

Limit switches

Omron designs and manufactures an extensive range of high-quality limit switches that bring easier, more effective switching solutions to machines and systems.

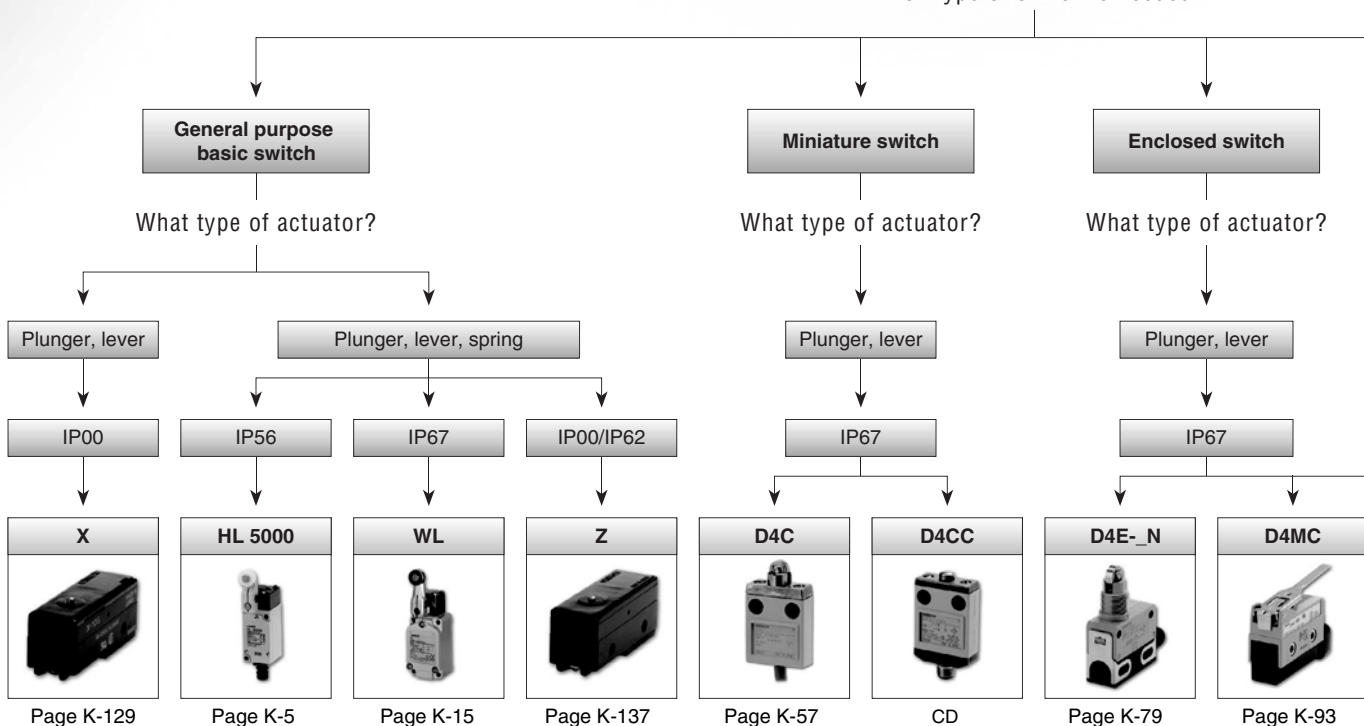
Models are available with a variety of roller lever heads, as well as various types of plunger heads. Better seals, higher resistance to shock and stronger covers make these switches the perfect solution for any industrial application, even in extreme environmental conditions.

These general purpose limit switches are ideal for use in applications across the industry including lifts, garages, production lines, safety doors, machine tools, automotive, security, domestic goods and vending machines.

- More contacts for increased functionality
- Compact, space-saving design without compromising on safety performance
- Robust construction for operating in the harshest of conditions
- Cost-effective, high-performance switches meeting the highest safety standards
- UL / CSA, TÜV, BIA, SUVA approvals
- Designed for global use



Which type of switch is needed?



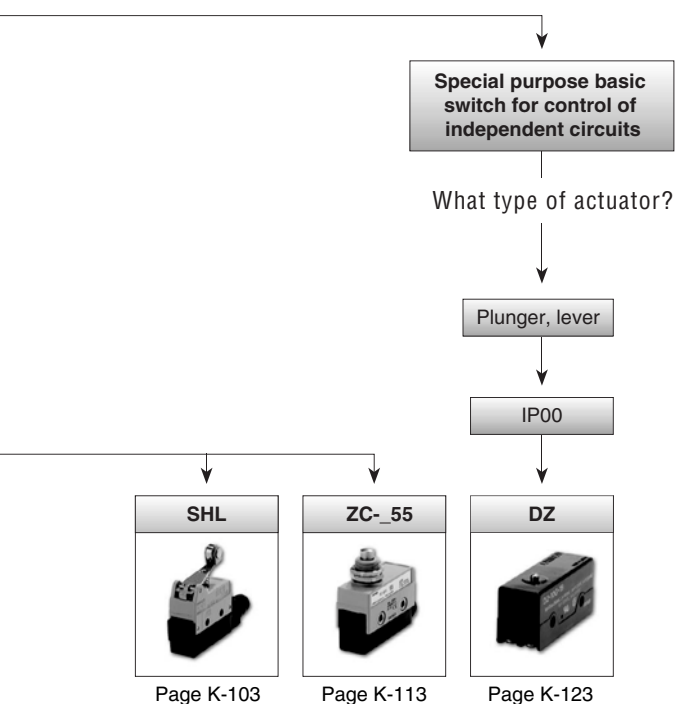









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Selection table

Category		Standard switches			Miniature switches		Enclosed switches		
									
Selection criteria	Model	D4A-N	HL-5000	WL	D4C	D4CC	D4E-N	D4MC	
	Category		General purpose switches		Special purpose switches				
	Degree of protection	IEC	IP67		IP67		IP67		
		JIS	Immersion-proof	Jet-proof	Immersion-proof	Immersion-proof			
	Rated current [A]	5 VDC							
		12 to 24 VDC							
		30 VDC		5		4	1	1	6
		125 / 250 VDC							
		24 VAC							
		115 VAC							0.5
		125 VAC	10	5	10	5	1	5	10
		100 to 240 VAC							
		250 VAC	10	5	10	5			10
		480 VAC	10		10				3
500 VAC				10					
Features	Weather resistant models		■		W				
	Microload type				0.1 A		0.1 A	0.1 A	
Actuators	Operation indicator		■		0.1 A		■	■	
	Adjustable rod lever		■		■				
	Adjustable roller lever		■						
	Bevel plunger				■		■		
	Center roller lever		■				■		
	Coil spring		■						
	Cone-shaped actuator								
	Cross roller plunger				■		■		
	Flexible rod		■						
	Fork lever lock								
	Hemispheric actuator				■				
	Hinge lever							■	
	Hinge roller lever							■	
	Hinge cross roller lever								
	Horizontal plunger		■						
	Horizontal roller plunger		■		■				
	Horizontal ball plunger		■		■				
	Leaf spring				■				
	Long hinge lever								
	Low force hinge lever								
	Low force wire hinge lever								
	One-way action hinge roller lever								
	One-way action short hinge roller lever							■	
	One-way action roller lever							■	
	Panel mount plunger				■			■	
	Panel mount pin plunger				■		■		
	Panel mount roller plunger				■		■	■	
	Panel mount cross roller plunger				■		■	■	
	Pin plunger				■		■	■	
	Plastic rod		■				■		
	Reverse hinge lever								
	Reverse hinge roller lever								
	Reverse short hinge roller lever								
	Rod spring lever								
	Roller leaf spring								
	Roller lever							■	
	Roller lever		■		■			■	
	Roller lever		■						
	Roller plunger		■		■		■	■	
	Sealed cross roller plunger				■		■	■	
	Sealed plunger		■		■		■	■	
	Sealed plunger roller		■		■		■	■	
	Short hinge cross roller lever				■				
	Short hinge lever							■	
	Short hinge roller lever								
	Short spring plunger								
	Side plunger		■						
	Side roller plunger horizontal		■		■				
	Side roller plunger vertical		■		■				
	Slim spring plunger				■				
	Spring plunger								
	Top ball plunger								
	Top plunger		■		■				
	Top roller plunger		■		■				
	Unidirectional short hinge roller lever								
	Variable rod lever		■						
	Variable roller lever		■						
	Wobble stick				■				

Limit switches

[illegible]

LEADING IN SERVICE

Focussed, progressive, distinctive. Be assured, choose Omron

At Omron we set high standards for ourselves. Our products are known all over the world for their unrivalled quality. But we offer more than just excellent quality. In an environment that places ever greater demands with regard to service, quality and costeffectiveness, other things are important too. Providing a top-quality service is what we do every day, including extra service as standard. This helps to ensure that we can provide tailor-made solutions for applications more effectively and more quickly.

More and more companies are choosing Omron as they seek to work in a partnership that is based on reliability and certainty.

Omron – the reassuring choice.



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Our products carry all relevant international standards and approvals, including CCC (Chinese Compulsory Certification), which makes exporting your system much easier.

- Reliability, also for your customers
- Maximum flexibility
- Confidence



5-day repair service

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EPLAN for Omron products

The majority of standard Omron products are provided in digital EPLAN format, which means that a few clicks of your mouse are all that is needed to design the right product into your switching panel.

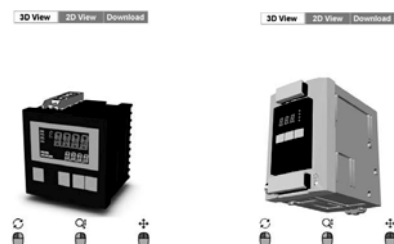
For more information please visit: <http://omron-industrial.com/en/eplan/>

- Very easy to use
- Always the right product
- Reduced engineering time

Downloadable 2-D and 3-D CAD drawings

Designers of switching panels and machines can download clear 2-D and 3-D CAD drawings for all current products from <http://omron-industrial.com/en/2D3D>, which can easily be incorporated into your design.

- Large number of formats supported for greater flexibility
- Readily available
- Convenience that saves you time



General-purpose Limit Switch

HL-5000

Economical, Miniature Limit Switch Boasting Rigid Construction

- Highly rigid construction (head and cover snugly fit in box).
- Dustproof and drip-proof construction.
- Smooth operation with greater OT.
- Easy-to-wire conduit opening design.
- Models with grounding terminals conform to the CE marking.
- Approved by CCC (Chinese standard).



Model Number Structure

Model Number Legend

HL-5□□
1 2

1. Actuators

- 000: Roller lever
- 030: Adjustable roller lever
- 050: Adjustable rod lever
- 100: Sealed plunger
- 200: Sealed roller plunger
- 300: Coil spring

2. Ground Terminal Specifications

- Blank: Without ground terminal
- G: With ground terminal/M5 tapping on the rear side

Ordering Information

List of Models

Actuator	Roller lever ○	Adjustable roller lever ⤴	Adjustable rod lever ↙	Sealed plunger ⬮	Sealed roller plunger ⬮○	Coil spring ↗
Model	HL-5000	HL-5030	HL-5050	HL-5100	HL-5200	HL-5300

Note: HL-5000 Limit Switches are offered with a choice of ground terminal/M5 tapping on the rear side conforming to various standards. When placing an order, add the code to the model number to indicate if ground terminal/M5 tapping on the rear side is required.
-G: with ground terminal/M5 tapping on the rear side.

Limit switches

Individual Parts (Head/Actuator)

Actuator type	Switch model number	Assembled head (head and lever)	Head (individual)	Lever (individual)
Roller lever	HL-5000	HL-1HPH100 (HL5 0031A)	HL-1HPH01 (HL5 0028A)	HL-1HPA100 (HL5 0025G)
Adjustable roller lever	HL-5030	HL-1HPH300 (HL5 0034F)	HL-1HPH01 (HL5 0028A)	HL-1HPA300 (HL5 0026E)
Adjustable rod lever	HL-5050	HL-1HPH500 (HL5 0037M)	HL-1HPH01 (HL5 0028A)	HL-1HPA500 (HL5 0027C)
Sealed plunger	HL-5100	HL-2HPH100 (HL5 0044C)	---	---
Sealed roller plunger	HL-5200	HL-2HPH200 (HL5 0041R)	---	---
Coil spring	HL-5300	HL-3HPH100 (HL5 0042G)	---	---
Remote control	HL-5500	HL-5HPH100 (HL5 0043E)	---	---

Specifications

■ Approved Standards

Agency	Standard	File No.
CCC (CQC)	GB14048.5	2003010303077624

Note: Ask your OMRON representative for information on approved models.

■ Approved Standard Ratings

CCC (GB14048.5)

Applicable category and ratings
AC-15 3 A/250 VAC

■ General Ratings

Rated voltage	Non-inductive load				Inductive load			
	Resistive load		Lamp load		Inductive load		Motor load	
	NC	NO	NC	NO	NC	NO	NC	NO
125 VAC	5 A		1.5 A	0.7 A	3 A		2 A	1 A
250 VAC	5 A		1 A	0.5 A	3 A		1.5 A	0.8 A
12 VDC	5 A		3 A		4 A		3 A	
24 VDC	5 A		3 A		4 A		3 A	
125 VDC	0.4 A	0.2 A	---		---		---	
250 VDC	0.4 A	0.2 A	---		---		---	

Inrush current	NC	24 A max.
	NO	12 A max.

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

■ Characteristics

Degree of protection	IP65
Durability (see note 3)	Mechanical: 10,000,000 operations min. (under rated conditions) Electrical: See the following <i>Electrical Durability</i> .
Operating speed	5 mm/s to 0.5 m/s
Operating frequency	Mechanical: 120 operations/min Electrical: 30 operations/min
Insulation resistance	100 MΩ min. (at 500 VDC)
Contact resistance	25 mΩ max. (initial value)
Dielectric strength	1,000 VAC, 50/60 Hz for 1 min between terminals of the same polarity 1,500 VAC, 50/60 Hz for 1 min between current-carrying metal parts and ground, and between each terminal and non-current-carrying metal part
Rated frequency	50/60 Hz
Vibration resistance	Malfunction: 10 to 55 Hz, 1.5-mm double amplitude (see note 4)
Shock resistance	Destruction: 1,000 m/s ² min. Malfunction: 300 m/s ² min. (see note 4)
Ambient temperature	Operating: -5°C to 65°C (with no icing)
Ambient humidity	Operating: 95% max.
Weight	Approx. 130 to 190 g

Note: 1. The above figures are initial values.

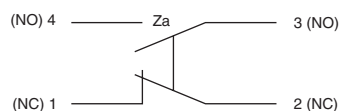
2. The above characteristics may vary depending on the model. For further details, contact your OMRON sales representative.

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

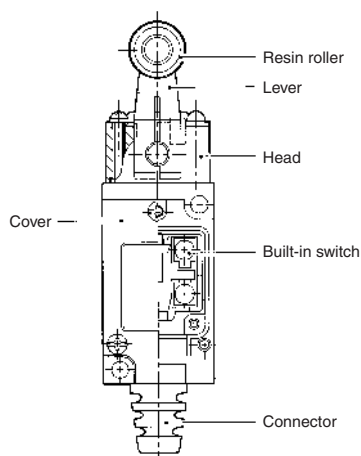
4. These values do not apply to the coil spring model.

Connections

■ Contact Form



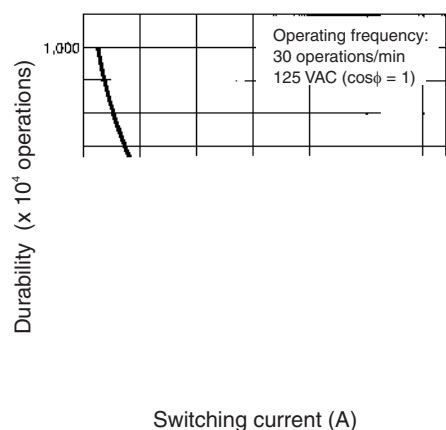
Nomenclature



Engineering Data

■ Electrical Durability ($\cos\phi=1$)

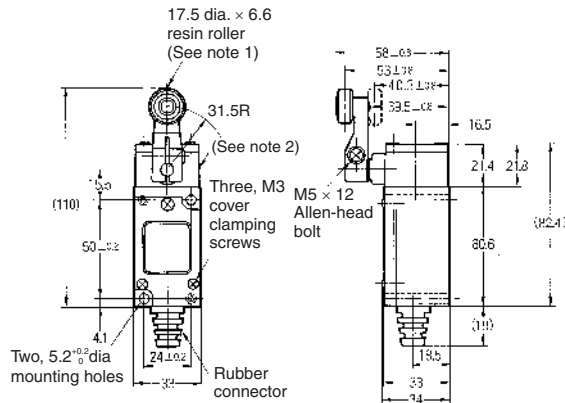
Operating temperature: 5°C to 35°C
Operating humidity: 40% to 70%



Dimensions

Note: 1. All units are in millimeters unless otherwise indicated.
2. Unless otherwise specified, a tolerance of ± 0.4 mm applies to all dimensions.

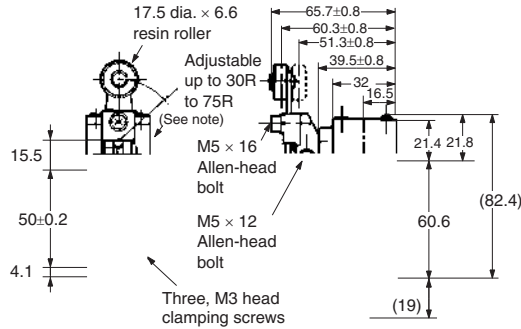
Roller Lever HL-5000



Note: 1. The head can be mounted anywhere in 360°.
2. The head can be mounted in any of the four directions.

Model	HL-5000
OF max.	7.35 N
RF min.	0.98 N
PT max.	20°
OT min.	50°
MD max.	12°
OP	---

Adjustable Roller Lever HL-5030

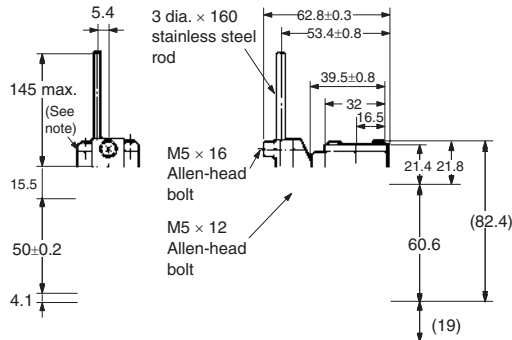


Note: The head can be mounted in any of the four directions. Dimensions not shown are the same as HL-5000.

Model	HL-5030 (see note)
OF max.	7.35 N
RF min.	0.98 N
PT max.	20°
OT min.	50°
MD max.	12°
OP	---

Note: Measured with the types of the 31.5-mm arm or rod length.

Adjustable Rod Lever HL-5050

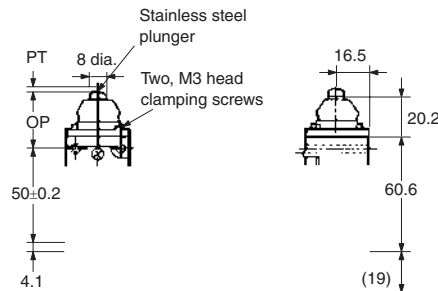


Note: The head can be mounted in any of the four

Model	HL-5050 (see note)
OF max.	7.35 N
RF min.	0.98 N
PT max.	20°
OT min.	50°
MD max.	12°
OP	---

Note: Measured with the types of the 31.5-mm arm or rod length.

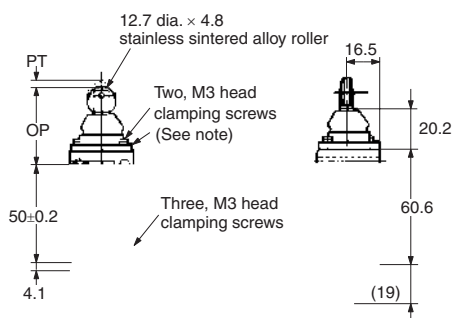
Sealed Plunger HL-5100



Note: Dimensions not shown are the same as HL-5000.

Model	HL-5100
OF max.	8.83 N
RF min.	1.47 N
PT max.	1.5 mm
OT min.	4 mm
MD max.	1 mm
OP	30 ± 0.8 mm

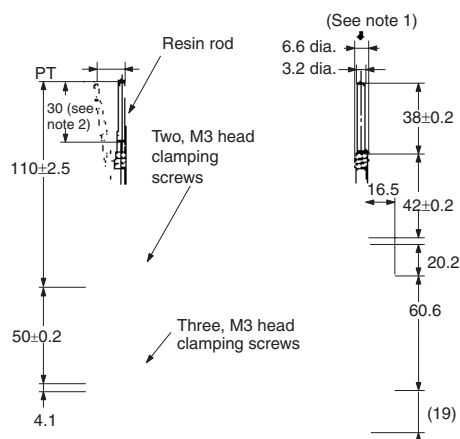
Sealed Roller Plunger HL-5200



Note: The head can be mounted in either of the two directions. Dimensions not shown are the same as HL-5000.

Model	HL-5200
OF max.	8.83 N
RF min.	1.47 N
PT max.	1.5 mm
OT min.	4 mm
MD max.	1 mm
OP	40±0.8 mm

Coil Spring HL-5300



Note: 1. The coil spring may be operated from any directions except axial directions (↓).
2. The operating range of the dog or cam is the top third (i.e. from the tip of the rod) of the whole actuator.
3. Dimensions not shown are the same as HL-5000.

Model	HL-5300
OF max.	1.47 N
RF min.	---
PT max.	30 mm
OT min.	---
MD max.	---
OP	---

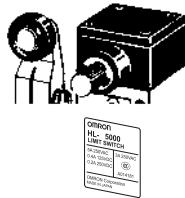
Note: OF and RF measured at the arm length of 75 mm for HL-5030, and 145 mm for HL-5050 (reference values).

Model	HL-5030	HL-5050
OF	3.09 N	1.60 N
RF	0.41 N	0.22 N

Installation

Actuator Position Change (HL-5000, HL-5030, HL-5050)

To change the angle of the actuator, loosen the Allen-head bolt on the side of the actuator lever. Then the actuator can be set at any angle.



Loosen the Allen-head bolt

Head Direction Change (HL-5000, HL-5030, HL-5050, HL5200)

To change the head direction, loosen the two mounting screws. Then the head can be changed at 90° increments in one of four directions.

The head of the HL-5200 can be mounted in two directions only. Refer to the following illustration.

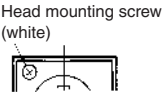
HL-5000 HL-5030



Head mounting screw (Small white screw that can be turned with either a Phillips-head or flat-blade screwdriver)

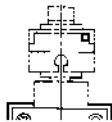
Head mounting screw (Black non-removable torque screw)

HL-5200



Head mounting screw (white)

HL-5050



Head mounting screw (Small white screw that can be turned with either a Phillips head or flat-blade screwdriver)

Head mounting screw (Black non-removable torque screw)

Precautions

Refer to the "Precautions for All Switches" on CD.

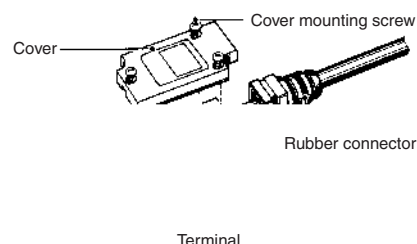
Correct Use

Wiring

Wiring Procedure

1. Loosen the cover mounting screws and remove the cover.
2. Disconnect the rubber connector from the box conduit and press-fit a solderless terminal. The following solderless terminals are available.
3. After inserting the solderless terminal into the Switch, tighten the terminal screws securely.

4. After wiring the Limit Switch, insert the rubber connector into the groove of the box securely.
5. Tighten the three mounting screws evenly. The optimum tightening torque for each screw is 0.49 to 0.59 N·m.



Applicable Lead Wires

Wire name	Applicable wire		
	Number of conductors	Conductor size	External size
Vinyl cabtire cord (VCTF)	2 3 4	0.75 mm ²	Round, 6 to 9 dia. Flat, 9.4 max.
Vinyl cabtire cable (VCT)	2	0.75 mm ²	
600-V vinyl-insulated sheath cable	2	1 dia./1.2 dia./1.6 dia.	

Note: Do not use wires containing silicone, otherwise a contact failure may result.

Applicable Solderless Terminal

The following solderless terminals are available. Do not use fork or any other type of terminals, otherwise an accidental disconnection resulting in a ground fault may result.

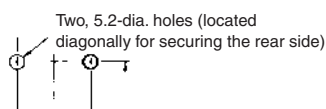
Bare terminal		Terminal with insulated grip	
Fig. 1 6.4 max. 10 max. 3.0 to 3.7 dia.	Fig. 2 6.4 max. 10 max. 3.0 to 3.7 dia.	Fig. 3 6.4 max. 14 max. 3.0 to 3.7 dia.	Fig. 4 6.4 max. 14 max. 3.0 to 3.7 dia.

Mounting

To mount the Limit Switch securely, be sure to use two M5 Allen-head bolts and washers. The tightening torque applied to each bolt is 4.90 to 5.88 N·m. To mount the Limit Switch more securely, use two M5 screw holes on the rear panel and rear holes for positioning if the model is the HL-5□□□G-Series Limit Switches.

If high-sealing performance is required along with shielded wiring or conduit wiring, use the D4C or WL.

Mounting holes



Two, M5 screws or 5.2-dia. holes (located diagonally for securing the front side)

Only the HL-5□□□G has M5 x 0.8 screw holes on the rear side.

Others

Do not use the Limit Switch outdoors, otherwise the Limit Switch will become damaged by rust or ozone.

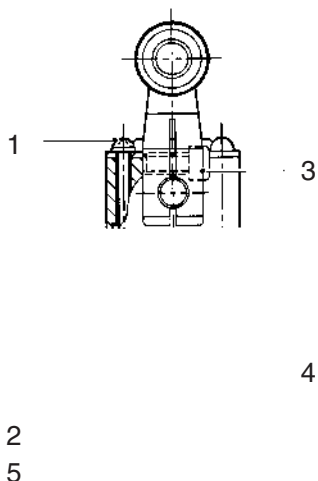
The Limit Switch is not suitable in places exposed to the spray of rainwater, seawater, or oily water. Consult your OMRON representative for models resisting rainwater, seawater, and oily water.

Tightening Torque

A loose screw may result in a malfunction. Be sure to tighten each screw to the proper tightening torque as shown below.

No.	Type	Optimum tightening torque
1	Head mounting screw	0.49 to 0.59 N·m
2	Cover mounting screw	0.49 to 0.59 N·m
3	Allen-head bolt	4.90 to 5.88 N·m
4	Terminal screw (M3 screw)	0.49 to 0.59 N·m
5	Switch mounting screw (M5 Allen-head bolt)	4.90 to 5.88 N·m

Note: If the head direction has been changed, check the torque of each screw and make sure that the screws are free of foreign substances, and that each screw is tightened to the proper torque.



ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.

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

Cat. No. C004-E2-11

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

Two-circuit Limit Switch

WL

Wide Selection of Two-circuit Limit Switches

- A wide selection of models are available, including the overtravel models with greater OT, lamp-equipped models for checking operation, low-temperature and heat-resistant models, and microload models.
- Microload models are added to the product lineup.
- Meets EN/IEC standards (only Switches with ground terminals).
- Switches with ground terminals have the CE marking.



Model Number Structure

■ Model Number Legend

General-purpose Models/Environment-resistant Models

WL□□-□□□□□□□□
1 2 3 4 5 6 7 8 9 10

1. Electrical Rating

Blank: Standard
01: Micro

2. Actuator and Head Specifications

Symbol	Actuator type
CA2	Roller lever: Standard model (R38)
CA2-7	Roller lever: Standard, standard model (R50)
CA2-8	Roller lever: Standard, standard model (R63)
H2	Roller lever: Overtravel, general-purpose model, 80°
G2	Roller lever: Overtravel, high-sensitivity, 80°
CA2-2N	Roller lever: Overtravel, 90°
GCA2	Roller lever: High-precision
CA12	Adjustable roller lever: Standard
H12	Adjustable roller lever: Overtravel, general-purpose model, 80°
G12	Adjustable roller lever: Overtravel, high-sensitivity, 80°
CA12-2N	Adjustable roller lever: Overtravel, 90°
CL	Adjustable rod lever: Standard
HL	Adjustable rod lever: Overtravel, general-purpose model, 80°, 25 to 140 mm
HLAL4	Adjustable rod lever: Overtravel, general-purpose model, 80°, 350 to 380 mm
GL	Adjustable rod lever: Overtravel, high-sensitivity, 80°, 25 to 140 mm
CL-2N	Adjustable rod lever: Overtravel, 90°, 25 to 140 mm
HAL5	Rod spring lever: Protective, Overtravel, general-purpose model, 80°
CA32-41	Fork lever lock: Protective, WL-5A100
CA32-42	Fork lever lock: Protective, WL-5A102
CA32-43	Fork lever lock: Protective, WL-5A104
D	Plunger: Top plunger
D2	Plunger: Top-roller plunger
D28	Plunger: Sealed top-roller plunger
D3	Plunger: Top-ball plunger
SD	Plunger: Horizontal plunger

Switches without levers

WLRC A2
WLRC A2
WLRC A2
WLRH2
WLRG2
WLRC A2-2N
WLRGCA2
WLRC A2
WLRH2
WLRG2
WLRC A2-2N
WLRCL
WLRH2
WLRH2
WLRG2
WLRC A2-2N
WLRH2
WLRC A32
WLRC A32
WLRC A32

Symbol	Actuator type	Switches without levers	
SD2	Plunger: Horizontal-roller plunger	---	
SD3	Plunger: Horizontal-ball plunger	---	
NJ	Flexible rod: Coil spring	---	
NJ-30	Flexible rod: Coil spring, multi-wire	---	
NJ-2	Flexible rod: Coil spring, resin rod	---	
NJ-S2	Flexible rod: Steel wire	---	
3. Environment-resistant Model Specifications			
Blank:	Standard		
RP:	Corrosion-proof (See note 1.)		
P1:	Weather-resistant (See note 1.)		
4. Built-in Switch Specifications			
Blank:	General-purpose built-in switch		
55:	Hermetically-sealed built-in switch (See note 1.)		
5. Temperature Specifications			
Blank:	Standard: −10°C to 80°C		
TH:	Heat-resistive: 5°C to 120°C (See note 1.)		
TC:	Low temperature: −40°C to 40°C (See note 1.)		
6. Special Hermetic Model Specifications			
Blank:	No cables or molding		
139:	General-purpose built-in switch with cables attached and molded conduit opening and cover (cover cannot be removed). (See note 1.)		
140:	Airtight built-in switch with cables attached and molded conduit opening, cover, and case cover (cover cannot be removed). (See note 1.)		
141:	Airtight built-in switch with cables attached and molded conduit opening, cover, and case cover (cover cannot be removed). The Head opening is created to protect it from cutting powder. (See note 1.)		
145:	Airtight built-in switch with cables attached and molded conduit opening, cover, and case cover (cover cannot be removed, Head can be mounted in any of 4 directions). The Head opening is created to protect it from cutting powder. (See note 1.)		
RP40:	Airtight built-in switch with cables attached, SC Connector can be used, molded conduit opening, cover, and case cover (cover cannot be removed, Head direction can be changed). (See note 1.)		
RP60:	Airtight built-in switch with cables attached, fluorine rubber-molded conduit opening, cover, and case cover (cover cannot be removed, Head direction cannot be changed). (See note 1.)		
7. Conduit Size, Ground Terminal Specifications (See note 2.)			
Blank:	G 1/2	Without ground terminal	
G1:	G 1/2	With ground terminal	
G:	Pg13.5	With ground terminal	
Y:	M20	With ground terminal	
TS:	1/2-14NPT	With ground terminal	
8. Indicator Type			
	Element	Voltage	Leakage Current
LE:	Neon lamp	125 VAC	Approx. 0.6 mA
		250 VAC	Approx. 1.9 mA
LD:	LED	10 to 115 VAC/VDC	Approx. 0.5 mA
9. Lamp Wiring			
2:	NC connection: Light-ON when operating		
3:	NO connection: Light-ON when not operating		
10.Lever Type			
Blank:	Standard lever		
A:	Double nut lever		
Note: 1. For information on applicable models, see page 18.			
2. Switches with ground terminals meet EN/IEC standards (and have the CE marking).			

Ground Terminal Models

WL

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1 2

1: Type of actuator
2: Conduit opening size
The models differ depending on the size of the case's conduit thread.

Model	Conduit opening size
G1	G 1/2
G	Pg 13.5
Y	M20
TS	1/2-14NPT

Sensor I/O Connector Models

WL

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 LD

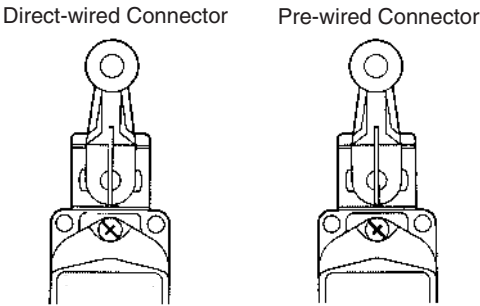
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1 2 3 4

1. Electrical Rating
- Blank: Standard
- 01: Microload
2. Actuator Type
- CA2: Roller lever: Standard
- GCA2: Roller lever: High-precision
- H2: Roller lever: Overtravel, general-purpose
- G2: Roller lever: Overtravel, high-sensitivity
- D2: Plunger: Top-roller plunger
- D28: Plunger: Sealed top-roller plunger
3. Built-in Switch Type
- Blank: Standard
- 55: Hermetically sealed

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

Note: 1. Models with pre-wired connectors and DC specifications have EN/IEC approval.
2. With 0.3-m cable attached.



Spatter-prevention Models

WL ☐ ☐ - ☐ ☐ S ☐
 1 2 3 4 5

1. Electrical Rating

Blank: Standard
 01: Microload

2. Actuator Type

CA2: Roller lever: Standard model
 GCA2: Roller lever: High-precision model
 H2: Roller lever: Overtravel, general-purpose model
 G2: Roller lever: Overtravel, high-sensitivity model
 D28: Plunger: Sealed top-roller plunger

3. Built-in Switch Type

Blank: Standard
 55: Hermetically sealed

4. Indicator Lamp

Blank: None
 LD: LED indicator lamp (AC/DC common)
 LE: Neon Lamp

5. Wiring Specifications

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

Note: With 0.3-m cable attached.

Ordering Information

Classification

Specifications			Standard	Overtravel	High-precision	Features	Page
Actuators	Roller lever		Yes	Yes	Yes	Five models: Roller lever, adjustable roller lever, adjustable rod lever, fork lever lock, rod spring lever.	35 to 52 20 to 22 27, 31 to 33
	Plunger		Yes	---	---	Six models: Top plunger, top-roller plunger, top-ball plunger, horizontal plunger, horizontal-roller plunger, horizontal-ball plunger.	
	Flexible rod		Yes	---	---	Two models: coil spring and steel wire.	
Load/contact	Standard load	SPST-NO/SPST-NC type	Yes			Standard models use a two-circuit double-break switch.	
	Microload	SPST-NO/SPST-NC type	Yes			Specifications include gold-plated contacts.	
Environment-resistant models (See note 3.)	Airtight-seal		WL□-55	Yes (Cannot be used with heat-resistive and low-temperature models.)		Uses an airtight-sealed built-in switch.	24, 34
	Hermetic seal	Molded terminals	WL□-139			Lead wires are attached. The case cover and conduit section are molded from epoxy resin to improve sealing performance.	
			WL□-140 WL□-141 WL□-145			Lead wires are attached. The case is filled with epoxy resin, to ensure high sealing performance. The Head opening is protected from cutting powder. (WL□-141 and -145 models) Only WLG2, WLCA2, and WLGCA2 can be fabricated. (WL□-141 models.)	
			Anti-coolant			WL□-RP40	
		WL□-RP60				Rubber parts are made from fluorine rubber. The Head cannot be removed.	
	Spatter-prevention		WL□-S	Yes	To improve spatter prevention during welding, a heat-resistant resin is used, and screws and rollers are all made from stainless steel.	25, 27, 29, 31, 34, 47	

Specifications			Standard	Overtravel	High-precision	Features	Page
Environment-resistant models (See note 3.)	Heat-resistive	WL□-TH	Yes (Cannot be used with airtight, hermetic, low-temperature, corrosion-proof, or lamp-equipped models.)			To improve heat resistance, silicone rubber is used for rubber parts and for the built-in switch. The operating temperature range is +5°C to 120°C.	24
	Low-temperature	WL□-TC	Yes (Cannot be used with airtight, hermetic, heat-resistive, corrosion-proof, or lamp-equipped models.)			To improve low temperature resistance, silicone rubber is used. The operating temperature range is −40°C to 40°C.	
	Corrosion-proof (See note 4.)	WL□-RP	Yes (Cannot be used with lamp-equipped models.)			Diecast parts such as the switch box are made of corrosion-proof aluminum. Rubber-sealing parts are made of fluorine rubber and exposed nuts and screws are made of stainless steel. These all aid in resisting oil, chemicals and adverse weather conditions.	
	Outdoor specifications	WL□-P1	---	Yes (See note 5.)	---	Rotary shafts are made of unquenched (i.e., untreated) stainless steel to improve corrosion resistance. Exposed nuts and screws are made of stainless steel and rubber sealing parts of silicone rubber. These factors all combine to create a product which is resistant to temperature changes and adverse weather conditions.	
Lamp-equipped		WL□-LE	Yes			Operating status can be checked at a glance. Lit when operating and not lit when not operating. WL□-LE: 100 VAC/VDC min. WL□-LD: 115 VAC/VDC min. (Refer to page 29 for detailed ratings.)	22, 30, 31, 33, 44
		WL□-LD	Yes				
Relevant pages			Pages 35 to 52			---	---

Note: 1. Do not expose to extreme changes in temperature.

2. Standard Models: Operate on each side at an angle of 45°. Possible to set to one-side operation on either side. Pretravel (PT) is 15°.

- Overtravel Models: Standard and high-sensitivity models operate on each side at an angle of 80°. Not possible to set to one-side operation. -2N Series operate on each side at an angle of 90°. Possible to set to one-side operation on either side.

- High-precision Models: Operate on each side at an angle of 45°. Possible to set to one-side operation on either side. Pretravel (PT) is 5°.

3. When ordering, add the suffix for the environment-resistant model or indicator specifications required according to the operating environment and purpose.
4. The overtravel model (-2N Series), fork lever lock model (WLCA32-41 to 44), horizontal plunger (WLSD□) model, heat-resistive model, low-temperature model, and lamp-equipped model cannot be used with the corrosion-proof model.
5. Outdoor specifications are available for some standard models. Consult your OMRON representative for details.
6. Outdoor specifications are only available for general models and high-sensitivity models.

List of Models

General-purpose Models








These Limit Switches are two-circuit double-break switches housed in rugged diecast, thus making it an oil-tight, waterproof and dustproof construction (complies with IP67).

In addition to the standard models, microload models are also available.

A wide range of actuators with a range of functions are available; rotating lever, plunger, flexible rod etc.

The rubber material in the standard models is designed to be resistant to water and most oils.

Roller Lever Models: Short, Medium, and Long Lever Models






Type		Total travel (TT)	Features	Actuator (See note 2.)		
				WL-1A100 Roller Lever: Short lever (R38) 	WL-1A200 Roller Lever: Medium lever (R50) 	WL-1A300 Roller Lever: Long lever (R63) 
Standard			One-side operation is possible. (See note 3.) Head can be mounted in any of the four directions.	WLCA2	WLCA2-7	WLCA2-8
Over-travel	General		One-side operation is impossible. (See note 3.) Head can be mounted in any of the four directions.	WLH2	---	---
	High-sensitivity		One-side operation is possible. (See note 3.) Head can be mounted in any of the four directions.	WLG2	---	---
	Side-installation		One-side operation is possible. (See note 3.) Head can be mounted in any of the two directions. (When the Head can be mounted horizontally, the Head can be mounted in any of the four directions.)	WLCA2-2N	---	---
High-precision			One-side operation is possible. (See note 3.) Head can be mounted in any of the four directions.	WLGCA2	---	---

Note: 1. For the approved standards file numbers, refer to page 27.

2. For external dimensions and other information, refer to pages 35 to 52.

3. One-side operation means that three operational directions can be selected electrically, according to the change in direction of the operating plunger. Those models for which one-side operation is impossible can only operate on both sides. For details, see page 52.

Adjustable Roller Levers and Adjustable Rod Levers





Type		Total Travel (TT)	Features	Actuator (See note 2.)	
				WL-2A100 Adjustable Roller Lever 	WL-4A100 Adjustable Rod Lever (Adjustable length: 25 to 140 mm) WL-3A100 (Adjustable length: 350 to 380 mm) 
Standard			One-side operation possible. (See note 3.) Head can be mounted in any of the four directions.	WLCA12	---
				---	WLCL (WL-4A100)
Overtravel	General		One-side operation possible. (See note 3.) Head can be mounted in any of the four directions.	WLH12	WLHL (WL-4A100) WLHAL4 (WL-3A100)
	High-sensitivity		One-side operation possible. (See note 3.) Head can be mounted in any of the four directions.	WLG12	WLGL (WL-4A100)
	Side-installation		One-side operation is possible. (See note 3.) Head can be mounted in any of the two directions. (When the Head can be mounted horizontally, the Head can be mounted in any of the four directions.)	WLCA12-2N	WLCL-2N (WL-4A100)

Note: 1. For the approved standards file numbers, refer to page 27.

2. For external dimensions and other information, refer to pages 35 to 52.

3. One-side operation means that three operational directions can be selected electrically, according to the change in direction of the operating plunger. The operating plunger is set for operation on both sides before delivery. Those models for which one-side operation is impossible can only operate on both sides. For details, see page 52. The operational plunger is factory-set to both sides.

Rod Spring Levers and Fork Lever Locks

Type		Total travel (TT)	Features	Actuator (See note 2.)	
				WL-3A200 Rod Spring Lever 	Fork Lever Locks: WL-5A100, WL-5A102, WL-5A104 
Protective			Head can be mounted in any of the four directions.	---	WLCA32-41 (WL-5A100)
					WLCA32-42 (WL-5A102)
					WLCA32-43 (WL-5A104)
Overtravel	General		One-side operation is possible. (See note 3.) Head can be mounted in any of the four directions.	WLHAL5	---







Note: 1. For the approved standard file numbers, refer to page 27.

2. For external dimensions and other information, refer to pages 35 to 52.

3. One-side operation means that three operational directions can be selected electrically, according to the change in direction of the operating plunger. The operating plunger is set for operation on both sides before delivery. Those models for which one-side operation is impossible can only operate on both sides. For details, see page 52. The operational plunger is factory-set to both sides.



4. The fork lever lock is configured so that the dog pushes the lever to reverse the output and this reversed state is maintained even after the dog continues on. If the dog then pushes the lever from the opposite direction, the lever will return to its original position.

Standard Plungers

Type	Actuators	Model
Top	Top Plunger 	WLD
	Top-roller Plunger 	WLD2 WLD28 (See note.)
	Top-ball Plunger 	WLD3
Horizontal	Horizontal Plunger 	WLS
	Horizontal-roller Plunger 	WLS2
	Horizontal-ball Plunger 	WLS3

Note: Sealed roller.

Standard Flexible Rods

Actuators		Model
Coil spring 	Spring dia. 6.5	WLNJ
	Spring dia. 4.8	WLNJ-30
	Resin rod dia. 8.0	WLNJ-2
Steel wire 	1.0-dia. wire	WLNJ-S2

Microload Models

A series of microload models has also been developed for the configurations outlined on pages 20 to 22. The model numbers become WL01□. For example, WLCA2 becomes WL01CA2.

Lamp-equipped Models

Operating characteristics	Rated voltage	Leakage current	Lamp-equipped Switch	Lamp-equipped cover only
Neon lamp	125 VAC	Approx. 0.6 mA	WL□-LE (See note 1.)	WL-LE
	250 VAC	Approx. 1.9 mA		
LED	10 to 115 VAC/VDC	Approx. 0.5 mA	WL□-LD (See note 1.)	WL-LD

Note: 1. In the model number, □ indicates the actuator number. For example, CA2, D, NJ, etc.

2. The default setting is "light-ON when not operating." Turn the lamp holder by 180° to change the setting to "light-ON when operating."

Ordering Information

When ordering general-purpose indicator-equipped models insert the specifications number at the end of the basic model number.

E.g.: When a neon lamp is installed in a General-purpose/Standard Roller Lever Switch (WLCA2).

<u>WLCA2</u>	<u>LE</u>
↑	↑
Standard	Lamp specifications

When ordering indicator-equipped molded terminal models, insert the specifications number at the end of the standard model number.

E.g.: When a Neon Lamp (WL-LE) is installed in a general-purpose molded terminal model (WLCA2-139).

<u>WLCA2-139</u>	<u>LE</u>	<u>2</u>	
↑	↑	↑	
Standard	Lamp specifications	Lamp wiring	2: NC connection: Light-ON when operating 3: NO connection: Light-ON when not operating

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

Sensor I/O Connector Models

A reduction in the amount of wiring and parts makes maintenance easy and reduced wiring mistakes, in addition it's already compact size for fitting into areas of limited space.

Ordering Information

Item		Standard	Overtravel	High sensitivity
Actuators	Rotating lever	Yes	Yes	Yes
	Plunger	Yes	---	---
Load	Standard load (SPST-NO/SPST-NC)	Yes		
	Microload (SPST-NO/SPST-NC)	Yes		
High-precision models WL-□55		Yes		
Spatter-prevention models (See note 3.)		Yes		
Lamp		Yes		

- Note:** 1. Standard Models: For standard models only one-side operation at an angle of 45° is possible.
 Overtravel Models: Only one-side operation at an angle of 80° is possible. One-side operation only is not possible.
 High-precision Models: Only one-side operation at an angle of 45° is possible, and pretravel (PT) is 5°, as opposed to 15° for standard models.
2. For information other than that listed at the above, contact your OMRON representative.
3. The spatter-prevention models are only available as pre-wired connectors.

Direct-wired Connectors

Type	2-core (NO)	4-core
Lamp-equipped	WL□-LDK13	WL□-LDK43
Double-seal	WL□-55LDK13	WL□-55LDK43

- Note:** 1. In the model number, □ indicates the actuator number. For example, Overtravel Model WLG2-LDK13.
2. The lamp is set to "light-ON when not operating" (NO connection).

Pre-wired Connectors

Type	2-core (NO)	2-core (NC)	4-core	3-core (NO)
Lamp-equipped	WL□-LD-M1J	WL□-LD-M1JB	WL□-LD-DGJ03	WL□-LD-DK1EJ03
Double-seal	WL□-55LD-M1J	WL□-55LD-M1JB	WL□-55LD-DGJ03	WL□-55LD-DK1EJ03

- Note:** 1. In the model number, □ indicates the actuator number. For example, Overtravel Model WLG2-LD-M1J.
2. The lamp is set to "light-ON when not operating" (NO connection).

Environment-resistant Models

Airtight, Hermetic Seal, Low-temperature, Heat-resistive, Corrosion-proof, and Weather-resistant Models

Using the general-purpose model, six types of environment-resistant models can be created to meet a variety of difficult operating conditions. Select the model most appropriate to your operating environment.

Type		Usage	Environment-resistant construction			Appropriate models
WL□-55	Airtight seal	For use in locations subject to splashes of water and anti-coolant	Uses the W-10FB3-55 Airtight Built-in Switch. (See note 2.)			All models except the low-temperature and heat-resistive models. (See note 3.)
WL□-139	Hermetic seal (molded terminals and anti-coolant models)		General-purpose built-in switch	Connection lead wires: Standard 5-m VCT (vinyl cabtire cable) cable attached. Finished diameter: 11.5 mm, 4-core.	The case cover and conduit opening are molded from epoxy resin. The cover cannot be removed.	All models except the low-temperature and heat-resistive models. (See note 4.)
WL□-140			Hermetically-sealed built-in switch	Connection lead wires: Standard 5-m VCT cable, with high flexibility and good anti-oil properties attached. Finished diameter: 11.5 mm, 4-core.	The case cover, cover box and conduit opening are molded from epoxy resin. The cover cannot be removed (141, 145). The Head opening is protected from cutting powder. (WL□-141)	
WL□-141					The connector can be removed, so it is possible to use flexible wires in the cable.	
WL□-145					Rubber parts are made from fluorine rubber.	
WL□-RP40						
WL□-RP60						
WL□-TC	Low-temperature	Can be used at a temperature of −40°C (The operating temperature range is −40°C to 40°C), but cannot withstand icing.	Uses the general-purpose built-in switch. Silicone rubber is used for rubber parts such as the O-ring, gasket, etc.		All models except airtight, hermetic, heat-resistive, corrosion-proof, or lamp-equipped models.	
WL□-TH	Heat-resistive	Can be used in temperatures of 120°C (The operating temperature range is 5°C to 120°C).	Uses a special built-in switch made from heat-resistant resin. Silicone rubber is used for rubber parts such as the O-ring, gasket etc.		All models except airtight, hermetic, low-temperature, corrosion-proof, lamp-equipped, nylon roller (WLCA2-26N), seal roller models, and resin rod (WLNJ-2) models.	
WL□-RP	Corrosion-proof	For use in locations subject to corrosive gases and chemicals.	Diecast parts such as the switch box are made of corrosion-proof aluminum. Rubber sealing parts are made of fluorine rubber which aids in resisting oil, chemicals and adverse weather conditions. Exposed nuts and screws (except the actuator section) are made of stainless steel. Moving and rotary parts such as rollers are made of sintered stainless steel or stainless steel.			All models except overtravel model (-2N), fork lever lock models (WLCA32-41 to -43), low-temperature, heat-resistive, and lamp-equipped models.
WL□-P1	Outdoor specifications	For use in parking lots and other such outdoor locations.	Rubber parts are made from silicone rubber, which has a high-tolerance to deterioration over time, and changes in temperature. Rollers are made of stainless steel to improve corrosion resistance. Exposed nuts and screws are made of stainless steel.			Only the general-purpose overtravel models (WLH2/12), the overtravel high-sensitivity models (WLG2/12) and some standard models (e.g., WLCA2) can be used. Excluding heat-resistive models.

Note: 1. Consult your OMRON representative for the microload WL01□ models.

2. Use the SC Connector for the conduit opening.

3. The actuator can be created using the standard model.

4. The actuator can be created using the standard model. For WL-□141 and -145, only WLG2, WLCA2, WLGCA2, and WLH2 can be used.

Ordering Information

Use the following as a guide when ordering environment-resistant models.

E.g.: For a hermetic model of WLCA2








WLCA2 -	55
↑	↑
Standard	Specifications No.

An additional catalog is available for outdoor specifications models.

Spatter-prevention Models






These models are most effective in an arc welding line or places where cutting powder is spattered.

Standard Models

Type		Total travel (TT)	Actuators	Neon lamp		LED	
				125 VAC	250 VAC	10 to 115 VAC/DC	
				Approx. 0.6 mA	Approx. 1.9 mA	Approx. 0.5 mA	
Standard		One-side operation is possible 	Double nut lever 	WLCA2-LEAS		WLCA2-LDAS	
			Allen-head lever 	WLCA2-LES		WLCA2-LDS	
Overtravel	General	One-side operation is impossible 	Double nut lever	WLH2-LEAS		WLH2-LDAS	
			Allen-head lever	WLH2-LES		WLH2-LDS	
	High-sensitivity		Double nut lever	WLG2-LEAS		WLG2-LDAS	
			Allen-head lever	WLG2-LES		WLG2-LDS	
High-precision		One-side operation is possible 	Double nut lever 	WLGA2-LEAS		WLGA2-LDAS	
			Allen-head lever 	WLGA2-LES		WLGA2-LDS	

Note: Consult your OMRON representative for the microload WL01□ models.

Levers/Lamp-equipped Covers









Type	Without lever 	Complete Head (lever with Head) 	Double nut lever 	Allen-head lever 	Lamp-equipped cover 
Model	Add an "R" to the product number to order. E.g.: WL□CA2-LES	WL-1H1100S (in case of WLCA2-□, WLGCA2-□)	WL-1A105S (forward and backward lever)	WL-1A103S (forward and backward lever)	WL-LES (Neon Lamp)
		WL-2H1100S (in case of WLH2-□, WLG2-□)			WL-LDS (LED)

Switches Without Lever

WLRCA2-LES, WLRCA2-LDS
 WLRH2-LES, WLRH2-LDS, WLRG2-LES
 WLRG2-LDS
 WLRGCA2-LES, WLRGCA2-LDS

Limit switches

Head Models

Actuators	Set model	Head model	Head model without lever
Roller lever 	WLCA2	WL-1H1100	WLRCA2
	WLGCA2	WL-1H1100-1 (See note.)	WLRGCA2
	WLG2	WL-2H1100	WLRG2
	WLH2	WL-2H1100-1 (See note.)	WLRH2
	WLCA2-2N	WL-6H1100	WLRCA2-2N
Adjustable roller lever 	WLCA12	WL-1H2100	WLRCA2
	WLG12	WL-2H2100	WLRG2
	WLH12	WL-2H2100-1 (See note.)	WLRH2
	WLCA12-2N	WL-6H2100	WLRCA2-2N
Adjustable rod lever 	WLCL	WL-4H4100	WLRCL
	WLGL	WL-2H4100	WLRG2
	WLCL-2N	WL-6H4100	WLRCA2-2N
Top plunger 	WLD	WL-7H100	---
	WLD2	WL-7H200	
	WLD3	WL-7H300	
	WLD28	WL-7H400	
Horizontal plunger 	WLS	WL-8H100	---
	WLS2	WL-8H200	
	WLS3	WL-8H300	
Fork lever lock  	WLCA32-41	WL-5H5100	WLRCA32
Coil spring 	WLNJ	WL-9H100	---
	WLNJ-30	WL-9H200	
	WLNJ-2	WL-9H300	
	WLNJ-S2	WL-9H400	

Note: For the model number of Heads without lever, simply remove the numbers after WL-□H. For example, WL-1H1100 becomes WL-1H. WLH2 and WLH12 however, become WL-2H-1, and WLGCA2 becomes WL-1H-1. Other Head models are available, but must be ordered separately.

Specifications

■ Approved Standards

Agency	Standard	File No.
UL	UL508	E76675
CSA	CSA C22.2 No. 14	LR45746
TÜV Rheinland	EN60947-5-1	R9551016

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

■ Approved Standard Ratings

General-purpose Models

UL/CSA

Standard Models: A600

Rated voltage	Carry current	Current		Volt-amperes	
		Make	Break	Make	Break
120 VAC	10 A	60 A	6 A	7,200 VA	720 VA
240 VAC		30 A	3 A		
480 VAC		15 A	1.5 A		
600 VAC		12 A	1.2 A		

Microload Models:

0.1 A at 125 VAC, 0.1 A at 30 VDC

TÜV (EN60947-5-1)

(Only Ground Terminal Models are Approved)

Model	Category/rating	Thermal current	Indicator
WL□-□	AC-15 2 A/250 V DC12 2 A/48 V	10 A	---
WL01□	AC-14 0.1 A/125 V DC12 0.1 A/48 V	0.5 A	---
WL□-LE	AC-15 2 A/250 V	10 A	Neon lamp
WL01□-LE	AC-14 0.1 A/125 V	0.5 A	Neon lamp
WL□-LD	AC-15 2 A/115 V DC12 2 A/48 V	10 A	LED
WL01□-LD	AC-14 0.1 A/115 V DC12 0.1 A/48 V	0.5 A	LED

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

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

Spatter-prevention Models

UL/CSA

LE (Neon Lamp) A300

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

LD (LED)

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

■ Ratings

General-purpose Models/Environment-resistant Models

Standard Load Models

Type	Rated voltage	Non-inductive load				Inductive load			
		Resistive load		Lamp load		Inductive load		Motor load	
		NC	NO	NC	NO	NC	NO	NC	NO
Standard, overtravel (except high-sensitivity models), and high-precision models.	125 VAC	10 A		3 A	1.5 A	10 A		5 A	2.5 A
	250 VAC	10 A		2 A	1 A	10 A		3 A	1.5 A
	500 VAC	10 A		1.5 A	0.8 A	3 A		1.5 A	0.8 A
	8 VDC	10 A		6 A	3 A	10 A		6 A	
	14 VDC	10 A		6 A	3 A	10 A		6 A	
	30 VDC	6 A		4 A	3 A	6 A		4 A	
	125 VDC	0.8 A		0.2 A	0.2 A	0.8 A		0.2 A	
	250 VDC	0.4 A		0.1 A	0.1 A	0.4 A		0.1 A	
Overtravel (high-sensitivity models)	125 VAC	5 A		---		---		---	
	250 VAC	5 A		---		---		---	
	125 VDC	0.4 A		---		---		---	
	250 VDC	0.2 A		---		---		---	

Note: 1. The above figures are for standard currents.

