













## 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.
- A number of switch units may be ganged for application.
- Pre-wired molded terminal models are available.
- Requires less operating force than conventional limit switches.
- Long life expectancy and economical.

### Ordering Information

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

### Specifications

#### ■ Ratings

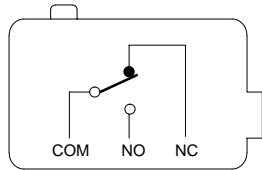
Rated voltage	Non-inductive load				Inductive load				Inrush current	
	Resistive load		Lamp load		Inductive load		Motor load		NC	NO
	NC	NO	NC	NO	NC	NO	NC	NO		
125 VAC	10 A		3 A	1.5 A	10 A		5 A	2.5 A	30 A max.	15 A max.
250 VAC	10 A		2.5 A	1.25 A	10 A		3 A	1.5 A		
8 VDC	10 A		3 A	1.5 A	6 A		5 A	2.5 A		
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		0.05 A		0.05 A			
250 VDC	0.25 A		0.2 A		0.03 A		0.03 A			

- Note:**
1. Inductive loads have 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

<b>Operating speed</b>	0.05 mm to 0.5 m/s (at pin plunger)
<b>Operating frequency</b>	Mechanical: 120 operations/min Electrical: 20 operations/min
<b>Insulation resistance</b>	100 MΩ min. (at 500 VDC)
<b>Contact resistance</b>	15 mΩ max.(initial)
<b>Dielectric strength</b>	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
<b>Vibration resistance</b>	Malfunction: 10 to 55 Hz, 1.5-mm double amplitude
<b>Shock resistance</b>	Destruction: 1,000 m/s <sup>2</sup> (approx. 100G) Malfunction: 300 m/s <sup>2</sup> (approx. 30G)
<b>Ambient temperature</b>	Operating: -10°C to 80°C (with no icing)
<b>Ambient humidity</b>	Operating: 35% to 95%
<b>Life expectancy</b>	Mechanical: 10,000,000 operations min. (at rated OT value) Electrical: See "Engineering Data".
<b>Enclosure ratings</b>	NEMA: 1, 2, 3, 4, and 5 IEC: IP67 JIS: Jet-proof construction Immersion-proof type
<b>Weight</b>	Approx. 110 g (at panel mount plunger)

### Contact Configuration



## ■ Operating Characteristics

Model	ZC-D55	ZC-Q55	ZC-Q2255	ZC-Q2155	ZC-N2255	ZC-N2155
<b>OF max.</b>	11.77 N (1,200 gf)	11.77 N (1,200 gf)			6.86 N (700 gf)	
<b>RF min.</b>	4.90 N (500 gf)	4.90 N (500 gf)			1.67 N (170 gf)	
<b>PT max.</b>	1.5 mm	1.5 mm			1.5 mm	
<b>OT min.</b>	2.4 mm	3 mm			2.5 mm	
<b>MD max.</b>	0.2 mm	0.2 mm			0.2 mm	
<b>OP</b>	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
<b>OF max.</b>	3.92 N (400 gf)	2.75 N (280 gf)	3.92 N (400 gf)	2.75 N (280 gf)	3.92 N (400 gf)	2.75 N (280 gf)
<b>RF min.</b>	0.78 N (80 gf)	0.59 N (60 gf)	0.78 N (80 gf)	0.59 N (60 gf)	0.78 N (80 gf)	0.59 N (60 gf)
<b>PT max.</b>	5 mm (see note)	7 mm (see note)	5 mm (see note)	7 mm (see note)	5 mm (see note)	7 mm (see note)
<b>OT min.</b>	6 mm	8.4 mm	6 mm	8.4 mm	6 mm	8.4 mm
<b>MD max.</b>	1 mm	1.4 mm	1 mm	1.4 mm	1 mm	1.4 mm
<b>OP</b>	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
<b>FP max.</b>	34.7 mm	36.7 mm	49.2 mm	51.3 mm	59.2 mm	61.2 mm

