

**A8 Series — Miniature Switches and Pilot Devices: 8mm**

**Key features:**

- 21/64" (8mm) round mounting hole
- Compact Design Saves Space
- Bright and Vivid Illumination
- Choice of Shapes and Functions
- Gold Clad Silver Contacts for reliable low level switching
- Snap action contacts
- IP40 (Dustproof) Construction



**Specifications**

|                       |  |
|-----------------------|--|
| LED Lamp Life         | 50,000 hours approximately (reduced to half of original intensity)   |
| Contact Configuration | SPDT   |
| Maximum Voltage       | 250V AC/DC   |
| Thermal Current       | 3A   |
| Contact Material      | Gold-clad Silver   |
| Terminal Style        | Solder Tab Terminal  |
| Operating Temperature | -25° to +55°C (no freezing)  |
| Operating Humidity    | 45 to 85% RH   |
| Contact Resistance    | 50mΩ maximum (initial value)   |
| Insulation Resistance | 100MΩ minimum<br>(500V DC megger)  |
| Vibration Resistance  | 5 to 55Hz, 0.75mm amplitude  |
| Shock Resistance      | Damage limits: 500m/sec <sup>2</sup> (approx. 50G)<br>Operating extremes: 200m/sec <sup>2</sup> (approx. 20G)  |
| Electrical Life       | 100,000 operations minimum   |
| Mechanical Life       | Maintained: 100,000 (1200 operations/hour)<br>Momentary: 200,000 minimum   |
| Degree of Protection  | IP40 Enclosed/Dustproof  |
| Soldering Temperature | 20W/5 seconds or 260°C/3 seconds   |
| Dielectric Strength   | Switch Unit: 2,000V AC, 1 min. between live/dead part and terminals of different poles; 1,000V AC, 1 minute between terminals of the same pole; 1,500V AC, 1 minute between contact and lamp terminals.<br>Illumination Unit: 2,000V AC, 1 min. between live part/ground |

**Contact Ratings**

| Operating Voltage |           | 24V  | 120V | 240V |
|-------------------|-----------|------|------|------|
| AC<br>50/60Hz     | Resistive | —    | 1.0A | 0.5A |
|                   | Inductive | —    | 0.7A | 0.5A |
| DC                | Resistive | 1.0A | 0.2A | —    |
|                   | Inductive | 0.7A | 0.1A | —    |

1. AC Inductive Load, PF = 0.6 – 0.7; DC Inductive Load, L/R = 7.
2. Minimum applicable load (reference value) is 5V AC/DC 3mA (applicable range is subject to the operating conditions and load).

**AB8 Non-Illuminated Pushbuttons (Assembled)**

**Non-Illuminated Pushbuttons**

| Style       | Contact | Part Numbers |            |
|-------------|---------|--------------|------------|
|             |         | Momentary    | Maintained |
| Round       | SPDT    | AB8M-M1-⓪    | AB8M-A1-⓪  |
| Square      | SPDT    | AB8Q-M1-⓪    | AB8Q-A1-⓪  |
| Rectangular | SPDT    | AB8H-M1-⓪    | AB8H-A1-⓪  |

① **Button Color Codes**

| Color  | Code |
|--------|------|
| Black  | B    |
| Green  | G    |
| Red    | R    |
| Blue   | S    |
| White  | W    |
| Yellow | Y    |

- 1. In place of ⓪, specify button color code from the table below.
- 2. For accessories, see page 459.
- 3. For dimensions, see page 460.

AL8 Illuminated Pushbuttons & Pilot Lights (Assembled)

Illuminated Pushbuttons

| Style   | Contact | Part Numbers |            | Pilot Light Part Number |
|---|---------|--------------|------------|-------------------------|
|   |         | Momentary    | Maintained |                         |
| Round        | SPDT    | AL8M-M11-②   | AL8M-A11-② | AL8M-P1-②               |
| Square       | SPDT    | AL8Q-M11-②   | AL8Q-A11-② | AL8Q-P1-②               |
| Rectangular  | SPDT    | AL8H-M11-②   | AL8H-A11-② | AL8H-P1-②               |

② LED/Lens Color Codes

| Color  | Code |
|--------|------|
| Amber  | A    |
| Green  | G    |
| Red    | R    |
| White  | W    |
| Yellow | Y    |

- In place of ②, specify lens color code from table on the right.
- A replaceable LED lamp is included with the operator.
- Because the LED lamp does not contain an internal current limiting resistor, an external resistor must be added. For recommended values, see table below.
- For accessories, see page 459.
- For dimensions, see page 460.

