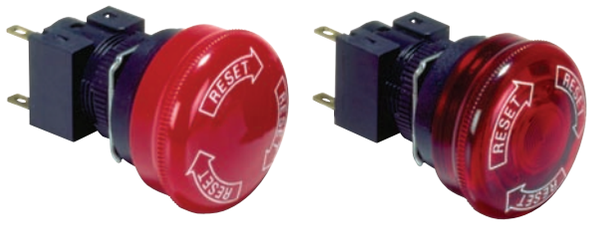
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# Emergency Stop Switch (16-dia.)
# A165E

CSM_A165E_DS_E_11_2

## Separate Construction with Minimal Depth

- Direct opening mechanism to open contacts in emergencies, such as when they are welded.
- Conforms to EN 60947-5-5.
- Includes a safety lock to prevent misuse.
- Features separate construction that allows the Switch to be separated for easier wiring and one-piece construction that allows easier handling.
- Models available with 3 contacts built into a single block (A165E-U).

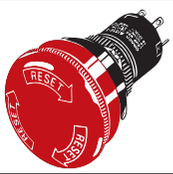


For the most recent information on models that have been certified for safety standards, refer to your OMRON website.

⚠ Be sure to read the *"Safety Precautions"* on page 9.

## Model Number Structure

### List of Models

| Diameter of Operation Unit | Function | Model | Shape | |
|---|---|---|---|---|
| 30-mm models<br>40-mm models | Push-Lock, turn-reset | **A165E** | Separate construction |  (30-mm model) |
| | | **A165E-□-03U** | One-piece construction |  (30-mm model) |

### Model Number Legend (Completely Assembled)

Shipped as a set that includes the Operation Unit and light source.

1 2 3 4

**A165E-LS-24D-02-□**

IP65 (Oil-resistant)

**1. Operation Unit Shape and Functions**

| Code | Functions | | Pushbutton |
|---|---|---|---|
| S | Non-lighted | Push-lock, turn-reset | 30 dia. |
| LS | Lighted | | |
| M | Non-lighted | | 40 dia. |
| LM | Lighted | | |

**2. Light Source**

| Code | Type | Operation voltage | Rated voltage |
|---|---|---|---|
| None | Non-lighted | --- | --- |
| 24D | LED | 24 VAC/ VDC±5% | 24 VAC/ VDC |

**Note:** Models with separate construction (1NC(1) and 2NC(2)) are for normal loads only. One-piece models (3NC(3)) are for either normal loads or microloads.

**3. Contacts**

| Code | Description |
|---|---|
| 01 | 1NC(1) |
| 02 | 2NC(2) |
| 03U | 3NC(3) ✻ |

✻ 3NC(3) models have one-piece construction with the contact unit. Only non-lighted models are available.

**4.**

| Code | Description |
|---|---|
| None | Arrows and text printed in white on Pushbutton. |
| PK | Arrows and text printed in pink on Pushbutton. |

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# Ordering Information

## List of Sets

| Illumination | Rated voltage | Pushbutton color | Pushbutton size | Terminal | Contact form | Model |
|---|---|---|---|---|---|---|
| LED | 24 VAC/VDC | Red | 30 dia. | Solder terminal | 1NC(1) | **A165E-LS-24D-01** |
| | | | | | | **A165E-LS-24D-01-PK** |
| | | | | | 2NC(2) | **A165E-LS-24D-02** |
| | | | | | | **A165E-LS-24D-02-PK** |
| Non-lighted | --- | | | | 1NC(1) | **A165E-S-01** |
| | | | | | | **A165E-S-01-PK** |
| | | | | | 2NC(2) | **A165E-S-02** |
| | | | | | | **A165E-S-02-PK** |
| LED | 24 VAC/VDC | | 40 dia. | | 1NC(1) | **A165E-LM-24D-01** |
| | | | | | | **A165E-LM-24D-01-PK** |
| | | | | | 2NC(2) | **A165E-LM-24D-02** |
| | | | | | | **A165E-LM-24D-02-PK** |
| Non-lighted | --- | | | | 1NC(1) | **A165E-M-01** |
| | | | | | | **A165E-M-01-PK** |
| | | | | | 2NC(2) | **A165E-M-02** |
| | | | | | | **A165E-M-02-PK** |
| Non-lighted | --- | | 30 dia. | | 3NC(3) | **A165E-S-03U** |
| | | | | | | **A165E-S-03U-PK** |
| | | | 40 dia. | | | **A165E-M-03U** |
| | | | | | | **A165E-M-03U-PK** |

