

## Pushbutton Switch / Indicator

A16 / M16

### Mounting Aperture of 16 mm

- Modular construction  
(Pushbutton + Case + Lamp + Switch Unit)
- Wide Variety of Control and Signal Devices:  
Lighted, Non-Lighted, and Buzzer  
(Refer to page 47.)
- UL and CSA approved, VDE (pending)
- Conforms to EN60943-5-1, IEC947-5-1
- Quick and easy assembly, snap-in Switch Unit.
- Wide range of switching capacity from general to microload
- High reliability, IP65
- Short mounting depth, less than 28.5 mm below panel



## Ordering Information

### Construction

#### Flange Shape

- Rectangular (A16□-J)
- Square (A16□-A)
- Round (A16□-T)

#### Available Colors

- For LED/incandescent  
Red, green, yellow, white, blue
- For neon  
Red, green
- For non-lighted  
Red, green, yellow, white, blue, black

#### Protective Structure and Terminal Type

- **Protective Structure**  
IP40/Oil-resistant IP65
- **Terminal Type**  
Solder terminals  
(tab terminals #110)

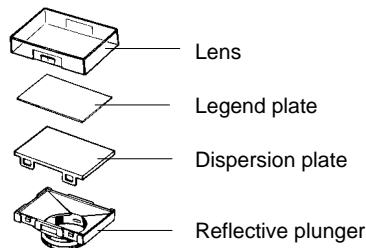
#### Lamp

- LED
- Incandescent lamp
- Neon lamp

#### Switch Unit Specifications

- **Ratings**  
125 VAC: 5 A  
250 VAC: 3 A  
30 VDC 3 A  
Minimum applicable load: 1 mA at 5 VDC

#### Structure of Pushbutton



## ■ Model Number Legend

### 1. Pushbutton

#### Non-lighted/Lighted

A16 □ L- □ □

1            2    3

#### 1. Degree of Protection

None: IP40

5: IP65

#### 2. Flange Shape

J: Rectangular

T: Round

A: Square

#### 3. Illumination Color for non-lighted

R: Red

G: Green

Y: Yellow

W: White

A: Blue

B: Black

#### Illumination Color for lighted

##### LED/Incandescent Lamp

R: Red

Y: Yellow

W: White

A: Blue

##### LED

GY: Green

##### Incandescent Lamp

G: Green

##### Neon Lamp

RN: Red

GN: Green

### 2. Lamp

A16- □ □

1    2

#### 1. Operating Voltage (Rated Voltage)

##### Incandescent Lamp

5: 5 VAC/DC (6 VAC/DC)

12: 12 VAC/DC (14 VAC/DC)

24: 24 VAC/DC (28 VAC/DC)

##### LED

5D: 5 VDC (5 VDC)

12D: 12 VDC (12 VDC)

24D: 24 VDC (24 VDC)

##### Neon Lamp

1N: 100 VAC (110 VAC)

2N: 200 VAC (220 VAC)

#### 2. Illumination Color

None: Incandescent Lamp

R: Red (LED)

G: Green (LED)

Y: Yellow (LED)

W: White (LED)

A: Blue (LED)

RN: Red (Neon Lamp)

GN: Green (Neon Lamp)

### 3. Case (Common Use)

A16 □ - □ □

1    2    3

#### 1. Degree of Protection

None: IP40

5: IP65

#### 2. Flange Shape

CJ: Rectangular

CT: Round

CA: Square

#### 3. Switch Action

M: Momentary

A: Alternate

#### 4. Switch Unit (Solder Terminals)

A16-□-□

1 2

##### 1. Contacts

- 1: SPDT  
2: DPDT

##### 2. Transformer Circuit (Operating Voltage/Rated Voltage)

None: Without transformer

T1: 100 VAC/110 VAC (Release: September 1999)

T2: 200 VAC/220 VAC (Release: September 1999)

#### 5. Indicator Socket (Solder Terminals Only)

M16-O-□

1

##### 1. Transformer Circuit (Operating Voltage/Rated Voltage)

None: Without transformer







T1: 100 VAC/110 VAC (Release: September 1999)

T2: 200 VAC/220 VAC (Release: September 1999)







### ■ Pushbutton Units

Illumination: red, yellow, and white use either LED or incandescent lamps.

#### LED

| Degree of protection     | IP40  |   |   | Oil-resistant IP65   |   |   |
|--------------------------|---|---|---|--|---|---|
|                          | Rectangular   | Square  | Round   | Rectangular  | Square  | Round   |
| Color of functional unit |  |  |  |  |  |  |
| Red                      | A16L-JR   | A16L-AR   | A16L-TR   | A165L-JR   | A165L-AR  | A165L-TR  |
| Yellow                   | A16L-JY   | A16L-AY   | A16L-TY   | A165L-JY   | A165L-AY  | A165L-TY  |
| Green                    | A16L-JGY  | A16L-AGY  | A16L-TGY  | A165L-TGY  | A165L-AGY   | A165L-TGY   |
| White                    | A16L-JW   | A16L-AW   | A16L-TW   | A165L-TW   | A165L-AW  | A165L-TW  |

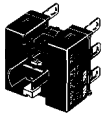
#### Incandescent Lamps

| Degree of protection     | IP40  |   |   | Oil-resistant IP65   |   |   |
|--------------------------|---|---|---|--|---|---|
|                          | Rectangular   | Square  | Round   | Rectangular  | Square  | Round   |
| Color of functional unit |  |  |  |  |  |  |
| Red                      | A16L-JR   | A16L-AR   | A16L-TR   | A165L-JR   | A165L-AR  | A165L-TR  |
| Yellow                   | A16L-JY   | A16L-AY   | A16L-TY   | A165L-JY   | A165L-AY  | A165L-TY  |
| Green                    | A16L-JG   | A16L-AG   | A16L-TG   | A165L-JG   | A165L-AG  | A165L-TG  |
| White                    | A16L-JW   | A16L-AW   | A16L-TW   | A165L-JW   | A165L-AW  | A165L-TW  |
| Blue                     | A16L-JA   | A16L-AA   | A16L-TA   | A165L-JA   | A165L-AA  | A165L-TA  |







