

## Compact, General-purpose Horizontal Switches.




### Models for Microloads Added to Series

- Approved by EN, UL, CSA, and CCC (Chinese standard). (Ask your OMRON representative for information on approved models.)
- Incorporates a switch with a durable coil spring in a tough, high-precision case.
- Compact and uses a single basic switch for applications where strength is required.
- Models for microloads and models with operation indicators added to series.
- Terminal protective cover can be switched to wire cable from either the left or right.
- Sealing characteristics that meet IEC IP67 degree of protection.













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

 Be sure to read *Safety Precautions* on page 7 and *Safety Precautions for All Limit Switches*.

## Ordering Information

### Switches

Actuator	Type	Standard	Micro load
		Model	Model
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

Actuator	Type	Standard	Micro load
		Model	Model
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

Note: Models are also available with molded terminals and with molded terminals and operation indicators. Refer to page 6.

## Molded Terminal Models with Wire Cable

### Without Operation Indicator

Location of lead outlet	Actuator	Type	Standard	Micro load
			Model	Model
Right-hand	Plunger		SHL-D55-MR VCTF 3M	SHL-D55-01MR VCTF 3M
	Panel mount plunger		SHL-Q55-MR VCTF 3M	SHL-Q55-01MR VCTF 3M
	Panel mount roller plunger		SHL-Q2255-MR VCTF 3M	SHL-Q2255-01MR VCTF 3M
	Panel mount crossroller plunger		SHL-Q2155-MR VCTF 3M	SHL-Q2155-01MR VCTF 3M
	Short hinge lever		SHL-W55-MR VCTF 3M	–
	Hinge lever		SHL-W155-MR VCTF 3M	–
	Short hinge roller lever		SHL-W255-MR VCTF 3M	SHL-W255-01MR VCTF 3M
	Hinge roller lever		SHL-W2155-MR VCTF 3M	SHL-W2155-01MR VCTF 3M
Left-hand	Plunger		SHL-D55-ML VCTF 3M	–
	Panel mount roller plunger		SHL-Q2255-ML VCTF 3M	SHL-Q2255-01ML VCTF 3M
	Panel mount crossroller plunger		SHL-Q2155-ML VCTF 3M	–
	Short hinge lever		SHL-W55-ML VCTF 3M	–
	Hinge lever		SHL-W155-ML VCTF 3M	–
	Short hinge roller lever		SHL-W255-ML VCTF 3M	–
	Hinge roller lever		SHL-W2155-ML VCTF 3M	SHL-W2155-01ML VCTF 3M
	One-way action short hinge roller lever		SHL-W355-MR VCTF 3M	–
Underside	Plunger		SHL-D55-MD VCTF 3M	–
	Panel mount plunger		SHL-Q55-MD VCTF 3M	–
	Panel mount roller plunger		SHL-Q2255-MD VCTF 3M	SHL-Q2255-01MD VCTF 3M
	Panel mount crossroller plunger		SHL-Q2155-MD VCTF 3M	–
	Short hinge lever		SHL-W55-MD VCTF 3M	–
	Hinge lever		SHL-W155-MD VCTF 3M	–
	Short hinge roller lever		SHL-W255-MD VCTF 3M	–
	Hinge roller lever		SHL-W2155-MD VCTF 3M	–
One-way action short hinge roller lever		SHL-W355-MD VCTF 3M	–	

