

## 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.

### Switches (Molded Terminal Models)

Without Operation Indicator, Lead Wired on Right

Standard		Micro load	
Model	Model	Model	Model
SHL-D55-MR SHL-Q55-MR SHL-Q2155-MR SHL-Q2255-MR SHL-W55-MR	SHL-W155-MR SHL-W255-MR SHL-W2155-MR SHL-W355-MR	SHL-D55-01MR SHL-Q55-01MR SHL-Q2155-01MR SHL-Q2255-01MR SHL-W55-01MR	SHL-W255-01MR SHL-W2155-01MR

Without Operation Indicator, Lead Wired on Left

Standard		Micro load
Model	Model	Model
SHL-D55-ML SHL-Q2155-ML SHL-Q2255-ML SHL-W55-ML SHL-W155-ML	SHL-W255-ML SHL-W2155-ML	SHL-Q2255-01ML SHL-W2155-01ML

## Without Operation Indicator, Lead Wired from Bottom

Standard		Micro load
Model	Model	Model
SHL-D55-MD SHL-Q55-MD SHL-Q2155-MD SHL-Q2255-MD SHL-W55-MD	SHL-W155-MD SHL-W255-MD SHL-W2155-MD SHL-W355-MD	SHL-Q2255-01MD

## Operation Indicator, Lead Wired on Right

Standard		Micro load
Model	Model	Model
SHL-D55-LMR SHL-Q55-LMR SHL-Q2155-LMR SHL-Q2255-LMR SHL-W155-LMR SHL-W255-LMR SHL-W2155-LMR SHL-D55-L2MR SHL-Q2255-L2MR SHL-D55-L3MR SHL-Q55-L3MR SHL-Q2155-L3MR	SHL-Q2255-L3MR SHL-W155-L3MR SHL-W255-L3MR SHL-W2155-L3MR SHL-D55-L4MR SHL-Q55-L4MR SHL-Q2155-L4MR SHL-Q2255-L4MR SHL-W255-L4MR SHL-W2155-L4MR SHL-W355-L4MR	SHL-Q2255-01LMR SHL-W255-01LMR SHL-D55-01L3MR SHL-Q2155-01L3MR SHL-Q2255-01L3MR SHL-Q2155-01L4MR SHL-Q2255-01L4MR SHL-W255-01L4MR SHL-W2155-01L4MR

## Operation Indicator, Lead Wired on Left

Standard		Micro load
Model	Model	Model
SHL-Q55-LML SHL-Q2255-LML SHL-W155-LML SHL-W255-LML SHL-W2155-LML SHL-Q55-L2ML SHL-Q2255-L3ML	SHL-W55-L3ML SHL-W155-L3ML SHL-W255-L3ML SHL-Q2255-L4ML SHL-W155-L4ML	SHL-W255-01LML SHL-W2155-01LML SHL-Q2255-01L3ML SHL-W255-01L4ML

## Operation Indicator, Lead Wired from Bottom

Standard		Micro load
Model	Model	Model
SHL-Q2255-LMD SHL-W255-LMD SHL-Q55-L3MD	SHL-Q2255-L4MD SHL-W255-L4MD SHL-W2155-L4MD	SHL-Q55-01LMD SHL-Q2255-01L4MD

## 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)	GB14048.5	2003010305072162	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 (GB14048.5)

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 240 VAC	10 A	60 30	6 3	7,200	720

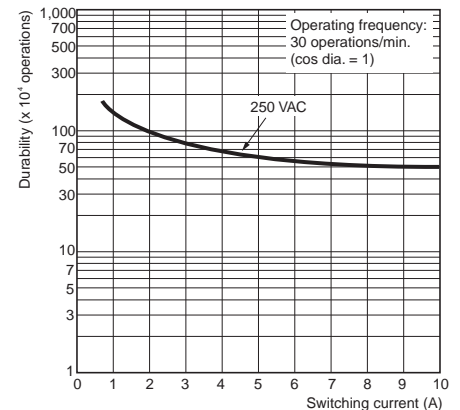
## Characteristics (For SHL-W155)