#### Neon Lamps

| Degree of protection | IP40     |          |          | Oil-resistant IP65 |           |           |
|----------------------|----------|----------|----------|--------------------|-----------|-----------|
| Red                  | A16L-JRN | A16L-ARN | A16L-TRN | A165L-JRN          | A165L-ARN | A165L-TRN |
| Green                | A16L-JGN | A16L-AGN | A16L-TGN | A165L-JGN          | A165L-AGN | A165L-TGN |

### ■ Switch Units

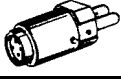
| Shape   | Classification                   |                                      |      | Model |
|---|----------------------------------|--------------------------------------|------|-------|
|  | Lighted/non-lighted (common use) | Socket (without transformer circuit) | SPDT | A16-1 |
|   |                                  |                                      | DPDT |       |

## Non-lighted

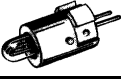
| Degree of protection     | IP40   |   |  | Oil-resistant IP65  |   |  |
|--------------------------|--|---|--|---|---|--|
|                          | Rectangular<br> | Square<br> | Round<br> | Rectangular<br> | Square<br> | Round<br> |
| Color of functional unit |  |   |  |   |   |  |
| Red                      | A16L-JR  | A16L-AR   | A16L-TR  | A165L-JR  | A165L-AR  | A165L-TR   |
| Yellow                   | A16L-JY  | A16L-AY   | A16L-TY  | A165L-JY  | A165L-AY  | A165L-TY   |
| Green                    | A16L-JG  | A16L-AG   | A16L-TG  | A165L-JG  | A165L-AG  | A165L-TG   |
| White                    | A16L-JW  | A16L-AW   | A16L-TW  | A165L-JW  | A165L-AW  | A165L-TW   |
| Blue                     | A16L-JA  | A16L-AA   | A16L-TA  | A165L-JA  | A165L-AA  | A165L-TA   |
| Black                    | A16L-JB  | A16L-AB   | A16L-TB  | A165L-JB  | A165L-AB  | A165L-TB   |

## ■ Lamps


## LED

| Rated voltage<br> | 5 VDC   | 12 VDC   | 24 VDC   |
|--|---------|----------|----------|
| LED light  |         |          |          |
| Red  | A16-5DR | A16-12DR | A16-24DR |
| Yellow   | A16-5DY | A16-12DY | A16-24DY |
| Green  | A16-5DG | A16-12DG | A16-24DG |
| White  | A16-5DW | A16-12DW | A16-24DW |
| Blue   | A16-5DA | A16-12DA | A16-24DA |

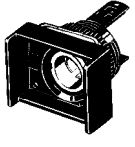
## Incandescent Lamp

| Rated voltage<br> | 6 V   | 14 V   | 28 V   |
|--|-------|--------|--------|
| Model  | A16-5 | A16-12 | A16-24 |

## Neon Lamp

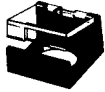


| Rated voltage<br> | 110 V            | 220 V    |          |
|--|------------------|----------|----------|
| LED light  |                  |          |          |
| Functional unit color  |                  |          |          |
| Red  | White and orange | A16-1NRN | A16-2NRN |
| Green  | Green            | A16-1NGN | A16-2NGN |

## ■ Cases





| Shape<br> | Classification        |                       | Model       |          |
|--|-----------------------|-----------------------|-------------|----------|
| IP40   | Momentary operation   | Rectangular           | A16-CJM     |          |
|  |                       | Square                | A16-CAM     |          |
|  |                       | Round                 | A16-CTM     |          |
|  | Alternating operation | Rectangular           | A16-CJA     |          |
|  |                       | Square                | A16-CAA     |          |
|  |                       | Round                 | A16-CTA     |          |
|  | Oil-resistant IP65    | Momentary operation   | Rectangular | A165-CJM |
|  |                       |                       | Square      | A165-CAM |
|  |                       |                       | Round       | A165-CTM |
|  |                       | Alternating operation | Rectangular | A165-CJA |
| Square   |                       |                       | A165-CAA    |          |
| Round  |                       |                       | A165-CTA    |          |

## Accessories (Order Separately)

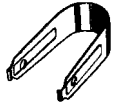


### ■ Accessories

| Name          | Shape   | Classification   | Model     | Remarks   |
|---------------|---|------------------|-----------|---|
| Switch Guards |  | Rectangular      | A3BJ-5050 | Cannot be used with the Dust Cover.                             |
|               |   | Square and round | A3BA-5050 |   |
| Dust Covers   |  | Rectangular      | A3BJ-5060 | Cannot be used with the Switch Cover.                           |
|               |   | Square           | A3BA-5060 |   |
|               |   | Round            | A3BT-5060 |   |
| Panel Plugs   |  | Rectangular      | A3BJ-3003 | Used for covering the panel cutouts for future panel expansion. |
|               |   | Square           | A3BA-3003 |   |
|               |   | Round            | A3BT-3003 |   |

