

## 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<br>SHL-Q55-MR<br>SHL-Q2155-MR<br>SHL-Q2255-MR<br>SHL-W55-MR | SHL-W155-MR<br>SHL-W255-MR<br>SHL-W2155-MR<br>SHL-W355-MR | SHL-D55-01MR<br>SHL-Q55-01MR<br>SHL-Q2155-01MR<br>SHL-Q2255-01MR<br>SHL-W55-01MR | SHL-W255-01MR<br>SHL-W2155-01MR |

Without Operation Indicator, Lead Wired on Left

| Standard                                                                |                             | Micro load                       |
|-------------------------------------------------------------------------|-----------------------------|----------------------------------|
| Model                                                                   | Model                       | Model                            |
| SHL-D55-ML<br>SHL-Q2155-ML<br>SHL-Q2255-ML<br>SHL-W55-ML<br>SHL-W155-ML | SHL-W255-ML<br>SHL-W2155-ML | SHL-Q2255-01ML<br>SHL-W2155-01ML |

## Without Operation Indicator, Lead Wired from Bottom

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

## Operation Indicator, Lead Wired on Right

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

## Operation Indicator, Lead Wired on Left

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

## Operation Indicator, Lead Wired from Bottom

| Standard                                      |                                                   | Micro load                        |
|-----------------------------------------------|---------------------------------------------------|-----------------------------------|
| Model                                         | Model                                             | Model                             |
| SHL-Q2255-LMD<br>SHL-W255-LMD<br>SHL-Q55-L3MD | SHL-Q2255-L4MD<br>SHL-W255-L4MD<br>SHL-W2155-L4MD | SHL-Q55-01LMD<br>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<br>DC-12 2 A/48 V     | 5 A<br>5 A     |
| SHL-□55-01   | AC-14 0.1 A/125 V<br>DC-12 0.1 A/48 V | 0.5 A<br>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 (I<sub>e</sub>): 2 A  
 Rated operating voltage (U<sub>e</sub>): 125 V

## UL/CSA A300

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

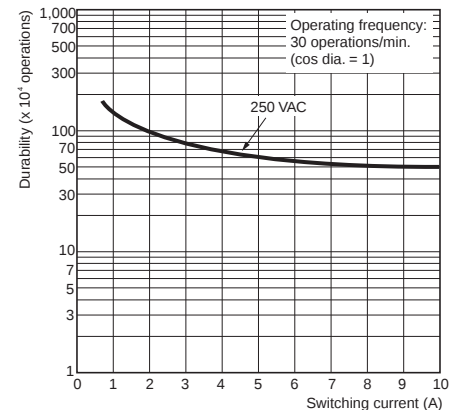
## Characteristics (For SHL-W155)

|                                                          |                                                           |                                                                      |
|----------------------------------------------------------|-----------------------------------------------------------|----------------------------------------------------------------------|
| 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 (U <sub>i</sub> )               |                                                           | 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

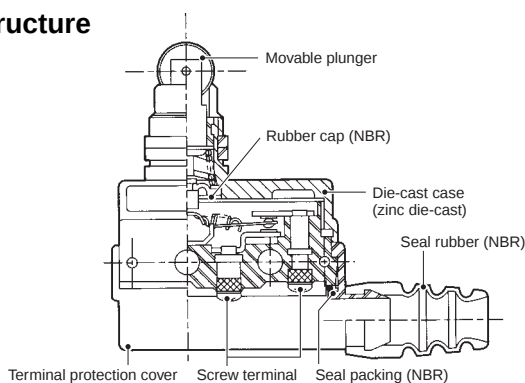
(Ambient temperature: +5°C to +35°C,  
 Ambient humidity: 40% to 50%RH)



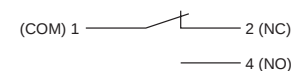
- Note: 1. The figures at the left are initial values.  
 2. The ratings at the left may vary depending on the model. Contact your OMRON representative for further details.  
 \*1. The head section of the plunger type SHL-D(Q)□□ is excluded.  
 \*2. Durability values are calculated at an operating temperature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

