**Compact High-capacity Push-button Switch**

- Ideal for use as a high breaking capacity Power Switch.
- Switches from micro load (minimum applicable load: 5 VDC 1mA) to high capacity load.

**List of Models**

- **Non-lighted Push-button Switches**
  - Appearance | Model
    - Square | A3AA-900K 1-00
    - Round | A3AT-900K 1-00

- **Lighted Push-button Switches**
  - Illumination | Appearance | Model
    - LED surface illumination | Square | A3AA-900K 1-00E
    - | Round | A3AT-900K 1-00E

**Model Number Structure**

- **Model Number Legend (Ordering as a Set)**
  - (1) Shape of Pushbutton
    - Symbol | Shape
      - A | Square
      - T | Round
  - (2) Terminal
    - Symbol | Type
      - 0 | Solder
      - 1 | PCB
  - (3) Switch Specifications
    - Symbol | Operation | Contact type
      - A | Momentary | SPDT (3 A at 125 VAC, 2 A at 30 VDC)
      - B | Alternate
      - K | Momentary | SPST-NO (6 A at 125 VAC, 2 A at 250 VDC, 4 A at 30 VDC)
      - L | Alternate
  - (4) Illumination
    - Symbol | Operation
      - 0 | Non-lighted
      - 00E | Surface illumination
  - (5) Pushbutton Color
    - Symbol | Pushbutton Color
      - L | Light gray
      - R | Red*
      - Y | Yellow*
      - G | Green*
      - A | Blue
      - B | Black
      - D | Dark gray
      - H | Gray

* The color is the same for both LED surface illumination models and non-lighted models (translucent).

**Specifications**: Refer to page 3.

**Accessories**: Refer to page 2.

**Dimensions**: Refer to page 5.
A3A Lighted Pushbutton Switch

List of Models

### SPST-NO

<table>
<thead>
<tr>
<th>Appearance</th>
<th>Terminal</th>
<th>Operation</th>
<th>Illumination</th>
<th>Model</th>
<th>Color symbol for pushbutton</th>
<th>Minimum packing unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Square/A3AA</td>
<td>Solder</td>
<td>Momentary</td>
<td>Non-lighted</td>
<td>LED surface illumination</td>
<td>A3AA-901-000</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Alternate</td>
<td>Non-lighted</td>
<td>LED surface illumination</td>
<td>A3AA-901-00E</td>
<td></td>
</tr>
<tr>
<td></td>
<td>PCB</td>
<td>Momentary</td>
<td>Non-lighted</td>
<td>LED surface illumination</td>
<td>A3AA-911-000</td>
<td></td>
</tr>
<tr>
<td>Round/A3AT</td>
<td>Solder</td>
<td>Momentary</td>
<td>Non-lighted</td>
<td>LED surface illumination</td>
<td>A3AT-901-000</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Alternate</td>
<td>Non-lighted</td>
<td>LED surface illumination</td>
<td>A3AT-901-00E</td>
<td></td>
</tr>
<tr>
<td></td>
<td>PCB</td>
<td>Momentary</td>
<td>Non-lighted</td>
<td>LED surface illumination</td>
<td>A3AT-911-000</td>
<td></td>
</tr>
</tbody>
</table>

Note: The above models each have a SPST-NO contact that can switch 6 A at 125 VAC, 2 A at 250 VAC, and 4 A at 30 VDC. When ordering any of the above models, replace of the model number with a code to indicate the pushbutton color of the model (i.e., replace with R, Y, G, L, A, B, D, H, and L). The pushbutton of an A3A does not illuminate if the color of the pushbutton is dark gray, gray, light gray, blue, or black.