## List of Sets (in Different Colors)

| Illumination | Pushbutton color ✻ | Pushbutton size | Terminal | Contact form | Model |
|---|---|---|---|---|---|
| Non-lighted | Yellow | 30 dia. | Solder terminal | 1NC(1) | **A165E-SY-01** |
| | Gray | | | | **A165E-SGR-01** |
| | Yellow | | | 2NC(2) | **A165E-SY-02** |
| | Gray | | | | **A165E-SGR-02** |
| | Yellow | | | 3NC(3) | **A165E-SY-03U** |
| | Gray | | | | **A165E-SGR-03U** |

✻ Models with yellow or gray pushbutton colors cannot be used as emergency switches.

## Individual Parts (for Switches with Separate Construction)

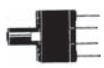
### Operation Units

| Appearance | Illumination | Model |
|---|---|---|
| 30 dia.  | Non-lighted | **A165E-S** |
| | | **A165E-S-PK** |
| | Lighted | **A165E-LS** |
| | | **A165E-LS-PK** |
| 40 dia.  | Non-lighted | **A165E-M** |
| | | **A165E-M-PK** |
| | Lighted | **A165E-LM** |
| | | **A165E-LM-PK** |

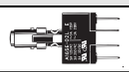
### Lamps

| Appearance | LED color | | Rated voltage | Model |
|---|---|---|---|---|
|  | Red | Bright | 5 VDC | **A16-5DSR** |
| | | | 12 VAC/VDC | **A16-12DSR** |
| | | | 24 VAC/VDC | **A16-24DSR** |

### Switches

| Appearance | Illumination | Contact form | Model |
|---|---|---|---|
|  | Non-lighted | 1NC(1) | **A165E-01** |
| | | 2NC(2) | **A165E-02** |
| | Lighted | 1NC(1) | **A165E-01L** |
| | | 2NC(2) | **A165E-02L** |

### Switch Units

| Appearance | Illumination | Contact form | Model |
|---|---|---|---|
|  | Lighted | 1NC(1) | **A165E-R-24D-01** |
| | | 2NC(2) | **A165E-R-24D-02** |

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## Accessories (Order Separately)

| Item | Appearance | Type | Model | Precautions |
|---|---|---|---|---|
| Yellow Plate |  | Yellow, 45 dia. | **A16Z-5070** | Use this as an emergency stop nameplate. |
| Panel Plug |  | Round | **A16ZT-3003** | Used for covering the panel cutouts for future panel expansion.<br>Degree of protection: IP40<br>Color: Black |
| Tightening Tool |  | --- | **A16Z-3004** | Useful for repetitive mounting. Be careful not to tighten excessively. |
| Extractor |  | | **A16Z-5080** | Convenient for extracting the Switch and Lamp. |

# Specifications

## Certified Standard Ratings

### UL508, CSA C22.2 No.14, CCC(GB14048.5)

#### Models with Separate Construction

| Rated voltage | Resistive load |
|---|---|
| 125 VAC<br>250 VAC<br>30 VDC | 5 A<br>3 A<br>3 A |

#### Models with One-piece Construction

| Rated voltage | Resistive load |
|---|---|
| 125 VAC<br>250 VAC<br>30 VDC | 1 A<br>0.5 A<br>1 A |

### TÜV(EN60947-5-1)

#### Models with Separate Construction

| Rated voltage | Resistive load |
|---|---|
| 250 VAC<br>30 VDC | 3 A<br>3 A |

#### Models with One-piece Construction

| Rated voltage | Resistive load |
|---|---|
| 250 VAC<br>30 VDC | 0.5 A<br>1 A |

## Certified Standards

| Certification body | Standards | File No. |
|---|---|---|
| UL ✻ | UL508,<br>CSA C22.2 No.14 | E76675 |
| TÜV SÜD | EN60947-5-1 (certified direct opening),<br>EN60947-5-5 | Consult your OMRON representative for details. |
| CQC (CCC) | GB14048.5 | 2003010303070678 |

✻ Certification for CSA C22.2 No. 14 has been obtained. Separate construction models have been certified for the Switch Unit.