### ■ Replacements

| Name   | Shape  | Classification                              | Model              | Remarks     |   |   |
|--|--|---|--------------------|-------------|---|---|
| Legend Panels  |                   | Rectangular                                 | IP40               | Milky       | A3BJ-5204   | A single Legend Panel (transparent) is included with a standard model.<br>The milky Legend Panel can be used with the IP40 and oil-resistant IP65.  |
|  |  |   |                    | Transparent | A3BJ-5202   |   |
|  |  |   | Oil-resistant IP65 | Milky       | A3BJ-5204   |   |
|  |  |   |                    | Transparent | A3BJ-5203   |   |
|  |  | Square                                      | IP40               | Milky       | A3BA-5204   |   |
|  |  |   |                    | Transparent | A3BA-5202   |   |
|  |  |   | Oil-resistant IP65 | Milky       | A3BA-5204   |   |
|  |  |   |                    | Transparent | A3BA-5203   |   |
|  |  | Round                                       | IP40               | Milky       | A3BT-5204   |   |
|  |  |   |                    | Transparent | A3BT-5202   |   |
|  |  |   | Oil-resistant IP65 | Milky       | A3BT-5204   |   |
|  |  |   |                    | Transparent | A3BT-5203   |   |
| Color Caps (for IP40)  | Rectangular<br> | LED indicator/incandescent lamp/non-lighted | White              | A3B□-5001W  | Insert one of the following letters into the box (□).<br>J: Rectangular<br>A: Square<br>T: Round<br>The Color Cap is usually supplied. Replace the Cap if the color is to be changed. |   |
|  |  |   | Red                | A3B□-5001R  |   |   |
|  |  |   | Yellow             | A3B□-5001Y  |   |   |
|  |  | LED indicator                               | Green              | A3B□-5001GY |   |   |
|  |  | Incandescent lamp/non-lighted               | Blue               | A3B□-5001A  |   |   |
|  | Green  |   | A3B□-5001G         |             |   |   |
|  | Square<br>      | LED indicator/incandescent lamp/non-lighted | White              | A3B□-5101W  |   | When using an LED indicator, be sure to use a Color Cap that matches the luminescent color of the LED.<br>The materials used for the IP40 and oil-resistant IP65 are different so be sure to use a Color Cap that matches the specifications of the Switch. |
|  |  |   | Red                | A3B□-5101R  |   |   |
|  |  |   | Yellow             | A3B□-5101Y  |   |   |
| LED indicator  |  | Green                                       | A3B□-5101GY        |             |   |   |
|  | Incandescent lamp/non-lighted  | Blue  | A3B□-5101A         |             |   |   |
| Green  |  | A3B□-5101G                                  |                    |             |   |   |
| Round<br> | LED indicator/incandescent lamp/non-lighted  | White                                       | A3B□-5101W         |             |   |   |
|  |  | Red   | A3B□-5101R         |             |   |   |
|  |  | Yellow                                      | A3B□-5101Y         |             |   |   |
| LED indicator  | Green  | A3B□-5101GY                                 |                    |             |   |   |
|  | Incandescent lamp/non-lighted  | Blue  | A3B□-5101A         |             |   |   |
|  |  | Green                                       | A3B□-5101G         |             |   |   |
| Non-lighted  | Black  | A3B□-5111B                                  |                    |             |   |   |

## ■ Tools

| Name          | Shape   | Model     | Applicable types  |                           |                          |                       |           | Remarks  |
|---------------|---|-----------|-------------------|---------------------------|--------------------------|-----------------------|-----------|--|
|               |   |           | Pushbutton Switch | Knob-type Selector Switch | Key-type Selector Switch | Emergency Stop Switch | Indicator |  |
| Extractor     |  | A3PJ-5080 | Yes               | No                        | No                       | No                    | Yes       | Convenient for extracting Pushbutton Switches  |
| Screw Fitting |  | A3B-3004  | Yes               | Yes                       | Yes                      | Yes                   | Yes       | Convenient for ganged installation.<br>Tighten to a torque of 0.39 N • m (5 kgf • cm) min. |
| Extractor     |  | A16Z-5080 | Yes               | Yes                       | Yes                      | Yes                   | Yes       | Convenient for extracting the Switch Unit and Lamps.                                       |

## Specifications

### ■ Approved Standards

| Recognized Organization | Standards   | File No. |
|-------------------------|-------------|----------|
| UL, cUL (see note)      | UL508       | E41515   |
| ASTA                    | EN60947-5-1 | ---      |

Note: UL: CSA C22 No. 14

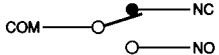
### ■ Ratings

| AC resistive load (AC15)     | DC resistive load (DC13) |
|------------------------------|--------------------------|
| 3 A, 250 VAC<br>5 A, 125 VAC | 3 A, 30 VDC              |

Minimum applicable load: 1 mA at 5 VDC  
Rated values are obtained from tests conducted under the following conditions according to JIS C4505 and C4520.

1. Load: Resistive load
2. Mounting conditions: No vibration and no shock
3. Temperature: 20°±2°C
4. Operating frequency: 20 operations/min

### Contact

| Name | Contact   |
|------|---|
| DPDT |  |

### LED

| Rated voltage | Rated current | Operating voltage | Internal limiting resistor |
|---------------|---------------|-------------------|----------------------------|
| 5 VDC         | 30 mA         | 5 VDC±5%          | 33 Ω                       |
| 12 VDC        | 15 mA         | 12 VDC±5%         | 270 Ω                      |
| 24 VDC        | 10 mA         | 24 VDC±5%         | 1600 Ω                     |

### Incandescent Lamp

| Rated voltage | Rated current | Operating voltage |
|---------------|---------------|-------------------|
| 6 VAC/DC      | 60 mA         | 5 VAC/DC          |
| 14 VAC/DC     | 40 mA         | 12 VAC/DC         |
| 28 VAC/DC     | 24 mA         | 24 VAC/DC         |