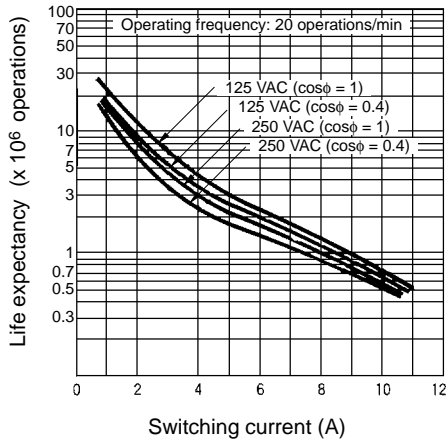
**Note:** Reference values

## ■ Approved Standards

**UL (File No. E76675)/CSA (File No. E45258)**

A300: 0.5 A at 125 VDC, 0.25 A at 250 VDC (excepting molded terminal model)

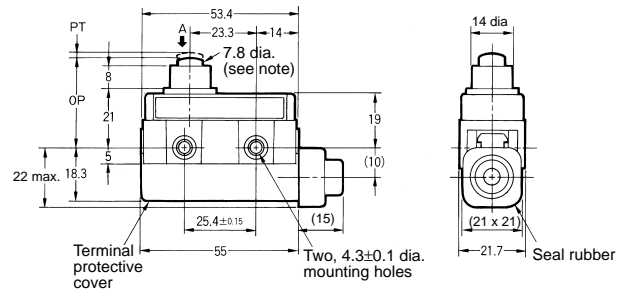
## Electrical Life Expectancy



## Dimensions

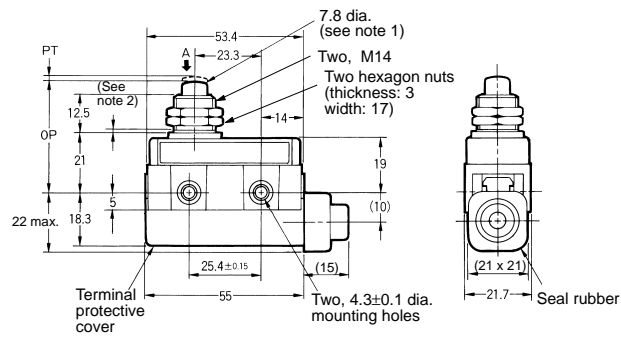
- Note:**
- All units are in millimeters unless otherwise indicated.
  - Unless otherwise specified, a tolerance of  $\pm 0.4$  mm applies to all dimensions.

### ZC-D55



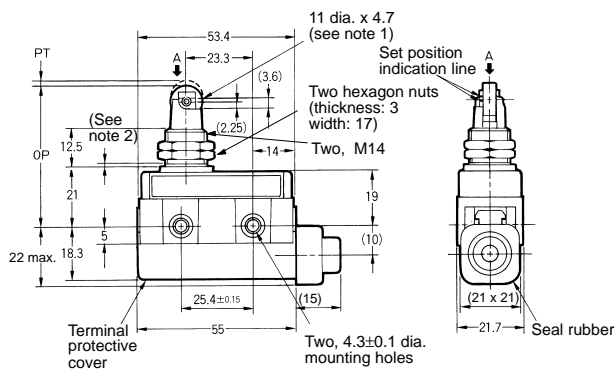
**Note:** Stainless steel plunger

### ZC-Q55



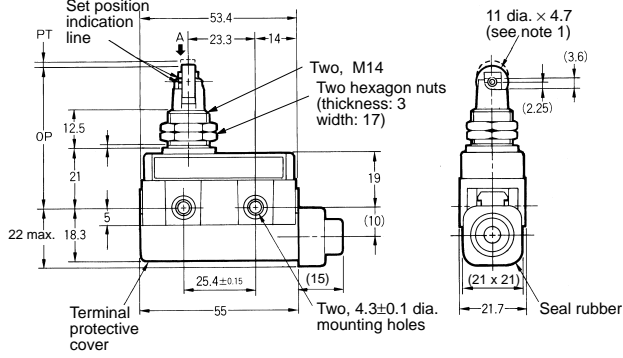
- Note:**
- Stainless steel plunger
  - The length of the imperfect threads is 1.5 mm maximum.