## Switch Ratings

### Models with Separate Construction

| Rated voltage | Resistive load |
|---|---|
| 125 VAC<br>250 VAC<br>30 VDC | 5 A<br>3 A<br>3 A |

**Note:** Minimum applicable load: 5 VDC, 150 mA

### Models with One-piece Construction

| Rated voltage | Resistive load |
|---|---|
| 125 VAC<br>250 VAC<br>30 VDC | 1 A<br>0.5 A<br>1 A |

**Note:** Minimum applicable load: 5 VDC, 1 mA

## LED Ratings

### (Only for Models with LEDs)

| Rated voltage | Rated current | Operation voltage |
|---|---|---|
| 24 VAC/VDC | 8 mA | 24 VAC/VDC±5% |

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## Characteristics

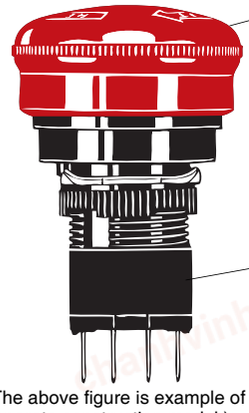
| Item | Type | Emergency Stop Switch | | |
|---|---|---|---|---|
| | | Non-lighted A165E-S/A165E-M | Lighted A165E-LS/A165-LM | Non-lighted, One-piece construction A165E-U |
| Allowable operating frequency | Mechanical | 20 operations/minute max. | | |
| | Electrical | 10 operations/minute max. | | |
| Insulation resistance | | 100 MΩ min. (at 500 VDC) | | |
| Dielectric strength | Between terminals of same polarity | 1,000 VAC, 50/60 Hz for 1 min | | |
| | Between terminals of different polarity | 2,000 VAC 50/60 Hz for 1 min | | |
| | Between each terminal and ground | 2,000 VAC 50/60 Hz for 1 min | | |
| | Between lamp terminals | 1,000 VAC, 50/60 Hz for 1 min ✻1 | | --- |
| Vibration resistance | Malfunction | 10 to 55 Hz, 1.5-mm double amplitude (malfunction within 1 ms) | | |
| Shock resistance | Destruction | 500 $m/s^2$ | | |
| | Malfunction | 300 $m/s^2$ max. (malfunction within 1 ms) | | 150 $m/s^2$ max. (malfunction within 1 ms) |
| Durability | Mechanical | 100,000 operations min. | | |
| | Electrical | 100,000 operations min. | | |
| Degree of protection | | IP65 Oil-resistant ✻2 | IP65 ✻2 | IP65 Oil-resistant ✻2 |
| Electric shock protection class | | Class II | | |
| PTI (tracking characteristic) | | 175 | | |
| Degree of contamination | | 3 (EN60947-5-1) | | |
| Weight | | Approx. 16 g (in case of 2NC(2) Switches) | | |
| Ambient operating temperature | | –10 to 55°C (with no icing or condensation) | | |
| Ambient operating humidity | | 35% to 85% | | |
| Ambient storage temperature | | –25 to 65°C (with no icing or condensation) | | |

✻1. LED not mounted. (Test them with the LED removed.)
✻2. Degree of protection from the front of the panel.

## Operating Characteristics

| Item | Type | Characteristics of models with separate construction | Characteristics of models with one-piece construction |
|---|---|---|---|
| Operating force | OF max. | 14.7 N | 14.7 N |
| Releasing torque | RF max. | 0.1 N·m | 0.1 N·m |
| Pretravel | PT | 3.5±0.5 mm | 3±0.5 mm |

## Structure and Nomenclature



(The above figure is example of the separate construction model.)

**Operation Unit**

### Color

**Operation Unit Color**

- Models with LED illumination: Red
- Non-lighted models ✻ : Red, yellow, or gray

### Degree of Protection

IP65 oil resistance

**Switch**

### Specifications

For standard load
125 VAC, 5 A
250 VAC, 3 A
30 VDC, 3 A

**Operation Unit**



**Switch Holder**

✻ Models with yellow or gray pushbutton colors cannot be used as emergency switches.

