

Pushbutton Switch (Lighted/Non-Lighted) (Cylindrical 12-dia.)

CSM_A3C_DS_E_2_1

Pushbutton Switch Series with Cylindrical 20-mm \times 12-dia. Body

- High-intensity uniform surface lighting.
- Round body enables easy hole making.
- Miniature size with excellent feeling of operation.

RoHS Compliant



Refer to Safety Precautions for All Pushbutton Switches and Safety Precautions on page 12.

List of Models

| Арр | earance | Model |
|-----------------------|---------|-------|
| Rectangular Models | | A3CJ |
| Square Models | | A3CA |
| Round Models | | A3CT |



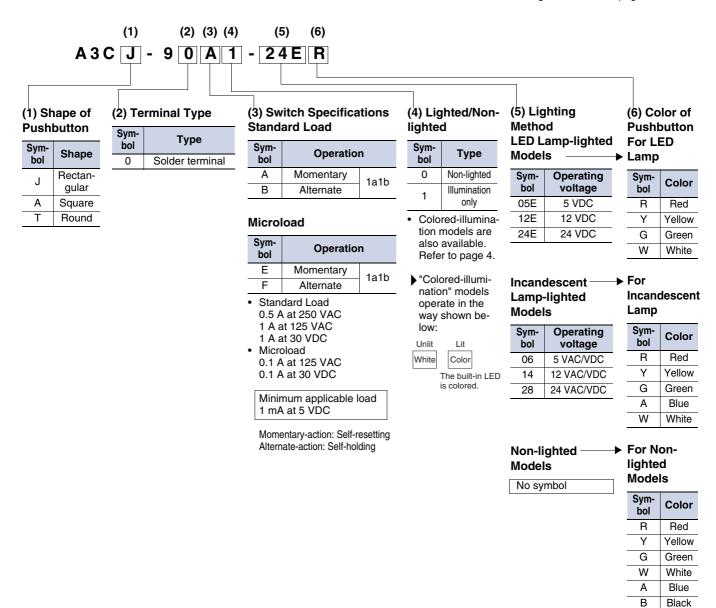
■ Precautions for correct use and safety precautions: Refer to page 12.



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Model Number LegendWhen placing your order, specify the individual component part model numbers of the Pushbutton, Lamp (lighted models only), and Switch, as listed in the ordering tables below.

For information on combinations, refer to Ordering Information on page 3.



Ordering as a Set The model numbers used to order sets of Units are given in the following tables. One set comprises the Pushbutton, Lamp (lighted models only), and Switch.













Lighted Pushbutton Switches (SPST-NO+SPST-NC Solder Terminals)

| | Operation | Standa | rd load | Microload | |
|--------------------|-------------------|--------------------------------------|------------------------------------|--------------------------------------|-------------------------|
| | Operation | Momentary operation (Self-resetting) | Alternate operation (Self-holding) | Momentary operation (Self-resetting) | Pushbutton |
| Shape | Lighting | Set | Set | Set | color symbol (Color) |
| | | A3CJ-90A1-05E□ | A3CJ-90B1-05E□ | A3CJ-90E1-05E□ | R: red |
| LED lamp | LED lamp | A3CJ-90A1-12E□ | A3CJ-90B1-12E□ | A3CJ-90E1-12E□ | Y: yellow G: green |
| | | A3CJ-90A1-24E□ | A3CJ-90B1-24E□ | A3CJ-90E1-24E□ | W: white |
| Rectangular (A3CJ) | | A3CJ-90A1-06□ | | | R: red |
| (, | Incandescent lamp | A3CJ-90A1-14□ | | | Y: yellow G: green |
| | . , | A3CJ-90A1-28□ | A3CJ-90B1-28□ | | W: white A: blue |
| | Non-lighted | A3CJ-90A0-□ | A3CJ-90B0-□ | A3CJ-90E0-□ | B: black * |
| | | A3CA-90A1-05E□ | A3CA-90B1-05E□ | A3CA-90E1-05E□ | R: red |
| LED lamp | A3CA-90A1-12E□ | A3CA-90B1-12E□ | A3CA-90E1-12E□ | Y: yellow G: green | |
| _ | | A3CA-90A1-24E□ | A3CA-90B1-24E□ | A3CA-90E1-24E□ | W: white |
| Square (A3CA) | | A3CA-90A1-06□ | | | R: red Y: yellow |
| , | Incandescent lamp | A3CA-90A1-14□ | | | G: green |
| | | A3CA-90A1-28□ | A3CA-90B1-28□ | | W: white |
| | Non-lighted | A3CA-90A0-□ | A3CA-90B0-□ | A3CA-90E0-□ | B: black * |
| | | A3CT-90A1-05E□ | A3CT-90B1-05E□ | A3CT-90E1-05E□ | R: red |
| | LED lamp | A3CT-90A1-12E□ | A3CT-90B1-12E□ | A3CT-90E1-12E□ | Y: yellow G: green |
| Round (A3CT) | A3CT-90A1-24E□ | A3CT-90B1-24E□ | A3CT-90E1-24E□ | W: white | |
| | | A3CT-90A1-06□ | | | R: red |
| / | Incandescent lamp | A3CT-90A1-14□ | | | Y: yellow G: green |
| | | A3CT-90A1-28□ | A3CT-90B1-28□ | | W: white A: blue |
| | Non-lighted | A3CT-90A0-□ | A3CT-90B0-□ | A3CT-90E0-□ | B: black * |

