



Think Automation and beyond...

AP/UP Series Miniature Pilot Lights UZ Series Miniature Buzzer


























IDEC CORPORATION

Pilot Lights / Buzzer Selection Guide

| Series | AP Series Miniature Pilot Lights | | | | AP6S Series Miniature Pilot Lights | |
|----------------------|--|--------------|---|------------------|--|--|
| Mounting Hole Size | ø16 | ø12 | ø10 | ø8 | ø16 | |
| Model | AP6M | AP2M | AP1M | AP8M | AP6MS / AP6QS / AP6HS | |
| Shape | | | | | | |
| Unit | Dome Flat | Dome Flat | Dome Flat | Dome Flat | Round, Square, Rectangular, Rectangular 3-sided barrier | |
| Bezel Size | | | | | | |
| Bezel Color | Black | | | | Black | |
| Light Source | Built-in LED | | | | LED lamp (IDEC LSTD) | |
| Illumination Color | Amber, Green, Red, White, Yellow | | Amber, Green, Pure White, Red, Blue, White, Yellow | | Amber, Green, Red, Blue, White, Yellow | |
| Rated Voltage | 6V, 12V, 24V DC | | 5V DC 12V, 24V AC/DC | | 6V, 12V, 24V AC/DC | |
| Degree of Protection | IP65 (IEC 60529) | | | IP40 (IEC 60529) | IP65 (IEC 60529) | |
| Terminal Style | Solder terminal | | | | Screw terminal (M2.6) Solder/tab terminal #110 | |
| Notes | <ul style="list-style-type: none"> •100/110V AC, 200/220V AC adapter available. •Flashing units (12/24V DC) available. •Built-in current limiting resistor and protection diode. •Marking is available on flat lens. | | <ul style="list-style-type: none"> •Built-in current limiting resistor and protection diode. •Marking is available on flat lens (except ø8). •Waterproof type (degree of protection IP65) available (except ø8). | | <ul style="list-style-type: none"> •Built-in BA9S base LED lamp. •Built-in current limiting resistor and protection diode in LED lamp. •Screw terminals and solder/tab terminals available. | |
| Approvals | | | | | — | |
| Page | 5 | 6 | 7 | 8 | 11 | |

Pilot Lights / Buzzer Selection Guide

| UP Series Miniature Pilot Lights | | | | |
|---|---|---|---|---|
| ø6 | ø7 | ø8 | ø9 | ø10 |
| UP06 | UP7 | UP8 | UP9 / UP9P | UP1 / UP1P |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
| 3 types | 6 types | 6 types | 6 types | 6 types |
|  |  |  |  |  |
| Chrome-plated (Metal) | | | | |
| Built-in LED | | | | |
| Amber, Green, Red, White, Yellow | | | | |
| Without a built-in current limiting resistor only | Without a built-in current limiting resistor With a built-in current limiting resistor (12/24V DC) | | | |
| Enclosed type (IP40) | | | Enclosed type (IP40) Waterproof, oiltight (IP65) | |
| Solder terminal | | | Solder terminal | |
| <ul style="list-style-type: none"> •LED miniature pilot lights available with current limiting resistor (except ø6). •Waterproof (degree of protection IP65) (ø10 and ø9) •Single board mounting applicable types also available (except ø7 and ø6). | | | | |
| — | | | | |
| 16, 21 | 17, 21 | 18, 21 | 19 | 19 |

| | |
|------------------------------|--|
| Series | UZ series Miniature Buzzer |
| Mounting Hole Size | ø16 |
| Type | UZ6 |
| Shape |  Buzzer Unit  Cyclical Sound Adapter (for pulsing sound) |
| Unit | Buzzer unit Continuous sound |
| Bezel Size |  |
| Bezel Color | Black (buzzer unit: blue) |
| Rated Voltage | 12/24V DC Cyclical sound adapter 12/24V DC |
| Sound Pressure and Frequency | 75 dB (at 1m) at rated voltage, 3.5 kHz ±800 Hz |
| Sound Cycle | Adjustable between 30 to 600 cycles per minute (period 0.1 to 2 sec) |
| Degree of Protection | IP40 (Buzzer unit) |
| Terminal Style | Solder terminal (cyclical sound adapter screw terminal M8) |
| Notes | <ul style="list-style-type: none"> •Same size and same terminal arrangement as AP6M series miniature pilot lights. •The intermittent sound adapter can be snapped on to the back of the buzzer unit. |
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ø8·10·12·16 AP series Miniature Pilot Lights

Super Bright LEDs with built-in current-limiting resistor and reverse polarity protection diode

- Space saving miniature style.
- Illumination colors: amber, blue, green, pure white, red, white, and yellow (blue and pure white available for AP8M and AP1M only)
- Marking is available on flat lens units. (except AP8M series)
- Built-in protection diode ensures a reverse withstand voltage of 100V.



- See website for details on approvals and standards.



AP2M
AC adapter unit

AP6M
AC adapter unit
Flasher unit

Pilot Light

| | | | | | | | |
|---------------------------|--|-------------|---------------|---|-------------------------------|--------------|---------------|
| Input Type | Full voltage | | | | | | |
| Model | AP2M / AP6M | | | AP8M / AP1M | | | |
| Rated Voltage | 6V DC | 12V DC | 24V DC | 5V DC | 12V AC/DC | 24V AC/DC | |
| Voltage Range | Colors except Y | 6V DC±5% | 12V DC±10% | 24V DC±10% | 5V DC±10% | 12 AC/DC±10% | 24V AC/DC±10% |
| | Y only | 6V AC/DC±5% | 12V AC/DC±10% | 24V AC/DC±10% | | | |
| Rated Current | Colors except Y | 33mA | 22mA | 11mA | 9mA (A, G, R, W), 7mA (PW, S) | | |
| | Y only | 9mA | 11mA | 11mA | 7mA | | |
| Illumination Color Code | A (amber), G (green), R (red), Y (yellow), W (white) | | | A (amber), G (green), PW (pure white), R (red), S (blue), Y (yellow), W (white) | | | |
| Operating Temperature | -20 to +55°C (no freezing) | | | | | | |
| Storage Temperature | -30 to +55°C (no freezing) | | | | | | |
| Operating Humidity | 45 to 85% RH (no condensation) | | | | | | |
| Insulation Resistance | Between live and dead parts: 100 MΩ minimum (500V DC megger) | | | | | | |
| Dielectric Strength | Between live and dead parts: 1000V, 1 minute | | | | | | |
| Reverse Withstand Voltage | 100V (AP2M, AP6M), 200V (AP8M, AP1M) | | | | | | |
| Solder Terminal | Soldering 350°C maximum (3 sec) | | | | | | |
| Applicable Wire | ø1.0 or 0.75 mm ² maximum (20 to 16 AWG) | | | | | | |
| Weight (approx.) | AP6M: 7.5g, AP2M: 4.5g, AP1M: 2.5g, AP8M: 2.0g | | | | | | |
| Degree of Protection | AP6M, AP2M, AP1M: IP65 AP8M: IP40 (according to IEC 60529) | | | | | | |

AC Adapter/DC-DC Converter (Option)



| Unit | AC Adapter | DC-DC Converter |
|-----------------------|---|-----------------|
| Applicable Unit | AP6M and AP2M (6V rating only) | |
| Rated Voltage | 100/110V AC, 200/220V AC 50/60 Hz | 110V DC |
| Voltage Range | 100/110V AC±10% 200/220V AC±10% | 90 to 140V |
| Power Consumption | 1.6 VA maximum | 1W maximum |
| Insulation Voltage | 250V AC | 140V DC |
| Insulation Resistance | Between live and dead parts: 100 MΩ minimum (500V DC megger) | |
| | Between live and dead parts: 2000V, 1 minute | |
| Dielectric Strength | Between I/O terminals: 2000V AC, 1 minute | |
| | Between I/O terminals: 1500V AC, 1 minute | |
| Terminal Style | M3 screw | |
| Weight (approx.) | 38g | 20g |

Flasher Unit (Option)

| | |
|------------------|--|
| Applicable Unit | AP6M (12V and 24V DC rating only) |
| Rated Voltage | 12/24V DC compatible |
| Voltage Range | 12/24V DC±10% |
| Flashing Period | Adjustable between approximately 30 to 600 cycles per minute (period 0.1 to 2 sec) |
| Current Draw | 4 mA (OFF) to 6 mA (ON) |
| Terminal Style | M3 screw |
| Weight (approx.) | 13.5g |

AP Series Miniature Pilot Lights ø16

AP6M Series (ø16)

| Shape | Operating Voltage | Part No. | Ordering No. | Package Quantity | Lens Color Code |
|---|-------------------|----------|--------------|------------------|--|
|  | 6V DC | AP6M266② | AP6M266② | 1 | Specify a lens color code in place of ② in the Part No. A: amber G: green R: red W: white Y: yellow |
| | | | AP6M266②PN10 | 10 | |
| | 12V DC | AP6M211② | AP6M211② | 1 | |
| | | | AP6M211②PN10 | 10 | |
| | 24V DC | AP6M222② | AP6M222② | 1 | |
| | | | AP6M222②PN10 | 10 | |
|  | 6V DC | AP6M166② | AP6M166② | 1 | |
| | | | AP6M166②PN10 | 10 | |
| | 12V DC | AP6M111② | AP6M111② | 1 | |
| | | | AP6M111②PN10 | 10 | |
| | 24V DC | AP6M122② | AP6M122② | 1 | |
| | | | AP6M122②PN10 | 10 | |

•Degree of protection: IP65 (IEC 60529)

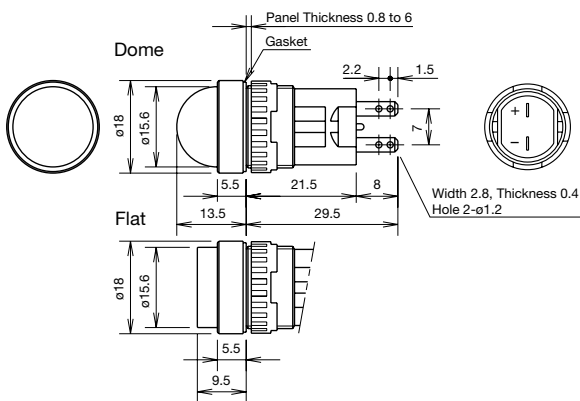
•The LED cannot be replaced.

Note: The voltage for Y (yellow) is 24V AC/DC.

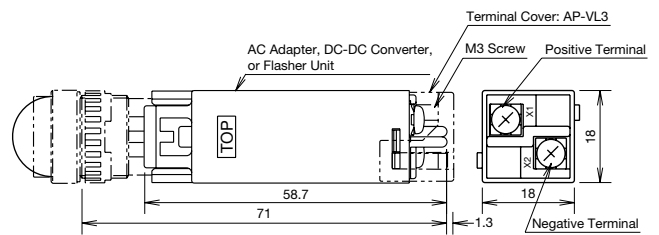
AC Adapter, DC-DC Converter, Flasher Unit

| Unit | Operating Voltage | Part No. | Applicable Pilot Light | Package Quantity |
|-----------------|-------------------------|-----------|--|------------------|
| AC Adapter | 100/110V AC | AP6-016D | AP6M266② (dome: 6V DC) AP6M166② (flat: 6V DC) | 1 |
| | 200/220V AC | AP6-026D | | |
| DC-DC Converter | 110V DC (90 to 140V DC) | AP6-016DD | | |
| Flasher Unit | 12/24V DC | UZ6-F10 | AP6M211② (dome: 12V DC) | |
| | | | AP6M222② (dome: 24V DC) | |
| | | | AP6M111② (flat: 12V DC) | |
| | | | AP6M122② (flat: 24V DC) | |

Dimensions



With AC Adapter, DC-DC Converter, Flasher Unit

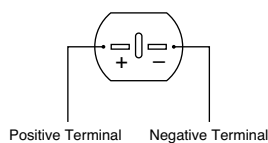


Terminal cover is not supplied.