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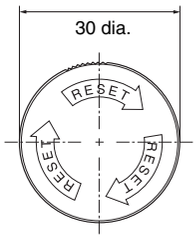
# Dimensions

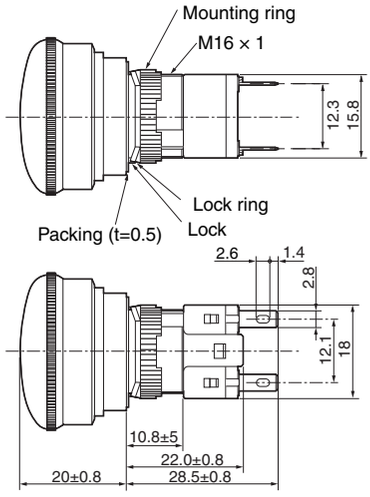
(Unit: mm)

## A165E-S

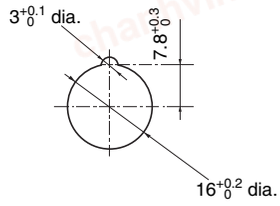
Non-lighted models
30 mm diameter



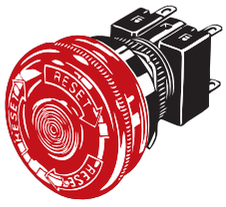

Panel cutout dimensions

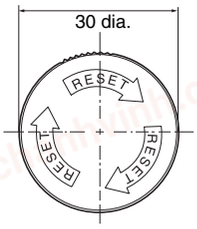


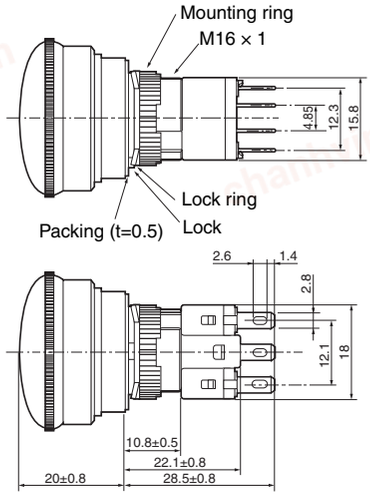

- When applying a coating such as paint to the panel, dimensions after the coating must satisfy the specified dimensions.
- Recommended panel thickness: 0.5 to 3.2 mm.

## A165E-LS

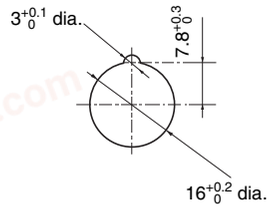
Lighted models
30 mm diameter



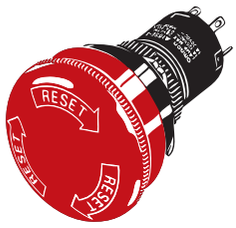

Panel cutout dimensions

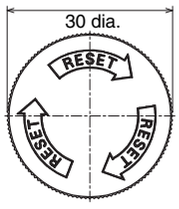


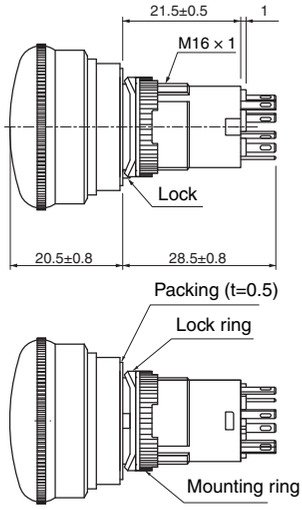

- When applying a coating such as paint to the panel, dimensions after the coating must satisfy the specified dimensions.
- Recommended panel thickness: 0.5 to 3.2 mm.