### Operation Indicator

Location of lead outlet	Actuator	Type	Standard	Micro load
		Voltage specification*	Model	Model
Right-hand	Plunger	L3	SHL-D55-L3MR VCTF 3M	SHL-D55-01L3MR VCTF 3M
		L4	SHL-D55-L4MR VCTF 3M	–
	Panel mount plunger	L3	SHL-Q55-L3MR VCTF 3M	–
		L4	SHL-Q55-L4MR VCTF 3M	–
	Panel mount roller plunger	L2	SHL-Q2255-L2MR VCTF 3M	–
		L3	SHL-Q2255-L3MR VCTF 3M	SHL-Q2255-01L3MR VCTF 3M
	Panel mount crossroller plunger	L4	SHL-Q2255-L4MR VCTF 3M	SHL-Q2255-01L4MR VCTF 3M
		L3	SHL-Q2155-L3MR VCTF 3M	SHL-Q2155-01L3MR VCTF 3M
	Hinge lever	L4	SHL-Q2155-L4MR VCTF 3M	SHL-Q2155-01L4MR VCTF 3M
		L3	SHL-W155-L3MR VCTF 3M	–
	Short hinge roller lever	L3	SHL-W255-L3MR VCTF 3M	–
		L4	SHL-W255-L4MR VCTF 3M	SHL-W255-01L4MR VCTF 3M
Hinge roller lever	L3	SHL-W2155-L3MR VCTF 3M	–	
	L4	SHL-W2155-L4MR VCTF 3M	SHL-W2155-01L4MR VCTF 3M	
One-way action short hinge roller lever	L4	SHL-W355-L4MR VCTF 3M	–	
Left-hand	Panel mount roller plunger	L3	SHL-Q2255-L3ML VCTF 3M	SHL-Q2255-01L3ML VCTF 3M
		L4	SHL-Q2255-L4ML VCTF 3M	–
	Short hinge lever	L3	SHL-W55-L3ML VCTF 3M	–
		L4	SHL-W155-L4ML VCTF 3M	–
	Hinge lever	L3	SHL-W155-L3ML VCTF 3M	–
		L4	SHL-W155-L4ML VCTF 3M	–
Short hinge roller lever	L3	SHL-W255-L3ML VCTF 3M	–	
	L4	–	SHL-W255-01L4ML VCTF 3M	
Underside	Panel mount roller plunger	L4	SHL-Q2255-L4MD VCTF 3M	SHL-Q2255-01L4MD VCTF 3M
	Short hinge roller lever	L3	SHL-W255-L3MD VCTF 3M	–
		L4	SHL-W255-L4MD VCTF 3M	–
Hinge roller lever	L4	SHL-W2155-L4MD VCTF 3M	–	

\* Refer to Voltage rating for voltage specifications on page 6.

## Specifications

### Approved Standards

Agency	Standard	File No.	Approved models
UL	UL508	E76675	General-purpose models listed on page 1.
CSA	CSA C22.2 No. 14	LR45746	
TÜV Rheinland	EN60947-5-1	J50062486	All SHL models listed in this datasheet.
CCC (CQC)	GB/T14048.5	Contact your OMRON representative for details.	Ask your OMRON representative for information on approved models.

### Ratings

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

### Micro load models

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

### Approved Standard Ratings TÜV (EN60947-5-1), CCC (GB/T14048.5)

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

- Note: "AC-15 2 A/125 V" indicates the following.  
 Application category: AC-16  
 Rated operating current (Ie): 2 A  
 Rated operating voltage (Ue): 125 V

### UL/CSA A300

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

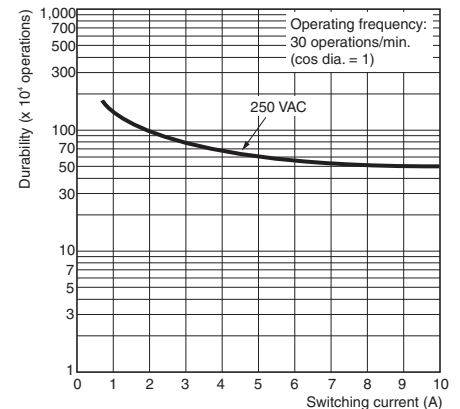
### Characteristics (For SHL-W155)