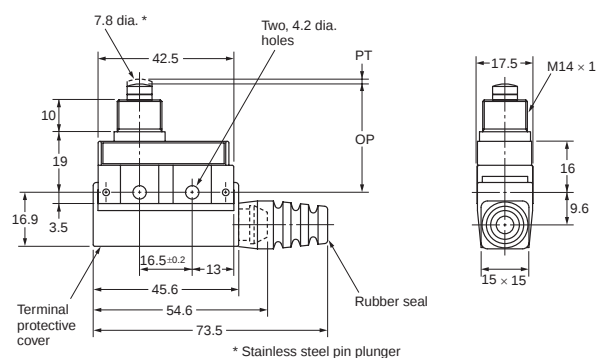
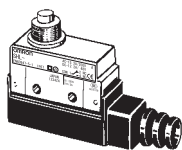
(Unit: mm)

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

#### Plunger

SHL-D55

SHL-D55-01

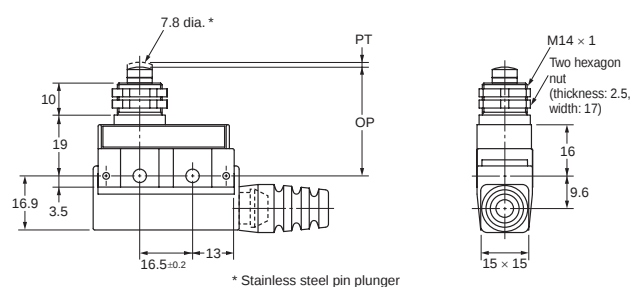
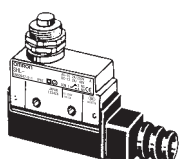


| Operating Characteristics |    | Model | SHL-D55<br>SHL-D55-01 |
|---------------------------|----|-------|-----------------------|
| Operating force           | OF | max.  | 9.81 N                |
| Release force             | RF | min.  | 1.96 N                |
| Pretravel                 | PT | 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

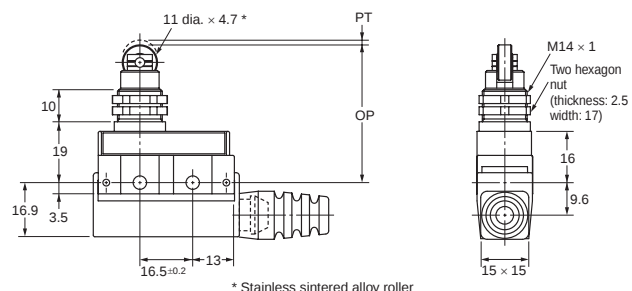
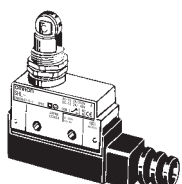


| Operating Characteristics |      | Model | SHL-Q55<br>SHL-Q55-01 |
|---------------------------|------|-------|-----------------------|
| OF                        | max. |       | 9.81 N                |
| RF                        | min. |       | 1.96 N                |
| PT                        | 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

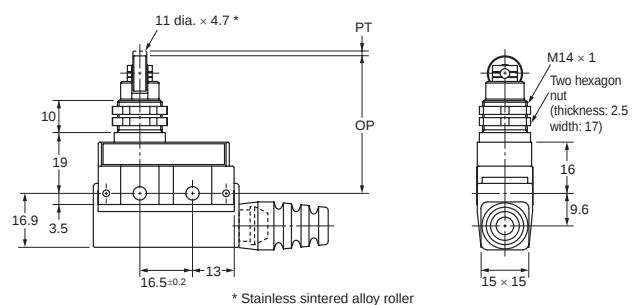
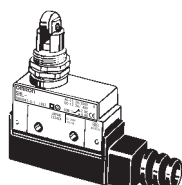


| Operating Characteristics |      | Model | SHL-Q2255<br>SHL-Q2255-01 |
|---------------------------|------|-------|---------------------------|
| OF                        | max. |       | 9.81 N                    |
| RF                        | min. |       | 1.96 N                    |
| PT                        | 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

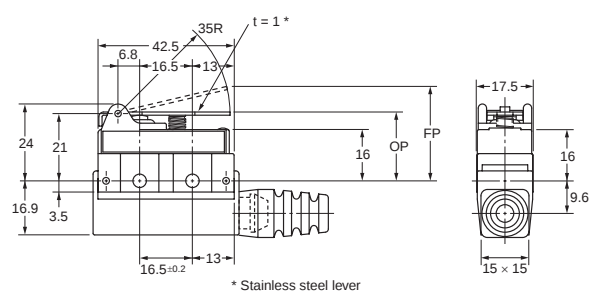
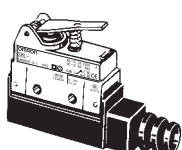


| Operating Characteristics |      | Model | SHL-Q2155<br>SHL-Q2155-01 |
|---------------------------|------|-------|---------------------------|
| OF                        | max. |       | 9.81 N                    |
| RF                        | min. |       | 1.96 N                    |
| PT                        | 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