## A165E-S-03U

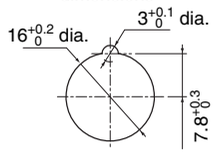
Non-lighted,
One-piece construction models
30 mm diameter




Panel cutout dimensions



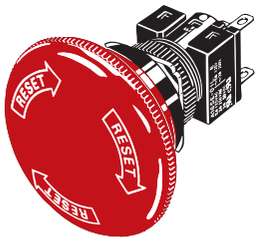

- When applying a coating such as paint to the panel, dimensions after the coating must satisfy the specified dimensions.
- Recommended panel thickness: 0.5 to 3.2 mm.

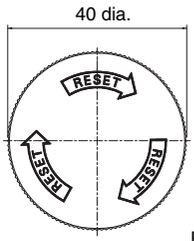
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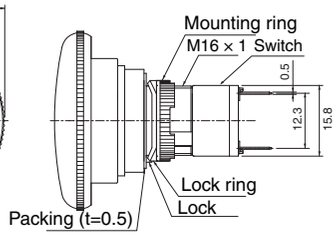


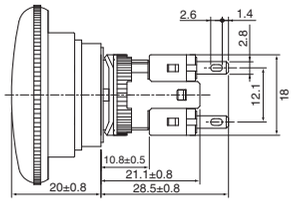
## A165E-M

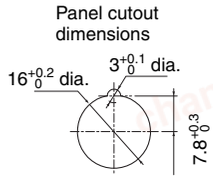
Non-lighted models
40 mm diameter



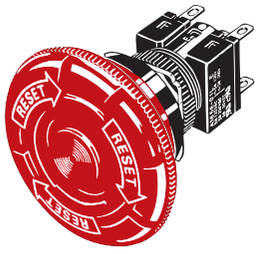



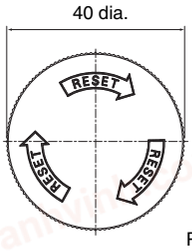



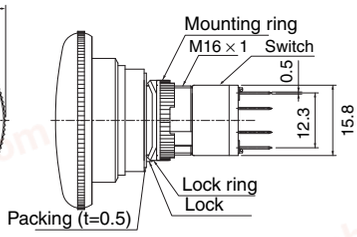

- When applying a coating such as paint to the panel, dimensions after the coating must satisfy the specified dimensions.
- Recommended panel thickness: 0.5 to 3.2 mm.

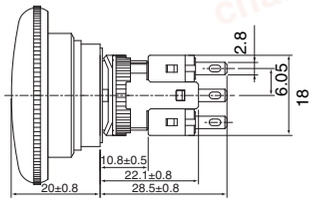
## A165E-LM

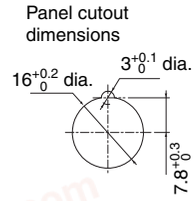
Lighted models
40 mm diameter



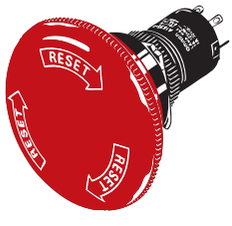



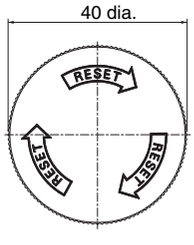



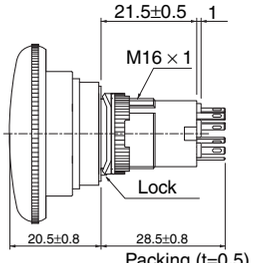

- When applying a coating such as paint to the panel, dimensions after the coating must satisfy the specified dimensions.
- Recommended panel thickness: 0.5 to 3.2 mm.

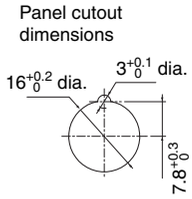
## A165E-M-03U

One-piece construction models
40 mm diameter




- When applying a coating such as paint to the panel, dimensions after the coating must satisfy the specified dimensions.
- Recommended panel thickness: 0.5 to 3.2 mm.