2. Inductive loads have a power factor of 0.4 min. (AC) and a time constant of 7 ms max. (DC).

3. Lamp load has an inrush current of 10 times the steady-state current.

4. Motor load has an inrush current of 6 times the steady-state current.

5. For PC loads, use the microload models.

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

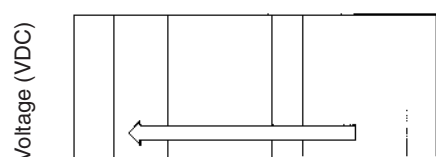
Note: Only for high-sensitivity overtravel models.

Microload Models

Rated voltage	Resistive load
125 VAC	0.1 A
30 VDC	

Operation within the three zones illustrated in the following diagram will produce optimum performance.

Recommended Load Range: 5 to 30 VDC, 0.5 to 100 mA



5 mW

0.8 W

Current (mA)

Lamp-equipped Models

Neon lamp (WL-LE)		LED (WL-LD)
125 VAC	250 VAC	10 to 115 VAC/DC
Approx. 0.6 mA	Approx. 1.9 mA	Approx. 0.5 mA
WLD28-LES		WLD28-LDS

Sensor I/O Connector Models

Type	Rated voltage	Non-inductive load				Inductive load			
		Resistive load		Lamp load		Inductive load		Motor load	
		NC	NO	NC	NO	NC	NO	NC	NO
For DC	12 VDC	1 A	1 A	1 A	1 A	1 A	1 A	1 A	1 A
	24 VDC	1 A	1 A	1 A	1 A	1 A	1 A	1 A	1 A
	48 VDC	1 A	1 A	1 A	1 A	1 A	1 A	1 A	1 A
	115 VDC	0.8 A	0.8 A	0.2 A	0.2 A	0.8 A	0.8 A	0.2 A	0.2 A
For AC	115 VAC	1 A	1 A	1 A	1 A	1 A	1 A	1 A	1 A

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

Spatter-prevention Models

Model	Rated current	Non-inductive load				Inductive load			
		Resistive load		Lamp load		Inductive load		Motor load	
		NC	NO	NC	NO	NC	NO	NC	NO
WL□-LES	125 VAC	10 A		3 A	1.5 A	10 A		5 A	2.5 A
	250 VAC	10 A		2 A	1 A	10 A		3 A	1.5 A
	125 VDC	0.8 A		0.2 A	0.2 A	0.8 A		0.2 A	0.2 A
	250 VDC	0.4 A		0.1 A	0.1 A	0.4 A		0.1 A	0.1 A
WL□-LDS	115 VAC	10 A		3 A	1.5 A	10 A		5 A	2.5 A
	12 VDC	10 A		6 A	3 A	10 A		6 A	
	24 VDC	6 A		4 A	3 A	6 A		4 A	
	48 VDC	3 A		2 A	1.5 A	3 A		2 A	

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

Inrush current	NC	30 A max.
	NO	20 A max.
Operating temperature	-10°C to 80°C (with no icing)	
Operating humidity	95% max.	

■ Characteristics

General-purpose Models/Environment-resistant Models

Degree of protection	IP67
Durability (See note 3.)	Mechanical: 15,000,000 operations min. (See note 4.) Electrical: 750,000 operations min. (See note 5.)
Operating speed	1 mm to 1 m/s (for WLCA2)
Operating frequency	Mechanical: 120 operations/minute min. Electrical: 30 operations/minute min.
Rated frequency	50/60 Hz
Insulation resistance	100 MΩ min. (at 500 VDC)
Contact resistance	25 mΩ max. (initial value)
Dielectric strength	1,000 VAC (600 VAC), 50/60 Hz for 1 min between non-continuous terminals. 2,200 VAC, 50/60 Hz for 1 min/Uimp 2.5 kV non-current-carrying metal part and ground. 2,200 VAC, 50/60 Hz for 1 min Uimp 2.5 kV between each terminal and non-current-carrying metal part.
Rated insulation voltage (U _i)	250 V (EN60947-5-1)
Switching overvoltage	1,000 V max. (EN60947-5-1)
Pollution degree (operating environment)	3 (EN60947-5-1)
Short-circuit protective device (SCPD)	10 A, fuse type gG or gI (IEC269)
Conditional short-circuit current	100 A (EN60947-5-1)
Conventional enclosed thermal current (I _{the})	10 A, 0.5 A (EN60947-5-1)
Protection against electric shock	Class I
Vibration resistance	10 to 55 Hz, 1.5-mm double amplitude (See note 6.)
Shock resistance	Destruction: 1,000 m/s ² min. Malfunction: 300 m/s ² min. (See note 6.)
Ambient temperature	Operating: -10°C to 80°C (with no icing) (See note 7.)
Ambient humidity	Operating: 95% max.
Weight	Approx. 275 g (in the case of WLCA2)

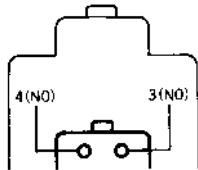
Note: 1. The above figures are initial values.

- The figures in parentheses for dielectric strength, are those for the overtravel (high-sensitivity) model.
- The values are calculated at an operating temperature of 5°C to 35°C, and an operating humidity of 40% to 70%. Contact your OMRON sales representative for more detailed information on other operating environments.
- 10,000,000 operations min. for general-purpose, high-sensitivity, and flexible rod overtravel models.
- 500,000 operations min. for high-precision and outdoor specifications models. All microload models however, are 1,000,000 operations min.
- Except the flexible rod models. The shock resistance (malfunction) for microload models is 200 m/s² min.
- For low temperature models this is -40°C to 40°C (no icing). For heat-resistive models the range is +5°C to 120°C.

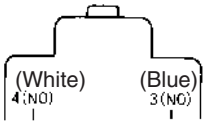
■ Contact Form

General-purpose Models

Standard (WL□)/Microload (WL01□) Models



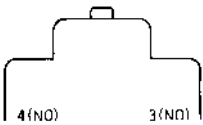
Environment-resistant Models




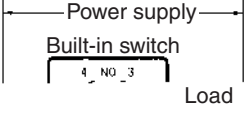

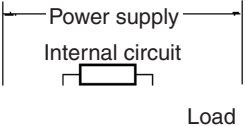
(Black) (Red)

Spatter-prevention Models

Standard Model



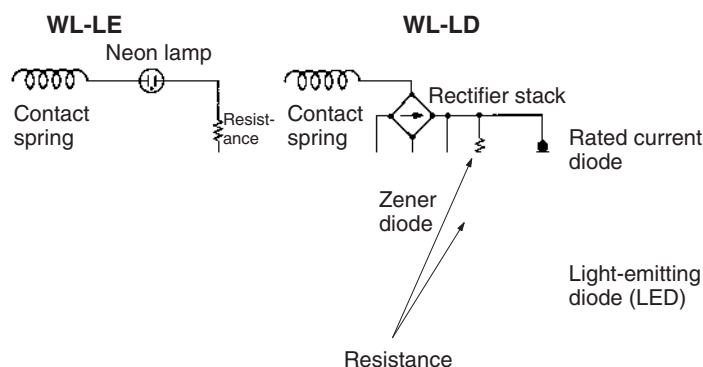
Lamp-equipped Models

Light-ON when operating (See note 1.)	WL-LE WL-LD 	
Light-ON when not operating (See note 2.)	WL-LE WL-LD 	

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

Limit
switches

Internal circuit of Lamp-equipped Models



■ Wiring Specifications of Sensor I/O Connector Models

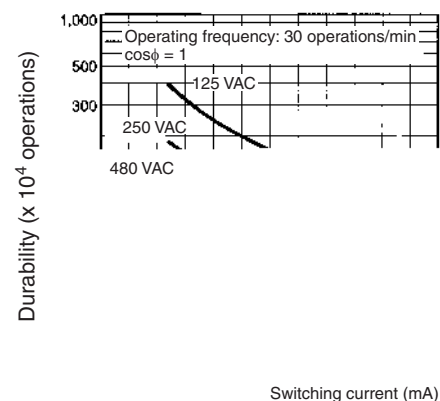
Direct-wired Connector				Pre-wired Connector									
2-core		4-core		2-core									
K13 (DC) K13A (AC)		K43 (DC) K43A (AC)		M1J (DC)		M1GJ (DC)		M1JB (DC)		DGJ03 (DC) AGJ03 (AC)		DK1EJ03 (DC)	
Built-in switch	Connector	Built-in switch	Connector	Built-in switch	Connector	Built-in switch	Connector	Built-in switch	Connector	Built-in switch	Connector	Built-in switch	Connector
1 (NC)	---	1 (NC)	1	1 (NC)	---	1 (NC)	---	1 (NC)	3	1 (NC)	1	1 (NC)	---
2 (NC)	---	2 (NC)	2	2 (NC)	---	2 (NC)	---	2 (NC)	2	2 (NC)	2	2 (NC)	2
3 (NO)	3	3 (NO)	3	3 (NO)	3	3 (NO)	1	3 (NO)	---	3 (NO)	3	3 (NO)	3
4 (NO)	4	4 (NO)	4	4 (NO)	4	4 (NO)	4	4 (NO)	---	4 (NO)	4	4 (NO)	4

Engineering Data

General-purpose Models/Spatter-prevention Models/Environment-resistant Models

Electrical Durability

Operating temperature: 5°C to 30°C
Operating humidity: 40% to 70%.



Nomenclature

General-purpose Models

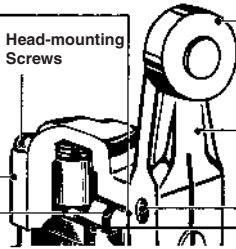


Set Position Marker Plate

After operation, set the indicator needle on the marker plate so that is in the convex section of the bearing. For the WLD2, insert the needle so that is between the two main wires on the plunger.

Requires maintenance (excessive overtravel)
Proper range
Requires maintenance (insufficient overtravel)
Proper range
Requires maintenance (excessive overtravel)

Head-mounting Screws



Roller

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

Lever

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

Roller Lever Setscrew

Operational Plunger (See note 2.)

Cover Seal

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

Terminal Screws M4 screws

Cover

Insulator

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

Cover Setscrew

A Phillips screw is used to ensure ease of use.

Head

The Head used in the roller lever type, adjustable rod lever type, or horizontal plunger type (except the -2N Series) can be mounted in any of the four directions by removing the screws at the four corners of the Head.

Shaft Section Seal

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

Bearing

The bearing smooths the plunger movement.

Built-in Switch

The built-in switch (for all models except the micro-load models) has an extended mechanical life of 15 million operations or more.

Conduit Opening (See note 1.)

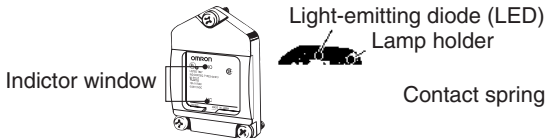
The conduit threads are parallel threads for G 1/2 tube and offer further increased sealing properties when used in conjunction with the SC connector.

- Note:** 1. The display for conduit threads has changed from PF1/2 to G1/2 according to revisions of JIS B 0202. This is only a change in the display, so the thread size and pitch have not changed. (Conduit threads Pg 13.5 and 1/2-14NPT are also available.)
2. By changing the orientation of the operational plunger, three operational directions can be selected electrically. (This is only possible with general-purpose roller lever, adjustable roller lever, and adjustable rod lever models. For the overtravel models, only -2N Series models have this function.)

Lamp-equipped Models

The operating status of the Switch can be checked using a neon lamp or LED indicator.

Circuit checks and troubleshooting errors are easy done.



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

WL-LD has a built-in rectifier stack, so it will not be necessary to change the polarity.

The indicator cover is molded from diecast aluminum and has outstanding sealing properties. Furthermore, regardless of whether the power is connected or not, the operating status is shown (operating or not operating), and indicators can be switched from light-ON when operating and light-ON when not operating, by simply rotating the lamp holder by 180°. (Molded terminals do not have this switching capacity.)

The lamp-equipped models are ideal in locations using a conveyor belt where items need to be checked, or locations that are difficult to inspect for faults.

Light-ON when Operating



LED at top



Light-ON when Not Operating



LED at bottom



■ Environment-resistant Models

Airtight Built-in Switch



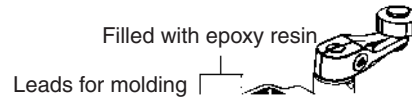
Sealed by the rubber boot of the plunger

Sealed by the resin molded into the case cover

Four, M4 \pm terminal screws

Hermetic Seal Model

The lead wires are sealed to the Limit Switch with resin, providing a hermetically sealed construction.



Filled with epoxy resin

Leads for molding

Exclusive connector

■ Spatter-prevention Models

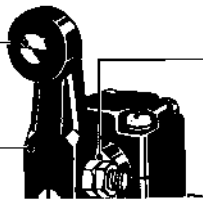
Double Nut Lever

Roller, Roller Axis

Using stainless steel prevents spatter from adhering.

Operating Lever

Melamine sinter-painted, it is easy to peel off the spatter.



SUS304 is used for double nut.

Screws

SUS304 is used, preventing spatter from adhering.

Head Cap

Using Teflon prevents spatter from adhering.

Note: Spatter means the Zn powder produced when welding. Adhering spatter to the Limit Switch may cause malfunction of lever or lamp cover.

Lamp Cover

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

The lack of gap prevents spatter powder from clogging.

Dimensions

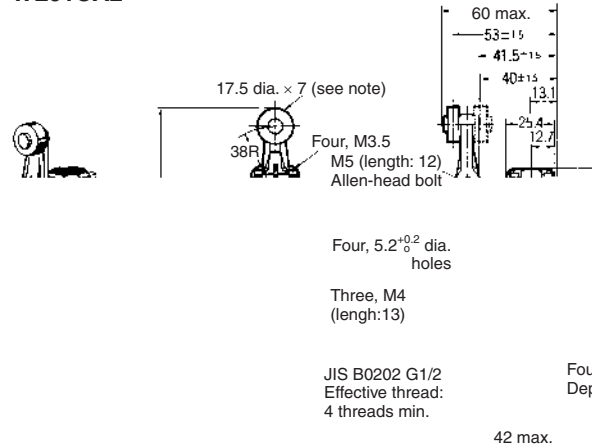
General-purpose Models

Standard Models

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

Roller Lever

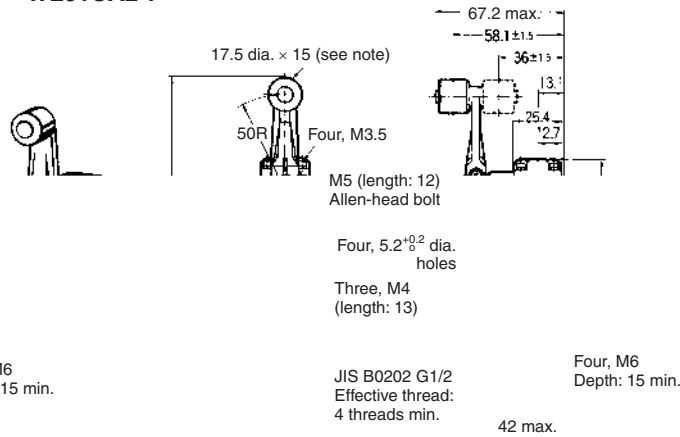
WLCA2
WL01CA2



Note: Stainless sintered roller

Roller Lever

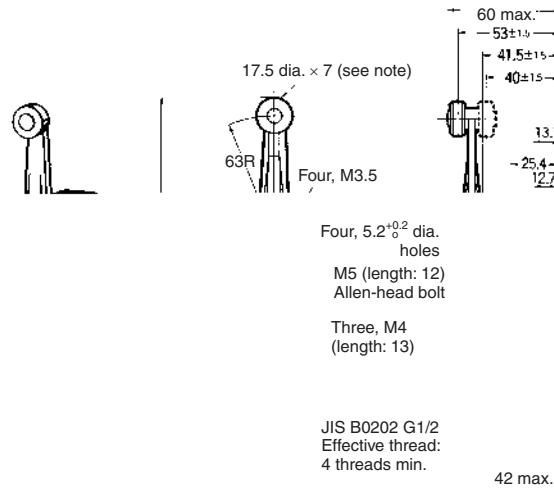
WLCA2-7
WL01CA2-7



Note: Stainless steel roller

Roller Lever

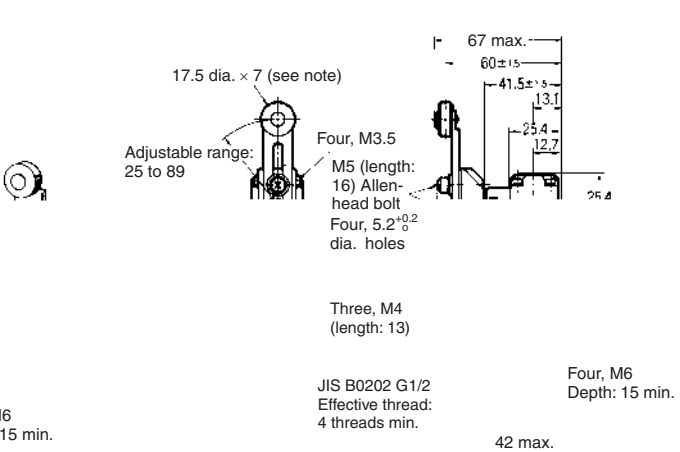
WLCA2-8
WL01CA2-8



Note: Stainless sintered roller

Adjustable Roller Lever

WLCA12
WL01CA12



Note: Stainless sintered roller

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

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

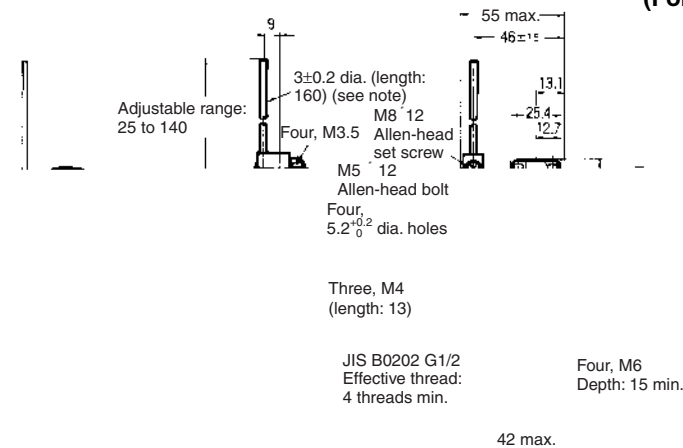
OF and RF for WLCA12, with a lever length of 89 mm.

Operating characteristics	WLCA12, WL01CA12
OF	5.68 N
RF	0.95 N

Rotating Lever Models: For all models WL indicates a standard model and WL01□ indicates a microload model.

Adjustable Rod Lever

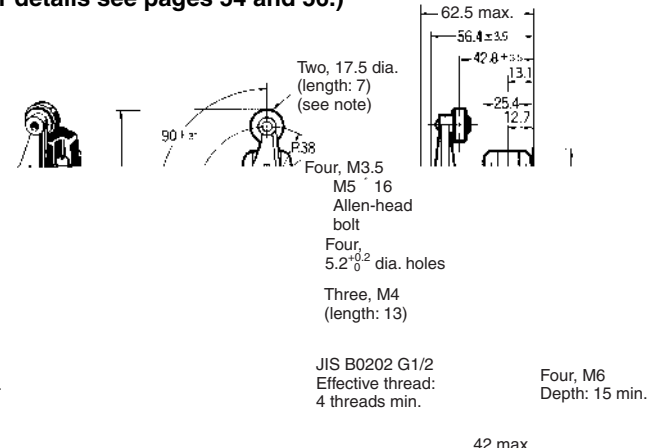
WLCL
WL01CL



Note: Stainless steel rod

Fork Lever Lock

WLCA32-41 to 44
WL01CA32-41 to 44
(For details see pages 54 and 56.)



Note: Plastic roller. This illustration shows the external dimensions of the WLCA32-41. (Models WLCA32-041 to -044 and WL01CA32-041 to -044 have stainless steel rollers.)

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



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

Operating characteristics	WLCL, WL01CL
Operating force: OF max.	1.39 N
Release force: RF min.	0.27 N
Pretravel: PT	$15 \pm 5^\circ$
Overtravel: OT min.	30°
Movement differential: MD max.	12°

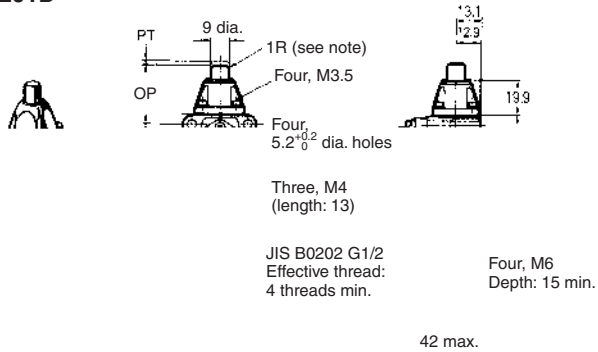
Note: The operating characteristics for WLCA12 and WL01CA12 are measured at the lever length of 140 mm.

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

Note: 1. Plunger Models: For all models WL□ indicates a standard model and WL01□ indicates a microload model.
2. Unless otherwise indicated, a tolerance of ± 0.4 mm applies to all dimensions.

Top Plunger

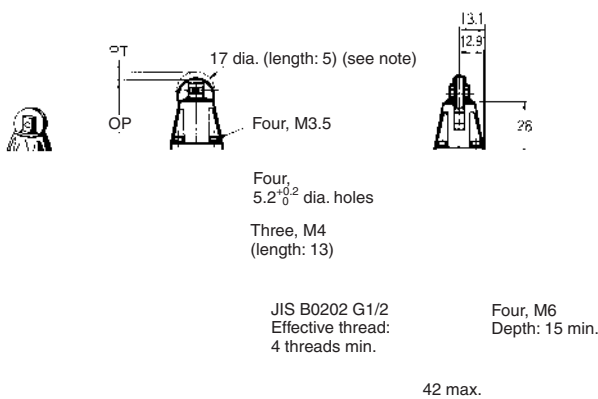
**WLD
WL01D**



Note: Stainless steel plunger

Top-roller Plunger

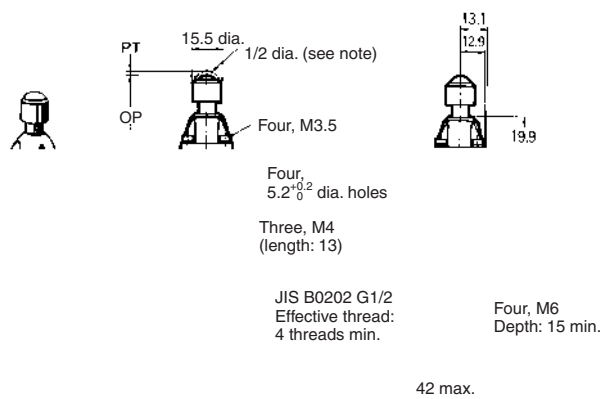
**WLD2
WL01D2**



Note: Stainless sintered roller

Top-ball Plunger

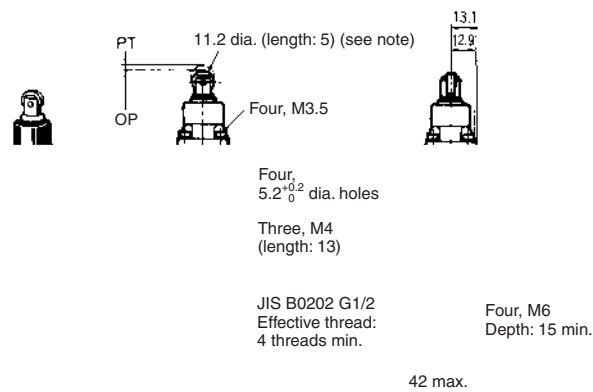
**WLD3
WL01D3**



Note: Stainless steel ball

Sealed Top-roller Plunger

**WLD28
WL01D28**

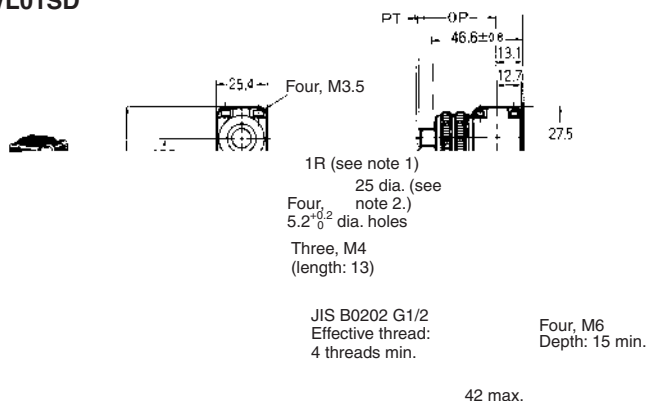


Note: Stainless steel roller

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

Horizontal Plunger

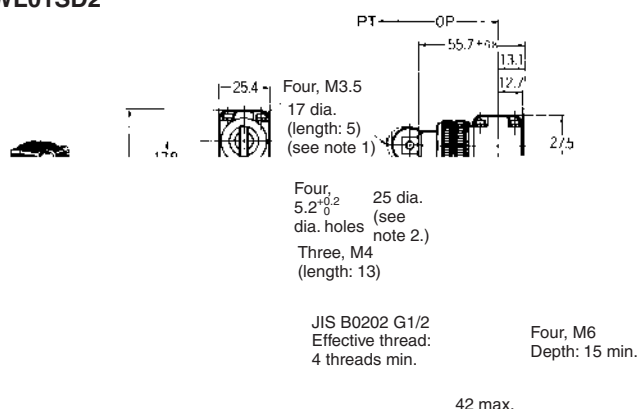
WLS
WL01SD



Note: 1. Stainless steel plunger
2. Cosmetic nuts.

Horizontal-roller Plunger

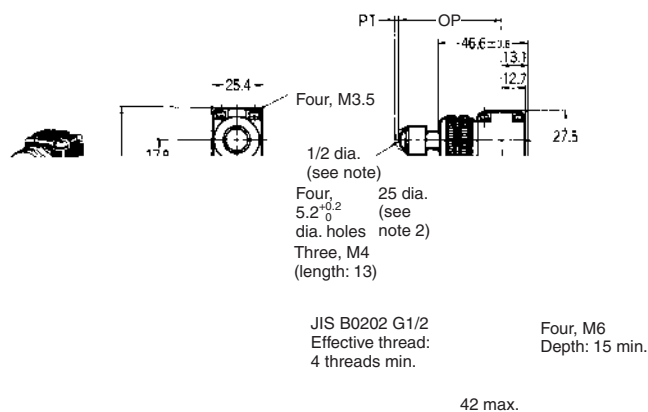
WLS2
WL01SD2



Note: 1. Stainless sintered roller
2. Cosmetic nuts
3. The WLS21 model, which has the roller rotated by 90° is also available.

Horizontal-ball Plunger

WLS3
WL01SD3



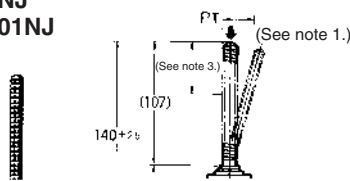
Note: 1. Stainless steel ball
2. Cosmetic nuts

Operating characteristics	WLD WL01D	WLD2 WL01D2	WLD3 WL01D3	WLD28 WL01D28	WLS WL01SD	WLS2 WL01SD2	WLS3 WL01SD3
Operating force: OF max.	26.67 N	26.67 N	26.67 N	16.67 N	40.03 N	40.03 N	40.03 N
Release force: RF min.	8.92 N	8.92 N	8.92 N	4.41 N	8.89 N	8.89 N	8.89 N
Pretravel: PT max.	1.7 mm	1.7 mm	1.7 mm	1.7 mm	2.8 mm	2.8 mm	2.8 mm
Overtravel: OT min.	6.4 mm	5.6 mm	4 mm	5.6 mm	6.4 mm	5.6 mm	4 mm
Movement differential: MD max.	1 mm	1 mm	1 mm	1 mm	1 mm	1 mm	1 mm
Operating position: OP	34±0.8 mm	44±0.8 mm	44.5±0.8 mm	44±0.8 mm	40.6±0.8 mm	54.2±0.8 mm	54.1±0.8 mm
Total travel position: TTP max.	29.5 mm	39.5 mm	41 mm	39.5 mm	---	---	---

Note: 1. Flexible Rod Models: For all models WL□ indicates a standard model and WL01□ indicates a microload model.
2. Unless otherwise indicated, a tolerance of ± 0.4 mm applies to all dimensions.

Coil Spring

WLNJ
WL01NJ

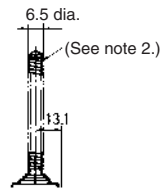


Four,
5.2^{+0.2}₀ dia. holes

Three, M4
(length: 13)

JIS B0202 G1/2
Effective thread:
4 threads min.

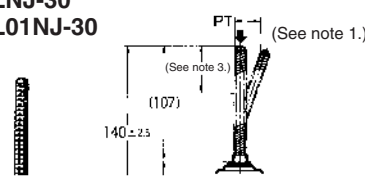
42 max.



Four, M6
Depth: 15 min.

Coil Spring (Multi-wire)

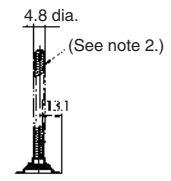
WLNJ-30
WL01NJ-30



Four,
5.2^{+0.2}₀ dia. holes
Three, M4
(length: 13)

JIS B0202 G1/2
Effective thread:
4 threads min.

42 max.



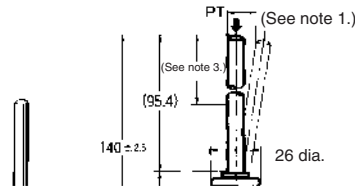
Four, M6
Depth: 15 min.

Note: 1. The coil spring may be operated from any direction except the axial direction (↓).
2. Stainless steel coil spring
3. Optimum operating range of the coil spring is within 1/3 of the entire length from the top end.

Note: 1. The coil spring may be operated from any direction except the axial direction (↓).
2. Piano wire coil
3. Optimum operating range of the coil spring is within 1/3 of the entire length from the top end.

Coil Spring (Resin Rod)

WLNJ-2
WL01NJ-2

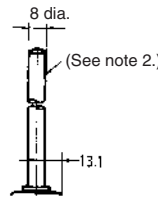


Four,
5.2^{+0.2}₀ dia. holes

Three, M4
(length: 13)

JIS B0202 G1/2
Effective thread:
4 threads min.

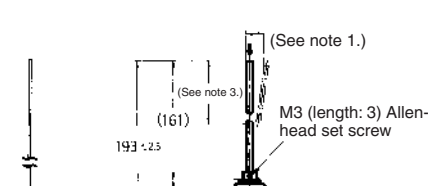
42 max.



Four, M6
Depth: 15 min.

Steel Wire

WLNJ-S2
WL01NJ-S2

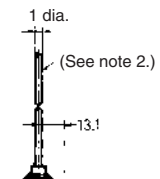


Four,
5.2^{+0.2}₀ dia. holes

Three, M4
(length: 13)

JIS B0202 G1/2
Effective thread:
4 threads min.

42 max.



Four, M6
Depth: 15 min.

Note: 1. The coil spring may be operated from any direction except the axial direction (↓).
2. Polyamide resin rod
3. Optimum operating range of the rod is within 1/3 of the entire length from the top end.

Note: 1. The coil spring may be operated from any direction except the axial direction (↓).
2. Stainless steel wire
3. Optimum operating range of the wire is within 1/3 of the entire length from the top end.

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

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

Overtravel Models



Overtravel models are Limit Switches which are provided with a greater OT to facilitate dog setting.

The overtravel models are classified into three types; general-purpose, high-sensitivity, and models which are capable of one-side 90° operation, the -2N Series.

The -2N Series can also be installed on either side.

Since this model is identical to the standard model in dimensions, both models are interchangeable.

Like the standard model, it is oil-tight, waterproof, and dustproof (complies with IP67).

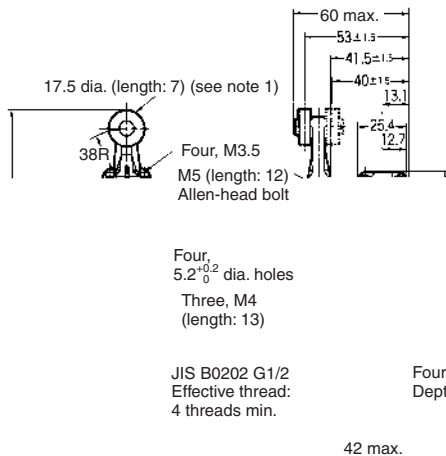
General-purpose, high sensitivity models	Side-installation models
	
Head can be mounted in any of the four directions. The lever operates on either side at 80°. One-side operation is impossible.	The Head can be mounted in two directions, forward and backward. The lever operates on either side at 90°. One side operation is possible.

General-purpose/High Sensitivity Models

- Note:**
- For all models WL□ indicates a standard model and WL01□ indicates a microload model.
 - One-side operation is not possible with the general-purpose and high-sensitivity models.
 - Unless otherwise indicated, a tolerance of ± 0.4 mm applies to all dimensions.

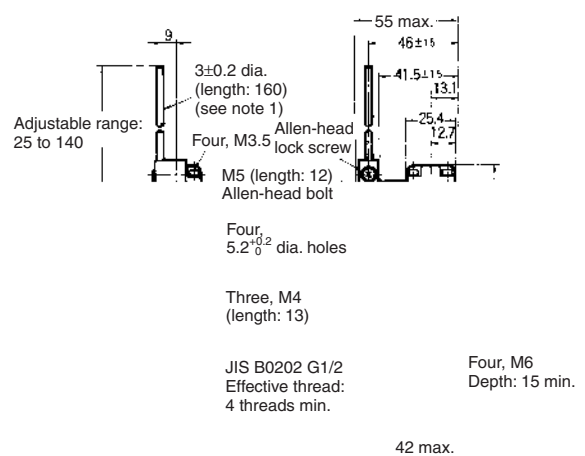
Roller Lever

WLH2
WL01H2
WLG2
WL01G2



Adjustable Rod Lever

WLHL
WL01HL
WLGL
WL01GL

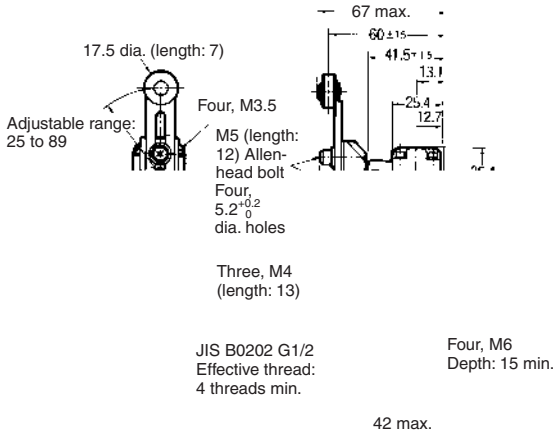


- Note:**
- Stainless sintered roller
 - WL□G2 is identical to other models except in the shape of the set position marker plate.
 - The built-in switch for WLH2 is W-10FB3.
 - The built-in switch for WLG2 is W-10FB3-8.

- Note:**
- WL□GL is identical to other models except in the shape of the set position marker plate.
 - The built-in switch for WLHL is W-10FB3.
 - The built-in switch for WLGL is W-10FB3-8.

Adjustable Roller Lever

WLH12
WL01H12
WLG12
WL01G12



- Note:**
1. Stainless sintered roller
 2. WL□G12 is identical to other models except in the shape of the set position marker plate.
 3. The built-in switch for WLH12 is W-10FB3.
 4. The built-in switch for WLG12 is W-10FB3-8.

Operating characteristics	WLH2 WL01H2	WLG2 WL01G2	WLHL WL01HL (See note 2.)	WLGL WL01GL (See note 2.)	WLH12 WL01H12 (See note 1.)	WLG12 WL01G12 (See note 1.)
Operating force: OF max.	9.81 N	9.81 N	2.84 N	2.84 N	9.81 N	9.81 N
Release force: RF min.	0.98 N	0.98 N	0.25 N	0.25 N	0.98 N	0.98 N
Pretravel: PT	15±5°	10 ⁺² ₋₁	15±5°	10 ⁺² ₋₁	15±5°	10 ⁺² ₋₁
Overtravel: OT min.	55°	65°	55°	65°	55°	65°
Movement differential: MD max.	12°	7°	12°	7°	12°	7°

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

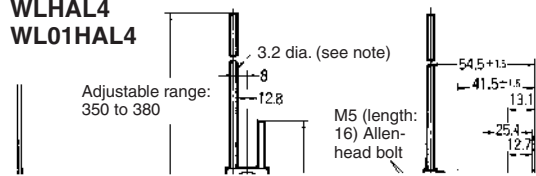
OF and RF for WLH12 and WL01H12, with a lever length of 89 mm.

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

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

Adjustable Rod Lever

WLHAL4
WL01HAL4



Four,
5.2 $^{+0.2}_{-0}$ dia. holes

Three, M4
(length: 13)

JIS B0202 G1/2
Effective thread:
4 threads min.

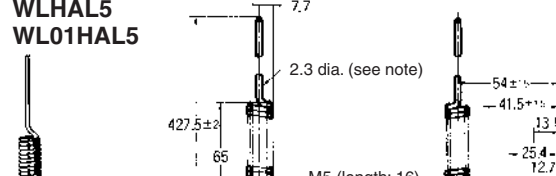
Four, M6
Depth: 15 min.

42 max.

Note: Stainless steel rod

Rod Spring Lever

WLHAL5
WL01HAL5



M5 (length: 16)
Allen-head bolt

Four,
5.2 $^{+0.2}_{-0}$ dia. holes

Three, M4
(length: 13)

JIS B0202 G1/2
Effective thread:
4 threads min.

Four, M6
Depth: 15 min.

42 max.

Note: Piano wire

Operating characteristics	WLHAL4 WL01HAL4 (See note 2.)	WLHAL5 WL01HAL5
Operating force: OF max.	0.98 N	0.90 N
Release force: RF min.	0.15 N	0.09 N
Pretravel: PT	15 \pm 5°	15 \pm 5°
Overtravel: OT min.	55°	55°
Movement differential: MD max.	12°	12°

Note: 1. With WLHAL4, WL01HAL4, WLHAL5, and WL01HAL5, the actuator's tare is large, so depending on the installation direction, they may not be properly reset. Always install so that the actuator is facing downwards.

2. The operating characteristics of WLHAL4, and WL01HAL4 are measured at the rod length of 380 mm.

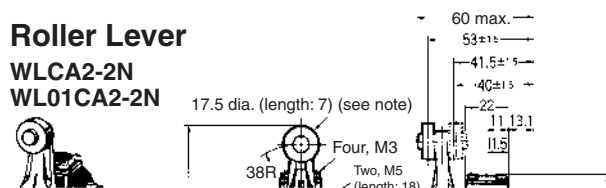
Side-installation Models

90° operation on one side is possible by simply changing the direction of the cam.

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

Roller Lever

WLCA2-2N
WL01CA2-2N



Four, M3
Two, M5
(length: 18)
M5 (length:
12) Allen-
head bolt
Four, 5.2 $^{+0.2}_{-0}$
dia. holes
Two, 5.2 $^{+0.2}_{-0}$ dia.

Three, M4
(length: 13)

JIS B0202 G1/2
Effective thread:
4 threads min.

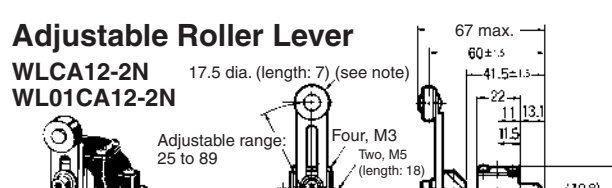
Four, M6
Depth: 15 min.

42 max.

Note: Stainless sintered roller

Adjustable Roller Lever

WLCA12-2N
WL01CA12-2N



M5 (length:
16) Allen-
head bolt
Two, 5.2 $^{+0.2}_{-0}$ dia.

Three, M4
(length: 13)

JIS B0202 G1/2
Effective thread:
4 threads min.

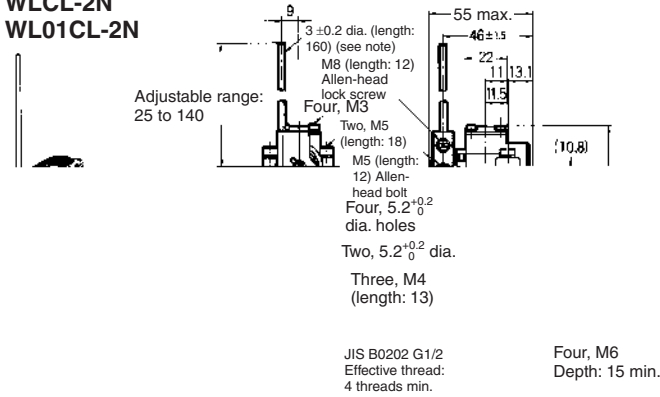
Four, M6
Depth: 15 min.

42 max.

Note: Stainless sintered roller

Adjustable Rod Lever

WLCL-2N
WL01CL-2N



Note: Stainless steel rod

42 max.

Operating characteristics	WLCA2-2N WL01CA2-2N	WLCA12-2N WL01CA12-2N (See note 1.)	WLCL-2N WL01CL-2N (See note 2.)
Operating force: OF max.	9.61 N	9.61 N	2.84 N
Release force: RF min.	1.18 N	1.18 N	0.25 N
Pretravel: PT max.	20°	20°	20°
Overtravel: OT min.	70°	70°	70°
Movement differential: MD max.	10°	10°	10°

Note: 1. The operating characteristics of WLCA12-2N and WL01CA12-2N are measured at the lever length of 38 mm.
2. The operating characteristics of WLCL-2N and WL01CL-2N are measured at the rod length of 140 mm.

OF and RF for WLCA12-2N and WL01CA12-2N, with a lever length of 89 mm.

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

High-precision Models

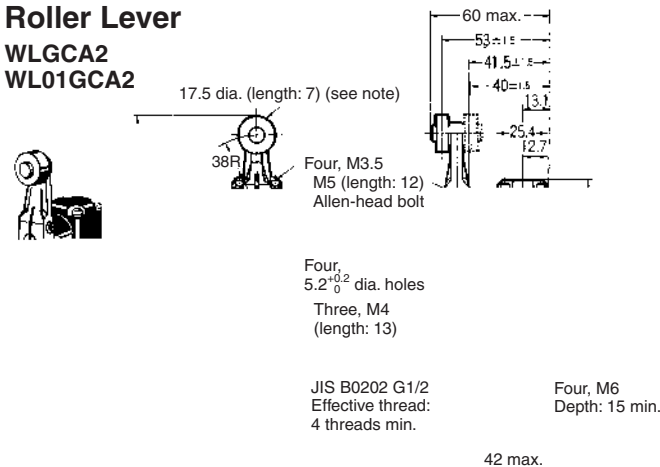
The high-precision models feature a pretravel of 5° (as compared with 15° for the standard models) and a repeat accuracy twice as great as standard models. The high-precision models are ideal for positioning control of machine tools.

For all models WL□ indicates a standard model and WL01□ indicates a microload model.

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

Roller Lever

WLGCA2
WL01GCA2



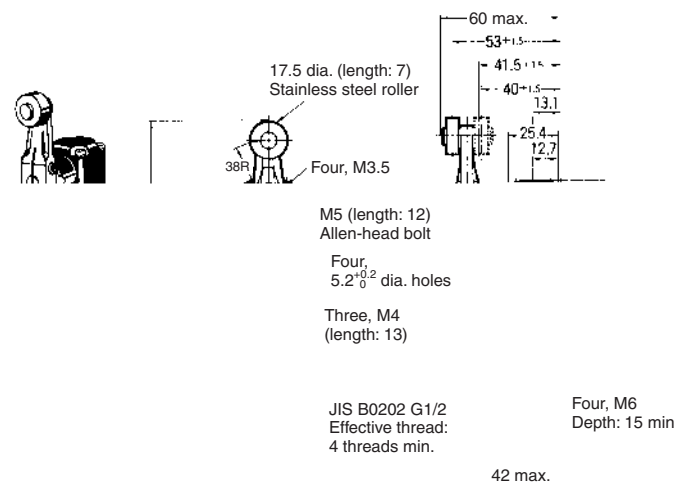
Operating characteristics	WLGCA2 WL01GCA2
Operating force: OF max.	13.34 N
Release force: RF min.	1.47 N
Pretravel: PT	5 ⁺² ₀
Overtravel: OT min.	40°
Movement differential: MD max.	3°

Note: Stainless sintered roller

Lamp-equipped Models

Roller Lever

WLCA2-LE/LD
WL01CA2-LE/LD



Note: Stainless steel roller

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

OF max.	13.34 N
RF min.	2.23 N
PT	$15 \pm 5^\circ$
OT min.	30°
MD max.	12°

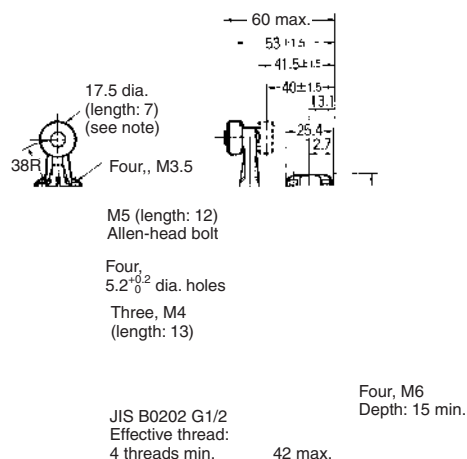
Sensor I/O Connector Models

Roller Lever Models

Standard Model (WLCA2), High-precision Model (WLGCA2), Overtravel Model (WLH2), and Overtravel High-sensitivity Model (WLG2)

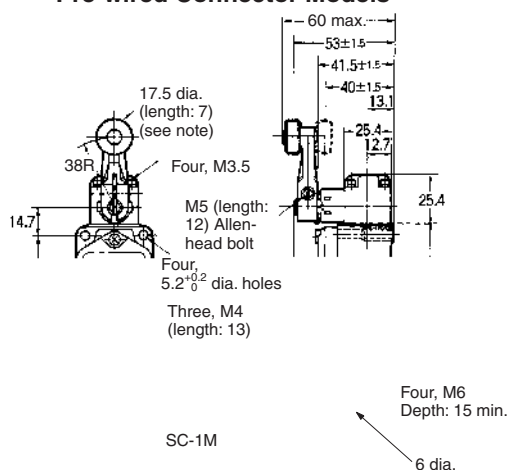
- Note: 1. For the WLG2 model, only the dimensions for the set position marker plate change.
2. Unless otherwise indicated, a tolerance of ± 0.4 mm applies to all dimensions.
3. The above diagram is for a lamp-equipped model.

Direct-wired Connector Models



Note: Stainless sintered roller

Pre-wired Connector Models



Note: Stainless sintered alloy roller

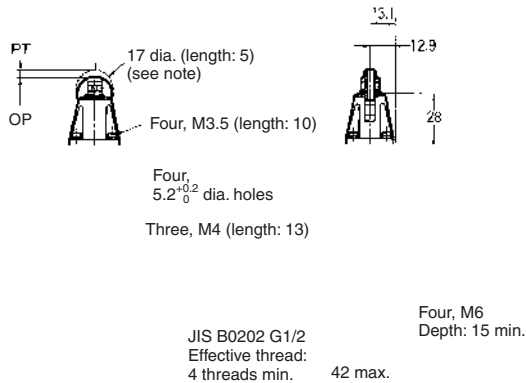
Operating characteristics	Roller lever/Standard model	Roller lever/High precision model	Roller lever/Overtravel model	Roller lever/Overtravel high sensitivity model
Operating force: OF max.	13.34 N	13.34 N	9.81 N	9.81 N
Release force: RF min.	2.23 N	1.47 N	0.98 N	0.98 N
Pretravel: PT	15±5°	5 ^{+2°} _{-0°}	15±5°	10 ^{+2°} _{-1°}
Overtravel: OT min.	30°	40°	55°	65°
Movement differential: MD max.	12°	3°	12°	7°

Top-roller Plunger

WLD2

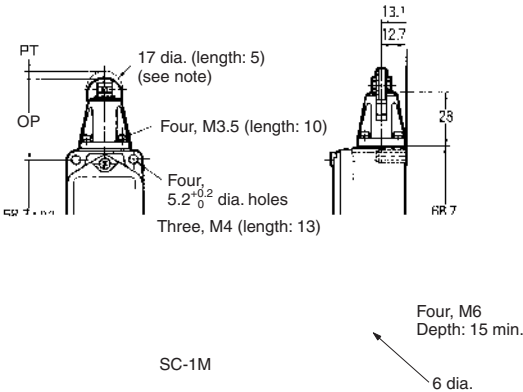
Note: 1. Unless otherwise indicated, a tolerance of ±0.4 mm applies to all dimensions.
2. The above diagram is for a lamp-equipped model.

Direct-wired Connector Models



Note: Stainless sintered roller

Pre-wired Connector Models



SC-1M

XS2H-D421

42 max.

Note: Stainless sintered roller

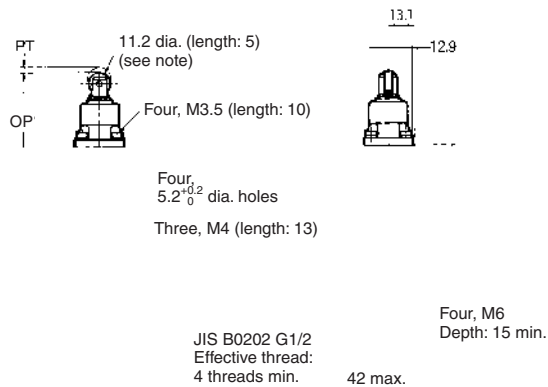
Operating characteristics	Top-roller plunger actuator
Operating force: OF max.	26.67 N
Release force: RF min.	8.92 N
Pretravel: PT max.	1.7 mm
Overtravel: OT min.	5.6 mm
Movement differential: MD max.	1 mm
Operating position: OP	44±0.8 mm
Total travel position: TTP max.	39.5 mm

Sealed Top-roller Plunger

WLD28

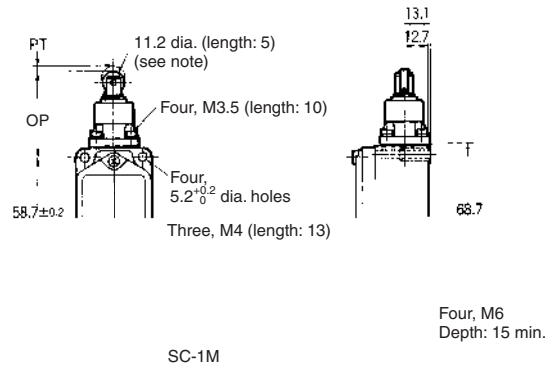
Note: 1. Unless otherwise indicated, a tolerance of ± 0.4 mm applies to all dimensions.
2. The above diagram is for a lamp-equipped model.

Direct-wired Connector Models



Note: Stainless sintered alloy roller

Pre-wired Connector Models



SC-1M

XS2H-D421

42 max.

Note: Stainless sintered alloy roller

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

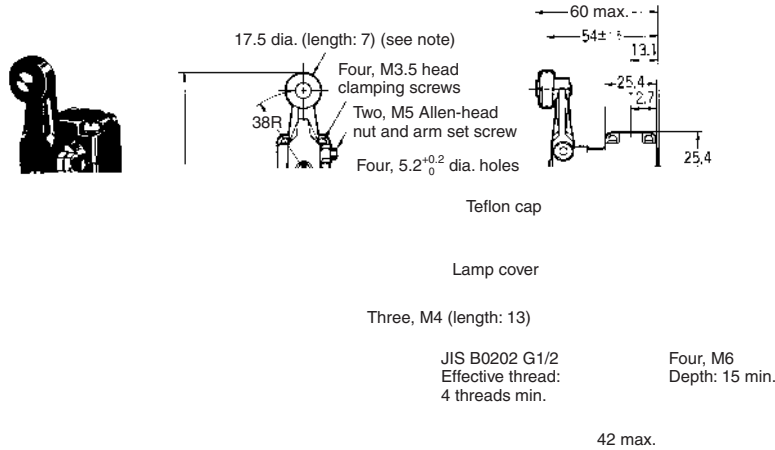
■ Environment-resistant Models

The dimensions and operating characteristics are the same as general-purpose, environment-resistant models.

■ Spatter-prevention Models

Roller Lever (Screw Terminals)

WLCA2-□S/WL01□-□S
 WLH2-□S/WLG2-□S
 WLGCA2-□S

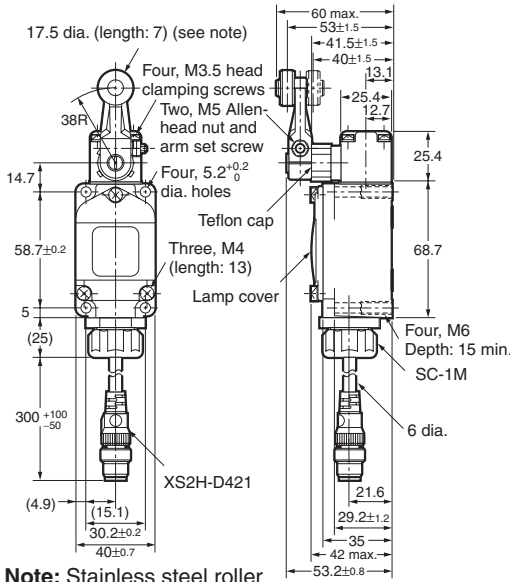


Note: Stainless steel roller

Roller Lever (Pre-wired Connector)

WLCA2-□S-M1J/WL01□-□S-M1J
 WLH2-□S-M1J/WLG2-□S-M1J
 WLGCA2-□S-M1J

Note: The dimensions are the same regardless of the number of core lines.

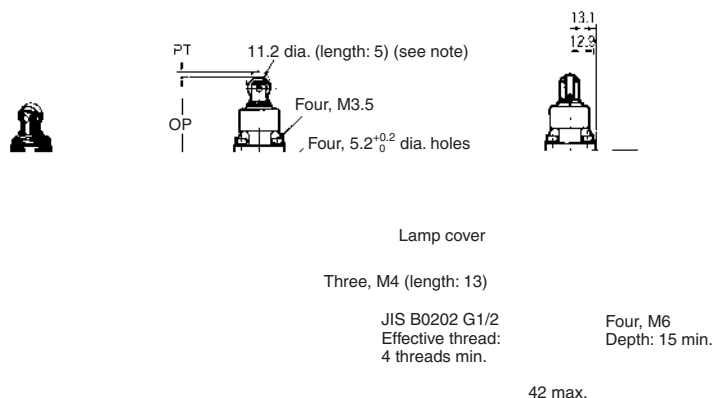


Note: Stainless steel roller

Operating characteristics	Standard	Overtravel models		High-precision
		General	High-sensitivity	
Operating force: OF max.	13.34 N	9.81 N	9.81 N	13.34 N
Release force: RF min.	2.23 N	0.98 N	0.98 N	1.47 N
Pretravel: PT	15°±5°	15°±5°	10° ⁺² ₋₁	5° ⁺² ₋₀
Overtravel: OT min.	30°	55°	65°	40°
Movement differential: MD max.	12°	12°	7°	3°

Sealed Top-roller Plunger (Screw Terminals)

WLD28-□S

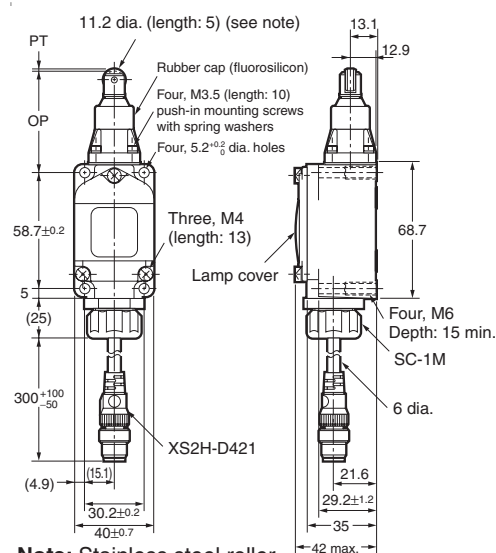


Note: Stainless steel roller

Sealed Top-roller Plunger (Pre-wired Connector)

WLD28-□S-M1J

Note: The dimensions are the same regardless of the number of core lines.