Note: 1. Enter the desired color symbol for the Pushbutton in the □ at the end of the model number.

2. There are also alternate-operation models that can be used for microloads. Refer to the Switch table on page 6.

* Black ("B") Pushbuttons are only available for non-lighted models.

Individual models: Refer to pages 5 to 6.

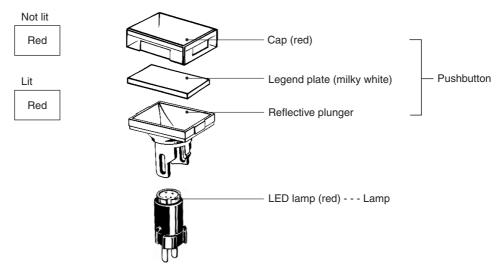
(The Pushbutton, Lamp, and Switch can be ordered separately.)

■ Specifications: Refer to page 8. ■ Dimensions: Refer to page 10.

■ Accessories: Refer to page 7.

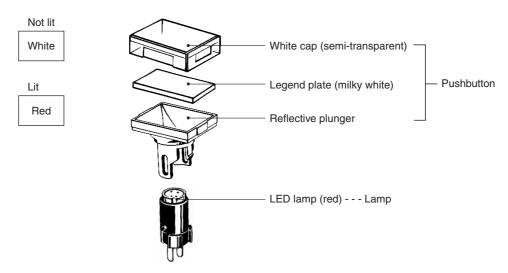
Illumination-only and Colored-illumination LED Models

"Illumination only" describes LED models for which the screen color is the same whether the LED is lit or not. Example: Red LED



"Colored illumination" describes LED models for which the screen color is white when the LED is not lit and changes to the color of the LED lamp when the LED is lit.

Example: Red LED



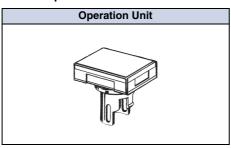
Ordering: With colored-illumination models, order the Pushbutton, Lamp, and Switch as shown in the following table.

| Illuminated color | Pushbutton | L | Switch | |
|-------------------|--|---------|---|---|
| Red | IP40 A3C□-500W | A16-□DR | Enter one of the | |
| Yellow | Enter one of the following symbols in □. J: Rectangular | A16-□DY | following symbols in □. 5: 5 VDC 12: 12 VDC | Refer to page 6. Make the selection according to the shape of the Pushbutton. |
| Green | A: Square T: Round | A16-□DG | 24: 24 VDC | |

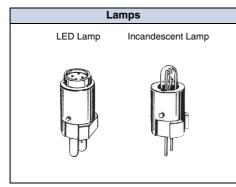
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Ordering: Specify a model number from the following page.

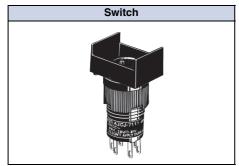




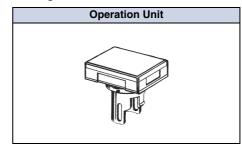


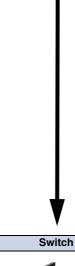


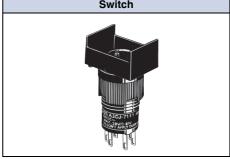




Non-lighted Models







Ordering set combinations: Refer to page 3.