## ■ Characteristics

| Item                            |             | Pushbutton Switch  |
|---------------------------------|-------------|--|
| Allowable operating frequency   | Mechanical  | Momentary operation: 120 operations/min max.<br>Alternating operation: 60 operations/min max. (see note 1)   |
|                                 | Electrical  | 20 operations/min max.   |
| Insulation resistance           |             | 100 M $\Omega$ min. (at 500 VDC)   |
| Dielectric strength             |             | 1,000 VAC, 50/60 Hz for 1 min between terminals of same polarity<br>2,000 VAC, 50/60 Hz for 1 min between terminals of different polarity and also between each terminal and ground<br>1,000 VAC, 50/60 Hz for 1 min between lamp terminals (see note 2) |
| Vibration resistance            | Malfunction | 10 to 55 Hz, 1.5-mm double amplitude (malfunction within 1 ms)   |
| Shock resistance                | Mechanical  | 500 m/s <sup>2</sup> (50G)   |
|                                 | Malfunction | 150 m/s <sup>2</sup> (15G) max. (malfunction within 1 ms)  |
| Life expectancy                 | Mechanical  | Momentary operation: 2,000,000 operations min.<br>Alternating operation: 200,000 operations min.   |
|                                 | Electrical  | 100,000 operations min.  |
| Ambient temperature             |             | Operating: -10°C to 55°C (with no icing or condensation)<br>Storage: -25°C to 65°C (with no icing or condensation)   |
| Ambient humidity                |             | Operating: 35% to 85%  |
| Electric shock protection class |             | Class II   |
| PTI (tracking characteristic)   |             | 175  |
| Degree of contamination         |             | 3 (IEC947-5-1)   |
| Weight                          |             | Approx. 10 g (in the case of a lighted DPDT switch with solder terminals)  |

- Note:** 1. Set and reset constitute one operation.  
2. With LED and incandescent lamp not mounted.

## ■ Operating Characteristics

| Features                             | Type | Pushbutton Switch |                 |                    |                 |
|--------------------------------------|------|-------------------|-----------------|--------------------|-----------------|
|                                      |      | IP40              |                 | Oil-resistant IP65 |                 |
|                                      |      | SPDT              | DPDT            | SPDT               | DPDT            |
| Operating force (OF) max.            |      | 2.45 N (250 gf)   | 4.41 N (450 gf) | 2.94 N (300 gf)    | 4.91 N (500 gf) |
| Releasing force (RF) min.            |      | 0.29 N (30 gf)    |                 |                    |                 |
| Total travel (TT)                    |      | Approx. 3 mm      |                 |                    |                 |
| Pretravel (PT) max.                  |      | 2.5 mm            |                 |                    |                 |
| Lock stroke (LTA) min.<br>(see note) |      | 0.5 mm            |                 |                    |                 |

- Note:** Lock stroke is only for alternating operation.

# Dimensions

**Note:** All units are in millimeters unless otherwise indicated.

## ■ Lighted/Non-lighted Pushbutton Switches without Transformer

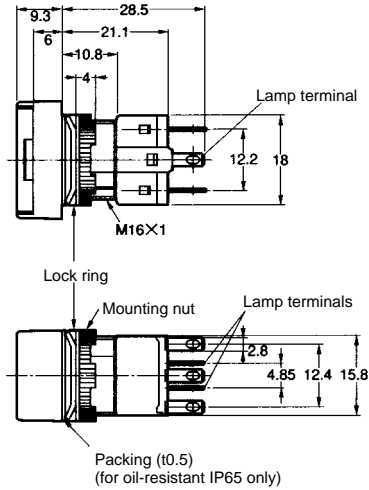
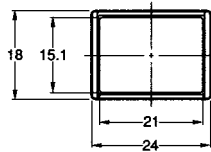
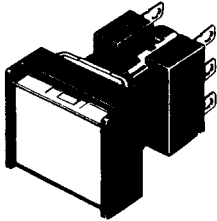
The lamp terminal is also provided with non-lighted models.

Solder terminals and tab terminals (#110) can be both used with Lighted and Non-lighted Pushbutton Switches.

### Rectangular

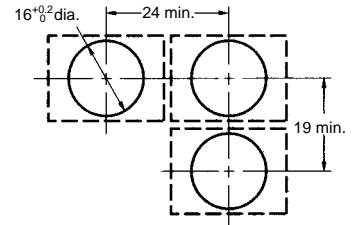
#### A16□-J

Solder terminals (tab terminals #110)



### Panel Cutouts

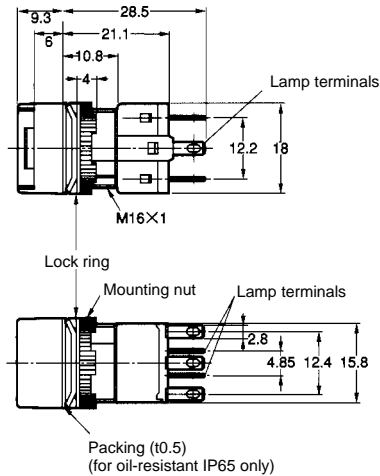
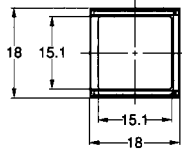
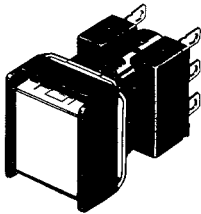
See page 17 for panel cutouts



### Square

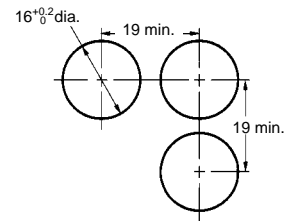
#### A16□-A

Solder terminals (tab terminals #110)