Note: Stainless steel roller

Operating characteristics	WLD28-L□S
Operating force: OF max.	16.67 N
Release force: RF min.	4.41 N
Pretravel: PT max.	1.7 mm
Overtravel: OT min.	5.6 mm
Movement differential: MD max.	1 mm
Operating position: OP	44±0.8 mm
Total travel position: TTP max.	39.5 mm

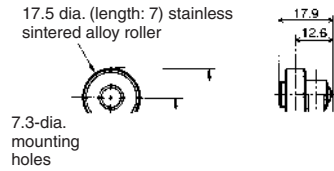
Note: Unless otherwise indicated, a tolerance of ±0.4 mm applies to all dimensions.

■ Actuators (Levers Only)

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

WL-1A100

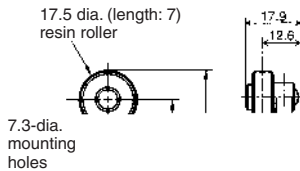
Standard Lever



M5
Allen-head bolt

WL-1A115

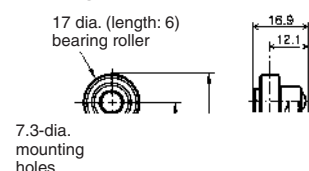
Resin Roller



M5
Allen-head bolt

WL-1A400

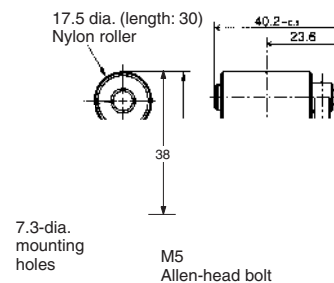
Bearing Roller



M5
Allen-head bolt

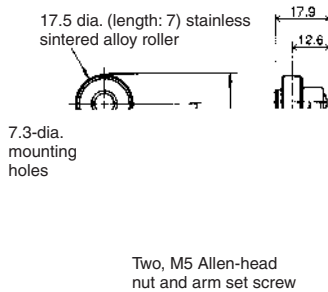
WL-1A118

Nylon Roller: Roller Width: 30 mm



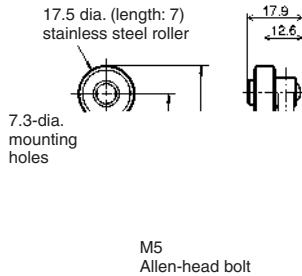
WL-1A105

Double Nut



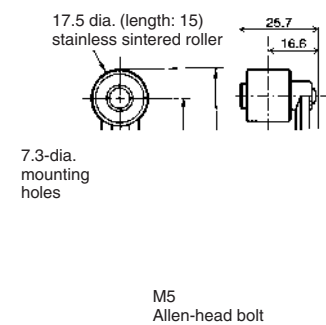
WL-1A103S

Spatter Prevention



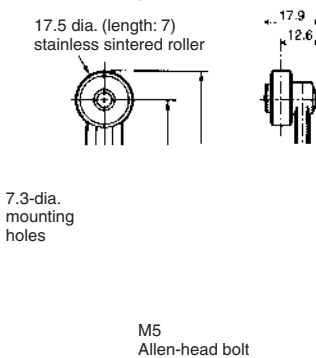
WL-1A200

Lever Length: 50 Roller Width: 15

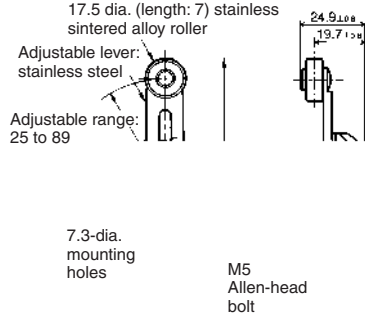


WL-1A300

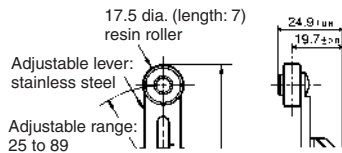
Lever Length: 63



WL-2A100



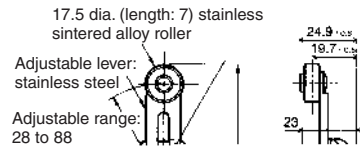
WL-2A111 Resin Roller



7.3-dia. mounting holes

M5 Allen-head bolt

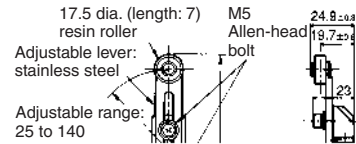
WL-2A107 Double Nut



7.3-dia. mounting holes

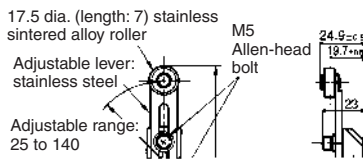
Two, M5 Allen-head nut and arm set screw

WL-2A108 Resin Roller



7.3-dia. mounting holes

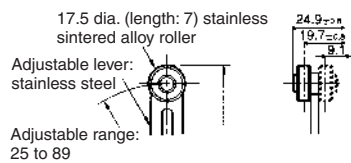
WL-2A122



7.3-dia. mounting holes

M5 Allen-head bolt

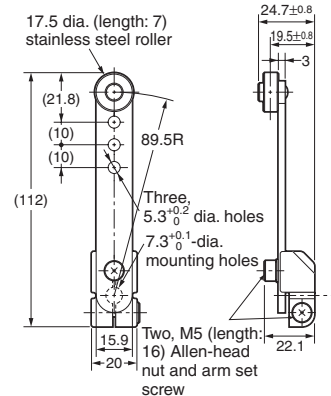
WL-2A106



7.3-dia. mounting holes

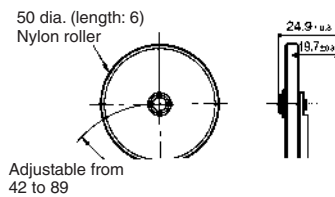
M5 Allen-head bolt

WL-2A130



Note: Can be installed on the rear side.

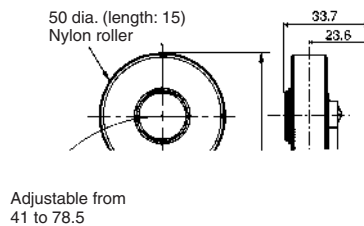
WL-2A104



7.3-dia. mounting holes

M5 Allen-head bolt

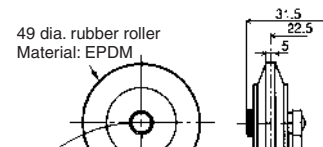
WL-2A110



7.3-dia. mounting holes

M5 Allen-head bolt

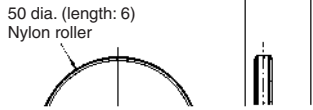
WL-2A105



7.3-dia. mounting holes

M5 Allen-head bolt

WL-1A106

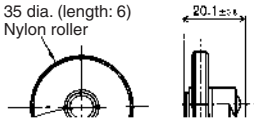


38R

M5
Allen-head
bolt

7.3-dia.
mounting
holes

WL-1A110

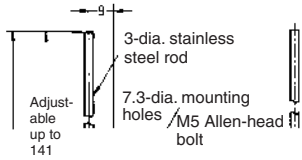


38R

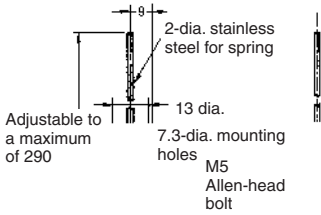
M5
Allen-head
bolt

7.3-dia.
mounting
holes

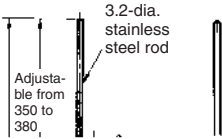
WL-4A100



WL-4A201



WL-3A100

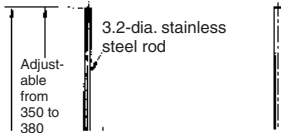


Actuator's
center of
rotation

7.3-dia. mounting
holes

M5
Allen-
head bolt 25.5 max.

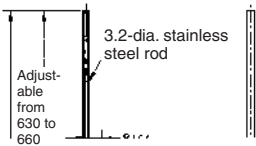
**WL-3A106
Double Nut**



7.3-dia. mounting
holes

Two, M5 Allen-
head nut and
arm set screw 25.5 max.

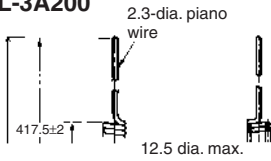
WL-3A108



7.3-dia.
mounting
holes

M5
Allen-head
bolt 25.5 max.

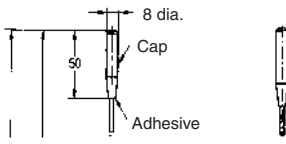
WL-3A200



7.3-dia.
mounting
holes

M5
Allen-head
bolt 24.6 max.

WL-3A203

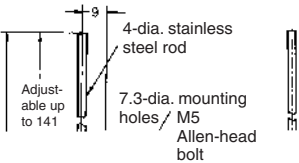


7.3-dia.
mounting
holes

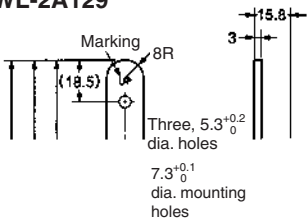
12.5 dia.
max.
2.3-dia.
operation
rod

M5
Allen-head bolt 24.6 max.

WL-4A112

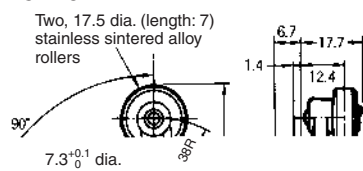


WL-2A129



Two,
M5 (length:
16) Allen-
head bolts

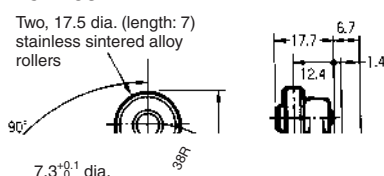
WL-5A101



M5 (length: 16)
Allen-head bolt

WL-5A100 has a resin roller

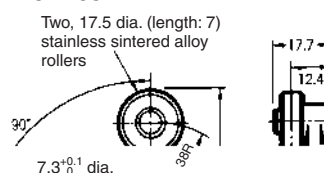
WL-5A103



M5 (length: 16)
Allen-head bolt

WL-5A102 has a resin roller

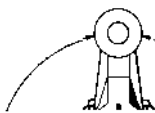
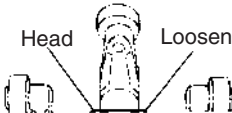

WL-5A105

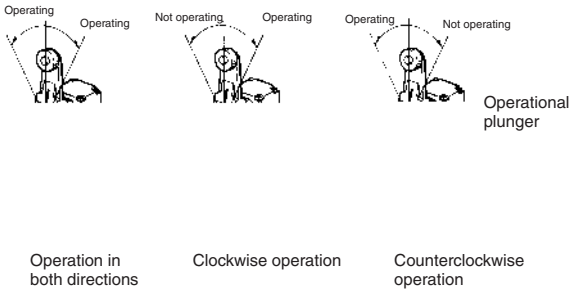
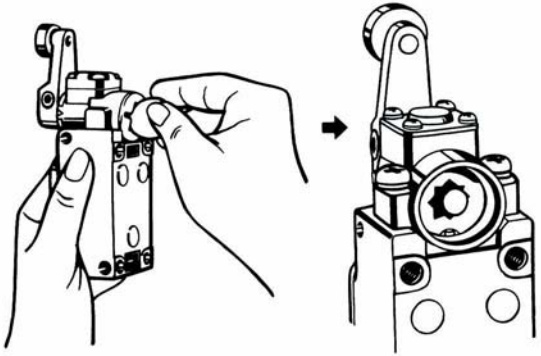
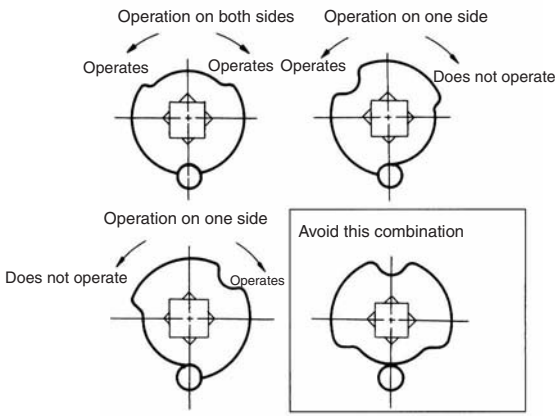



M5 (length: 16)
Allen-head bolt



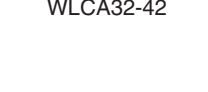
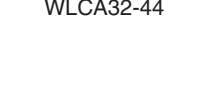
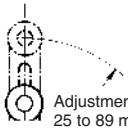

WL-5A104 has a resin roller

Installation

Item	Appropriate model/actuator	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 Lamp-equipped Switches, the actuator lever comes in contact with the top of the lamp cover, so use caution when rotating and setting the lever. When the lever only moves forwards and back-wards, it will not contact the lamp cover.	Roller Levers: WLCA2, WL01CA2, WLH2, WL01H2, WLG2, WL01G2 Adjustable Roller Levers: WLCA12, WL01CA12, WLH12, WL01H12, WLG12, WL01G12 Adjustable Rod Levers: WLCL, WL01CL, WLHL, WL01HL, WLGL, WL01GL	 <p>Loosen the M5 × 12 bolt, set the actuator's position and then tighten the bolt again.</p>
Changing the orientation of the Head By removing the screws in the four corners of the Head, the Head can be set in any of the four directions. Be sure to change the plunger for internal operations at the same time. (The operational plunger does not need to be changed on overtravel general-purpose and high-sensitivity models.) The roller plunger can be set in either two positions at 90°. WLCA2-2N and WL01CA2-2N can only be set in either the forward or backward direction.	Roller Levers: WLCA□, WL01CA□, WLGCA□ Adjustable Rod Levers: WLCL, WL01CL Horizontal Plungers: WLSD□, WL01SD□ Roller Plungers: WLD2, WL01D2 Sealed Roller Plungers: WLD28, WL01D28. Note: Does not include -RP60 Series or -141 Series.	 <p>Head</p> <p>Loosen the screws.</p>  <p>Head</p> <p>Loosen the screws.</p>

Item	Appropriate model/actuator	Details
<p>Changing the operating direction</p> <p>By removing the Head on models which can operate on one-side only, and then changing the direction of the operational plunger, one of three operating directions can be selected. In the case of overtravel models, by loosening the rubber holder using either a coin or a flat-blade screwdriver, and changing the direction of the internal rubber section, one of three operating directions can be selected.</p> <p>The tightening torque for the screws on the Head is 0.78 to 0.88 N·m.</p>	<p>Roller Levers: WLCA2, WL01CA2, WLGCA2, WLMGCA2□</p> <p>Adjustable Roller Levers: WLCA12, WL01CA12</p> <p>Adjustable Rod Levers: WLCL, WL01CL</p> <p>Overtravel Models: WLCA□-2N, WL01CA□-2N</p> <p>Note: The diagram at the right is not correct for the overtravel -2N models.</p>	<p>The output of the Switch will be changed, regardless of which direction the lever is pushed.</p> <p>The output of the Switch will only be changed when the lever is pushed in one direction.</p>  <p>For details on overtravel -2N models, refer to page 43.</p> <p>Cam direction changing procedure for side-installation models</p> <p>Loosen the cam holder with a coin or screwdriver. Take out the cam from the Switch.</p> <p>Change the direction of the cam as required by your intended operation and then reinstall the cam.</p>  <p>Relationship of cam to operation as observed from the rear of Switch</p>  <p>Installing the roller on the inside</p> <p>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.)</p> <p>Roller Levers: WLCA□, WL01CA□, except for the adjustable roller levers.</p> <p>Fork Lever Locks: WLCA32-4□, WL01CA32-4□</p>  <p>Loosen the Allen-head bolt.</p>

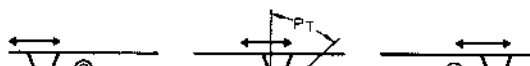
Limit switches

Item	Appropriate model/actuator	Details
Selecting the roller position There are four types of fork lever lock for use depending on the roller position.	Fork Lever Locks: WLCA32-4□, WL01CA32-4□	<div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;">  <p>WLCA32-41</p> </div> <div style="text-align: center;">  <p>WLCA32-43</p> </div> </div> <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;">  <p>WLCA32-42</p> </div> <div style="text-align: center;">  <p>WLCA32-44</p> </div> </div> <p>Note: An explanation of the operation of fork lever locks is provided after this table.</p>
Adjusting the length of the rod or lever The length of the rod or lever can be adjusted by loosening the Allen-head bolt.	Adjustable Roller Levers: WLCA12, WL01CA12 etc. Adjustable Rod Levers: WLCL, WL01CL, etc.	<p>WLCA12 etc.</p> <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;">  <p>Adjustment range: 25 to 89 mm</p> </div> <div style="text-align: center;">  </div> </div> <p>Loosen this Allen-head bolt and adjust the length of the lever.</p> <p>Loosen this Allen-head bolt and adjust the length of the rod.</p>

■ Operation of Fork Lever Locks

The fork lever lock is configured so that the dog pushes the lever to reverse the output and this reversed state is maintained even after the dog continues on. If the dog then pushes the lever from the opposite direction, the lever will return to its original position.

Example



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

Precautions

Refer to the *Technical Information for Limit Switches* (Cat. No. C121).

Correct Use

When a rod or wired-type actuator is used, do not touch the top end of the actuator. Doing so may result in injury.

Applicable models: WLHAL5 and WL01HAL5 Rod Spring Levers and WLNJ-S2 and WL01NJ-S2 Steel-wire Actuators.

A short-circuit may cause damage to the Switch, so insert a circuit breaker fuse, of 1.5 to 2 times the rated current, in parallel with the Switch. In order to meet EN approval ratings, use a 10-A fuse that corresponds to IEC269, either a gI or gG for general-purpose types and spatter-prevention models only.

When wiring terminal screws, use M4 round crimp terminals and tighten screws to the recommended torque. Wiring with broken wires, or the incorrect crimp terminals, or not tightening screws to the recommended torque can lead to short-circuits, leakage current, and fire.

When performing internal wiring there is a chance of short-circuit, leakage current, or fire, so be sure to protect the inside of the Switch from splashes of oil or water, corrosive gases, and cutting powder.

Using an inappropriate connector or assembling Switches incorrectly (assembly, tightening torque) can result in malfunction, leakage current, or fire, so be sure to read the instruction manual thoroughly beforehand.

Even when the connector is assembled and set correctly, the end of the cable and the inside of the Switch may come in contact. This can lead to malfunction, leakage current, or fire, so be sure to protect the end of the cable from splashes of oil or water and corrosive gases.

Environmental Precautions

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

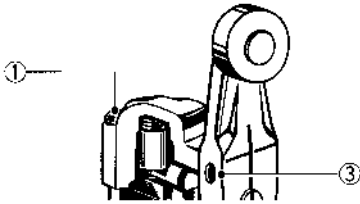
Built-in Switch

Do not remove or replace the built-in switch. If the position of the built-in switch moves, it can cause reduced performance, and if the insulation sheet moves (separator), the insulation may become ineffective.

Tightening Torque

If screws are too loose they can lead to an early malfunction of the Switch, so ensure that all screws are tightened using the correct torque.

No.	Type	Torque
①	Head mounting screw	0.78 to 0.88 N·m
②	Cover mounting screw	1.18 to 1.37 N·m
③	Allen-head bolt (for securing the lever)	4.90 to 5.88 N·m
④	Terminal screw	0.59 to 0.78 N·m
⑤	Connector	1.77 to 2.16 N·m
⑥	Main Unit screws	4.90 to 5.88 N·m



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.

Installing the Switch

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

Standard/Overtravel model	Overtravel model (side installation)
<p>Mounting holes</p> <p>Four, $5.2^{+0.2}_{-0}$ dia. holes</p>	<p>Mounting holes</p> <p>Two, $5.2^{+0.2}_{-0}$ dia. holes</p>

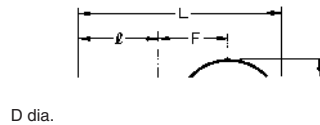
Connectors

Either the easy-to-use Allen-head nut or the SC Connector can be used as connectors. To ensure high-sealing properties, use the SC Connector. Consult your OMRON representative for details on SC Connectors.

Wiring

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

Crimp Terminal External Dimensions



dz dia.:	4.3
D dia.:	4.5
B:	8.5
L:	21.0
F:	7.8
l:	9.0 (mm)

dz dia.

Rotating Lever Set Position

All rotating lever models, except the fork lever lock, have a set position marker plate. (See page 33.) After operation, set the indicator needle on the marker plate so that it is in the convex section of the bearing.

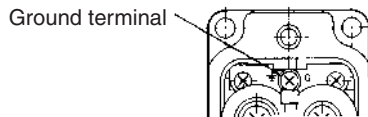
Terminal Plate

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



Wiring Method

Switch Box Section



NO terminal

NC terminal

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

t = 0.6 Copper plate

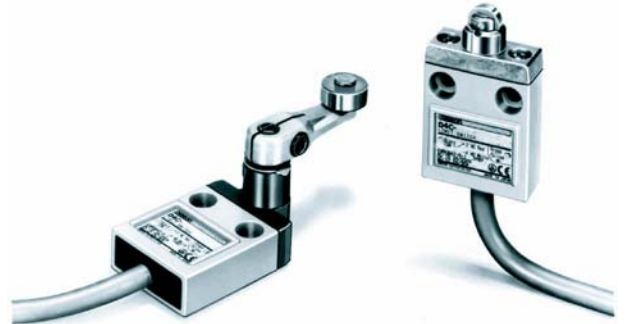
ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.

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

Enclosed Switch D4C

Sealed, Compact, and Slim-bodied Switch Offers Choice of Many Actuators

- Liquid- and dust-resistance conforms to IEC IP67 standard.
- Triple-sealed construction:
Plunger section sealed via nitrile rubber packing seal and diaphragm; switch section sealed via nitrile rubber cap; cable entrance sealed via encapsulating material.
- Standard cable (S-FLEX VCTF) in 2-, 3-, or 5-meter lengths offers high flexibility with outstanding oil and extreme temperature resistance.
- Low temperature models are available.



Model Number Structure

■ Model Number Legend

Standard Models

D4C-□□□
1 2 3

1. Rated Current

- 1: 5 A at 250 VAC, 4 A at 30 VDC
- 2: 5 A at 125 VAC (with LED indicator)
- 3: 4 A 30 VDC (with LED indicator)
- 4: 0.1 A at 125 VAC, 0.1 A at 30 VDC
- 5: 0.1 A at 125 VAC (with LED indicator)
- 6: 0.1 A at 30 VDC (with LED indicator)

2. Cable Specifications

- 2: VCTF oil-resistant cable (3 m)
- 3: VCTF oil-resistant cable (5 m)
- 4: VCTF (3 m)
- 5: VCTF (5 m)
- 6: SJT(O) (3 m)
- 7: SJT(O) (5 m)
- 8: VCTF oil-resistant cable (2 m)
- 9: VCTF (2 m)

3. Actuator

- 01: Pin plunger
- 02: Roller plunger
- 03: Crossroller plunger
- 10: Bevel plunger
- 20: Roller lever
- 24: Roller lever (high-sensitivity model)
- 31: Sealed pin plunger
- 32: Sealed roller plunger
- 33: Sealed crossroller
- 41: Panel mount pin plunger
- 42: Panel mount roller plunger
- 43: Panel mount crossroller plunger
- 50: Plastic rod
- 60: Center roller lever plunger

Note 1: Some combinations of the above may not be supported.

2: With standard models, the operation indicator turns OFF when the switch operates. If models with operation indicators that turn ON when the switch operates are required, add "-B" to the end of the model number.

Pre-wired Models (Use VCTF Oil-resistant Cable)

D4C-□0□□-□□□□□□
 1 2 3 4

1. Operation Indicator Lamp

- 1: Without operation indicator
- 2: 1 A at 125 VAC (with operation indicator)
- 3: 1 A at 30 VDC (with operation indicator)

2. Actuator

- 01: Pin plunger
- 02: Roller plunger
- 31: Sealed plunger
- 32: Sealed roller plunger
- 24: Roller lever (high-sensitivity model)

3. Wiring Specifications

- DK1EJ: Pre-wired models
(3 conductors: DC specification, NC wiring)
- AK1EJ: Pre-wired models
(3 conductors: AC specification, NC wiring)
- M1J: Connector models for ASI devices
(2 conductors: NO wiring)

4. Cable length

- 03: 0.3 m
- 05: 0.5 m
- 10: 1 m

Wiring Specifications

Internal switch	Connector
COM	3
NC	2
NO	4

Note: Since the above wiring specifications are different from those for the D4CC, be careful not to mistake them.

Weather-resistant Models

D4C-□□□-P
 1 2 3

1. Rated Current

- 1: 5 A at 250 VAC, 4 A at 30 VDC
- 2: 5 A at 125 VAC (with LED indicator)
- 3: 4 A at 30 VDC (with LED indicator)
- 4: 0.1 A at 125 VAC, 0.1 A at 30 VDC
- 5: 0.1 A at 125 VAC (with LED indicator)
- 6: 0.1 A at 30 VDC (with LED indicator)

2. Cable Specifications

- 2: VCTF oil-resistant cable (3 m)
- 3: VCTF oil-resistant cable (5 m)















3. Actuator

- 20: Roller lever
- 24: Roller lever (high-sensitivity model)
- 27: Variable roller lever
- 29: Variable rod lever

Ordering Information

List of Models

Standard Models

Actuator		Standard cable models						UL/CSA-approved cable models			
		S-FLEX VCTF Cable*			VCTF Cable**			5 A at 250 VAC without LED indicator	5 A at 125 VAC with LED indicator (100 VAC)		
		EN60947-5-1 approved						SJT(O) Cable***			
		2 m	3 m	5 m	2 m	3 m	5 m	3 m	5 m	3 m	5 m
Pin plunger		D4C-□801	D4C-□201	D4C-□301	D4C-□901	D4C-□401	D4C-□501	D4C-1601	D4C-1701	D4C-2601	D4C-2701
Sealed plunger		D4C-□831	D4C-□231	D4C-□331	D4C-□931	D4C-□431	D4C-□531	D4C-1631	D4C-1731	D4C-2631	D4C-2731
Roller plunger		D4C-□802	D4C-□202	D4C-□302	D4C-□902	D4C-□402	D4C-□502	D4C-1602	D4C-1702	D4C-2602	D4C-2702
Sealed roller plunger		D4C-□832	D4C-□232	D4C-□332	D4C-□932	D4C-□432	D4C-□532	D4C-1632	D4C-1732	D4C-2632	D4C-2732
Crossroller plunger		D4C-□803	D4C-□203	D4C-□303	D4C-□903	D4C-□403	D4C-□503	D4C-1603	D4C-1703	D4C-2603	D4C-2703
Sealed crossroller plunger		D4C-□833	D4C-□233	D4C-□333	D4C-□933	D4C-□433	D4C-□533	D4C-1633	D4C-1733	D4C-2633	D4C-2733
Bevel plunger		D4C-□810	D4C-□210	D4C-□310	D4C-□910	D4C-□410	D4C-□510	D4C-1610	D4C-1710	D4C-2610	D4C-2710
Coil spring		D4C-□850	D4C-□250	D4C-□350	D4C-□950	D4C-□450	D4C-□550	D4C-1650	D4C-1750	D4C-2650	D4C-2750
Roller lever		D4C-□820	D4C-□220	D4C-□320	D4C-□920	D4C-□420	D4C-□520	D4C-1620	D4C-1720	D4C-2620	D4C-2720
Roller lever (high-sensitivity model)		D4C-□824	D4C-□224	D4C-□324	D4C-□924	D4C-□424	D4C-□524	D4C-1624	D4C-1724	D4C-2624	D4C-2724
Panel mount pin plunger		D4C-□841	D4C-□241	D4C-□341	D4C-□941	D4C-□441	D4C-□541	D4C-1641	D4C-1741	D4C-2641	D4C-2741
Panel mount roller plunger		D4C-□842	D4C-□242	D4C-□342	D4C-□942	D4C-□442	D4C-□542	D4C-1642	D4C-1742	D4C-2642	D4C-2742
Panel mount crossroller plunger		D4C-□843	D4C-□243	D4C-□343	D4C-□943	D4C-□443	D4C-□543	D4C-1643	D4C-1743	D4C-2643	D4C-2743
Center roller lever plunger		D4C-□860	D4C-□260	D4C-□360	D4C-□960	D4C-□460	D4C-□560	D4C-1660	D4C-1760	D4C-2660	D4C-2760

Note 1. Cold-resistant models are also available. Order these models with reference to the following example.

D4C-1201 → D4C-1201-C

2. Models with viscosity-resistant oil specification (with an oil drain hole) are also available. Order these models with reference to the following example. Applicable only to the plunger models.

D4C-1202 → D4C-1202-M














3. Variable roller lever models are also available.

* Oil-resistant vinyl cabtire cables.






** Ordinary vinyl cabtire cables.

*** Models with SJT(O) Cables (approved by UL and CSA standards) conform to UL and CSA standards.

Standard Models (Continued)

Actuator	CENELEC cable models			
	EN60947-5-1 approved			
	1 m	2 m	3 m	5 m
Pin plunger 	D4C-1G01 1 M	D4C-1G01 2 M	D4C-1G01 3 M	D4C-1G01 5 M
Sealed plunger 	D4C-1G31 1 M	D4C-1G31 2 M	D4C-1G31 3 M	D4C-1G31 5 M
Roller plunger 	D4C-1G02 1 M	D4C-1G02 2 M	D4C-1G02 3 M	D4C-1G02 5 M
Sealed roller plunger 	D4C-1G32 1 M	D4C-1G32 2 M	D4C-1G32 3 M	D4C-1G32 5 M
Crossroller plunger 	D4C-1G03 1 M	D4C-1G03 2 M	D4C-1G03 3 M	D4C-1G03 5 M
Sealed crossroller plunger 	D4C-1G33 1 M	D4C-1G33 2 M	D4C-1G33 3 M	D4C-1G33 5 M
Bevel plunger 	D4C-1G10 1 M	D4C-1G10 2 M	D4C-1G10 3 M	D4C-1G10 5 M
Coil spring 	D4C-1G50 1 M	D4C-1G50 2 M	D4C-1G50 3 M	D4C-1G50 5 M
Roller lever 	D4C-1G20 1 M	D4C-1G20 2 M	D4C-1G20 3 M	D4C-1G20 5 M
Roller lever (high-sensitivity model) 	D4C-1G24 1 M	D4C-1G24 2 M	D4C-1G24 3 M	D4C-1G24 5 M
Panel mount pin plunger 	D4C-1G41 1 M	D4C-1G41 2 M	D4C-1G41 3 M	D4C-1G41 5 M
Panel mount roller plunger 	D4C-1G42 1 M	D4C-1G42 2 M	D4C-1G42 3 M	D4C-1G42 5 M
Panel mount crossroller plunger 	D4C-1G43 1 M	D4C-1G43 2 M	D4C-1G43 3 M	D4C-1G43 5 M

Pre-wired Models (Use VCTF Oil-resistant Cable)





Actuator	1 A at 125 VAC without operation indicator	1 A at 125 VAC with operation indicator	1 A at 30 VDC without operation indicator	1 A at 30 VDC with operation indicator
Pin plunger 	D4C-1001-AK1EJ□	D4C-2001-AK1EJ□	D4C-1001-DK1EJ□	D4C-3001-DK1EJ□
Roller plunger 	D4C-1002-AK1EJ□	D4C-2002-AK1EJ□	D4C-1002-DK1EJ□	D4C-3002-DK1EJ□
Sealed plunger 	D4C-1031-AK1EJ□	D4C-2031-AK1EJ□	D4C-1031-DK1EJ□	D4C-3031-DK1EJ□
Sealed roller plunger 	D4C-1032-AK1EJ□	D4C-2032-AK1EJ□	D4C-1032-DK1EJ□	D4C-3032-DK1EJ□
Roller lever (high-sensitivity model) 	D4C-1024-AK1EJ□	D4C-2024-AK1EJ□	D4C-1024-DK1EJ□	D4C-3024-DK1EJ□

Note 1. The □ contains the length of the cable.

For example: 30 cm → D4C-1001-AK1EJ03

2. M1 models are also available. Contact your OMRON sales representative for further information.

Weather-resistant Models

Actuator		5 A at 250 VAC 4 A at 30 VDC without operation indicator	0.1 A at 125 VAC 0.1 A at 30 VDC without operation indicator	5 A at 125 VAC with operation indicator	4 A at 30 VDC with operation indicator	0.1 A at 125 VAC with operation indicator	0.1 A at 30 VDC with operation indicator
Roller lever 	3 m	D4C-1220-P	D4C-4220-P	D4C-2220-P	D4C-3220-P	D4C-5220-P	D4C-6220-P
	5 m	D4C-1320-P	D4C-4320-P	D4C-2320-P	D4C-3320-P	D4C-5320-P	D4C-6320-P
Roller lever (high-sensitivity model) 	3 m	D4C-1224-P	D4C-4224-P	D4C-2224-P	D4C-3224-P	D4C-5224-P	D4C-6224-P
	5 m	D4C-1324-P	D4C-4324-P	D4C-2324-P	D4C-3324-P	D4C-5324-P	D4C-6324-P
Variable roller lever 	3 m	D4C-1227-P	D4C-4227-P	D4C-2227-P	D4C-3227-P	D4C-5227-P	D4C-6227-P
	5 m	D4C-1327-P	D4C-4327-P	D4C-2327-P	D4C-3327-P	D4C-5327-P	D4C-6327-P
Variable rod lever 	3 m	D4C-1229-P	D4C-4229-P	D4C-2229-P	D4C-3229-P	D4C-5229-P	D4C-6229-P
	5 m	D4C-1329-P	D4C-4329-P	D4C-2329-P	D4C-3329-P	D4C-5329-P	D4C-6329-P

Individual Parts (Head/Actuator)

Actuator type	Head (with actuator)	Actuator
Pin plunger	D4C-0001	-
Roller plunger	D4C-0002	-
Crossroller plunger	D4C-0003	-
Bevel plunger	D4C-0010	-
Roller lever	D4C-0020	WL-1A100
Roller lever	D4C-0024	WL-1A100
Variable roller lever	D4C-0027	HL-1HPA320
Variable rod lever	D4C-0029	HL-1HPA500
Sealed pin plunger	D4C-0031	-
Sealed roller plunger	D4C-0032	-
Sealed crossroller plunger	D4C-0033	-
Panel mount pin plunger	D4C-0041	-
Panel mount roller plunger	D4C-0042	-
Panel mount crossroller plunger	D4C-0043	-
Plastic rod	D4C-0050	-
Center roller lever	D4C-0060	-

Note 1: The model numbers for heads are of the form D4C-00□□, with the numbers in the squares indicating the type of actuator.

2: Actuators for plunger models, plastic rod models, and center roller lever models cannot be ordered individually. They must be ordered together with the head.

3: Consult your OMRON representative for details on cold-resistant specifications.

Mounting Plates

The WL model incorporated by equipment can be replaced with the D4C together with the Mounting Plate without changing the position of the dog or cam.

List of Replaceable Models

Contact your OMRON representative for the period required for delivery.

WL model (Actuator)	D4C model (Actuator)	Plate
WLD/WL01D (Top plunger)	→D4C-□□01 (Plunger)	D4C-P001
WLD2/WL01D2 (Top-roller plunger)	→D4C-□□02 (Roller plunger)	D4C-P002
WLCA2/WL01CA2 (Roller lever)	→D4C-□□20 (Roller lever)	D4C-P020

Note: The WL01□ is for micro loads.

Application Example

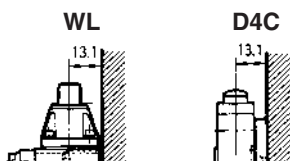
Note: The position of the dog remains unchanged.



Mounting Plate

Remarks

There is no difference in mounting pitch between the Mounting Plate and the WL. The mounting depth of the D4C with the Mounting Plate attached is, however, shorter than that of the panel-mounted WL.



Plate

Specifications

■ Approved Standards

Agency	Standard	File No.
TÜV Rheinland	EN60947-5-1	R9451333 (see note 1) J9950970 (see note 2)
UL	UL508	E76675 (see note 3)
CSA	CSA C22.2 No. 14	LR45746 (see note 3)

Note 1: Models with VCTF oil-resistant cables only.

2: Pre-wired models only.

3: SJT(0)-cable models only.

■ Approved Standard Ratings

General Ratings

Model	Rated voltage	Non-inductive load				Inductive load				Inrush current	
		Resistive load		Lamp load		Inductive load		Motor load			
		NC	NO	NC	NO	NC	NO	NC	NO	NC	NO
D4C-1□□□	125 VAC	5 A	5 A	1.5 A	0.7 A	3 A	3 A	2.5 A	1.3 A	20 A max.	10 A max.
	250 VAC	5 A	5 A	1 A	0.5 A	2 A	2 A	1.5 A	0.8 A		
	8 VDC	5 A	5 A	2 A	2 A	5 A	4 A	3 A	3 A		
	14 VDC	5 A	5 A	2 A	2 A	4 A	4 A	3 A	3 A		
	30 VDC	4 A	4 A	2 A	2 A	3 A	3 A	3 A	3 A		
	125 VDC	0.4 A	0.4 A	0.05 A	0.05 A	0.4 A	0.4 A	0.05 A	0.05 A		
	250 VDC	0.2 A	0.2 A	0.03 A	0.03 A	0.2 A	0.2 A	0.03 A	0.03 A		
D4C-2□□□	125 VAC	5 A	5 A	1.5 A	0.7 A	3 A	3 A	2.5 A	1.3 A		
	125 VDC	0.4 A	0.4 A	0.05 A	0.05 A	0.4 A	0.4 A	0.05 A	0.05 A		
D4C-3□□□	30 VDC	4 A	4 A	2 A	2 A	3 A	3 A	3 A	3 A		
D4C-4□□□	125 VAC	0.1 A	0.1 A	---		---					
	8 VDC	0.1 A	0.1 A								
	14 VDC	0.1 A	0.1 A								
	30 VDC	0.1 A	0.1 A								
D4C-5□□□	125 VAC	0.1 A	0.1 A	---		---					
D4C-6□□□	30 VDC	0.1 A	0.1 A	---		---					

Ratings for Pre-wired Models

Rated voltage	Non-inductive load				Inductive load				Inrush current	
	Resistive load		Lamp load		Inductive load		Motor load			
	NC	NO	NC	NO	NC	NO	NC	NO	NC	NO
125 VAC	1	1	1	0.7	1	1	1	1	20 A max.	10 A max.
30 VDC	1	1	1	1	1	1	1	1		

- Note** 1. Inductive loads have a power factor of 0.4 min. (AC) and a time constant of 7 ms max. (DC).
2. Lamp loads have an inrush current of 10 times the steady-state current.
3. Motor loads have an inrush current of 6 times the steady-state current.

UL/CSA Approved Ratings

B300 (D4C-16□□, -17□□), B150 (D4C-26□□, -27□□)

NEMA B300 (D4C-16□□, -17□□)

Rated voltage	Carry current	Current		Volt-amperes	
		Make	Break	Make	Break
120 VAC	5 A	30 A	3 A	3,600 VA	360 VA
240 VAC		15 A	1.5 A		

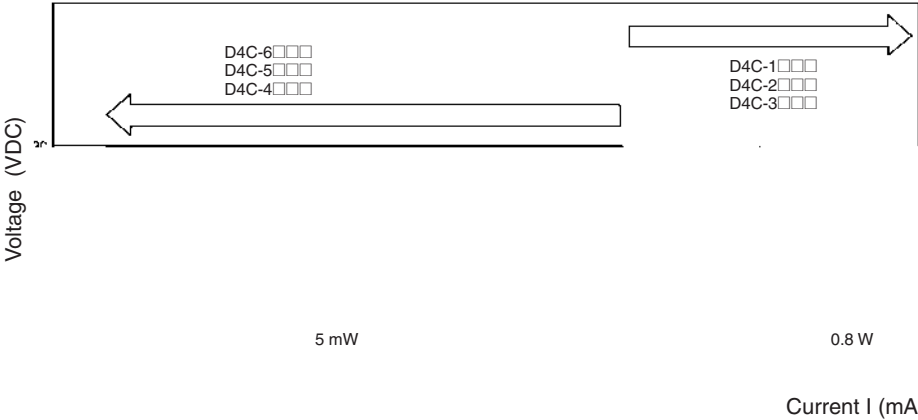
NEMA B150 (D4C-26□□, -27□□)

Rated voltage	Carry current	Current		Volt-amperes	
		Make	Break	Make	Break
120 VAC	5 A	30 A	3 A	3,600 VA	360 VA

TÜV Rheinland Approved Ratings (EN60947-5-1)

Model	Category and rating	I the
D4C-1□□□	AC-15 2 A/250 VAC DC-12 2 A/30 VDC	5 A 4 A
D4C-2□□□	AC-15 2 A/125 VAC	5 A
D4C-3□□□	DC-12 2 A/30 VDC	4 A
D4C-4□□□	AC-14 0.1 A/125 VAC DC-12 0.1 A/30 VDC	0.5 A 0.5 A
D4C-5□□□	AC-14 0.1 A/125 VAC	0.5 A
D4C-6□□□	DC-12 0.1 A/30 VDC	0.5 A

Applicable Load Range



■ Characteristics

Degree of protection	IP67
Durability (see note 2)	Mechanical: 10,000,000 operations min. Electrical: 200,000 operations min. (5A at 250 VAC, resistive load)
Operating speed	0.1 mm to 0.5 m/s (in case of plunger) 1 mm to 1 m/s (in case of roller lever)
Operating frequency	Mechanical: 120 operations/min Electrical: 30 operations/min
Rated frequency	50/60 Hz
Insulation resistance	100 MΩ min. (at 500 VDC)
Contact resistance (initial)	250 mΩ max. (initial value with 2-m VCTF cable) 300 mΩ max. (initial value with 3-m VCTF cable) 400 mΩ max. (initial value with 5-m VCTF cable)
Dielectric strength	1,000 VAC, 50/60 Hz for 1 min between terminals of the same polarity 1,500 VAC, 50/60 Hz for 1 min between current-carrying metal part and ground, and between each terminal and non-current-carrying metal part, Uimp: 2.5 kV (EN60947-5-1)
Rated insulation voltage (U _i)	300 V (EN60947-5-1)
Switching overvoltage	1,000 VAC, 300 VDC max. (EN60947-5-1)
Pollution degree (operating environment)	3 (IEC60947-5-1)
Short-circuit protective device (SCPD)	10 A fuse type gG (IEC269)
Conditional short-circuit current	100 A (EN60947-5-1)
Conventional enclosed thermal current (I _{the})	5 A, 4 A, 0.5 A (EN60947-5-1)
Protection against electric shock	Class I (with grounding wire)
Vibration resistance	Malfunction: 10 to 55 Hz, 1.5-mm double amplitude
Shock resistance	Destruction: Approx. 1,000 m/s ² min. Malfunction: Approx. 500 m/s ² min.
Ambient temperature (see note)	Operating: -10°C to 70°C (with no icing)
Ambient humidity	Operating: 95% max.
Weight	With 3-m VCTF cable: 360 g; With 5-m VCTF cable: 540 g

Note 1. The above figures are initial values.

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

■ Operating Characteristics

Model	D4C-□□01 D4C-□001-□K1EJ□	D4C-□□31 D4C-□031-□K1EJ□	D4C-□□02 D4C-□002-□K1EJ□	D4C-□□32 D4C-□032-□K1EJ□	D4C-□□03
OF max.	11.77 N	17.65 N	11.77 N	17.65 N	11.77 N
RF min.	4.41 N	4.41 N	4.41 N	4.41 N	4.41 N
PT max.	1.8 mm	1.8 mm	1.8 mm	1.8 mm	1.8 mm
OT min.	3 mm	3 mm	3 mm	3 mm	3 mm
MD max.	0.2 mm	0.2 mm	0.2 mm	0.2 mm	0.2 mm
OP	15.7±1 mm	24.9±1 mm	28.5±1 mm	34.3±1 mm	28.5±1 mm
TT	(5) mm	(5) mm	(5) mm	(5) mm	(5) mm

Model	D4C-□□33	D4C-□□10	D4C-□□50	D4C-□□20 D4C-□□27-P (see note 1) D4C-□□29-P (see note 1)	D4C-□□24 D4C-□□24-P D4C-□024-□K1EJ□
OF max.	17.65 N	11.77 N	1.47 N	5.69 N	5.69 N
RF min.	4.41 N	4.41 N	---	1.47 N	1.47 N
PT max.	1.8 mm	1.8 mm	15°	25°	10±3°
OT min.	3 mm	3 mm	---	40°	50°
MD max.	0.2 mm	0.2 mm	---	3°	3°
OP	34.3±1 mm	28.5±1 mm	---	---	---
TT	(5) mm	(5) mm	---	(70°)	(70°)

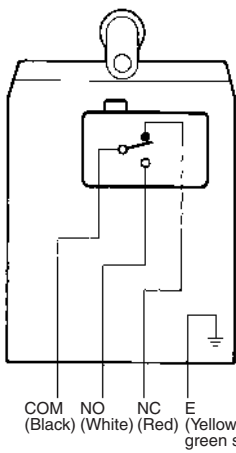
Model	D4C-□□41	D4C-□□42	D4C-□□43	D4C-□□60
OF max.	11.77 N	11.77 N	11.77 N	6.67 N
RF min.	4.41 N	4.41 N	4.41 N	1.47 N
PT max.	1.8 mm	1.8 mm	1.8 mm	10±3°
OT min.	3 mm	3 mm	3 mm	50°
MD max.	0.2 mm	0.2 mm	0.2 mm	3°
OP	31.2±1 mm	36.8±1 mm	36.8 mm	---
TT	(5) mm	(5) mm	(5) mm	---

Note 1. The values given for D4C-□□27-P and D4C-□□29-P are for when the length of the lever is 38 mm.
2. The operating characteristics for M1J□ models are the same as those for □K1EJ□ models.

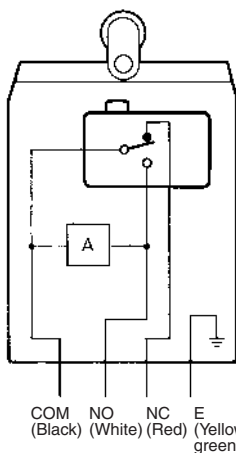
■ Contact Form

Standard Models / Weather-resistant Models

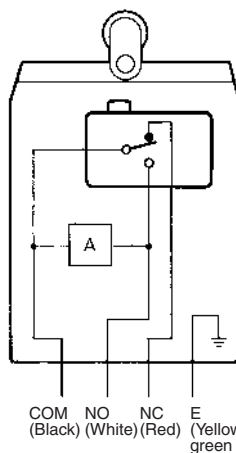
Without LED Indicator
(S-FLEX VCTF Cable)



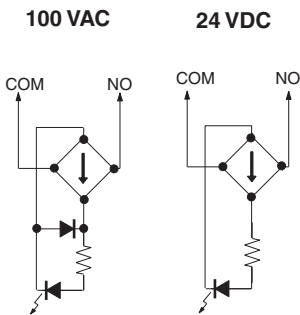
With LED Indicator
(S-FLEX VCTF Cable)



With LED Indicator
(lights when operated)



LED Indicator Circuits



Yellow/green: VCTF resin cable
 Green: VCTF
 UL/CSA-approved cable SJT(0)

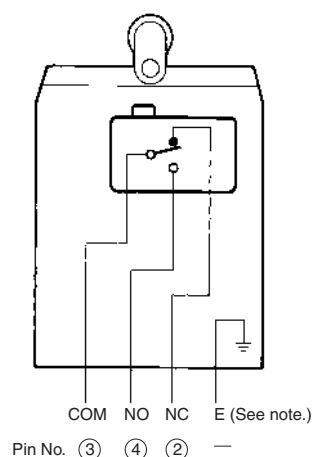
Note 1. "Lights when operated" means that when the actuator is turned or pushed and the Limit Switch contact leaves the NC side, the indicator lights.
2. "Lights when not in operation" means that when the actuator is in the free position, the indicator is lit, and when the actuator is turned or pushed and the contact comes into contact with the NO side, the indicator turns OFF.

Wire Color

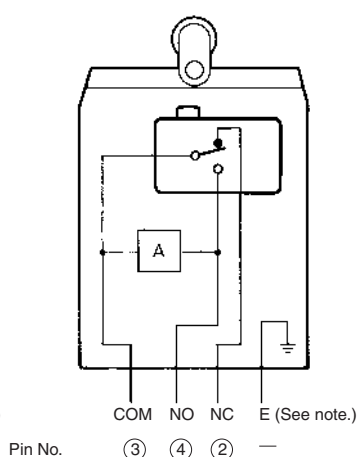
Cable	Without LED				With LED			
	COM	NO	NC	E	COM	NO	NC	E
VCTF	Black	White	Red	Green	Black	White	Red	Green
S-FLEX VCTF	Black	White	Red	Yellow/ Green	Black	White	Red	Yellow/ Green
SJT (0)	Black	Blue	Red	Green	Black	Blue	Red	Green
CENELEC CABLE	Blue	Black	Brown	Yellow/ Green	Blue	Black	Brown	Yellow/ Green

Pre-wired Models

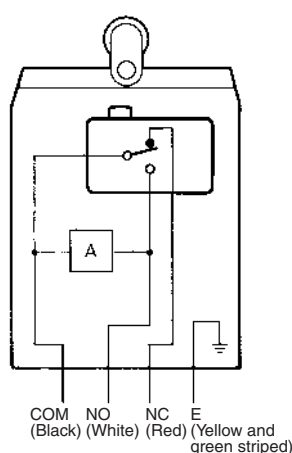
Without LED Indicator



With LED Indicator
(lights when not in operation)



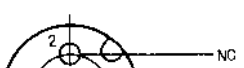
With LED Indicator
(lights when operated)



AC



DC



Note: Not connected to the ground.

Yellow/green: VCTF resin cable

Green: VCTF

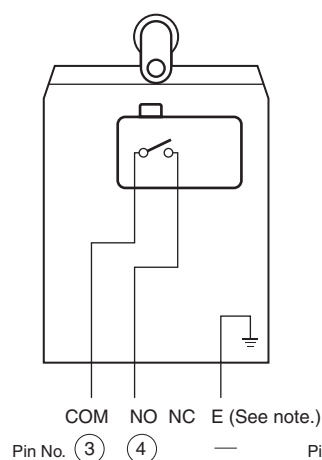
UL/CSA-approved cable SJT(0)

Note 1. "Lights when operated" means that when the actuator is turned or pushed and the Limit Switch contact leaves the NC side, the indicator lights.

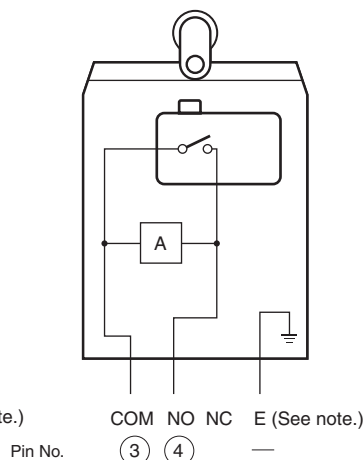
2. "Lights when not in operation" means that when the actuator is in the free position, the indicator is lit, and when the actuator is turned or pushed and the contact comes into contact with the NO side, the indicator turns OFF.

Connector Models for ASI Devices

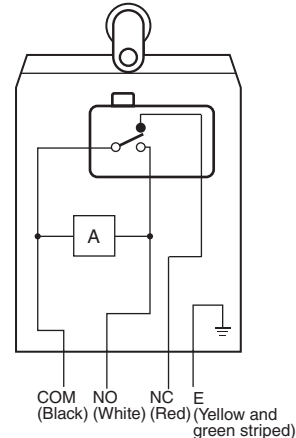
Without LED Indicator



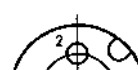
With LED Indicator
(lights when not in operation)



With LED Indicator
(lights when operated)



DC



Note: Not connected to the ground.

Yellow/green: VCTF resin cable

Green: VCTF

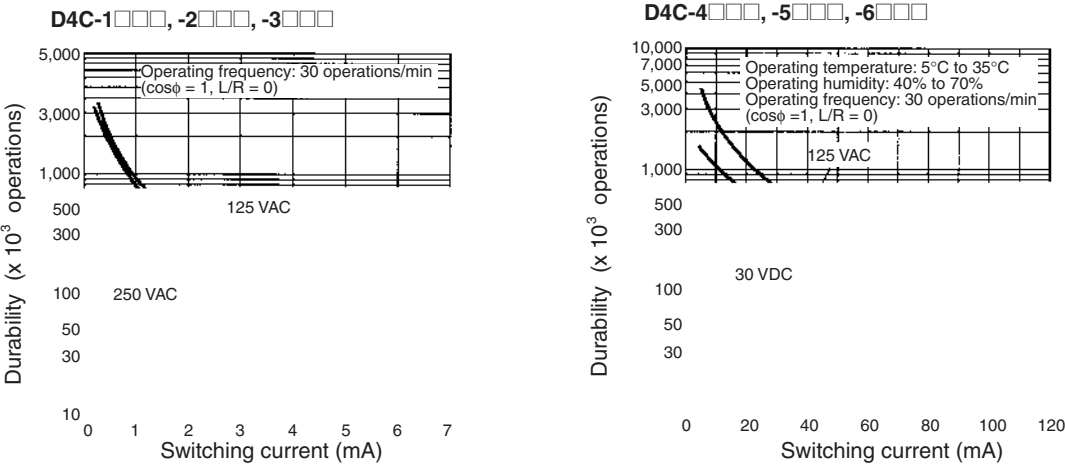
UL/CSA-approved cable SJT(0)

Note 1. "Lights when operated" means that when the actuator is turned or pushed and the Limit Switch contact leaves the NC side, the indicator lights.

2. "Lights when not in operation" means that when the actuator is in the free position, the indicator is lit, and when the actuator is turned or pushed and the contact comes into contact with the NO side, the indicator turns OFF.

Engineering Data

Electrical Durability



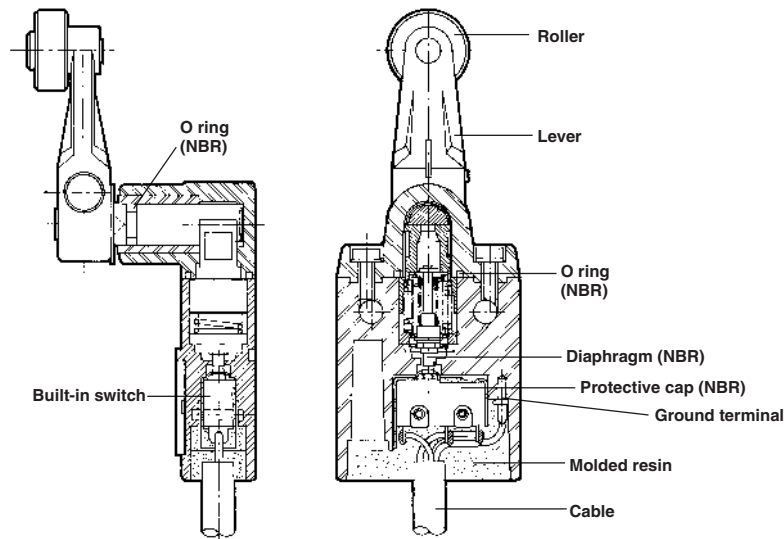
Leakage Current for LED-indicator Models

Model	Voltage	Leakage current	Resistance
D4C-2□□□	125 VAC	1.7 mA	68 kΩ
D4C-3□□□	30 VDC	1.7 mA	15 kΩ
D4C-5□□□	125 VAC	1.7 mA	68 kΩ
D4C-6□□□	30 VDC	1.7 mA	15 kΩ

Nomenclature

Standard Models

Roller Lever Models Without Indicator



Weather-resistant Models

Roller Lever Models Without Indicator

Roller

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

Shaft Section Seal

By fitting an O-ring to the rotary shaft and with an appropriate interference of the screws, high-sealing properties are maintained. The O-ring is made of silicone rubber and is resistant to temperature changes and adverse weather conditions.

