if the connector includes an O-ring) on the threaded section of the connector to ensure sealing performance.
- To ensure compliance of this Switch with the CSA standards, use of a waterproof connector compliant with the CSA is recommended.
- Using an inappropriate connector or assembling Switches incorrectly (assembly, tightening torque) can result in malfunction, leakage current, or fire, so be sure to read the connector instruction manual thoroughly beforehand.
- Even when the connector is assembled and set correctly, the end of the cable and the inside of the Switch may come in contact. This can lead to malfunction, leakage current, or fire, so be sure to protect the end of the cable from splashes of oil or water and corrosive gases.
- The following wiring is recommended for preventing the entry of fluids from the conduit opening.



(1) Connector tube contains internal stranded wire

(2) Connector tube contains internal stranded wire and external jacket

(3) Connector tube contains external jacket

Microload Applications

- The WL-N basic model, WLG high-sensitivity model, and high-precision model 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.

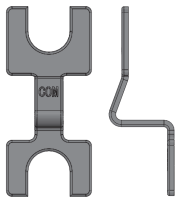
Operaition indicator

Indicator-equipped switch has contacts and indicator in parallel. When contacts are open, leakage current flows through the indicator circuit and may cause load's malfunction. Leakage current may cause load malfunction (i.e., the load may remain ON). Make sure that the load operating current is higher than the leakage current. For countermeasures, refer to technical support on your OMRON website.

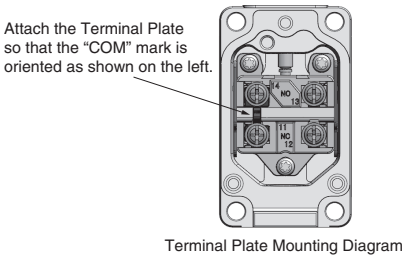
Terminal Plate

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

WL-N TERMINAL PLATE



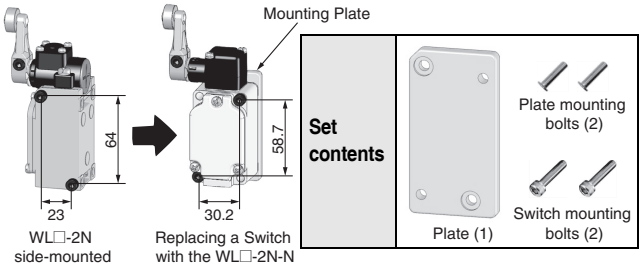
Terminal Plate



Terminal Plate Mounting Diagram

To customers using the WL□-2N series model in a side-mounted configuration

We provide a special mounting plate (sold separately) that features mounting compatibility when replacing with the WL□-2N-N series. If you use the Mounting Plate, the Switch mounting holes and actuator position will be compatible. Note: The position of the dog remains unchanged.



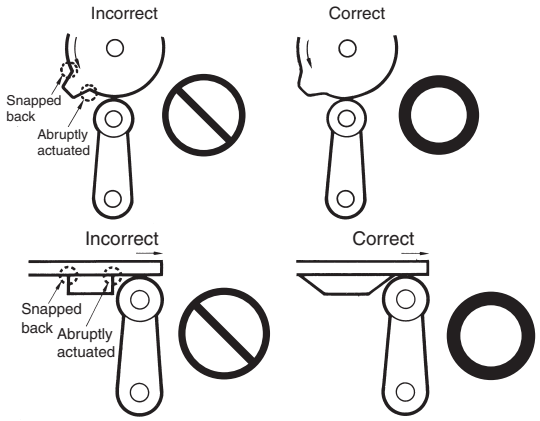
WL□-2N side-mounted

Replacing a Switch with the WL□-2N-N

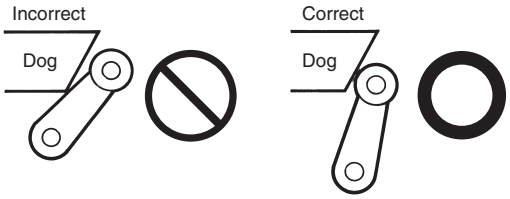
Operation Procedures

Operation

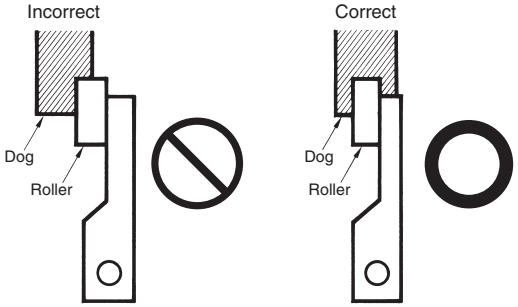
- Carefully determine the position and shape of the dog or cam so that the actuator will not abruptly snap back, thus causing shock. In order to operate the Limit Switch at a comparatively high speed, use a dog or cam that keeps the Limit Switch turned ON for a sufficient time so that the relay or valve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