### Panel Cutouts

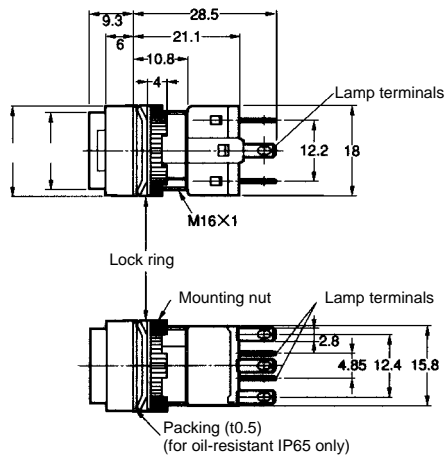
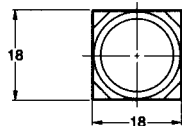
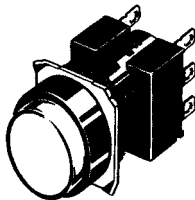
See page 17 for panel cutouts



### Round

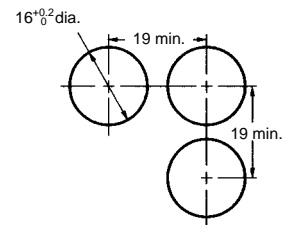
#### A16□-T

Solder terminals (tab terminals #110)



### Panel Cutouts

See page 17 for panel cutouts

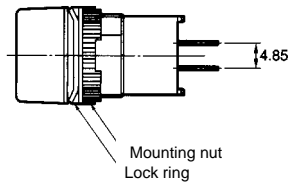
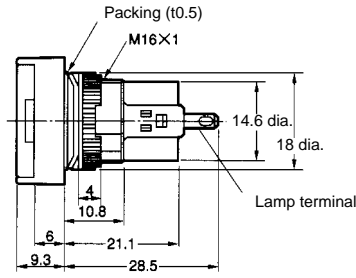
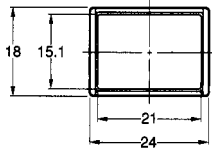




■ Indicators without Transformer

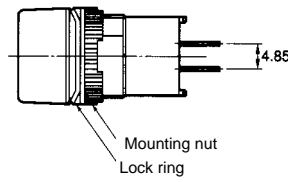
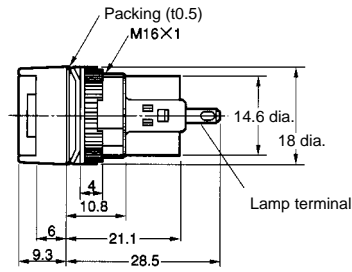
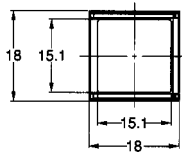
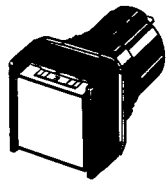
**Rectangular  
M16-J**

Solder terminals (tab terminals #110)



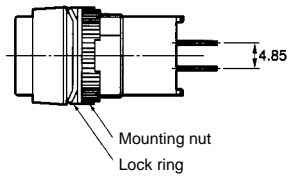
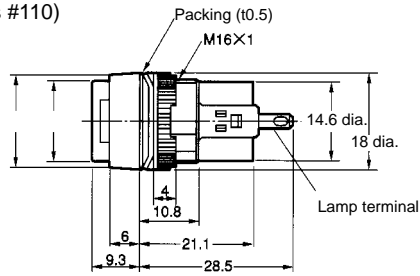
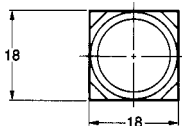
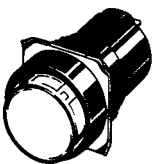
**Square  
M16-A**

Solder terminals (tab terminals #110)



**Round  
M16-T**

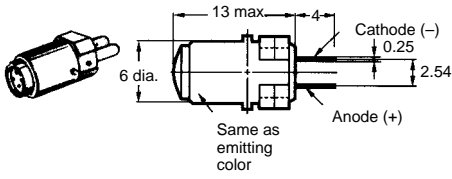
Solder terminals (tab terminals #110)



■ Lamps

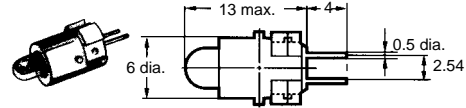
LED

A16-5D□/-12D□/-24D□



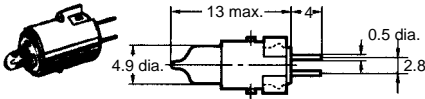
Incandescent Lamp

A16-5/-12/-24



Neon Lamp

A16-1N/-2N

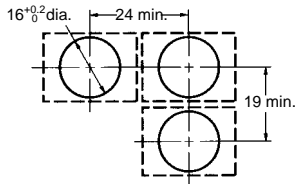


■ Panel Cutouts

Rectangular

A16□-J/M16□-J

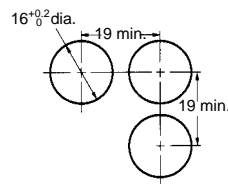
(Top View)



Square A16□-A/M16□-A

Round A16□-T/M16□-T

(Top View)



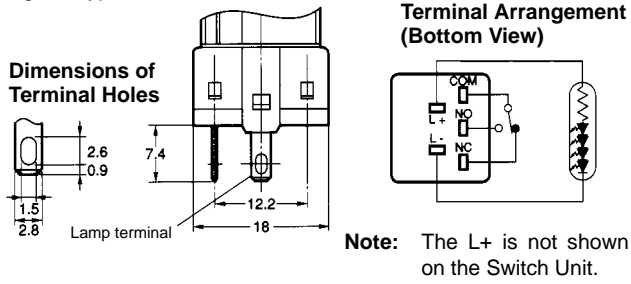
- Note:**
1. Make sure the thickness of the mounting panel is between 0.5 and 3.2 mm. If, however, a Switch Guard or Dust Cover is used, the thickness of the mounting panel must be between 0.5 and 2 mm.
  2. If the panel is to be finished with coating, etc., make sure that the panel meets the specified dimensions after coating.

### Terminal Arrangement

Non-lighted Pushbutton Switches are also provided with lamp terminals.