Head-mounting Screw

Diaphragm

The diaphragm is made of silicone rubber and is resistant to temperature changes and adverse weather conditions.

Cable

Vinyl cabtire cable and is resistant to adverse weather conditions.



Lever

The lever forged of anti-corrosive aluminium alloy features high corrosion resistances and outstanding ruggedness.

Roller Lever Setscrew

This screw is made of stainless steel and has high corrosion resistance.

Rotary Shaft

The shaft is made of stainless steel decreasing the likelihood of rusting.

Built-in Switch

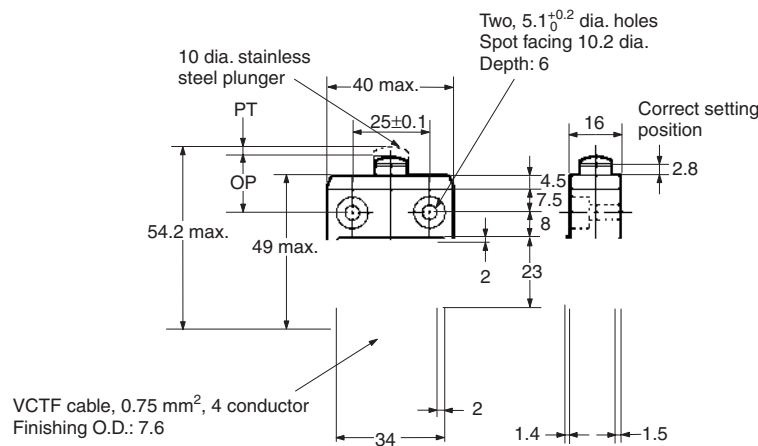
Both standard load and microload models available.

Dimensions

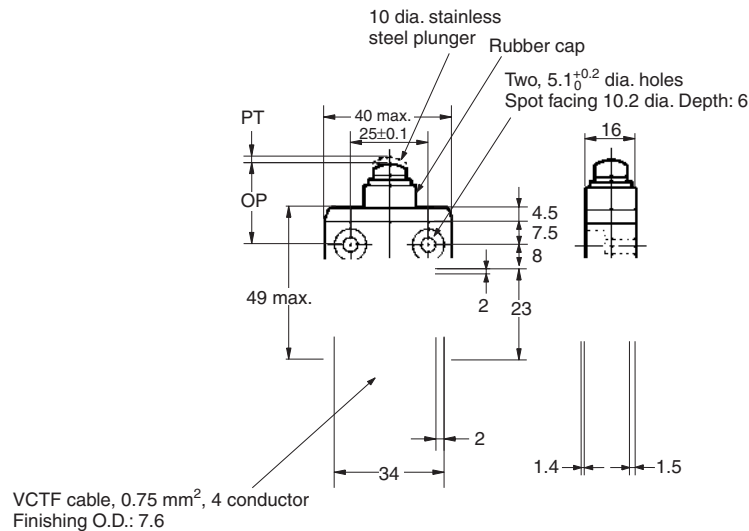
Note 1. All units are in millimeters unless otherwise indicated.
2. Unless otherwise specified, a tolerance of ± 0.4 mm applies to all dimensions.

Standard Models

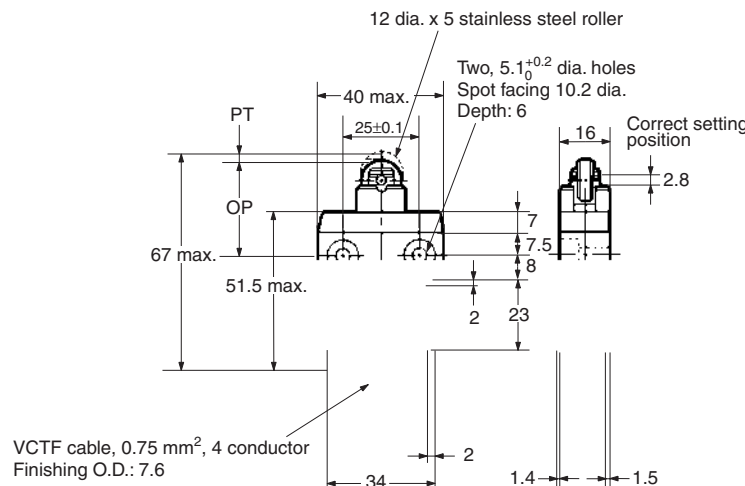
Pin Plunger D4C-□□01



Sealed Plunger D4C-□□31

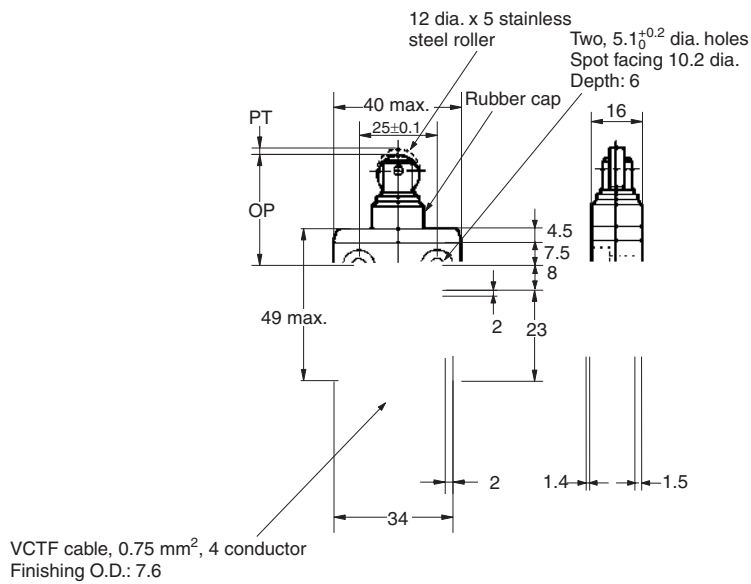


Roller Plunger D4C-□□02



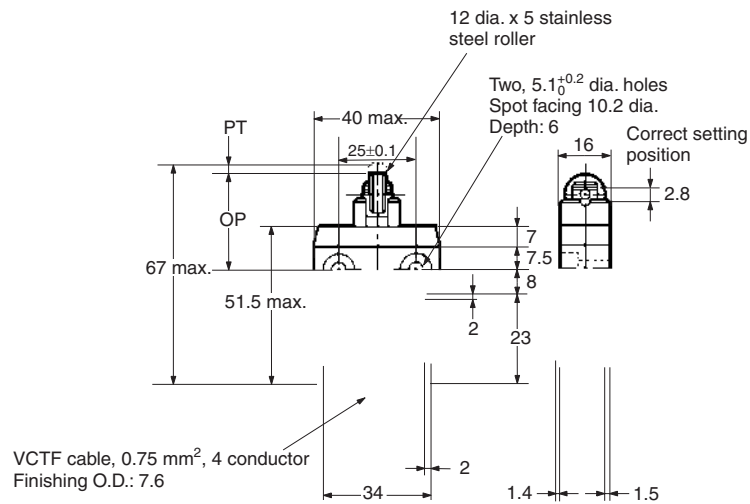
Sealed Roller Plunger

D4C-□□32



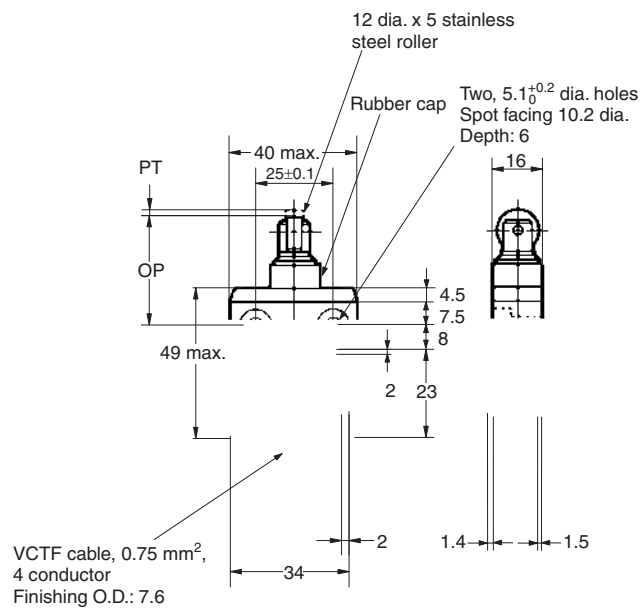
Crossroller Plunger

D4C-□□03



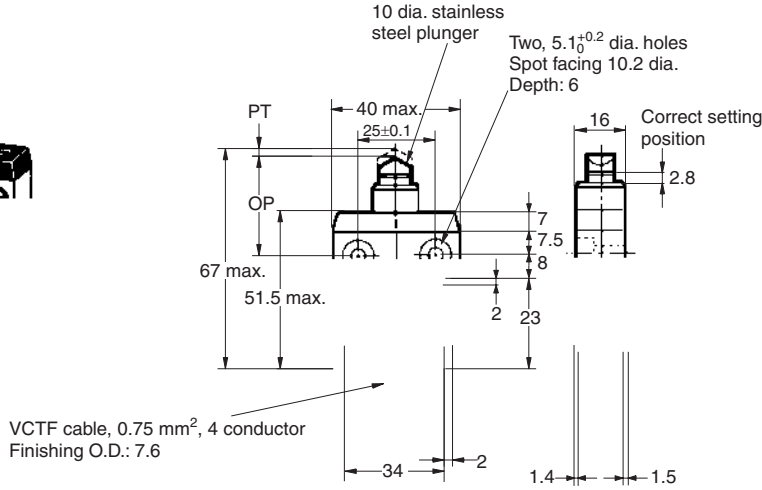
Sealed Crossroller Plunger

D4C-□□33



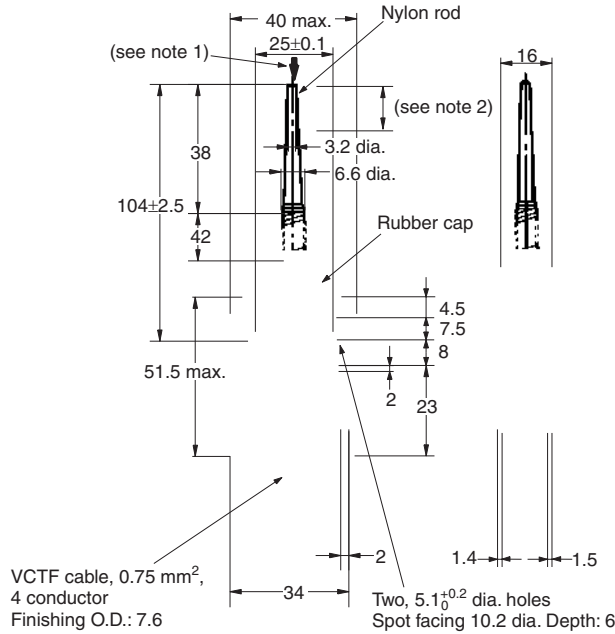
Bevel Plunger

D4C-□□10



Coil Spring

D4C-□□50

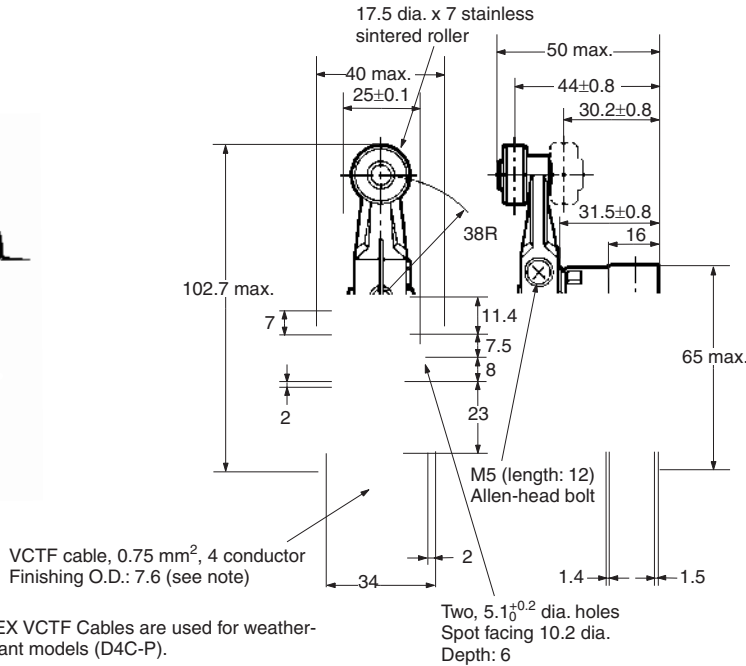
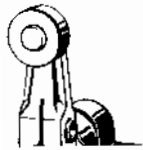


- Note:**
1. Operation is possible in any direction except in parallel to the axis ↓.
 2. The ideal range for operation is between the tip of the rod and 1/3 of the length of the actuator.

Roller Lever

D4C-□□20

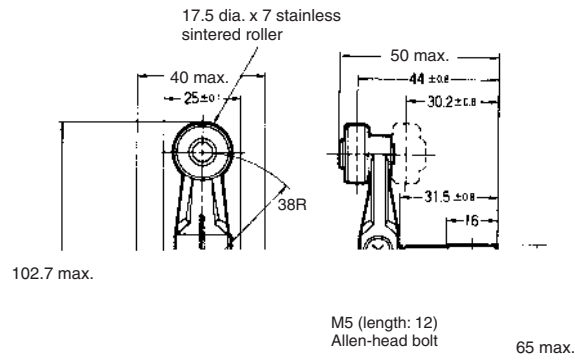
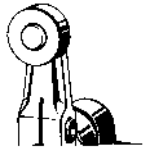
D4C-□□20-P



Note: S-FLEX VCTF Cables are used for weather-resistant models (D4C-P).

Roller Lever (High-Sensitivity Model)

D4C-□□24
D4C-□□24-P



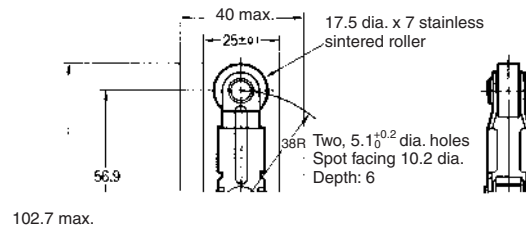
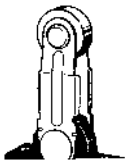
Two, 5.1^{+0.2}₀ dia. holes
Spot facing 10.2 dia.
Depth: 6

VCTF cable, 0.75 mm², 4 conductor
Finishing O.D.: 7.6 (see note)

Note: S-FLEX VCTF Cables are used for weather-resistant models (D4C-P).

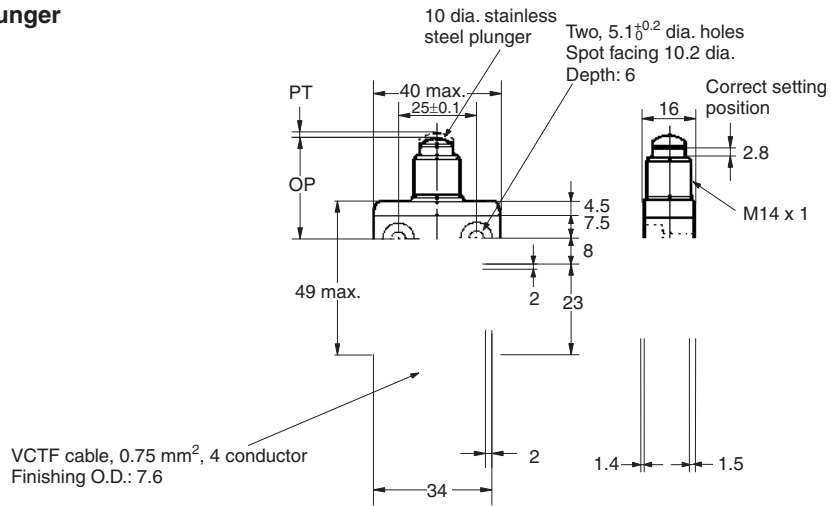
Center Roller Lever Plunger

D4C-□□60

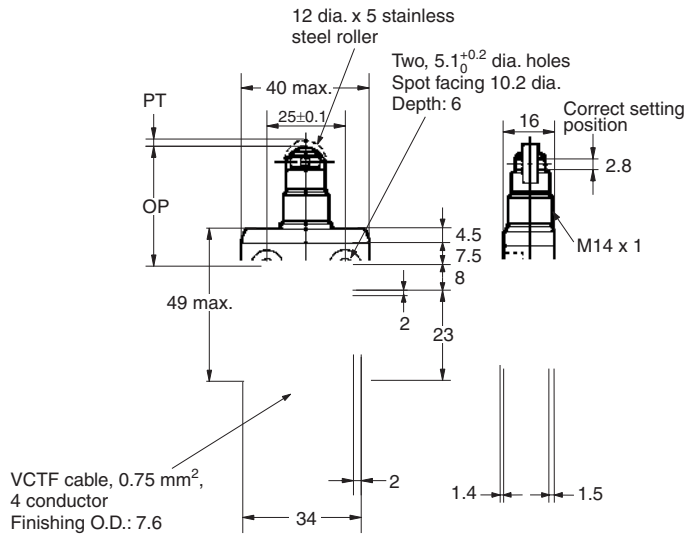


VCTF cable, 0.75 mm², 4 conductor
Finishing O.D.: 7.6

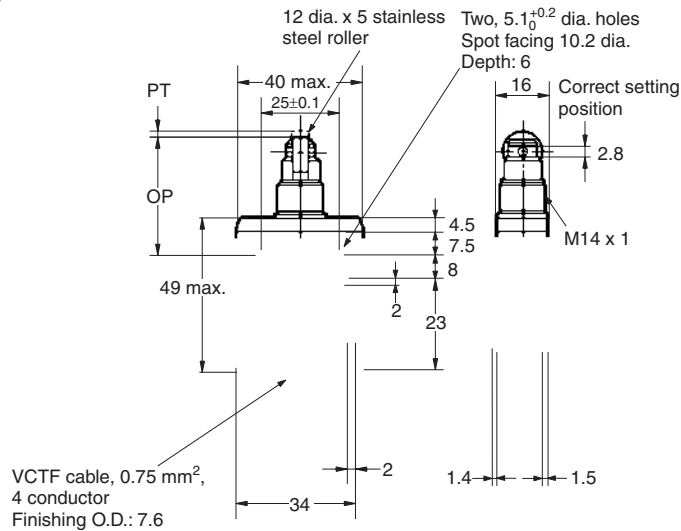
Panel Mount Pin Plunger
D4C-□□41



Panel Mount Roller Plunger
D4C-□□42



Panel Mount Crossroller Plunger
D4C-□□43



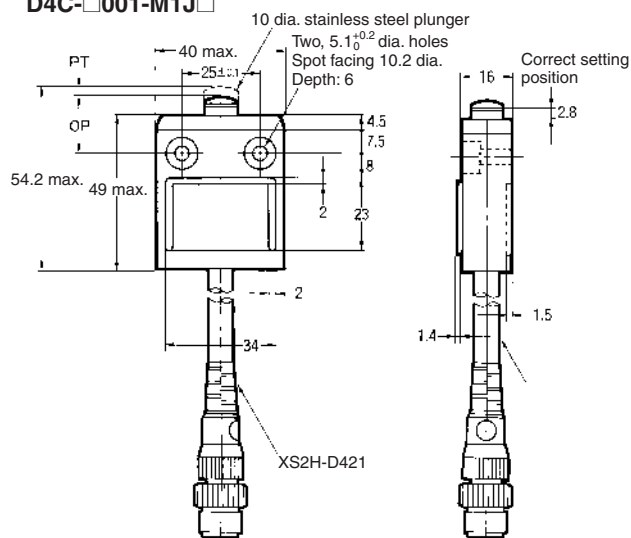
Note: Two nuts (thickness: 2.5; distance across: 17) are included with the D4C-□□41, D4C-□□42 and D4C-□□43.

Pre-wired Models

Pin Plunger

D4C-□001-□K1EJ□

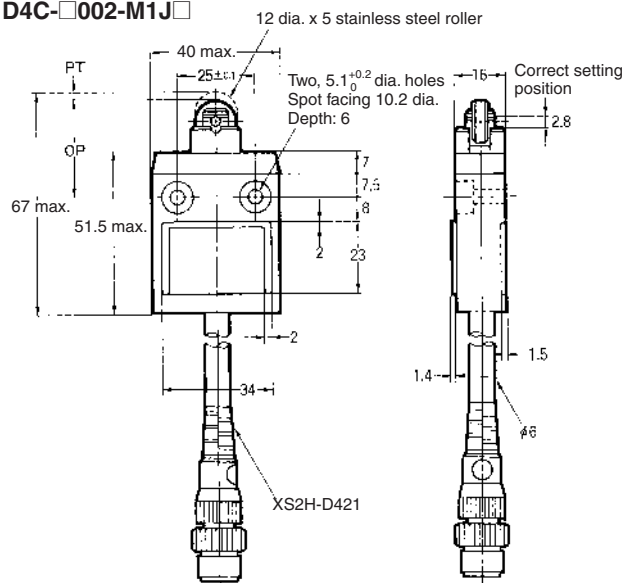
D4C-□001-M1J□



Roller Plunger

D4C-□002-□K1EJ□

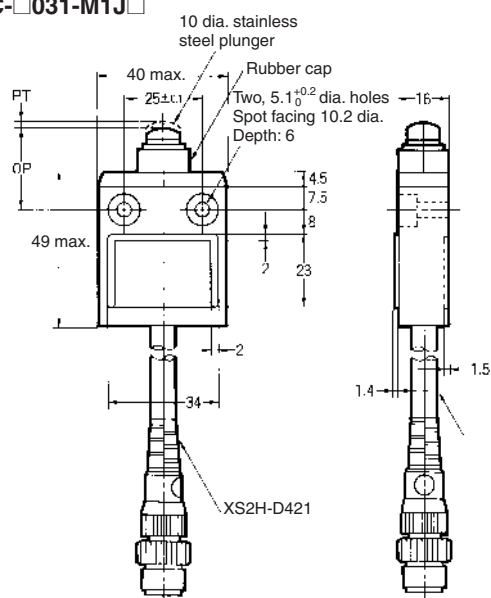
D4C-□002-M1J□



Sealed Pin Plunger

D4C-□031-□K1EJ□

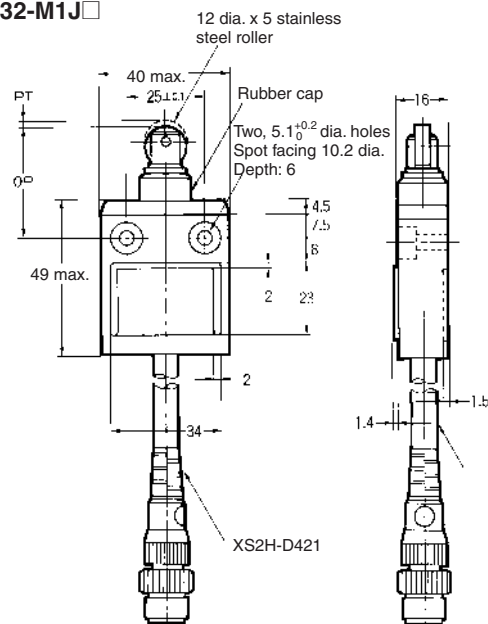
D4C-□031-M1J□



Sealed Roller Plunger

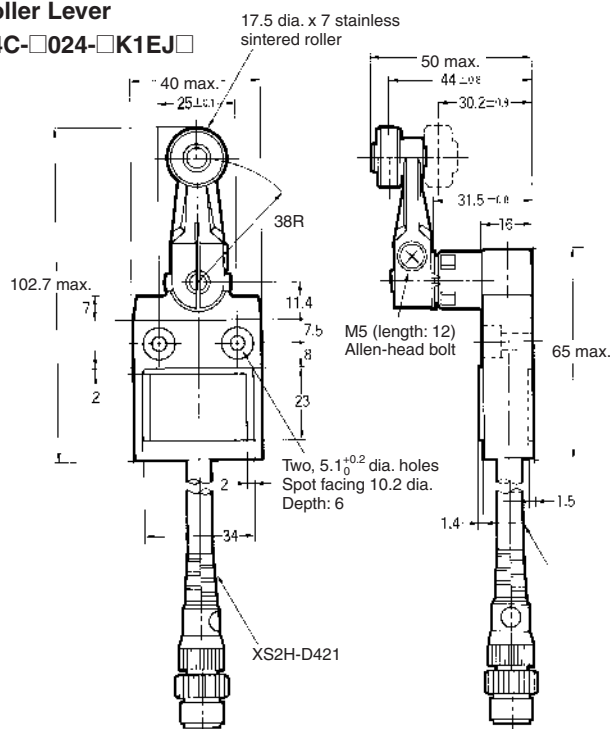
D4C-□032-□K1EJ□

D4C-□032-M1J□



Roller Lever

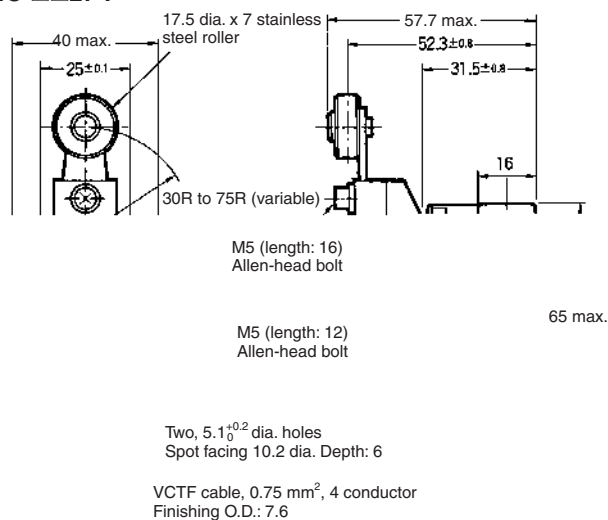
D4C-□024-□K1EJ□



Weather-resistant Models

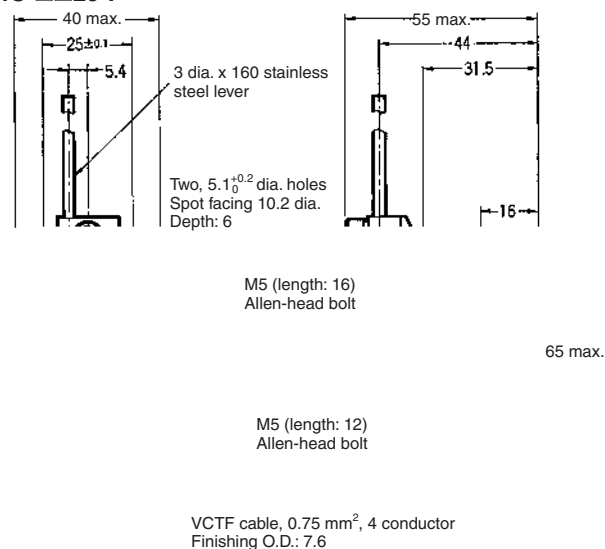
Adjustable Roller Lever

D4C-□□27-P



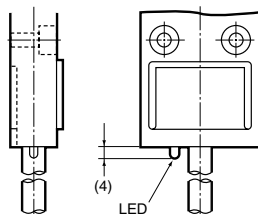
Adjustable Rod Lever

D4C-□□29-P



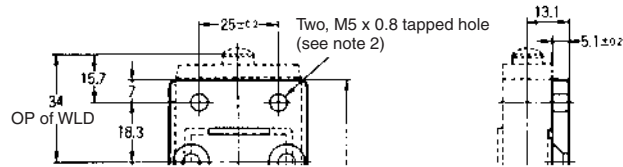
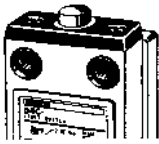
Models with LED Indicator

The dimensions of the LED indicator for models equipped with one are shown below.



Special Mounting Plates (Plates are not provided with Limit Switches.)

D4C-P001



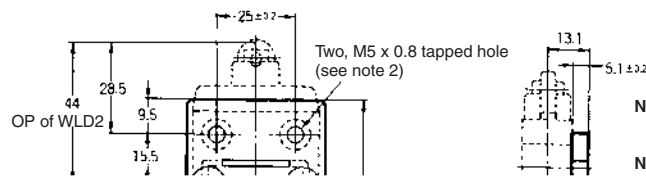
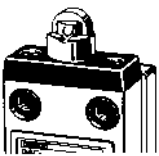
Note: Four, M5 x 0.8 hexagon pan-head bolts and two M5 x 0.8 Allen-head bolts are provided.

- Note:** 1. Tighten the $5.2^{+0.2}_{-0}$ dia. holes with the M5 x 10 hexagon pan-head screws.
2. Insert the M5 Allen-head bolts into the M5 tapping holes to tighten the Mounting Plate securely.

11 dia.

Four, $5.2^{+0.2}_{-0}$ dia. holes (see note 1)

D4C-P002



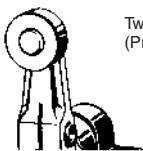
Note: Four, M5 x 0.8 hexagon pan-head bolts and two M5 x 0.8 Allen-head bolts are provided.

- Note:** 1. Tighten the $5.2^{+0.2}_{-0}$ dia. holes with the M5 x 10 hexagon pan-head screws.
2. Insert the M5 Allen-head bolts into the M5 tapping holes to tighten the Mounting Plate securely.

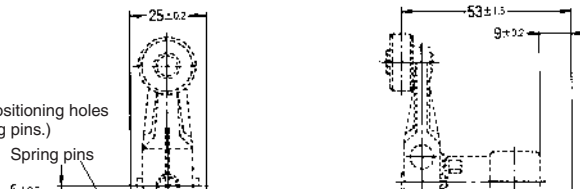
11 dia.

Four, $5.2^{+0.2}_{-0}$ dia. holes (see note 1)

D4C-P020



Two, $4.2^{+0.12}_{-0}$ dia. positioning holes (Press-fit the spring pins.)



Note: Four, M5 x 0.8 hexagon pan-head bolts and two M5 x 0.8 Allen-head bolts are provided.

- Note:** 1. Tighten the $5.2^{+0.2}_{-0}$ dia. holes with the M5 x 10 hexagon pan-head screws.
Four, M5 x 0.8 hexagon pan-head bolts, two M5 x 0.8 Allen-head bolts are provided, and two 4 x 14 spring pins are provided.
2. Insert the M5 Allen-head bolts into the M5 tapping holes to tighten the Mounting Plate securely.

Two, M5 x 0.8 tapped hole (see note 2)

11 dia.

Two, $5.2^{+0.2}_{-0}$ dia. holes (see note 1)

Note: Each dimension has a tolerance of ±0.4 mm unless otherwise specified.

Precautions

■ Correct Use

Handling

The bottom of the Switch at the cable outlet is resin-molded. Secure the cable at a point 5 cm from the Switch bottom to prevent exertion of excess force on the cable.

When bending the cable, provide a bending radius of 45 mm min. so as not to damage the cable insulation or sheath. Excessive bending may cause fire or leakage current.



Secure here

5 cm

Bending radius:
(R45 mm min.)

Connections

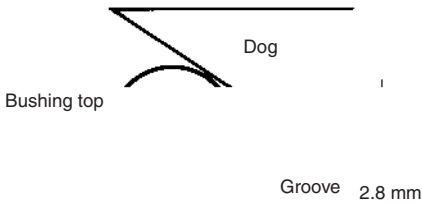
Be sure to connect a fuse with a breaking current 1.5 to 2 times larger than the rated current to the Limit Switch in series in order to protect the Limit Switch from damage due to short-circuiting.

When using the Limit Switch for the EN ratings, use the gl or gG 10-A fuse.

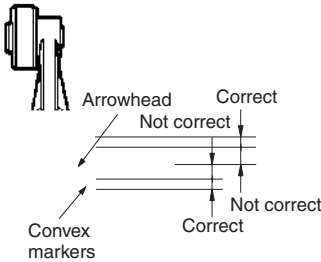
Operation

Operation method, shapes of cam and dog, operating frequency, and overtravel have a significant effect on the service life and precision of a Limit Switch. For this reason, the dog angle must be 30° max., the surface roughness of the dog must be 6.3S min. and hardness must be Hv400 to 500.

To allow the plunger-type actuator to travel properly, adjust the dog and cam to the proper setting positions. The proper position is where the plunger groove fits the bushing top.



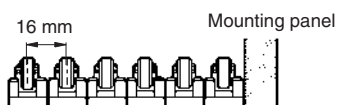
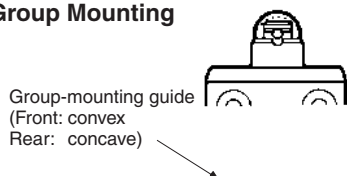
To allow the roller lever-type actuator to travel properly, adjust the dog and cam so that the arrow head is positioned between the two convex markers as shown below.



Mounting

A maximum of 6 Switches may be group-mounted. In this case, pay attention to the mounting direction so that the convex part of the group-mounting guide on one Switch fits into the concave part of the guide on the other Switch as shown in the figure below. For group mounting, the mounting panel must have a thickness (t) of 6 mm min.

Group Mounting



Group-mounting guide
(Front: convex
Rear: concave)

If the mounting panel is warped or has protruding parts, a malfunction may result. Make sure that the mounting panel is not warped and has even surfaces.

Mounting Holes

Two, 5.2-dia. or M5 screw holes

Use a Switch with a rubber cap when using the plunger type in an environment where malfunction is possible due to environmental conditions such as dust or cutting chips which may not allow resetting.

Do not expose the Switch to water exceeding 70°C or use it in steam.

When the D4C is used in a circuit of a device to be exported to Europe, classified as Overvoltage Class III as specified in IEC664, provide a contact protection circuit.

Tighten each screw to a torque according to the following table.

No.	Type	Torque
1	M5 Allen-head bolt	4.90 to 5.88 N·m
2	M3.5 head mounting screw	0.78 to 0.88 N·m
3	M5 Allen-head bolt	4.90 to 5.88 N·m

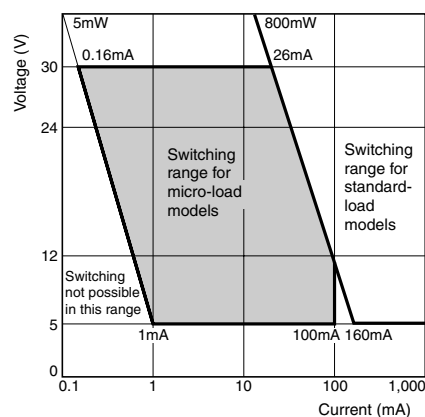
Note: By removing the two screws from the head, the head direction can be rotated 180°. After changing the head direction, re-tighten to the torque specified above. Be careful not to allow any foreign substance to enter the Switch.



Micro-load Models (D4C-4, -5, -6)

Switching Range

Micro-load models can be used for switching in the range shown below.



ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.

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

Small Sealed Switch D4E-□N

Slim and Compact Switch with Better Seal and Ensuring Longer Service Life than D4E

- Flat springs with an improved lever ratio of the built-in switch ensure smooth snap action and long life expectancy.
- Protection cover protects the built-in switch from dust and oil. Plunger incorporates a tough seal cap that lasts for a long time.
- One touch connector eliminates need for tedious wiring operations and reduces downtime for wiring and maintenance (models with standard, easy-to-use screw terminals are also available).
- Minute load model with gold cladding is optimal for electronic control.
- Molded terminal types as well as molded terminal types with operating indicator lamps are available for screw terminal systems.
- No difference in mounting pitch and characteristics between D4E-□N and D4E models.



Model Number Structure

■ Model Number Legend

D4E-□□□□N
1 2 3 4

1. Rated Current

- 1: 5 A at 125 VAC
(1 A at 125 VAC/30 VDC for model with a connector)
- 2: 0.1 A at 125 VAC
(0.1 A at 125 VAC/30 VDC for model with a connector)

2. Actuator

- A: Roller plunger
- B: Crossroller plunger
- C: Plunger
- D: Sealed roller plunger
- E: Sealed crossroller plunger
- F: Sealed plunger
- G: Roller lever
- H: One-way action roller lever

3. Terminals

- 00: AC connector
- 10: DC connector
- 20: Screw terminals without a cable
- 21: Screw terminals with a cable (right-hand)
- 22: Screw terminals with a cable (left-hand)
- 23: Molded terminals with a cable (right-hand)
- 24: Molded terminals with a cable (left-hand)
(Cable is S-FLEX VCTF 3 m)

4. Operation Indicator














- L: Neon lamp (250 VAC)
- L1: LED (12 VDC)
- L2: LED (24 VDC)
- L3: LED (48 VDC)

Note: 1. Only the molded terminal models can be equipped with an operation indicator.

2. Desired Switches may not be manufactured depending on the combination between molds and indicators. Contact our sales representative for further information.

Ordering Information

List of Models

	One-touch connector type		Screw terminal type			
	General-purpose	Micro load	General-purpose without cable	Micro load without cable	General-purpose with cable	Micro load with cable
						
Actuator						
Roller plunger 	D4E-1A□0N	D4E-2A□0N	D4E-1A20N (see note 2)	D4E-2A20N	D4E-1A21N	D4E-2A21N
Crossroller plunger 	D4E-1B□0N	D4E-2B□0N	D4E-1B20N (see note 2)	D4E-2B20N	D4E-1B21N	D4E-2B21N
Plunger 	D4E-1C□0N	D4E-2C□0N	D4E-1C20N (see note 2)	D4E-2C20N	D4E-1C21N	D4E-2C21N
Sealed roller plunger 	D4E-1D□0N	D4E-2D□0N	D4E-1D20N (see note 2)	D4E-2D20N	D4E-1D21N	D4E-2D21N
Sealed crossroller plunger 	D4E-1E□0N	D4E-2E□0N	D4E-1E20N (see note 2)	D4E-2E20N	D4E-1E21N	D4E-2E21N
Sealed plunger 	D4E-1F□0N	D4E-2F□0N	D4E-1F20N (see note 2)	D4E-2F20N	D4E-1F21N	D4E-2F21N
Roller lever 	D4E-1G□0N	D4E-2G□0N	D4E-1G20N (see note 2)	D4E-2G20N	D4E-1G21N	D4E-2G21N
One-way action roller lever 	D4E-1H□0N	D4E-2H□0N	D4E-1H20N (see note 2)	D4E-2H20N	D4E-1H21N	D4E-2H21N

Note: 1. When ordering, specify the current type by replacing the blank box of the model number with 0 for AC connector or 1 for DC connector.
 2. Approved by UL and CSA.
 3. For the plunger and lever actuator models, the NC and NO terminal indicators are reversed.
 4. Cold tolerance specifications are available for actuator models with an A, B, C, G, or H in the model number. When ordering, add C to the model number.
 For example: D4E-1A20N → D4E-1A20N-C

Accessories (Order Separately)

Plug

Model	Current	Type	No. of conductors	Cable length	Applicable models
XS2F-A421-D90-A	AC	Straight	4	2 m	D4E-□□00N
XS2F-A421-G90-A				5 m	
XS2F-D421-D80A	DC			2 m	D4E-□□10N
XS2F-D421-G80-A				5 m	

Specifications

■ Approved Standards

Agency	Standard	File No.
UL	UL508	E76675
CSA	CSA C22.2 No. 14	LR45746
TÜV Rheinland	EN60947-5-1	R9551015

■ Approved Standard Ratings

UL, CSA

A300

Voltage	Carry current	Current		Volt-amperes	
		Make	Break	Make	Break
120 V	10 A	60 A	6 A	7,200 VA	720 VA
240 V		30 A	3 A		

TÜV (EN60947-5-1)

D4E- $\frac{1}{I}$ $\frac{G}{II}$ $\frac{23}{III}$ $\frac{L}{IV}$ N

I	Model			Applicable category and ratings	Thermal current (I_{the})	Indicator
	II	III	IV			
1	<input type="checkbox"/>	00		AC-14 0.5 A/125 VAC	5 A	---
1	<input type="checkbox"/>	10		DC-12 0.5 A/30 VDC	5 A	---
1	<input type="checkbox"/>	20, 21, 22		AC-15 2A/250 VAC DC-12 2A/48 VDC	5 A	---
1	<input type="checkbox"/>	23, 24	L	AC-15 2A/250 VAC	5 A	Neon lamp
1	<input type="checkbox"/>	23, 24	L1	DC-12 2A/12 VDC	5 A	LED
1	<input type="checkbox"/>	23, 24	L2	DC-12 2A/24 VDC	5 A	LED
1	<input type="checkbox"/>	23, 24	L3	DC-12 2A/48 VDC	5 A	LED
2	<input type="checkbox"/>	00		AC-14 0.1A/125 VAC	0.5 A	---
2	<input type="checkbox"/>	10		DC-12 0.1A/30 VDC	0.5 A	---
2	<input type="checkbox"/>	20, 21, 22		AC-14 0.1A/125 VAC DC-12 0.1A/48 VDC	0.5 A	---
2	<input type="checkbox"/>	23, 24	L	AC-14 0.1A/125 VAC	0.5 A	Neon lamp
2	<input type="checkbox"/>	23, 24	L1	DC-12 0.1A/12 VDC	0.5 A	LED
2	<input type="checkbox"/>	23, 24	L2	DC-12 0.1A/24 VDC	0.5 A	LED
2	<input type="checkbox"/>	23, 24	L3	DC-12 0.1A/48 VDC	0.5 A	LED

- Note:** 1. ☐: Actuator variation of item II
 2. AC-14 0.5 A/125 VAC means as follows:
 Applicable category: AC-14
 Rated operating current (I_o): 0.5 A
 Rated operating voltage (U_o): 125 VAC

■ Ratings

Rated voltage	General-purpose								Micro load	
	Non-inductive load				Inductive load				Non-inductive load	
	Resistive load		Lamp load		Inductive load		Motor load		Resistive load	
	NC	NO	NC	NO	NC	NO	NC	NO	NC	NO
125 VAC	5 (1) A		1.5 (1) A		3 (1) A		2 (1) A	1 (1) A	0.1 A	
250 VAC	5 (1) A		1.5 (1) A		3 (1) A		1 A	0.5 A	---	
8 VDC	5 (1) A		---		1.5 (1) A		---		0.1 A	
14 VDC	5 (1) A		---		1.5 (1) A		---		0.1 A	
30 VDC	5 (1) A		---		1.5 (1) A		---		0.1 A	
125 VDC	0.5 A		---		0.05 A		---		---	
250 VDC	0.25 A		---		0.03 A		---		---	

Inrush current	NC	10 A max.
	NO	10 A max.

- Note:** 1. The above current ratings are for a standard current and the values in parentheses are for models with a connector.
 2. Inductive loads have a power factor of 0.4 min. (AC) and a time constant of 7 ms max. (DC).
 3. Lamp load has an inrush current of 10 times the steady-state current.
 4. Motor load has an inrush current of 6 times the steady-state current.

■ Characteristics

Degree of protection	IP67
Durability (see note 3)	Mechanical: 10,000,000 operations min. Electrical: 500,000 operations min. (5 A at 250 VAC, resistive load) 5,000,000 operations min. (10 mA at 24 VDC, resistive load)
Operating speed	0.1 mm to 0.5 m/sec
Operating frequency	Mechanical: 120 operations/min Electrical: 30 operations/min
Rated frequency	50/60 Hz
Insulation resistance	100 MΩ min. (at 500 VDC)
Contact resistance	15 mΩ max. (initial value)
Dielectric strength	1,000 VAC, 50/60 Hz for 1 min between terminals of same polarity 1,500 VAC, 50/60 Hz for 1 min/Uimp at 2.5 kV (EN60947-5-1) between current-carrying metal parts and ground, and between each terminal and non-current-carrying metal part
Rated insulation voltage (Ui)	250 VAC
Switching overvoltage	1,000 VAC max. (EN60947-5-1)
Pollution degree (operating environment)	3 (EN60947-5-1)
Short-circuit protective device (SCPD)	10 A fuse (type gG or gL, IEC269 approved)
Conditional short-circuit current	100 A (EN60947-5-1)
Conventional enclosed thermal current (I _{the})	5 A (EN60947-5-1)
Protection against electric shock	Class II (grounding not required with double insulation)
Vibration resistance	Malfunction: 10 to 55 Hz, 1.5-mm double amplitude
Shock resistance	Destruction: 1,000 m/s ² min. Malfunction: 300 m/s ² min.
Ambient temperature	Operating: -10°C to 80°C (with no icing)
Ambient humidity	Operating: 95% max.
Weight	Approx. 86 g (in case of roller plunger)

- Note:** 1. The above values are initial values.
 2. The above ratings may vary depending on the model. Contact your OMRON representative for further details.
 3. Durability values are calculated at an operating temperature of 5°C to 35°C, and an operating humidity of 40% to 70%. Contact your OMRON sales representative for more detailed information on other operating environments.

■ Operating Characteristics

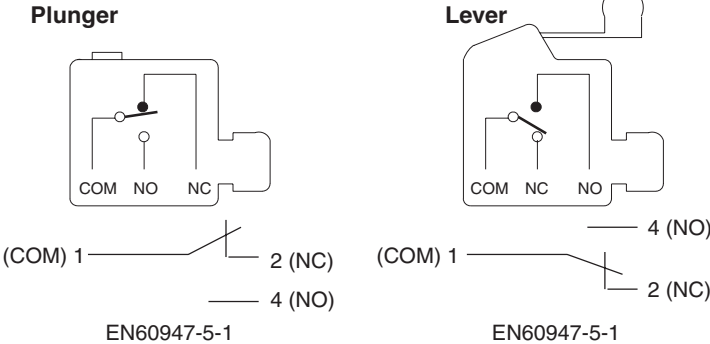
Model	D4E-1A□□N D4E-2A□□N	D4E-1B□□N D4E-2B□□N	D4E-1C□□N D4E-2C□□N	D4E-1D□□N D4E-2D□□N	D4E-1E□□N D4E-2E□□N
OF max.	11.77 N	11.77 N	11.77 N	11.77 N	11.77 N
RF min.	4.90 N	4.90 N	4.90 N	4.90 N	4.90 N
PT max.	1.5 mm	1.5 mm	1.5 mm	1.5 mm	1.5 mm
OT min.	3 mm	3 mm	3 mm	3 mm	3 mm
MD(reference value)	(0.1 mm)	(0.1 mm)	(0.1 mm)	(0.1 mm)	(0.1 mm)
OP	31.4±0.8 mm	31.4±0.8 mm	25.4±0.8 mm	41.3±0.8 mm	41.3±0.8 mm

Model	D4E-1F□□N D4E-2F□□N	D4E-1G□□N D4E-2G□□N	D4E-1H□□N D4E-2H□□N
OF max.	11.77 N	3.92 N	3.92 N
RF min.	4.90 N	0.78 N	0.78 N
PT max.	1.5 mm	2 mm	2 mm
OT min.	3 mm	4 mm	4 mm
MD(reference value)	(0.1 mm)	(0.3 mm)	(0.3 mm)
OP	30±0.8 mm	23.1±0.8 mm	34.3±0.8 mm

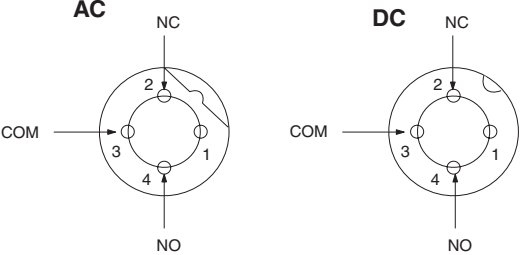
Note: The values given in parentheses are reference values.

■ Contact Form

Screw Terminal Type

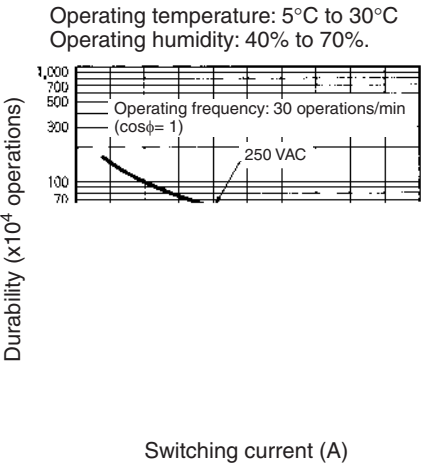


Connector Type



Engineering Data

Electrical Durability ($\cos\phi=1$)



Nomenclature

Movable Plunger

Rubber Cap (NBR)

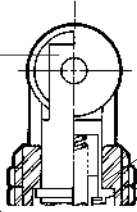
Rubber cap provides a tight seal and ensures a long service life and smooth reset at low temperatures.

Seal Packing (NBR)

Seal packing withstands a pressure of 186 kPa (D4E's seal packing withstands a pressure of 98 kPa).

Terminal Protection Cover

D4E-□N has a wide wiring space of 10 mm horizontally (D4E has a space of 7.5 mm horizontally).



Bearing

The actuator strength has been increased to 4,903 N (D4E: 294 N) in order to prevent faulty resetting of the bearing, which may occur when the roller is pressed with excessive force.

Built-in Switch

Switch cover ensures high insulation between the terminals and die-cast. Double insulation means that grounding is unnecessary. Meets UL, CSA, and EN standards.

Prevents the movable piece from being pushed in too far, and thereby contributes to a longer service life.

Die-cast Case

Zinc die-cast case is anti-corrosive and tough.

Screw Terminal

Screw terminal incorporates a M3 screw with a toothed washer.

Wiring Ease

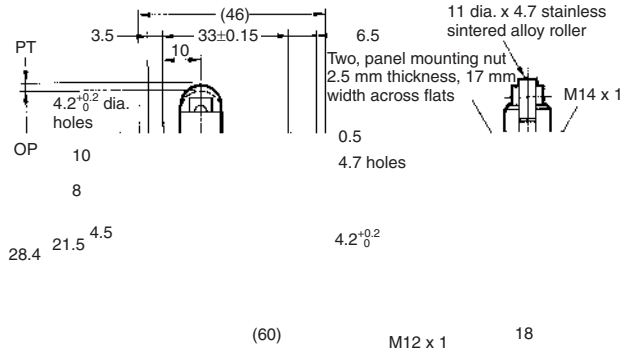
Wired made easier using (D4CC-type) plug-in connector.

Dimensions

- Note:** 1. All units are in millimeters unless otherwise indicated.
 2. Unless otherwise specified, a tolerance of ± 0.4 mm applies to all dimensions.
 3. A 3-m lead wire cable equivalent to the 3-conductor VCTF S-FLEX cable (0.75 mm², 7 mm in dia.) is provided.
 4. A 5.8- to 7.6-dia. cable can be applied to the seal rubber for the lead wire outlet.

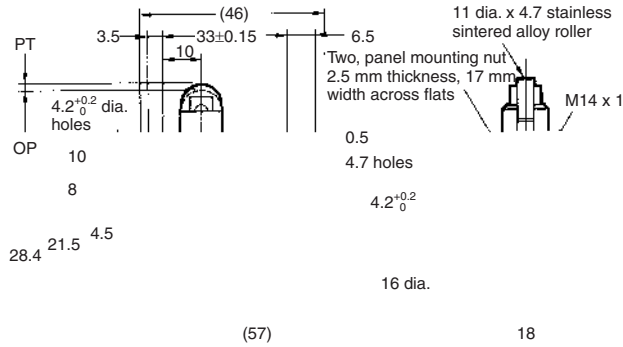
Roller Plunger

D4E-1A00N
 D4E-1A10N
 D4E-2A00N
 D4E-2A10N



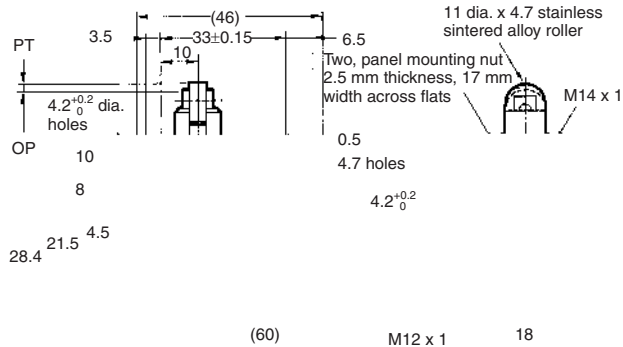
Roller Plunger

D4E-1A20N (See note 4.)
 D4E-2A20N (See note 4.)
 D4E-1A21N (See note 3.)
 D4E-2A21N (See note 3.)



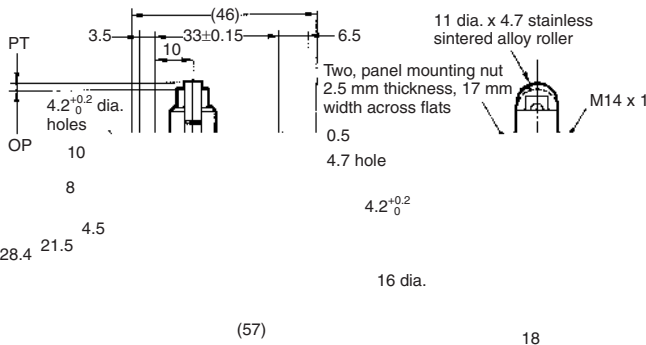
Cross Roller Plunger

D4E-1B00N
 D4E-1B10N
 D4E-2B00N
 D4E-2B10N



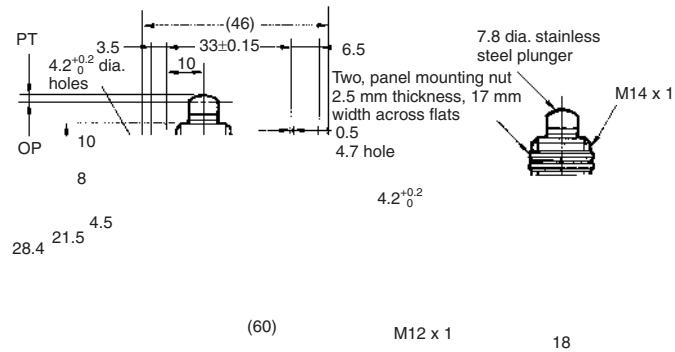
Cross Roller Plunger

D4E-1B20N
 D4E-2B20N
 D4E-1B21N
 D4E-2B21N



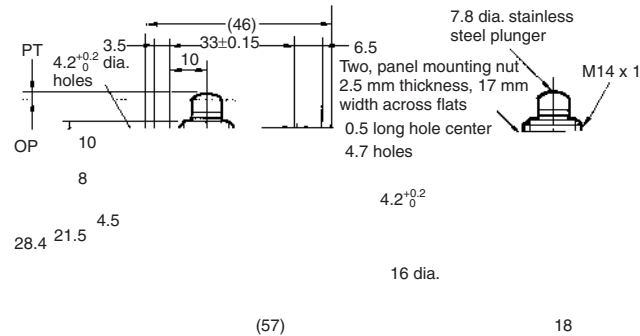
Plunger

D4E-1C00N
D4E-1C10N
D4E-2C00N
D4E-2C10N



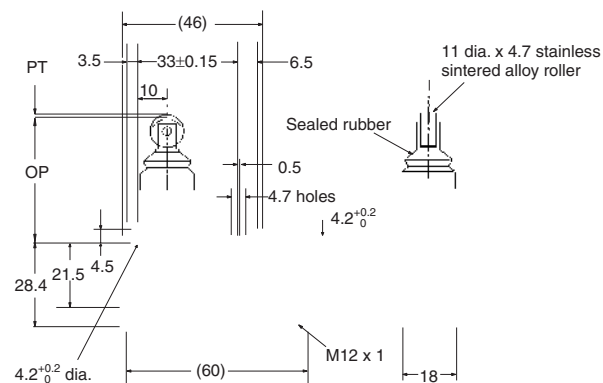
Plunger

D4E-1C20N (See note 4.)
D4E-2C20N (See note 4.)
D4E-1C21N (See note 3.)
D4E-2C21N (See note 3.)