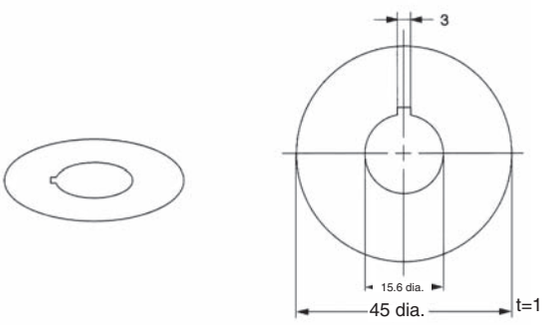
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## Accessories

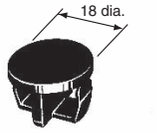
### Yellow Plate (Vinyl Chloride)

**A16Z-5070**



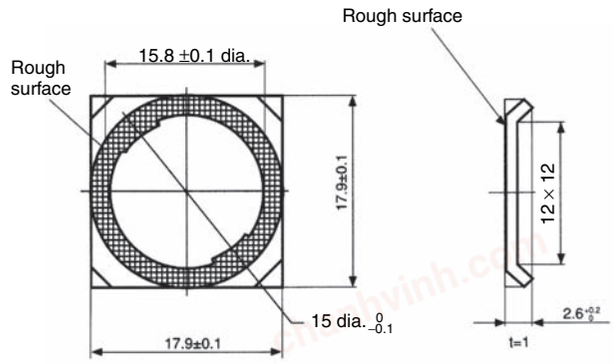

### Panel Plugs (Round Type)

**A16ZT-3003**



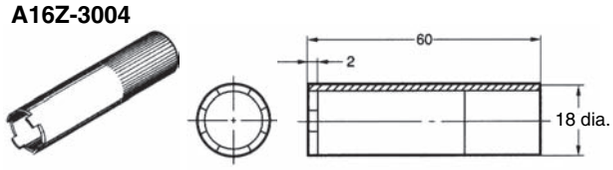

- Select an appropriate Panel Plug according to the panel design and mount from the front side of the panel. Panel cutout dimensions are the same as those for the Operation Unit.

### Lock Ring

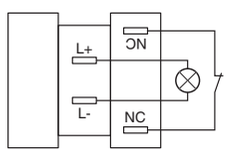
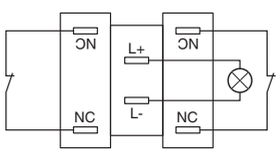
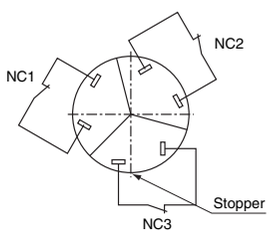



### Tightening Tool

**A16Z-3004**




## Terminal Arrangement

| 1NC(1) | 2NC(2) | 3NC(3) |
|---|---|---|
|  |  |  |



**Note:** The L+ and L– terminals are not available with the non-lighted models.

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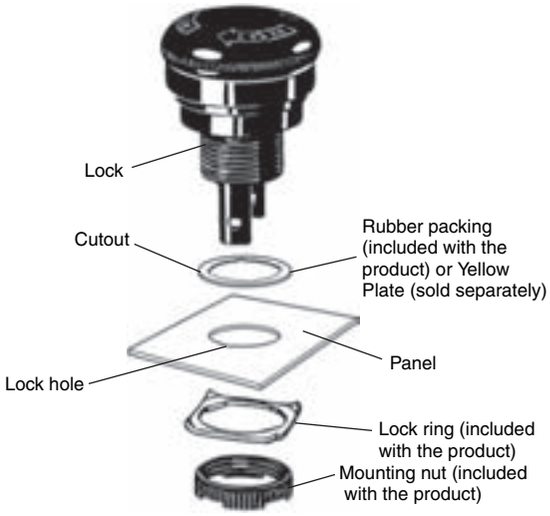
# Installation

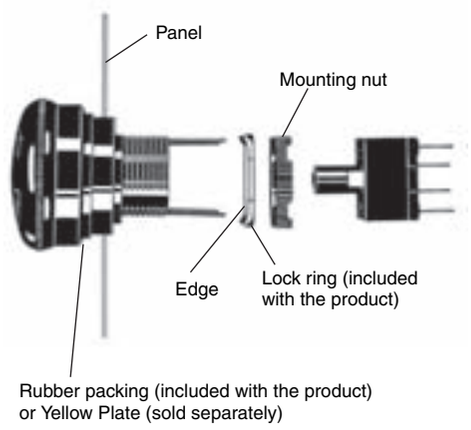
## Mounting to the Panel (Models with Separate Construction)

After installing the Operation Unit, snap in the Switch from the back of the panel.