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

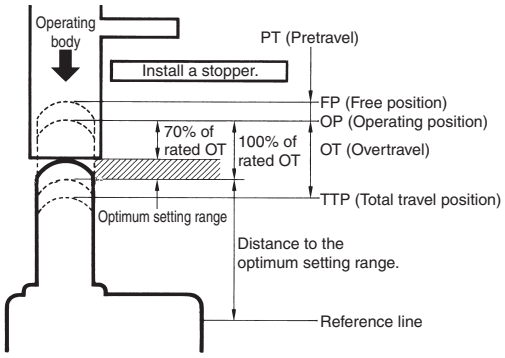


- Unbalanced force must not be imposed on the actuator. Otherwise, wear and tear on the actuator may result.

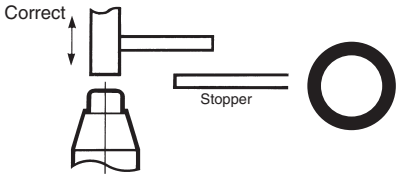


- With a roller actuator, the dog must touch the actuator at a right angle. The actuator or shaft may deform or break if the dog touches the actuator (roller) at an oblique angle.

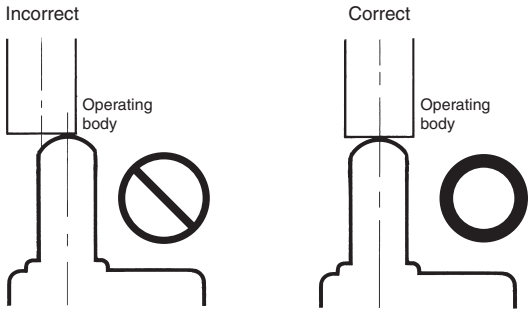
- Mount so that the actuator travel after operation (OT) is not exceeded. If the travel after operation (OT) exceeds the limit, switch failure could result. When mounting the Limit Switch, be sure to adjust the Limit Switch carefully while considering the whole movement of the actuator.



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



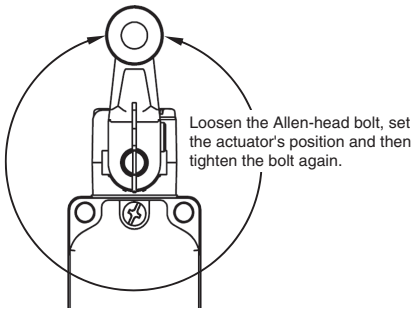
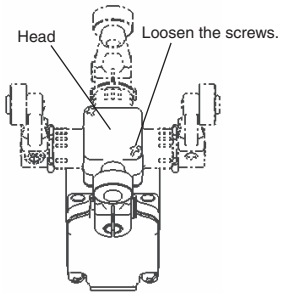
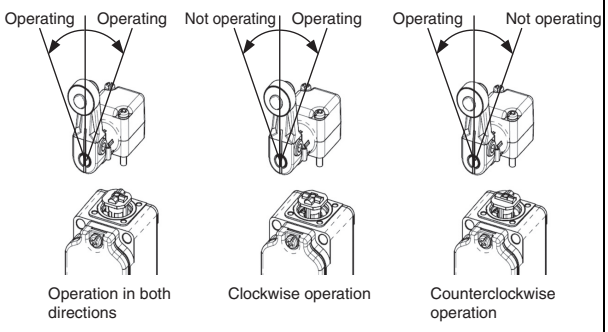
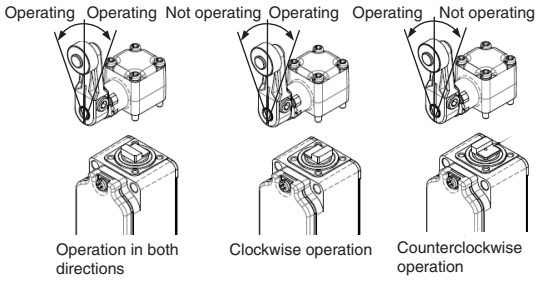
- When using a pin-plunger actuator, make sure that the stroke of the actuator and the movement of the dog are located along a single straight line.