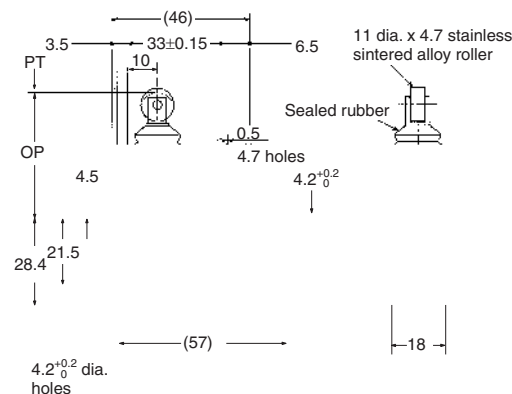
Sealed Roller Plunger

D4E-1D00N
D4E-1D10N
D4E-2D00N
D4E-2D10N



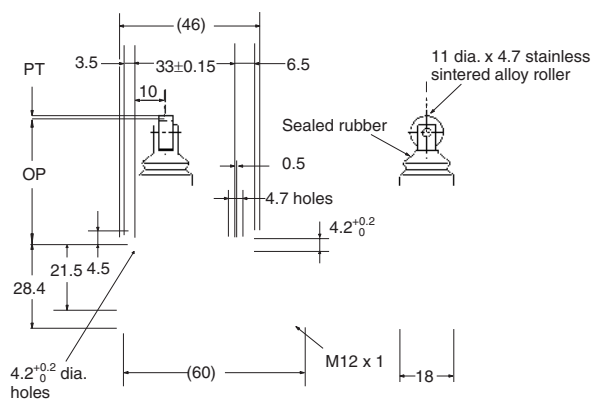
Sealed Roller Plunger

D4E-1D20N (See note 4.)
D4E-2D20N (See note 4.)
D4E-1D21N (See note 3.)
D4E-2D21N (See note 3.)



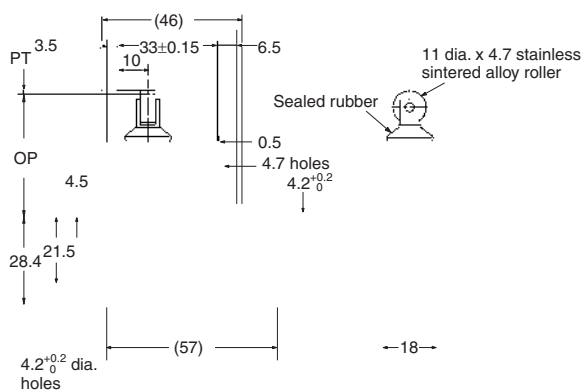
Sealed Cross Roller Plunger

D4E-1E00N
D4E-1E10N
D4E-2E00N
D4E-2E10N



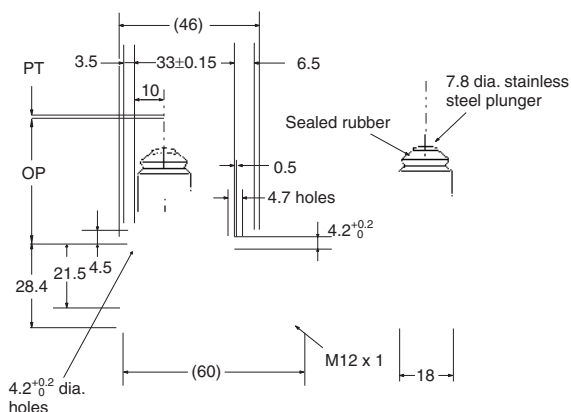
Sealed Cross Roller Plunger

D4E-1E20N (See note 4.)
D4E-2E20N (See note 4.)
D4E-1E21N (See note 3.)
D4E-2E21N (See note 3.)



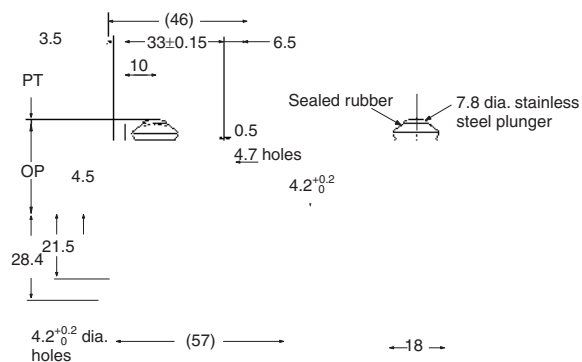
Sealed Plunger

D4E-1F00N
D4E-1F10N
D4E-2F00N
D4E-2F10N



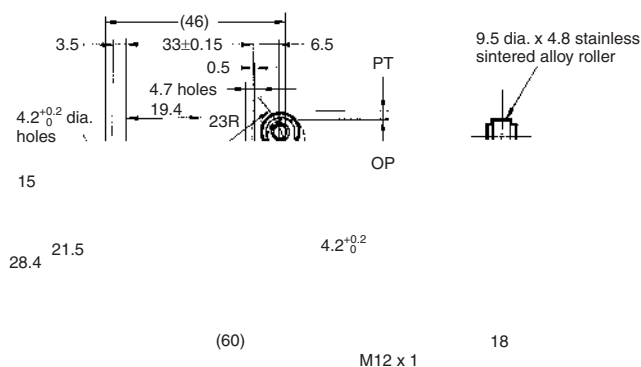
Sealed Plunger

D4E-1F20N (See note 4.)
D4E-2F20N (See note 4.)
D4E-1F21N (See note 3.)
D4E-2F21N (See note 3.)



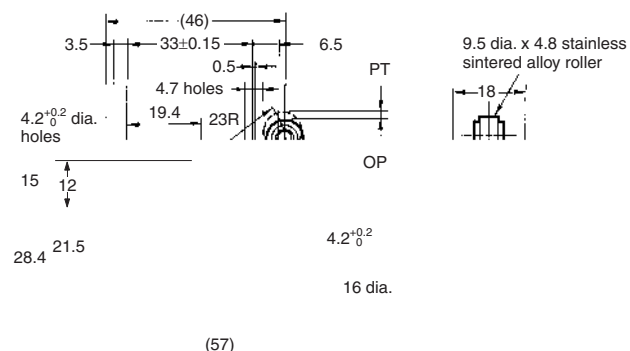
Roller Lever

D4E-1G00N
D4E-1G10N
D4E-2G00N
D4E-2G10N



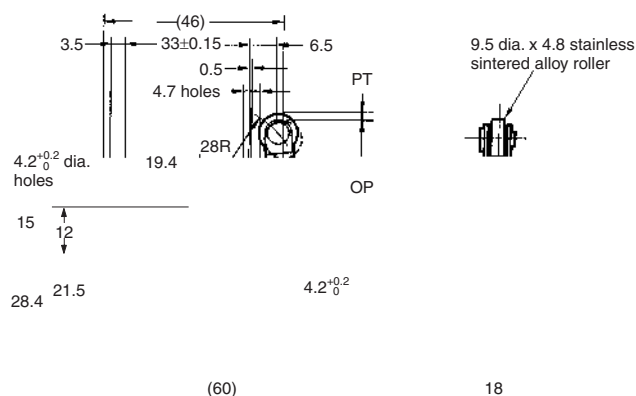
Roller Lever

D4E-1G20N (See note 4.)
D4E-2G20N (See note 4.)
D4E-1G21N (See note 3.)
D4E-2G21N (See note 3.)



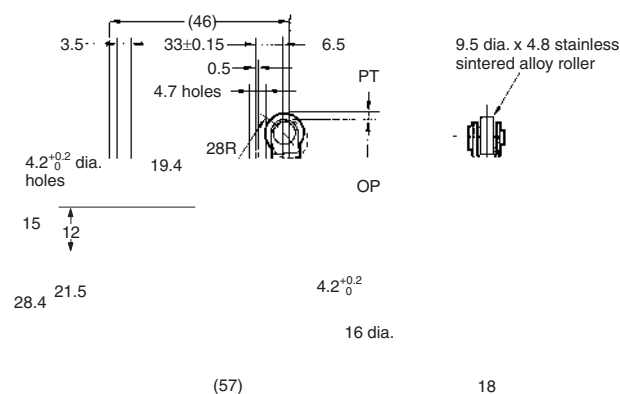
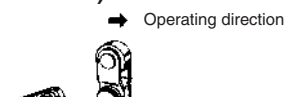
One-way Action Roller Lever

D4E-1H00N
D4E-1H10N
D4E-2H00N
D4E-2H10N



One-way Action Roller Lever

D4E-1H20N (See note 4.)
D4E-2H20N (See note 4.)
D4E-1H21N (See note 3.)
D4E-2H21N (See note 3.)



Molded Terminal Models

■ Molded Terminal Models

The molded-terminal model is available with right-hand, left-hand and underside leads and is recommended for use where the Switch is exposed to dust, oil or moisture. It can be used like a screw-terminal model (with a cable), and the dimensions and operating characteristics are the same as for standard models.



Example:

Standard type: D4E-1A20N

Location of lead output: Right-hand → D4E-1A23N

Suffix by Location of Lead Outlet

Location of lead output	Suffix for pre-wired terminal
	COM, NC, NO
(1) Right-hand	D4E-□□23N
(2) Left-hand	D4E-□□24N

Lead Supplies

Leads	Nominal cross-sectional area	Finished outside diameter	Terminal connections	Standard length
V.C.T.F. S-FLEX (vinyl cabtire coat)	0.75 mm ²	3 conductors	Black: COM	3 m
		7 mm dia.	White: NO Red: NC	

Comparison between Old and New Mold Terminal Models

The D4E-N and D4E are different from each other in terminal specifications.

Location of lead output	D4E-N	D4E
Right-hand	D4E-□□23N	D4E-□□21
Left-hand	D4E-□□24N	D4E-□□23
Underside	---	D4E-□□22

■ Operation of Indicator-equipped Models

The molded terminal model may be equipped with an operation indicator (neon lamp or LED) upon request to facilitate maintenance and inspection.

The operation indicator is designed to illuminate when the Switch is not operating. (Because of the molded terminal model, any change to the Switch wiring cannot be made.)

AC Operation

A neon lamp indicator is provided.
The operating voltage is 90 to 250 VAC.



Neon lamp

Terminal protection cover
(transparent)

There is no difference in operating characteristics between D4E AC Models and corresponding D4E Standard Models.

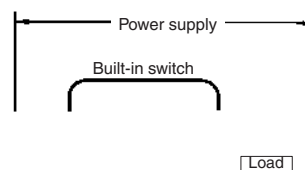
There is no difference in dimensions between D4E AC Models and D4E Standard Models.

Example:

Basic type: D4E-1A23N

When placing your order for the molded terminal model with an neon lamp operation indicator, specify the model number as D4E-1A23LN.

Internal Circuit



Neon lamp $R = 240 \text{ k}\Omega$

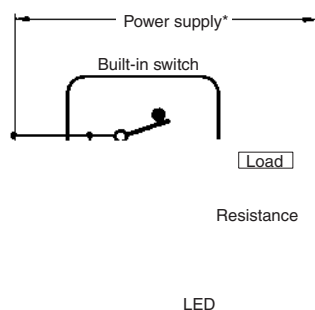
DC Operation

LED indicator is provided.

As a rectifier stack is incorporated, into the unit and no directionality exists for connection of + and –, this type can also be operated on AC.

Voltage ratings of LED indicators are as shown in the table below.

Internal Circuit



Note: *An external 24VDC power supply can be used, eg. OMRON S8VS.

Type	Voltage rating	Lamp current	Internal resistance
L1	12 V	Approx. 2.4 mA	4.3 k Ω
L2	24 V	Approx. 1.2 mA	18 k Ω
L3	48 V	Approx. 2.1 mA	22 k Ω

Example:

When ordering a D4E DC Model, add the following suffix to the model number.

Basic Model: The model number of the D4E-1A23N with a built-in 12-V LED indicator is D4E-1A23L1N.

Precautions

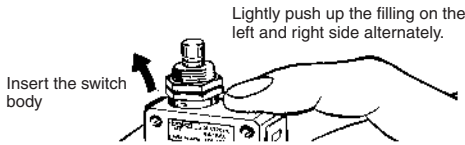
Refer to the *Technical Information for Limit Switches* (Cat. No. C121).

Correct Use

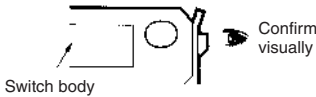
Do not solder the screw terminals.

Sealing materials may deteriorate when used outdoors or when exposed to cutting oil, solvents, or chemicals. Check this on actual equipment and, if deterioration is foreseen, consult your OMRON representative in advance.

If the one-touch connector is to be mounted onto the switch body, lightly push up the fitting so that the switch body can then be inserted into the clamp.



Be sure that the clamp is inserted to the full depth, because the Switch will not function properly if one of the clamps is improperly inserted.



Clamp fitting

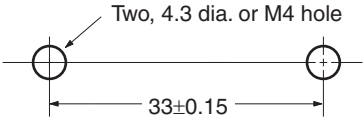
If the clamp is properly inserted up to the full depth, it will not slide out easily. Be sure to carefully confirm all the above items.

Be sure to connect a fuse with a breaking current 1.5 to 2 times the rated current to the Limit Switch in series in order to protect the Limit Switch from damage due to short-circuiting. When using the Limit under the EN ratings, use a gI or gG 10-A fuse that conforms to IEC260.

Mounting

Secure the Switch with two M4 screws and washers. The tightening torque applied to each terminal must be 1.18 to 1.37 N·m. Tighten the screws to the specified torque. An excessive tightening torque may damage the Switch and cause a malfunction.

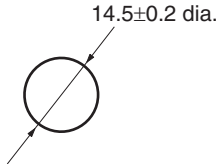
Mounting Holes



When mounting the panel mount-type Switch with screws on a side surface, remove the hexagonal nuts from the actuator.

When mounting the panel mount type on a panel, tighten the hexagonal nuts of the actuator to a torque less than 7.85 N·m.

Mounting Hole



Operating method, shape of cam or dog, operating frequency, and the overtravel (OT) have significant effect on the service life and precision of the Limit Switch. Make sure that the shape of the cam is smooth enough.

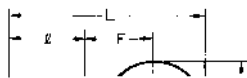
Check that OT has a sufficient margin. The actual OT should be rated OT x 0.7 to 1.

Do not change the operating position by remodeling the actuator.

Wiring

When wiring screw terminals, M3-size round solderless terminals with an insulation tube is recommended. The conductor size should be 0.75 mm² and cable diameter should be 7 mm.

Refer to the following when wiring.



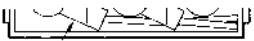
D dia.

dz dia.

dz dia.:	3.2
D dia.:	1.9
B:	5.2
L:	16.4
F:	5.8
ℓ:	8.0 (mm)

Wiring Method

D4E-N

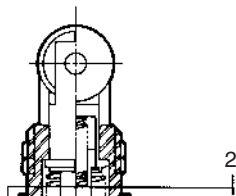


Round solderless terminal

Tightening Torque

A loose screw may result in a malfunction. Be sure to tighten each screw to the proper tightening torque as shown below.

No.	Type	Torque
1	Terminal screw (M3)	0.24 to 0.44 N·m
2	Switch mounting screw (M4)	1.18 to 1.37 N·m



ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.

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

Enclosed Switch D4MC

Economical, High Utility Enclosed Switch

- High precision and long life (10,000,000 mechanical operations) through employment of the moving spring used in OMRON Z Basic Switch.
- Sealed with gasket diaphragm to provide high sealing property without use of any adhesive or pin.
- Suitable for applications demanding higher mechanical strength, dustproof and drip-proof properties than those on basic switches.
- Panel mount versions have the same operating position as Z Basic Switch.
- Resin molded terminal versions are available.
- Approved by UL, CSA, and CCC (Chinese standard).



Model Number Structure

■ Model Number Legend

D4MC-









1

1. Actuator

- 5000: Panel mount plunger
- 5020: Panel mount roller plunger
- 5040: Panel mount crossroller plunger
- 1020: Short hinge lever
- 1000: Hinge lever
- 2000: Hinge roller lever
- 2020: Short hinge roller lever
- 3030: One-way action short hinge roller lever

Ordering Information

List of Models

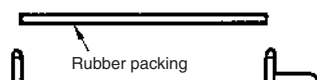
Actuator		Model
Panel mount plunger		D4MC-5000
Panel mount roller plunger		D4MC-5020
Panel mount crossroller plunger		D4MC-5040
Short hinge lever		D4MC-1020
Hinge lever		D4MC-1000
Hinge roller lever		D4MC-2000
Short hinge roller lever		D4MC-2020
One-way action short hinge roller lever		D4MC-3030

Note: Use molded terminal models (refer to page 100) when using the Switch under one of the following conditions:

a) dusty, b) high amount of dripping oil, or c) high humidity

Terminal Protective Cover, Seal Rubber, and Rubber Packing

(The Switch is equipped with these 3 items as a standard.)



- ZC Terminal Cover
(Product code: ZC55-0002H)
- ZC Seal Rubber
(Product code: SC-1404C)
- ZC Rubber Packing
(Product code: ZC55-0003F)

Terminal cover

Seal rubber

Specifications

■ Approved Standards (Except Molded Terminal Models)

Agency	Standard	File No.
UL	508	E76675
CSA	C22.2 No. 14	E45258
CCC (CQC)	GB14048.5	2003010303077627

Note: Ask your OMRON representative for information on approved models.

■ Approved Standard Ratings

UL/CSA

A300

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

EN60947-1 and EN60947-5-1

250 V, 10 A (AC12) (Tested by ASTA)

CCC (GB14048.5)

Applicable category and ratings
AC-12 10 A/250 VAC

■ General Ratings

Rated voltage	Non-inductive load				Inductive load			
	Resistive load		Lamp load		Inductive load		Motor load	
	NC	NO	NC	NO	NC	NO	NC	NO
125 VAC	10 A		3 A	1.5 A	10 A		5 A	2.5 A
250 VAC	10 A		2.5 A	1.25 A	10 A		3 A	1.5 A
480 VAC	3 A		1.5 A	0.75 A	2.5 A		1.5 A	0.75 A
8 VDC	10 A		3 A	1.5 A	6 A		5 A	2.5 A
14 VDC	10 A		3 A	1.5 A	6 A		5 A	2.5 A
30 VDC	6 A		3 A	1.5 A	5 A		5 A	2.5 A
125 VDC	0.5 A		0.4 A	0.4 A	0.05 A		0.05 A	0.05 A
250 VDC	0.25 A		0.2 A	0.2 A	0.03 A		0.03 A	0.03 A

Inrush current	NC	30 A max.
	NO	15 A max.

- Note:**
- The above figures are for steady-state currents.
 - Inductive loads have a power factor of 0.4 min. (AC) and a time constant of 7 ms max. (DC).
 - Lamp load has an inrush current of 10 times the steady-state current.
 - Motor load has an inrush current of 6 times the steady-state current.
 - The above ratings were tested under the following conditions.
 Ambient temperature: 20±2°C
 Ambient humidity: 65±5%
 Operating frequency: 20 operations/min

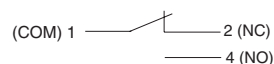
■ Characteristics

Degree of protection	IP67
Durability	Mechanical: 10,000,000 operations min. Electrical: 500,000 operations min.
Operating speed	0.05 mm/s to 0.5 m/s (for plunger models)
Operating frequency	Mechanical: 120 operations/min Electrical: 20 operations/min
Rated frequency	50/60 Hz
Insulation resistance	100 MΩ min. (at 500 VDC)
Contact resistance	15 mΩ max. (initial value)
Dielectric strength	1,000 VAC, 50/60 Hz for 1 min between terminals of the same polarity 2,000 VAC, 50/60 Hz for 1 min between current-carrying metal parts and ground, and between each terminal and non-current-carrying part
Rated insulation voltage (U _i)	1,000 VAC
Pollution degree (operating environment)	3 (IEC947-5-1)
Protection against electric shock	Class II
PTI (tracking characteristics)	175
Switch category	D (IEC335)
Rated operating current (I _e)	10 A
Rated operating voltage (U _e)	250 VAC
Vibration resistance	Malfunction: 10 to 55 Hz, 1.5-mm double amplitude (see note)
Shock resistance	Destruction: 1,000 m/s ² min. Malfunction: 100 m/s ² min. (for plunger models) (see note)
Ambient temperature	Operating: -10°C to 80°C (with no icing)
Ambient humidity	Operating: 35% to 95%
Weight	Approx. 71 g (at panel mount plunger)

Note: Less than 1 ms under a free state at the operating limits.

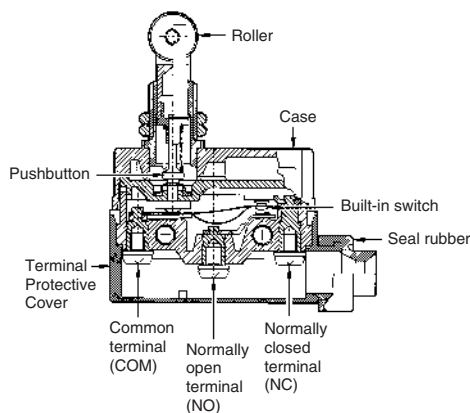
Connections

■ Contact Form



Nomenclature

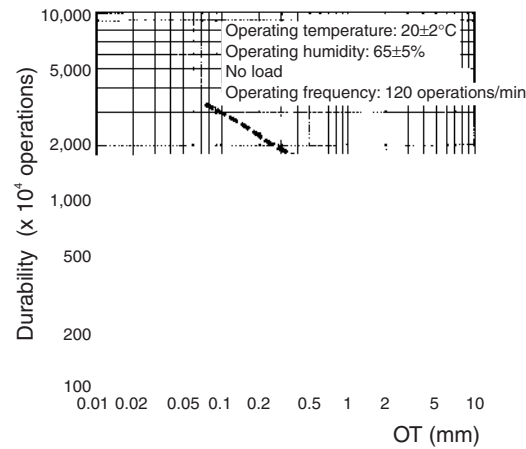
Changing the Terminal Protective Cover around allows the cable to be pulled out from either the right or the left.



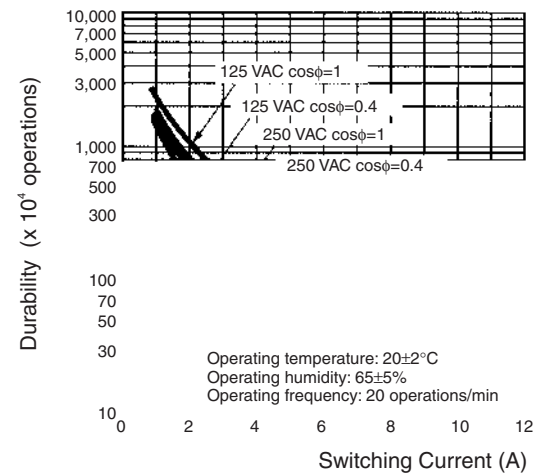
Note: M4 binding head screws (with toothed washers) are used as the terminal screws.

Engineering Data

Mechanical Durability
(D4MC-5000)



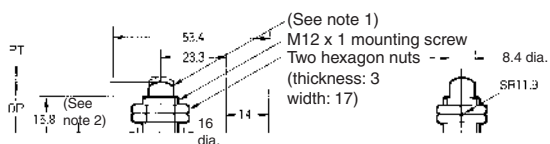
Electrical Durability



Dimensions

Note: 1. All units are in millimeters unless otherwise indicated.
2. Unless otherwise specified, a tolerance of ± 0.4 mm applies to all dimensions.

Panel Mount Plunger D4MC-5000



22 max.

Terminal
protective
cover

15

Two, 4.3 ± 0.1 dia.
mounting holes

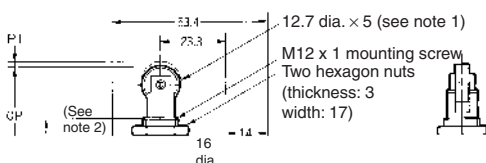
(21 x 21)

Seal rubber (NBR)

Note: 1. Stainless steel plunger
2. The length of the imperfect threads is 1.5 mm maximum.
3. Do not use the M12 mounting screw and the case mounting hole at the same time.

Model	D4MC-5000
OF max.	5.88 N
RF min.	0.98 N
PT max.	1.6 mm
OT min.	5 mm
MD max.	0.2 mm
OP	21.8 ± 1.2 mm
FP max.	---

Panel Mount Roller Plunger D4MC-5020



22 max.

Terminal
protective
cover

15

Two, 4.3 ± 0.1 dia.
mounting holes

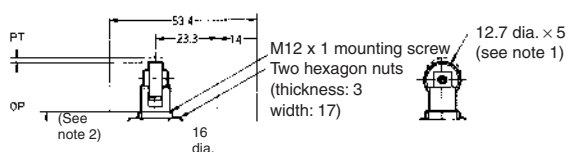
(21 x 21)

Seal rubber (NBR)

Note: 1. Stainless steel roller
2. The length of the imperfect threads is 1.5 mm maximum.
3. Do not use the M12 mounting screw and the case mounting hole at the same time.

Model	D4MC-5020
OF max.	5.88 N
RF min.	0.98 N
PT max.	1.6 mm
OT min.	5 mm
MD max.	0.2 mm
OP	33.4 ± 1.2 mm
FP max.	---

Panel Mount Crossroller Plunger D4MC-5040



22 max.

Terminal
protective
cover

(21 x 21)

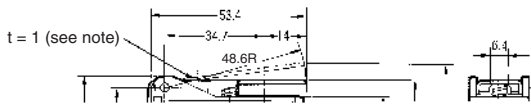
Two, 4.3 ± 0.1 dia.
mounting holes

Seal rubber (NBR)

Note: 1. Stainless steel roller
2. The length of the imperfect threads is 1.5 mm maximum.
3. Do not use the M12 mounting screw and the case mounting hole at the same time.

Model	D4MC-5040
OF max.	5.88 N
RF min.	0.98 N
PT max.	1.6 mm
OT min.	5 mm
MD max.	0.2 mm
OP	33.4 ± 1.2 mm
FP max.	---

Short Hinge Lever
D4MC-1020



Note: Stainless steel lever

Model	D4MC-1020
OF max.	2.55 N
RF min.	0.34 N
PT max.	---
OT min.	2.5 mm
MD max.	1.7 mm
OP	25±1 mm
FP max.	33 mm

22 max.

Terminal protective cover

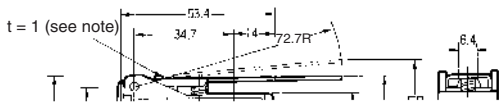
15

Two, 4.3±0.1 dia. mounting holes

(21 x 21)

Seal rubber (NBR)

Hinge Lever
D4MC-1000



Note: Stainless steel lever

Model	D4MC-1000
OF max.	1.67 N
RF min.	0.25 N
PT max.	---
OT min.	4 mm
MD max.	3 mm
OP	25±1 mm
FP max.	36 mm

22 max.

Terminal protective cover

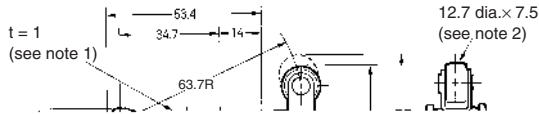
15

Two, 4.3±0.1 dia. mounting holes

(21 x 21)

Seal rubber (NBR)

Hinge Roller Lever
D4MC-2000



Note: 1. Stainless steel lever
2. Plastic roller

Model	D4MC-2000
OF max.	1.96 N
RF min.	0.39 N
PT max.	---
OT min.	5 mm
MD max.	3 mm
OP	40±1 mm
FP max.	51 mm

22 max.

Terminal protective cover

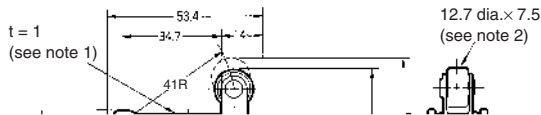
15

Two, 4.3±0.1 dia. mounting holes

(21 x 21)

Seal rubber (NBR)

Short Hinge Roller Lever
D4MC-2020



Note: 1. Stainless steel lever
2. Plastic roller

Model	D4MC-2020
OF max.	2.94 N
RF min.	0.39 N
PT max.	---
OT min.	2 mm
MD max.	1.5 mm
OP	40±1 mm
FP max.	47 mm

22 max.

Terminal protective cover

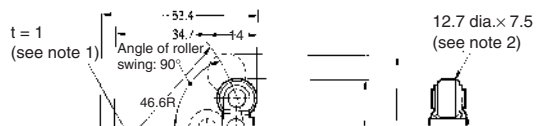
15

Two, 4.3±0.1 dia. mounting holes

(21 x 21)

Seal rubber (NBR)

One-way Action Short Hinge Roller Lever D4MC-3030



Note: 1. Stainless steel lever
2. Plastic roller

Model	D4MC-3030
OF max.	2.94 N
RF min.	0.39 N
PT max.	---
OT min.	2 mm
MD max.	1.5 mm
OP	50±1 mm
FP max.	57.2 mm

22 max.

Terminal protective cover
15
Two, 4.3±0.1 dia. mounting holes
Seal rubber (NBR)
(21 x 21)

Molded Terminal Models

■ Molded Terminal Models

The molded terminal model is available with right-hand, left-hand and underside leads and is recommended for use where the Switch is exposed to dust, oil, or moisture.



(2)

(1)

(3)

When placing your order for the Switch specify the required length of V.C.T. cable in addition to the model number of the Switch

Example:

Standard type: D4MC-5020

Location of lead outlet: Underside

Length of lead: 1 m (V.C.T. lead)

When placing your order for the above Switch specify the model number as D4MC-5023 VCT 1M

Suffix by Location of Lead Outlet

Location of lead outlet	Model
	COM, NC, and NO
Right-hand	D4MC-□□□1
Left-hand	D4MC-□□□2
Underside	D4MC-□□□3

Leads Supplied

Leads	Nominal cross-sectional area	Finished outside diameter	Terminal connections	Standard length
V.C.T. (Vinyl cabtire cable)	1.25 mm ²	3 core:10.5 mm dia.	Black: COM White: NO Red: NC	1, 3 m

Precautions

Refer to the "Precautions for All Switches" on CD.

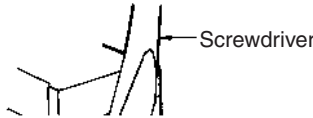
■ Correct Use

Operating

Excessive dog angle, operating speed, or overtravel (OT) may damage the actuator. Check that OT has a sufficient margin. The actual OT should be rated OT x 0.7 to 1.

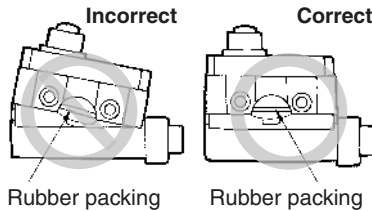
Handling

- Do not expose the Switch to water exceeding 60°C or use it in steam.
- Do not use the Switch in oil or water.
- An 8.5- to 10.5-dia. cable can be applied as seal rubber for the lead wire outlet. (Use two- or three-core cable of VCT1.25 mm².)
- When detaching the Terminal Protective Cover, insert a screwdriver and apply a force in the opening direction. Do not use excess force to remove the cover. Doing so may cause deformation in the fitting section and reduce the holding force.



Terminal Protective Cover

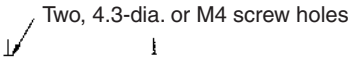
When mounting the Terminal Protective Cover to the case, align the cover on the case and then press the cover down to mount it firmly. If the cover is pressed down in an inclined position, rubber packing will deform and thus affect the sealing capability.



Mounting

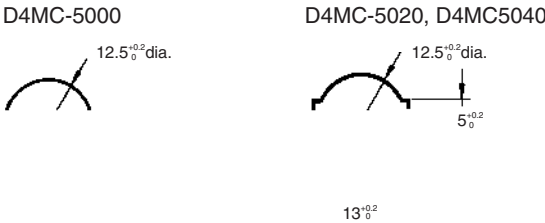
When mounting the Switch with screws on a side surface, fasten the Switch with M4 screws and use washers, spring washers, etc., to ensure secure mounting.

Mounting Holes



- When mounting the Panel Mount-type Switch (D4MC-5000, D4MC-5020, or D4MC-5040) with screws on a side surface, remove the hexagonal nuts from the actuator.
- When mounting the panel mount type on a panel, be careful not to tighten to an excessive torque. Tightening the screws to a torque exceeding 4.91 N·m will cause the plunger to fail.

Mounting Hole Dimensions



Correct Tightening Torque

A loose screw may cause malfunctions. Be sure to tighten each screw to the proper tightening torque as shown in the table.

No.	Type	Torque
1	Terminal screw	0.78 to 1.18 N·m
2	Panel mounting screw	2.94 to 4.92 N·m
3	Side mounting screw	1.18 to 1.47 N·m

ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.

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

Cat. No. C027-E2-09

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

Enclosed Switch SHL

Subminiature Enclosed Switch (Measuring 48 x 17.5 x 45 mm) with High Sealing Property

- Built-in coil spring type basic switch housed in rigid zinc diecast alloy casting boasts long life and high precision.
- Requires nearly the same operating force as conventional basic precision switches (2.35 to 3.92 N).
- Molded terminal model is available.
- Operation indicator model is also available.



Model Number Structure

■ Model Number Legend

Standard Models

SHL-55-

1 2

1. Actuator

- D: Plunger
- Q: Panel mount plunger
- Q22: Panel mount roller plunger
- Q21: Panel mount crossroller plunger
- W: Short hinge lever
- W1: Hinge lever
- W2: Short hinge roller lever
- W21: Hinge roller lever
- W3: One-way action short hinge roller lever
- W31: One-way action hinge roller lever











2. Rated Current

- None: Standard
- 01: Micro Load

Note: Refer to page 110 for *Molded Terminal Models*.

Ordering Information

■ List of Models

Actuator	Standard model	Micro voltage
Plunger 	SHL-D55	SHL-D55-01
Panel mount plunger 	SHL-Q55	SHL-Q55-01
Panel mount roller plunger 	SHL-Q2255	SHL-Q2255-01
Panel mount crossroller plunger 	SHL-Q2155	SHL-Q2155-01
Short hinge lever 	SHL-W55	SHL-W55-01
Hinge lever 	SHL-W155	SHL-W155-01
Short hinge roller lever 	SHL-W255	SHL-W255-01
Hinge roller lever 	SHL-W2155	SHL-W2155-01
One-way action short hinge roller lever 	SHL-W355	SHL-W355-01
One-way action hinge roller lever 	SHL-W3155	SHL-W3155-01

Specifications

■ Approved Standards

Agency	Standard	File No.
UL	UL508	E76675
CSA	CSA C22.2 No. 14	LR45746
TÜV Rheinland	EN60947-5-1	R9451332

■ Approved Standard Ratings

UL/CSA

A300

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

TÜV Rheinland Approved Ratings (EN60947-5-1)

Model	Category and rating	I the
SHL-□55	AC-15 2 A/125 V DC-12 2 A/48 V	5 A 4 A
SHL-□55-01	AC-14 0.1 A/125 V DC-12 0.1 A/48 V	0.5 A 0.5 A
SHL-□55-L	AC-15 2 A/125 V	5 A
SHL-□55-01L	AC-14 0.1 A/125 V	0.5 A
SHL-□55-01L2	DC-12 0.1 A/12 V	0.5 A
SHL-□55-L3	DC-12 2 A/24 V	4 A
SHL-□55-01L3	DC-12 0.1 A/24 V	0.5 A
SHL-□55-L4	DC-12 2 A/24 V	4 A
SHL-□55-01L4	DC-12 0.1 A/24 V	0.5 A
SHL-□55-L5	DC-12 2 A/48 V	4 A
SHL-□55-01L5	DC-12 0.1 A/48 V	0.5 A

Note: For details on the above models, refer to *Model Number Legend* under *Molded Terminal Models*.

■ Ratings

Rated voltage	Non-inductive load				Inductive load				Inrush current	
	Resistive load		Lamp load		Inductive load		Motor load			
	NC	NO	NC	NO	NC	NO	NC	NO	NC	NO
125 VAC	10 A		1.5 A		3 A		2.5 A		15 A max.	
250 VAC	10 A		1.5 A		2 A		1.5 A			
480 VAC	2 A		---		---		---			
8 VDC	10 A		2 A		5 A		2 A			
14 VDC	10 A		2 A		5 A		2 A			
30 VDC	5 A		1.5 A		1.5 A		1.5 A			
125 VDC	0.4 A		0.4 A		0.05 A		0.05 A			
250 VDC	0.2 A		0.2 A		0.03 A		0.03 A			

- 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. Lamp load has an inrush current of 10 times the steady-state current.
 4. Motor load has an inrush current of 6 times the steady-state current.

Micro Voltage/Current Load Model

Rated voltage	Non-inductive load	
	Resistive load	
	NC	NO
125 VAC	0.1 A	
8 VDC	0.1 A	
14 VDC	0.1 A	
30 VDC	0.1 A	

■ Characteristics

Degree of protections (see note 3)	IP67 (EN60947-5-1)
Durability (see note 4)	Mechanical: 10,000,000 operations min. Electrical: 500,000 operations min.
Operating speed	0.1 mm to 0.5 m/s (hinge lever models)
Operating frequency	Mechanical: 120 operations/min Electrical: 30 operations/min
Rated frequency	50/60 Hz
Insulation resistance	100 MΩ min. (at 500 VDC)
Contact resistance	15 mΩ max.(initial value)
Dielectric strength	1,000 VAC, 50/60 Hz for 1 min between terminals of the same polarity 2,000 VAC, 50/60 Hz for 1 min/Uimp at 2.5 kV (EN60947-5-1) between current-carrying metal part and ground, and between each terminal and non-current-carrying metal part
Rated insulation voltage (U _i)	150 V (EN60947-5-1)
Switching overvoltage	1,000 VAC max., 300 VDC max. (EN60947-5-1)
Pollution degree (operating environment)	3 (EN60947-5-1)
Short-circuit protective device (SCPD)	10 A fuse type gG (IEC269)
Conditional short-circuit current	100 A (EN60947-5-1)
Conventional enclosed thermal current (I _{the})	5 A (EN60947-5-1)
Protection against electric shock	Class II (grounding not required with double insulation)
OFF reverse voltage	1,000 VAC max., 300 VDC max. (EN60947-5-1)
Vibration resistance	Malfunction: 10 to 55 Hz, 1.5-mm double amplitude
Shock resistance	Destruction: 1,000 m/s ² min. Malfunction: 300 m/s ² min.
Ambient temperature	Operating: -10°C to 80°C (no icing)
Ambient humidity	Operating: 95% max.
Weight (see note 5)	Approx. 62 to 72 g

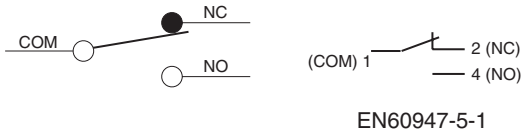
- Note:**
1. The above figures are for standard currents.
 2. The above ratings may vary depending on the model. Contact your OMRON representative for further details.
 3. The head section of the plunger type SHL-D(Q)□□ is excluded.
 4. Durability values are calculated at an operating temperature of 5°C to 35°C, and an operating humidity of 40% to 70%. Contact your OMRON sales representative for more detailed information on other operating environments.
 5. The values are for the plunger-type models.

■ Operating Characteristics

Model	SHL-D55 SHL-D55-01	SHL-Q55 SHL-Q55-01	SHL-Q2255 SHL-Q2255-01	SHL-Q2155 SHL-Q2155-01	SHL-W55 SHL-W55-01
OF max.	9.81 N	9.81 N	9.81 N	9.81 N	3.14 N
RF min.	1.96 N	1.96 N	1.96 N	1.96 N	0.78 N
PT max.	1.5 mm	1.5 mm	1.5 mm	1.5 mm	8 mm
OT min.	2 mm	2 mm	2 mm	2 mm	3 mm
MD max.	0.5 mm	0.5 mm	0.5 mm	0.5 mm	2.5 mm
OP	34±0.8 mm	34±0.8 mm	43±0.8 mm	43±0.8 mm	21.5±1 mm
FP max.	---	---	---	---	29.5 mm

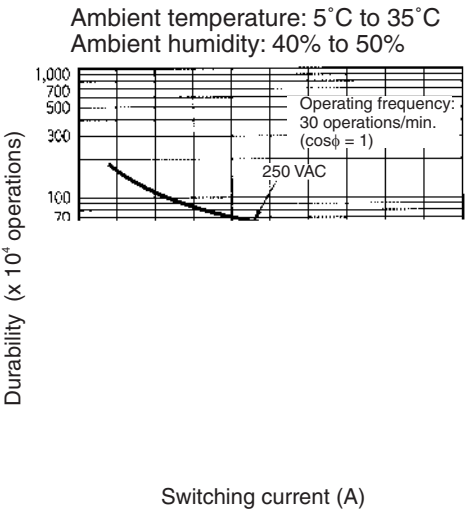
Model	SHL-W155 SHL-W155-01	SHL-W255 SHL-W255-01	SHL-W2155 SHL-W2155-01	SHL-W355 SHL-W355-01	SHL-W3155 SHL-W3155-01
OF max.	2.35 N	3.92 N	2.55 N	3.92 N	2.55 N
RF min.	0.44 N	0.78 N	0.49 N	0.78 N	0.49 N
PT max.	13 mm	8 mm	13 mm	8 mm	13 mm
OT min.	5 mm	3 mm	5.5 mm	3 mm	5.5 mm
MD max.	4 mm	2.5 mm	4 mm	2.5 mm	4 mm
OP	21.5±1 mm	33±1 mm	33.5±1 mm	44.5±1 mm	44.5±1 mm
FP max.	34.5 mm	41 mm	46.5 mm	52.5 mm	57.5 mm

■ Contact Form

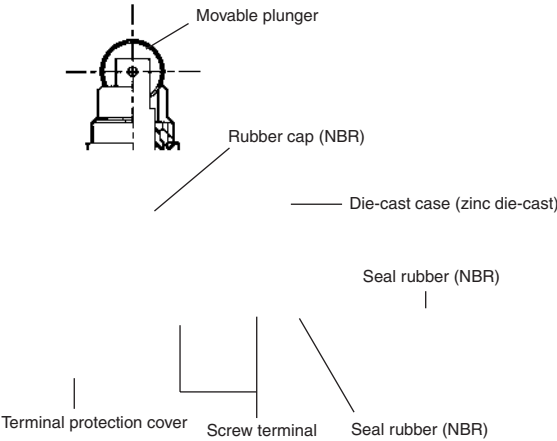


Engineering Data

■ Electrical Durability



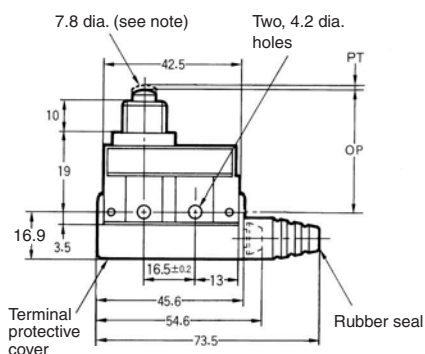
Nomenclature



Dimensions

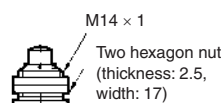
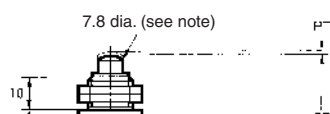
Note: 1. All units are in millimeters unless otherwise indicated.
2. Unless otherwise specified, a tolerance of ± 0.4 mm applies to all dimensions.

Plunger SHL-D55, SHL-D55-01



Note: Stainless steel pin plunger

Panel Mount Plunger SHL-Q55, SHL-Q55-01



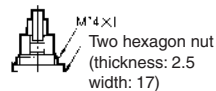
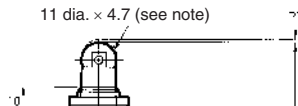
16.9

9.6

15 x 15

Note: Stainless steel pin plunger

Panel Mount Roller Plunger SHL-Q2255, SHL-Q2255-01



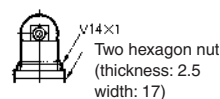
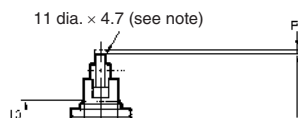
16.9

9.6

15 x 15

Note: Stainless sintered alloy roller

Panel Mount Crossroller Plunger SHL-Q2155, SHL-Q2155-01



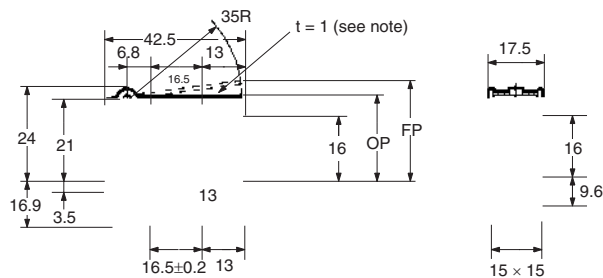
16.9

9.6

15 x 15

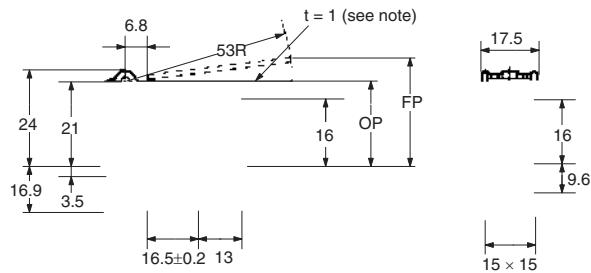
Note: Stainless sintered alloy roller

Short Hinge Lever
SHL-W55, SHL-W55-01



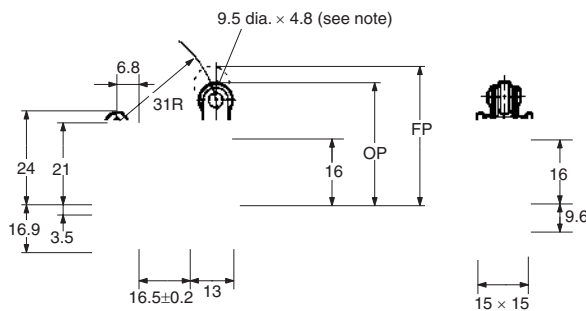
Note: Stainless steel lever

Hinge Lever
SHL-W155, SHL-W155-01



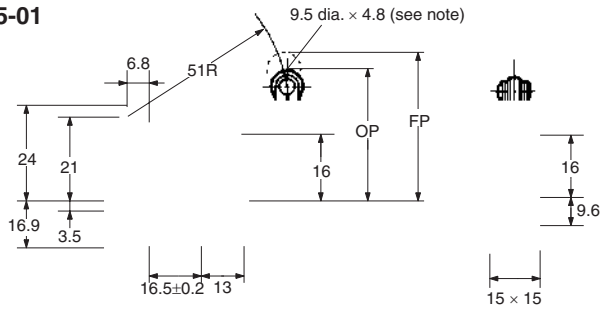
Note: Stainless steel lever

Short Hinge Roller Lever
SHL-W255, SHL-W255-01



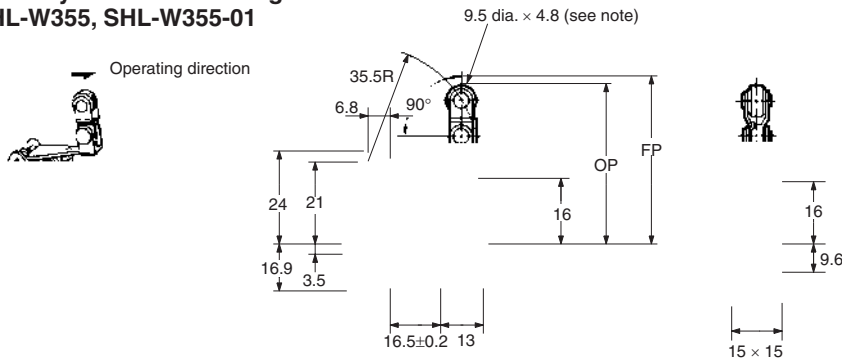
Note: Sintered stainless roller

Hinge Roller Lever
SHL-W2155, SHL-W2155-01



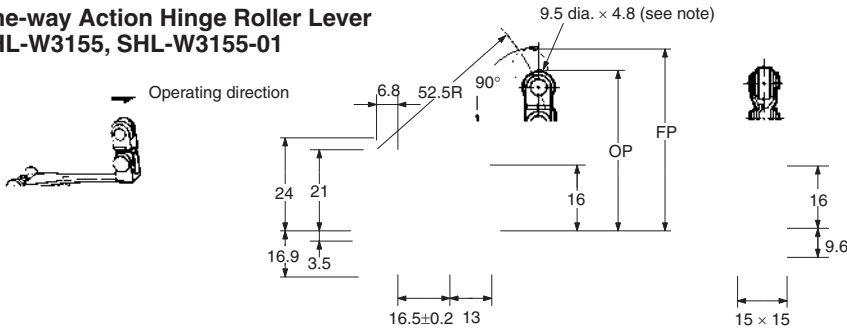
Note: Sintered stainless roller

One-way Action Short Hinge Roller Lever SHL-W355, SHL-W355-01



Note: Stainless sintered roller

One-way Action Hinge Roller Lever SHL-W3155, SHL-W3155-01



Note: Stainless sintered roller

Molded Terminal Models

Model Number Legend

Molded Terminal Models

SHL- 55- M

1 2 3 4

Items 1 (Actuator) and 2 (Rated Current) are the same as those in *Standard Models*.

3. Operation Indicator

- None: Not provided
- L: Neon Lamp: 90 to 250 VAC
- L2: LED: 12 V
- L3: LED: 24 V
- L4: LED: 24 V
- L5: LED: 48 V

4. Location of Lead Outlet

- R: Right-hand
- L: Left-hand
- D: Underside

Use of the molded terminal model is recommended in locations subject to excessive dust, oil drips, or moisture.

All types of SHL Switches can be fabricated into a molded terminal version. In this case, the molded terminal model will have the same dimensions and operating characteristics as the basic model from which the molded terminal model is fabricated.



Note: Three leads (COM, NO, and NC) are provided for terminal connections.

Example:

Basic type: SHL-Q2255

Location of lead outlet: Right-hand

When placing your order for the above Switch specify the model number as SHL-Q2255-MR

ML

MR

MD

Suffix by Location of Lead Outlet

Location of lead outlet	Model
Right-hand	SHL-□-MR
Left-hand	SHL-□-ML
Underside	SHL-□-MD

Lead Supplies

Leads	Nominal cross-sectional area	No. of conductors/cond. dia.	Finished outside diameter	Terminal connections	Standard length
VCTF (Vinyl cabtire cable)	0.75 mm ²	30/0.18 dia.	3-core 7 dia.	Black: COM White: NO Red: NC	3 m

■ Operation Indicator-equipped Models

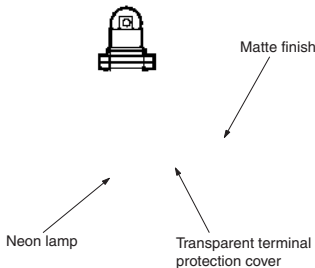
UL, CSA and/or EN (IEC) approved models are available.

The molded terminal model may be equipped with an operation indicator (neon lamp or LED) upon request to facilitate maintenance and inspection.

The operation indicator is designed to illuminate when the Switch is not operating. (Because of the molded terminal model, any change to the Switch wiring cannot be made.)

AC Operation

A neon lamp indicator is provided.
The operating voltage is 90 to 250 VAC.



Operating characteristics are the same as the basic model from which the operation indicator equipped model is fabricated.

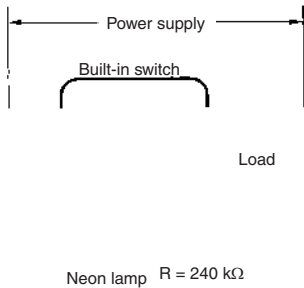
Dimension are the same as the standard model.

Example:

Basic type: SHL-Q2255-01MR

When placing your order for the molded terminal model with an neon lamp operation indicator, specify the model number as SHL-Q2255-01LMR.

Contact Circuit



DC Operation

LED indicator is provided.

As a rectifier stack is incorporated, into the unit and no directionality exists for connection of + and -, this type can also be operated on AC.

Voltage ratings of LED indicators are as shown in the table below.

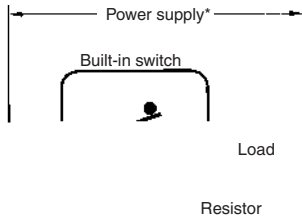
The Switch case has a protrusion to facilitate visual confirmation of LED indicator.

Example:

Basic type: SHL-Q2255-01MR

When placing your order for the molded terminal with an LED indicator rated at 12 V, specify the model number as SHL-Q2255-01L2MR.

Contact Circuit



LED

*An external power supply can be used, eg. OMRON S8VS or S82K.

Type	Voltage rating	Lamp current	Internal resistance
L2	12 V	Approx. 2.4 mA	4.3 kΩ
L3	24 V	Approx. 2 mA	10 kΩ
L4	24 V	Approx. 1.2 mA	18 kΩ
L5	48 V	Approx. 2.1 mA	22 kΩ

Precautions

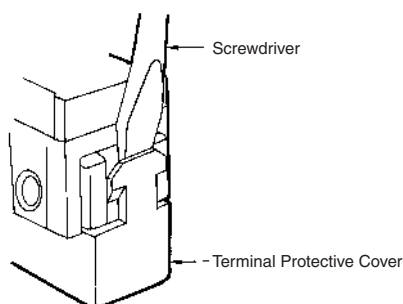
Correct Use

Be sure to connect a fuse with a breaking current 1.5 to 2 times the rated current to the Limit Switch in series in order to protect the Limit Switch from damage due to short-circuiting.

When using the Limit under the EN ratings, use a gI or gG 10-A fuse that conforms to IEC260.

Handling

When detaching the Terminal Protective Cover, insert a screwdriver and apply a force in the opening direction. Do not use excess force to remove the cover. Doing so may cause deformation in the fitting section and reduce the holding force.



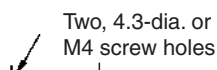
When mounting the Terminal Protective Cover to the case, align the cover on the case and then press the cover down to mount it firmly. If the cover is pressed down in an inclined position, rubber packing will deform and thus affect the sealing capability.

Mounting

Secure the Switch with two M4 screws and washers. The tightening torque applied to each terminal must be 1.18 to 1.37 N·m. Tighten the screws to the specified torque. An excessive tightening torque may damage the Switch and cause a malfunction.

When mounting the panel mount-type Switch with screws on a side surface, remove the hexagonal nuts from the actuator.

Mounting Holes



When mounting the panel mount type (SHL-Q55, SHL-Q2255, or SHL-Q2155) on a panel, tighten the hexagonal nuts of the actuator to a torque less than 7.84 N·m.

Tightening Torque

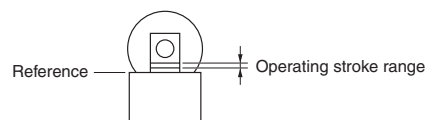
A loose screw may result in a malfunction. Be sure to tighten each screw to the proper tightening torque as shown below.

No.	Type	Torque
1	Terminal screw (M3 screw)	0.24 to 0.44 N·m
2	Panel mounting screw (M4 screw)	1.18 to 1.37 N·m

When wiring, use M3 round solderless terminals and apply insulation shielding to the connections. Tighten the terminals screws to 0.24 to 0.44 N·m.

Operating Stroke

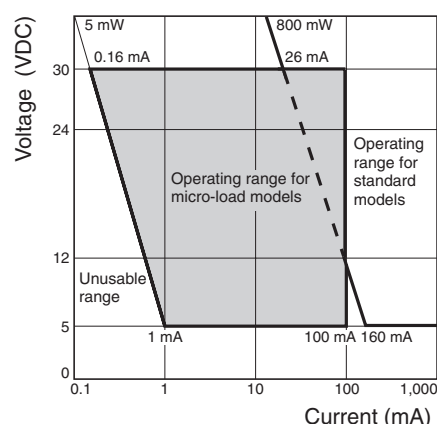
Ensure that the operating stroke for roller plunger models is within the set position display.



Micro Load Applicable Ranges

When using a Limit Switch for opening or closing micro-load circuit (zones 1 through 3), contact failure may occur if a Limit Switch with ordinary contact specifications is used. Therefore, when using Limit Switches in the micro-load range, use ones with contact specifications that are suited to each zone.

Use the SHL-□-01 micro-load models within the zones (1 through 3) shown in the following diagram.



The above diagram is for standard conditions (5°C to 35°C, 40% to 70%). Since the values vary depending on the operating environment conditions, contact your OMRON representative for further details.

Others

The standard seal rubber for the lead wire outlet is one that allows 6- to 8-dia. cables. The appropriate nominal cross-section of the lead wire is 0.75 mm². (When the sealing capability is required over a long period of time, use mold specifications.)

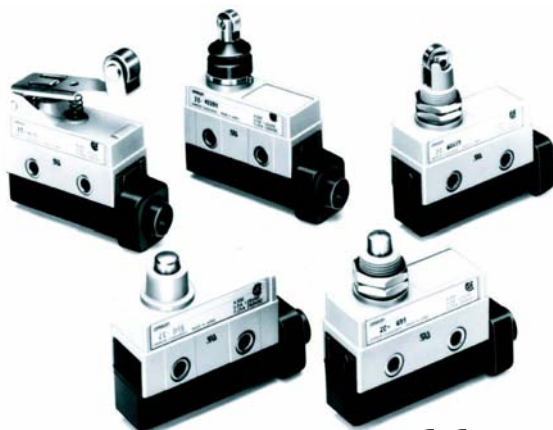
ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.