Degree of protections *1	IP67 (EN60947-5-1)	
Durability *2	Mechanical	10,000,000 operations min.
	Electrical	500,000 operations min.
Operating speed	0.1 mm/s 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 for the built-in switch when tested alone)	
Dielectric strength	Between terminals of the same polarity	1,000 VAC, 50/60 Hz for 1 min
	Between each terminal and non-current-carrying metal part	2,000 VAC, 50/60 Hz for 1 min/Uimp at 2.5 kV (EN60947-5-1)
Rated insulation voltage (Ui)	150 V (EN60947-5-1)	
Pollution degree (operating environment)	3 (EN60947-5-1)	
Short-circuit protective device (SCPD)	10 A fuse type gI or gG (IEC60269)	
Conditional short-circuit current	100 A (EN60947-5-1)	
Conventional enclosed thermal current (Ithe)	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 <sup>2</sup> max.
	Malfunction	300 m/s <sup>2</sup> max.
Ambient operating temperature	-10°C to +80°C (with no icing)	
Ambient operating humidity	35% to 95%RH	
Weight *3	Approx. 62 to 72 g	

### Engineering Data

#### Electrical Durability

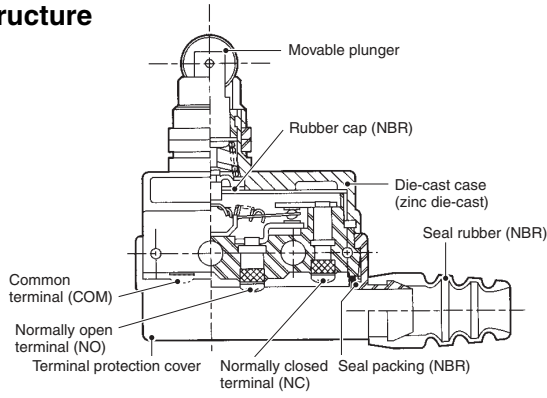
(Ambient temperature: +5°C to +35°C,  
Ambient humidity: 40% to 50%RH)



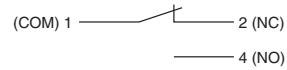
- Note: 1. The figures at the left are initial values.  
 2. The ratings at the left may vary depending on the model. Contact your OMRON representative for further details.  
 \*1. The head section of the plunger type SHL-D(Q)□□ is excluded.  
 \*2. Durability values are calculated at an operating temperature of +5°C to +35°C, and an operating humidity of 40% to 70%RH.  
 \*3. The values are for the plunger-type models.

Structure and Nomenclature

Structure



Contact Form



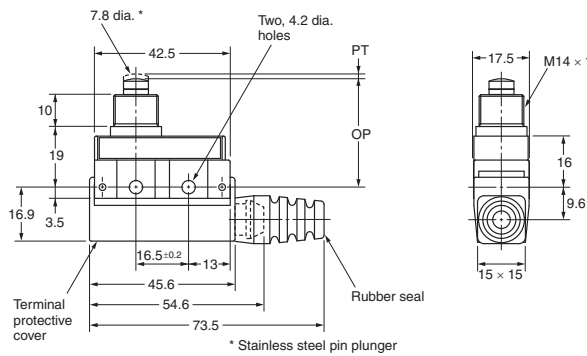
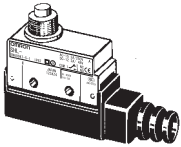
Dimensions and Operating Characteristics

(Unit: mm)

Switches (Note: Omitted dimensions are the same as those of the plunger models.)

Plunger

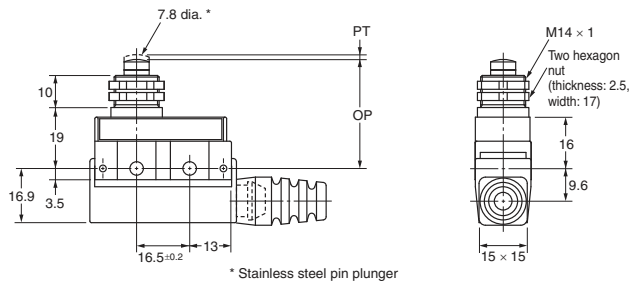
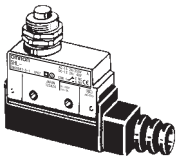
SHL-D55  
SHL-D55-01