### SPDT

<table>
<thead>
<tr>
<th>Appearance</th>
<th>Terminal</th>
<th>Operation</th>
<th>Illumination</th>
<th>Model</th>
<th>Color symbol for pushbutton</th>
<th>Minimum packing unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Square/A3AA</td>
<td>Solder</td>
<td>Momentary</td>
<td>Non-lighted</td>
<td>LED surface illumination</td>
<td>A3AA-90A1-000</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Alternate</td>
<td>Non-lighted</td>
<td>LED surface illumination</td>
<td>A3AA-90A1-00E</td>
<td></td>
</tr>
<tr>
<td></td>
<td>PCB</td>
<td>Momentary</td>
<td>Non-lighted</td>
<td>LED surface illumination</td>
<td>A3AA-91A1-000</td>
<td></td>
</tr>
<tr>
<td>Round/A3AT</td>
<td>Solder</td>
<td>Momentary</td>
<td>Non-lighted</td>
<td>LED surface illumination</td>
<td>A3AT-90A1-000</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Alternate</td>
<td>Non-lighted</td>
<td>LED surface illumination</td>
<td>A3AT-90A1-00E</td>
<td></td>
</tr>
<tr>
<td></td>
<td>PCB</td>
<td>Momentary</td>
<td>Non-lighted</td>
<td>LED surface illumination</td>
<td>A3AT-91A1-000</td>
<td></td>
</tr>
</tbody>
</table>

### Accessories

**Flange** (Select according to panel color.)

<table>
<thead>
<tr>
<th>Name</th>
<th>Shape</th>
<th>Classification</th>
<th>Model</th>
<th>Minimum packing unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flange</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Square</td>
<td>12.7</td>
<td>Flange alone</td>
<td>Black</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Light gray</td>
</tr>
<tr>
<td></td>
<td>Round</td>
<td>12.7</td>
<td>Leaf spring</td>
<td>Black</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Light gray</td>
</tr>
<tr>
<td></td>
<td>Square</td>
<td>12.7</td>
<td>Flange and leaf spring (one each)</td>
<td>Black</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Light gray</td>
</tr>
<tr>
<td></td>
<td>Round</td>
<td>12.7</td>
<td></td>
<td>Black</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Light gray</td>
</tr>
</tbody>
</table>

Note: An A3A with solder terminals is provided with a round or square black flange and leaf spring. A round black flange is provided with each A3A having solder terminals and a round pushbutton. A square black flange is provided with each A3A having solder terminals and a square pushbutton.
A3A Lighted Pushbutton Switch

Specifications

- **Approved Standards**
  - UL (File No. E41515), CSA (File No. LR45258)
  - 1a: 6 A at 125 VAC, 2 A at 250 VAC, 4 A at 30 VDC
  - 1c: 3 A at 125 VAC, 2 A at 30 VDC

- **Ratings**
  - **Type**
    - **Item**
    - **Contact form**
    - **AC resistive load**
    - **DC resistive load**
    - **General load**
      - 1a: 6 A at 125 VAC, 2 A at 250 VAC, 4 A at 30 VDC
      - 1c: 3 A at 125 VAC, 2 A at 30 VDC
  - **Note:** Minimum allowable load: 5 VDC 1 mA (Resistive)
  - The ratings given above are for testing under the following conditions:
    1. Ambient temperature: 20 ±2°C
    2. Ambient humidity: 65 ±5%RH
    3. Operating frequency: 20 times/minute

- **LED**
  - **LED Surface Illumination**
    - **Item**
    - **Illumination**
      - Red
      - Yellow: 2.1
      - Green: 2.1
    - **Forward voltage Vf**
      - Standard value (V) *(If = 10 mA)*: 2.0
      - Maximum value (V): 3.0
    - **Forward current I(F)**
      - Maximum value (mA): 20
    - **Permissible loss PD**
      - Maximum value (mW): 60
    - **Reverse voltage Vr**
      - Maximum value (V): 3

  - **Note:** The above built-in LEDs do not have a resistor. Connect to each of the above built-in LEDs a resistor that satisfies the above conditions.
  - * Refer to the Vf – IF characteristic graphs on page 8.

- **Operating Characteristics**
  - **Operating force**
    - OF max.: 2.45 N
  - **Release force**
    - RF min.: 0.15 N
  - **Total travel**
    - TT: Approx. 2mm
  - **Pretravel**
    - PT max.: 1.5 mm
  - **Locktravel alternate** *
    - LTA min.: 0.5 mm

  - * Alternate operation models only.

