

Miniature Switches and Pilot lights

Ø12 A2 Series

Ø10 A1 Series

Ø8 A8 Series



A2 Series



A1 Series









A8 Series

Bright illumination face and snap-action switching.



• See website for details on approvals and standards.

| Hole Size | Model | Function | Degree of Protection |
|-----------|---|---|----------------------------|
| Ø12 |  AL2 | Illuminated Pushbuttons Momentary Maintained Pilot Light | IP65 IP40 (IEC60529) |
| |  AB2 | Pushbuttons Momentary Maintained | |
| Ø10 |  AL1 | Illuminated Pushbuttons Momentary Maintained Pilot Light | IP40 (IEC60529) |
| |  AB1 | Pushbuttons Momentary Maintained | |
| Ø8 |  AL8 | Illuminated Pushbuttons Momentary Maintained Pilot Light | IP40 (IEC60529) |
| |  AB8 | Pushbuttons Momentary Maintained | |

ø12 A2/ø10 A1/ø8 A8 Series Miniature Pilot Lights

Bright illumination face and snap-action switching. 22 mm short body.

Contact Ratings (Contact Block)

| | | | | |
|---------------------------|----------------|------|------|------|
| Rated Insulation Voltage | 250V | | | |
| Rated Thermal Current | 3A | | | |
| Operating Voltage (AC/DC) | 24V | 110V | 220V | |
| AC 50/60 Hz | Resistive Load | — | 1.0A | 0.5A |
| | Inductive Load | — | 0.7A | 0.5A |
| DC | Resistive Load | 1.0A | 0.2A | — |
| | Inductive Load | 0.7A | 0.1A | — |
| Contact Material | Silver | | | |

- Minimum applicable load: 5V AC/DC, 3 mA (applicable range may vary with operating conditions and load types)

Weight (Example)

| | | |
|------------------|-----------|---------------------------------|
| Weight (approx.) | A2 Series | 4g (AL2M-M11, AL2M-P1, AB2M-M1) |
| | A1 Series | 3g (AL1M-M11, AL1M-P1, AB1M-M1) |
| | A8 Series | 2g (AL8M-M11, AL8M-P1, AB8M-M1) |

Specifications

| | | |
|--|--|---|
| Operating Temperature | -25 to +55°C (no freezing) | |
| Storage Temperature | -30 to +80°C (no freezing) | |
| Operating Humidity | 45 to 85% RH (no condensation) | |
| Contact Resistance | 50 mΩ maximum (initial value) | |
| Insulation Resistance | 100 MΩ minimum (500V DC megger) | |
| Dielectric Strength | Switch Unit | Between live and dead metal parts: 2,000V AC, 1 minute Between terminals of different poles: 2,000V AC, 1 minute Between terminals of the same pole: 1,000V AC, 1 minute Between contact and lamp terminals: 1,500V AC, 1 minute |
| | Illumination Unit | Between live part and ground: 2,000V AC, 1 minute |
| Vibration Resistance | Damage limits, Operating extremes: 5 to 55 Hz, amplitude 0.75 mm | |
| Shock Resistance | Damage limits: 500 m/s ² (50G) Operating extremes: 200 m/s ² (20G) | |
| Mechanical Durability (minimum operations) | Momentary: 200,000 operations Maintained: 100,000 operations | |
| Electrical Durability (minimum operations) | Momentary: 100,000 operations Maintained: 50,000 operations (Switching frequency 1200 operations/h) | |
| Degree of Protection (*1) | IP40, IP65 (IEC 60529) | |

*1) IP65: A2 series only

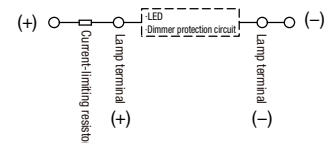
LED Lamp Ratings (LAD-S)

| | | | | |
|---|--|-------------|-------------|------------------------------|
| Rated Current | 20 mA | | | |
| Built-in LED Part No. | LAD-SRN | LAD-SGN | LAD-SAN | LAD-SJWN |
| Lamp Base | Exclusive for A series | | | |
| Forward Voltage (Vf) (nominal) | 2.0V | 2.9V | 2.0V | 2.7V |
| Reverse Voltage (Vr) | 4V | | | |
| Illumination Color | R | G | AG | JW |
| LED Lamp Color | Red clear | Green clear | Amber clear | White diffused |
| Applicable Lens Color | Red (R) | Green (G) | Amber (A) | Yellow (Y) / Pure white (JW) |
| LED Lamp Life (reference value) | Approx. 50,000 hours (The illuminance reduces to 50% of the initial intensity when used on complete DC.) | | | |
| Operating Voltage & External Current-limiting Resistor (recommended value) (Note) | 5V DC: 150Ω, 0.5W 6V DC: 200Ω, 0.5W 12V DC: 510Ω, 0.75W 24V DC: 1.1 kΩ, 0.75W | | | |
| Internal Circuit | | | | |

Note: When LED lamps are used on voltages other than the above, external resistor value R is determined by the following formula:

$$R = (\text{operating voltage} - V_f) / I_f$$

- LED lamps do not have a current-limiting resistor, and external resistors of recommended values for each voltage must be provided. Connect a current-limiting resistor in series, otherwise LED lamps will be damaged. Because no protection diode is contained, ensure the correct polarity is observed.