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

Enclosed Switch ZC-□55

Small, High-precision Enclosed Switch

- Employs a modified version of Z Basic Switch as built-in switch.
- Same mounting pitch as Z Basic Switch.
- Pre-wired molded terminal models are available.
- Requires less operating force than conventional limit switches.
- Long life expectancy and economical.
- UL, CSA, and EN models are available.



Model Number Structure

■ Model Number Legend

ZC-155













1. Actuator

- D: Plunger
Q: Panel mount plunger
Q22: Panel mount roller plunger
Q21: Panel mount crossroller plunger
N22: Sealed roller plunger
N21: Sealed crossroller plunger

- W: Short hinge lever
W1: Hinge lever
W2: Short hinge roller lever
W21: Hinge roller lever
W3: One-way action short hinge roller lever
W31: One-way action hinge roller lever

Ordering Information

■ List of Models

Actuator	Model	Actuator	Model
Plunger 	ZC-D55	Short hinge lever 	ZC-W55
Panel mount plunger 	ZC-Q55	Hinge lever 	ZC-W155
Panel mount roller plunger 	ZC-Q2255	Short hinge roller lever 	ZC-W255
Panel mount crossroller plunger 	ZC-Q2155	Hinge roller lever 	ZC-W2155
Sealed roller plunger 	ZC-N2255	One-way action short hinge roller lever 	ZC-W355
Sealed crossroller plunger 	ZC-N2155	One-way action hinge roller lever 	ZC-W3155

Note: 1. Use molded terminal models (refer to page 121) when using the Switch under one of the following conditions:

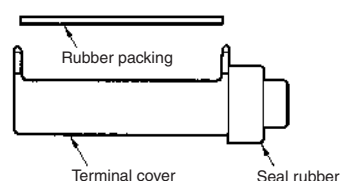
- a) dusty, b) high amount of dripping oil, or c) high humidity

2. Micro-load models are available.

e.g. <u>Standard model</u>	<u>Micro-load model</u>
ZC-Q55	ZC-Q55-01

Terminal Protective Cover, Seal Rubber, and Rubber Packing

(The Switch is equipped with these 3 items as a standard.)



- ZC Terminal Cover
(Product code: ZC55-0002H)
- ZC Seal Rubber
(Product code: SC-1404C)
- ZC Rubber Packing
(Product code: ZC55-9999G)

Specifications

■ Approved Standards

(Except Molded Terminal Models and Operation Indicator-equipped Model)

Agency	Standard	File No.
UL	UL508	E76675
CSA	C22.2, No. 14	LR45258
TÜV Rheinland	EN60947-1, EN60947-5-1	J9650089

■ Approved Standard Ratings

UL/CSA

A300

Voltage	Carry current	Current		Volt-amperes	
		Make	Break	Make	Break
120 VAC	10 A	60 A	6 A	7,200 VA	720 VA
240 VAC		30 A	3 A		

Micro load	0.1 A, 125 VAC 0.1 A, 30 VDC
------------	---------------------------------

TÜV Rheinland

250 V, 10 A (AC12)

■ Ratings

Rated voltage	Non-inductive load				Inductive load			
	Resistive load		Lamp load		Inductive load		Motor load	
	NC	NO	NC	NO	NC	NO	NC	NO
125 VAC	10 A		3 A	1.5 A	10 A		5 A	2.5 A
250 VAC	10 A		2.5 A	1.25 A	10 A		3 A	1.5 A
8 VDC	10 A		3 A	1.5 A	6 A		5 A	2.5 A
14 VDC	10 A		3 A	1.5 A	6 A		5 A	2.5 A
30 VDC	6 A		3 A	1.5 A	5 A		5 A	2.5 A
125 VDC	0.5 A		0.4 A	0.4 A	0.05 A		0.05 A	0.05 A
250 VDC	0.25 A		0.2 A	0.2 A	0.03 A		0.03 A	0.03 A

Inrush current	NC	30 A max.
	NO	15 A max.

- Note:**
1. The above figures are for steady-state currents.
 2. Inductive loads have a power factor of 0.4 min. (AC) and a time constant of 7 ms max. (DC).
 3. Lamp load has an inrush current of 10 times the steady-state current.
 4. Motor load has an inrush current of 6 times the steady-state current.
 5. The above ratings were tested under the following conditions according to JIS C4508.
 - Ambient temperature: 20±2°C
 - Ambient humidity: 65±5%
 - Operating frequency: 20 operations/min

■ Characteristics

Degree of protections	IP67
Durability	Mechanical: 10,000,000 operations min. Electrical: 500,000 operations min.
Operating speed	0.05 mm to 0.5 m/s (at pin plunger)
Operating frequency	Mechanical: 120 operations/min Electrical: 20 operations/min
Insulation resistance	100 MΩ min. (at 500 VDC)
Contact resistance	15 mΩ max. (initial value)
Dielectric strength	1,000 VAC, 50/60 Hz for 1 min between non-continuous terminals 2,000 VAC, 50/60 Hz for 1 min between current-carrying metal part and ground, and between each terminal and non-current-carrying metal parts
Rated insulation voltage (U _i)	1,000 VAC
Pollution degree (operating environment)	3 (IEC947-5-1)
Short-circuit protective device	10 A-fuse type gG (IEC 269)
Protection against electric shock	Class II
PT1 (tracking characteristics)	175
Switch category	D (IEC335)
Rated operating current (I _e)	10 A
Rated operating voltage (U _e)	250 VAC
Vibration resistance	Malfunction: 10 to 55 Hz, 1.5-mm double amplitude (see note)
Shock resistance	Destruction: 1,000 m/s ² max. Malfunction: 300 m/s ² max. (at pin plunger) (see note)
Ambient temperature	Operating: -10°C to 80°C (with no icing)
Ambient humidity	Operating: 35% to 95%
Weight	Approx. 92 g (in case of ZC-Q22(21)55)

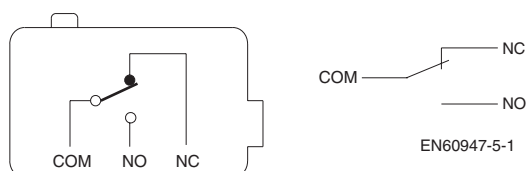
Note: Less than 1 ms under a free state at the operating limits.

■ Operating Characteristics

Model	ZC-D55	ZC-Q55	ZC-Q2255	ZC-Q2155	ZC-N2255	ZC-N2155
OF max.	11.8 N	11.8 N			6.86 N	
RF min.	4.90 N	4.90 N			1.67 N	
PT max.	1.5 mm	1.5 mm			1.5 mm	
OT min.	2.4 mm	3 mm			2.5 mm	
MD max.	0.2 mm	0.2 mm			0.2 mm	
OP	32.4±0.8 mm	38.2±0.8 mm	47.4±0.8 mm			

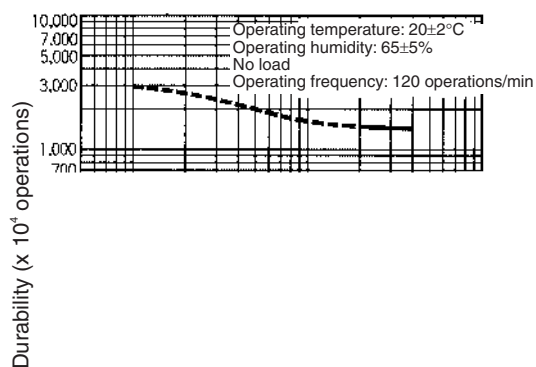
Model	ZC-W55	ZC-W155	ZC-W255	ZC-W2155	ZC-W355	ZC-W3155
OF max.	3.92 N	2.75 N	3.92 N	2.75 N	3.92 N	2.75 N
RF min.	0.78 N	0.59 N	0.78 N	0.59 N	0.78 N	0.59 N
OT min.	6 mm	8.4 mm	6 mm	8.4 mm	6 mm	8.4 mm
MD max.	1 mm	1.4 mm	1 mm	1.4 mm	1 mm	1.4 mm
OP	28.5±1.2 mm	28.5±1.2 mm	43±1.2 mm	43±1.2 mm	53±1.2 mm	53±1.2 mm
FP max.	34.7 mm	36.7 mm	49.2 mm	51.3 mm	59.2 mm	61.2 mm

■ Contact Form



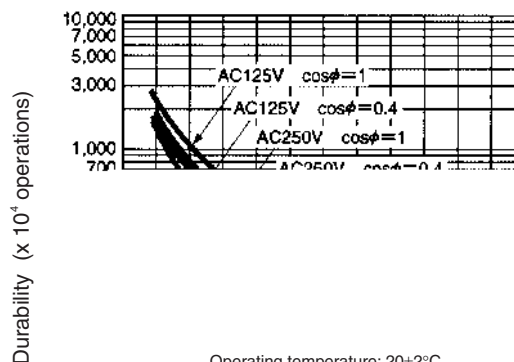
Engineering Data

Mechanical Durability (for ZC-Q55)



OT (mm)

Electrical Durability

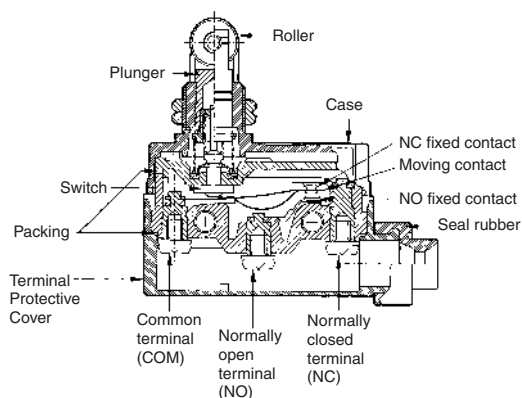


Operating temperature: $20 \pm 2^\circ\text{C}$
 Operating humidity: $65 \pm 5\%$
 Operating frequency: 20 operations/min

Switching current (A)

Nomenclature

Changing the Terminal Protective Cover around allows the cable to be pulled out from either the right or the left.

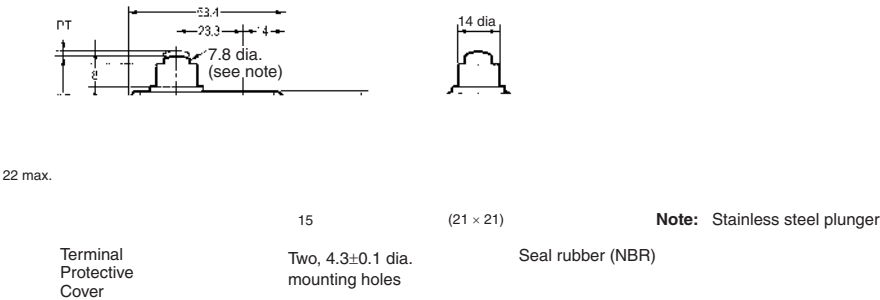


Note: M4 binding head screws (with toothed washers) are used as the terminal screws.

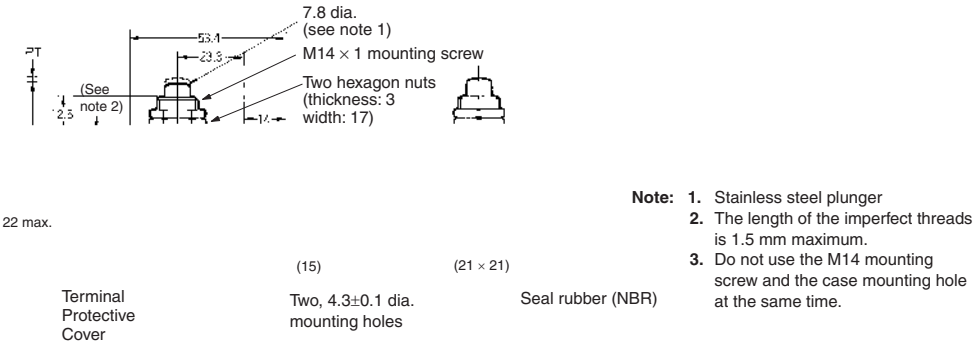
Dimensions

Note: 1. All units are in millimeters unless otherwise indicated.
2. Unless otherwise specified, a tolerance of ± 0.4 mm applies to all dimensions.

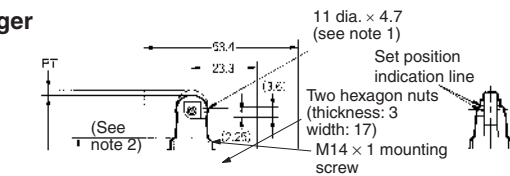
Plunger ZC-D55



Panel Mount Plunger ZC-Q55



Panel Mount Roller Plunger ZC-Q2255



22 max.

Terminal
Protective
Cover

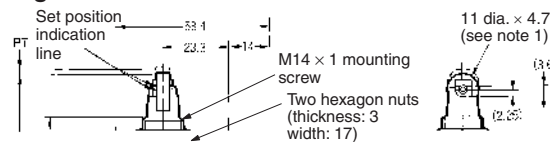
15
Two, 4.3±0.1 dia.
mounting holes

(21 × 21)

Seal rubber (NBR)

- Note:**
1. Stainless sintered alloy roller
 2. The length of the imperfect threads is 1.5 mm maximum.
 3. Do not use the M14 mounting screw and the case mounting hole at the same time.

Panel Mount Crossroller Plunger ZC-Q2155



22 max.

Terminal
Protective
Cover

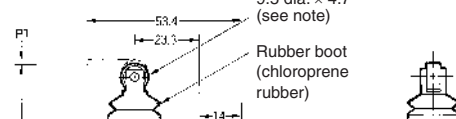
15
Two, 4.3±0.1 dia.
mounting holes

(21 × 21)

Seal rubber (NBR)

- Note:**
1. Stainless sintered alloy roller
 2. The length of the imperfect threads is 1.5 mm maximum.
 3. Do not use the M14 mounting screw and the case mounting hole at the same time.

Sealed Roller Plunger ZC-N2255



22 max.

Terminal
Protective
Cover

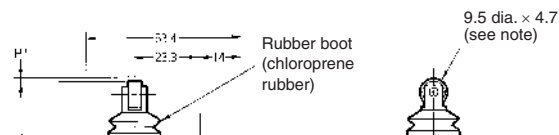
15
Two, 4.3±0.1 dia.
mounting holes

(21 × 21)

Seal rubber (NBR)

Note: Stainless sintered alloy roller

Sealed Crossroller Plunger ZC-N2155



22 max.

Terminal
Protective
Cover

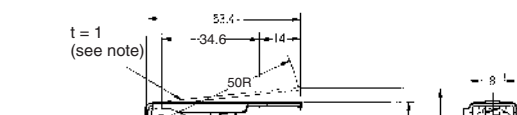
15
Two, 4.3±0.1 dia.
mounting holes

(21 × 21)

Seal rubber (NBR)

Note: Stainless sintered alloy roller

Short Hinge Roller Lever ZC-W55



22 max.

Terminal
Protective
Cover

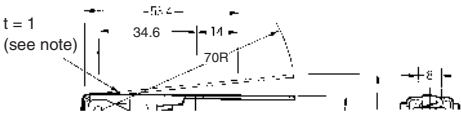
15
Two, 4.3±0.1 dia.
mounting holes

(21 × 21)

Seal rubber (NBR)

Note: Stainless steel lever

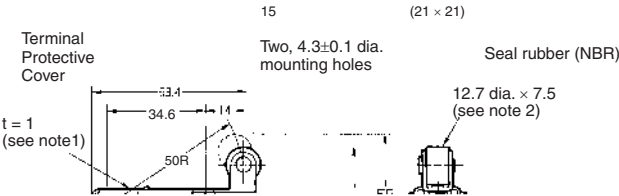
Hinge Lever
ZC-W155



22 max.

Note: Stainless steel lever

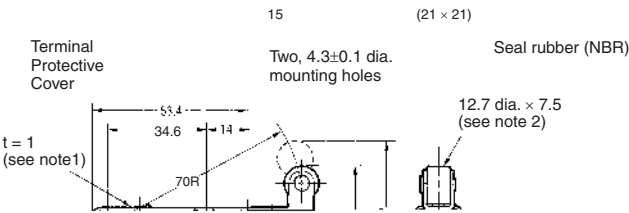
Short Hinge Roller Lever
ZC-W255



22 max.

Note: 1. Stainless steel lever
2. Stainless steel roller

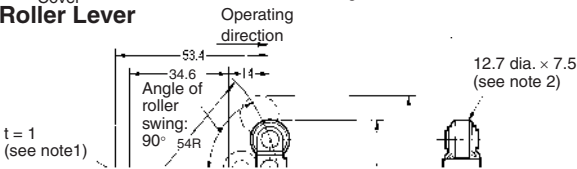
Hinge Roller Lever
ZC-W2155



22 max.

Note: 1. Stainless steel lever
2. Stainless steel roller

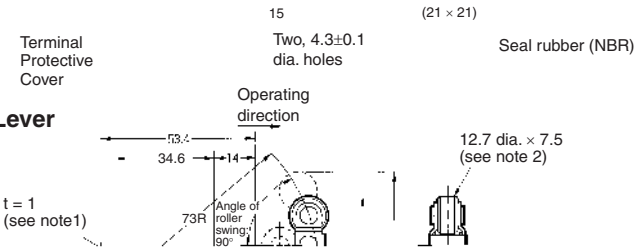
One-way Action Short Hinge Roller Lever
ZC-W355



22 max.

Note: 1. Stainless steel lever
2. Stainless steel roller

One-way Action Hinge Roller Lever
ZC-W3155



22 max.

Note: 1. Stainless steel lever
2. Stainless steel roller

■ Operation Indicator-equipped Models

All the models can be equipped upon request with an operation indicator to facilitate maintenance and inspection.

Because the indicator is incorporated in the Terminal Protective Cover, the dimensions of the Limit Switch are not affected. In this model, the lead wire is to be connected to the screw terminal. (A connecting washer is provided on the tip of the lead wire).

The lead wire can be connected to either the NC or NO terminal.

Operating characteristics are the same as the standard model from which the operation indicator equipped model is fabricated.

AC Operation

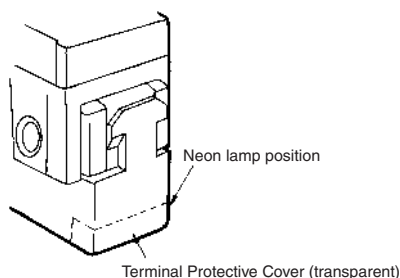
The operating voltage range is from 90 to 250 VAC.

The dimensions are the same as the standard type. The top of the Terminal Protective Cover is transparent to allow checking the operation easily.

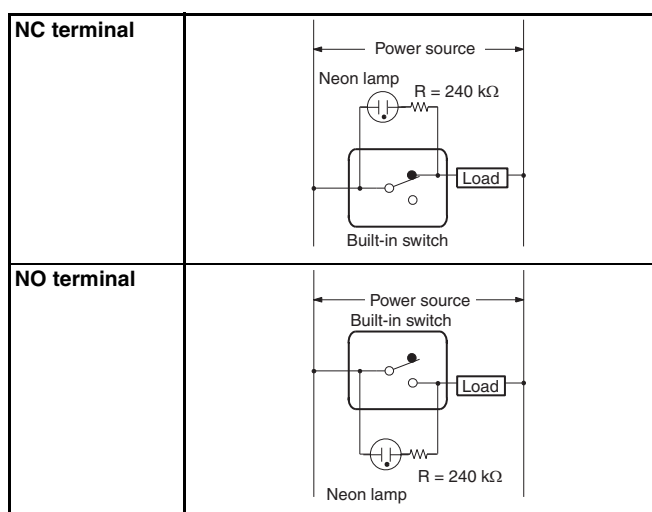
When placing your order for the indicator equipped, AC-operated model, add suffix "L" to the end of the model number.

Example:

Standard type: ZC-Q2255
Indicator equipped type: ZC-Q2255-L



Contact Circuit



Note: If the wiring is as shown above, the operation of the respective parts will be as follows:

Contact	Neon lamp	Load	Actuator
NC	ON	Does not operate	Operates
	OFF	Operates	Does not operate
NO	ON	Does not operate	Does not operate
	OFF	Operates	Operates

DC Operation

The DC-operated is provided with an LED indicator.

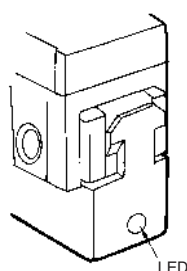
Since a rectifier stack is incorporated into the unit to permit reversing the polarity, this type can also operate on AC power source. An external 24VDC power supply can be used, eg. OMRON S8VS or S82K.

The LED projects from the housing for easy visibility.

When placing your order, add suffix "L2" to "L5" to the model number of the standard type.

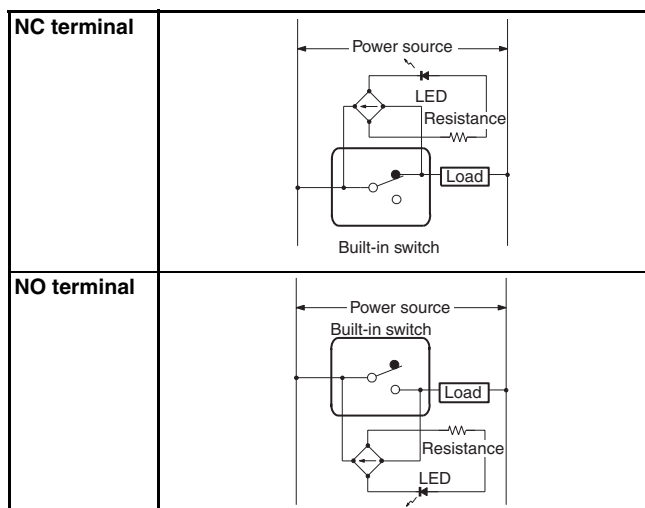
Example:

Standard type: ZC-Q2255
Indicator equipped type: ZC-Q2255-L2



Type	Voltage rating	Leakage current	Internal resistance
L2	12 V	Approx. 2.4 mA	4.3 kΩ
L4	24 V	Approx. 1.2 mA	18 kΩ

Contact Circuit



Note: If the wiring is as shown above, the operation of the respective parts will be as follows:

Contact	LED	Load	Actuator
NC	ON	Does not operate	Operates
	OFF	Operates	Does not operate
NO	ON	Does not operate	Does not operate
	OFF	Operates	Operates

Molded Terminal Models

Molded Terminal Model

The molded-terminal model is available with right-hand, left-hand and underside leads and is recommended for use where the Switch is exposed to dust, oil or moisture.

The molded-terminal model is not approved by UL and CSA.



ML

MR

MD

Note: When placing your order for the Switch, specify the required length of V.C.T. cable in addition to the model number of the Switch.

Example:
Standard type: ZC-Q2155
Location of lead output: Underside
Length of lead: 1 m (V.C.T. lead)
When placing your order for the above Switch, specify the model number as ZC-Q2155-MD VCT 1 m.

Suffix by Location of Lead Outlet

Location of lead output	Model
	COM, NC and NO
Right-hand	ZC-□-MR
Left-hand	ZC-□-ML
Underside	ZC-□-MD

Lead Supplies

Leads	Nominal cross-sectional area	Finished outside diameter	Terminal connections	Standard length
V.C.T. (vinyl cabtire cable)	1.25 mm ²	3 core: 10.5 dia.	Black: COM White: NO Red: NC	1, 3, 5 m

Precautions

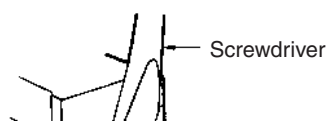
■ Correct Use

Dog Angle

When operating the roller type, be sure to set the dog angle to less than 30° (even when operating at a low speed). Operating the model at a dog angle exceeding 30° will soon cause abrasion or damage. Do not apply a twisting force to the plunger. Set the OT to 70% to 100% of the specified value so that the actuator will not exceed the OT.

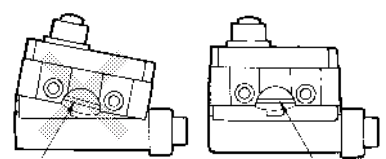
Handling

When detaching the Terminal Protective Cover, insert a screwdriver and apply a force in the opening direction. Do not use excess force to remove the cover. Doing so may cause deformation in the fitting section and reduce the holding force.



Terminal Protective Cover

When mounting the Terminal Protective Cover to the case, align the cover on the case and then press the cover down to mount it firmly. If the cover is pressed down in an inclined position, rubber packing will deform and thus affect the sealing capability.



Rubber packing

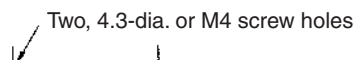
Rubber packing

- A 8.5- to 10.5-dia. cable can be applied as seal rubber for the lead wire outlet. (Use two- or three-core cable of VCT1.25 mm².)
- Use weather-proof rubber (chloroprene rubber) as seal rubber for the ZC-N22(21)55.

Mounting

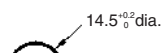
- When mounting the Switch with screws on a side surface, fasten the Switch with M4 screws and use washers, spring washers, etc., to ensure secure mounting.

Mounting Holes



- When mounting the Panel Mount-type Enclosed Switch (ZC-Q55, ZC-Q2255, or ZC-Q2155) with screws on a side surface, remove the hexagonal nuts from the actuator.

Mounting Hole Dimensions



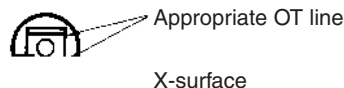
Tightening Torque

A loose screw may result in a malfunction. Be sure to tighten each screw to the proper tightening torque as shown below.

No.	Type	Torque
1	Terminal screw	0.78 to 1.18 N·m
2	Panel mounting screw	4.90 to 7.84 N·m
3	Side mounting screw	1.18 to 1.47 N·m

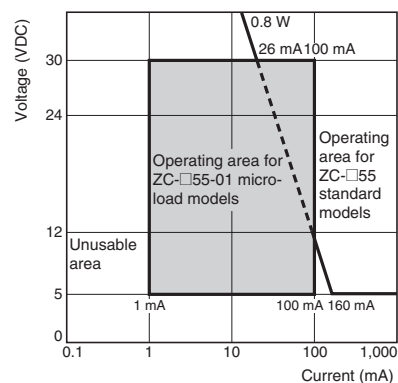
Operation

With the ZC-Q22(21)55, an appropriate OT line is marked on the plunger. Set the OT so that it is between the two X-surface lines.



Micro-load Applicable Ranges

Using a standard load switch for opening and closing a micro-load circuit may cause wear on the contacts. Use the switch within the operating range. (Refer to the diagram below.) Even when using micro-load models within the operating range shown below, if inrush current occurs when the contact is opened or closed, it may cause the contact surface to become rough, and so decrease life expectancy. Therefore, insert a contact protection circuit where necessary. The minimum applicable load is the N-level reference value. This value indicates the malfunction reference level for the reliability level of 60% (λ_{60}). The equation $\lambda_{60} = 0.5 \times 10^{-6}/\text{operations}$ indicates that the estimated malfunction rate is less than 1/2,000,000 operations with a reliability level of 60%.



Model	ZC-Q55-01	ZC-Q55
Minimum applicable load	1 mA at 5 VDC	160 mA at 5 VDC

ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.

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

Special-purpose Basic Switch

DZ

DPDT Basic Switch for Two Independent Circuit Control

- Incorporates two completely independent built-in switches.
- Ideal for switching the circuits operating on two different voltages, and for controlling two independent circuits.
- Interchangeable with OMRON Z Basic Switches, as both switches are identical in mounting hole dimensions, mounting pitch and pin plunger position.



Model Number Structure

Model Number Legend

DZ-10G□-1□
1 2 3 4 5

1. Ratings

10: 10 A (250 VAC)

2. Contact Gap

G: 0.5 mm

3. Actuator

None: Pin plunger

V: Hinge lever

V22: Short hinge roller lever

V2: Hinge roller lever

W: Hinge lever

W22: Short hinge roller lever

W2: Hinge roller lever

4. Contact Form

1: DPDT

5. Terminals

A: Solder terminal

B: Screw terminal

Ordering Information

List of Models

Actuator	OT	Solder terminal	Screw terminal
Pin plunger	0.13 mm min.	DZ-10G-1A	DZ-10G-1B
Hinge lever	1.6 mm min.	DZ-10GW-1A	DZ-10GW-1B
	0.4 mm min.	DZ-10GV-1A	DZ-10GV-1B
Short hinge roller lever	0.9 mm min.	DZ-10GW22-1A	DZ-10GW22-1B
	0.13 mm min.	DZ-10GV22-1A	DZ-10GV22-1B
Hinge roller lever	1.2 mm min.	DZ-10GW2-1A	DZ-10GW2-1B
	0.26 mm min.	DZ-10GV2-1A	DZ-10GV2-1B

Limit
switches

Specifications

■ Approved Standards

Agency	Standard	File No.
UL	UL508	E41515
CSA	CSA C22.2 No. 55	LR21642

■ Approved Standard Ratings

UL508 (File No. E41515)/

CSA C22.2 No. 55 (File No. LR21642)

Rated voltage	DZ-10G
125 VAC	10 A 1/3 HP
250 VAC	10 A 1/4 HP
480 VAC	2 A
125 VDC	0.5 A
250 VDC	0.25 A

■ Ratings

Rated voltage	Non-inductive load				Inductive load				Inrush current	
	Resistive load		Lamp load		Inductive load		Motor load			
	NC	NO	NC	NO	NC	NO	NC	NO	NC	NO
125 VAC	10 A		2 A	1 A	6 A		3 A	1.5 A	30 A max.	15 A max.
250 VAC	10 A		1.5 A	0.7 A	4 A		2 A	1 A		
8 VDC	10 A		3 A	1.5 A	6 A		5 A	2.5 A		
14 VDC	10 A		3 A	1.5 A	6 A		5 A	2.5 A		
30 VDC	10 A		3 A	1.5 A	4 A		3 A	1.5 A		
125 VAC	0.5 A		0.5 A		0.05 A		0.05 A			
250 VDC	0.25 A		0.25 A		0.03 A		0.03 A			

Note: 1. Inductive load has a power factor of 0.4 min. (AC) and a time constant of 7 ms max. (DC).

2. Lamp load has an inrush current of 10 times the steady-state current.

3. Motor load has an inrush current of 6 times the steady-state current.

■ Characteristics

Operating speed	0.1 mm to 1 m/s (at pin plunger)
Operating frequency	Mechanical: 240 operations/min Electrical: 20 operations/min
Insulation resistance	100 MΩ min. (at 500 VDC)
Contact resistance	15 mΩ max. (initial value)
Dielectric strength	1,000 VAC, 50/60 Hz for 1 min between non-continuous terminals 1,500 VAC, 50/60 Hz for 1 min between current-carrying metal parts and non-current-carrying metal part, and between current-carrying metal part and ground and between switches
Vibration resistance	Malfunction: 10 to 55 Hz, 1.5-mm double amplitude
Shock resistance	Destruction: 1,000 m/s ² {approx. 100G} max. Malfunction: 300 m/s ² {approx. 30G} max. (See notes 1 and 2.)
Durability	Mechanical: 1,000,000 operations min. Electrical: 500,000 operations min.
Ambient temperature	Operating: -25°C to 80°C (with no icing)
Ambient humidity	Operating: 35% to 85% max.
Weight	Approx. 30 to 50 g

Note: 1. The values are for pin plunger models. (Contact your OMRON representative for other models.)

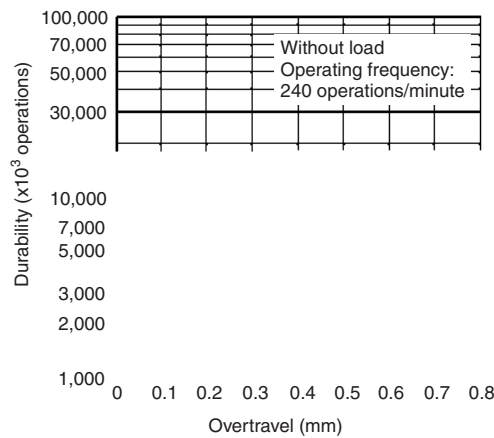
2. Malfunction: 1 ms max.

■ Contact Form (DPDT)

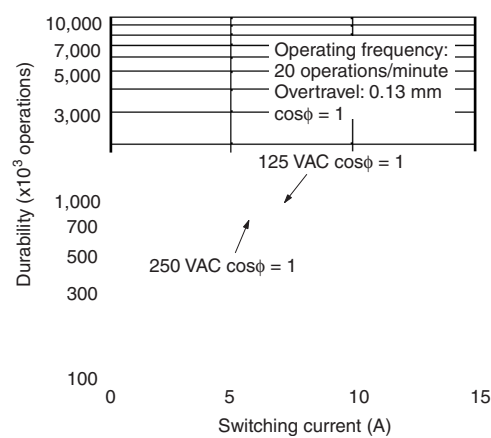


Engineering Data

Mechanical Durability (Pin Plunger)



Electrical Durability (Pin Plunger)

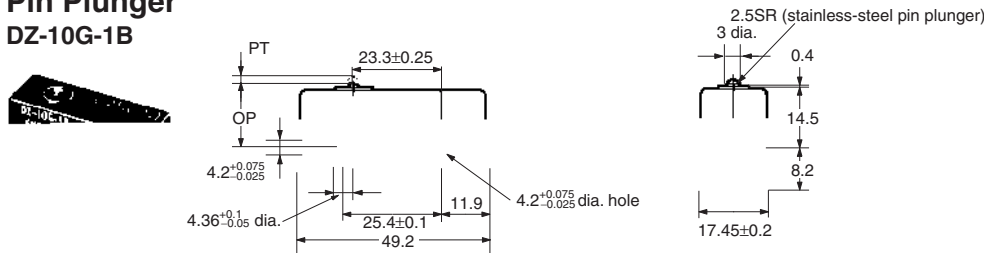


Dimensions

Dimensions and Operating Characteristics

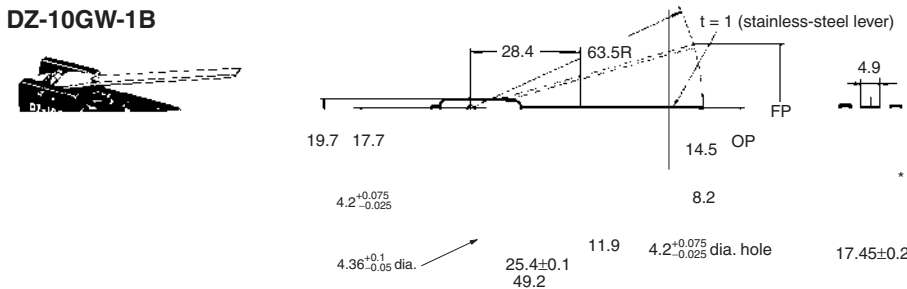
- Note: 1. All units are in millimeters unless otherwise indicated.
2. Unless otherwise specified, a tolerance of ± 0.4 mm applies to all dimensions.
3. The solder terminal model has a suffix "-1A" in its model number and its omitted dimensions are the same as the corresponding dimensions of the pin plunger model.

Pin Plunger
DZ-10G-1B



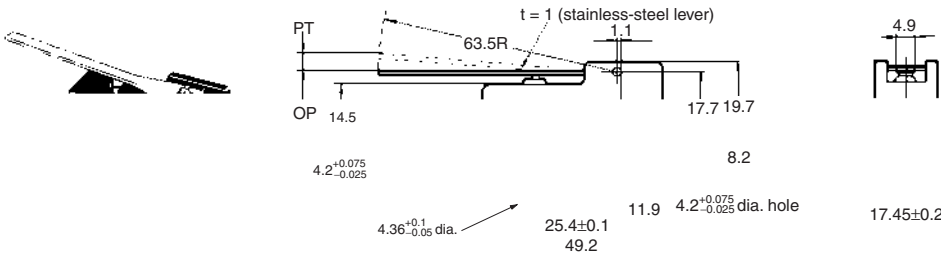
OF max.	5.59 N {570 gf}
RF min.	0.55 N {57 gf}
PT max.	1.7 mm
OT min.	0.13 mm
MD max.	0.4 mm
OP	15.6±0.4 mm

Hinge Lever
DZ-10GW-1B



OF max.	1.67 N {170 gf}
RF min.	0.27 N {28 gf}
OT min.	1.6 mm
MD max.	4 mm
FP max.	46.3 mm
OP	21.8±1 mm

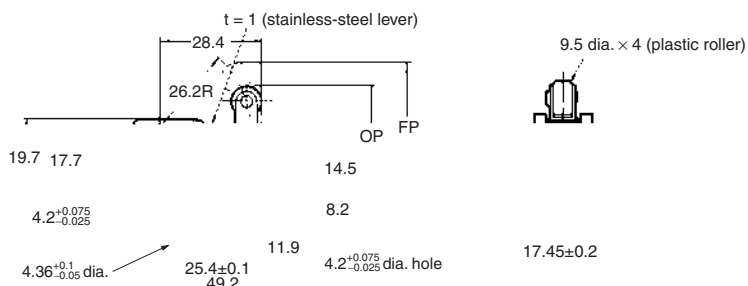
DZ-10GV-1B



OF max.	1.96 N {200 gf}
RF min.	0.13 N {14 gf}
PT max.	6 mm
OT min.	0.4 mm
MD max.	1.7 mm
OP	18.3±1 mm

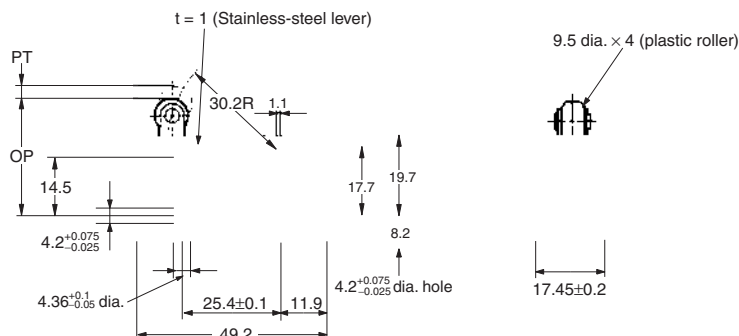
Short Hinge Roller Lever

DZ-10GW22-1B



OF max.	3.92 N {400 gf}
RF min.	0.83 N {85 gf}
OT min.	0.9 mm
MD max.	2.4 mm
FP max.	39.7 mm
OP	30.2±0.8 mm

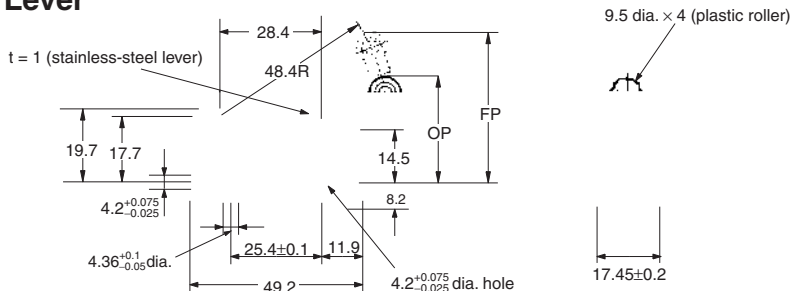
DZ-10GV22-1B



OF max.	4.22 N {430 gf}
RF min.	0.41 N {42 gf}
PT max.	3 mm
OT min.	0.13 mm
MD max.	0.6 mm
OP	29.4±0.8 mm

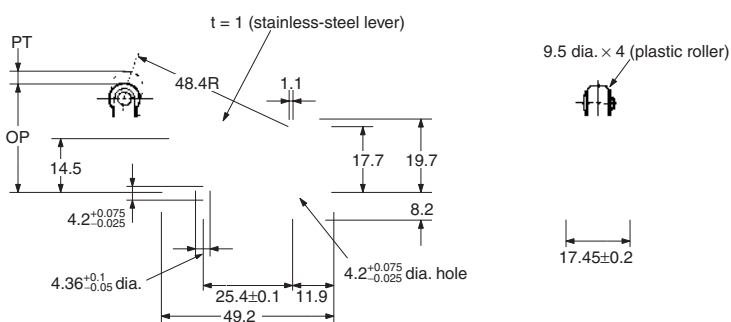
Hinge Roller Lever

DZ-10GW2-1B



OF max.	2.09 N {213 gf}
RF min.	0.41 N {42 gf}
OT min.	1.2 mm
MD max.	3.3 mm
FP max.	47.6 mm
OP	31.8±0.8 mm

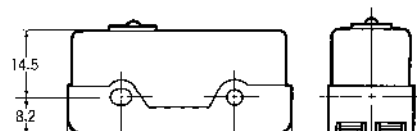
DZ-10GV2-1B



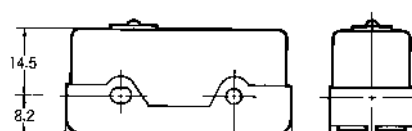
OF max.	2.65 N {270 gf}
RF min.	0.33 N {34 gf}
PT max.	4 mm
OT min.	0.26 mm
MD max.	1.1 mm
OP	29.4±0.8 mm

■ Terminals

Solder Terminals (-1A)



Screw Terminals (-1B)



Six M3 pan head screws
(with toothed washer)

Precautions

Refer to the *Technical Information for Basic Switches* (Cat. No. C122) for common precautions.

■ Cautions

Terminal Connection

When soldering lead wires to the Switch, make sure that the capacity of the soldering iron is 60 W maximum. Do not take more than 5 s to solder any part of the Switch. Improper soldering may cause abnormal heat radiation from the Switch and the Switch may burn.

The characteristics of the Switch will deteriorate if a soldering iron with a capacity of more than 60 W is applied to any part of the Switch for 6 s or more.

Operation

Make sure that the switching frequency or speed is within the specified range.

If the switching speed is extremely slow, the contact may not be switched smoothly, which may result in a contact failure or contact welding.

If the switching speed is extremely fast, switching shock may damage the Switch soon. If the switching frequency is too high, the contact may not catch up with the speed.

The rated permissible switching speed and frequency indicate the switching reliability of the Switch.

The life of a Switch is determined at the specified switching speed. The life varies with the switching speed and frequency even when they are within the permissible ranges. In order to determine the life of a Switch model to be applied to a particular use, it is best to conduct an appropriate durability test on some samples of the model under actual conditions.

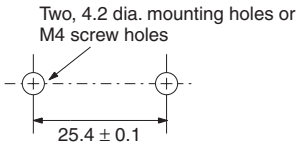
Make sure that the actuator travel does not exceed the permissible OT position. The operating stroke must be set to 70% to 100% of the rated OT.

■ Correct Use

Mounting

Use M4 mounting screws with plane washers or spring washers to securely mount the Switch. Tighten the screws to a torque of 1.18 to 1.47 N·m {12 to 15 kgf·cm}

Mounting Holes



■ Accessories (Order separately)

Refer to *Z/A/X/DZ Common Accessories* for details about Terminal Covers, Separators, and Actuators.

ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.

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

Cat. No. B060-E2-07

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

General-purpose Basic Switch

X

Direct Current Switch with Built-in Magnetic Blowout

- Incorporates a small permanent magnet in the contact mechanism to deflect the arc to effectively extinguish it.
- Same shape and mounting procedures as the Z Basic Switches.



Model Number Structure

■ Model Number Legend

X-10G

1 2 3 4

1. Ratings

10: 10 A (125 VDC)

2. Contact Gap

G: 0.9 mm

3. Actuator

None: Pin plunger

D: Short spring plunger

S: Slim spring plunger

Q: Panel mount plunger

Q21: Panel mount cross roller plunger

Q22: Panel mount roller plunger

L: Leaf spring

W: Hinge lever

W2: Hinge roller lever

W21: Short hinge lever

W22: Short hinge roller lever

W4: Low-force hinge lever

M: Reverse hinge lever

M2: Reverse hinge roller lever

M22: Reverse short hinge roller lever









4. Terminals


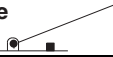





None: Solder terminal

B: Screw terminal (with toothed washer)

Ordering Information

List of Models

Actuator	Solder	Screw
Pin plunger 	X-10G	X-10G-B
Slim spring plunger 	X-10GS	X-10GS-B
Short spring plunger 	X-10GD	X-10GD-B
Panel mount plunger 	X-10GQ	X-10GQ-B
Panel mount roller plunger 	X-10GQ22	X-10GQ22-B
Panel mount cross roller plunger 	X-10GQ21	X-10GQ21-B
Leaf spring 	X-10GL	X-10GL-B
Short hinge lever 	X-10GW21	X-10GW21-B

Actuator	Solder	Screw
Hinge lever 	X-10GW	X-10GW-B
Low-force hinge lever 	X-10GW4	X-10GW4-B
Short hinge roller lever 	X-10GW22	X-10GW22-B
Hinge roller lever 	X-10GW2	X-10GW2-B
Reverse hinge lever 	X-10GM	X-10GM-B
Reverse short hinge roller lever 	X-10GM22	X-10GM22-B
Reverse hinge roller lever 	X-10GM2	X-10GM2-B

Note: The plungers of reverse-type models are continuously pressed by the compression coil springs and the plungers are freed by operating the levers.

Specifications

Approved Standards

Agency	Standard	File No.
UL	UL508	E41515
CSA	CSA C22.2 No. 55	LR21642

Approved Standard Ratings

UL508 (File No. E41515)

CSA C22.2 No.55 (File No. LR21642)

Rated voltage	X-10G
125 VDC	10 A
250 VDC	3 A

Ratings

Rated voltage	Non-inductive load			Inductive load			
	Resistive load	Lamp load		Inductive load		Motor load	
		NC	NO	NC	NO	NC	NO
8 VDC	10 A	3 A	1.5 A	10 A	10 A	5 A	2.5 A
14 VDC	10 A	3 A	1.5 A	10 A	10 A	5 A	2.5 A
30 VDC	10 A	3 A	1.5 A	10 A	10 A	5 A	2.5 A
125 VDC	10 A	3 A	1.5 A	7.5 A	6 A	5 A	2.5 A
250 VDC	3 A	1.5 A	0.75 A	2 A	1.5 A	2 A	1.5 A

- Note:** 1. The above values are for the steady-state current.
 2. Inductive load has a power factor of 0.4 min. (AC) and a time constant of 7 ms max. (DC).
 3. Lamp load has an inrush current of 10 times the steady-state current.
 4. Motor load has an inrush current of 6 times the steady-state current.
 5. The above electrical ratings also apply to the AC voltage.
 6. With the reverse-type models (X-10GM□), the normally closed circuits and normally open circuits are reversed.
 7. The ratings values apply under the following test conditions:
 Ambient temperature: 20±2°C
 Ambient humidity: 65±5%
 Operating frequency: 20 operations/min

Characteristics

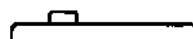
Operating speed	0.1 mm to 1 m/s (see note 1)
Operating frequency	Mechanical: 240 operations/min Electrical: 20 operations/min
Insulation resistance	100 MΩ min. (at 500 VDC)
Contact resistance	15 mΩ max. (initial value)
Dielectric strength	1,500 VAC, 50/60 Hz for 1 min between terminals of the same polarity, between current-carrying metal parts and the ground, and between each terminal and non-current-carrying metal parts
Vibration resistance	Malfunction: 10 to 55 Hz, 1.5-mm double amplitude (see note 2)
Shock resistance	Destruction: 1,000 m/s ² {approx. 100G} max. Malfunction: 300 m/s ² {approx. 30G} max. (see note 1, 2)
Durability	Mechanical: 1,000,000 operations min. Electrical: 100,000 operations min.
Degree of protection	IP00
Degree of protection against electric shock	Class I
Proof tracking index (PTI)	175
Switch category	D (IEC335-1)
Ambient temperature	Operating: -25°C to 80°C (with no icing)
Ambient humidity	Operating: 35% to 85% max.
Weight	Approx. 27 to 63 g

- Note:** 1. The values are for the pin plunger models. (Contact your OMRON representative for other models.)
 2. Malfunction: 1 ms max.

Contact Specification

Item		X-10
Contacts	Material	Silver alloy
	Gap (standard value)	0.9 mm
Inrush current	NC	30 A max.
	NO	15 A max.

Contact Form (SPDT)

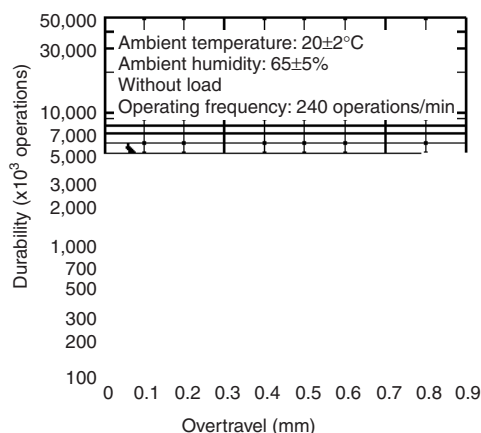


COM NC NO

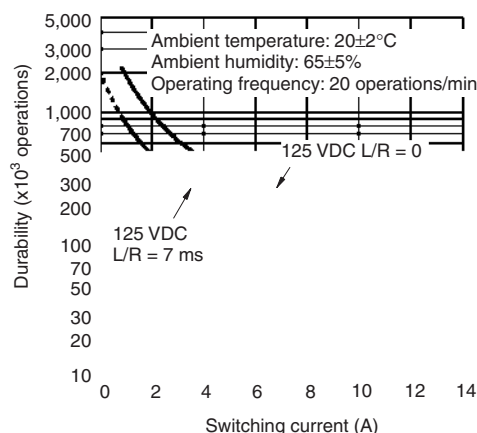
- Note:** With the reverse-type models (X-10GM□), the NC and NO terminal arrangements are reversed.

Engineering Data

Mechanical Durability (Pin Plunger)



Electrical Durability (Pin Plunger)



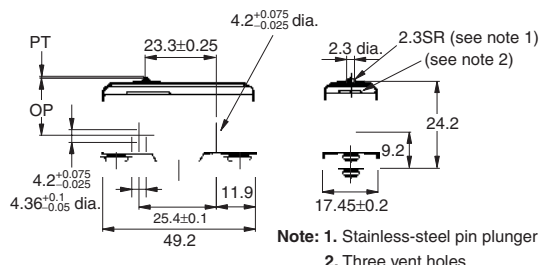
Dimensions

- Note:** 1. All units are in millimeters unless otherwise indicated.
2. Unless otherwise specified, a tolerance of ± 0.4 mm applies to all dimensions.

Dimensions and Operating Characteristics

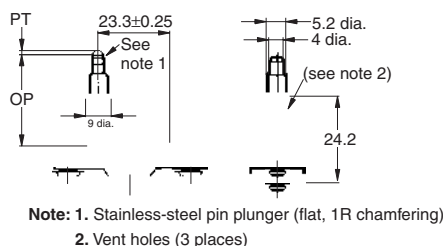
The models, illustrations, and graphics are for screw-terminal models. (The dimensions for models that are omitted here are the same as for pin-plunger models.)

Pin Plunger X-10G-B



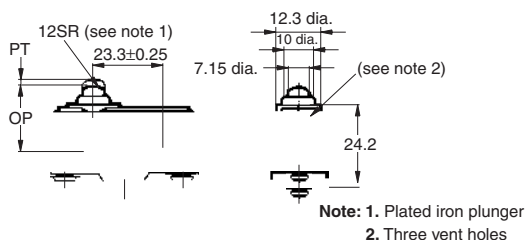
OF max.	5.00 N {510 gf}
RF min.	1.12 N {114 gf}
PT max.	0.9 mm
OT min.	0.13 mm
MD max.	0.18 mm
OP	15.9 ± 0.4 mm

Slim Spring Plunger X-10GS-B



OF max.	5.00 N {510 gf}
RF min.	1.12 N {114 gf}
PT max.	0.9 mm
OT min.	1.6 mm
MD max.	0.18 mm
OP	28.2 ± 0.5 mm

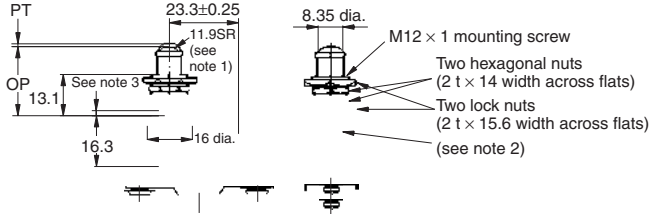
Short Spring Plunger X-10GD-B



OF max.	5.00 N {510 gf}
RF min.	1.12 N {114 gf}
PT max.	0.9 mm
OT min.	1.6 mm
MD max.	0.18 mm
OP	21.2 ± 0.5 mm

Panel Mount Plunger

X-10GQ-B

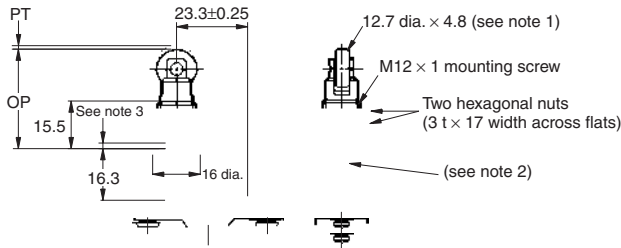


- Note:** 1. Stainless-steel pin plunger
2. Three vent holes
3. Imperfect screw part with a maximum length of 1.5 mm.

OF max.	5.00 N {510 gf}
RF min.	1.12 N {114 gf}
PT max.	0.9 mm
OT min.	5.5 mm
MD max.	0.18 mm
OP	21.8±0.8 mm

Panel Mount Roller Plunger

X-10GQ22-B

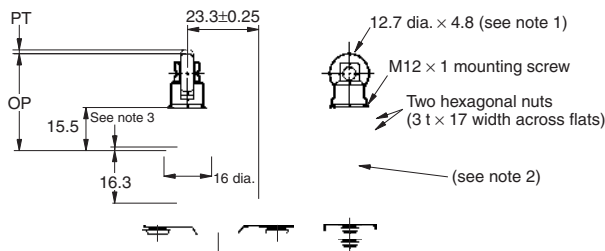


- Note:** 1. Stainless-steel roller
2. Three vent holes
3. Imperfect screw part with a maximum length of 1.5 mm.

OF max.	5.00 N {510 gf}
RF min.	1.12 N {114 gf}
PT max.	0.9 mm
OT min.	3.6 mm
MD max.	0.18 mm
OP	33.4±1.2 mm

Panel Mount Cross Roller Plunger

X-10GQ21-B

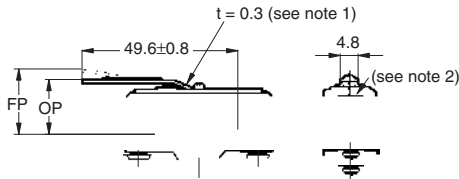


- Note:** 1. Stainless-steel roller
2. Three vent holes
3. Imperfect screw part with a maximum length of 1.5 mm.

OF max.	5.00 N {510 gf}
RF min.	1.12 N {114 gf}
PT max.	0.9 mm
OT min.	3.6 mm
MD max.	0.18 mm
OP	33.4±1.2 mm

Leaf Spring

X-10GL-B

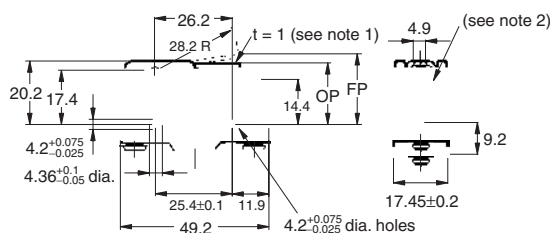


- Note:** 1. Stainless-steel spring lever
2. Three vent holes

OF max.	1.96 N {200 gf}
RF min.	0.14 N {14 gf}
OT min.	1.6 mm (see note)
MD max.	2.3 mm
FP max.	22.1 mm
OP	17.4±0.8 mm

- Note:** 1. Reference value
2. Be sure to use the switch at the rated OT value of 1.6 mm.