**ZC-Q2255**



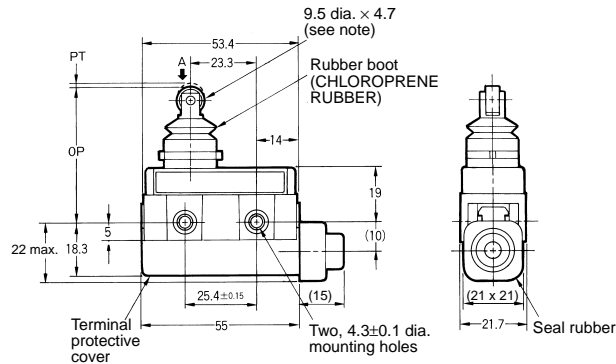
- Note:**
1. Stainless steel roller
  2. The length of the imperfect threads is 1.5 mm maximum.

**ZC-Q2155**



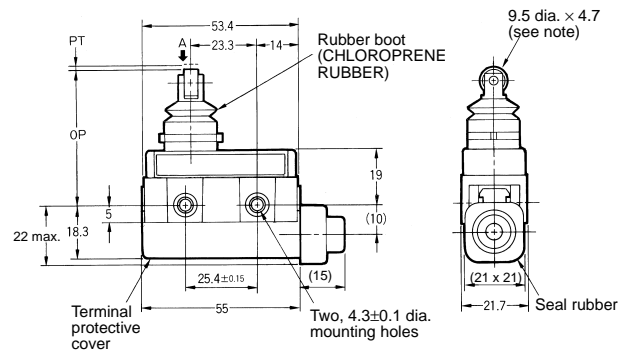
- Note:**
1. Stainless steel roller
  2. The length of the imperfect threads is 1.5 mm maximum.