APEM

Switches & Pilot Lights

Control Boxes

Emergency Stop Switches

Enabling Switches

Safety Products

Explosion Proof

Terminal Blocks

Relays & Sockets

Circuit Protectors

Power Supplies

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Controllers

Operator Interfaces

Sensors

AUTO-ID

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ø16

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Miniature

Pilot Lights

HW1Z

AP22

A Series

LD6A



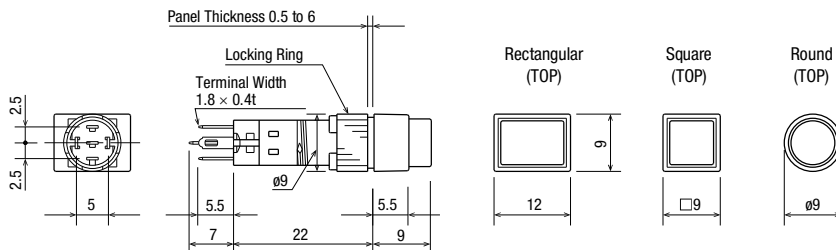
ø8 A8 Series Illuminated Pushbuttons & Pilot Lights

Package Quantity: 1

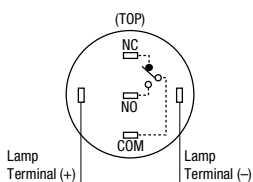
| Shape | Operation | Contact | Part No. | ② Lens Color Code | LED Lamp |
|--|-------------|---------|-----------|---|--|
| | | | IP40 | | Part No., Rated Current (External Resistor Recommended Value) |
| Round AL8M  | Momentary | SPDT | AL8M-M11② | Specify a color code in place of ② in the Part No. R: red G: green Y: yellow A: amber JW: pure white | R: LAD-SRN G: LAD-SGN Y/JW: LAD-SJWN A: LAD-SAN Rated Current: 20 mA 5V DC: 150Ω, 0.5W 6V DC: 200Ω, 0.5W 12V DC: 510Ω, 0.75W 24V DC: 1.1 kΩ, 0.75W |
| | Maintained | SPDT | AL8M-A11② | | |
| | Pilot Light | — | AL8M-P1② | | |
| Square AL8Q  | Momentary | SPDT | AL8Q-M11② | | |
| | Maintained | SPDT | AL8Q-A11② | | |
| | Pilot Light | — | AL8Q-P1② | | |
| Rectangular AL8H  | Momentary | SPDT | AL8H-M11② | | |
| | Maintained | SPDT | AL8H-A11② | | |
| | Pilot Light | — | AL8H-P1② | | |

- LED lamps do not have a current-limiting resistor. Connect a current-limiting resistor in series, otherwise LED lamps will be damaged.
- AP8M series pilot lights (round bezel only) with built-in current-limiting resistor are also available.
- Pilot lights are not CCC certified.

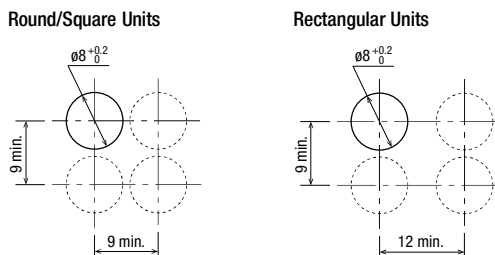
Dimensions



Terminal Arrangement



Mounting Hole Layout



Note: Determine mounting centers to ensure easy operation.



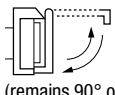



All dimensions in mm.