When using terminal covers, order AP-VL3 terminal covers.

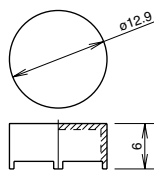
Terminal Arrangement

(Bottom View)



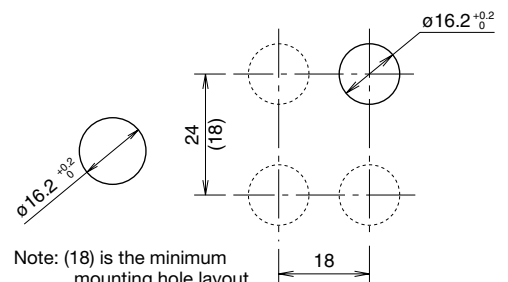
Positive Terminal Negative Terminal

Marking Plate



Engraving depth: 0.5 mm maximum
Marking plate material: White acrylic

Panel Cut-out / Mounting Hole Layout





Note: (18) is the minimum mounting hole layout without AC adapter or flasher unit.

All dimensions in mm.

ø12 AP Series Miniature Pilot Lights

AP2M Series (ø12)

| Shape | Operating Voltage | Part No. | Ordering No. | Package Quantity | Lens Color Code |
|---|-------------------|----------|--------------|------------------|--|
|  | 6V DC ±5% | AP2M266② | AP2M266② | 1 | Specify a lens color code in place of ② in the Part No. A: amber G: green R: red W: white Y: yellow |
| | | | AP2M266②PN10 | 10 | |
| | 12V DC ±10% | AP2M211② | AP2M211② | 1 | |
| | | | AP2M211②PN10 | 10 | |
| | 24V DC ±10% | AP2M222② | AP2M222② | 1 | |
| | | | AP2M222②PN10 | 10 | |
|  | 6V DC ±5% | AP2M166② | AP2M166② | 1 | |
| | | | AP2M166②PN10 | 10 | |
| | 12V DC ±10% | AP2M111② | AP2M111② | 1 | |
| | | | AP2M111②PN10 | 10 | |
| | 24V DC ±10% | AP2M122② | AP2M122② | 1 | |
| | | | AP2M122②PN10 | 10 | |

•Degree of protection: IP65 (IEC 60529)

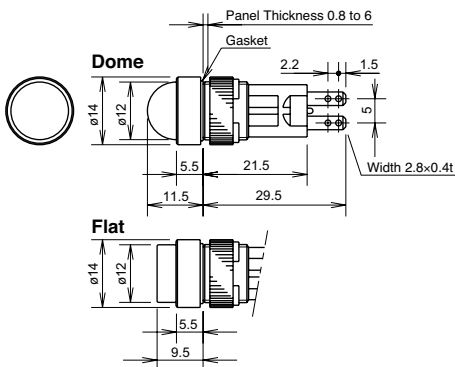
•The LED cannot be replaced.

Note: The voltage for Y (yellow) is 24V AC/DC.

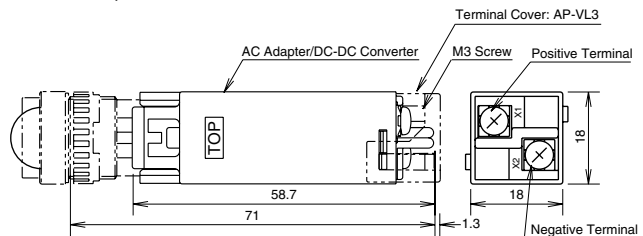
AC Adapter, DC-DC Converter

| Unit | Operating Voltage | Part No. | Applicable Pilot Light | Package Quantity |
|-----------------|-------------------------|-----------|--|------------------|
| AC Adapter | 100/110V AC | AP2-016D | AP6M266② (dome: 6V DC) AP6M166② (flat: 6V DC) | 1 |
| | 200/220V AC | AP2-026D | | |
| DC-DC Converter | 110V DC (90 to 140V DC) | AP2-016DD | | |

Dimensions



With AC Adapter or DC-DC Converter

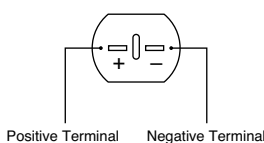


Terminal cover is not supplied.

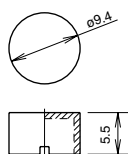
When using terminal covers, order AP-VL3 terminal covers.

Terminal Arrangement

(Bottom View)

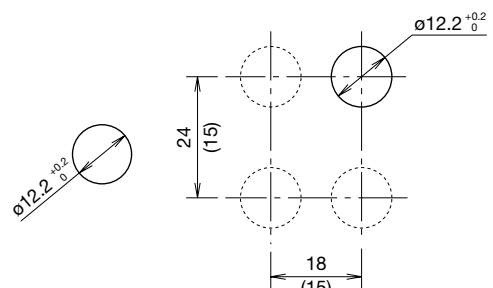


Marking Plate



Engraving depth: 0.5 mm maximum
Marking plate material: White acrylic

Panel Cut-out / Mounting Hole Layout





Note: (15) is the minimum mounting hole layout without AC adapter or flasher unit.

All dimensions in mm.

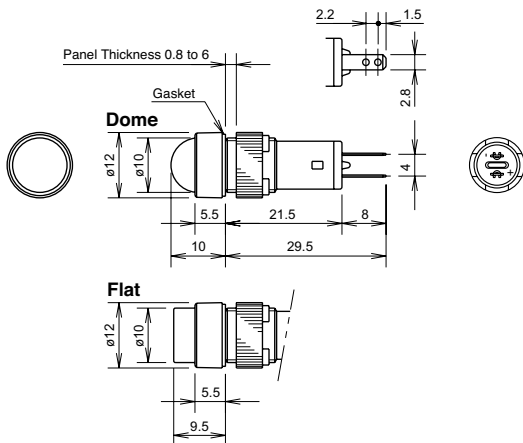
AP Series Miniature Pilot Lights ø10

AP1M Series (ø10)

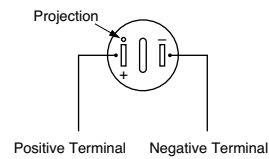
| Shape | Operating Voltage | Part No. | Ordering No. | Package Quantity | Lens Color Code |
|---|-------------------|----------|--------------|------------------|---|
|  | 5V DC ±5% | AP1M255② | AP1M255② | 1 | Specify a lens color code in place of ② in the Part No. A: amber G: green PW: pure white R: red S: blue W: white Y: yellow |
| | | | AP1M255②PN10 | 10 | |
| | 12V AC/DC ±10% | AP1M211② | AP1M211② | 1 | |
| | | | AP1M211②PN10 | 10 | |
| | 24V AC/DC ±10% | AP1M222② | AP1M222② | 1 | |
| | | | AP1M222②PN10 | 10 | |
|  | 5V DC ±5% | AP1M155② | AP1M155② | 1 | |
| | | | AP1M155②PN10 | 10 | |
| | 12V AC/DC ±10% | AP1M111② | AP1M111② | 1 | |
| | | | AP1M111②PN10 | 10 | |
| | 24V AC/DC ±10% | AP1M122② | AP1M122② | 1 | |
| | | | AP1M122②PN10 | 10 | |

- Degree of protection: IP65 (IEC 60529)
- The LED cannot be replaced.
- Separate transformer (TWR512, TWR522, TWR542) can be used for 24V AC/DC pilot lights.

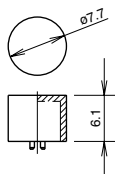
Dimensions



Terminal Arrangement (Bottom View)

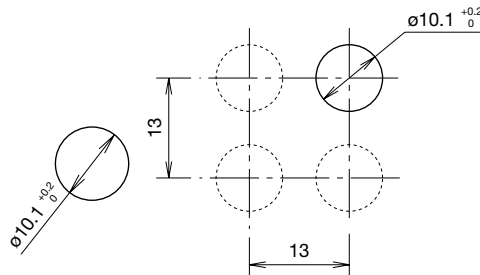


Marking Plate



Engraving depth: 0.5 mm maximum
 Marking plate material: White acrylic





Panel Cut-out / Mounting Hole Layout



All dimensions in mm.

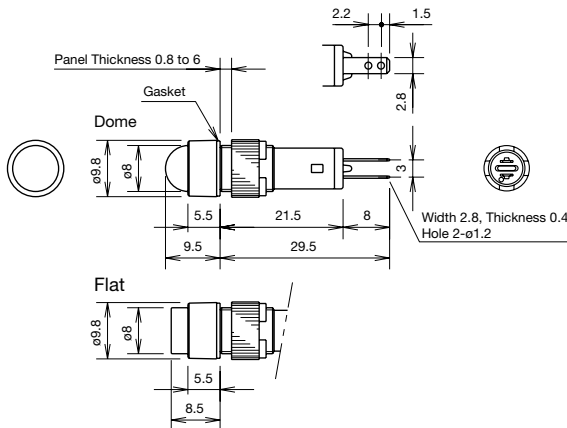
ø16 AP Series Miniature Pilot Lights

AP8M Series (ø8)

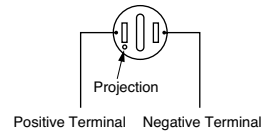
| Shape | Operating Voltage | Part No. | Ordering No. | Package Quantity | Lens Color Code |
|--|-------------------|----------|--------------|------------------|---|
|   | 5V DC ±5% | AP8M255② | AP8M255② | 1 | Specify a lens color code in place of ② in the Part No. A: amber G: green PW: pure white R: red S: blue W: white Y: yellow |
| | | | AP8M255②PN10 | 10 | |
| | 12V AC/DC ±10% | AP8M211② | AP8M211② | 1 | |
| | | | AP8M211②PN10 | 10 | |
| | 24V AC/DC ±10% | AP8M222② | AP8M222② | 1 | |
| | | | AP8M222②PN10 | 10 | |
|   | 5V DC ±5% | AP8M155② | AP8M155② | 1 | |
| | | | AP8M155②PN10 | 10 | |
| | 12V AC/DC ±10% | AP8M111② | AP8M111② | 1 | |
| | | | AP8M111②PN10 | 10 | |
| | 24V AC/DC ±10% | AP8M122② | AP8M122② | 1 | |
| | | | AP8M122②PN10 | 10 | |

- The lens or LED cannot be removed or replaced.
- Degree of protection: IP40 (IEC 60529)
- Separate transformer (TWR512, TWR522, TWR542) can be used for 24V AC/DC pilot lights.