■ Specifications: Refer to page 8. ■ Dimensions: Refer to page 10.

■ Accessories: Refer to page 7.

Ordering IndividuallyPushbuttons, Lamps, and Switches can be ordered separately. Combinations that are not available as sets can be created using individual Units. Also, store the parts as spares for maintenance and repairs.

Pushbuttons

LED Lamp

| Shape | Rectangular | Square | Round |
|--------------|-------------|------------|------------|
| Button color | | | |
| Red | A3CJ-500R | A3CA-500R | A3CT-500R |
| Yellow | A3CJ-500Y | A3CA-500Y | A3CT-500Y |
| Green | A3CJ-500GY | A3CA-500GY | A3CT-500GY |
| White | A3CJ-500W | A3CA-500W | A3CT-500W |

Note: The red, yellow, and white Pushbuttons listed above can be used with either LED lamp-lighted models or incandescent lamp-lighted models.

Incandescent Lamp

| Shape | Rectangular | Square | Round |
|--------------|-------------|-----------|-----------|
| Button color | | | |
| Red | A3CJ-500R | A3CA-500R | A3CT-500R |
| Yellow | A3CJ-500Y | A3CA-500Y | A3CT-500Y |
| Green | A3CJ-500G | A3CA-500G | A3CT-500G |
| White | A3CJ-500W | A3CA-500W | A3CT-500W |
| Blue | A3CJ-500A | A3CA-500A | A3CT-500A |

Non-lighted Models

| Shape | Rectangular | Square | Round |
|--------------|-------------|-----------|-----------|
| Button color | | | |
| Red | A3CJ-500R | A3CA-500R | A3CT-500R |
| Yellow | A3CJ-500Y | A3CA-500Y | A3CT-500Y |
| Green | A3CJ-500G | A3CA-500G | A3CT-500G |
| White | A3CJ-500W | A3CA-500W | A3CT-500W |
| Blue | A3CJ-500A | A3CA-500A | A3CT-500A |
| Black | A3CJ-501B | A3CA-501B | A3CT-501B |

Note: Models other than black can also be used with incandescent lamps.

Lamps **LED Lamp**

| Color Rated voltage | Red | Yellow | Green | White |
|---------------------|----------|----------|----------|----------|
| 5 VDC | A16-5DR | A16-5DY | A16-5DG | A16-5DW |
| 12 VDC | A16-12DR | A16-12DY | A16-12DG | A16-12DW |
| 24 VDC | A16-24DR | A16-24DY | A16-24DG | A16-24DW |

Incandescent Lamp

| Rated voltage | Model |
|---------------|--------|
| 6 VAC/DC | A16-5 |
| 14 VAC/DC | A16-12 |
| 28 VAC/DC | A16-24 |

Switches

| | | | Sealing | Degree of protection: IP40 | | |
|---------------|----------|---------------|----------|----------------------------|-----------|-----------|
| | | | | Rectangular | Square | Round |
| Shape | | | | | | |
| Contact type | | Switch action | Terminal | | | |
| Standard load | | Momentary | Solder | A3CJ-7011 | A3CA-7011 | A3CT-7011 |
| Standard load | SPST-NO+ | Alternate | Joidei | A3CJ-7021 | A3CA-7021 | A3CT-7021 |
| Microload | SPST NC | Momentary | Solder | A3CJ-7111 | A3CA-7111 | A3CT-7111 |
| IVIICI OIOau | | Alternate | Joidei | A3CJ-7121 | A3CA-7121 | A3CT-7121 |

Ordering set combinations: Refer to page 3.

■ Specifications: Refer to page 8. ■ Dimensions: Refer to page 10.

■ Accessories: Refer to page 7.

Accessories, Replacements, and Tools

Accessories

| Name | Appearance | Classification | Model | Remarks |
|------------------|------------|--------------------------|-----------|---|
| | 9 | Wire-wrap terminal | A3C-4101 | |
| Socket | | PCB terminal | A3C-4102 | Cannot be used with Insulation Cover. |
| | 11 [1 | Solder terminal | A3C-4103 | |
| Insulation Cover | | | A3C-3002 | Cannot be used with Socket. |
| Constant Consum | | For rectangular models | A3CJ-5050 | Course to be a use of with Durat Course |
| Switch Guard | | For square, round models | A3CA-5050 | Cannot be used with Dust Cover. |
| Dust Cover | | For rectangular models | A3CJ-5060 | Cannot be used with Switch Guard. Can be used with Dust Cover attached. |