Degree of protections		IP67 (EN60947-5-1)
Durability	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 (I <sub>th</sub> )		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		Approx. 62 to 72 g

## Engineering Data

### Electrical Durability

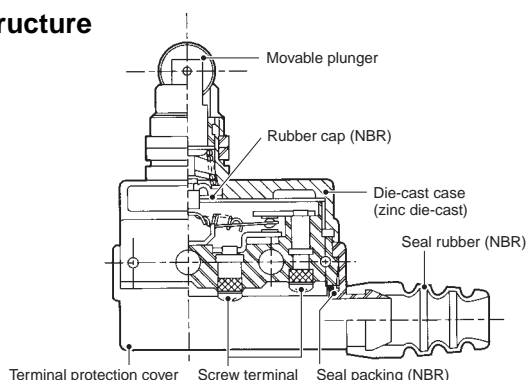
(Ambient temperature: +5°C to +35°C,  
 Ambient humidity: 40% to 50%RH)



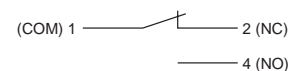
- Note: 1. The figures at the left are initial values.  
 2. The ratings at the left may vary depending on the model. Contact your OMRON representative for further details.  
 \*1. The head section of the plunger type SHL-D(Q)□□ is excluded.  
 \*2. Durability values are calculated at an operating temperature 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

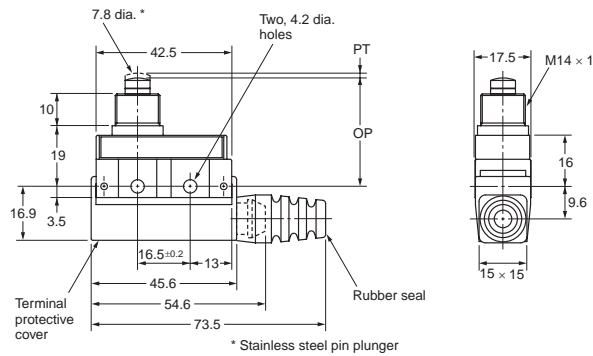
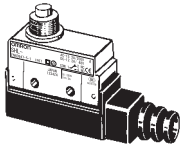


## Dimensions and Operating Characteristics

(Unit: mm)

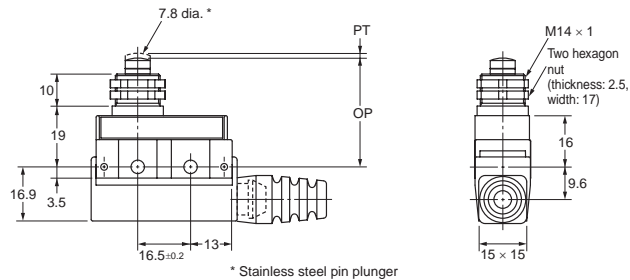
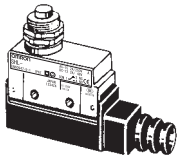
### Switches (Note: Omitted dimensions are the same as those of the plunger models.)

#### Plunger SHL-D55 SHL-D55-01



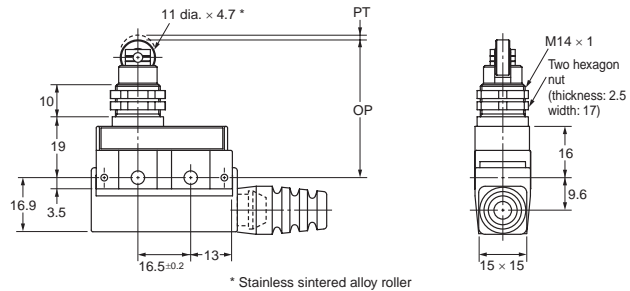
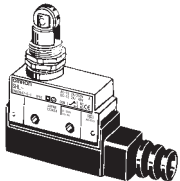
Operating Characteristics		Model	SHL-D55 SHL-D55-01
Operating force	OF	max.	9.81 N
Release force	RF	min.	1.96 N
Pretravel	PT	max.	1.5 mm
Overtravel	OT	min.	2 mm
Movement Differential	MD	max.	0.5 mm
Free Position	FP	max.	—
Operating Position	OP		34±0.8 mm