Operating Characteristics		Model	SHL-D55 SHL-D55-01
Operating force	OF	max.	9.81 N
Release force	RF	min.	1.96 N
Pretravel	PT	max.	1.5 mm
Overtravel	OT	min.	2 mm
Movement Differential	MD	max.	0.5 mm
Free Position	FP	max.	-
Operating Position	OP		34±0.8 mm

Panel Mount Plunger

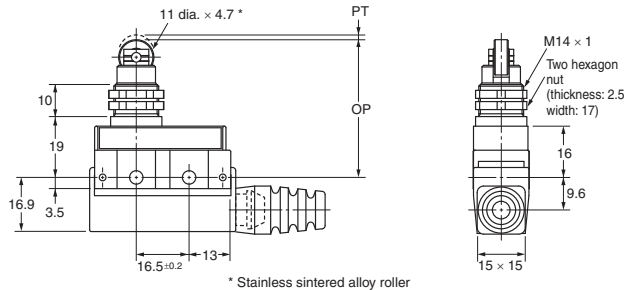
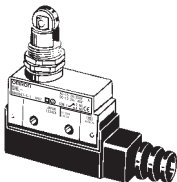
SHL-Q55  
SHL-Q55-01



Operating Characteristics		Model	SHL-Q55 SHL-Q55-01
OF	max.		9.81 N
RF	min.		1.96 N
PT	max.		1.5 mm
OT	min.		2 mm
MD	max.		0.5 mm
FP	max.		-
OP			34±0.8 mm

Panel Mount Roller Plunger

SHL-Q2255  
SHL-Q2255-01

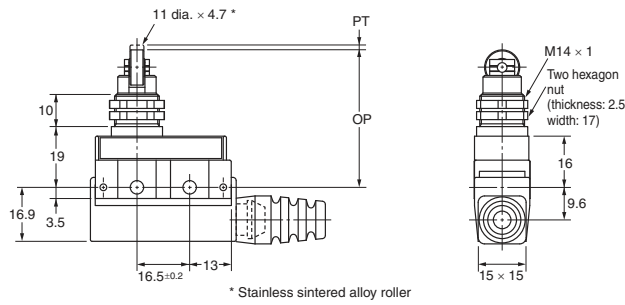
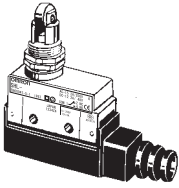


Operating Characteristics		Model	SHL-Q2255 SHL-Q2255-01
OF	max.		9.81 N
RF	min.		1.96 N
PT	max.		1.5 mm
OT	min.		2 mm
MD	max.		0.5 mm
FP	max.		-
OP			43±0.8 mm

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

Panel Mount Crossroller Plunger

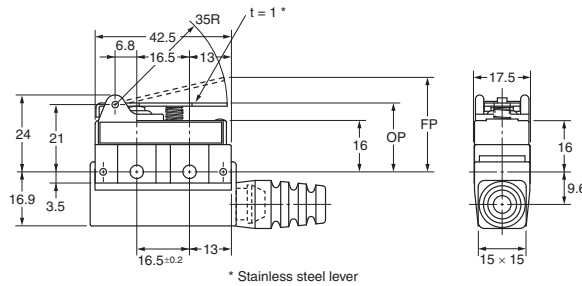
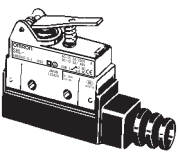
SHL-Q2155  
SHL-Q2155-01



Model		SHL-Q2155 SHL-Q2155-01
<b>Operating Characteristics</b>		
OF	max.	9.81 N
RF	min.	1.96 N
PT	max.	1.5 mm
OT	min.	2 mm
MD	max.	0.5 mm
FP	max.	-
OP	max.	43±0.8 mm