Tools

| Name | Appearance | Classification | Model | Remarks |
|-----------------|------------|----------------|-----------|--|
| Tightening Tool | | | A3C-3004 | The tightening torque is 0.20 to 0.39 N⋅m. |
| Extractor | | | A3PJ-5080 | |

Replacements

| Name | Appearance | Classification | Model | Remarks |
|--------------|------------------------|-------------------|-----------|--|
| | For rectangular models | A3CJ-5201 | | |
| Legend Plate | | For square models | A3CA-5201 | One Legend Plate (milk-white) is supplied per standard Switch. |
| | For round models | A3CT-5201 | | |

 \blacksquare Specifications: Refer to page 8. \blacksquare Dimensions: Refer to page 10.

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Approved Standard Ratings UL (File No. E41515), CSA (File No. LR45258)

0.5 A at 250 VAC Standard Load:

1 A at 125 VAC 1 A at 30 VDC

Microload: 0.1 A at 125 VAC

0.1 A at 30 VDC

Note: Certification has been obtained for the Switch Unit.

For detailed information on individual products that have received

certification, consult your supplier.

CCC (GB14048.5)

Standard Load: 0.5 A at 250 VAC Microload: 0.1 A at 250 VAC

Ratings

| Model Item | AC resistive load | DC resistive load |
|---------------|------------------------------------|-------------------|
| Standard load | 0.5 A at 250 VAC 1 A at 125 VAC | 1 A at 30 VDC |
| Microload * | 0.1 A at 125 VAC | 0.1 A at 30 VDC |

Note: The above ratings are for testing under the following conditions:

- 1) Load: Resistive load
- 2) Mounting conditions: No vibrations or shock
- 3) Temperature: $20^{\circ}\text{C} \pm 2^{\circ}\text{C}$ 4) Operation frequency: 20 operations/minute * The minimum permissible load is 1 mA, 5 VDC.

LED Lamp

| Rated voltage | Rated current | Operating voltage | Internal limiting resistance |
|---------------|---------------|-------------------|------------------------------|
| 5 VDC | 30 mA | 5 VDC ± 5% | 33 Ω |
| 12 VDC | 15 mA | 12 VDC ± 5% | 270 Ω |
| 24 VDC | 10 mA | 24 VDC ± 5% | 1,600 Ω |

Incandescent Lamp

| Rated voltage | Rated current | Operating voltage |
|---------------|---------------|-------------------|
| 6 VAC/DC | 60 mA | 5 VAC/DC |
| 14 VAC/DC | 40 mA | 12 VAC/DC |
| 28 VAC/DC | 24 mA | 24 VAC/DC |

Characteristics

| Operat- | Mechanical | Momentary-action models: 120 operations/minute max. Alternate-action models: 60 operations/minute max. *1 | |
|--|---|---|--|
| quency Electrical | | 20 operations/minute max. | |
| Contact Resistance Standard load Microload | | 50m $Ω$ max. | |
| | | 100mΩ max. | |
| Insulation resistance | | 100 MΩ min. (at 500 VDC) | |
| | Between terminals of same polarity | 1,000 VAC, 50/60 Hz for 1 min | |
| Dielectric | Between terminals of different polarity | 2,000 VAC, 50/60 Hz for 1 min | |
| strength | 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 *2 | |
| Vibration resistance | Malfunction | 10 to 55 Hz, 1.5-mm double amplitude *3 | |
| Shock Destruction | | 500 m/s ² | |
| resis- tance | Malfunction | 150 m/s² *3 | |
| Mechanical Durability | | Momentary-operation models: 1,000,000 operations min. Alternate-operation models: 100,000 operations min. *1 | |
| • | Electrical | 100,000 operations min. | |
| Weight | | Approx. 5 g <the (spst-no+spst-nc).="" applies="" here="" indicated="" lighted="" models="" the="" to="" weight=""></the> | |
| Ambient operating temperature | | -10°C to +55°C (with no icing or condensation) | |
| Ambient operating humidity | | 35% to 85%RH | |
| Ambient storage temperature | | -25°C to +65°C (with no icing or condensation) | |
| Degree of protection | | IP40 | |
| Electric shock protection class | | Class II | |
| PTI (proof tracking index) | | 175 | |
| Pollution | degree | 3 (IEC60947-5-1) | |

^{*1.} With alternate-operation models, one operation cycle consists of set and reset operations.