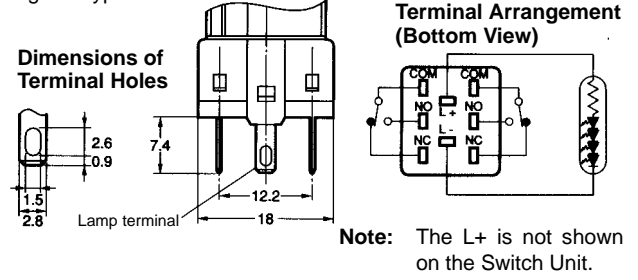
#### SPDT Switches

Lighted type



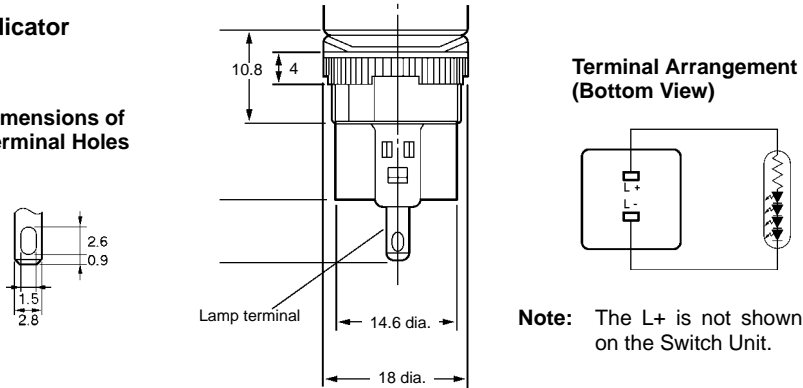
#### DPDT Switches

Lighted type



#### Indicator

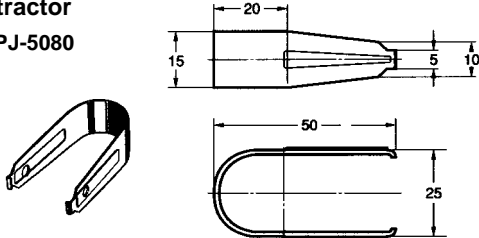
**Dimensions of Terminal Holes**



### Accessories, Tools, and Components

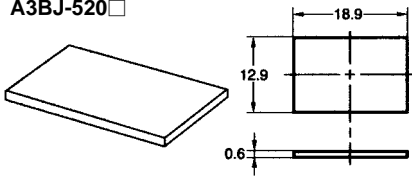
#### Extractor

A3PJ-5080

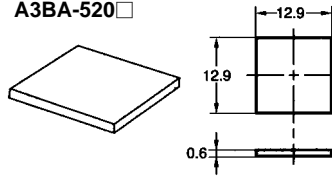


**Legend Panels**

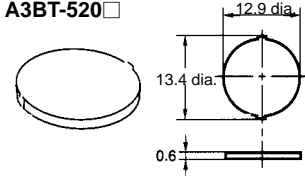
**A3BJ-520** □



**A3BA-520** □



**A3BT-520** □



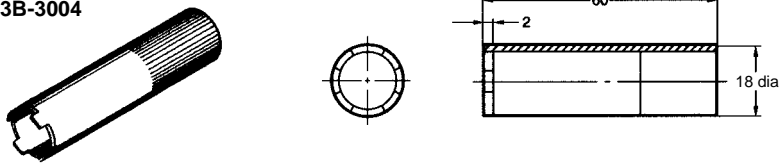
- Note:**
1. The panel is 0.6 mm thick.
  2. The panel is made of the materials listed in the following table.

| Color       | Degree of protection | Materials           |
|-------------|----------------------|---------------------|
| Milky       | IP40                 | Polyacrylate resin  |
|             | IP65                 |                     |
| Transparent | IP40                 | Polycarbonate resin |
|             | IP65                 | Polyacrylate resin  |

**Note:** The standard model is transparent.

**Screw Fitting**

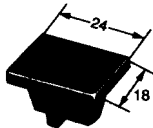
**A3B-3004**



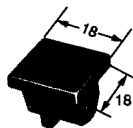
**Panel Plugs (Black Resin)**

Select the Plug that fits the panel design and mount from the front of the Panel. Panel cutouts are the same as those for Switches.