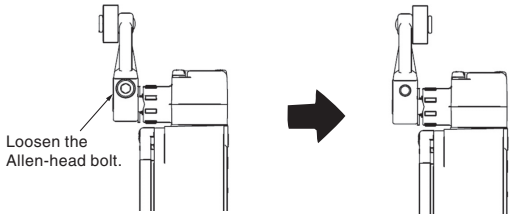
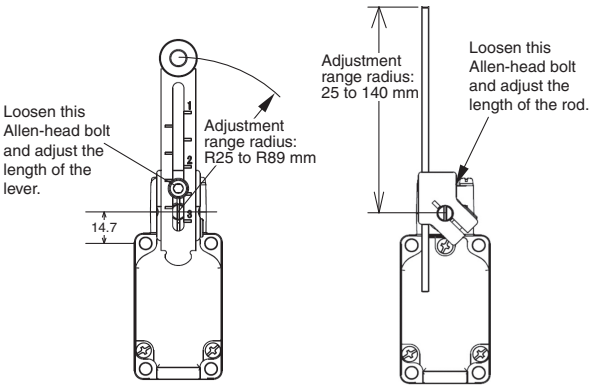
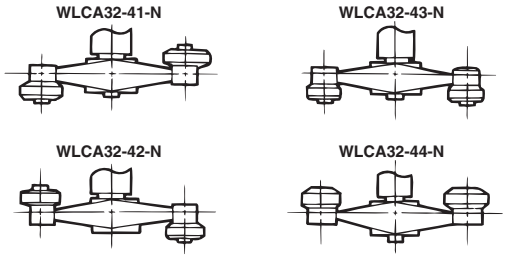


Others

- If the Switch will be left in a location outside the storage environment conditions, if condensation has formed, or after long-term storage exceeding one year, at the minimum, check the operating characteristics, contact resistance, insulation resistance, and dielectric strength, and conduct a check under the operating conditions.
- If using normal open (NO), be sure to fully press in the actuator. The proper press-in depth is 70 to 100% of rated OT.
- Conduct periodic inspection on a regular schedule.

Using the Switches

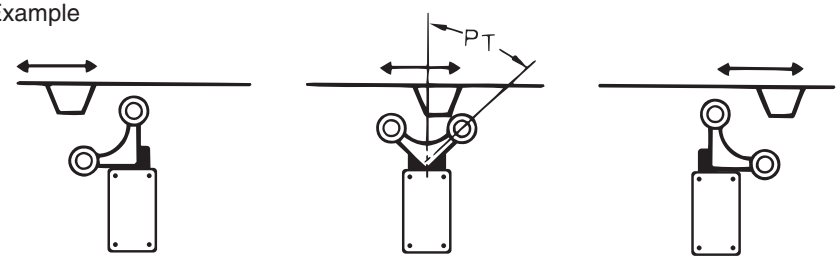
Item	Applicable models and Actuators	Details
Changing the Installation Position of the Actuator By loosening the Allen-head bolt on the actuator lever, the position of the actuator can be set anywhere within the 360°. With Operation Indicator-equipped Switches, the actuator lever comes in contact with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

Item	Applicable models and Actuators	Details
Installing the Roller on the Inside By installing the roller lever in the opposite direction, the roller can be installed on the inside. (Set so that operation can be completed within a 180° level range.)	Roller lever: (WLCA2-N, WLCA2-2-N, WLCA2-2N-N, WLG2, WLCA2-7-N, WLCA2-8-N, WLGCA2, WLMCA2-N, WLMG2, WLMGCA2) Fork lock lever (WLCA32-4□-N)	
Adjusting the Length of the Rod or Lever The length of the rod or lever can be adjusted by loosening the Allen-head bolt.	Adjustable roller lever (WLCA12-N, WLCA12-2-N, WLCA12-2N-N, WLG12) Adjustable rod lever (WLCL-N, WLCL-2-N, WLCL-2N-N, WLGL, WLCAL4-N)	 **Adjustable Roller Levers:** **Adjustable Rod Levers:**
Selecting the Roller Position There are four types of Switches with Fork Lock Levers for use depending on the roller position.	Fork lock lever: (WLCA32-4□-N)	 An explanation of the operation of fork lock levers is provided after this table.

Operation of Fork Lock Levers

A Switch with a Fork Lock Lever is constructed so that the dog pushes the lever to invert the output and this inverted state is maintained even after the dog moves on. If the dog then pushes the lever from the opposite direction, the lever will return to its original position.

Example



NC terminal: ON NO terminal: ON NO terminal: ON

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