Operating Characteristics

| Operating force OF max. | 2.45 N {250 gf} |
|----------------------------------|-----------------|
| Releasing force RF min. | 0.29 N {30 gf} |
| Total travel TT | Approx. 3.5 mm |
| Lock travel alternate LTA min. * | 0.5 mm |
| Pretravel PT max. | 2.5 mm |

^{*} Alternate operation models only.

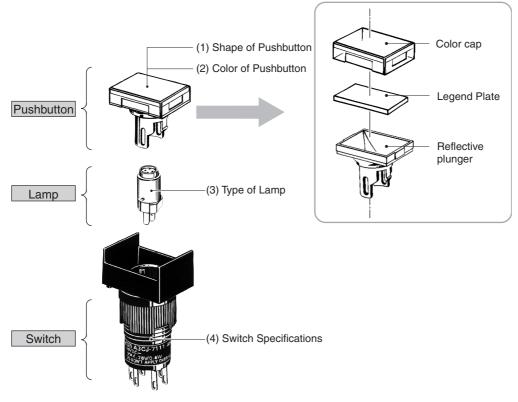
Contact Form

| Contact name | Contact form |
|--------------|--------------|
| SPDT | NO NO NC |

^{*2.} The figure given above for the dielectric strength between lamp terminals is for when there is no LED lamp or incandescent lamp mounted.

 $^{^{\}star}$ 3. No malfunction for more than 1s.

Nomenclature Model Structure Display Unit Structure

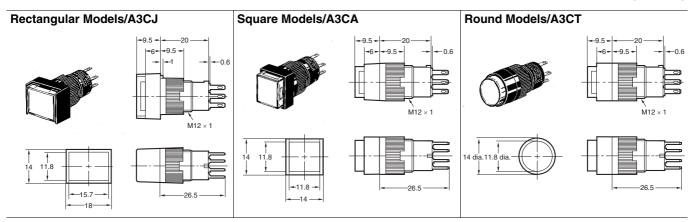


Note: The A3CJ model is shown here as a representative example.

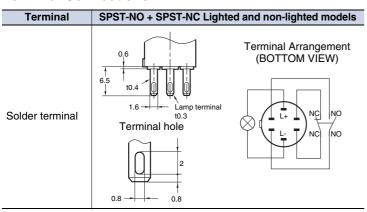
| | Туре | Specifications | |
|-----|---|---|--|
| (1) | Shape of Pushbutton Rectangular Square Round (A3CJ) (A3CA) (A3CT) | | |
| (2) | LED lamp-lighted Models: Red, Yellow, Green, White Incandescent lamp-lighted Models: Red, Yellow, Green, White, Blue Non-lighted Models: Red, Yellow, Green, White, Blue, Black | | |
| (3) | LED Lamp | | |
| | Incandescent Lamp | | |
| (4) | Standard load | 0.5 A at 250 VAC 1 A at 125 VAC 1 A at 30 VDC | |
| | Microload | 0.1 A at 125 VAC 0.1 A at 30 VDC Minimum applicable load: 1 mA at 5 VDC | |

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Dimensions (Unit: mm)



Terminal Connections



Panel Cutout (Top View)

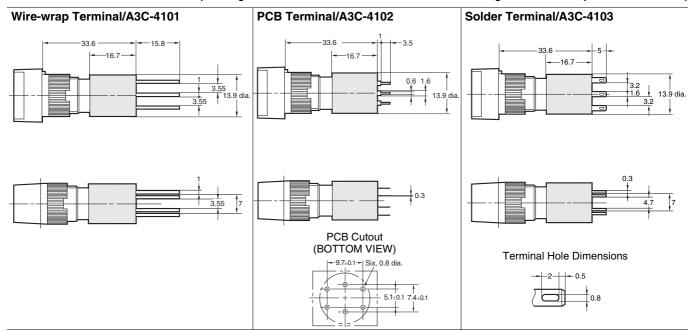
| Accessories used | Rectangular/A3CJ | Square/A3CA, Round/A3CT |
|-------------------|---|---|
| Switch only | 12 dia. +0.2 | 12 dia. ⁴⁰² |
| | Note: Recommended panel thickness: 1.0 to 3.2 mm. | Note: Recommended panel thickness: 1.0 to 3.2 mm. |
| With Switch Guard | 12 dia. 0.2 22.5 min. 7.5±0.1 2 dia. 19 min. | 12 dia ^{+0.2} 19 min. 19 min. |
| With Dust Cover | 12 dia. 0.2 23.5 min. 7.5±0.1 2 dia. 5.5±0.1 | |

[•] If the panel is to be finished (e.g., coated), make sure that the panel meets the specified dimensions after the coating.