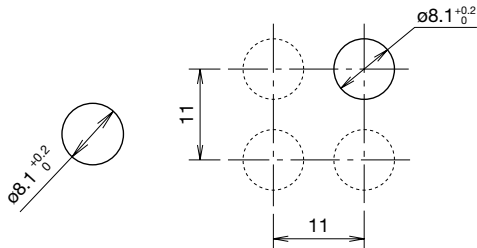
Dimensions



Terminal Arrangement (Bottom View)




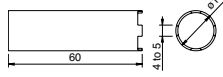

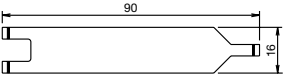

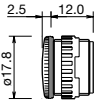
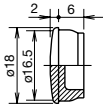
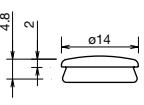
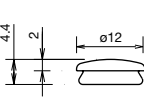
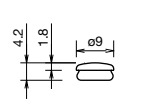
Panel Cut-out / Mounting Hole Layout







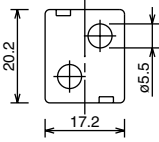
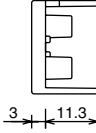
All dimensions in mm.

AP Series Miniature Pilot Lights

Accessories

| Shape | For | Material | Part No. | Ordering No. | Package Quantity | Remarks | | | | | | | | | | |
|--|----------|---|----------|--------------|------------------|--|----------|------|--------|-----|--------|-----|--------|-----|--------|------|
|  | ø16 | Metal (nickel-plated brass) | MT-001 | MT-001 | 1 | <ul style="list-style-type: none"> •Used to tighten the locking ring when installing an AP unit onto a panel. •Tighten the locking ring using a recommended tightening torque.  <table border="1" data-bbox="1300 407 1465 526"> <thead> <tr> <th>Part No.</th> <th>Size</th> </tr> </thead> <tbody> <tr> <td>MT-001</td> <td>ø18</td> </tr> <tr> <td>MT-002</td> <td>ø14</td> </tr> <tr> <td>MT-003</td> <td>ø12</td> </tr> <tr> <td>MT-004</td> <td>ø9.5</td> </tr> </tbody> </table> | Part No. | Size | MT-001 | ø18 | MT-002 | ø14 | MT-003 | ø12 | MT-004 | ø9.5 |
| | Part No. | | Size | | | | | | | | | | | | | |
| | MT-001 | | ø18 | | | | | | | | | | | | | |
| | MT-002 | | ø14 | | | | | | | | | | | | | |
| MT-003 | ø12 | | | | | | | | | | | | | | | |
| MT-004 | ø9.5 | | | | | | | | | | | | | | | |
| ø12 | MT-002 | MT-002 | 1 | | | | | | | | | | | | | |
| ø10 | MT-003 | MT-003 | 1 | | | | | | | | | | | | | |
| ø8 | MT-004 | MT-004 | 1 | | | | | | | | | | | | | |
|  | | Stainless steel | MT-100 | MT-100 | 1 | <ul style="list-style-type: none"> •Used to remove the AC adapter, DC-DC converter, or flasher unit.  | | | | | | | | | | |
|  | ø16 | Metal (diecast) Locking ring (polyacetal) | AL-BM6 | AL-BM6 | 1 | <ul style="list-style-type: none"> •Degree of protection: IP65  | | | | | | | | | | |
| | | Nitril rubber (black) | AL-B6 | AL-B6PN05 | 5 | <ul style="list-style-type: none"> •Degree of protection: IP65  | | | | | | | | | | |
| | ø12 | Nitril rubber (black) | AL-B2 | AL-B2PN05 | 5 | <ul style="list-style-type: none"> •Degree of protection: IP65  | | | | | | | | | | |
| | ø10 | Nitril rubber (black) | AL-B1 | AL-B1PN05 | 5 | <ul style="list-style-type: none"> •Degree of protection: IP65  | | | | | | | | | | |
| | ø8 | Nitril rubber (black) | AL-B8 | AL-B8PN05 | 5 | <ul style="list-style-type: none"> •Degree of protection: IP65  | | | | | | | | | | |

Replacement Parts for AP6M/AP2M/AP1M

| Shape | For | Part No. | Ordering No. | Package Quantity | Lens Color Code | |
|---|--------------|--|--------------|------------------|-----------------|---|
|  | AP6M | Dome lens | AP6M-L2② | AP6M-L2②PN05 | 5 | A (amber), G (green), R (red), W (white), Y (yellow) (Note 1) |
| | | Flat lens | AP6M-L1② | AP6M-L1②PN05 | 5 | A (amber), C (clear), G (green), R (red), Y (yellow) (Note 2) |
| | AP2M | Dome lens | AP2M-L2② | AP2M-L2②PN05 | 5 | A (amber), G (green), R (red), W (white), Y (yellow) (Note 1) |
| | | Flat lens | AP2M-L1② | AP2M-L1②PN05 | 5 | A (amber), C (clear), G (green), R (red), Y (yellow) (Note 2) |
| | AP1M | Dome lens | AP1M-L2② | AP1M-L2②PN05 | 5 | A (amber), G (green), R (red), S (blue), W (white), Y (yellow) (Note 1) |
| | | Flat lens | AP1M-L1② | AP1M-L1②PN05 | 5 | A (amber), C (clear), G (green), R (red), S (blue), Y (yellow) (Note 2) |
|  | AP6M | Flat lens | AP6M-P1W | AP6M-P1WPN05 | 5 | White |
| | AP2M | | AP2M-P1W | AP2M-P1WPN05 | 5 | |
| | AP1M | | AP1M-PN1W | AP1M-PN1WPN05 | 5 | |
|  | AP1M | Dome lens | AP1M-PN2W | AP1M-PN2WPN05 | 5 | White |
|  | AP6M AP2M | AC adapter DC-DC converter Flasher unit | AP-VL3 | AP-VL3 | 1 |   |

Specify a lens color code in place of ② in the Ordering No.

Note 1: On the dome lens, use a white (W) lens for white (W) illumination.

Note 2: On the flat lens, use a clear (C) lens for white (W) illumination.

AP Series Miniature Pilot Lights

Safety Precautions

- Turn off power to the AP series pilot lights before installation, removal, wiring, maintenance, and inspection. Failure to turn power off may cause electrical shocks or fire hazard.
- For wiring, use wires of proper size to meet the voltage and current requirements. Improper wiring may cause overheating and

create a fire hazard. Tighten the M3 terminal screws to a torque of 0.6 to 1.0 N·m. Failure to tighten terminal screws may cause overheating and fire.

Instructions

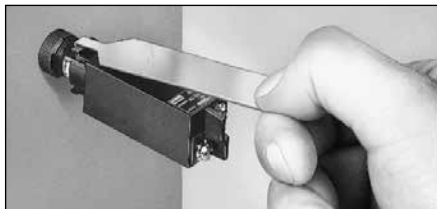
Panel Mounting

When mounting the AP series pilot lights on a panel, use the optional locking ring wrench. Do not use pliers. Excessive tightening will damage the locking ring.

| Unit | Tightening Torque |
|------|-------------------|
| AP6M | 0.88 N·m |
| AP2M | 0.78 N·m |
| AP1M | 0.29 N·m |
| AP8M | 0.29 N·m |

Installing the AC Adapter, DC-DC Converter, and Flasher Unit

1. Make sure that the voltage rating and terminal style of the AP series pilot lights are applicable to the AC adapter, DC-DC Converter, and flasher units.
2. Install the pilot light into a panel cut-out before mounting an AC adapter, DC-DC Converter, or flasher unit. Note that the pilot light cannot be installed in a panel cut-out with an AC adapter, DC-DC Converter, or flasher unit mounted.
3. When installing an AC adapter, DC-DC Converter, or flasher unit, make sure that the TOP marking is on the same side as the TOP marking of the pilot light. AC adapter, DC-DC Converter, and flasher unit are snapped on to the back of the pilot light.
4. To remove the AC adapter, DC-DC Converter, or flasher unit, insert the tip of the removal tool into the joint hook and pull towards you as shown in the photo below.



Wiring

1. Note the positive and negative polarities when wiring.
2. All DC type AP series pilot lights contain a diode for protection against reverse polarity and a current limiting resistor, eliminating the need for external resistors.
3. Solder the terminal at 350°C within 3 seconds using a 60W soldering iron. SnAgCu type lead-free solder is recommended. When soldering, do not touch the pilot light housing with the soldering iron. Also ensure that no tensile force is applied to the terminal. Do not bend the terminal or apply excessive force to the terminal.
Use a non-corrosive rosin flux.

DC-DC Converter

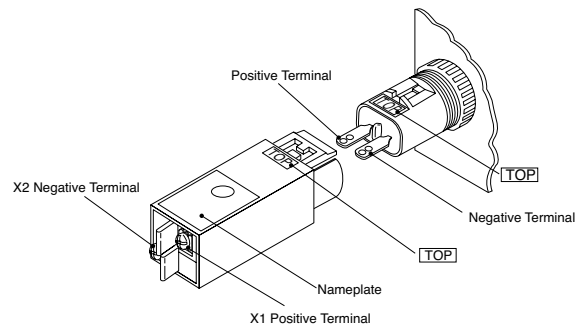
DC-DC converters employ an electronic oscillating circuit. Oscillating sounds may be heard depending on operating conditions, but will not affect performance characteristics.

Marking

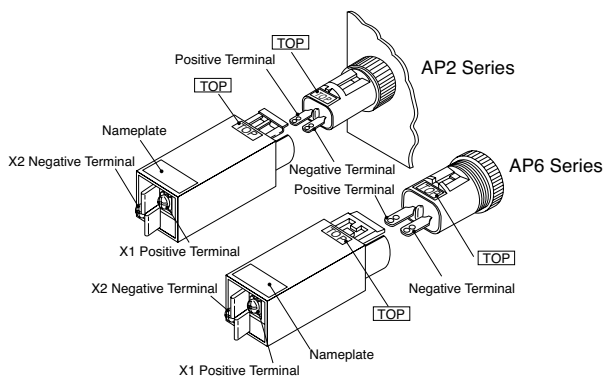
AP6M, AP2M, and AP1M round flat lenses contain a white marking plate inside the lens. (AP8M lens cannot be removed.)

Flasher Unit

Pierce the round mark on the nameplate on top of the flasher unit with a flat screwdriver and adjust the variable resistor inside. Turn clockwise to lengthen the flashing period.

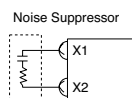


Note: Do not apply excessive force to terminals X1 and X2 during wiring.



Note: Do not apply excessive force to terminals X1 and X2 during wiring.

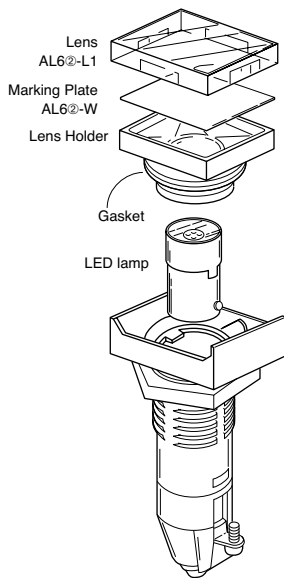
5. When using an AC adapter, DC-DC Converter, or flasher unit where the units are subjected to noise, connect a noise suppressor across terminals X1 and X2 as shown in the diagram below.



