

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



UL Listed  
File No. E55996



CSA Certified  
File No. LR21451

Specifications

|                              |                                                                                                                                                                                                                                                                          |
|------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>LED Lamp Life</b>         | 50,000 hours approximately (reduced to half of original intensity)                                                                                                                                                                                                       |
| <b>Contact Configuration</b> | SPDT                                                                                                                                                                                                                                                                     |
| <b>Maximum Voltage</b>       | 250V AC/DC                                                                                                                                                                                                                                                               |
| <b>Thermal Current</b>       | 3A                                                                                                                                                                                                                                                                       |
| <b>Contact Material</b>      | Gold-clad Silver                                                                                                                                                                                                                                                         |
| <b>Terminal Style</b>        | Solder Tab Terminal                                                                                                                                                                                                                                                      |
| <b>Operating Temperature</b> | -25° to +55°C (no freezing)                                                                                                                                                                                                                                              |
| <b>Operating Humidity</b>    | 45 to 85% RH                                                                                                                                                                                                                                                             |
| <b>Contact Resistance</b>    | 50mΩ maximum (initial value)                                                                                                                                                                                                                                             |
| <b>Insulation Resistance</b> | 100MΩ minimum<br>(500V DC megger)                                                                                                                                                                                                                                        |
| <b>Vibration Resistance</b>  | 5 to 55Hz, 0.75mm amplitude                                                                                                                                                                                                                                              |
| <b>Shock Resistance</b>      | Damage limits: 500m/sec <sup>2</sup> (approx. 50G)<br>Operating extremes: 200m/sec <sup>2</sup> (approx. 20G)                                                                                                                                                            |
| <b>Electrical Life</b>       | 100,000 operations minimum                                                                                                                                                                                                                                               |
| <b>Mechanical Life</b>       | Maintained: 100,000 (1200 operations/hour)<br>Momentary: 200,000 minimum                                                                                                                                                                                                 |
| <b>Degree of Protection</b>  | IP40 Enclosed/Dustproof                                                                                                                                                                                                                                                  |
| <b>Soldering Temperature</b> | 20W/5 seconds or 260°C/3 seconds                                                                                                                                                                                                                                         |
| <b>Dielectric Strength</b>   | 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-M1-①    | AB8M-A1-①  |
| Square      |  | SPDT    | AB8Q-M1-①    | AB8Q-A1-①  |
| Rectangular |  | SPDT    | AB8H-M1-①    | AB8H-A1-①  |

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1. In place of ①, specify button color code from the table below.

2. For accessories, see page 449.

3. For dimensions, see page 450.

① Button Color Codes

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

## 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 449.
- For dimensions, see page 450.

### 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, 3/4W        |
| 24V DC  | 1.1kΩ, 3/4W       |

### LED Lamp Ratings: LED Specifications

| LED Lamp | Forward Current<br>$I_f$ | Forward Voltage (Nominal)<br>$V_f$ | Reverse Voltage<br>$V_r$ | 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, 3/4w<br>24V DC: 1.1kΩ, 3/4w |
| 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:  $R = (\text{Operating Voltage} - V_f) / I_f$

## Accessories

| Appearance                                                                                                                              | Description                                                                                                                                  | Used With                                |             | Part Number     |
|-----------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------|-------------|-----------------|
| Locking Ring Wrench<br>                                | Made of metal. Used for tightening plastic locking ring during installation. Tightening torque should not exceed 3kgf-cm                     | All units                                |             | MT-004          |
| Lens Removal Tool<br>                                  | Made of metal. Used for removing lens or button from the housing                                                                             | Illuminated pushbuttons and pilot lights |             | MT-101          |
| Lamp Holder Tool<br>                                   | Made of rubber. Used for removing and replacing LED lamps in illuminated units                                                               | Illuminated pushbuttons and pilot lights |             | OR-66           |
| Switch Guard<br>                                       | Used to avoid operating the pushbutton inadvertently. Cover flips open 90°. Provides IP40 protection                                         | Round & square units                     |             | AL-K8           |
|                                                                                                                                         |                                                                                                                                              | Rectangular units                        |             | AL-KH8          |
| Terminal Cover<br>                                     | Made of translucent nylon. Fits over and shields the terminals                                                                               | All units                                |             | AL-V8           |
| Adaptor Socket<br><br>AL-C8      AL-C8V shown attached | 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.                                                                    |                                          |             | AL-C8V          |
| Mounting Hole Plug<br>                                 | Made of rubber. Fills unused mounting holes to provide IP65 protection                                                                       | Extra panel cutouts                      |             | AL-B8           |
| Replacements LEDs<br>                                | 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) |
| Replacement Engraving Inserts<br>                    |                                                                                                                                              | Illuminated pushbuttons and pilot lights | Round       | AL8M-W          |
|                                                                                                                                         |                                                                                                                                              |                                          | Square      | AL8Q-W          |
|                                                                                                                                         |                                                                                                                                              |                                          | Rectangular | AL8H-W          |
| Replacement Lenses<br>                               |                                                                                                                                              | Illuminated pushbuttons and pilot lights | Round       | AL8M-LK1-②      |
|                                                                                                                                         |                                                                                                                                              |                                          | Square      | AL8Q-LK1-②      |
|                                                                                                                                         |                                                                                                                                              |                                          | Rectangular | AL8H-LK1-②      |
| Replacement Buttons<br>                              |                                                                                                                                              | 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