Replacement LEDs

| Lens Color | LED Lamp | Part Number |
|------------|----------|-------------|
| Amber      | Amber    | LAD-SA      |
| Green      | Green    | LAD-SG      |
| Red        | Red      | LAD-SR      |
| White      | Yellow*  | LAD-SY      |
| Yellow     | Yellow   | LAD-SY      |

\* White units use a white lens and a yellow LED.

LED Voltage and Recommended Current Limiting Resistor


| Voltage | External Resistor |
|---------|-------------------|
| 5V DC   | 150Ω, 1/2W        |
| 6V DC   | 200Ω, 1/2W        |
| 12V DC  | 510Ω, 1W          |
| 24V DC  | 1.1kΩ, 1W         |


LED Lamp Ratings: LED Specifications

| LED Lamp | Forward Current $I_f$ | Forward Voltage (Nominal) $V_f$ | Reverse Voltage $V_r$ | Operating Voltage & External Current Limiting Resistor (Recommended Value)      |
|----------|-----------------------|---------------------------------|-----------------------|---|
| Amber    | 20mA                  | 2.2V                            | 4V                    | 5V DC: 150Ω, 1/2W<br>6V DC: 200Ω, 1/2W<br>12V DC: 510Ω, 1W<br>24V DC: 1.1kΩ, 1W |
| Green    | 20mA                  | 2.1V                            | 4V                    |   |
| Red      | 20mA                  | 1.7V                            | 4V                    |   |
| Yellow   | 20mA                  | 2.2V                            | 4V                    |   |

When LED lamps are used at voltages other than those stated above, external resistor value, R, is determined by the following formula:  $R = (Operating\ Voltage - V_f) / I_f$

## Accessories

| Item   | Description  | Used With                                | Part Number   |
|--|--|--|---|
| <br>Locking Ring Wrench   | Made of metal. Used for tightening plastic locking ring during installation. Tightening torque should not exceed 3kgf-cm                     | All units                                | MT-004  |
| <br>Lens Removal Tool   | Made of metal. Used for removing lens or button from the housing   | Illuminated pushbuttons and pilot lights | MT-101  |
| <br>Lamp Holder Tool  | Made of rubber. Used for removing and replacing LED lamps in illuminated units   | Illuminated pushbuttons and pilot lights | OR-66   |
| <br>Switch Guard  | Used to avoid operating the pushbutton inadvertently. Cover flips open 90°. Provides IP40 protection   | Round & square units                     | AL-K8   |
|  |  | Rectangular units                        | AL-KH8  |
| <br>Terminal Cover  | Made of translucent nylon. Fits over and shields the terminals   | All units                                | AL-V8   |
| <br>Adaptor Socket<br><small>AL-C8      AL-C8V shown attached</small> | Plug-on adaptor with solder terminals, allows easy control unit replacement.   | All units                                | AL-C8   |
|  |  |  | Plug-on adaptor with PCB terminals, allows easy control unit replacement. |
| <br>Mounting Hole Plug  | Made of rubber. Fills unused mounting holes to provide IP65 protection   | Extra panel cutouts                      | AL-B8   |
| <br>Replacements LEDs   | LED lamp is included in every illuminated control unit. Replacement lamp is ordered separately. External current limiting resistor required. | Illuminated units and pilot lights       | LAD-SR (red)  |
|  |  |  | LAD-SG (green)  |
|  |  |  | LAD-SA (amber)  |
|  |  |  | LAD-SY (yellow)   |
| <br>Replacement Lenses  |  | Illuminated pushbuttons and pilot lights | Round      AL8M-LK1-②   |
|  |  |  | Square      AL8Q-LK1-②  |
|  |  |  | Rectangular      AL8H-LK1-②   |
| <br>Replacement Buttons   |  | Non-Illuminated buttons                  | Round      AB8M-BK1-①   |
|  |  |  | Square      AB8Q-BK1-①  |
|  |  |  | Rectangular      AB8H-BK1-①   |

-  1. In place of ①, specify Button Color Code from the table.  
 2. In place of ②, specify Lens Color Code from table.