- **Characteristics**

  - **Operating frequency**
    - Mechanical: Momentary action: 120 operations/minute max.
    - Alternate: 60 operations/minute max. *
  - **Insulation resistance**
    - 100 MΩ min.
    - (at 500 VDC with insulation tester)
  - **Contact resistance**
    - (initial value): 100 mΩ max.
  - **Dielectric strength**
    - Between terminals of the same polarity: 600 VAC, 50/60 Hz for 1 min
    - Between each terminal and ground: 2,000 VAC, 50/60 Hz for 1 min
  - **Vibration resistance**
    - Malfunction: 10 to 55 Hz, 1.5-mm double amplitude *
  - **Shock resistance**
    - Destruction: 500 m/s² max.
    - Malfunction: 150 m/s² *
  - **Durability**
    - Mechanical: Momentary-operation model: 1,000,000 operations min.
    - Alternate-operation model: 50,000 operations min. *
  - **Weight**
    - Approx. 3.2 g
  - **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**
    - IEC IP40
  - **Electric shock protection class**
    - Class II
  - **PTI (proof tracking index)**
    - 175
  - **Pollution degree**
    - 3 (IEC60947-5-1)

  - * With alternate operation models, one operation cycle consists of set and reset operations.
  - *1 Indicates malfunctions of less than 1 ms.

- **Contact Form**

  - **Contact name**
    - **Contact form**

      - SPST-NO
      - COM ———— NO
      - SPDT
      - COM ———— NC ———— NO

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Nomenclature

■Model Structure

1. Shape
   - Square (A3AA)
   - Round (A3AT)

2. Terminals
   - Solder terminal
   - PCB terminal

3. Ratings
   - Standard load (1a)
     - 6 A at 125 VAC
     - 2 A at 250 VAC
     - 4 A at 30 VDC
   - Standard load (1c)
     - 3 A at 125 VAC
     - 2 A at 30 VDC
   * Minimum applicable load:
     - 1 mA at 5 VDC (resistive load)

4. Color cap

5. Color
   - Non-lighted Model
     - Red, yellow, light gray, gray, dark gray, green, blue, black
   - Surface illumination Model
     - Red, yellow, green

Note 1. The above is for the A3AA.

2. An A3A with solder terminals is provided with a black flange and leaf spring, however an A3A with PCB terminals is not provided with them. If a black flange and leaf spring are required for an A3A with PCB terminals, order them from your OMRON representative. (Refer to page 2.)
A3A Lighted Pushbutton Switch

Dimensions (Unit: mm)

Non-lighted Model

Square Pushbutton

Round Pushbutton

LED Surface Illumination Models

Square Pushbutton

Round Pushbutton

Note: All units are in millimeters unless otherwise indicated.
The illustrations below show switches with solder terminals, without a flange or leaf spring. Unless specified, there is a tolerance of ±0.4mm for dimensions.
# A3 A Lighted Pushbutton Switch

## Terminal Arrangement

### Contact Solder terminal PCB terminal

<table>
<thead>
<tr>
<th>Terminal Hole Dimensions</th>
<th>Non-lighted Models</th>
<th>LED Surface Illumination Models</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SPST-NO</strong></td>
<td>Switch terminal: 10.4</td>
<td>Switch terminal: 10.4</td>
</tr>
<tr>
<td>Non-lighted Models</td>
<td>Switch terminal: 10.4</td>
<td>Switch terminal: 10.4</td>
</tr>
<tr>
<td>LED Surface Illumination Models</td>
<td>Lamp terminal: 10.3</td>
<td>LED terminal: 10.4</td>
</tr>
<tr>
<td>Terminal for models with an illuminating push-button</td>
<td>Terminal for models with an illuminating push-button</td>
<td>Terminal for models with an illuminating push-button</td>
</tr>
</tbody>
</table>

### Terminal Arrangement (BOTTOM VIEW)

<table>
<thead>
<tr>
<th>Non-lighted Models</th>
<th>LED Surface Illumination Models</th>
</tr>
</thead>
<tbody>
<tr>
<td>Switch terminal: 10.4</td>
<td>Switch terminal: 10.4</td>
</tr>
<tr>
<td>Lamp terminal: 10.3</td>
<td>LED terminal: 10.4</td>
</tr>
</tbody>
</table>