**ZC-N2255**



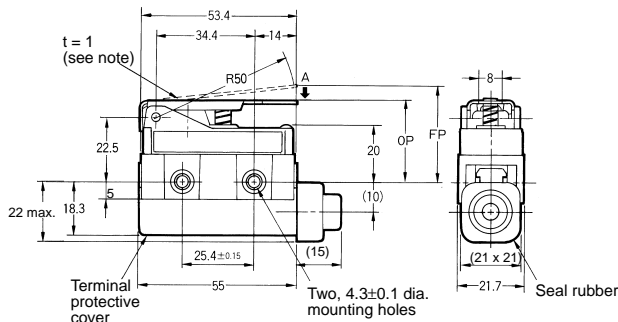
- Note:** Stainless steel roller

**ZC-N2155**



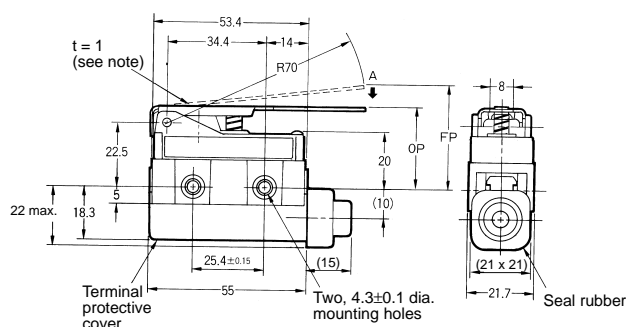
- Note:** Stainless steel roller

**ZC-W55**



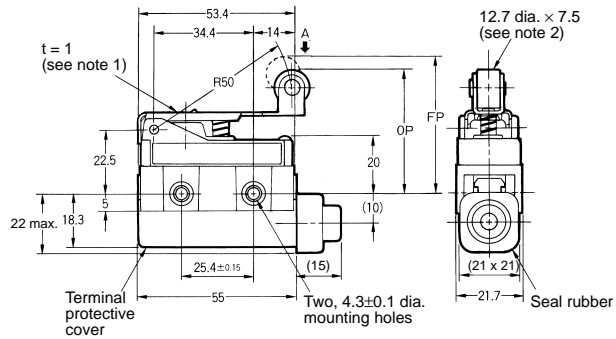
- Note:** Stainless steel lever

ZC-W155



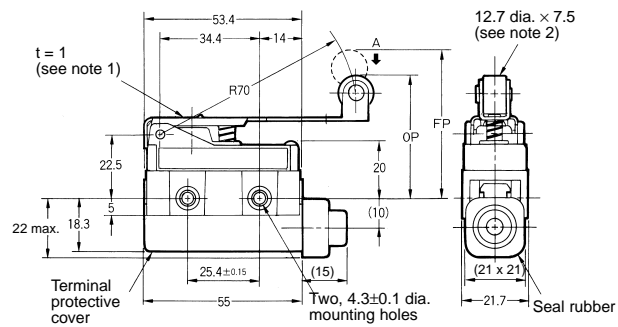
Note: Stainless steel lever

ZC-W255



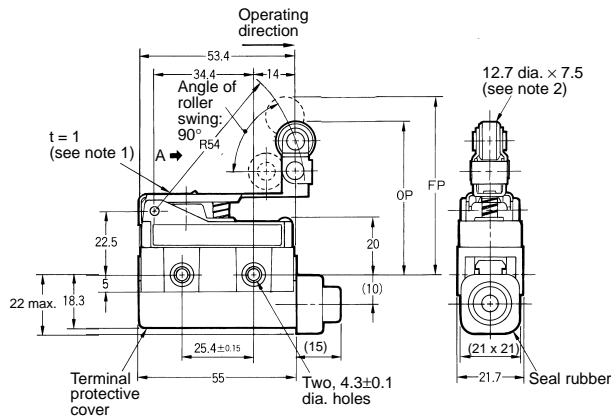
Note: 1. Stainless steel lever  
2. Stainless steel roller

ZC-W2155



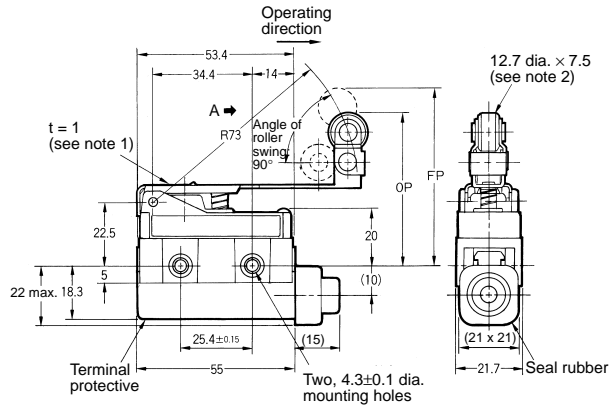
Note: 1. Stainless steel lever  
2. Stainless steel roller

ZC-W355



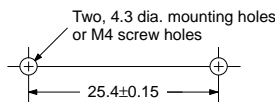
Note: 1. Stainless steel lever  
2. Stainless steel roller

ZC-W3155



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

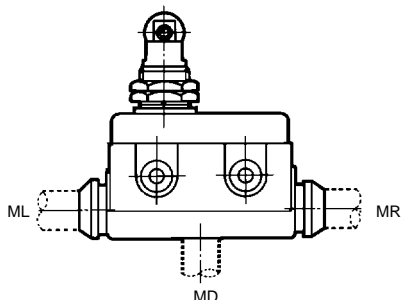
## Mounting Holes



## 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.



### Ordering Information

**Note:** When placing your order for the switch, specify the required length of V.S.F. or V.C.T. cable in addition to the model number of the switch.