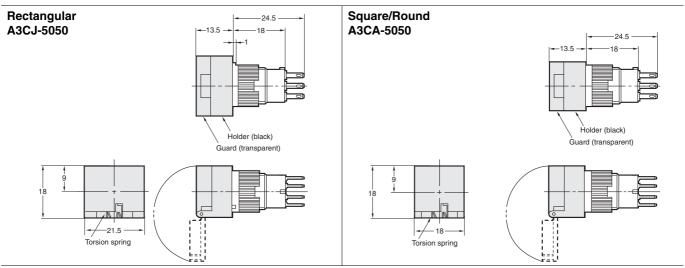
Dimensions (Unit: mm)

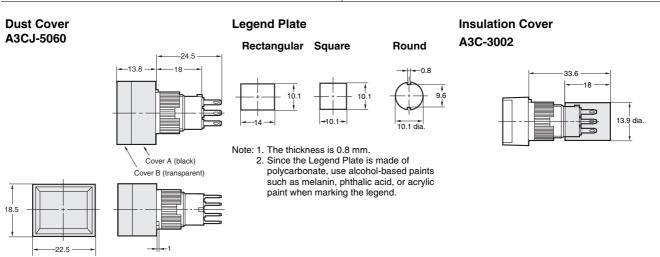
Accessory Mounting Dimensions

Dimensions with Socket Mounted (The diagrams below show the external dimensions for rectangular models as representative models.)



Switch Guard





Safety Precautions

Refer to Safety Precautions for All Pushbutton Switches.

CAUTION

Do not apply a voltage higher than the maximum rated operating voltage between the lamp terminals, as there is a risk that the incandescent lamp or LED lamp will be damaged, and the Pushbutton will be ejected.



When replacing the incandescent lamp, first turn OFF the power supply, and then wait 10 minutes before performing replacement, as the lamp is still hot immediately after the power is turned OFF, so there is a risk of burns.



Precautions for Correct Use

Mounting

- To prevent electric shock or a fire, always make sure that the power is turned OFF before mounting, removing, or wiring the Switch, or performing maintenance.
- Do not tighten the mounting ring excessively using pliers or a similar tool. Excessive tightening may damage the mounting ring.
 (Tightening torque: 0.20 to 0.39 N·m {20 gf to 40 gf})

Wiring

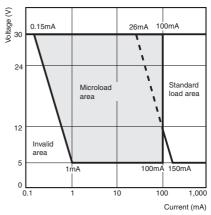
- When wiring, use wires of a size appropriate for the applied voltage and carry current. Perform soldering correctly under the conditions given below. Using the Switch with the wires soldered incorrectly may cause the terminals to become abnormally hot and cause a fire.
- 1. Soldering iron tip temperature: 350°C max. within 3 seconds.
- Dip soldering: At 350°C within 3 seconds.
 Wait for one minute after soldering before exerting any external force on the solder.
- Use a non-corrosive rosin liquid for the flux.
- Perform wiring so that the wire sheaths do not come into contact with the Switch. If this is unavoidable, use wires that can withstand temperatures of 100°C min.
- After wiring to the Switch has been completed, ensure an appropriate insulation distance.

Operating Environment

 Do not use in locations that are subject to dust, oil, or metal filings as these may penetrate the interior of the Switch and cause malfunction.

Using Microloads

• Using a standard load switch for opening and closing a microload circuit may cause wear on the contacts. Use the switch within the operating range. (Refer to the diagram below.) Even when using microload models within the operating range shown below, if inrush current occurs when the contact is opened or closed, it may cause the contact surface to become rough, and so decrease life expectancy. Therefore, insert a contact protection circuit where necessary. The minimum applicable load is the N-level reference value. This value indicates the malfunction reference level for the reliability level of 60% (λ 60) (conforming to JIS C5003). The equation, λ 60 = 0.5 x 10⁻⁶/times indicates that the estimated malfunction rate is less than 1/2,000,000 with a reliability level of 60%.