#### Panel Mount Plunger SHL-Q55 SHL-Q55-01



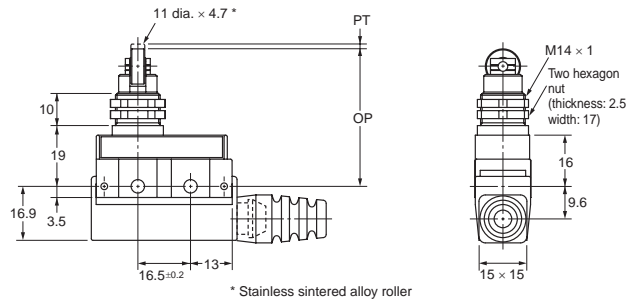
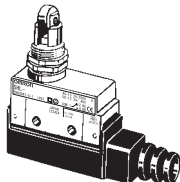
Operating Characteristics		Model	SHL-Q55 SHL-Q55-01
OF	max.		9.81 N
RF	min.		1.96 N
PT	max.		1.5 mm
OT	min.		2 mm
MD	max.		0.5 mm
FP	max.		—
OP			34±0.8 mm

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



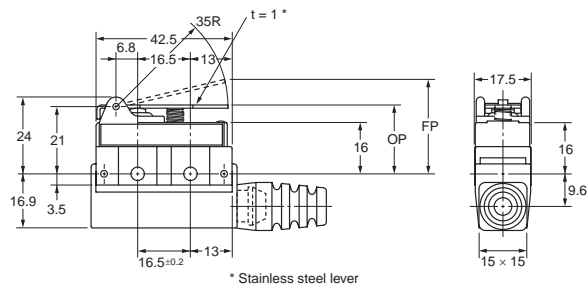
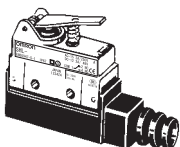
Operating Characteristics		Model	SHL-Q2255 SHL-Q2255-01
OF	max.		9.81 N
RF	min.		1.96 N
PT	max.		1.5 mm
OT	min.		2 mm
MD	max.		0.5 mm
FP	max.		—
OP			43±0.8 mm

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



Operating Characteristics		Model	SHL-Q2155 SHL-Q2155-01
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

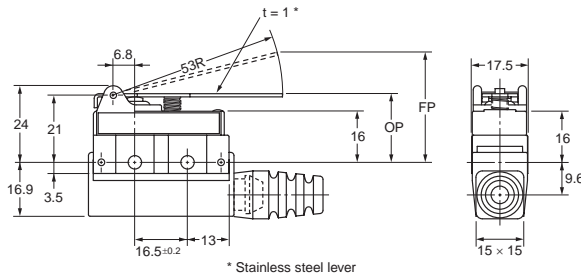
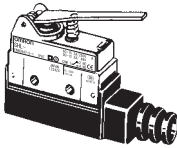
#### Short Hinge Lever SHL-W55 SHL-W55-01



Operating Characteristics		Model	SHL-W55 SHL-W55-01
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			21.5±1 mm

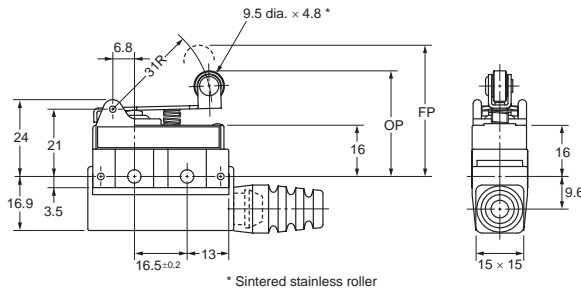
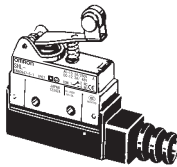
Note: Unless otherwise specified, a tolerance of ±0.4 mm applies to all dimensions.