ø16 AP6S Series Miniature Pilot Lights

Miniature Pilot Lights with Super Bright LEDs





- IDEC's LSTD LED lamps with BA9S base
- Six illumination colors: amber, green, red, blue, white, and yellow
- Screw terminal and solder/tab terminal available
- Degree of protection: IP65
- The current-limiting resistor in the LED lamp eliminates the need for external resistors



Specifications

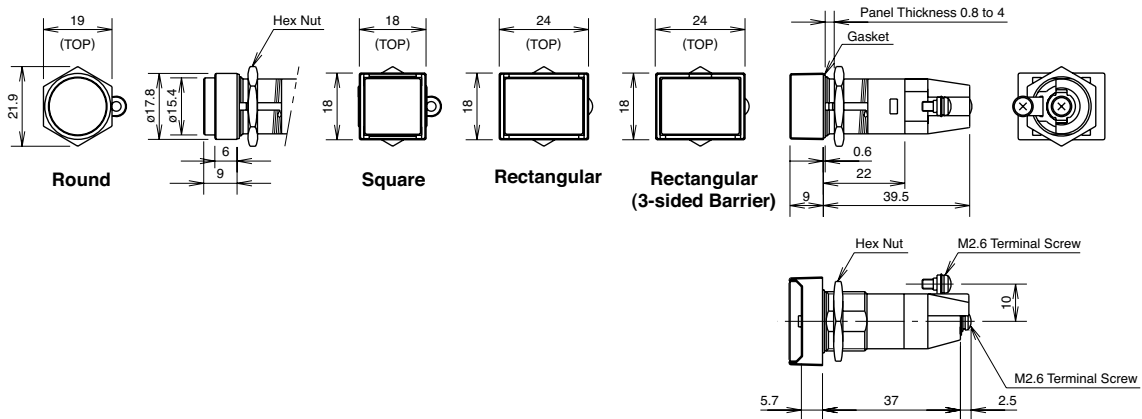
| | | | |
|-----------------------|--|---------------|---------------|
| Illumination | LED | | |
| Rated Voltage | 6V AC/DC | 12V AC/DC | 24V AC/DC |
| Voltage Range | 6V AC/DC±10% | 12V AC/DC±10% | 24V AC/DC±10% |
| LED Lamp Part No. | LSTD-6② | LSTD-1② | LSTD-2② |
| LED Life | 50,000 hours approx. | | |
| Operating Temperature | -20°C to +50°C (no freezing) | | |
| Storage Temperature | -30°C to +80°C (no freezing) | | |
| Operating Humidity | 45 to 85% RH (no condensation) | | |
| Insulation Resistance | Between live and dead metal parts: 100mΩ minimum (500V DC megger) | | |
| Dielectric Strength | Between live and dead metal parts: 2000V AC, 1 minute | | |
| Terminal Style | Screw terminal: M2.6 Tab terminal: #110 solder/tab terminal (applicable cable: 1.25 mm ² max.) | | |
| Housing Material | Black plastic | | |
| Degree of Protection | IP65 (IEC 60529) | | |
| Weight (approx.) | Terminal screw type: 18g Solder/tab screw type: 9g | | |

- Specify a color code in place of ② in the LED Lamp Part No.
A (amber), G (green), PW (pure white), R (red), S (blue), W (white), Y (yellow)

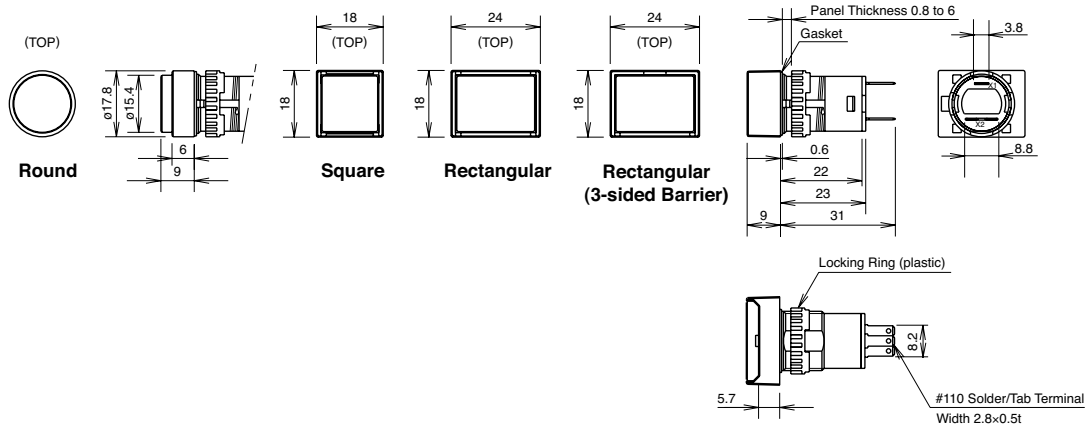
| Shape | Terminal Style | Operating Voltage | Part No. | Lens Color Code | Built-in LED (Part No.) |
|---|---------------------|-------------------|-----------|---|-------------------------|
| Round  | Solder/Tab Terminal | 6V AC/DC±5% | AP6MS52② | Specify a lens color code in place of ② in the Part No. A: amber G: green PW: pure white R: red S: blue W: white Y: yellow | LSTD-6② |
| | | 12V AC/DC±10% | AP6MS53② | | LSTD-1② |
| | | 24V AC/DC±10% | AP6MS54② | | LSTD-2② |
| | Screw Terminal | 6V AC/DC±5% | AP6MS52M② | | LSTD-6② |
| | | 12V AC/DC±10% | AP6MS53M② | | LSTD-1② |
| | | 24V AC/DC±10% | AP6MS54M② | | LSTD-2② |
| Square  | Solder/Tab Terminal | 6V AC/DC±5% | AP6QS52② | | LSTD-6② |
| | | 12V AC/DC±10% | AP6QS53② | | LSTD-1② |
| | | 24V AC/DC±10% | AP6QS54② | | LSTD-2② |
| | Screw Terminal | 6V AC/DC±5% | AP6QS52M② | | LSTD-6② |
| | | 12V AC/DC±10% | AP6QS53M② | | LSTD-1② |
| | | 24V AC/DC±10% | AP6QS54M② | | LSTD-2② |
| Rectangular  | Solder/Tab Terminal | 6V AC/DC±5% | AP6HS52② | LSTD-6② | |
| | | 12V AC/DC±10% | AP6HS53② | LSTD-1② | |
| | | 24V AC/DC±10% | AP6HS54② | LSTD-2② | |
| | Screw Terminal | 6V AC/DC±5% | AP6HS52M② | LSTD-6② | |
| | | 12V AC/DC±10% | AP6HS53M② | LSTD-1② | |
| | | 24V AC/DC±10% | AP6HS54M② | LSTD-2② | |
| Rectangular with 3-sided Barrier  | Solder/Tab Terminal | 6V AC/DC±5% | AP6GS52② | LSTD-6② | |
| | | 12V AC/DC±10% | AP6GS53② | LSTD-1② | |
| | | 24V AC/DC±10% | AP6GS54② | LSTD-2② | |
| | Screw Terminal | 6V AC/DC±5% | AP6GS52M② | LSTD-6② | |
| | | 12V AC/DC±10% | AP6GS53M② | LSTD-1② | |
| | | 24V AC/DC±10% | AP6GS54M② | LSTD-2② | |

ø16 AP6S Series Miniature Pilot Lights

Dimensions Screw Terminal

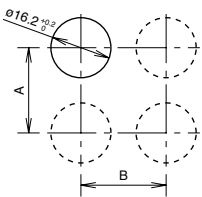


Solder/Tab Screw Terminal



Mounting Hole Layout

All dimensions in mm.

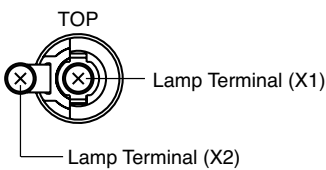


Minimum Mounting Centers

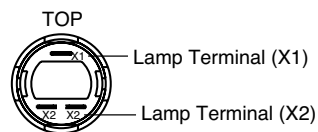
| | A | | B | |
|----------------|--------------|-------------|--------------|-------------|
| | Round/Square | Rectangular | Round/Square | Rectangular |
| Screw Terminal | 23 mm | 23 mm | 23 mm | 24 mm |
| Tab Terminal | 18 mm | 18 mm | 18 mm | 24 mm |

Terminal Arrangement (Bottom View)

Screw Terminal

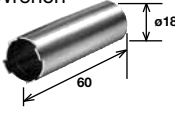

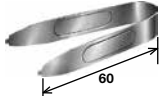


Solder/Tab Terminal





Accessories

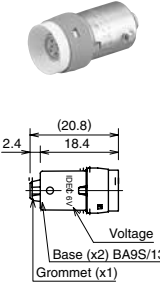
Tools

| Shape | Specification | Part No. | Ordering No. | Package Quantity | Remarks |
|--|-----------------------------|----------|--------------|------------------|---|
| Locking Ring Wrench  | Metal (nickel-plated brass) | MT-001 | MT-001 | 1 | Used to tighten the locking ring when installing an AP6S unit onto a panel. |
| Lamp Holder Tool  | Nitril Rubber | OR-55 | OR-55 | 1 | Used to install and remove LED lamps. |
| Lens Removal Tool  | Stainless Steel | MT-101 | MT-101 | 1 | Used to remove lens and buttons. |

Replacement Parts for AP6M/AP2M/AP1M


| Shape | Part No. | Ordering No. | Package Quantity | Remarks | |
|--|---|---------------------|--------------------------|---------|---|
| Lens  | Round | AL6M-L ^② | AL6M-L ^② PN05 | 5 | Specify a color code in place of ^② in the Ordering No. A: amber C: clear G: green R: red S: blue Y: yellow Use a clear lens for white or pure white illumination. |
| | Square | AL6Q-L ^② | AL6Q-L ^② PN05 | 5 | |
| | Rectangular Rectangular with 3-sided Barrier | AL6H-L ^② | AL6H-L ^② PN05 | 5 | |
| Marking Plate  | Round | AL6M-W | AL6M-WPN05 | 5 | White |
| | Square | AL6Q-W | AL6Q-WPN05 | 5 | |
| | Rectangular Rectangular with 3-sided Barrier | AL6H-W | AL6H-WPN05 | 5 | |

LED Lamps

| Dimensions | Operating Voltage | Current Draw | | Part No. | Ordering No. | ②Illumination Color Code | Package Quantity | Base |
|---|-------------------|--------------|---|---------------------|--------------------------|--|------------------|---------|
| | | AC | DC | | | | | |
|  | 6V DC ±10% | 8 mA | 7 mA (A, R, W) 5.5 mA (G, PW, S) | LSTD-6 ^② | LSTD-6 ^② | Specify a color code in place of ^② in the Ordering No. A: amber G: green PW: pure white R: red S: blue W: white | 1 | BA9S/13 |
| | | | | | LSTD-6 ^② PN10 | | 10 | |
| | 12V AC/DC ±10% | 11 mA | 10 mA | LSTD-1 ^② | LSTD-1 ^② | Use a pure white (PW) LED lamp with yellow (Y) lens. | 1 | |
| | | | | | LSTD-1 ^② PN10 | | 10 | |
| | 24V AC/DC ±10% | 11 mA | 10 mA | LSTD-2 ^② | LSTD-2 ^② | Use a pure white (PW) LED lamp with yellow (Y) lens. | 1 | |
| | | | | | LSTD-2 ^② PN10 | | 10 | |