LED

 Resistance to limit the LED current is provided internally and so an external resistance is not required.

| Rated voltage | Internal limiting resistance |
|---------------|------------------------------|
| 5 VDC | 33 Ω |
| 12 VDC | 270 Ω |
| 24 VDC | 1,600 Ω |

Application

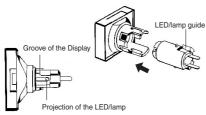
Mounting and Replacing the Pushbutton

- (1) Mounting Direction for the Pushbutton/Display and Lamp Lighted Pushbutton Switch
- Insert the Lamp (incandescent lamp or LED lamp) into the Pushbutton so that the lamp guide fits into the wider gap between the projections on the Pushbutton.



Indicator

• With Indicators, the Lamp is inserted facing the opposite direction (i.e., at 180°) to that for Lighted Pushbutton Switches.

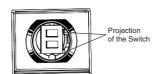


Note: Push the projections on the Lamp into the grooves on the Pushbutton/ Display.

The Lamp for Lighted Pushbutton Switches moves, but the Lamp for Indicators is fixed.

(2) Mounting Direction for the Pushbutton/Display and Switch

- Insert the Pushbutton/Display into the Switch so that the lamp guide is aligned with the non-projecting part of the Switch.
- Apply a pressure between 9.8 and 24.5 N.



- Note: 1. The mounting direction for Indicators is 180° to that for Lighted Pushbutton Switches. Be sure to insert the Legend Plate and other parts with the correct orientation.
 - If the terminals of the Lamp become bent, it may be impossible to fit them into the lamp terminal holes. Ensure that the terminals are straight when they are inserted.
 - Take particular care about the mounting direction with the round models (A3CT).

(3) Removing the Pushbutton/Display

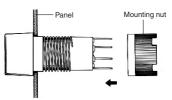
Hold the recessed portions on the cap of the Pushbutton and pull.



Note: Do not use tools such as pliers to remove the Pushbutton as this may damage the cap.

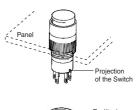
Panel Mounting

- Insert the Switch from the front of the panel. Mount the mounting nut from the terminal end of the Switch and tighten it.
- There are projections on the terminal end of the Switch which may, depending on the orientation, block the nut. In this case, turn the nut until it is possible to mount it. Tighten the nut to a torque between 0.20 and 0.39 N·m.
- If soldering is used, mount the mounting nut first. Lead wires and mounds of solder may make it impossible to mount the nut after soldering.



Socket Mounting

- After securing the Switch to the panel using the mounting nut, insert the Socket into the Switch.
- Align the positioning holes of the Socket with the projections of the Switch before inserting the Socket.





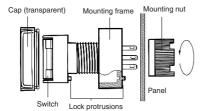
Mounting the Insulation Cover

- After securing the Switch to the panel using the mounting nut, pass
 the lead wires through the holes in the Insulation Cover and then
 perform wiring. Hold the Insulation Cover so that the cylindrical hole
 is facing the Switch, and insert the lead wires from the end with the
 barriers.
- After wiring is completed, mount the Insulation Cover by pushing it into the Switch.



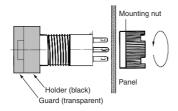
Mounting the Dust Cover

- The Dust Cover separates into 2 parts: the cap and the mounting frame.
- 2. Insert the Switch into the mounting frame. (Align the lock projection with the recess on the mounting frame.)
- Insert the Switch in the state described in step 2 into the panel. (Align the lock protrusion on the mounting frame with the hole in the panel.)
- 4. Mount the mounting nut from the back of the panel and tighten it.
- Insert the cap into the mounting frame. Ensure that the entire
 perimeter of the cap is properly inserted into the mounting frame
 by pressing down on the cap from different directions.



Mounting the Switch Guard

- 1. Insert the Switch into the Switch Guard.
- 2. Insert the Switch into the panel in the state described in step 1.
- 3. Mount the mounting nut from the back of the panel and tighten it.



Application examples provided in this document are for reference only. In actual applications, confirm equipment functions and safety before using the product.

Note: Do not use this document to operate the Unit.

OMRON Corporation

ELECTRONIC AND MECHANICAL COMPONENTS COMPANY Contact: www.omron.com/ecb

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Consult your OMRON representative before using the product under conditions which are not described in the manual or applying the product to nuclear control systems, railroad
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