**Rectangular**  
**A3BJ-3003**



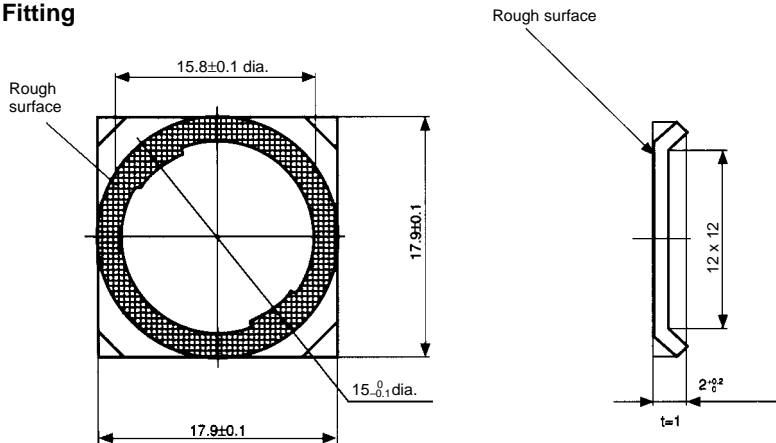
**Square**  
**A3BA-3003**



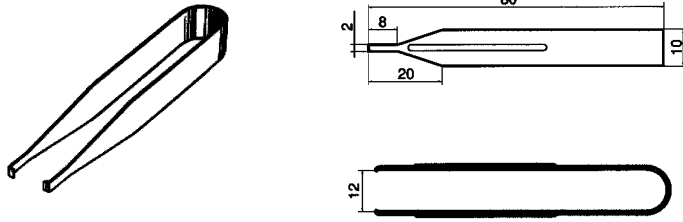
**Round**  
**A3BT-3003**



**Lock Fitting**



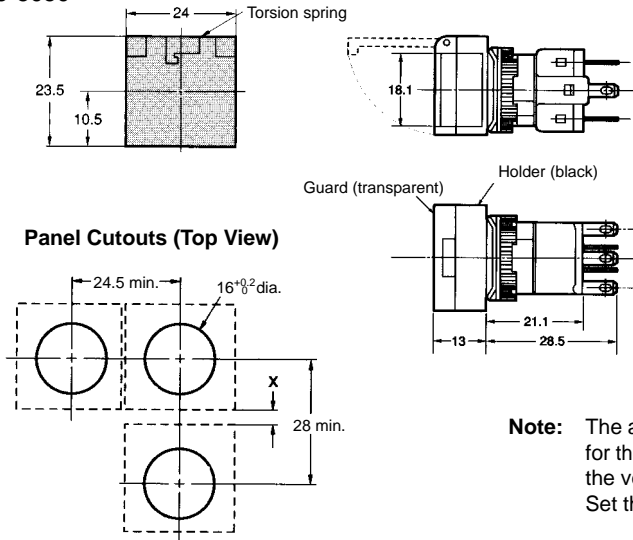
A16Z-5080 Extractor



■ Dimensions when Mounting Accessories

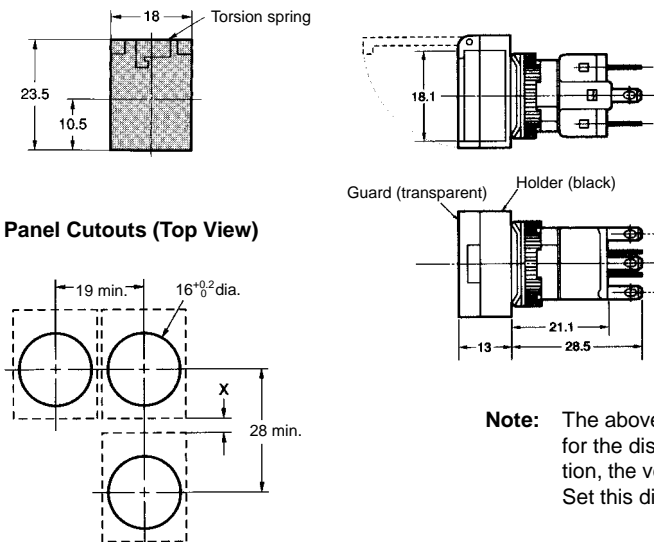
Switch Guards

Rectangular  
A3BJ-5050



**Note:** The above illustration shows a case where 4.5 mm is provided for the distance "x." If no clearance is required for the "x" section, the vertical mounting dimension can be as small as 24 mm. Set this distance according to operating conditions.

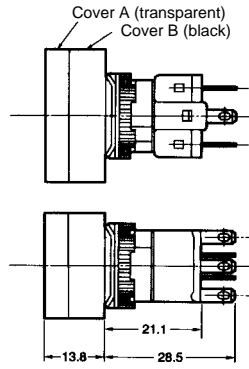
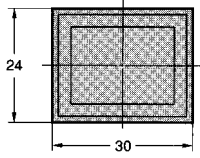
Square  
A3BA-5050



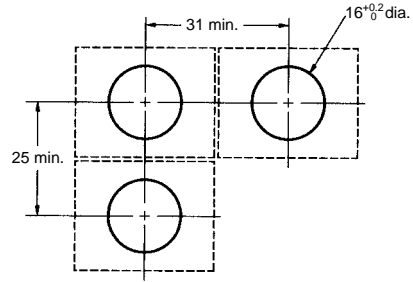
**Note:** The above illustration shows a case where 4.5 mm is provided for the distance "x." If no clearance is required for the "x" section, the vertical mounting dimension can be as small as 24 mm. Set this distance according to operating conditions.

**Dust Covers**

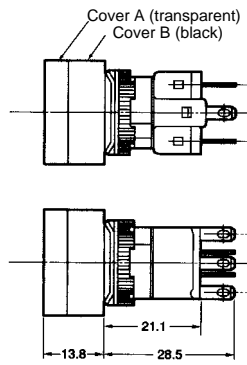
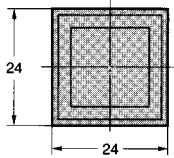
**Rectangular  
A3BJ-5060**



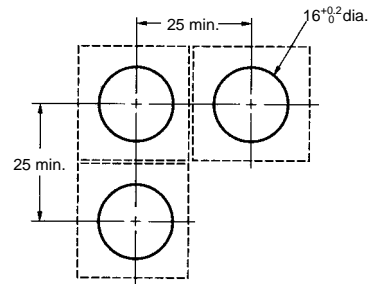
**Panel Cutouts**



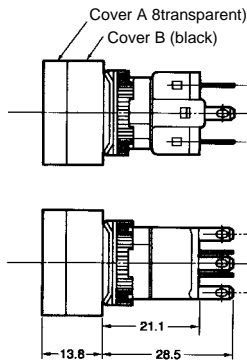
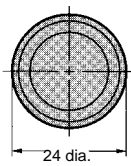
**Square  
A3BA-5060**



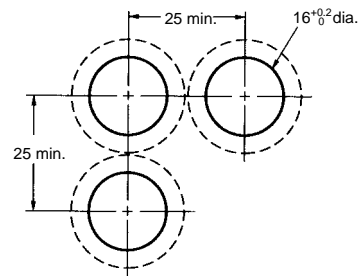
**Panel Cutouts**



**Round  
A3BT-5050**



**Panel Cutouts**



# Installation

## ■ Mounting the Panel

After mounting the Pushbutton Unit to the panel, snap in the Socket Unit from the back of the panel.