ø16 AP6S Series Miniature Pilot Lights

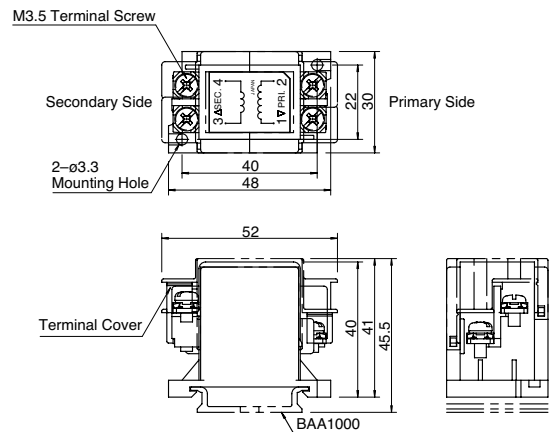
Transformer

| Shape | Primary Voltage | Secondary Voltage | Part No. | Applicable Load |
|--|-----------------|-------------------|----------|---|
| Din Rail Mount Transformer For 6V  | 100/110V AC | 5.5V AC, 1W | TWR516 | LSTD-6 LED lamp (6V AC/DC) or LS-6 incandescent lamp (6V AC/DC, 1W) |
| | 115/120V AC | | TWR5126 | |
| | 200/220V AC | | TWR526 | |
| | 230/240V AC | | TWR5246 | |
| | 380V AC | | TWR5386 | |
| | 400/440V AC | | TWR546 | |
| | 480V AC | | TWR5486 | |

Specifications

| | |
|--------------------------|---|
| Operating Voltage | 100/110V AC, 115/120V AC, 200/220V AC, 230/240V AC, 380V AC, 400/440V AC, 480V AC (50/60Hz) |
| Current Draw | 2.4 VA |
| Rated Insulation Voltage | 600V |
| Insulation Resistance | 100 MΩ minimum (500V DC megger) |
| Operating Temperature | -30 to +60°C (no freezing) |
| Storage Temperature | -40 to +80°C (no freezing) |
| Operating Humidity | 35 to 85% RH (no condensation) |
| Vibration Resistance | Damage Limits: 30 Hz, amplitude 1.5 mm Operating extremes: 5 to 55 Hz, amplitude 0.5 mm |
| Shock Resistance | Damage limits: 1,000 m/s ² Operating Extremes: 100 m/s ² |
| Dielectric Strength | 2,500V AC, 1 minute |
| Terminal Screw | M3.5 |
| Applicable Wire | 2 mm ² maximum, 2 wires maximum |
| Weight (approx.) | 87g |

Dimensions

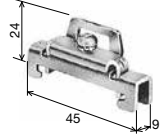


Accessories

DIN Rail

| Part No. | Ordering No. | Length | Weight (approx.) | Material | Package Quantity |
|----------|--------------|---------|------------------|----------|------------------|
| BAA1000 | BAA1000PN10 | 1000 mm | 200g | Aluminum | 10 |
| BAP1000 | BAP1000PN10 | 1000 mm | 320g | Steel | 10 |

End Clip

| Part No. | Ordering No. | Applicable DIN Rail | Weight (approx.) | Material | Package Quantity | Dimensions |
|----------|--------------|---------------------|------------------|------------------------|------------------|---|
| BNL6 | BNL6PN10 | BAA1000 BAP1000 | 15g | Steel (Zinc-plated) | 10 |  |

Safety Precautions

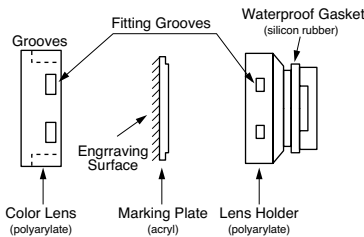
- Turn off power to the AP6S series units before installation, removal, wiring, maintenance, and inspection. Failure to turn power off may cause electrical shocks or fire hazard.
- For wiring, use wires of proper size to meet the voltage and current requirements. Improper soldering may cause overheating and create fire hazards.

Instructions

Replacing Lens and Marking Plate

Removal

Remove the operator (color lens, marking plate, and lens holder) by holding the color lens recesses with the Lens Removal Tool (MT-101) and pulling it out. Remove the marking plate by disengaging the latches between the color lens and lens holder. The marking plate must be engraved on the front side as shown below.



Installation

Place the marking plate on the lens holder in the correct direction and press the color lens onto the lens holder to engage the latches. Insert the lens holder into the housing in the correct direction.

Marking Plate and Engraving Area

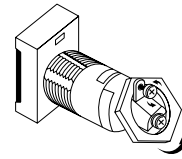
Engraving must be made on the engraving area less than 0.5mm deep.

| Lens | Round | Square | Rectangular |
|-------------------------|--|--------|-------------|
| Built-in Marking Plate | <ul style="list-style-type: none"> • Engraving must be made on the engraving area within 0.5mm deep. • The marking plate is made of white acrylic resin. | | |
| Applicable Marking Film | | | |
| | <ul style="list-style-type: none"> *Thickness = 0.1 mm × 1 pc • Marking film is not supplied. • Recommended marking film: Polyester film | | |

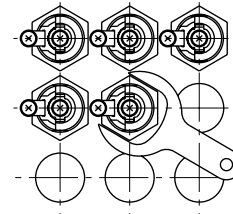
Notes on Mounting

Screw Terminal

- Because screw terminal types use hexagonal nuts, they cannot be mounted closely together. However, rectangular units can be mounted closely when installed horizontally.
- When removing the hexagonal nuts, loosen the terminal screws. The hexagonal nuts cannot be removed when the terminal screws are tightened.



- When mounting the pilot lights collectively, note the mounting order. Pilot lights mounted in between units cannot be removed.



Tab Terminal

The locking ring is plastic. To tighten the ring, use an optional locking ring wrench (MT-001). Do not use pliers. Do not tighten with excessive force, otherwise the locking ring will be damaged. Tightening torque should not exceed 0.88 N·m

Collective Mounting and Continuous Illumination

Collective mounting or continuous illumination of pilot lights may cause the ambient temperature to rise above the rated operating temperature. Make sure to provide efficient ventilation when the mounting panel is not metallic or when the pilot lights are mounted collectively.

Wiring

Solder the terminal at 350°C within 3 seconds using a 60W soldering iron. SnAgCu type lead-free solder is recommended. When soldering, do not touch the pilot light housing with the soldering iron. Also ensure that no tensile force is applied to the terminal. Do not bend the terminal or apply excessive force to the terminal.

Power Supply for LED Lamps

The operating voltage of the LED lamp is within ±5% or ±10% of the rated voltage. Make sure that the power voltage is within this range.

ø6·7·8·9·10 UP series Miniature Pilot Lights

Available in Various Sizes

- Five illumination colors: amber, green, red, white, yellow
- Various sizes and design.
- Available with a built-in current limiting resistor.
- Degree of protection: IP65 (ø9 and ø10)
- Panel thickness 0.6 to 4 mm
(built-in current limiting resistor type 0.6 to 6 mm)

Specifications

Without a Built-in Current Limiting Resistor

| | |
|-----------------------|---|
| Color Code | A (amber), G (Green), R (Red), W (white), Y (yellow) |
| Rated Current | 10 mA (Amber, Green, Red, Yellow) 15 mA (White) |
| Forward Current | 20 mA maximum at 25°C |
| Reverse Voltage | 3V maximum at 25°C |
| Power Consumption | 60 mW maximum at 25°C |
| Operating Temperature | -20 to +55°C |
| Storage Temperature | -25 to +80°C |
| Forward Voltage | Maximum value: 3V Standard value: 2V (forward current: 10 mA) |
| Dielectric Strength | Between live and dead parts: 500V AC, 1 minute |

- Approx. 30,000 hours (until the brightness reduces to 50% of the initial value when lit at complete direct current the rated voltage under 25°C environment.)

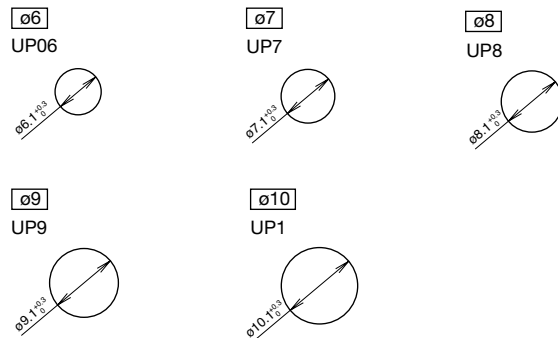
With a Built-in Current Limiting Resistor

| | |
|-----------------------|--|
| Color Code | A (amber), G (Green), R (Red), W (white), Y (yellow) |
| Operating Voltage | 12V DC±10%, 24V DC±10% |
| Rated Current | 15 mA |
| Operating Temperature | -20 to +55°C (no freezing) |
| Storage Temperature | -25 to +80°C (no freezing) |
| Operating Humidity | 45 to 85% RH (no condensation) |
| Dielectric Strength | Between live and dead parts: 500V AC, 1 minute |

- Approx. 30,000 hours (until the brightness reduces to 50% of the initial value when lit at complete direct current the rated voltage under 25°C environment.)



Panel Cut-out


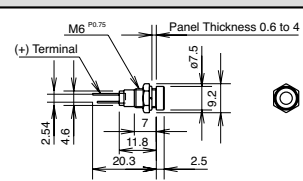

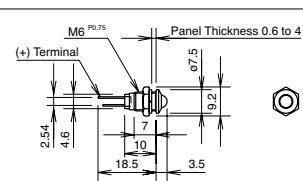

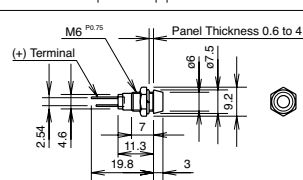


All dimensions in mm.

Weight (example)

| | |
|------------------|---------------|
| Weight (approx.) | 2g (UP06-67) |
| | 5g (UP7-1277) |
| | 6g (UP8-2487) |
| | 7g (UP9-2497) |
| | 8g (UP1-2417) |



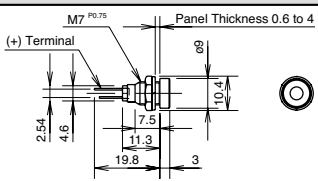



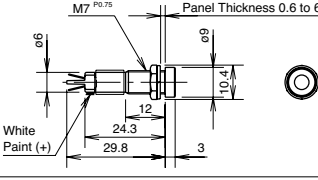


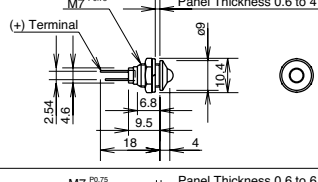



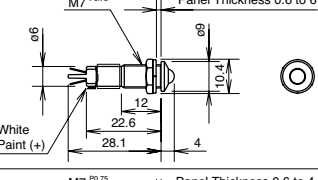


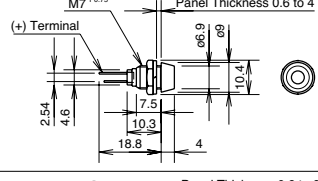



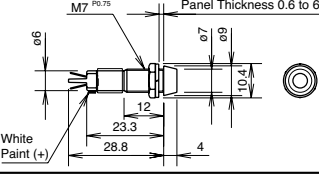
ø6 UP06 Series

| Shape | Operating Voltage | Degree of Protection | Part No. | Ordering No. | Color Code | Dimensions | Package Quantity |
|--|-------------------|----------------------|----------|--------------|---|---|------------------|
|  (+) ○ (-) | — | IP40 | UP06-67② | UP06-67② | Specify a color code in place of ② in the Part No. A: amber G: green R: red W: white Y: yellow |  | 1 |
| | | | | UP06-67②PN10 | | | 10 |
|  (+) ○ (-) | — | IP40 | UP06-68② | UP06-68② | Specify a color code in place of ② in the Part No. A: amber G: green R: red W: white Y: yellow |  | 1 |
| | | | | UP06-68②PN10 | | | 10 |
|  (+) ○ (-) | — | IP40 | UP06-69② | UP06-69② | Specify a color code in place of ② in the Part No. A: amber G: green R: red W: white Y: yellow |  | 1 |
| | | | | UP06-69②PN10 | | | 10 |

Note: For UP series pilot lights without built-in current limiting resistors, connect an external resistor in series. Otherwise, the LED may be damaged.