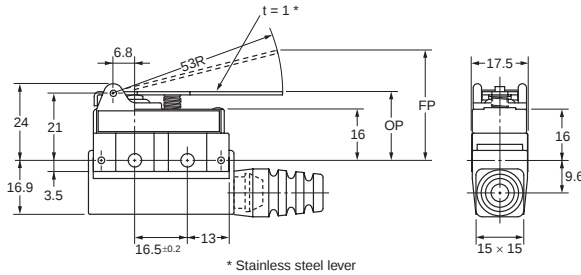
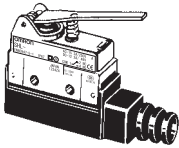
SHL-W55-01



| Operating Characteristics |      | Model | SHL-W55<br>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             |

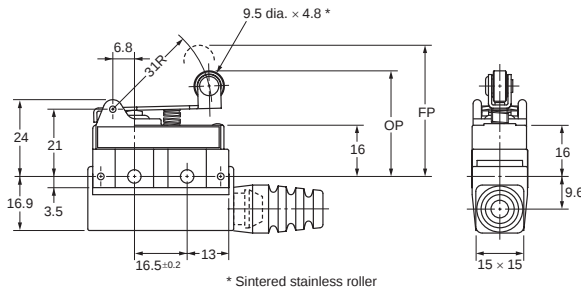
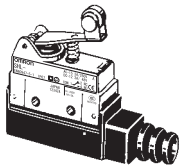
Note: Unless otherwise specified, a tolerance of ±0.4 mm applies to all dimensions.

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



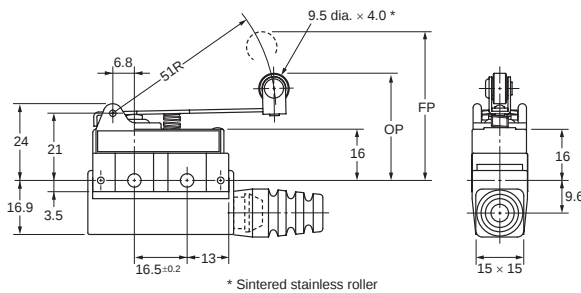
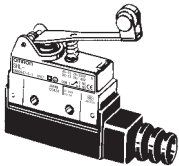
| Model                     |      | SHL-W155    |
|---------------------------|------|-------------|
| Operating Characteristics |      | SHL-W155-01 |
| OF                        | max. | 2.35 N      |
| RF                        | min. | 0.44 N      |
| PT                        | max. | 13 mm       |
| 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**



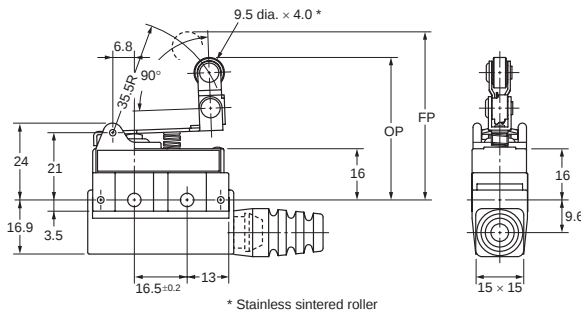
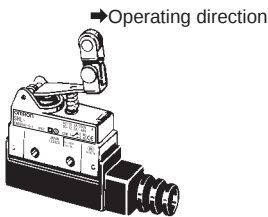
| Model                     |      | SHL-W255    |
|---------------------------|------|-------------|
| Operating Characteristics |      | SHL-W255-01 |
| OF                        | max. | 3.92 N      |
| RF                        | min. | 0.78 N      |
| PT                        | max. | 8 mm        |
| 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**