- APEM
- Switches & Pilot Lights
- Control Boxes
- Emergency Stop Switches
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- HW1Z
- AP22
- A Series
- LD6A

ø8 A8 Series Accessories

All dimensions in mm.

| Shape | Material | Part No. | Ordering Part No. | Package Quantity | Remarks |
|--|---|----------|-------------------|------------------|--|
|  <p>Locking Ring Wrench</p> | Metal (nickel-plated brass) | MT-004 | MT-004 | 1 | <ul style="list-style-type: none"> Used to tighten the locking ring when installing the A8 series into a panel. |
|  <p>Switch Guard</p> | 90° open For round/square Unit For rectangular unit | AL-K8 | AL-K8 | 1 | <ul style="list-style-type: none"> Used to protect pushbuttons from inadvertent operation. See B-393 for dimensions.  <p>(remains 90° open)</p> |
| | | AL-KH8 | AL-KH8 | 1 | |
|  <p>Socket</p> | Solder Terminal | AL-C8 | AL-C8 | 1 | <ul style="list-style-type: none"> Snaps on the rear of the A8 series. (see B-393 for dimensions) |
| | PC Board Terminal | AL-C8V | AL-C8V | 1 | |
|  <p>Terminal Cover</p> | Nylon | AL-V8 | AL-V8PN10 | 10 | <ul style="list-style-type: none"> When wiring the terminals, insert the lead wires into the terminal cover holes before soldering. Terminal cover is not attached and must be ordered separately. |
|  <p>Mounting Hole Plug</p> | Nitril rubber (black) | AL-B8 | AL-B8PN05 | 5 | <ul style="list-style-type: none"> Degree of protection: IP65 |

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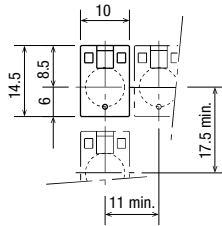
LD6A

ø8 A8 Series Dimensions

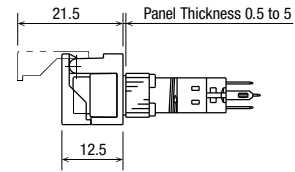
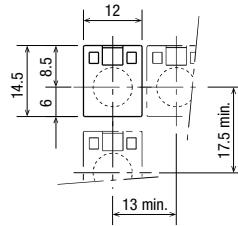
All dimensions in mm.

Switch Guard

For Round/Square Units (AL-K8)



For Rectangular Units (AL-KH8)



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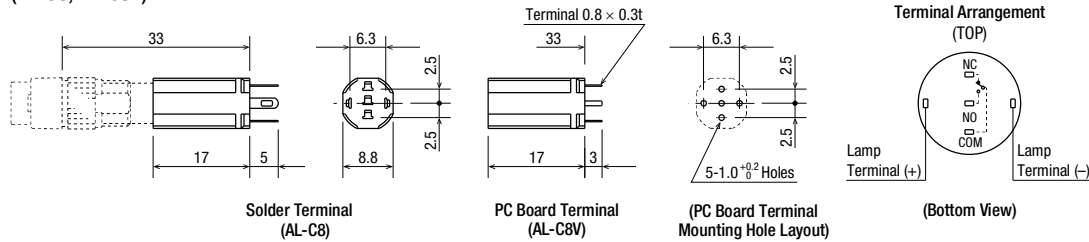
AP22

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LD6A

Socket

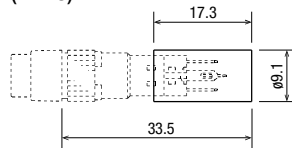
(AL-C8, AL-C8V)

Solder Terminal
(AL-C8)PC Board Terminal
(AL-C8V)(PC Board Terminal
Mounting Hole Layout)

(Bottom View)

Terminal Cover




(AL-V8)



Note: When wiring the terminals, insert the lead wires into the terminal cover holes before soldering.

ø8 A8 Series Maintenance Parts

All dimensions in mm.

| Shape | | Part No. | Ordering Part No. | Package Quantity | Color Code ①② |
|---|-------------|------------|-------------------|------------------|--|
|  | Round | AL8M-W | AL8M-WPN05 | 5 | • White |
| | Square | AL8Q-W | AL8Q-WPN05 | | |
| | Rectangular | AL8H-W | AL8H-WPN05 | | |
|  | Round | AL8M-LK1-② | AL8M-LK1-②PN02 | 2 | Specify a color code in place of ② in the Part No. A (amber), G (green), R (red) W (white), Y (yellow) |
| | Square | AL8Q-LK1-② | AL8Q-LK1-②PN02 | | |
| | Rectangular | AL8H-LK1-② | AL8H-LK1-②PN02 | | |
|  | Round | AB8M-BK1-① | AB8M-BK1-①PN02 | 2 | Specify a color code in place of ① in the Part No. B (black), G (green), R (red) S (blue), W (white), Y (yellow) |
| | Square | AB8Q-BK1-① | AB8Q-BK1-①PN02 | | |
| | Rectangular | AB8H-BK1-① | AB8H-BK1-①PN02 | | |