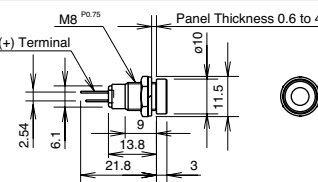



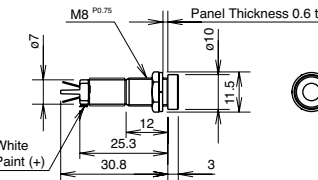


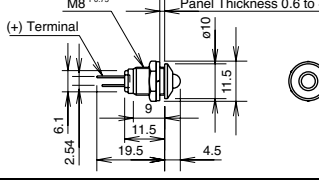
UP Series Miniature Pilot Lights ø6-7-8-9-10

ø7 UP7 Series

| Shape | Operating Voltage | Degree of Protection | Part No. | Ordering No. | Color Code | Dimensions | Package Quantity |
|--|-------------------|----------------------|-------------|---|---|--|------------------|
|  (+) ○ —  ○ (-) | — | IP40 | UP7-77② | UP7-77② | Specify a color code in place of ② in the Part No. A: amber G: green R: red W: white Y: yellow |  | 1 |
| | | | | UP7-77②PN10 | | | 10 |
|  (+) ○ —   ○ (-) | 12V DC ±10% | | UP7-1277② | UP7-1277② | |  | 1 |
| | 24V DC ±10% | | | UP7-2477② | | | 10 |
| | | | | UP7-2477② | | | UP7-2477② |
| | | | | | | | UP7-2477②PN10 |
|  (+) ○ —  ○ (-) | — | | UP7-78② | UP7-78② | |  | 1 |
| | | | | UP7-78②PN10 | | | 10 |
|  (+) ○ —   ○ (-) | 12V DC ±10% | | UP7-1278② | UP7-1278② | |  | 1 |
| | 24V DC ±10% | | | UP7-2478② | | | 10 |
| | | | | UP7-2478② | | | UP7-2478② |
| | | | | | | | UP7-2478②PN10 |
|  (+) ○ —  ○ (-) | — | UP7-79② | UP7-79② |  | 1 | | |
| | | | UP7-79②PN10 | | 10 | | |
|  (+) ○ —   ○ (-) | 12V DC ±10% | UP7-1279② | UP7-1279② |  | 1 | | |
| | 24V DC ±10% | | UP7-2479② | | 10 | | |
| | | | UP7-2479② | | UP7-2479② | 1 | |
| | | | | | UP7-2479②PN10 | 10 | |

Note: For UP series pilot lights without built-in current limiting resistors, connect an external resistor in series. Otherwise, the LED may be damaged.


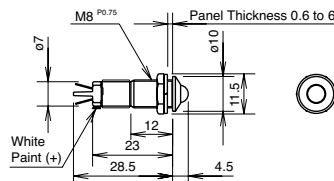
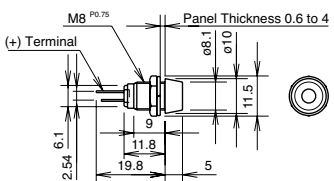

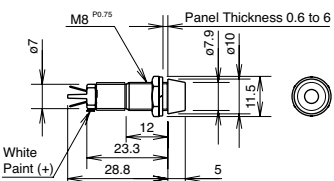
ø8 UP8 Series

| Shape | Operating Voltage | Degree of Protection | Part No. | Ordering No. | Color Code | Dimensions (mm) | Package Quantity |
|--|-------------------|----------------------|-----------|--------------|---|---|------------------|
|  (+) ○ —  ○ (-) | — | IP40 | UP8-87② | UP8-87② | Specify a color code in place of ② in the Part No. A: amber G: green R: red W: white Y: yellow |  | 1 |
| | | | | UP8-87②PN10 | | | 10 |
|  (+) ○ —   ○ (-) | 12V DC ±10% | | UP8-1287② | UP8-1287② | |  | 1 |
| | 24V DC ±10% | | | UP8-2487② | | | 10 |
| | | | | UP8-2487② | | | UP8-2487② |
| | | | | | | | UP8-2487②PN10 |
|  (+) ○ —  ○ (-) | — | | UP8-88② | UP8-88② | |  | 1 |
| | | | | UP8-88②PN10 | | | 10 |

Note: For UP series pilot lights without built-in current limiting resistors, connect an external resistor in series. Otherwise, the LED may be damaged.


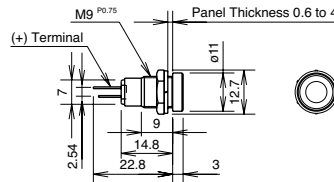

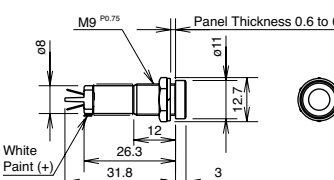
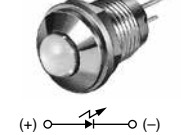
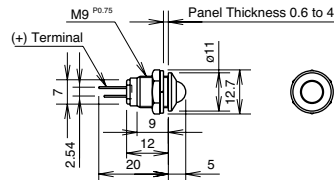

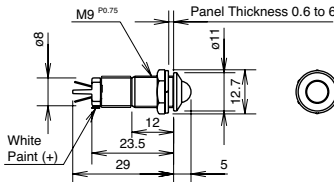

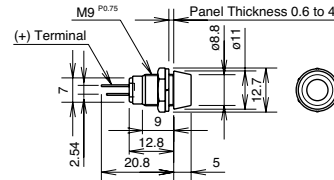
ø6.7.8.9.10 UP Series Miniature Pilot Lights

ø8 UP8 Series

| Shape | Operating Voltage | Degree of Protection | Part No. | Ordering No. | Color Code | Dimensions (mm) | Package Quantity | | |
|--|-------------------|----------------------|---------------|---------------|---|---|---|---|----|
|  (+) o—W— —o (-) | 12V DC ±10% | IP40 | UP8-1288② | UP8-1288② | Specify a color code in place of ② in the Part No. A: amber G: green R: red W: white Y: yellow |  | 1 | | |
| | | | | UP8-1288②PN10 | | | 10 | | |
| | 24V DC ±10% | | UP8-2488② | UP8-2488② | | | 1 | | |
| | | | | UP8-2488②PN10 | | | 10 | | |
| Deep Shroud | — | | UP8-89② | UP8-89② | | UP8-89② |  | 1 | |
| | | | | | | UP8-89②PN10 | | 10 | |
|  (+) o—W— —o (-) | 12V DC ±10% | | UP8-1289② | UP8-1289② | | UP8-1289② | |  | 1 |
| | | | | | | UP8-1289②PN10 | | | 10 |
| | 24V DC ±10% | UP8-2489② | UP8-2489② | 1 | | | | | |
| | | | UP8-2489②PN10 | 10 | | | | | |

Note: For UP series pilot lights without built-in current limiting resistors, connect an external resistor in series. Otherwise, the LED may be damaged.

ø9 UP9 Series

| Shape | Operating Voltage | Degree of Protection | Part No. | Ordering No. | Color Code | Dimensions (mm) | Package Quantity | |
|--|-------------------|----------------------|------------|----------------|---|---|---|----|
|  (+) o— —o (-) | — | IP40 | UP9-97② | UP9-97② | Specify a color code in place of ② in the Part No. A: amber G: green R: red W: white Y: yellow |  | 1 | |
| | | | | UP9-97②PN10 | | | 10 | |
| | | IP65 | UP9P-97② | UP9P-97② | | | 1 | |
| | | | | UP9P-97②PN10 | | | 10 | |
|  (+) o—W— —o (-) | | 12V DC ±10% | IP40 | UP9-1297② | | UP9-1297② |  | 1 |
| | | | | | | UP9-1297②PN10 | | 10 |
| | | IP65 | UP9P-1297② | UP9P-1297② | | 1 | | |
| | | | | UP9P-1297②PN10 | | 10 | | |
| | 24V DC ±10% | IP40 | UP9-2497② | UP9-2497② | 1 | | | |
| | | | | UP9-2497②PN10 | 10 | | | |
| IP65 | UP9P-2497② | UP9P-2497② | 1 | | | | | |
| | | UP9P-2497②PN10 | 10 | | | | | |
|  (+) o— —o (-) | — | IP40 | UP9-98② | UP9-98② | Specify a color code in place of ② in the Part No. A: amber G: green R: red W: white Y: yellow |  | 1 | |
| | | | | UP9-98②PN10 | | | 10 | |
| | | IP65 | UP9P-98② | UP9P-98② | | | 1 | |
| | | | | UP9P-98②PN10 | | | 10 | |
|  (+) o—W— —o (-) | | 12V DC ±10% | IP40 | UP9-1298② | | UP9-1298② |  | 1 |
| | | | | | | UP9-1298②PN10 | | 10 |
| | | IP65 | UP9P-1298② | UP9P-1298② | | 1 | | |
| | | | | UP9P-1298②PN10 | | 10 | | |
| | 24V DC ±10% | IP40 | UP9-2498② | UP9-2498② | 1 | | | |
| | | | | UP9-2498②PN10 | 10 | | | |
| IP65 | UP9P-2498② | UP9P-2498② | 1 | | | | | |
| | | UP9P-2498②PN10 | 10 | | | | | |
|  (+) o— —o (-) | — | IP40 | UP9-99② | UP9-99② |  | 1 | | |
| | | | | UP9-99②PN10 | | 10 | | |
| | | IP65 | UP9P-99② | UP9P-99② | | 1 | | |
| | | | | UP9P-99②PN10 | | 10 | | |

Note: For UP series pilot lights without built-in current limiting resistors, connect an external resistor in series. Otherwise, the LED may be damaged.

UP Series Miniature Pilot Lights ø6-7-8-9-10

ø9 UP9 Series

| Shape | Operating Voltage | Degree of Protection | Part No. | Ordering No. | Color Code | Dimensions (mm) | Package Quantity |
|---------------------------|-------------------|----------------------|-----------|---------------|---|-----------------|------------------|
| (+) o — W — (+) o (-) | 12V DC ±10% | IP40 | UP9-1299② | UP9-1299② | Specify a color code in place of ② in the Part No. A: amber G: green R: red W: white Y: yellow | | 1 |
| | | | | UP9-1299②PN10 | | | 10 |
| | | 24V DC ±10% | IP65 | UP9P-1299② | | | UP9P-1299② |
| | UP9P-1299②PN10 | | | | | | 10 |
| | IP40 | | UP9-2499② | UP9-2499② | | | 1 |
| | | UP9-2499②PN10 | | 10 | | | |
| IP65 | UP9P-2499② | UP9P-2499② | 1 | | | | |
| | | UP9P-2499②PN10 | 10 | | | | |

Note: For UP series pilot lights without built-in current limiting resistors, connect an external resistor in series. Otherwise, the LED may be damaged.