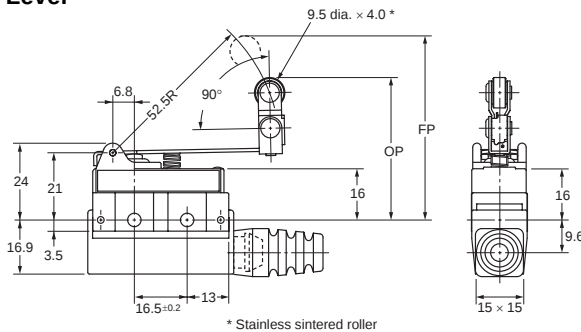
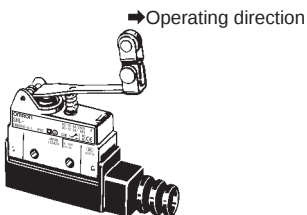
| Model                     |      | SHL-W2155    |
|---------------------------|------|--------------|
| Operating Characteristics |      | SHL-W2155-01 |
| OF                        | max. | 2.55 N       |
| RF                        | min. | 0.49 N       |
| PT                        | max. | 13 mm        |
| 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**

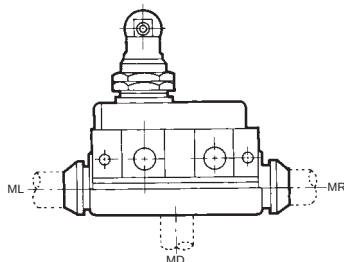


| Model                     |      | SHL-W3155    |
|---------------------------|------|--------------|
| Operating Characteristics |      | SHL-W3155-01 |
| OF                        | max. | 2.55 N       |
| RF                        | min. | 0.49 N       |
| PT                        | max. | 13 mm        |
| 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<br>(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<br>(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<br>White: NO<br>Red: NC |
| Length (m)                                      |                | 3 (standard)                       |

## Operation Indicator-equipped Models

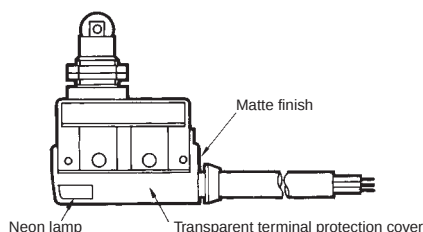
The molded terminal model may be equipped with an operation indicator (neon lamp or LED) upon request to facilitate maintenance and inspection.

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).



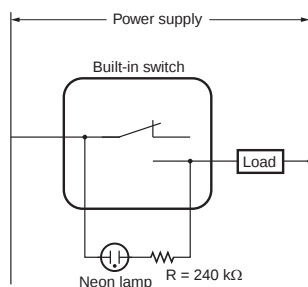
- Operating characteristics are the same as the basic model from which the operation indicator equipped model is fabricated.
- Dimension are the same as the standard model.

### 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.

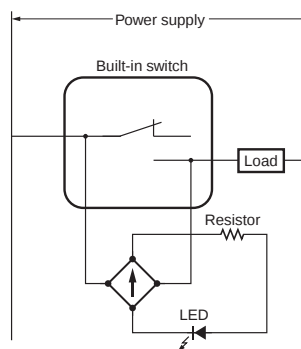
| Model | Voltage rating (V) | Leakage current (mA) | Internal resistance (kΩ) |
|-------|--------------------|----------------------|--------------------------|
| L2    | 12                 | Approx. 2.4          | 4.3                      |
| L3    | 24                 | Approx. 2            | 10 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

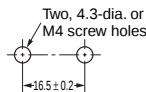
#### Connections

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

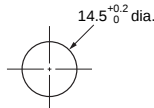
- Secure the Switch with two M4 screws and washers. The tightening torque applied to each terminal must be 1.18 to 1.37 N·m. Tighten the screws to the specified torque. An excessive tightening torque may damage the Switch and cause a malfunction.
- When mounting the panel mount-type Switch with screws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

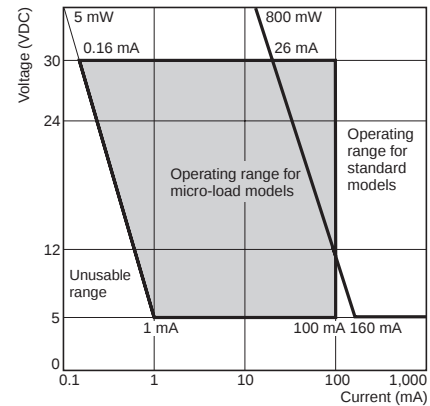
##### Mounting Holes



#### 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

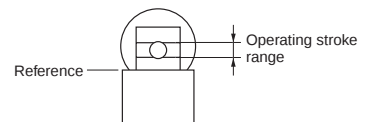
- A loose screw may result in a malfunction. Be sure to tighten each screw to the proper tightening torque as shown below.

| 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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