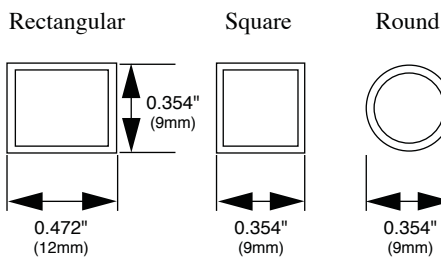
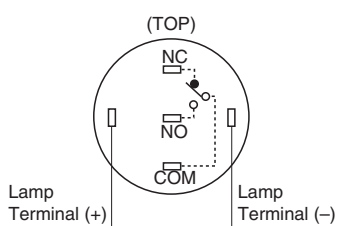
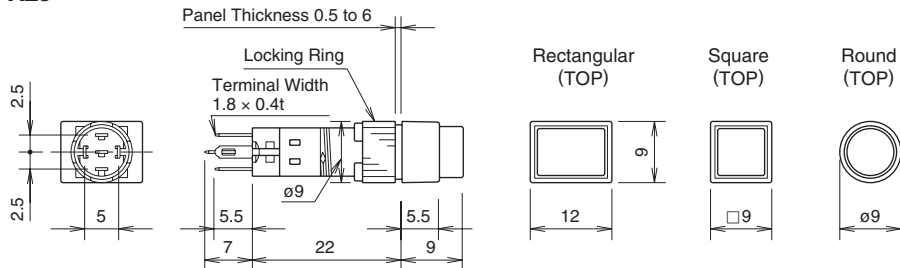
| Color  | Code |
|--------|------|
| Black  | B    |
| Green  | G    |
| Red    | R    |
| Blue   | S    |
| White  | W    |
| Yellow | Y    |

## ② LED/Lens Color Codes

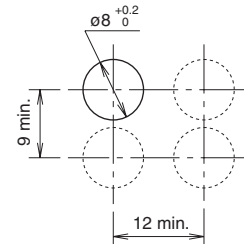
| Color  | Code |
|--------|------|
| Amber  | A    |
| Green  | G    |
| Red    | R    |
| White  | W    |
| Yellow | Y    |

## Dimensions

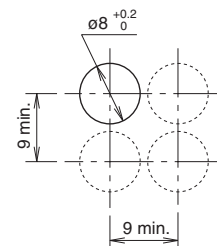
### AΔ8



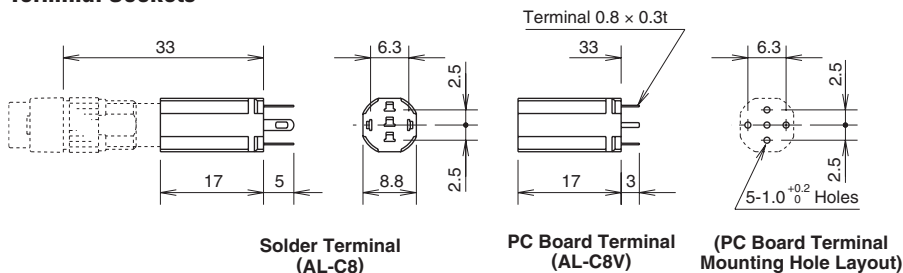
### Panel Cut-Out (not drawn to scale) Rectangular



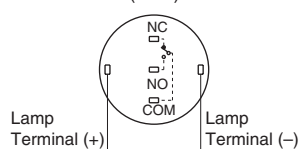
### Round/Square



### Terminal Sockets

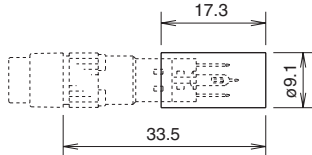


### Terminal Arrangement (TOP)

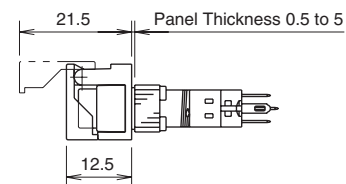


### (Bottom View)

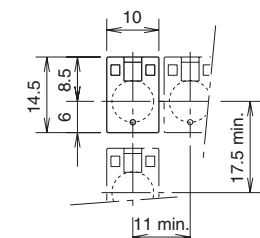
### Terminal Cover AL-V8, Ø 21/64" (8mm)



### Switch Guard, Ø 21/64" (8mm)



### For Round/Square Units (AL-K8)



### For Rectangular Units (AL-KH8)