ø10 UP1 Series

| Shape | Operating Voltage | Degree of Protection | Part No. | Ordering No. | Color Code | Dimensions (mm) | Package Quantity |
|---------------------------|-------------------|----------------------|------------|---------------|---|-----------------|------------------|
| (+) o — (+) o (-) | — | IP40 | UP1-17② | UP1-17② | Specify a color code in place of ② in the Part No. A: amber G: green R: red W: white Y: yellow | | 1 |
| | | | | UP1-17②PN10 | | | 10 |
| | | IP65 | UP1P-17② | UP1P-17② | | | 1 |
| | | | | UP1P-17②PN10 | | | 10 |
| (+) o — W — (+) o (-) | 12V DC ±10% | IP40 | UP1-1217② | UP1-1217② | Specify a color code in place of ② in the Part No. A: amber G: green R: red W: white Y: yellow | | 1 |
| | | | | UP1-1217②PN10 | | | 10 |
| | | IP65 | UP1P-1217② | UP1P-1217② | | | 1 |
| | UP1P-1217②PN10 | | | 10 | | | |
| | 24V DC ±10% | IP40 | UP1-2417② | UP1-2417② | | | 1 |
| | | | | UP1-2417②PN10 | | | 10 |
| IP65 | | UP1P-2417② | UP1P-2417② | 1 | | | |
| | UP1P-2417②PN10 | | 10 | | | | |
| (+) o — (+) o (-) | — | IP40 | UP1-18② | UP1-18② | Specify a color code in place of ② in the Part No. A: amber G: green R: red W: white Y: yellow | | 1 |
| | | | | UP1-18②PN10 | | | 10 |
| | | IP65 | UP1P-18② | UP1P-18② | | | 1 |
| | | | | UP1P-18②PN10 | | | 10 |
| (+) o — W — (+) o (-) | 12V DC ±10% | IP40 | UP1-1218② | UP1-1218② | Specify a color code in place of ② in the Part No. A: amber G: green R: red W: white Y: yellow | | 1 |
| | | | | UP1-1218②PN10 | | | 10 |
| | | IP65 | UP1P-1218② | UP1P-1218② | | | 1 |
| | UP1P-1218②PN10 | | | 10 | | | |
| | 24V DC ±10% | IP40 | UP1-2418② | UP1-2418② | | | 1 |
| | | | | UP1-2418②PN10 | | | 10 |
| IP65 | | UP1P-2418② | UP1P-2418② | 1 | | | |
| | UP1P-2418②PN10 | | 10 | | | | |
| (+) o — (+) o (-) | — | IP40 | UP1-19② | UP1-19② | Specify a color code in place of ② in the Part No. A: amber G: green R: red W: white Y: yellow | | 1 |
| | | | | UP1-19②PN10 | | | 10 |
| | | IP65 | UP1P-19② | UP1P-19② | | | 1 |
| | | | | UP1P-19②PN10 | | | 10 |
| (+) o — W — (+) o (-) | 12V DC ±10% | IP40 | UP1-1219② | UP1-1219② | Specify a color code in place of ② in the Part No. A: amber G: green R: red W: white Y: yellow | | 1 |
| | | | | UP1-1219②PN10 | | | 10 |
| | | IP65 | UP1P-1219② | UP1P-1219② | | | 1 |
| | UP1P-1219②PN10 | | | 10 | | | |
| | 24V DC ±10% | IP40 | UP1-2419② | UP1-2419② | | | 1 |
| | | | | UP1-2419②PN10 | | | 10 |
| IP65 | | UP1P-2419② | UP1P-2419② | 1 | | | |
| | UP1P-2419②PN10 | | 10 | | | | |

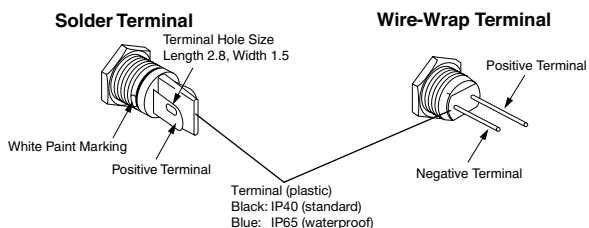
Note: For UP series pilot lights without built-in current limiting resistors, connect an external resistor in series. Otherwise, the LED may be damaged.

ø6.7.8.9.10 UP Series Miniature Pilot Lights

Instructions

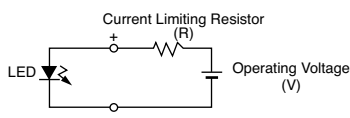
Polarity

Pay attention to the polarity of the power supply as UP series units do not contain a diode for protection against reverse polarity. On solder terminal units, the terminal with a white paint marking is positive. On wire-wrap terminal units, the long terminal is positive and the short terminal is negative.



Current Limiting Resistor

When using a UP series unit without a built-in current limiting resistor, connect an external current limiting resistor. Calculate the resistance using the following formula.



$$\text{Resistance (R)} = \frac{\text{Operating Voltage (V)} - 2}{\text{Rated Current (I)} *}$$

* Rated Current (I) = 10 mA, except white color at 15 mA

Note: Use a resistor of higher resistance than the calculated value (R).

$$\text{Rated Wattage of Resistor (W)} = \frac{\text{Rated Current (I)} \times \text{Operating Voltage (V)}}{2} \times 2 \text{ to } 3 *$$

* 2 to 3 is a safety factor

Reference Value of Current Limit Resistor

| Color | Amber, Green, Red, Yellow | White |
|-------------------|---------------------------|--------------|
| Operating Voltage | | |
| 5V DC | 300Ω (1/4W) | 200Ω (1/4W) |
| 6V DC | 390Ω (1/4W) | 270Ω (1/4W) |
| 12V DC | 1000Ω (1/4W) | 680Ω (1/4W) |
| 24V DC | 2200Ω (1/2W) | 1500Ω (1/2W) |

Waterproof Type

The degree of protection is distinguished by the color of the terminal.

| Terminal (Plastic) | Degree of Protection |
|--------------------|----------------------|
| Black | IP40 |
| Blue | IP65 |

Wiring

Solder the terminal at 350°C within 3 seconds using a 60W soldering iron. SnAgCu type lead-free solder is recommended. When soldering, do not touch the pilot light housing with the terminal. Do not bend the terminal or apply excessive force to the terminal.

Notes on Operating Voltage

The rated operating voltage represents a complete DC value. When using a pulsating voltage such as a full-wave rectification voltage, keep peak currents within the forward current I_f . Peak currents exceeding I_f may shorten the life of the LED lamp.

Panel Mounting

When mounting UP series units on to the panel, refer to the table below for the recommended tightening torque. Do not tighten with excessive force, otherwise the locking ring will be damaged.

| Model | Recommended Tightening Torque |
|-------|-------------------------------|
| UP06 | 0.29 N·m |
| UP7 | 0.39 N·m |
| UP8 | 0.49 N·m |
| UP9 | 0.59 N·m |
| UP9P | 0.29 N·m |
| UP1 | 0.59 N·m |
| UP1P | 0.29 N·m |

UP Series Miniature Pilot Lights (Single Board Mounting)

Single board mounting for miniature LEDs. Same length as H6, L6, and LW series control units

- Five illumination colors: amber, green, red, white, yellow

Specifications

| | |
|-----------------------|---|
| Rated Current | 10 mA (Amber, Green, Red, Yellow) 15 mA (White) |
| Forward Current | 20 mA maximum at 25°C |
| Reverse Voltage | 3V maximum at 25°C |
| Power Consumption | 60 mW maximum at 25°C |
| Operating Temperature | -20 to +55°C (no freezing) |
| Storage Temperature | -25 to +80°C (no freezing) |
| Forward Voltage | Maximum value: 3V Standard value: 2V (forward current: 10 mA) |
| Dielectric Strength | Between live and dead parts: 500V AC, 1 minute |
| Weight (approx.) | 6g (UP8-89V) |



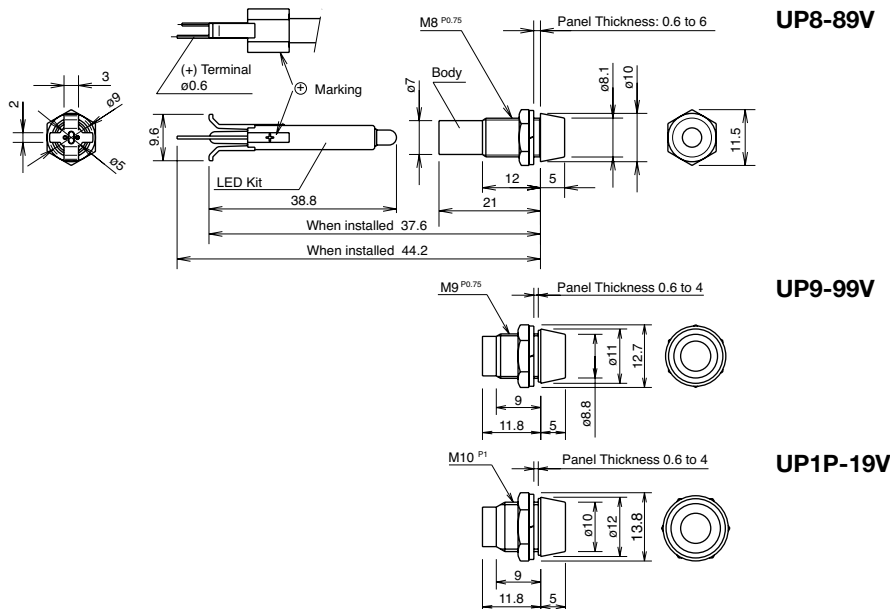
ø8 ø9 ø10 UP8 / UP9P / UP1P

| Mounting Hole Size | Shape | Degree of Protection | Part No. | Ordering No. | Color Code | Package Quantity |
|--------------------|-------------|----------------------|-----------------------|----------------------------|-----------------------|------------------|
| ø8 UP8 | Deep shroud | IP40 | UP8-89V ^② | UP8-89V ^② PN10 | A: amber | 10 |
| ø9 UP9 | Deep shroud | IP65 | UP9P-99V ^② | UP9P-99V ^② PN10 | G: green R: red | |
| ø10 UP1P | Deep shroud | IP65 | UP1P-19V ^② | UP1P-19V ^② PN10 | W: white Y: yellow | 10 |

•Specify a color code in place of ② in the Part No.

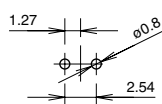
Note: Connect an external current limiting resistor in series. Otherwise, the LED may be damaged.

Dimensions

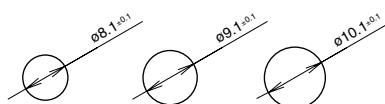


All dimensions in mm.

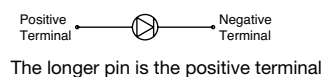
PC Board Mounting Hole



Panel Cut-out



Internal Circuit



UP Series Miniature Pilot Lights

Safety Precautions

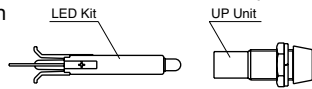
• Turn off power to the unit before installation, removal, wiring, maintenance, and inspection. Failure to turn off may cause electrical shocks or fire hazard.

• For wiring, use wires of a proper size to meet the voltage and current requirements. Improper soldering or failure to tighten the terminal screw may cause overheating and fire.