Short Hinge Lever

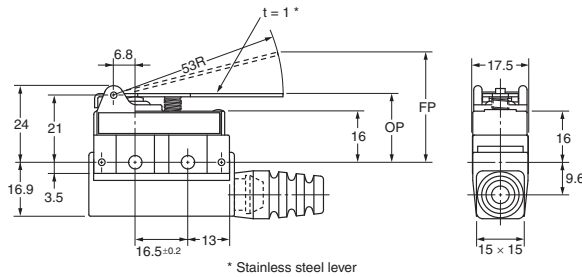
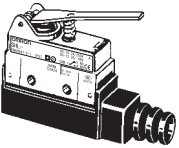
SHL-W55  
SHL-W55-01



Model		SHL-W55 SHL-W55-01
<b>Operating Characteristics</b>		
OF	max.	3.14 N
RF	min.	0.78 N
PT	max.	8 mm
OT	min.	3 mm
MD	max.	2.5 mm
FP	max.	29.5 mm
OP	max.	21.5±1 mm

Hinge Lever

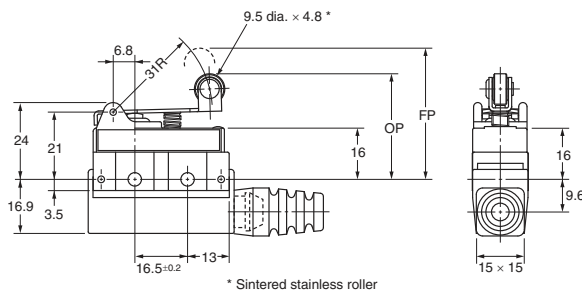
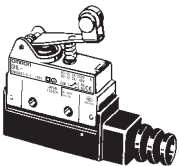
SHL-W155  
SHL-W155-01



Model		SHL-W155 SHL-W155-01
<b>Operating Characteristics</b>		
OF	max.	2.35 N
RF	min.	0.44 N
PT	max.	13 mm
OT	min.	5 mm
MD	max.	4 mm
FP	max.	34.5 mm
OP	max.	21.5±1 mm

Short Hinge Roller Lever

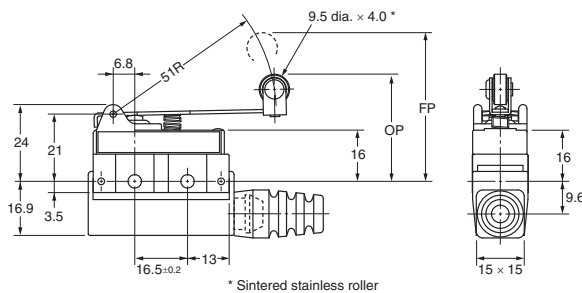
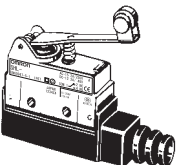
SHL-W255  
SHL-W255-01



Model		SHL-W255 SHL-W255-01
<b>Operating Characteristics</b>		
OF	max.	3.92 N
RF	min.	0.78 N
PT	max.	8 mm
OT	min.	3 mm
MD	max.	2.5 mm
FP	max.	41 mm
OP	max.	33±1 mm

Hinge Roller Lever

SHL-W2155  
SHL-W2155-01

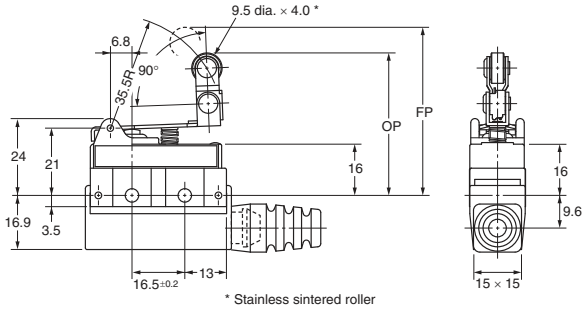
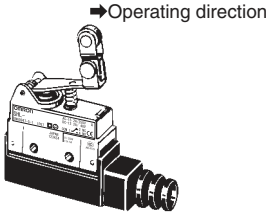


Model		SHL-W2155 SHL-W2155-01
<b>Operating Characteristics</b>		
OF	max.	2.55 N
RF	min.	0.49 N
PT	max.	13 mm
OT	min.	5.5 mm
MD	max.	4 mm
FP	max.	46.5 mm
OP	max.	33.5±1 mm