### ① Button Color Codes

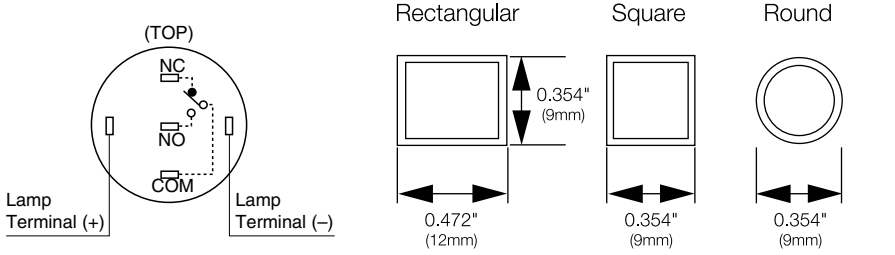
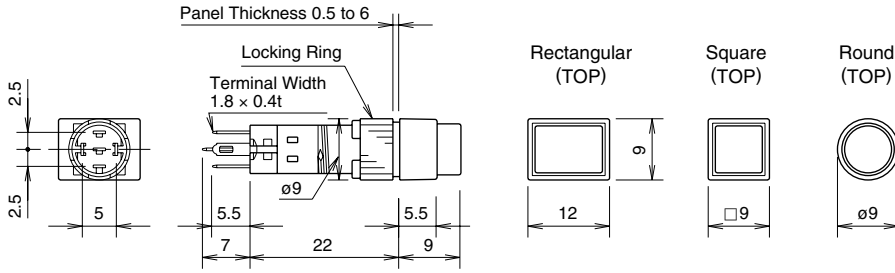
| Color  | Code |
|--------|------|
| Black  | B    |
| Green  | G    |
| Red    | R    |
| Blue   | S    |
| White  | W    |
| Yellow | Y    |

### ② LED/Lens Color Codes

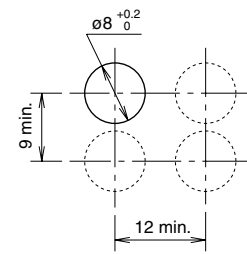
| Color  | Code |
|--------|------|
| Amber  | A    |
| Green  | G    |
| Red    | R    |
| White  | W    |
| Yellow | Y    |

Dimensions

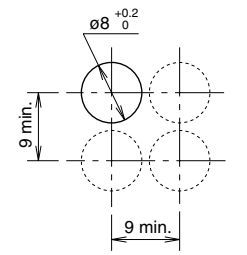
AΔ8



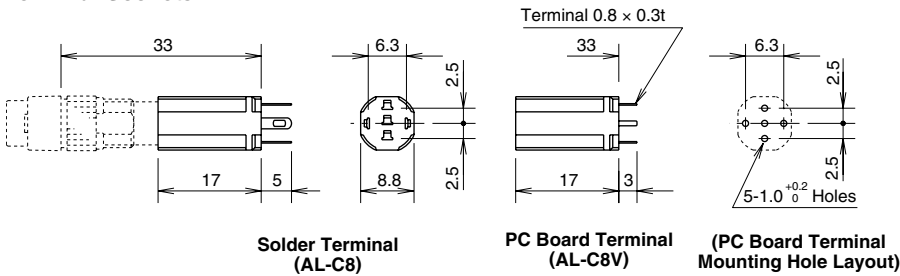
Panel Cut-Out (not drawn to scale)  
Rectangular



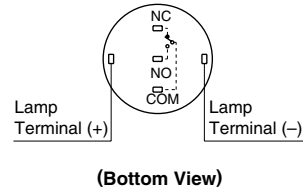
Round/Square



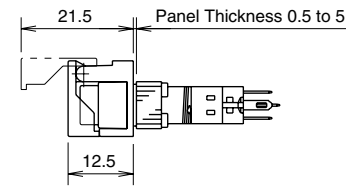
Terminal Sockets



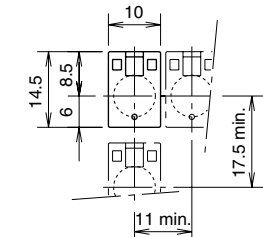
Terminal Arrangement (TOP)



Switch Guard, Ø 21/64" (8mm)

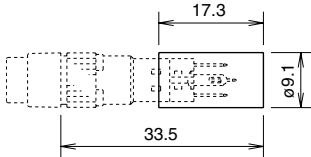


For Round/Square Units (AL-K8)



Terminal Cover

AL-V8, Ø 21/64" (8mm)



For Rectangular Units (AL-KH8)