### PCB Dimensions (BOTTOM VIEW)

<table>
<thead>
<tr>
<th>LED Surface Illumination Models</th>
<th>Non-lighted Models</th>
</tr>
</thead>
<tbody>
<tr>
<td>Switch terminal: 10.4</td>
<td>Switch terminal: 10.4</td>
</tr>
<tr>
<td>LED terminal: 10.4</td>
<td>LED terminal: 10.4</td>
</tr>
</tbody>
</table>

### Terminal Hole Dimensions

<table>
<thead>
<tr>
<th>LED terminal: 10.4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Four, 1 dia. holes</td>
</tr>
</tbody>
</table>

Non-lighted Models: Terminal Hole Dimensions

- **Switch terminal:** 10.4
- **Lamp terminal:** 10.3

LED Surface Illumination Models: Terminal Hole Dimensions

- **Switch terminal:** 10.4
- **Lamp terminal:** 10.3

---

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A3A Lighted Pushbutton Switch

Accessories Dimensions

**Leaf Spring A3A-200**

**Flange (Square) A3A-24**

**Flange (Round) A3A-25**

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

Panel Cutouts

<table>
<thead>
<tr>
<th>Square Pushbutton</th>
<th>For Side-by-side Mounting</th>
<th>Round Pushbutton</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Square pushbutton</td>
<td>Round pushbutton</td>
</tr>
<tr>
<td></td>
<td>Horizontal multiple</td>
<td>11.5±0.2 dia.</td>
</tr>
<tr>
<td></td>
<td>mounting</td>
<td>15.3 min.</td>
</tr>
<tr>
<td></td>
<td>Vertical multiple</td>
<td>11.5±0.2 dia.</td>
</tr>
<tr>
<td></td>
<td>mounting</td>
<td>12.7 min.</td>
</tr>
</tbody>
</table>

Panel Mounting Dimensions

(The diagram shows the lighted SPST-NO model.)

Recommended panel thickness: 1 to 1.6 mm
A3A Lighted Pushbutton Switch

Precautions

Refer to the “Push-button Switches/Indicators Common Precautions” for correct use.

Precautions for Correct Use

• Please do not perform wiring or touch the charged parts of terminals while power is supplied to the Switch. Doing so may result in electric shock.
• Make sure to keep a secure insulation distance after wiring to the Switch.

Mounting

• When opening a hole on a panel to mount an A3A to the panel, make sure that the hole has no burr.
• When mounting a flange to the switching mechanism of an A3A, make sure that the flange and the casing of the switching mechanism are engaged securely.

Wiring

• When soldering the terminals of an A3A, refer to the following.
  1. For manual soldering:
     Use a soldering iron with the terminals at a temperature of 350°C maximum within three seconds.
  2. Do not impose any external force on the terminals for one minute after the terminals are soldered.
• Do not pull the terminals of any A3A with a force exceeding 5.34 N, otherwise the joint part of the A3A may be damaged.
• When soldering the terminals of an A3A, apply non-corrosive rosin flux to the terminals.
• After soldering the terminals of an A3A, do not wash the A3A with any solvent.
• When mounting an A3A to a PCB and soldering the terminals of the A3A to the PCB, make sure that the flux will not rise above the surface of the PCB.

Operating Environment

• When using an A3A, make sure that dust, metal powder, or oil will not penetrate into the interior of the A3A.

LED

• The polarity of the LED is indicated on the back of the Switch. Wire the LED correctly according to the polarity.
• An A3A with a built-in LED does not have a limiting resistor. Connect a limiting resistor.
• The resistance can be calculated by using the following expression.

\[
R = \frac{E - V_F}{I_F} \quad (\Omega)
\]

where:
- \( E \): Applied voltage (V)
- \( V_F \): LED forward voltage (V)
- \( I_F \): LED forward current (A)

Example

Conditions: Red LED with an If of 

-10 mA at 24 V and a Ta of 25°C.