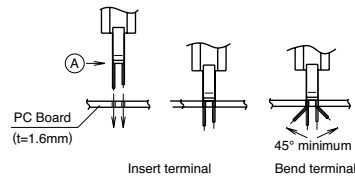
Instructions

Single Board Mounting

UP series miniature pilot light single board mounting types can be mounted with H6, L6, LW series control units on the same panel. Follow the instructions below on single board mounting.

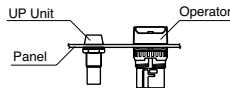


1. Mount the LED kit to the PC board.

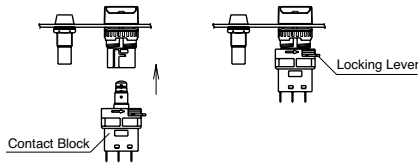


• Temporary mounting
 1. Note the polarity of the terminals and insert the terminals to the PC board.
 2. Make sure that part A of the LED kit is pressed tightly to the PC board. Bend the terminals sideways as shown on the left.

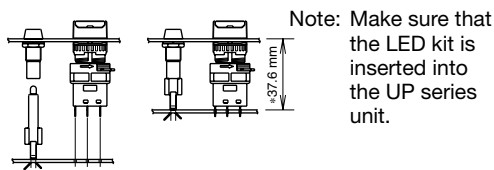
2. Mount the operator and the UP series pilot lights on to the control panel.



3. Mount the contact block to the operator of the miniature control unit and lock the unit by turning the locking lever.



4. Install the PC board in 1. to the panel in 3.



5. Solder the terminals.

Before soldering, make sure that each terminal of the contact block is securely inserted into the PC board holes.

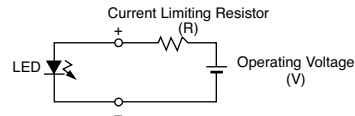
* When mounting H6, L6, LW, and UP series on a single board, make sure that the distance between the front of the panel and the mounting side of the PC board is 37.6 mm.

Polarity

Pay attention to the polarity of the power supply as UP series units do not contain a diode for protection against reverse polarity. The long terminal is positive and the short terminal is negative.

Current Limiting Resistor

When using a UP series unit without a built-in current limiting resistor, connect an external current limiting resistor. Calculate the resistance using the following formula.



$$\text{Resistance (R)} = \frac{\text{Operating Voltage (V)} - 2}{\text{Rated Current (I)} *}$$

* Rated Current (I) = 10 mA, except white color at 15 mA

Note: Use a resistor of higher resistance than the calculated value (R).

$$\text{Rated Wattage of Resistor (W)} = \text{Rated Current (I)} \times \text{Operating Voltage (V)} \times 2 \text{ to } 3 *$$

* 2 to 3 is a safety factor

Current Limiting Resistor Reference Value

| Color | Amber, Green, Yellow, Amber | White |
|-------------------|-----------------------------|--------------|
| Operating Voltage | | |
| 5V DC | 300Ω (1/4W) | 200Ω (1/4W) |
| 6V DC | 390Ω (1/4W) | 270Ω (1/4W) |
| 12V DC | 1000Ω (1/4W) | 680Ω (1/4W) |
| 24V DC | 2200Ω (1/2W) | 1500Ω (1/2W) |

Wiring

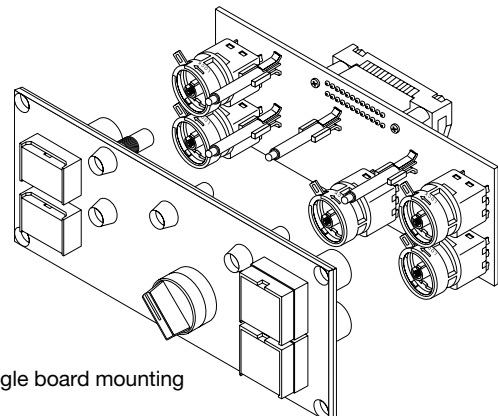
Solder the terminal at 350°C within 3 seconds using a 60W soldering iron. SnAgCu type lead-free solder is recommended. When soldering, do not touch the pilot light housing with the terminal. Do not bend the terminal or apply excessive force to the terminal.

Notes on Panel Mounting

Use an optional locking ring wrench to mount the unit onto a panel. Tightening torque should not exceed 0.5 N·m. Do not use pliers. Do not tighten with excessive force, otherwise the locking ring will be damaged.

PC Board and Circuit Design

Use glass epoxy copper clad laminate, double-sided through-hole PC boards with a thickness of 1.6 mm.



Example of single board mounting

ø16 UZ6 series Miniature Buzzer

Miniature Electronic Buzzer for mounting in ø16 mm Mounting Hole

- Same size and terminal alignment as AP6M series miniature pilot lights.
- Sounds can be adjusted from approximately 30 to 600 cycles per minute using the optional sound adapter.
- The sound adapter can be snapped on to the rear part of the buzzer unit.



Specifications

Buzzer Unit

| | |
|--------------------------|--|
| Insulation Voltage | 60V DC |
| Rated Voltage | 12V DC, 24V DC |
| Voltage Range | 12V DC $\pm 10\%$, 24V DC $\pm 10\%$ |
| Current Draw | 24 mA |
| Sound Pressure (at 0.1m) | Steady sound: 75dB (at the rated voltage) |
| Sound Frequency | 3.5 kHz $\pm 800\text{Hz}$ |
| Operating Temperature | -20 to +50°C (no freezing) |
| Storage Temperature | -25 to +80°C (no freezing) |
| Operating Humidity | 45 to 85% RH (no condensation) |
| Insulation Resistance | 100 M Ω minimum (500V DC megger) |
| Dielectric Strength | Between live and dead parts: 1,000V AC, 1 minute |
| Degree of Protection | IP40 (IEC 60529) |
| Terminal Style | Solder terminal |
| Applicable Wire | $\phi 1$ or 0.75 mm ² max. |
| Cap Color | Blue |
| Weight (approx.) | 6.5g |

Ratings / Cyclical Sound Adapter

| | |
|------------------------|--|
| Rated Voltage | 12/24V DC |
| Voltage Range | 12/24V DC $\pm 10\%$ |
| Current Draw | 30 mA (when installed on the buzzer unit) |
| Cyclical Sound | 30 to 600 cycles per minute (period: 0.1 to 2 sec) ON/OFF time ratio 1:1 |
| Applicable Buzzer Unit | 12V DC, 24V DC buzzers (UZ6-11, UZ6-12) |
| Terminal Screw | M3 |
| Applicable Wire | 1.25 mm ² max. |
| Weight (approx.) | 13.5g |

Buzzer Unit (continuous sound)

| Shape | Terminal Style | Operating Voltage | Part No. | Package Quantity |
|-------|----------------|-------------------|---------------|------------------|
| | Solder | 12V DC $\pm 10\%$ | UZ6-11 | 1 |
| | | 24V DC $\pm 10\%$ | UZ6-12 | 1 |

Cyclical Sound Adapter

| Shape | Terminal Style | Operating Voltage | Part No. | Package Quantity |
|-------|----------------|-----------------------|----------------|------------------|
| | Screw | 12V/24V DC $\pm 10\%$ | UZ6-F10 | 1 |

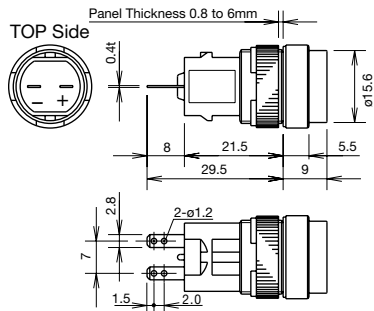
Accessories

| Shape | Specification | Part No. | Remarks |
|-------|----------------------------|---------------|---|
| | Nickel-plated brass | MT-001 | Used to tighten the locking ring when installing a UZ6 buzzer onto a panel. |
| | Stainless steel | MT-100 | Used to remove the cyclical sound adapter from the buzzer. The cyclical sound adapter can be removed by using the tip of the tool as shown in the left photo. |
| | For cyclical sound adapter | AP-VL3 | |

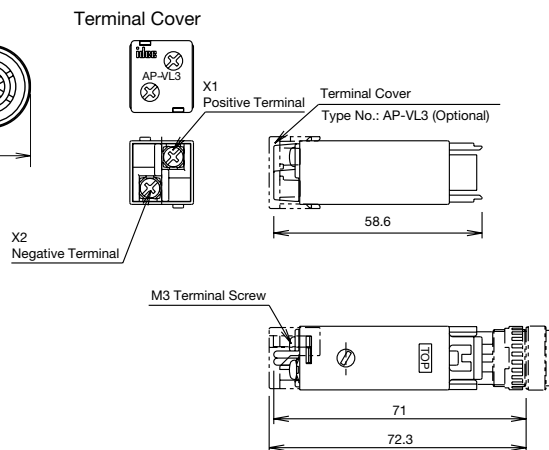
ø16 UZ6 Series Miniature Buzzer

Dimensions

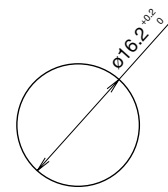
Buzzer Unit



Cyclical Sound Adapter



Panel Cut-out



Safety Precautions

• Turn off power to the buzzer before installation, removal, wiring, maintenance, and inspection. Failure to turn off may cause electrical shocks or fire hazard.

• For wiring, use wires of a proper size to meet the voltage and current requirements. Tighten the M3 screw terminal of the cyclical sound adapter to a torque of 0.6 to 1.0 N·m. Improper soldering or failure to tighten the terminal screw may cause overheating and fire.

Instructions

Notes on Panel Mounting

Use an optional locking ring wrench to mount the unit onto a panel. Tightening torque should not exceed 0.88 N·m. Do not use pliers. Do not tighten with excessive force, otherwise the locking ring will be damaged.

Power Supply Noise

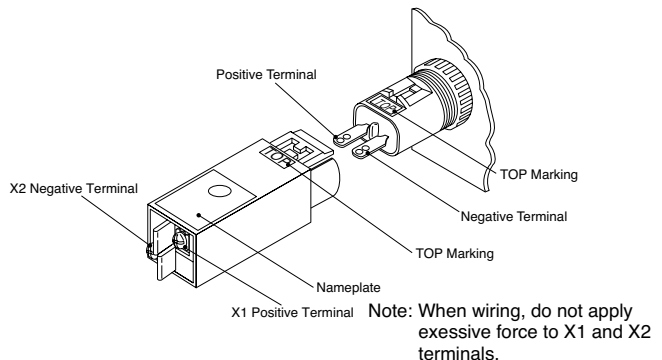
When the buzzer is used where power noise might occur, use a noise suppressor element to prevent noise interference.

Cyclical Sound Adjustment

Pierce the round mark on the nameplate on top of the cyclical sound adapter with a flat screwdriver and adjust the variable resistor inside. Turn clockwise for longer cyclical sounds and counterclockwise for shorter cyclical sounds.

Notes on Installing the Cyclical Sound Adapter

1. The cyclical sound adapter can be used on 12V and 24V DC buzzer units (UZ6-11, UZ6-12).
2. Mount the buzzer unit on the panel before installing the cyclical sound adapter on the panel. The buzzer unit cannot be mounted with the cyclical sound adapter installed.
3. When installing the cyclical sound adapter, make sure that the TOP marking on the cyclical sound adapter is on the same side as the TOP marking on the buzzer unit and press in.



Wiring

Solder the terminal at 350°C within 3 seconds using a 60W soldering iron. SnAgCu type lead-free solder is recommended. When soldering, do not touch the buzzer unit housing with the terminal. Do not bend the terminal or apply excessive force to the terminal.

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