### (1) Installing the Operation Unit

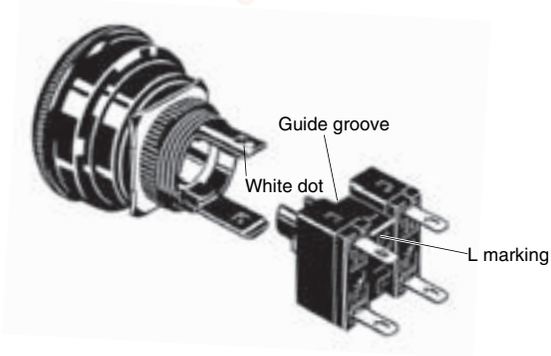
- Attach rubber packing or the Yellow Plate onto the Operation Unit from its terminal side. Insert the Operation Unit into the panel from the front. Install the lock ring and mounting nut from the terminal side and tighten.
- Adjust the slits on the hole of rubber packing and Yellow Plate to the protruding part of the Unit.
- Rubber packing is not necessary when the Yellow Plate is used.
- Tighten the nut to the torque of 0.29 to 0.49 N·m.
- The Operation Unit should be installed with its protruding part adjusted to the slit of the panel hole.
- Align the lock ring to the groove of the Operation Unit so that the edge is drawn to the panel side.



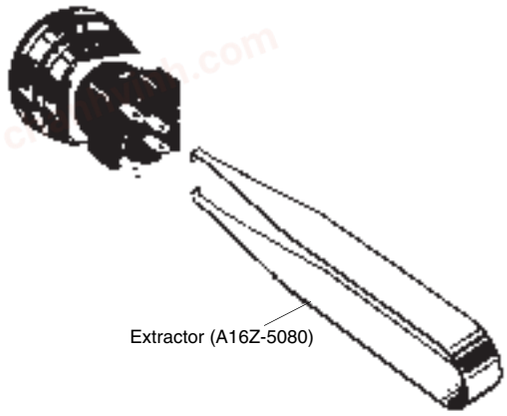

### (2) Mounting the Switch

- Snap on the Switch to the Operation Unit.
- Make sure that the Switch has the correct orientation when snapping it onto the Operation Unit.
- Align the white dot on the Operation Unit with the guide groove on the side of the Switch marked with an “L” as shown below, and push the Switch into the Operation Unit until it clicks into place. Confirm that the Switch is securely in place before using.



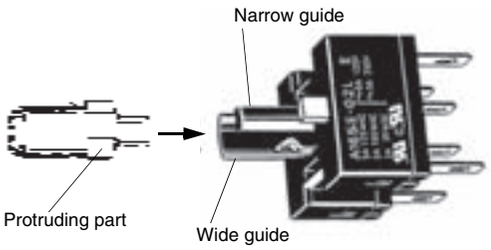

### (3) Removing the Switch

- Insert the prongs of the A16Z-5080 Extractor between the Switch and the Operation Unit, grip the Switch, and pull to remove.




### (4) Installing the LED Lamp

- When mounting the Lamp, make sure it is facing the direction shown in the following diagram. Insert the Lamp while matching the protruding part of the Lamp and the small guides on the outer surface of the switch.



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# Safety Precautions

**Be sure to read the precautions for all A165E models in the website at: http://www.ia.omron.com/.**

## Indication and Meaning for Safe Use

| | |
|---|---|
| ⚠ CAUTION | **Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury or in property damage.** |
| **Precautions for Safe Use** | **Supplementary comments on what to do or avoid doing, to use the product safely.** |

**⚠ CAUTION**

If the Operation Unit is separated from the Switch Unit, the equipment will not stop, creating a hazardous condition. Always confirm that safety functions are operating before starting operation.



## Precautions for Correct Use

### Mounting

- Always make sure that the power is turned OFF before mounting, removing, or wiring the Switch, or performing maintenance. Electrical shock or fire may result if the power is not turned OFF.
- The tightening torque is 0.29 to 0.49 N·m.