From the red LED characteristic below, 

\( V_F \) will be 2 V when \( I_F \) is 10 mA.

Therefore, 

\[ R = \frac{24 \text{ V} - 2 \text{ V}}{0.01 \text{ A}} = 2,200 \Omega. \]

Thus the recommended resistance is 

2.2 kΩ at 0.5 W (2^2 x I_F^2R).

Note: A factor of 2 (marked with an asterisk) is applied because the permissible wattage of the resistor must be twice as large as the required wattage.

LED Characteristics

(VF – IF Characteristics)

Ta: Ambient Temperature

Red

Yellow

Green

Pushbutton

• When exchanging the Pushbutton (except the ones for the mechanical indicator models) with a new one, pull out the Pushbutton from the Switch, holding the Pushbutton in the longitudinal direction. Do not remove the Pushbutton of the mechanical indicator model.

Engraving of Pushbutton

• Depth of engraving: 0.3 mm max. for illuminating pushbutton
• Since the Pushbutton is made of polycarbonate, use an alcohol-based paint when marking legend.

Pressing of Pushbutton

• Apply firm pressure to the Pushbutton when operating it. In doing so, however, do not apply a pressure greater than 11.8 N.
### Installation

#### Mounting and Replacing the Pushbutton

<table>
<thead>
<tr>
<th>1. Mounting Direction for the Pushbutton and Switch</th>
<th>2. Removing the Pushbutton (Non-lighted Models Only)</th>
</tr>
</thead>
</table>
| • Insert the catches of the Pushbutton into the grooves of the Switch and push down on the Pushbutton until it is fixed securely to the Switch.  
• With lighted models, the LED is built into the Switch and cannot be replaced. | • To remove the Pushbutton, hold both the Pushbutton and the Switch on the longer sides and pull the Pushbutton away from the Switch.  
(If the catches on the Pushbutton are bent outwards, it may result in malfunction.)  
• When replacing the Pushbutton, if the cap is held on the sides with catches, internal components (e.g., plate) may come loose. Be sure to hold the Pushbutton by the sides without catches (i.e., the longer sides of the Switch) when removing. |

[Diagram: Catches on the Pushbutton, Grooves in the Switch, LED terminals]

---

#### Mounting Switch on a Panel

|----------------------|--------------------------|---------------------------|-------------------|
| • Press the leaf spring into the fitted groove on the upper surface of the Switch. For an easier fitting, first fit one side of the leaf spring, then press the other side into the fitting groove.  
(It will be easier mounting the leaf spring of one side first, then mount the other side.) | • Insert the flange from the front surface of the panel.  
• The flange has two opposing guides to facilitate its insertion into the panel cutout hole. Be sure the flange does not remain tilted with respect to the panel surface after being installed.  
(Cross Section: Flange, Panel (t = 1 to 1.6 mm)) | • While holding the flange, insert the opposing supports into the gaps between the leaf spring and Switch on the longer sides of the housing, and fit the rectangular hole of the flange with the projections of the switch housing.  
Note: Completely remove any burrs on the panel cutout surface; otherwise, the flange and Switch will not attach solidly. | • Insert a small flat-bladed screwdriver or tweezers into the flange support exposed on the rear of the panel. Pry up on each side to pull out the Switch.  
Note: Do not pry up the flange support more than necessary or the switch holding portions may be damaged. |

[Diagram: Leaf spring, Leaf spring fitting groove, Switch, Flange, Guide, Panel, Cross Section, Support, Panel Projection, Flat-bladed screwdriver or tweezers]
A3A Lighted Pushbutton Switch

• Application examples provided in this document are for reference only. In actual applications, confirm equipment functions and safety before using the product.
• 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 systems, aviation systems, vehicles, combustion systems, medical equipment, amusement machines, safety equipment, and other systems or equipment that may have a serious influence on lives and property if used improperly. Make sure that the ratings and performance characteristics of the product provide a margin of safety for the system or equipment, and be sure to provide the system or equipment with double safety mechanisms.

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

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