**Hinge Lever**  
**SHL-W155**  
**SHL-W155-01**



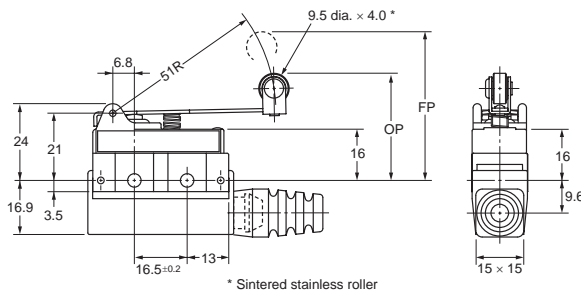
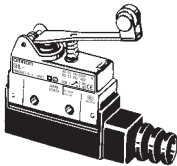
Model		SHL-W155
Operating Characteristics		SHL-W155-01
OF	max.	2.35 N
RF	min.	0.44 N
PT	max.	13 mm
OT	min.	5 mm
MD	max.	4 mm
FP	max.	34.5 mm
OP		21.5±1 mm

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



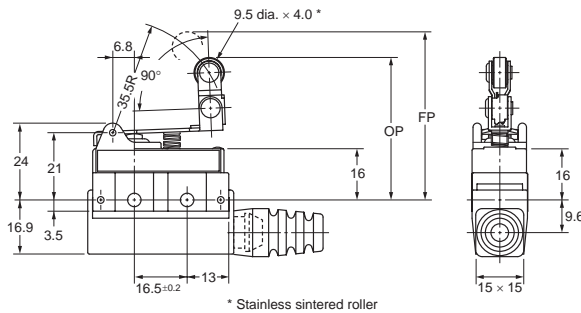
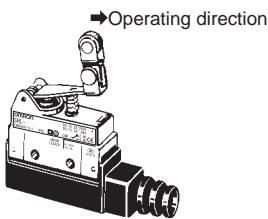
Model		SHL-W255
Operating Characteristics		SHL-W255-01
OF	max.	3.92 N
RF	min.	0.78 N
PT	max.	8 mm
OT	min.	3 mm
MD	max.	2.5 mm
FP	max.	41 mm
OP		33±1 mm

**Hinge Roller Lever**  
**SHL-W2155**  
**SHL-W2155-01**



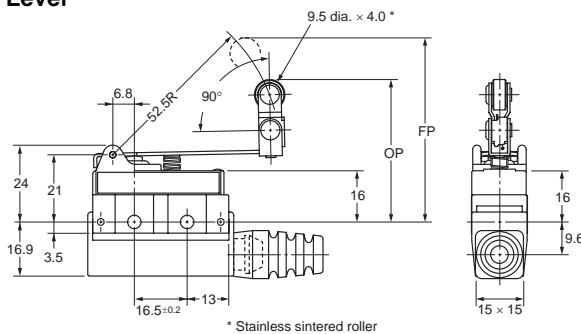
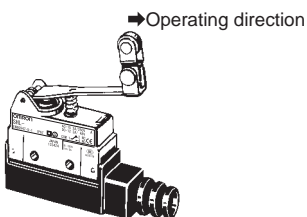
Model		SHL-W2155
Operating Characteristics		SHL-W2155-01
OF	max.	2.55 N
RF	min.	0.49 N
PT	max.	13 mm
OT	min.	5.5 mm
MD	max.	4 mm
FP	max.	46.5 mm
OP		33.5±1 mm

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



Model		SHL-W355
Operating Characteristics		SHL-W355-01
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**

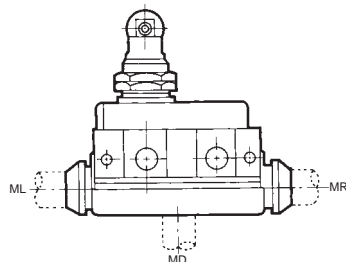


Model		SHL-W3155
Operating Characteristics		SHL-W3155-01
OF	max.	2.55 N
RF	min.	0.49 N
PT	max.	13 mm
OT	min.	5.5 mm
MD	max.	4 mm
FP	max.	57.5 mm
OP		44.5±1 mm

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. 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.