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

**One-way Action Short Hinge Roller Lever**

SHL-W355  
SHL-W355-01

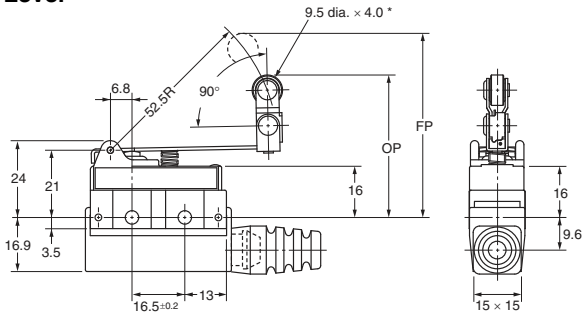
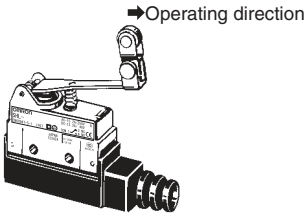


\* Stainless sintered roller

Model		SHL-W355 SHL-W355-01
<b>Operating Characteristics</b>		
OF	max.	3.92 N
RF	min.	0.78 N
PT	max.	8 mm
OT	min.	3 mm
MD	max.	2.5 mm
FP	max.	52.5 mm
OP		44.5±1 mm

**One-way Action Hinge Roller Lever**

SHL-W3155  
SHL-W3155-01



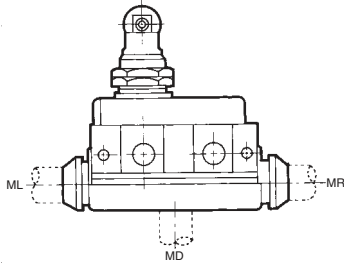
\* Stainless sintered roller

Model		SHL-W3155 SHL-W3155-01
<b>Operating Characteristics</b>		
OF	max.	2.55 N
RF	min.	0.49 N
PT	max.	13 mm
OT	min.	5.5 mm
MD	max.	4 mm
FP	max.	57.5 mm
OP		44.5±1 mm

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

**Molded Terminal Models**

Use of the molded terminal model is recommended in locations subject to excessive dust, oil drips, or moisture. The molded terminal model will have the same dimensions and operating characteristics as the basic model.



Suffix by Location of Lead Outlet

Location of lead outlet (Refer to above figure)	Model (suffix)	
	Terminal	COM, NC, NO
Right-hand	-MR	
Left-hand	-ML	
Underside	-MD	

Note: The above suffixes can be added to the model numbers given on page 1 to specify molded terminals.

**Lead Supplies**

Specifications	VCTF (Vinyl cabtire cable)
Leads	
Nominal cross-sectional area (mm <sup>2</sup> )	0.75
No. of conductors/cond. dia.	30/0.18
External diameter (mm)	3-conductor 7 dia.
Terminal connections	Black: COM White: NO Red: NC
Length (m)	3 (standard)

**Operation 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.

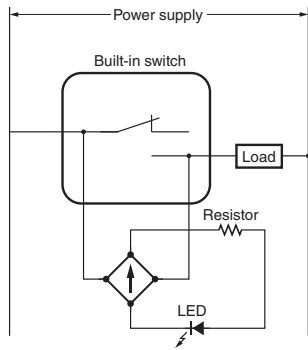
The operation indicator is designed to illuminate when the Switch is not operating. (Because of the molded terminal model, any change to the Switch wiring cannot be made.)

**For DC**

- 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.
- The voltage specifications are given below.
- Voltage ratings of LED indicators are as shown in the table below.

Model	Voltage rating (V)	Leakage current (mA)	Internal resistance (kΩ)
L2	12	Approx. 2.4	4.3
L3	24	Approx. 2	10
L4	24	Approx. 1.2	18

**Contact Circuit**



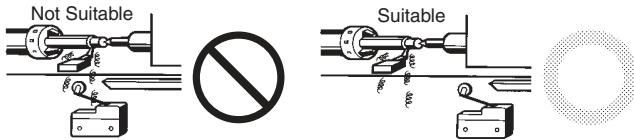
## Safety Precautions

Refer to *Safety Precautions for All Limit Switches*.