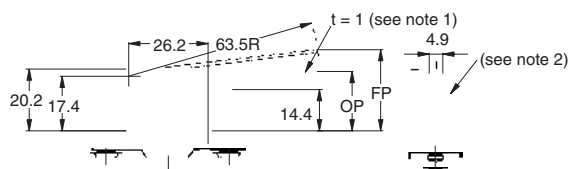
Short Hinge Lever X-10GW21-B



Note: 1. Stainless-steel lever
2. Three vent holes

OF max.	2.45 N {250 gf}
RF min.	0.31 N {32 gf}
OT min.	2.1 mm
MD max.	1.7 mm
FP max.	25.5 mm
OP	20.7±0.8 mm

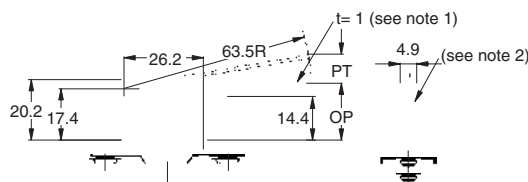
Hinge Lever X-10GW-B



Note: 1. Stainless-steel lever
2. Three vent holes

OF max.	1.08 N {110 gf}
RF min.	0.14 N {14 gf}
OT min.	4.8 mm
MD max.	3.9 mm
FP max.	34.6 mm
OP	21.1±0.8 mm

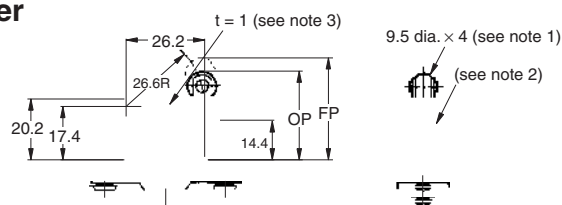
Low-force Hinge Lever X-10GW4-B



Note: 1. Stainless-steel lever
2. Three vent holes

OF max.	0.25 N {25 gf}
RF min.	0.05 N {5 gf}
PT max.	14.3 mm
OT min.	4.8 mm
MD max.	3.9 mm
OP	21.1±0.8 mm

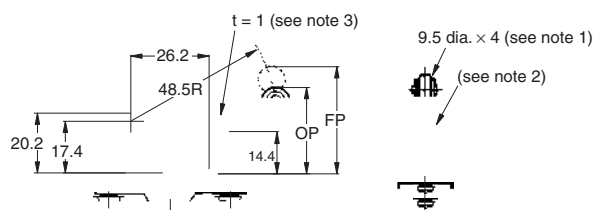
Short Hinge Roller Lever X-10GW22-B



Note: 1. Plastic roller
2. Three vent holes
3. Stainless-steel spring lever

OF max.	2.16 N {220 gf}
RF min.	0.34 N {35 gf}
OT min.	2.4 mm
MD max.	1.7 mm
FP max.	37.1 mm
OP	32.2±0.8 mm

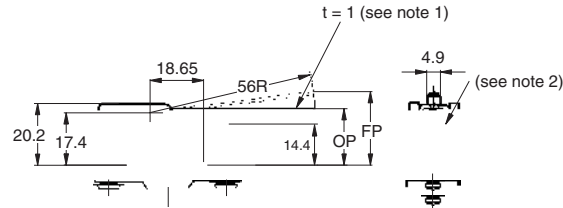
Hinge Roller Lever X-10GW2-B



Note: 1. Plastic roller
2. Three vent holes
3. Stainless-steel spring lever

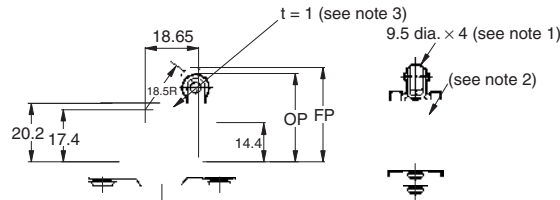
OF max.	1.42 N {145 gf}
RF min.	0.21 N {21 gf}
OT min.	4 mm
MD max.	3 mm
FP max.	40.5 mm
OP	32.2±0.8 mm

Reverse Hinge Lever X-10GM-B



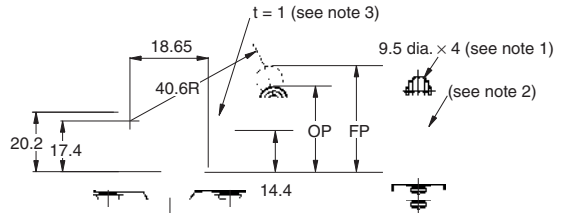
OF max.	2.16 N {220 gf}
RF min.	0.25 N {25 gf}
OT min.	5.5 mm
MD max.	2.1 mm
FP max.	26.8 mm
OP	21.1±0.8 mm

Reverse Short Hinge Lever X-10GM22-B



OF max.	6.86 N {700 gf}
RF min.	1.52 N {155 gf}
OT min.	2 mm
MD max.	0.75 mm
FP max.	36.1 mm
OP	32.2±0.8 mm

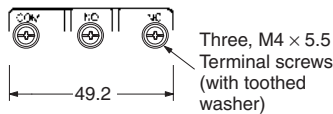
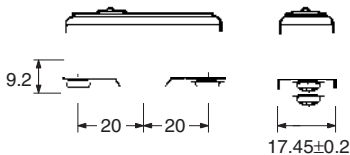
Reverse Hinge Roller Lever X-10GM2-B



OF max.	3.14 N {320 gf}
RF min.	0.49 N {50 gf}
OT min.	4 mm
MD max.	1.5 mm
FP max.	37.4 mm
OP	32.2±0.8 mm

Terminals

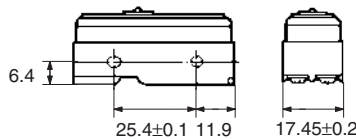
Screw Terminals (-B)



Appropriate terminal screw tightening torque:
0.78 to 1.18 N·m {8 to 12 kgf·cm}.

- Note:** 1. Tighten the terminal screws to a torque of 0.78 to 1.18 N·m {8 to 12 kgf·cm}.
2. In case of DC voltage, set the COM to the positive terminal.

Solder Terminal



Precautions

Refer to the *Technical Information for Basic Switches* (Cat. No. C122) for common precautions.

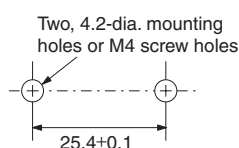
■ Correct Use

Mounting

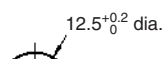
Use M4 mounting screws with plane washers or spring washers to securely mount the Switch. Tighten the screws to a torque of 1.18 to 1.47 N·m {12 to 15 kgf·cm}

The Switch can be panel mounted, provided that the hexagonal nut of the actuator is tightened to a torque of 2.94 to 4.9 N·m {30 to 50 kgf·cm}.

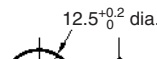
Mounting Holes



Panel Mount Plunger



Panel Mount Roller Plunger



Handling

Set the common (COM) terminal to the positive terminal. If it is set to the negative terminal, the Switch will not turn OFF.

When using the Switch under an inductive load, the arc suppression capability varies depending on current. If the current becomes 0.6 to 1.2 A or of the time constant L/R exceeds 7 ms, be sure to provide an arc suppressor.

Since the Switch incorporates a permanent magnet, attention must be paid to the following points:

- Avoid mounting the Switch directly onto a magnetic substance.
- Do not subject the Switch to severe shocks.
- Avoid placing the Switch in a strong magnetic field.
- Be sure to prevent iron dust or iron chips from adhering to the built-in magnet or the magnetic blowout function of the Switch will be adversely affected.
- Do not apply thermal shock to the Switch, or the magnetic flux will be diminished.

Since a ventilation hole is provided to avoid abnormal corrosion due to operating conditions, provide a dustproofing device in locations where the Switch is exposed to dust.

Do not change operating positions for the actuator. Changing the position may cause malfunction.

Panel-mounted Model (X-10GQ□)

To side-mount the panel-mount Switch to the panel with screws, remove the hexagonal nut from the actuator.

Too large a dog angle and too fast operating speed may damage the Switch when the Switch is side-mounted on the panel.

Too fast operating speed and too long overtravel of the roller plunger Switch may result in damage to the Switch.

■ Accessories (Order separately)

Refer to *Z/A/X/DZ Common Accessories* for details about Terminal Covers, Separators, and Actuators.

ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.

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

General-purpose Basic Switch

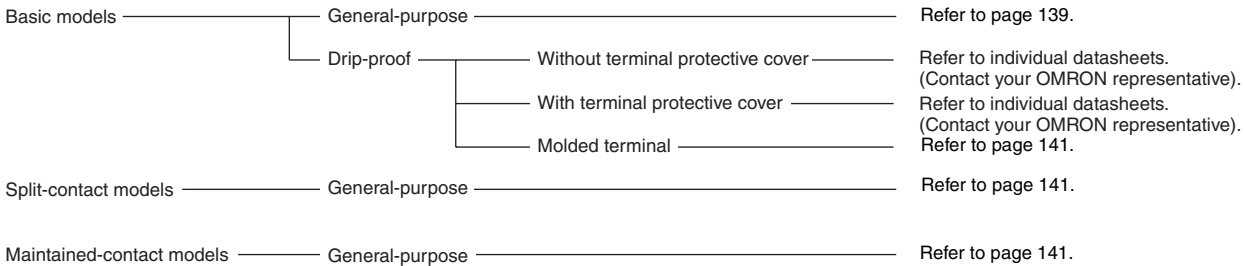
Best-selling Basic Switch Boasting High Precision and Wide Variety

- A large switching capacity of 15 A with high repeat accuracy.
- A wide range of variations in contact form for your selection: basic, split-contact, maintained-contact, and adjustable contact gap types.
- A series of standard models for micro loads is available.
- A series of molded terminal-type models incorporating safety terminal protective cover is available.



Model Number Structure

Configuration



Basic Models

General-purpose

A variety of actuators is available for a wide range of application.

The contact mechanism of models for micro loads is a crossbar type with gold-alloy contacts, which ensures highly reliable operations for micro loads.

Contact Gap:

H: 0.25 mm (high-sensitivity, micro voltage current load)

G: 0.5 mm (standard)

E: 1.8 mm (high-capacity)

F: 1.0 mm (split-contact models)

Split-contact Models

This type is identical in construction to the general-purpose basic switch except that it has two pairs of simultaneous acting contacts by splitting moving contacts.

Since the moving contacts are connected to a common terminal, either parallel or series connection is possible.

Highly reliable micro load switching is ensured if the model is used as a twin-contact switch.

Maintained-contact Models

The maintained-contact type has a reset button at the bottom of the switch case, in addition to the pushbutton (plunger) located on the opposite side of the reset button. Use these buttons alternately.

Since the Switch has greater pretravel than overtravel, it is suitable for use in reversible control circuits, manual reset circuits, safety limit circuits, and other circuits which are not preferable for automatic resetting. (For further details, refer to individual datasheets.)

■ Model Number Legend

Basic Models

Z-□□□□-□
1 2 3 4 5

1. Ratings

01: 0.1 A (for micro load)
15: 15 A

2. Contact Gap

H: 0.25 mm (high-sensitivity, micro load)
G: 0.5 mm (standard)
E: 1.8 mm (high-capacity)

3. Actuator

None: Pin plunger
S: Slim spring plunger
D: Short spring plunger
K: Spring plunger (medium OP)
K3: Spring plunger (high OP)
Q3: Panel mount plunger (low OP)
Q: Panel mount plunger (medium OP)
Q8: Panel mount plunger (high OP)
Q22: Panel mount roller plunger
Q21: Panel mount cross roller plunger
L: Leaf spring (high OF)
L2: Roller leaf spring
W21: Short hinge lever
W: Hinge lever (low OF)
W3: Hinge lever (medium OF)
W32: Hinge lever (high OF)
W4: Low-force hinge lever
W44: Long hinge lever
W78: Low-force wire hinge lever (low OF)
W52: Low-force wire hinge lever (high OF)
W22: Short hinge roller lever
W2: Hinge roller lever
W25: Hinge roller lever (large roller)
W49: Short hinge cross roller lever
W54: Hinge cross roller lever
W2277: Unidirectional short hinge roller lever (Low OF)
M: Reverse hinge lever
M22: Reverse short hinge roller lever
M2: Reverse hinge roller lever
NJ: Flexible rod (high OF)
NJS: Flexible rod (low OF)

4. Degree of Protection

None: General-purpose
55: Drip-proof
A55: Drip-proof (including the terminals)

5. Terminals

None: Solder terminal
B: Screw terminal (with toothed washer)
B5V: Screw terminal with terminal cover (for Z-15G□A55 only)

Note: For combinations of models, refer to the following pages.

Split-contact Models

Z-10F□Y-B
1 2 3 4 5

1. Ratings

10: 10 A

2. Contact Gap

F: 1 mm (high-capacity)

3. Actuator

None: Pin plunger
S: Slim spring plunger
D: Short spring plunger
Q: Panel mount plunger
Q22: Panel mount roller plunger
W: Hinge lever
W22: Short hinge roller lever
W2: Hinge roller lever
M22: Reverse short hinge roller lever

4. Construction

Y: Split-contact models

5. Terminals

None: Solder terminal
B: Screw terminal (with toothed washer)

Maintained-contact Models

Z-15-E□R
1 2 3 4

1. Ratings

15: 15 A

2. Contact Gap

E: 1.8 mm (High capacity)

3. Actuator

None: Pin plunger
S: Slim spring plunger
W: Hinge lever











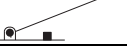




4. Structure




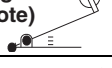

R: Maintained-contact models

Ordering Information

List of Models

Basic Models (General-purpose)

Actuator			Standard G (0.5 mm)	High-sensitivity H (0.25 mm)	High-capacity E (1.8 mm)	Micro load H (0.25 mm)
Pin plunger 		Solder terminal	Z-15G	Z-15H	Z-15E	Z-01H
		Screw terminal	Z-15G-B	Z-15H-B	Z-15E-B	Z-01H-B
Slim spring plunger 		Solder terminal	Z-15GS	Z-15HS	---	Z-01HS
		Screw terminal	Z-15GS-B	Z-15HS-B	---	Z-01HS-B
Short spring plunger 		Solder terminal	Z-15GD	Z-15HD	Z-15ED	Z-01HD
		Screw terminal	Z-15GD-B	Z-15HD-B	Z-15ED-B	Z-01HD-B
Panel mount plunger 	Low OP	Solder terminal	Z-15GQ3	---	---	---
		Screw terminal	Z-15GQ3-B			
	Medium OP	Solder terminal	Z-15GQ	Z-15HQ	Z-15EQ	Z-01HQ
		Screw terminal	Z-15GQ-B	Z-15HQ-B	Z-15EQ-B	Z-01HQ-B
	High OP	Solder terminal	Z-15GQ8	---	---	---
		Screw terminal	Z-15GQ8-B			
Panel mount roller plunger 		Solder terminal	Z-15GQ22	Z-15HQ22	Z-15EQ22	---
		Screw terminal	Z-15GQ22-B	Z-15HQ22-B	Z-15EQ22-B	---
Panel mount cross roller plunger 		Solder terminal	Z-15GQ21	Z-15HQ21	Z-15EQ21	---
		Screw terminal	Z-15GQ21-B	Z-15HQ21-B	Z-15EQ21-B	---
Leaf spring 		Solder terminal	Z-15GL	---	---	---
		Screw terminal	Z-15GL-B			
Roller leaf spring 		Solder terminal	Z-15GL2	---	---	---
		Screw terminal	Z-15GL2-B			
Short hinge lever 		Solder terminal	Z-15GW21	---	---	---
		Screw terminal	Z-15GW21-B			
Hinge lever 	Low OF	Solder terminal	Z-15GW	Z-15HW	---	---
		Screw terminal	Z-15GW-B	Z-15HW-B	---	---
	Medium OF	Solder terminal	Z-15GW3	---	---	---
		Screw terminal	Z-15GW3-B			
	High OF	Solder terminal	Z-15GW32	---	---	---
		Screw terminal	Z-15GW32-B			
Low-force hinge lever 		Solder terminal	Z-15GW4	Z-15HW24	---	---
		Screw terminal	Z-15GW4-B	Z-15HW24-B	---	
Low-force wire hinge lever 	Low OF	Solder terminal	---	Z-15HW78	---	---
		Screw terminal	---	Z-15HW78-B	---	
	High OF	Solder terminal	---	Z-15HW52	---	---
		Screw terminal	---	Z-15HW52-B	---	
Short hinge roller lever 		Solder terminal	Z-15GW22	Z-15HW22	Z-15EW22	Z-01HW22
		Screw terminal	Z-15GW22-B	Z-15HW22-B	Z-15EW22-B	Z-01HW22-B
Short hinge cross roller lever 		Solder terminal	Z-15GW49	---	---	---
		Screw terminal	Z-15GW49-B			
Hinge roller lever 	Parallel	Solder terminal	Z-15GW2	Z-15HW2	---	---
		Screw terminal	Z-15GW2-B	Z-15HW2-B	---	---
	Large roller	Solder terminal	Z-15GW25	---	---	---
		Screw terminal	Z-15GW25-B			

Actuator		Standard	High-sensitivity	High-capacity	Micro load
		G (0.5 mm)	H (0.25 mm)	E (1.8 mm)	H (0.25 mm)
Hinge cross roller lever 	Solder terminal	Z-15GW54	---	---	---
	Screw terminal	Z-15GW54-B	---	---	---
Unidirectional short hinge roller lever 	Solder terminal	Z-15GW2277	---	---	---
	Screw terminal	Z-15GW2277-B	---	---	---
Reverse hinge lever (see note) 	Solder terminal	Z-15GM	---	---	---
	Screw terminal	Z-15GM-B	---	---	---
Reverse short hinge roller lever (see note) 	Solder terminal	Z-15GM22	---	---	---
	Screw terminal	Z-15GM22-B	---	---	---
Reverse hinge roller lever (see note) 	Solder terminal	Z-15GM2	---	---	---
	Screw terminal	Z-15GM2-B	---	---	---










Note: The pin plungers of reverse-type models are continuously pressed by the actuator levers with compression coil springs and the pin plungers are freed by operating the levers. Reverse-type models are highly vibration- and shock-resistive because the pin plungers are normally pressed.

Minimum Order Lot

The following models are available at the minimum order lot specified below. Orders must be placed per lot.




Actuator	Standard	High-sensitivity	Minimum order lot (pcs)
	G (0.5 mm)	H (0.25 mm)	
Short spring plunger	Z-15GD-B	---	10
Panel mount plunger	Z-15GQ	---	
	Z-15GQ-B	---	
	Z-15GQ8-B	---	
Panel mount roller plunger	Z-15GQ22	---	
	Z-15GQ22-B	---	
Panel mount cross roller plunger	Z-15GQ21-B	---	
Short hinge lever	Z-15GW21-B	---	
Hinge lever	Z-15GW	---	
	Z-15GW-B	---	
Low-force hinge lever	Z-15GW4-B	Z-15HW24-B	
Low-force hinge wire lever	---	Z-15HW78-B	
Short hinge roller lever	Z-15GW22	---	
	Z-15GW22-B	---	
Hinge roller lever	Z-15GW2	---	
	Z-15GW2-B	---	
Reverse short hinge roller lever	Z-15GM22-B	---	
Reverse hinge roller lever	Z-15GM2-B	---	

Split-contact Models










Actuator		F (1.0 mm)	
Pin plunger 		Solder terminal	---
		Screw terminal	Z-10FY-B
Slim spring plunger 		Solder terminal	---
		Screw terminal	Z-10FSY-B
Short spring plunger 		Solder terminal	---
		Screw terminal	Z-10FDY-B
Panel mount plunger 	Medium OP	Solder terminal	---
		Screw terminal	Z-10FQY-B
Panel mount roller plunger 		Solder terminal	---
		Screw terminal	Z-10FQ22Y-B
Hinge lever 	Low OP	Solder terminal	---
		Screw terminal	Z-10FWY-B
Short hinge roller lever 		Solder terminal	---
		Screw terminal	Z-10FW22Y-B
Hinge roller lever 	Parallel	Solder terminal	---
		Screw terminal	Z-10FW2Y-B
Reverse short hinge roller lever 		Solder terminal	---
		Screw terminal	Z-10FM22Y-B










Note: The pin plungers of reverse-type models are continuously pressed by the actuator levers with compression coil springs and the pin plungers are freed by operating the levers. Reverse-type models are highly vibration- and shock-resistive because the pin plungers are normally pressed.

Maintained-contact Models

Actuator	Maintained-contact model
Pin plunger 	Z-15ER
Slim spring plunger 	Z-15ESR
Hinge lever 	Z-15EWR

Basic Models (Drip-proof Models)

Actuator		Basic model (drip-proof)			
		Standard		Micro load	
		G (0.5 mm)		H (0.25 mm)	
		Without drip-proof terminal protective cover	With drip-proof terminal protective cover	Without drip-proof terminal protective cover	
Pin plunger 		Solder terminal	Z-15G55	---	Z-01H55
		Screw terminal	Z-15G55-B	Z-15GA55-B5V	Z-01H55-B
Short spring plunger 		Solder terminal	Z-15GD55	---	Z-01HD55
		Screw terminal	Z-15GD55-B		Z-01HD55-B
Spring plunger 	Medium OP	Solder terminal	Z-15GK55	---	---
		Screw terminal	Z-15GK55-B		
	High OP	Solder terminal	Z-15GK355	---	---
		Screw terminal	Z-15GK355-B	Z-15GK3A55-B5V	
Panel mount plunger 	Medium OP	Solder terminal	Z-15GQ55	---	---
		Screw terminal	Z-15GQ55-B	Z-15GQA55-B5V	
Panel mount roller plunger 		Solder terminal	Z-15GQ2255	---	---
		Screw terminal	Z-15GQ2255-B	Z-15GQ22A55-B5V	
Panel mount cross roller plunger 		Solder terminal	---	---	---
		Screw terminal	Z-15GQ2155-B	Z-15GQ21A55-B5V	
Leaf spring 		Solder terminal	Z-15GL55	---	---
		Screw terminal	Z-15GL55-B		
Roller leaf spring 		Solder terminal	Z-15GL255	---	---
		Screw terminal	Z-15GL255-B		
Short hinge lever 		Solder terminal	Z-15GW2155	---	---
		Screw terminal	Z-15GW2155-B		

Actuator		Basic model (drip-proof)		
		Standard		Micro load
		G (0.5 mm)		H (0.25 mm)
		Without drip-proof terminal protective cover	With drip-proof terminal protective cover	Without drip-proof terminal protective cover
Long hinge lever 	Solder terminal	Z-15GW4455	---	---
	Screw terminal	Z-15GW4455-B	Z-15GW44A55-B5V	---
Hinge lever 	Solder terminal	Z-15GW55	---	---
	Screw terminal	Z-15GW55-B	Z-15GWA55-B5V	---
Short hinge roller lever 	Solder terminal	Z-15GW2255	---	Z-01HW2255
	Screw terminal	Z-15GW2255-B	Z-15GW22A55-B5V	Z-01HW2255-B
Hinge roller lever 	Parallel	Solder terminal	Z-15GW255	---
		Screw terminal	Z-15GW255-B	Z-15GW2A55-B5V
Unidirectional short hinge roller lever 	Solder terminal	Z-15GW227755	---	---
	Screw terminal	Z-15GW227755-B	Z-15GW2277A55-B5V	---
Reverse hinge lever (see note 1) 	Solder terminal	Z-15GM55	---	---
	Screw terminal	Z-15GM55-B	---	---
Reverse short hinge roller lever (see note 1) 	Solder terminal	Z-15GM2255	---	---
	Screw terminal	Z-15GM2255-B	---	---
Reverse hinge roller lever (see note 1) 	Solder terminal	Z-15GM255	---	---
	Screw terminal	Z-15GM255-B	---	---
Flexible rod (coil spring) (see note 2) 	Solder terminal	Z-15GNJ55	---	---
	Screw terminal	Z-15GNJ55-B	---	---


Note: 1. The pin plungers of reverse-type models are continuously pressed by the actuator levers with compression coil springs and the pin plungers are freed by operating the levers.
2. The tip is made of resin.

Minimum Order Lot

The following models are available at the minimum order lot specified below. Orders must be placed per lot.

Actuator	Standard		High-sensitivity	Minimum order lot
	G (0.5 mm)		H (0.25 mm)	
Short spring plunger	Z-15GD55-B	---	---	10
Spring plunger	Z-15GK55-B	---	---	
Hinge lever	Z-15GW4455-B	---	---	
	Z-15GW55 Z-15GW55-B	---	---	
Short hinge roller lever	Z-15GW2255 Z-15GW2255-B	---	---	
Hinge roller lever	Z-15GW255-B	---	---	
Flexible rod (coil spring)	Z-15GNJ55-B	---	---	
Flexible rod (steel wire)	---	---	Z-15HNJS55-B	

Basic Models (Drip-proof High-sensitivity Models)

Actuator		High-sensitivity	
		H (0.25 mm)	
Flexible rod (steel wire) 	Solder terminal	Z-15HNJS55	
	Screw terminal	Z-15HNJS55-B	

Specifications

Approved Standards

Agency	Standard	File No.
UL	UL508	E41515
CSA	CSA C22.2 No. 55	LR21642
TÜV Rheinland	EN61058-1	R9451585

Approved Standard Ratings

UL508 (File No. E41515)

CSA C22.2 No.55 (File No. LR21642)

Rated voltage	Z-15	Z-10F	Z-01H
125 VAC	15 A 1/8 HP	6 A 1/10 HP	0.1 A
250 VAC	15 A 1/4 HP	6 A 1/8 HP	---
480 VAC	15 A	6 A	---
30 VDC	---	---	0.1 A
125 VDC	0.5 A	0.6 A	---
250 VDC	0.25 A	0.3 A	---

EN (EN61058-1)

Rated voltage	Z-15H□-B	Z-15G□-B	Z-01H□-B
250 VAC	15 A	15 A	---
125 VAC	---	---	0.1 A
30 VDC	---	---	0.1 A

Note: Consult with OMRON about approved part numbers by standards.

Ratings

Z-15 (Except Micro Load and Flexible Rod Models)

Item Model	Rated voltage	Non-inductive load				Inductive load			
		Resistive load		Lamp load		Inductive load		Motor load	
		NC	NO	NC	NO	NC	NO	NC	NO
G, H, E	125 VAC 250 VAC 500 VAC	15 (10) A (see note) 15 (10) A (see note) 10 A		3 A 2.5 A 1.5 A	1.5 A 1.25 A 0.75 A	15 (10) A (see note) 15 (10) A (see note) 6 A		5 A 3 A 1.5 A	2.5 A 1.5 A 0.75 A
G	8 VDC 14 VDC 30 VDC 125 VDC 250 VDC	15 A 15 A 6 A 0.5 A 0.25 A		3 A 3 A 3 A 0.5 A 0.25 A	1.5 A 1.5 A 1.5 A 0.5 A 0.25 A	15 A 10 A 5 A 0.05 A 0.03 A		5 A 5 A 5 A 0.05 A 0.03 A	2.5 A 2.5 A 2.5 A 0.05 A 0.03 A
H	8 VDC 14 VDC 30 VDC 125 VDC 250 VDC	15 A 15 A 2 A 0.4 A 0.2 A		3 A 3 A 2 A 0.4 A 0.2 A	1.5 A 1.5 A 1.4 A 0.4 A 0.2 A	15 A 10 A 1 A 0.03 A 0.02 A		5 A 5 A 1 A 0.03 A 0.02 A	2.5 A 2.5 A 1 A 0.03 A 0.02 A
E	8 VDC 14 VDC 30 VDC 125 VDC 250 VDC	15 A 15 A 15 A 0.75 A 0.3 A		3 A 3 A 3 A 0.75 A 0.3 A	1.5 A 1.5 A 1.5 A 0.75 A 0.3 A	15 A 15 A 10 A 0.4 A 0.2 A		5 A 5 A 5 A 0.4 A 0.2 A	2.5 A 2.5 A 2.5 A 0.4 A 0.2 A

Note: Figures in parentheses are for the Z-15HW52 and Z-15HW78(-B) models, the AC ratings of these models are 125 and 250 V only.

Z-15 (Flexible Rod Models)

Rated voltage	Non-inductive load				Inductive load			
	Resistive load		Lamp load		Inductive load		Motor load	
	NC	NO	NC	NO	NC	NO	NC	NO
125 VAC 250 VAC	15 A		2 A 1 A	1 A 0.5 A	7 A 5 A		2.5 A 1.5 A	2 A 1 A
8 VDC 14 VDC 30 VDC 125 VDC 250 VDC	15 A 15 A 2 A 0.4 A 0.2 A		2 A 2 A 2 A 0.4 A 0.2 A	1 A 1 A 1 A 0.4 A 0.2 A	7 A 7 A 1 A 0.03 A 0.02 A		3 A 3 A 1 A 0.03 A 0.02 A	1.5 A 1.5 A 0.5 A 0.03 A 0.02 A

Z-01H

Rated voltage	Resistive load	
	NC	NO
125 VAC	0.1 A	
8 VDC	0.1 A	
14 VDC	0.1 A	
30 VDC	0.1 A	

Z-10F

Model	Rated voltage	Non-inductive load				Inductive load			
		Resistive load		Lamp load		Inductive load		Motor load	
		NC	NO	NC	NO	NC	NO	NC	NO
Series connection	125 VAC	10 A		4 A	2 A	6 A		5 A	2.5 A
	250 VAC	10 A		2.5 A	1.5 A			3 A	1.5 A
	30 VDC	10 A		4 A	2 A	6 A		6 A	3 A
	125 VDC	1 A		1 A	1 A	0.1 A		0.1 A	0.1 A
Parallel connection	250 VDC	0.6 A		0.6 A	0.6 A	0.05 A		0.05 A	0.05 A
	125 VAC	6 A		3 A	1.5 A	4 A		4 A	2 A
	250 VAC	6 A		2.5 A	1.25 A	4 A		2 A	1 A
	30 VDC	6 A		4 A	2 A	4 A		6 A	3 A
	125 VDC	0.6 A		0.6 A	0.6 A	0.1 A		0.1 A	0.1 A
	250 VDC	0.3 A		0.3 A	0.3 A	0.05 A		0.05 A	0.05 A

- Note:**
- The above current ratings are the values of the steady-state current.
 - Inductive load has a power factor of 0.4 min. (AC) and a time constant of 7 ms max. (DC).
 - Lamp load has an inrush current of 10 times the steady-state current.
 - Motor load has an inrush current of 6 times the steady-state current.
 - The normally closed and normally open ratings of reverse hinge lever models are opposite to each other.
 - The AC ratings of molded terminals are 125 and 250 V only.
 - The ratings values apply under the following test conditions:
 Ambient temperature: 20±2°C
 Ambient humidity: 65±5%
 Operating frequency: 20 operations/min

■ Characteristics

Item	Basic (except micro load and flexible rod)/ maintained contact Z-15	Basic (micro load) Z-01H	Basic (flexible rod) Z-15	Split-contact Z-10F
Operating speed (see note)	0.01 mm to 1 m/s (see note 1)		1 mm to 1 m/s	0.1 mm to 1 m/s (see note 1)
Operating frequency	Mechanical: 240 operations/min Electrical: 20 operations/min		Mechanical: 120 operations/min Electrical: 20 operations/min	Mechanical: 240 operations/min Electrical: 20 operations/min
Insulation resistance	100 MΩ min. (at 500 VDC)			
Contact resistance	15 mΩ max. (initial value)	50 mΩ max. (initial value)	15 mΩ max. (initial value)	25 mΩ max. (initial value)
Dielectric strength	<u>Between contacts of same polarity</u> Contact gap G: 1,000 VAC, 50/60 Hz for 1 min Contact gap H: 600 VAC, 50/60 Hz for 1 min Contact gap E: 1,500 VAC, 50/60 Hz for 1 min <u>Between current-carrying metal parts and ground, and between each terminal and non-current-carrying metal parts</u> 2,000 VAC, 50/60 Hz for 1 min		<u>Between contacts of same polarity</u> Contact gap G: 1,000 VAC, 50/60 Hz for 1 min Contact gap H: 600 VAC, 50/60 Hz for 1 min <u>Between current-carrying metal parts and ground, and between each terminal and non-current-carrying metal parts</u> 2,000 VAC, 50/60 Hz for 1 min	<u>Between contacts of same polarity</u> Contact gap F: 1,500 VAC, 50/60 Hz for 1 min <u>Between current-carrying metal parts and ground, and between each terminal and non-current-carrying metal parts</u> 2,000 VAC, 50/60 Hz for 1 min
Vibration resistance	Malfunction: 10 to 55 Hz, 1.5-mm double amplitude (see note 5)		Malfunction: 10 to 20 Hz, 1.5-mm double amplitude (see note 5)	Malfunction: 10 to 55 Hz, 1.5-mm double amplitude (see note 5)
Shock resistance	<u>Destruction:</u> 1,000 m/s ² {approx. 100G} max. <u>Malfunction:</u> 300 m/s ² {approx. 30G} max. (see note 2, 5)		<u>Destruction:</u> 1,000 m/s ² {approx. 100G} max. <u>Malfunction:</u> 50 m/s ² {approx. 5G} max. (see note 5)	<u>Destruction:</u> 1,000 m/s ² {approx. 100G} max. <u>Malfunction:</u> 300 m/s ² {approx. 30G} max. (see note 3, 5)
Durability	<u>Mechanical:</u> Contact gap G, H: 20,000,000 operations min. (see note 4) Contact gap E: 300,000 operations <u>Electrical:</u> Contact gap G, H: 500,000 operations min. Contact gap E: 100,000 operations min.		<u>Mechanical:</u> 1,000,000 operations min. <u>Electrical:</u> 100,000 operations min.	<u>Mechanical:</u> 500,000 operations min. (see note 1) <u>Electrical:</u> 100,000 operations min.
Degree of protection	General-purpose: IP00 Drip-proof: IP62			
Degree of protection against electric shock	Class I			
Proof tracking index (PTI)	175			
Switch category	D (IEC335-1)			
Ambient temperature	Operating: General-purpose: -25°C to 80°C (with no icing) Drip-proof: -15°C to 80°C (with no icing)			
Ambient humidity	Operating: General-purpose: 35% to 85% Drip-proof: 35% to 95%			
Weight	Approx. 22 to 58 g		Approx. 42 to 48 g	Approx. 34 to 61 g

Note: 1. The values are for the plunger models. (For the lever models, the values are at the plunger section.) (Contract your OMRON representative for other models.)

2. The values are for the Z-15G pin plunger.

3. The values are for the Z-10FY-B.

4. The values are for the pin plunger. The durability for models other than the pin plunger is 10,000,000 min.

5. Malfunction: 1 ms max.

■ Contacts Specification

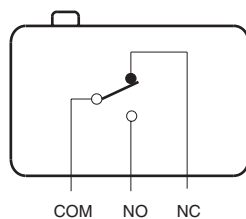
Item		Z-15	Z-01H	Z-10F
Contacts	Shape	Rivet	Single crossbar	Rivet
	Material	Silver alloy	Gold alloy	Silver alloy
Inrush current	NC	30 A max.	0.1 A max.	40 A max.
	NO	15 A max.	0.1 A max.	20 A max.

■ Contact Form

Basic Models

General-purpose

Contact Form (SPDT)



Note: The Z-15GM is a reversible model and the NO and NC positions are reversed.

Split-contact Models

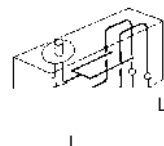
Contact Form (Split-contact)



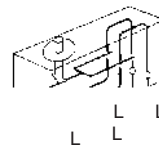
COM NO NC
NO NC

Connection Example

Series Connection

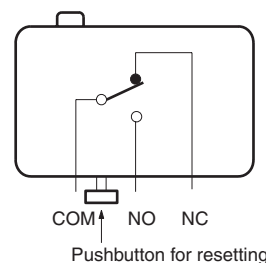


Parallel Connection



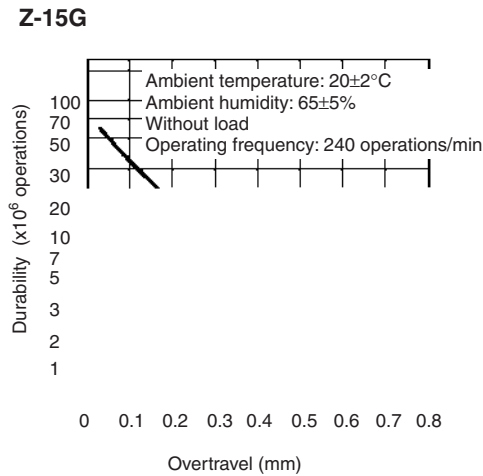
Maintained-contact Models

Contact Form (Maintained-contact)

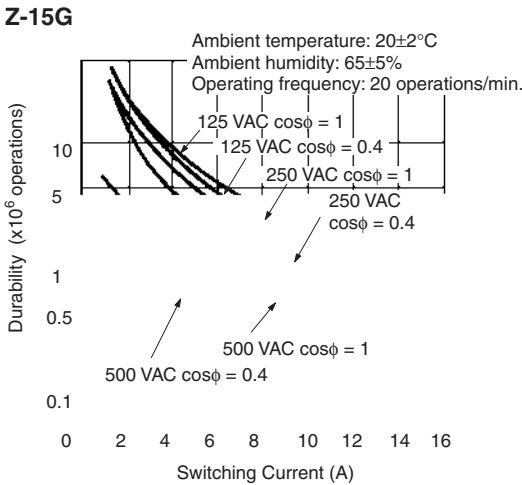


Engineering Data

Mechanical Durability



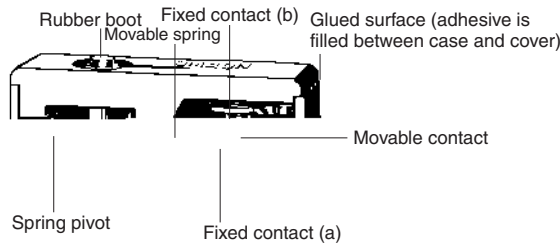
Electrical Durability



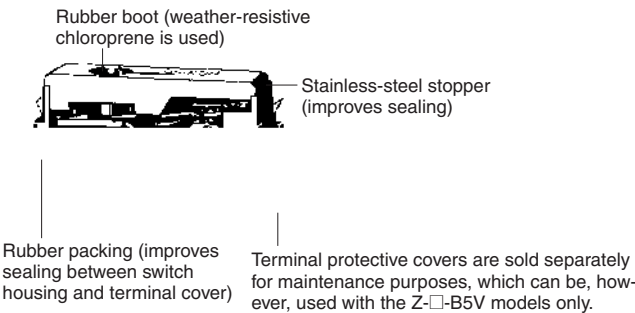
Nomenclature

Drip-proof Construction

Without Terminal Protective Cover



With Terminal Protective Cover



Dimensions

- Note:** 1. Unless otherwise indicated, all units are in millimeters.
2. Unless otherwise specified, a tolerance of ± 0.4 mm applies to all dimensions.

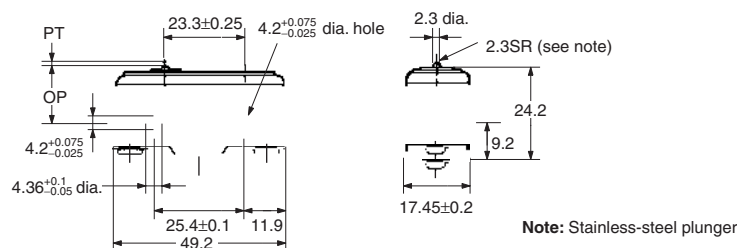
■ Dimensions and Operating Characteristics

Basic Models (General-purpose) & Split-contact Models

The models, illustrations, and graphics are for screw-terminal models (-B). The "-A" at the end of the model number for solder terminal models has been omitted. For details of the terminals, refer to *Terminals* above.

Pin Plunger

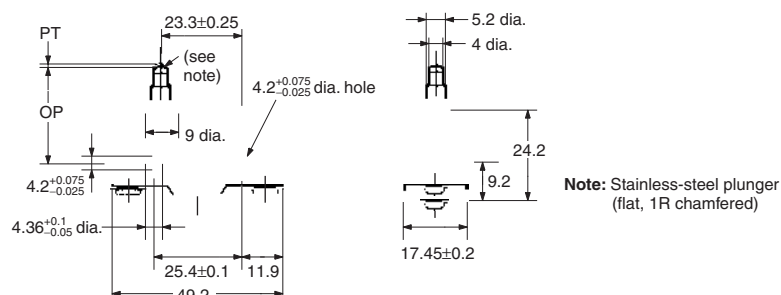
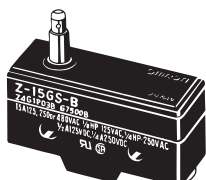
Z-15G-B, Z-15E-B
Z-15H-B, Z-01H-B
Z-10FY-B



	Z-15G-B	Z-15H-B	Z-15E-B	Z-01H-B	Z-10FY-B
OF	2.45 to 3.43 N {250 to 350 gf}	1.96 to 2.75 N {200 to 280 gf}	6.12 to 7.85 N {625 to 800 gf}	2.45 N {250 gf} max.	4.46 to 7.26 N {455 to 740 gf}
RF min.	1.12 N {114 gf}	1.12 N {114 gf}	1.12 N {114 gf}	0.78 N {80 gf}	1.12 N {114 gf}
PT max.	0.4 mm	0.3 mm	0.8 mm	0.5 mm	0.8 mm
OT min.	0.13 mm	0.13 mm	0.13 mm	0.13 mm	0.13 mm
MD max.	0.05 mm	0.025 mm	0.13 mm	0.04 mm	0.1 mm
OP	15.9±0.4 mm				

Slim Spring Plunger

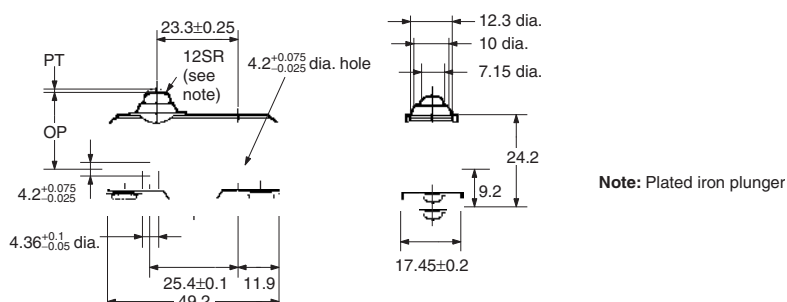
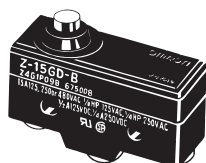
Z-15GS-B, Z-15HS-B,
Z-01HS-B, Z-10FSY-B



	Z-15GS-B	Z-15HS-B	Z-01HS	Z-10FSY-B
OF	2.45 to 3.43 N {250 to 350 gf}	1.96 to 2.79 N {200 to 285 gf}	2.45 N {250 gf} max.	4.46 to 7.26 N {455 to 740 gf}
RF min.	1.12 N {114 gf}	1.12 N {114 gf}	0.78 N {80 gf}	1.12 N {114 gf}
PT max.	0.4 mm	0.3 mm	0.5 mm	0.8 mm
OT min.	1.6 mm	1.6 mm	1.6 mm	1.6 mm
MD max.	0.05 mm	0.025 mm	0.05 mm	0.1 mm
OP	28.2±0.5 mm			

Short Spring Plunger

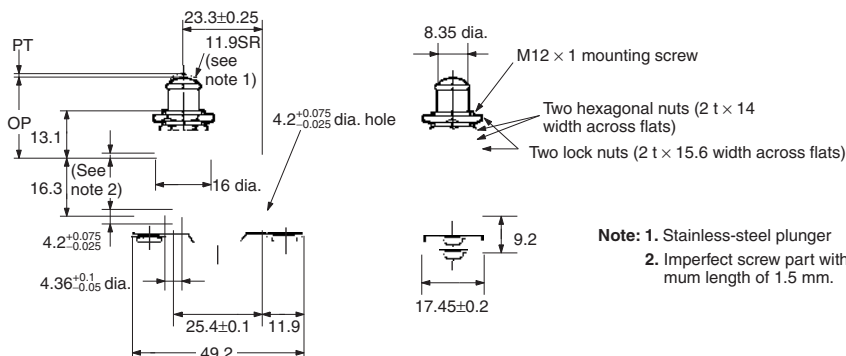
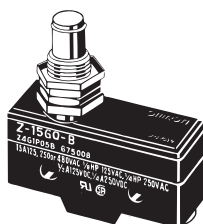
Z-15GD-B, Z-01HD-B
Z-15HD-B, Z-10FDY-B
Z-15ED-B



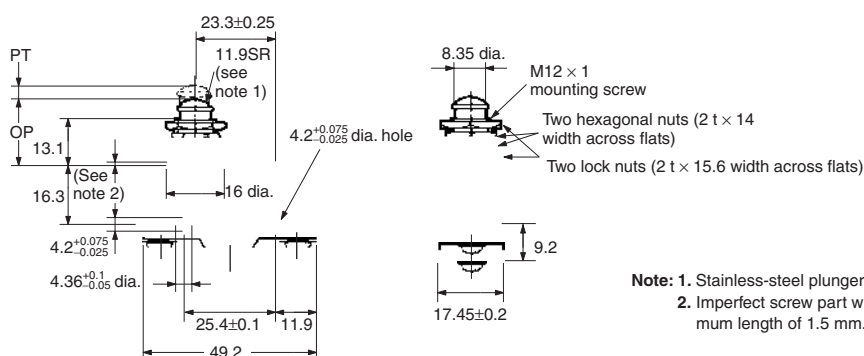
	Z-15GD-B	Z-15HD-B	Z-15ED-B	Z-01HD-B	Z-10FDY-B
OF	2.45 to 3.43 N {250 to 350 gf}	1.96 to 2.79 N {200 to 285 gf}	6.13 to 7.85 N {625 to 800 gf}	2.45 N {250 gf} max.	4.46 to 7.26 N {455 to 740 gf}
RF min.	1.12 N {114 gf}	1.12 N {114 gf}	1.12 N {114 gf}	0.78 N {80 gf}	1.12 N {114 gf}
PT max.	0.4 mm	0.3 mm	0.8 mm	0.5 mm	0.8 mm
OT min.	1.6 mm	1.6 mm	1.6 mm	1.6 mm	1.6 mm
MD max.	0.05 mm	0.025 mm	0.13 mm	0.05 mm	0.1 mm
OP	21.5±0.5 mm				

Panel Mount Plunger

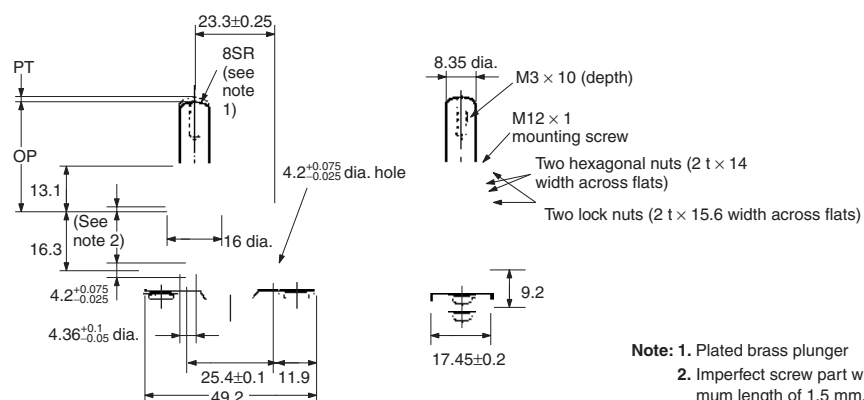
Z-15GQ-B, Z-01HQ-B
Z-15HQ-B, Z-10FQY-B
Z-15EQ-B



Z-15GQ3-B



Z-15GQ8-B

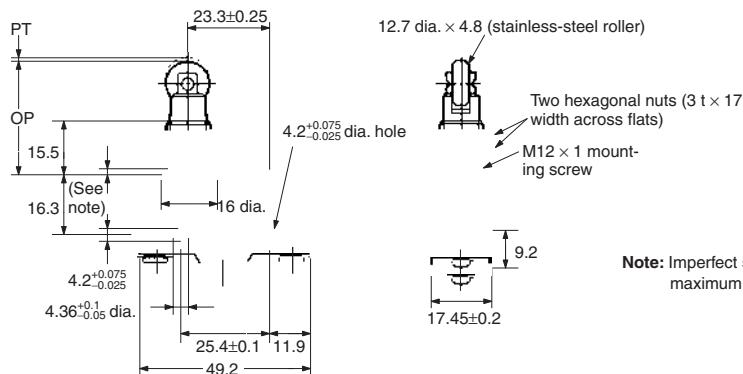
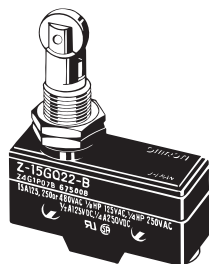


	Z-15GQ-B	Z-15HQ-B	Z-15EQ-B	Z-01HQ-B	Z-10FQY-B	Z-15GQ3-B	Z-15GQ8-B
OF	2.45 to 3.43 N {250 to 350 gf}	1.96 to 2.79 N {200 to 285 gf}	6.13 to 7.85 N {625 to 800 gf}	2.45 N {250 gf} max.	4.46 to 7.26 N {455 to 740 gf}	2.45 to 3.43 N {250 to 350 gf}	2.45 to 3.43 N {250 to 350 gf}
RF min.	1.12 N {114 gf}	1.12 N {114 gf}	1.12 N {114 gf}	0.78 N {80 gf}	1.12 N {114 gf}	1.12 N {114 gf}	1.12 N {114 gf}
PT max.	0.4 mm	0.3 mm	0.8 mm	0.5 mm	0.8 mm	4.2 mm	0.5 mm
OT min.	5.5 mm	5.5 mm	5.5 mm	5.5 mm	5.5 mm	2.5 mm	5.5 mm
MD max.	0.05 mm	0.025 mm	0.13 mm	0.05 mm	0.1 mm	2.2 mm	0.05 mm
OP	21.8±0.8 mm					18.8±0.8 mm	32.5±1 mm

Note: 1. Do not use the M12 mounting screw and the case mounting hole at the same time, or excessive pulling force will be imposed on the Switch and the case and cover may be damaged.
2. On the model Z-15GQ3-B, PT can be set to a value larger than that for the Z-15GQ.
3. On the model Z-15GQ8-B, operating position can be adjusted by providing a screw in the plunger section. The M3 hole with a depth of 10 mm is a through hole. Take precautions so that no water or screw lock agent penetrates into the hole.

Panel Mount Roller Plunger

Z-15GQ22-B, Z-15EQ22-B
Z-15HQ22-B, Z-10FQ22Y-B

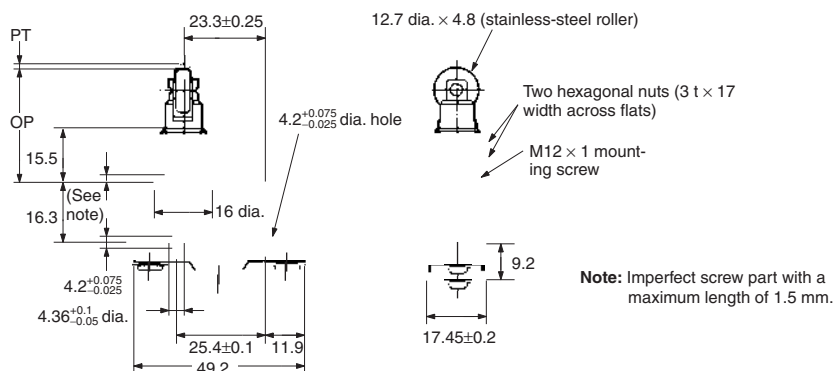
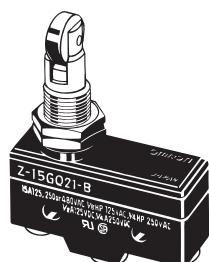


	Z-15GQ22-B	Z-15HQ22-B	Z-15EQ22-B	Z-10FQ22Y-B
OF	2.45 to 3.43 N {250 to 350 gf}	1.96 to 2.79 N {200 to 285 gf}	6.13 to 7.85 N {625 to 800 gf}	4.46 to 7.26 N {455 to 740 gf}
RF min.	1.12 N {114 gf}	1.12 N {114 gf}	1.12 N {114 gf}	1.12 N {114 gf}
PT max.	0.4 mm	0.3 mm	0.8 mm	1 mm
OT min.	3.58 mm	3.58 mm	3.58 mm	3.55 mm
MD max.	0.05 mm	0.025 mm	0.13 mm	0.1 mm
OP	33.4±1.2 mm			

Note: Do not use the M12 mounting screw and the case mounting hole at the same time, or the case may be damaged.

Panel Mount Cross Roller Plunger

Z-15GQ21-B, Z-15HQ21-B,
Z-15EQ21-B

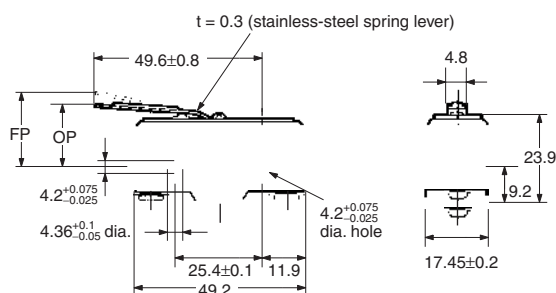
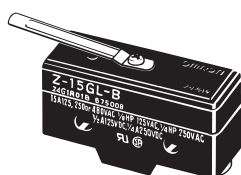


	Z-15GQ21-B	Z-15HQ21-B	Z-15EQ21-B
OF	2.45 to 3.43 N {250 to 350 gf}	1.96 to 2.79 N {200 to 285 gf}	6.13 to 7.85 N {625 to 800 gf}
RF min.	1.12 N {114 gf}	1.12 N {114 gf}	1.12 N {114 gf}
PT max.	0.4 mm	0.3 mm	0.8 mm
OT min.	3.58 mm	3.58 mm	3.58 mm
MD max.	0.05 mm	0.025 mm	0.13 mm
OP	33.4±1.2 mm		

Note: Do not use the M12 mounting screw and the case mounting hole at the same time, or the case may be damaged.

Leaf Spring

Z-15GL-B

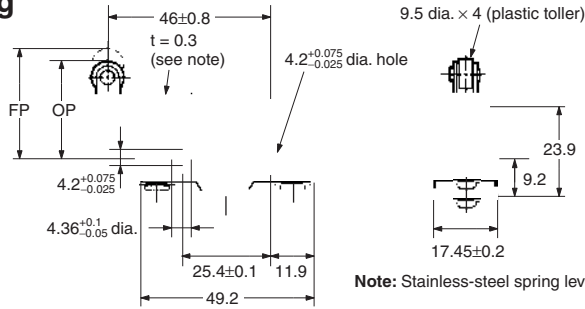
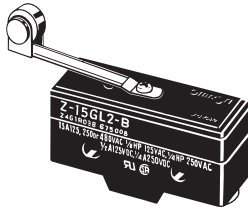


OF max.	1.38 N {141 gf}
RF min.	0.14 N {14 gf}
OT min.	1.6 mm (see note)
MD max.	1.3 mm
FP max.	20.6 mm
OP	17.4±0.8 mm

Note: When operating, be sure not to exceed 1.6 mm.

Roller Leaf Spring

Z-15GL2-B

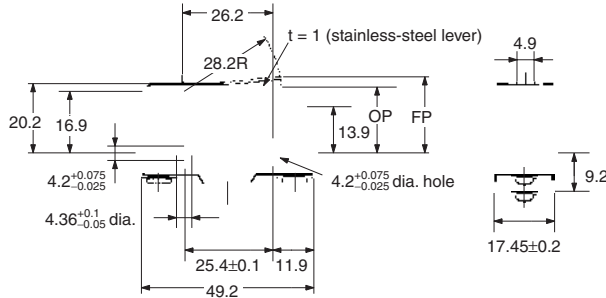
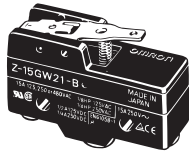


OF max.	1.38 N {141 gf}
RF min.	0.14 M {14 gf}
OT min.	1.6 mm (see note)
MD max.	1.3 mm
FP max.	31.8 mm
OP	28.6±0.8 mm

Note: When operating, be sure not to exceed 1.6 mm.