### Suffix by Location of Lead Outlet

Location of lead outlet (Refer to left 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.

### How to order

#### Example:

Basic type: SHL-Q2255

Location of lead outlet: Right side

Length of lead: 3 m (V.C.T.F. lead)

When placing your order for the above Switch specify the model number as SHL-Q2255-MR VCTF 3M.

### Lead Supplies

Leads	Specifications	VCTF (Vinyl cabtire cable)
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

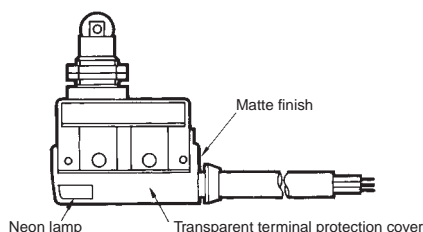
The molded terminal model may be equipped with an operation indicator (neon lamp or LED) upon request to facilitate maintenance and inspection.

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.)

Note: Refer to the previous table for model numbers for Switch with molded terminals and operation indicators.

### For AC

- The applicable voltage is 90 to 250 VAC (microload models: 90 to 125 VAC).



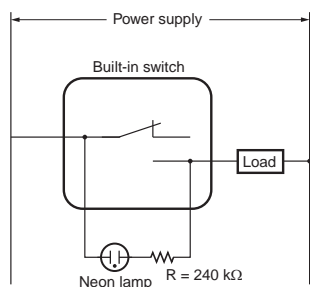
- Operating characteristics are the same as the basic model from which the operation indicator equipped model is fabricated.
- Dimension are the same as the standard model.

### Example:

Basic type: SHL-Q2255-MR

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

### Contact Circuit



### 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.

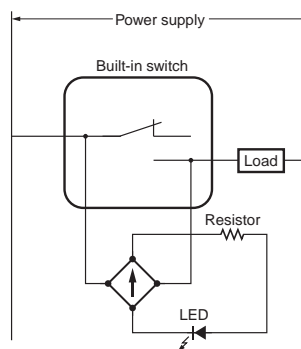
Model	Voltage rating (V)	Leakage current (mA)	Internal resistance (kΩ)
L2	12	Approx. 2.4	4.3
L3	24	Approx. 2	10
L4	24	Approx. 1.2	18

### Example:

Basic type: SHL-Q2255-MR

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

### Contact Circuit



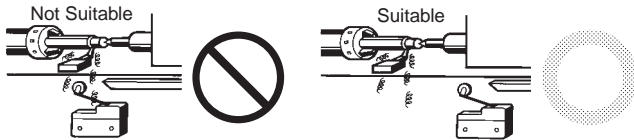
## Safety Precautions

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.

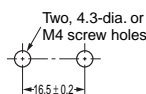
#### Connections

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

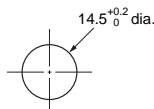
- Secure the Switch with two M4 screws and washers. The tightening torque applied to each terminal must be 1.18 to 1.37 N·m. Tighten the screws to the specified torque. An excessive tightening torque may damage the Switch and cause a malfunction.
- When mounting the panel mount-type Switch with screws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

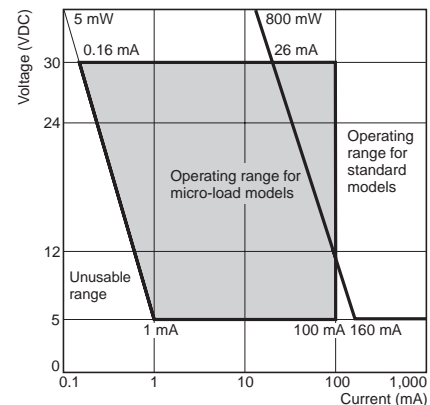
##### Mounting Holes



#### 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

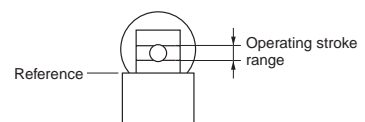
- A loose screw may result in a malfunction. Be sure to tighten each screw to the proper tightening torque as shown below.

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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