**Example:**

Standard type: ZC-Q2155  
Location of lead output: Underside

Pre-wired terminals: COM and NO  
Length of lead: 1 m (V.C.T. lead)

When placing your order for the above switch, specify the model number as ZC-Q2155-MD3 (VCT 1 m).

#### Suffix by Location of Lead Outlet

Location of lead output	Suffix for pre-wired terminal		
	COM, NC, NO	COM, NC	COM, NO
Right-hand	ZC-□-MR	ZC-□-MR2	ZC-□-MR3
Left-hand	ZC-□-ML	ZC-□-ML2	ZC-□-ML3
Underside	ZC-□-MD	ZC-□-MD2	ZC-□-MD3

### Lead Supplies

Leads	Nominal cross-sectional area	No. of component wires/ component wire diameter	Finished outside diameter		Terminal connections	Standard length
V.S.F. (single-conductor vinyl cable)	1.25 mm <sup>2</sup>	50/0.18 dia.	3.1 mm dia.		Black: COM White: NO Red: NC	1, 3, 5 m
V.C.T. (vinyl cabtyre cable)			2 conductors	3 conductors		
			9.6 mm dia.	10.5 mm dia.		

## Operation Indicator Equipped Model

All the models can be equipped upon request with a 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.

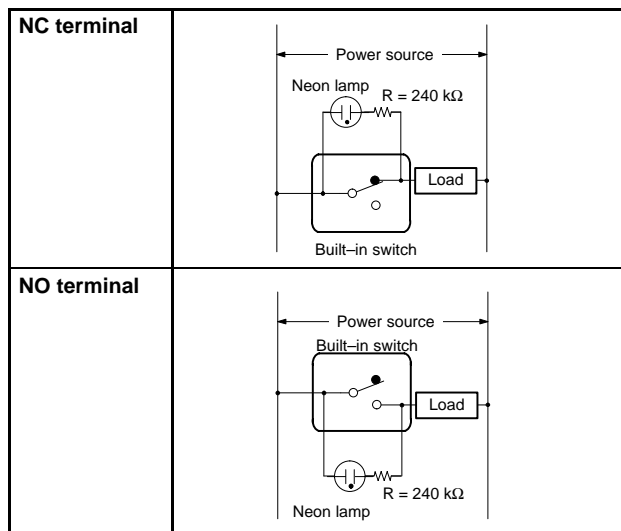
The dimensions are the same as the standard type. The top of the terminal protective cover is transparent to allow checking the operation easily.

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

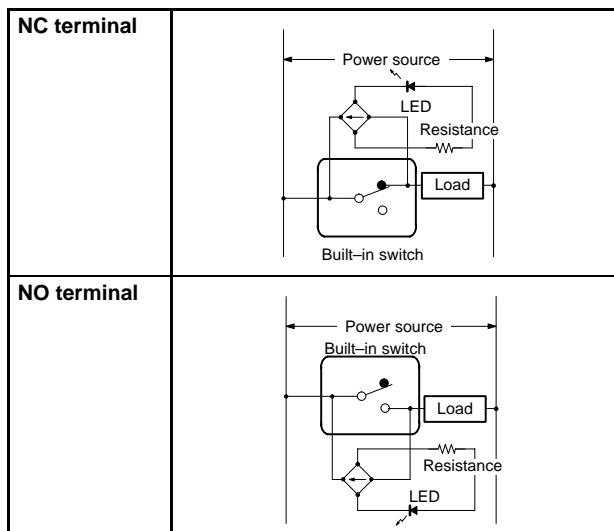
### Contact Circuit



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

Contact	Neon lamp	Load	Actuator
<b>NC</b>	ON	Does not operate	Operates
	OFF	Operates	Does not operate
<b>NO</b>	ON	Does not operate	Operates
	OFF	Operates	Does not operate

### 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
<b>NC</b>	ON	Does not operate	Operates
	OFF	Operates	Does not operate
<b>NO</b>	ON	Does not operate	Operates
	OFF	Operates	Does not operate

### 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.

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	4.2 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

**ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.**

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