Short Hinge Lever

Z-15GW21-B



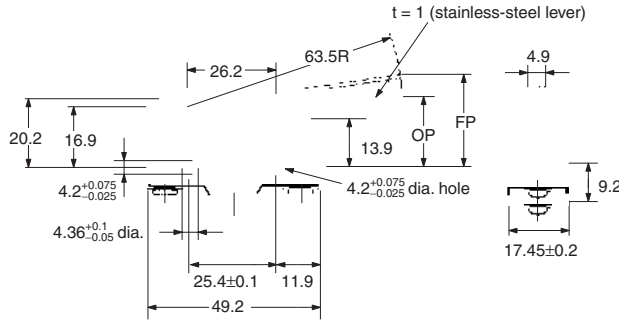
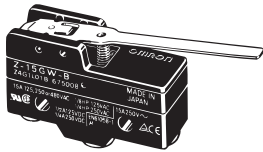
OF max.	1.57 N {160 gf}
RF min.	0.27 N {28 gf}
OT min.	2 mm
MD max.	1 mm
FP max.	24.8 mm
OP	19±0.8 mm

Hinge Lever

Z-15GW-B, Z-15GW32-B

Z-15HW-B, Z-10FWY-B

Z-15GW3-B (Lever Length: 56R)
(see note)

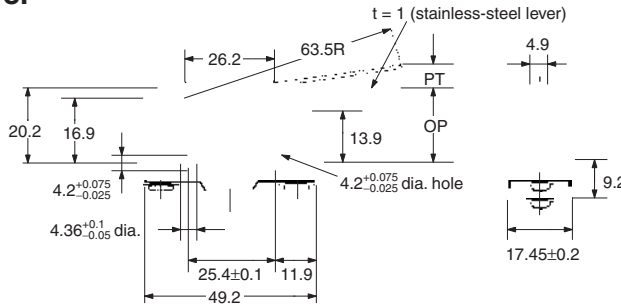


Note: The external dimensions of the actuator vary.

	Z-15GW-B	Z-15HW-B	Z-15GW32-B	Z-10FWY-B	Z-15GW3-B
OF max.	0.69 N {70 gf}	0.66 N {67 gf}	1.47 to 1.96 N {150 to 200 gf}	0.88 N {90 gf}	0.78 N {80 gf}
RF min.	0.14 N {14 gf}	0.14 N {14 gf}	0.92 N {94 gf}	0.14 N {14 gf}	0.15 N {15.5 gf}
OT min.	5.6 mm	5.6 mm	5.6 mm	5.6 mm	4.8 mm
MD max.	1.27 mm	0.63 mm	1.27 mm	2.4 mm	1.12 mm
FP max.	28.2 mm	27.4 mm	28.2 mm	29.8 mm	27.2 mm
OP	19±0.8 mm				

Low-force Hinge Lever

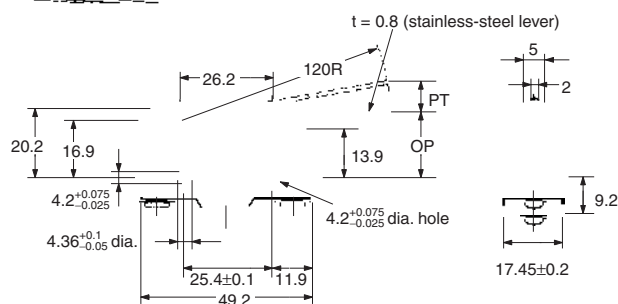
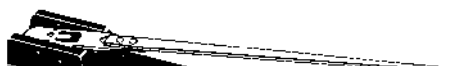
Z-15GW4-B



OF max.	274 mN {28 gf}
RF min.	34.3 mN {3.5 gf}
PT max.	10 mm
OT min.	5.6 mm
MD max.	1.27 mm
OP	19±0.8 mm

Limit switches

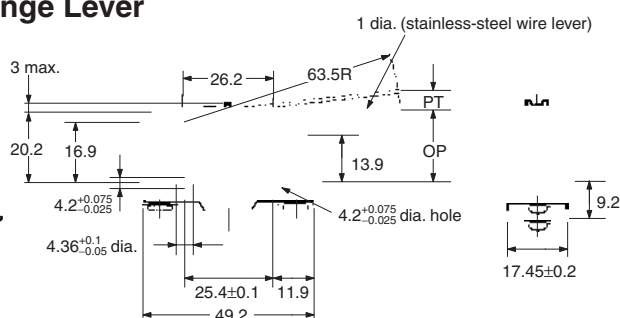
Z-15HW24-B



OF max.	58.8 mN {6 gf}
RF min.	4.90 mN {0.5 gf}
PT max.	19.8 mm
OT min.	10 mm
MD max.	2 mm
OP	19.8±1.6 mm

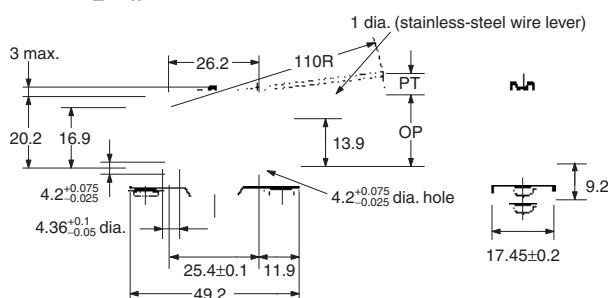
Low-force Wire Hinge Lever

Z-15HW52-B



OF max.	58.8 mN {6 gf}
RF min.	4.90 mN {0.5 gf}
PT max.	8.3 mm
OT min.	5.6 mm
MD max.	0.65 mm
OP	19±1 mm

Z-15HW78-B



OF max.	39.2 mN {4 gf}
RF min.	2.94 mN {0.3 gf}
PT max.	10 mm
OT min.	6 mm
MD max.	3 mm
OP	20±1 mm

Note: The AC rating is 10 A at 125 or 250 V.

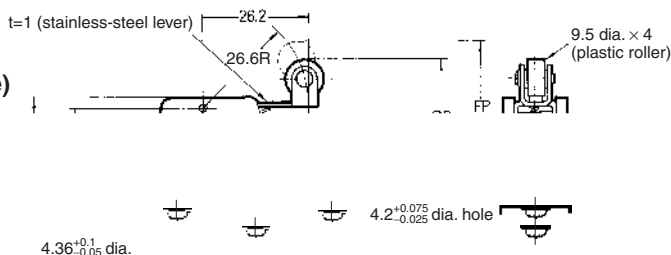
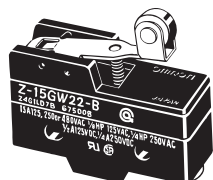
Short Hinge Roller Lever

Z-15GW22-B, Z-01HW22-B

Z-15HW22-B, Z-10FW22Y-B (see note)

Z-15EW22-B, Z-15GW2-B

Z-15HW2-B (see note), Z-10FW2Y-B (see note) (Lever Length: 48.5R) (see note)



Note: The external dimensions of the actuator vary.

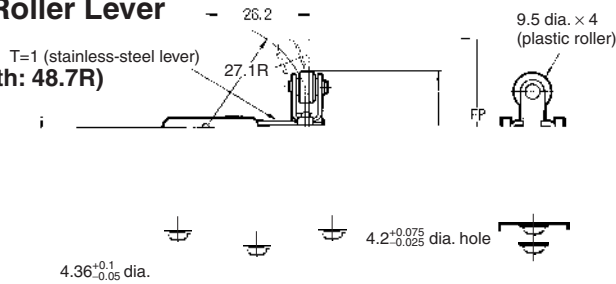
	Z-15GW22-B	Z-15HW22-B	Z-15EW22-B	Z-01HW22-B	Z-10FW22Y-B	Z-15GW2-B	Z-15HW2-B	Z-10FW2Y-B
OF max.	1.57 N {160 gf}	1.47 N {150 gf}	1.94 N {198 gf}	1.57 N {160 gf}	2.45 N {250 gf}	0.98 N {100 gf}	0.84 N {86 gf}	1.27 N {130 gf}
RF min.	0.41 N {42 gf}	0.41 N {42 gf}	0.41 N {42 gf}	0.27 N {28 gf}	0.34 N {35 gf}	0.22 N {22 gf}	0.22 N {22 gf}	0.22 N {22 gf}
OT min.	2.4 mm	2.4 mm	2.4 mm	2.4 mm	2.4 mm	4 mm	4 mm	4 mm
MD max.	0.5 mm	0.45 mm	1.3 mm	0.5 mm	1 mm	1.02 mm	0.6 mm	2 mm
FP max.	32.5 mm		35.1 mm	32.5 mm	34.8 mm	36.5 mm		37.4 mm
OP	30.2±0.4 mm		30.2±0.4 mm	30.2±0.4 mm	30.2±0.4 mm	30.2±0.8 mm		30.2±0.8 mm

Short Hinge Cross Roller Lever

Z-15GW49-B

Z-15GW54-B (Lever Length: 48.7R)

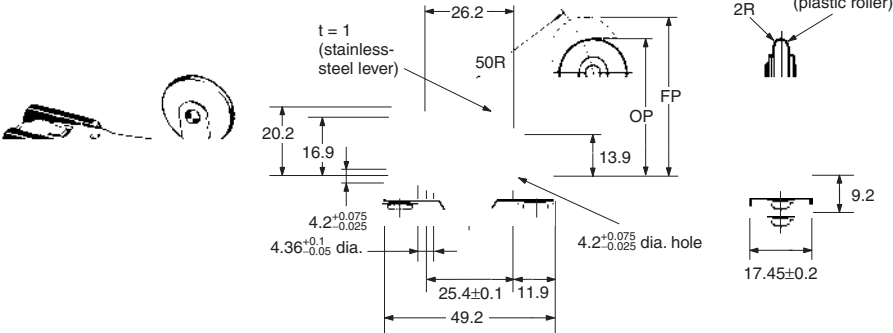
(see note)



Model	Z-15GW49-B	Z-15GW54-B
OF max.	1.67 N {170 gf}	0.98 N {100 gf}
RF min.	0.41 N {42 gf}	0.22 N {22 gf}
OT min.	2.4 mm	4 mm
MD max.	0.51 mm	1 mm
FP max.	33.3 mm	37.3 mm
OP	31±0.4 mm	31±0.8 mm

Note: The external dimensions of the actuator vary.

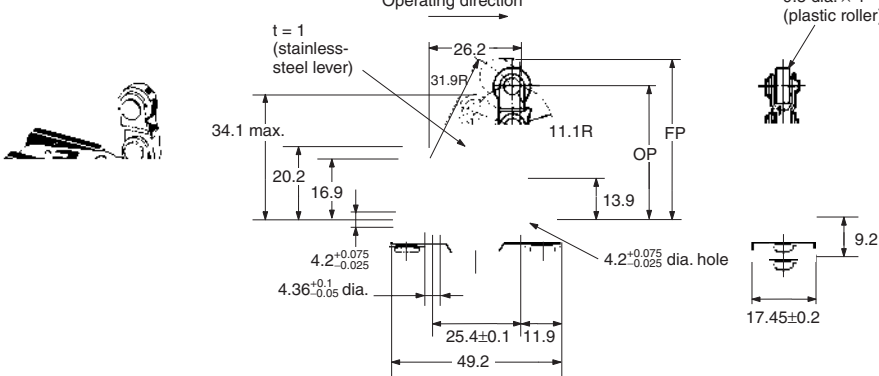
Z-15GW25-B



OF max.	0.98 N {100 gf}
RF min.	0.21 N {21 gf}
OT min.	4 mm
MD max.	1.6 mm
FP max.	47.5 mm
OP	41.2±0.8 mm

Unidirectional Short Hinge Roller Lever

Z-15GW2277-B

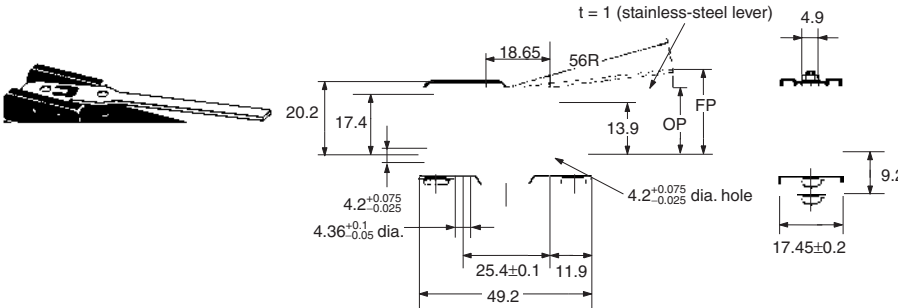


OF max.	1.67 N {170 gf}
RF min.	0.41 N {42 gf}
OT min.	2.4 mm
MD max.	0.51 mm
FP max.	43.6 mm
OP	41.3±0.8 mm

Reverse Hinge Lever

Note: The pin plungers of reverse-type models are continuously pressed by the actuator levers with compression coil springs and the pin plungers are freed by operating the levers. Reverse-type models are highly vibration- and shock-resistive because the pin plungers are normally pressed.

Z-15GM-B



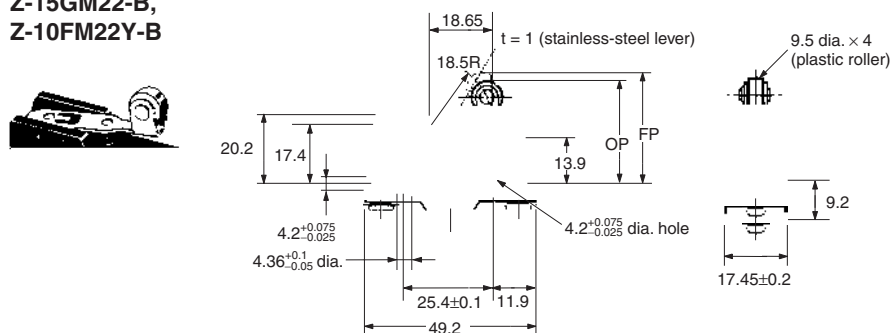
OF max.	1.67 N {170 gf}
RF min.	0.27 N {28 gf}
OT min.	5.6 mm
MD max.	0.89 mm
FP max.	23.8 mm
OP	19±0.8 mm

Limit switches

Reverse Short Hinge Roller Lever

Note: The pin plungers of reverse-type models are continuously pressed by the actuator levers with compression coil springs and the pin plungers are freed by operating the levers. Reverse-type models are highly vibration- and shock-resistive because the pin plungers are normally pressed.

Z-15GM22-B, Z-10FM22Y-B

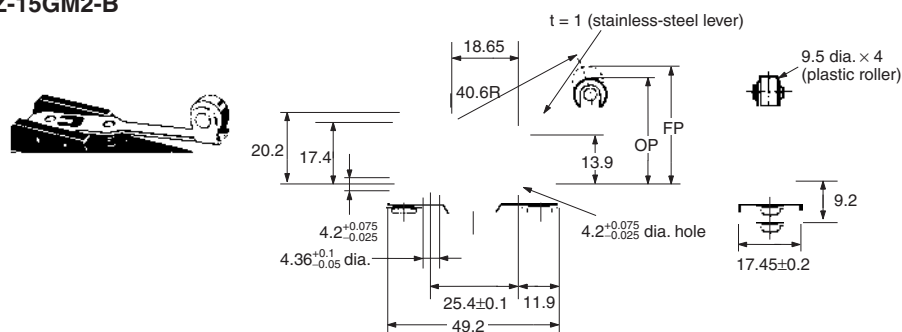


Model	Z-15GM22-B	Z-10FM22Y-B
OF max.	5.28 N {538 gf}	6.37 N {650 gf}
RF min.	1.67 N {170 gf}	1.67 N {170 gf}
OT min.	2 mm	2 mm
MD max.	0.28 mm	0.56 mm
FP max.	31.8 mm	33 mm
OP	29.4±0.4 mm	29.4±0.4 mm

Reverse Hinge Roller Lever

Note: The pin plungers of reverse-type models are continuously pressed by the actuator levers with compression coil springs and the pin plungers are freed by operating the levers. Reverse-type models are highly vibration- and shock-resistive because the pin plungers are normally pressed.

Z-15GM2-B

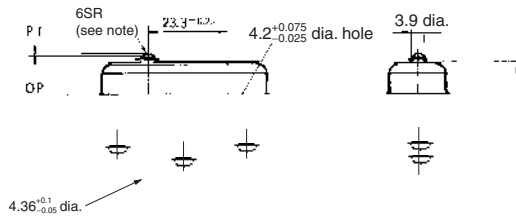


OF max.	2.35 N {240 gf}
RF min.	0.55 N {56 gf}
OT min.	4 mm
MD max.	0.64 mm
FP max.	35 mm
OP	30.2±0.8 mm

Basic Models (Drip-proof) without Terminal Protective Cover

Pin Plunger

Z-15G55-B
Z-01H55-B

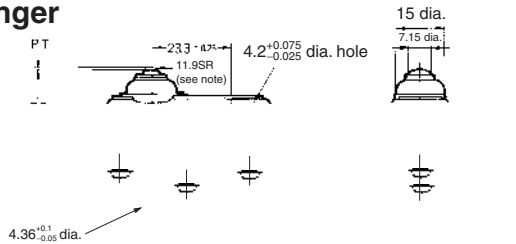


Note: Stainless-steel plunger

Model	Z-15G55-B	Z-01H55-B
OF	2.45 to 4.22 N {250 to 431 gf}	3.43 N {350 gf} max.
RF min.	1.12 N {114 gf}	0.78 N {80 gf}
PT max.	2.2 mm	2.2 mm
OT min.	0.13 mm	0.13 mm
MD max.	0.06 mm	0.06 mm
OP	15.9±0.4 mm	

Short Spring Plunger

Z-15GD55-B
Z-01HD55-B

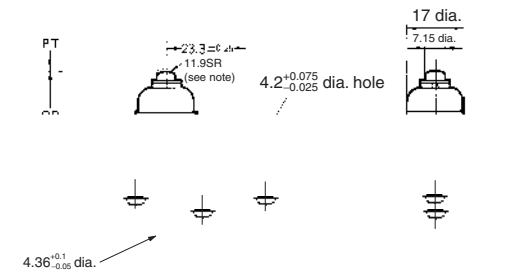


Note: Stainless-steel plunger

Model	Z-15GD55-B	Z-01HD55-B
OF max.	5.30 N {541 gf}	3.63 N {370 gf}
RF min.	1.12 N {114 gf}	0.78 N {80 gf}
PT max.	1.8 mm	1.9 mm
OT min.	1.6 mm	1.6 mm
MD max.	0.06 mm	0.06 mm
OP	21.5±0.5 mm	

Spring Plunger

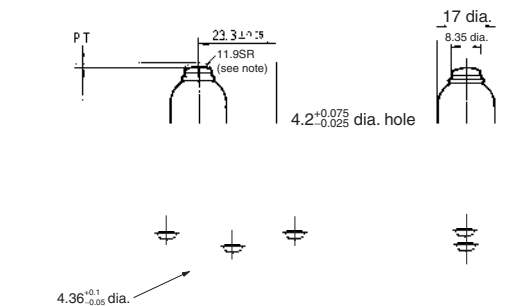
Z-15GK55-B



Note: Stainless-steel plunger

OF max.	5.30 N {541 gf}
RF min.	1.12 N {114 gf}
PT max.	2.3 mm
OT min.	1.6 mm
MD max.	0.06 mm
OP	28.2±0.5 mm

Z-15GK355-B

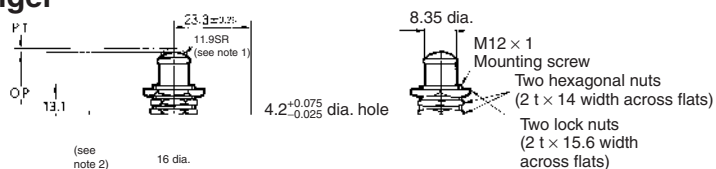


Note: Stainless-steel plunger

OF max.	5.30 N {541 gf}
RF min.	1.12 N {114 gf}
PT max.	2.4 mm
OT min.	3.5 mm
MD max.	0.06 mm
OP	37.8±1.2 mm

Panel Mount Plunger

Z-15GQ55-B



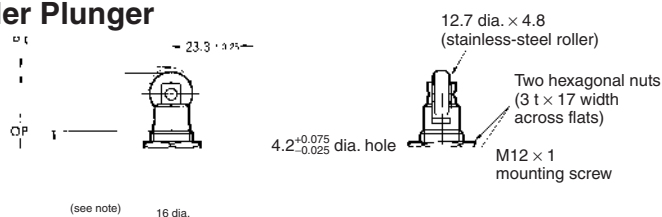
OF max.	5.30 N {541 gf}
RF min.	1.12 N {114 gf}
PT max.	1.8 mm
OT min.	5.5 mm
MD max.	0.06 mm
OP	21.8±0.8 mm

Note: 1. Stainless-steel plunger
2. Imperfect screw part with a maximum length of 1.5 mm.

Note: Do not use the M12 mounting screw and the case mounting hole at the same time, or the case may be damaged.

Panel Mount Roller Plunger

Z-15GQ2255-B



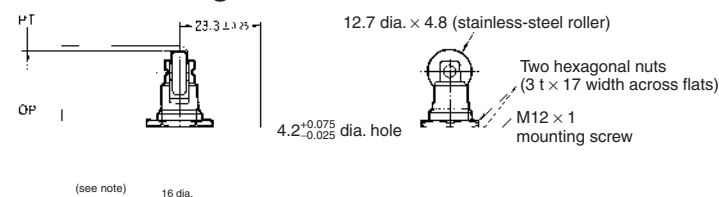
OF max.	5.30 N {541 gf}
RF min.	1.12 N {114 gf}
PT max.	1.8 mm
OT min.	3.58 mm
MD max.	0.06 mm
OP	33.4±1.2 mm

Note: Imperfect screw part with a maximum length of 1.5 mm.

Note: Do not use the M12 mounting screw and the case mounting hole at the same time, or the case may be damaged.

Panel Mount Cross Roller Plunger

Z-15GQ2155-B



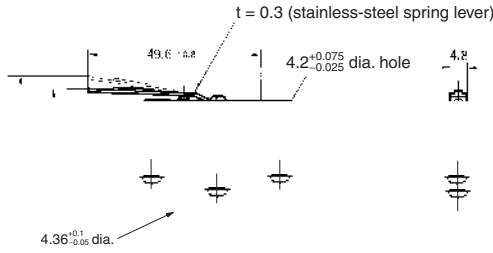
OF max.	5.30 N {541 gf}
RF min.	1.12 N {114 gf}
PT max.	1.8 mm
OT min.	3.58 mm
MD max.	0.06 mm
OP	33.4±1.2 mm

Note: Imperfect screw part with a maximum length of 1.5 mm.

Note: Do not use the M12 mounting screw and the case mounting hole at the same time, or the case may be damaged.

Leaf Spring

Z-15GL55-B

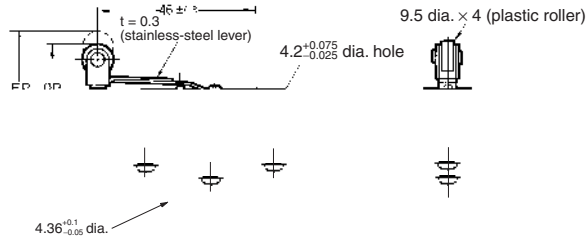


OF max.	1.96 N {200 gf}
RF min.	0.14 N {14 gf}
OT min.	1.6 mm
MD max.	1.3 mm
FP max.	20.6 mm
OP	17.5±0.8 mm

Note: When operating, be sure not to exceed 1.6 mm.

Roller Leaf Spring

Z-15GL255-B

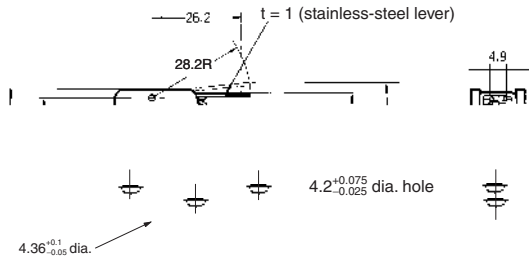


OF max.	1.96 N {200 gf}
RF min.	0.14 N {14 gf}
OT min.	1.6 mm
MD max.	1.3 mm
FP max.	31.8 mm
OP	28.6±0.8 mm

Note: When operating, be sure not to exceed 1.6 mm.

Short Hinge Lever

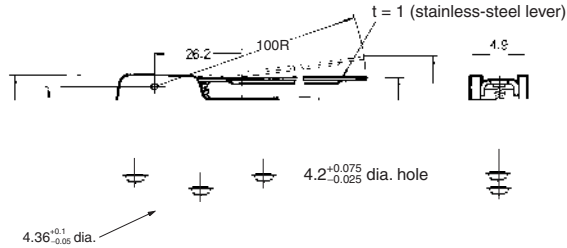
Z-15GW2155-B



OF max.	1.86 N {190 gf}
RF min.	0.27 N {28 gf}
OT min.	2 mm
MD max.	1 mm
FP max.	25 mm
OP	19±0.8 mm

Long Hinge Lever

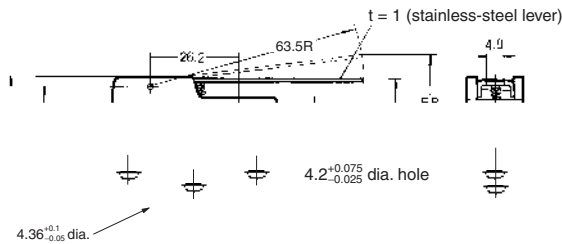
Z-15GW4455-B



OF max.	0.88 N {90 gf}
RF min.	0.14 N {14 gf}
OT min.	5.6 mm
MD max.	3.5 mm
FP max.	33 mm
OP	19±1.2 mm

Hinge Lever

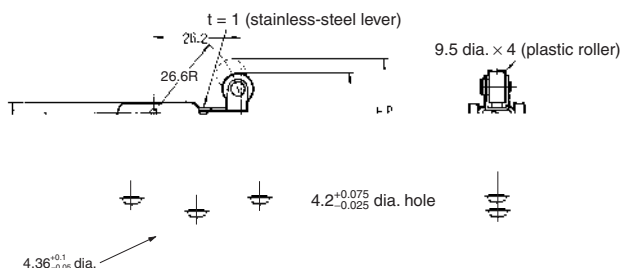
Z-15GW55-B



OF max.	0.98 N {100 gf}
RF min.	0.14 N {14 gf}
OT min.	5.6 mm
MD max.	2 mm
FP max.	28.2 mm
OP	19±0.8 mm

Short Hinge Roller Lever

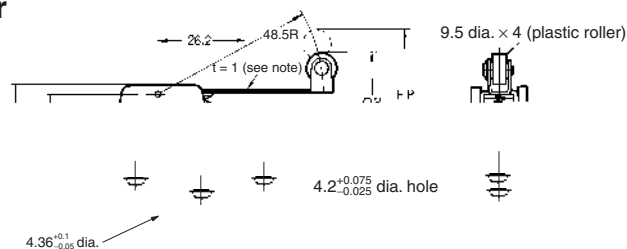
Z-15GW2255-B
Z-01HW2255-B



Model	Z-15GW2255-B	Z-01HW2255-B
OF max.	1.96 N {200 gf}	1.96 N {200 gf}
RF min.	0.41 N {42 gf}	0.27 N {28 gf}
OT min.	2.4 mm	2.4 mm
MD max.	0.8 mm	0.8 mm
FP max.	32.9 mm	
OP	30.2±0.4 mm	

Hinge Roller Lever

Z-15GW255-B

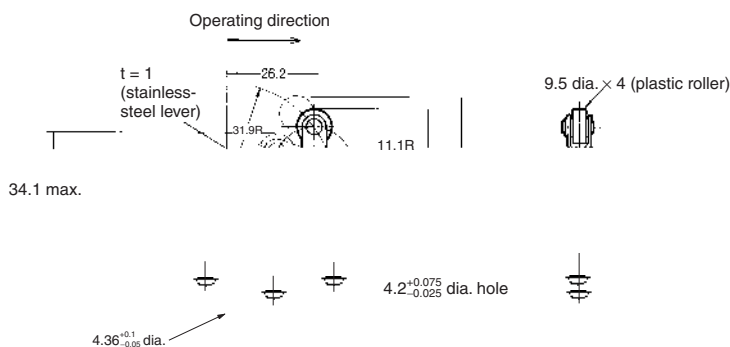


Note: Stainless-steel lever

OF max.	1.27 N {130 gf}
RF min.	0.21 N {21 gf}
OT min.	4 mm
MD max.	1.6 mm
FP max.	36.5 mm
OP	30.2±0.8 mm

Unidirectional Short Hinge Roller Lever

Z-15GW227755-B

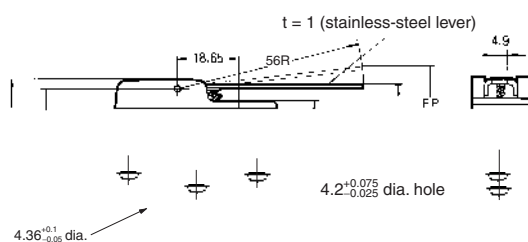


OF max.	1.77 N {181 gf}
RF min.	0.49 N {50 gf}
OT min.	2.4 mm
MD max.	0.8 mm
FP max.	43.6 mm
OP	41.3±0.8 mm

Reverse Hinge Lever

Note: The pin plungers of reverse-type models are continuously pressed by the actuator levers with compression coil springs and the pin plungers are freed by operating the levers. Reverse-type models are highly vibration- and shock-resistive because the pin plungers are normally pressed.

Z-15GM55-B

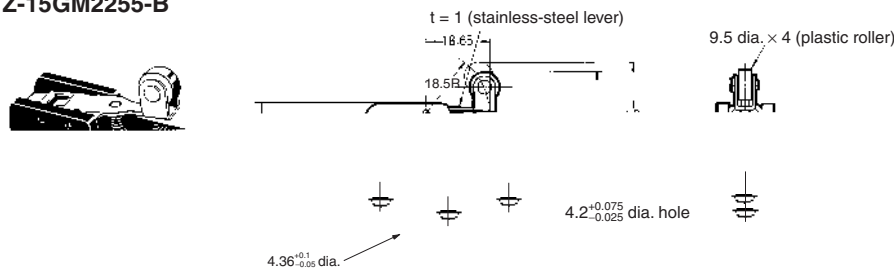


OF max.	1.96 N {200 gf}
RF min.	0.27 N {28 gf}
OT min.	5.6 mm
MD max.	0.89 mm
FP max.	23.8 mm
OP	19±0.8 mm

Reverse Short Hinge Roller Lever

Note: The pin plungers of reverse-type models are continuously pressed by the actuator levers with compression coil springs and the pin plungers are freed by operating the levers. Reverse-type models are highly vibration- and shock-resistive because the pin plungers are normally pressed.

Z-15GM2255-B

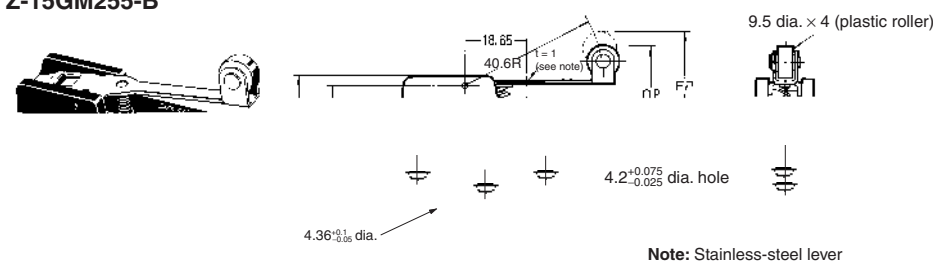


OF max.	5.69 N {581 gf}
RF min.	1.67 N {170 gf}
OT min.	2 mm
MD max.	0.28 mm
FP max.	31.8 mm
OP	29.4±0.4 mm

Reverse Hinge Roller Lever

Note: The pin plungers of reverse-type models are continuously pressed by the actuator levers with compression coil springs and the pin plungers are freed by operating the levers. Reverse-type models are highly vibration- and shock-resistive because the pin plungers are normally pressed.

Z-15GM255-B

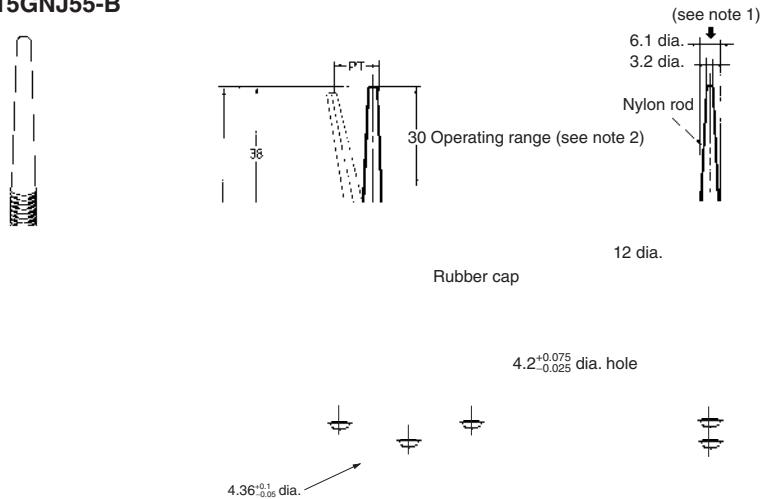


OF max.	2.65 N {270 gf}
RF min.	0.55 N {56 gf}
OT min.	4 mm
MD max.	0.64 mm
FP max.	35 mm
OP	30.2±0.8 mm

Flexible Rod (Coil Spring)

Z-15GNJ55-B

OF max.	0.49 N {50 gf}
PT max.	(20 mm)
OT	42 to 60 mm

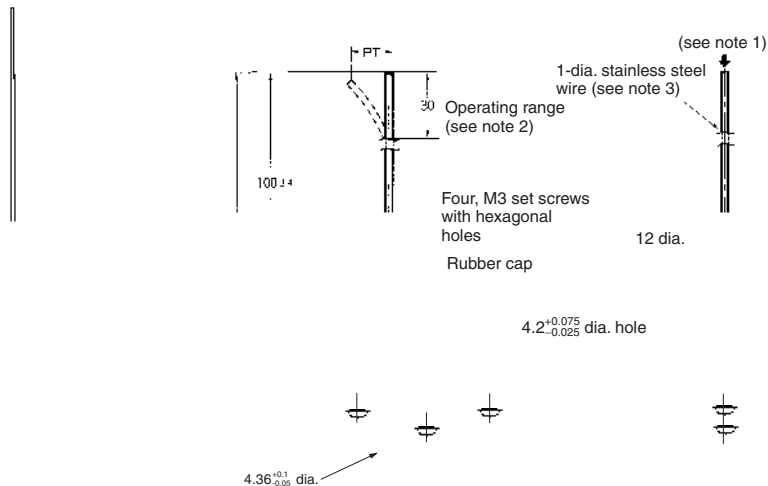


- Note:** 1. Operation is possible in any direction other than the axial direction (indicated by the arrow ↓).
 2. Use only the area within the top 30 mm of the rod as the operating part. (Do not use the area that falls within 80 mm from the mounting hole as the operating part. Using this area may cause damage to the nylon rod.)

Flexible Rod (Steel Wire)

Z-15HNJS55-B

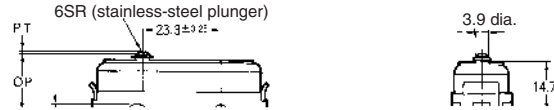
OF max.	0.15 N {15 gf}
PT max.	(25 mm)



- Note:** 1. Operation is possible in any direction other than the axial direction (indicated by the arrow ↓).
 2. Use only the area within the top 30 mm of the rod as the operating part. (Do not use the area that falls within 100 mm from the mounting hole as the operating part. Using this area may cause damage to the steel wire.)
 3. The steel wire can be replaced if damaged. (Model: Lever for HNJS55)

Basic Models (Drip-proof) with Terminal Protective Cover

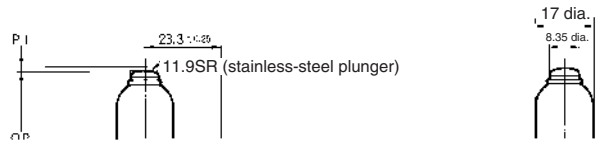
Pin Plunger
Z-15GA55-B5V



4.36^{+0.1}_{-0.05} dia. 4.2^{+0.075}_{-0.025} dia. hole

OF max.	2.45 to 4.22 N {250 to 431 gf}
RF min.	1.12 N {114 gf}
PT max.	2.2 mm
OT min.	0.13 mm
MD max.	0.06 mm
OP	15.9±0.4 mm

Z-15GK3A55-B5V

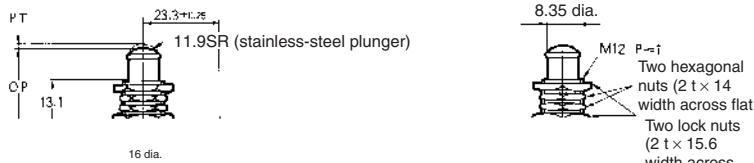


4.2^{+0.075}_{-0.025} dia. hole

4.36^{+0.1}_{-0.05} dia.

OF max.	5.30 N {541 gf}
RF min.	1.12 N {114 gf}
PT max.	2.4 mm
OT min.	3.5 mm
MD max.	0.06 mm
OP	37.8±1.2 mm

Panel Mount Plunger
Z-15GQA55-B5V

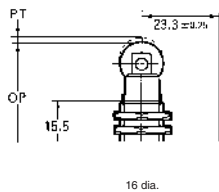


4.36^{+0.1}_{-0.05} dia. 4.2^{+0.075}_{-0.025} dia. hole

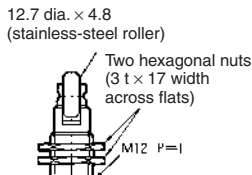
OF max.	5.30 N {541 gf}
RF min.	1.12 N {114 gf}
PT max.	1.8 mm
OT min.	5.5 mm
MD max.	0.06 mm
OP	21.8±0.8 mm

Note: Do not use the M12 mounting screw and the case mounting hole at the same time, or the case may be damaged.

Panel Mount Roller Plunger
Z-15GQ22A55-B5V

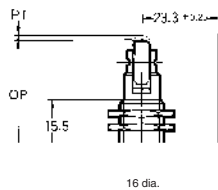


4.36^{+0.1}_{-0.05} dia.

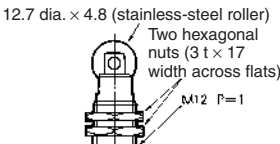


OF max.	5.30 N {541 gf}
RF min.	1.12 N {114 gf}
PT max.	1.8 mm
OT min.	3.58 mm
MD max.	0.06 mm
OP	33.4±1.2 mm

Panel Mount Cross-roller Plunger
Z-15GQ21A55-B5V



4.36^{+0.1}_{-0.05} dia. 4.2^{+0.075}_{-0.025} dia. hole



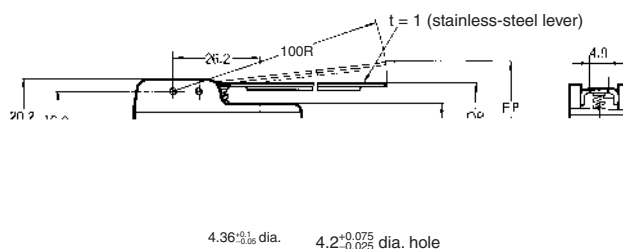
be damaged.

OF max.	5.30 N {541 gf}
RF min.	1.12 N {114 gf}
PT max.	1.8 mm
OT min.	3.58 mm
MD max.	0.06 mm
OP	33.4±1.2 mm

Note: Do not use the M12 mounting screw and the case mounting hole at the same time, or the case may be damaged.

Long Hinge Lever

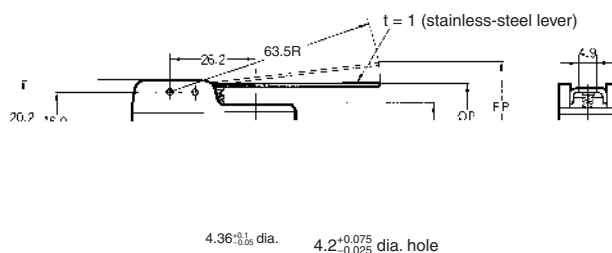
Z-15GW44A55-B5V



OF max.	0.88 N {90 gf}
RF min.	1.14 N {116 gf}
OT min.	5.6 mm
MD max.	3.5 mm
FP max.	33 mm
OP	19±1.2 mm

Hinge Lever

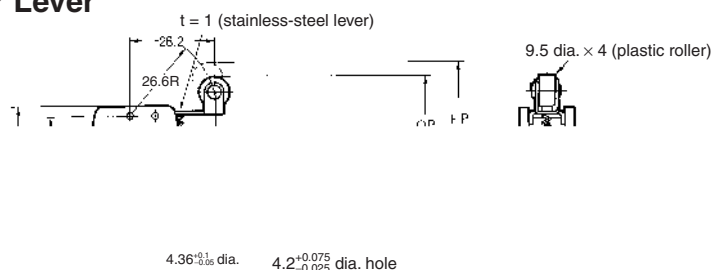
Z-15GWA55-B5V



OF max.	0.98 N {100 gf}
RF min.	0.14 N {14 gf}
OT min.	5.6 mm
MD max.	2 mm
FP max.	28.2 mm
OP	19±0.8 mm

Short Hinge Roller Lever

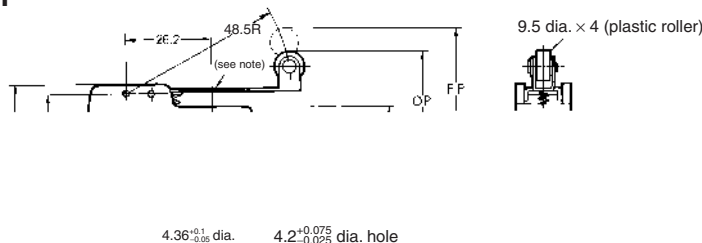
Z-15GW22A55-B5V



OF max.	1.96 N {200 gf}
RF min.	0.41 N {42 gf}
OT min.	2.4 mm
MD max.	0.8 mm
FP max.	32.9 mm
OP	30.2±0.4 mm

Hinge Roller Lever

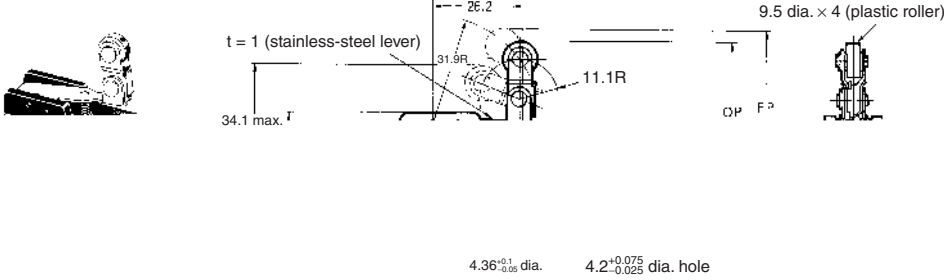
Z-15GW2A55-B5V



OF max.	1.27 N {130 gf}
RF min.	0.21 N {21 gf}
OT min.	4 mm
MD max.	1.6 mm
FP max.	36.5 mm
OP	30.2±0.8 mm

Note: t = 1 (stainless-steel lever)

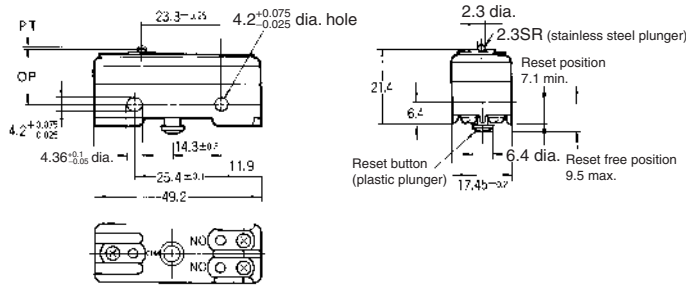
Unidirectional Short Hinge Roller Lever Z-15GW2277A55-B5V



OF max.	1.77 N {181 gf}
RF min.	0.49 N {50 gf}
OT min.	2.4 mm
MD max.	0.8 mm
FP max.	43.6 mm
OP	41.3±0.8 mm

Maintained-contact Models

Pin Plunger Z-15ER



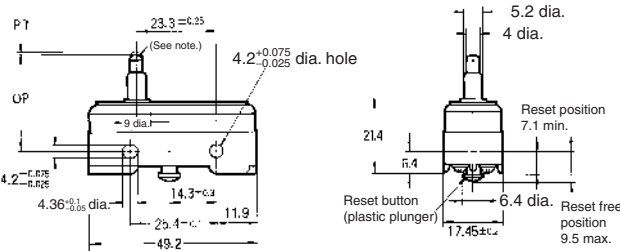
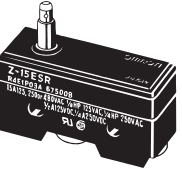
Plunger

OF max.	1.96 to 2.50 N {200 to 255 gf}
PT max.	0.4 mm
OT min.	0.13 mm
OP	15.9±0.4 mm

Reset Button

OF max.	0.55 to 2.79 N {56 to 285 gf}
OT min.	0.4 mm

Slim Spring Plunger Z-15ESR



Note: Stainless steel plunger (tip only, flat, R1 bevel).

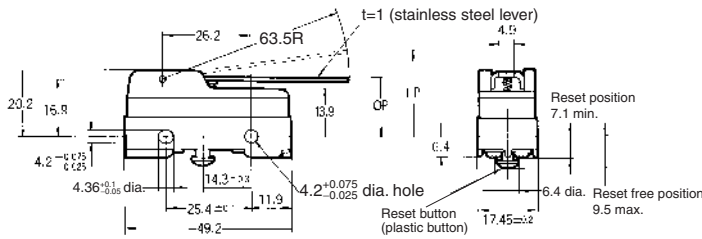
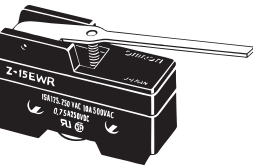
Plunger

OF max.	2.65 N {270 gf}
PT max.	0.4 mm
OT min.	1.6 mm
OP	28.2±0.5 mm

Reset Button

OF max.	2.79 N {285 gf}
OT min.	0.4 mm

Hinge Lever Z-15EWR



Lever Tip

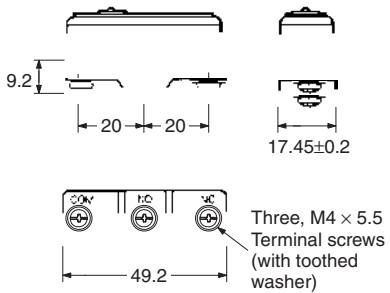
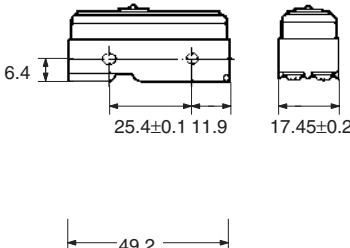
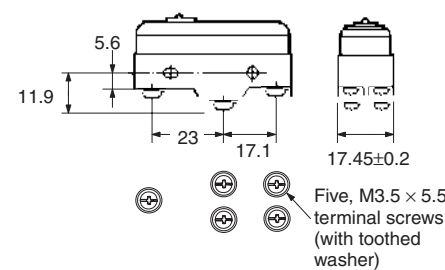
OF max.	0.54 N {55 gf}
OT min.	5.6 mm
FP max.	28.2 mm
OP	19±0.8 mm

Reset Button

OF max.	2.94 N {0.3 gf}
OT min.	0.4 mm

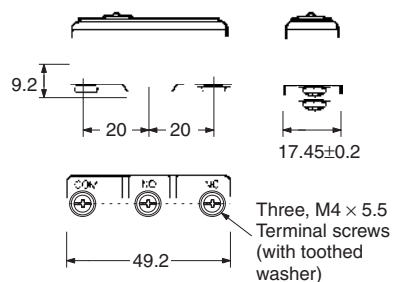
Terminals

Basic Models (General-purpose) & Split-contact Models

Basic (General-purpose) Models		Split-contact Models
<p>Screw Terminals (-B)</p>  <p>Three, M4 × 5.5 Terminal screws (with toothed washer)</p> <p>Appropriate terminal screw tightening torque: 0.78 to 1.18 N·m {8 to 12 kgf·cm}.</p>	<p>Solder Terminal</p> 	<p>Screw Terminals (Y-B)</p>  <p>Five, M3.5 × 5.5 terminal screws (with toothed washer)</p> <p>Appropriate terminal screw tightening torque: 0.49 to 0.78 N·m {5 to 8 kgf·cm}.</p>
<p>Note: With reverse action models (Z-15GM), the positions of NO and NC terminals are reversed.</p>		<p>Note: With reverse action models (Z-10FM), the positions of NO and NC terminals are reversed.</p>

Basic Models (Drip-proof) without Terminal Protective Cover

Without Terminal Protective Cover



Note: With reverse action models (Z-15GM), the positions of NO and NC terminals are reversed.

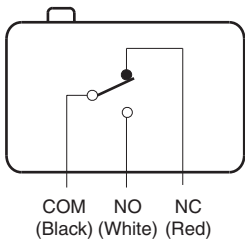
Molded Terminals (Drip-proof Type/Molded Terminal)

Model Number Legend

Z-□55-M□□□M
1 2 3 4

- 1. Drip-proof Type
- 2. Lead Outlets
None: VSF
19: VCT
- 3. Directions of Lead Outlets
Refer to the following diagrams.
- 4. Length of Lead Outlets
0.5: 0.5 m
1: 1 m
2: 2 m
3: 3 m

Contact Form

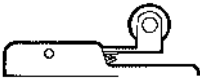


Note: With the reverse action model (Z-15GM), the positions of NO and NC terminals are reversed.

Dimensions

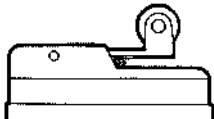
L/R Type

(The following illustration is the R type.)



Lead wire	a	b	d
VSF	12	4	13
VCT	19	11	20

D Type



Lead wire	a	b	d
VSF	12	4	12
VCT	19	11	16

Lead Wire Specifications

Lead wire	Nominal cross-sectional area (mm ²)	Finished outer diameter (mm)	Connection to terminal	Length (m)
VSF (single-core, vinyl cord)	1.25	Approx. 3.1 dia.	Black: COM	0.5, 1, 2, 3
VCT (vinyl-insulated cable)		Three-core: approx. 10.5 dia.	White: NO Red: NC	

Note: No models with molded terminals are approved by UL, CSA, or TÜV.

Precautions

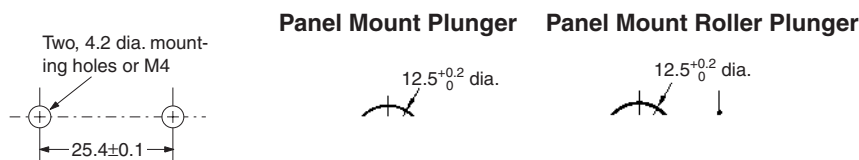
Refer to the *Technical Information for Basic Switches* (Cat. No. C122) for common precautions.

■ Correct Use

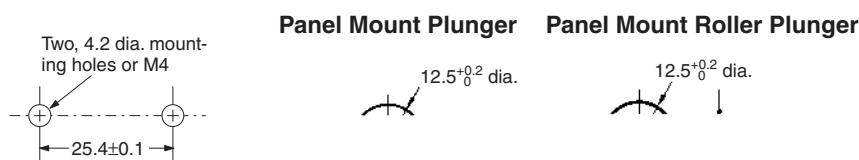
Mounting

Use M4 screws with plane washers and spring washers to mount the Switch. Tighten each mounting screw securely to a torque of 1.18 to 1.47 N·m {12 to 15 kgf·cm}.

Basic Models (General-purpose) & Split-contact Models



Basic Models (Drip-proof) without Terminal Protective Cover



Panel Mount Switch (Z-15□Q□, Z-01□Q□)

When mounting the panel mount plunger model with screws on a side surface, be careful of the dog angle and operation speed. Excessive dog angle or operation speed may damage the Switch.

The Switch can be panel mounted, provided that the hexagonal nut of the actuator is tightened to a torque of 2.94 to 4.9 N·m {30 to 50 kgf·cm}.

When using the panel mount plunger model mounted with screws on a side surface, be careful not to apply a large shock. Applying a shock exceeding 100G may damage the Switch.

When using the panel mount plunger model mounted with screws on a side surface, remove the hexagonal nuts from the actuator.

High-sensitivity Switch (Z-15H)

When using the Switch in a DC circuit, be sure to provide an arc suppressor as well because the small contact gap of the Switch may result in contact troubles.

In an application where a high repeat accuracy is required, limit the current that flows through the Switch to within 0.1 A. Also, use a relay to control a high-capacity load if the Switch is connected to such a load. (In this case, the exciting current of the relay coil is the load of the Switch.)

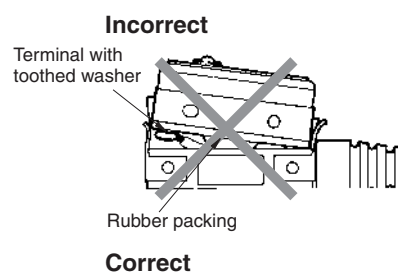
Do not apply a force of 19.6 N {2 kgf} or higher to the pin plunger.

Exercise care that the environment conditions such as temperature and humidity do not change abruptly.

Models with Drip-proof Terminal Cover (Z-□A55-B5V)

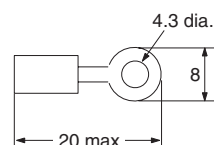
Wiring

To attach the Protective Cover to the case, hold the cover in almost parallel to the case and then push it to the case. If the cover is pushed diagonally, the rubber packing may slip off, degrading the sealability of the Switch.



Use round solderless terminals having the following dimensions to connect leads to the terminals. Tighten the screws of terminals to a torque of 0.78 to 1.18 N·m {8 to 12 kgf·cm}.

Use the terminal shown below.



A cable 8.5 to 10.5 mm in diameter can be applicable to the sealing rubber of the lead outlet of the Switch. A two-core or three-core VCT cable having a cross-sectional area of 1.25 mm² is especially suitable for this.

Use M4 small screws with spring toothed washer are used as the terminal screws.

Drip-proof Switch (Z□55)

The Switch is not perfectly oil-tight; so do not dip it in oil or water.
The rubber boots are made from weather-resistive chloroprene rubber.
Do not use Basic Switches in places with radical changes in temperature.

Split-contact Switch (Z-10F□Y)

The applicable current varies depending on how the contacts are used. If the Switch is connected in series, the Switch can endure a current 1.5 to 2 times higher than the current that can be applied in parallel connection.

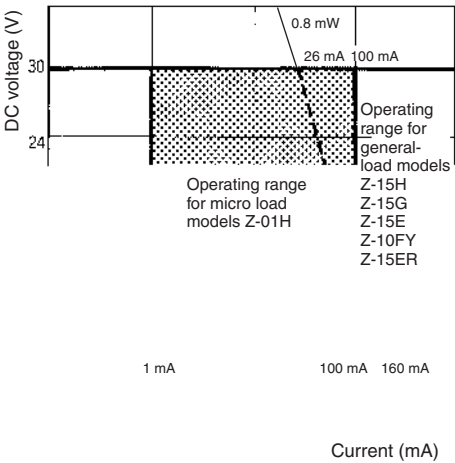
Flexible Rod Switch (Z-15□NJ□55, Drip-proof)

When the rod is fully swung, the Switch may operate when the lever returns, causing chattering. Use a circuit that compensates for chattering wherever possible.
Do not switch the rod to the fullest extent when the Switch is to break a power circuit because such a practice may cause metal deposition to occur between the mating contacts of the Switch.

Micro Load Applicable Range

Using a model for ordinary loads to open or close the contact of a micro load circuit may result in faulty contact. Use models that operate in the following range. However, even when using micro load models within the operating range shown here, if inrush current occurs when the contact is opened or closed, it may increase contact wear and so decrease life expectancy. Therefore, insert a contact protection circuit where necessary.

The minimum applicable load is the N-level reference value. This value indicates the malfunction reference level for the reliability level of 60% (λ 60). The equation, λ 60 = 0.5×10^{-6} /operations indicates that the estimated malfunction rate is less than 1/2,000,000 operations with a reliability level of 60%.



Item	Z-01H	Z-15□, Z-10FY
Minimum applicable load	1 mA at 5 VDC	160 mA at 5 VDC

Others

Do not apply an excessive force to the mounting bracket with a screwdriver or a similar object when attaching or detaching the protective cover; otherwise, the cover will be deformed.



This terminal protective cover cannot be used with models whose model number does not have the prefix “-B5V.”
Terminal protective covers can be ordered separately for maintenance use.

Accessories (Order Separately)

Refer to *Z/A/X/DZ Common Accessories* for details about Terminal Covers, Separators, and Actuators.

ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.
To convert millimeters into inches, multiply by 0.03937. To convert grams into ounces, multiply by 0.03527.