### Precautions for Correct Use

#### Operating Environment

- Seal material may deteriorate if a Switch is used outdoor or where subject to special cutting oils, solvents, or chemicals. Always appraise performance under actual application conditions and set suitable maintenance and replacement periods.
- Install Switches where they will not be directly subject to cutting chips, dust, or dirt. The Actuator and Switch must also be protected from the accumulation of cutting chips or sludge.



- Constantly subjecting a Switch to vibration or shock can result in wear, which can lead to contact interference with contacts, operation failure, reduced durability, and other problems. Excessive vibration or shock can lead to false contact operation or damage. Install Switches in locations not subject to shock and vibration and in orientations that will not produce resonance.
- The Switches have physical contacts. Using them in environments containing silicon gas will result in the formation of silicon oxide ( $\text{SiO}_2$ ) due to arc energy. If silicon oxide accumulates on the contacts, contact interference can occur. If silicon oil, silicon filling agents, silicon cables, or other silicon products are present near the Switch, suppress arcing with contact protective circuits (surge killers) or remove the source of silicon gas.

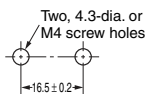
#### Connections

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 Switch under the EN ratings, use a gI or gG 10-A fuse that conforms to IEC60269.

#### Mounting

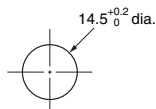
- Secure the Switch with two M4 screws and washers. The tightening torque applied to each terminal must be 1.18 to 1.37 N·m. Tighten the screws to the specified torque. An excessive tightening torque may damage the Switch and cause a malfunction.
- When mounting the panel mount-type Switch with screws on a side surface, remove the hexagonal nuts from the actuator.

##### Mounting Holes

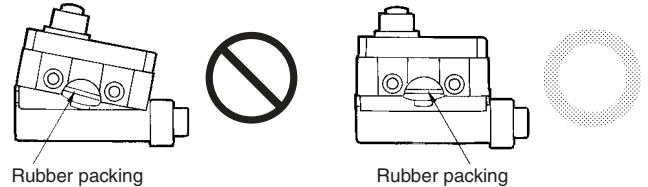


- When mounting the panel mount type (SHL-Q55, SHL-Q2255, or SHL-Q2155) on a panel, tighten the hexagonal nuts of the actuator to a torque less than 4.90 to 7.84 N·m.

##### Mounting Holes



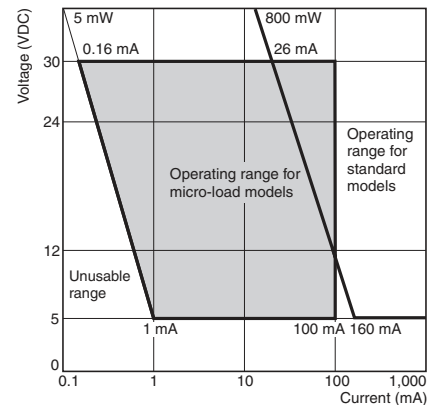
- When mounting the Terminal Protective Cover to the case, align the cover on the case and then press the cover down to mount it firmly. If the cover is pressed down in an inclined position, rubber packing will deform and thus affect the sealing capability.



#### Micro Load Models

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.

##### Micro Load Applicable Ranges



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

#### Tightening Torque

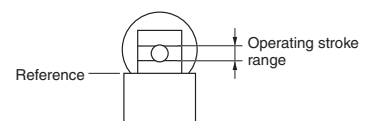
- A loose screw may result in a malfunction. Be sure to tighten each screw to the proper tightening torque as shown below.

No.	Type	Appropriate tightening torque
1	Terminal screw (M3 screw)	0.24 to 0.44 N·m
2	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.



#### 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 mm<sup>2</sup>. (When the sealing capability is required over a long period of time, use mold specifications.)

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