### Wiring

- Be sure to use electrical wires that are a size appropriate for the applied voltage and carry current. Perform soldering according to the conditions given below. If the soldering is not properly performed, abnormal heating may result, possibly resulting in fire.
  1. Hand soldering: 30 W, within 5 s
  2. Dip soldering: 240°C, within 3 s

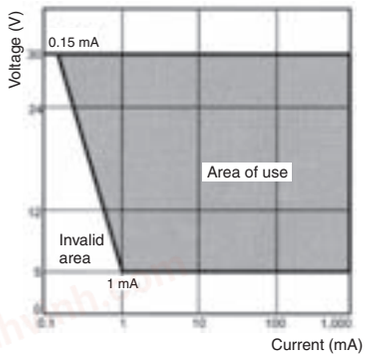
  Wait for one minute after soldering before exerting any external force on the solder.
- Use non-corrosive resin fluid as the flux.
- Make sure that the electric cord is wired so that it does not touch the Unit. If the electric cord will touch the Unit, then electric wires with a heat resistance of 100°C min. must be used.
- After wiring the Switch, maintain an appropriate clearance and creepage distance.

### Operating Environment

- The IP65 model is designed with a degree of protection so that it will not sustain damage if it is subjected to water from any direction to the front of the panel.
- The Switch is intended for indoor use only. Using the Switch outdoor may cause it to fail.

### Using the Microload

- Insert a contact protection circuit, if necessary, to prevent the reduction of life expectancy due to extreme wear on the contacts caused by loads where inrush current occurs when the contact is opened and closed.
- The A165E-□U (one-piece construction) allows both a standard load (125 V at 1 A, 250 V at 0.5 A) and a microload. If a standard load is applied, however, the microload area cannot be used. If the microload area is used with a standard load, the contact surface will become rough, and the opening and closing of the contact for a microload may become unreliable.
- The minimum applicable load is the N-level reference value. This value indicates the malfunction reference level for the reliability level of 60% ($\lambda_{60}$) (conforming to JIS C5003).
- The equation, $\lambda_{60} = 0.5 \times 10^{-6}$/time indicates that the estimated malfunction rate is less than 1/2,000,000 with a reliability level of 60%.




### LEDs

The LED current-limiting resistor is built-in, so external resistance is not required.

| Rated voltage | Internal limiting resistor |
|---|---|
| 24 VAC/VDC | 2.4 kΩ |

### Operating Torque

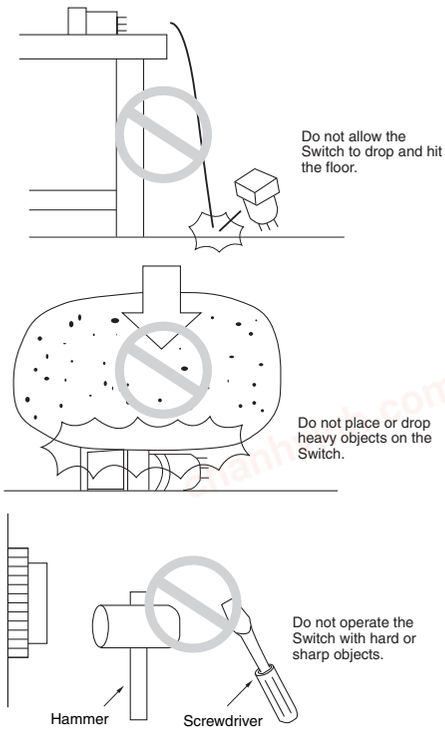
- Do not exceed an operating torque of 0.49 N·m in the direction of rotation.
- Do not pull the operating button or apply excessive force to any side of the button.
  Otherwise it may be damaged.

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## Others

- The oil-resistant IP65 uses NBR rubber and is resistant to general cutting oil and cooling oil. Some special oils cannot be used with the oil-resistant IP65, however, so contact your OMRON representative for details.
- If the panel is to be coated, make sure that the panel meets the specified dimensions after coating.
- Due to the structure of the Switch, severe shock or vibration may cause malfunctions or damage to the Switch.
  Also, most Switches are made from resin and will be damaged if they come into contact with sharp objects. Particularly scratches on the Operation Unit may create visual and operational obtrusions. Handle the Switches with care, and do not throw or drop them.



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