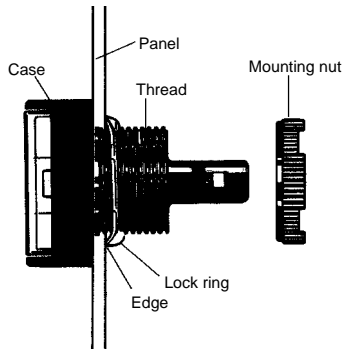
### Mounting the Panel

Insert the Pushbutton Unit into the front of the panel, and fix the lock ring and mounting nut from the terminal side.

Make sure that the lock ring is aligned with the thread of the case and the edge of the lock ring is touching the panel.

Tighten the mounting nuts to a torque of 0.20 to 0.39 N • m (3 to 5 kgf • cm).

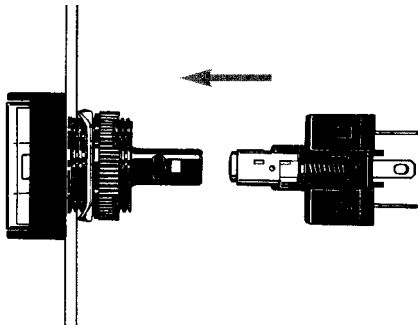
The maximum tightening torque is 0.39 N • m (5 kgf • cm).



## Switch Mounting

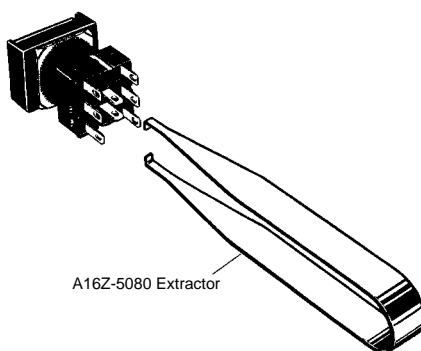
Snap on the Switch Unit to the Pushbutton Unit.

Make sure the the Switch Unit is in the proper orientation when snapping on to the Pushbutton Unit.



## Switch Removal

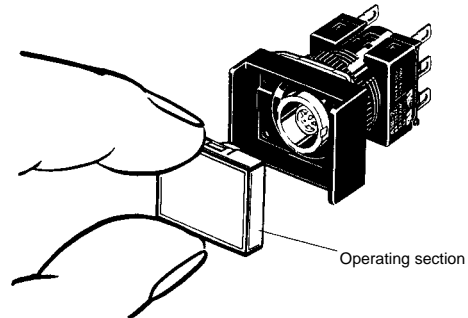
Grip the part between the Switch holder of the case and the Switch Unit using the A16Z-5080 Extractor, and pull to remove the Switch Unit.



## ■ Mounting and Replacing the Operating Part

### Removing and Mounting the Operating Part

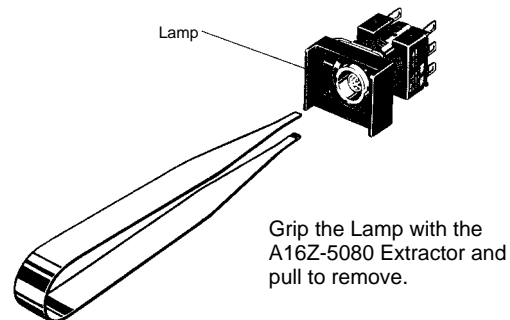
1. Remove the operating part as shown in the following diagram. If the operating part cannot be removed by hand, use the A3PJ-5080 Extractor.



2. To attach the operating part, push until it clicks into place.

### Removing the Lamp

#### Removing from the Operating Part End

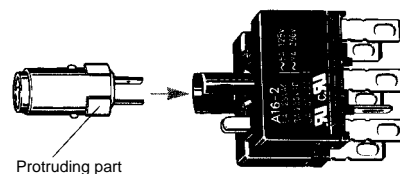


#### Removing from the Switch Unit End

The Lamp can be removed by hand once the Switch is removed using the A16Z-5080 Extractor.

### Installing the Lamp

When mounting the Lamp, make sure it is facing the direction shown in the following diagram. Insert the Lamp while matching the protruding part of the Lamp and the small guides on the outer surface of the case.



The Lamp can be mounted from the operating part end by using the A16Z-5080 Extractor. The lamp can be mounted by following the opposite procedure for removing the Lamp.

# Precautions

## ! WARNING

Do not apply a voltage between the incandescent lamp and the terminal that is greater than the rated voltage. If the incandescent lamp is broken, the operating part may pop out.

Always turn OFF the power and wait for 10 minutes before replacing the incandescent lamp. If the lamp is replaced immediately after the power is turned OFF, the remaining heat may cause burns.

## ■ Correct Use

### Mounting

Always make sure that the power is turned OFF before mounting, removing, or wiring the Switch, or performing maintenance.

Do not tighten the mounting nut more than necessary using tools such as pointed-nose pliers. Doing so will damage the mounting nut. The tightening torque is 0.20 to 0.39 N • m (3 to 5 kgf • cm).

### Wiring

Solder terminals and quick-connect terminals (#110) are commonly used for terminals.

Be sure to use electrical wires that are a size appropriate for the applied voltage and carry current (conductor size is 0.5 to 0.75 mm<sup>2</sup>). Perform soldering according to the conditions provided below. If the soldering is not properly performed, the lead wires will become detached, resulting in short-circuits.

1. Hand soldering: 30 W, within 5 s
2. Dip soldering: 240°C, within 3 s

Wait for one minute after soldering before exerting any external force on the solder.

Use non-corrosive resin fluid as the flux.

Make sure that the electric cord is wired so that it does not touch the Unit. If the electric cord will touch the Unit, then electric wires with a heat resistance of 100°C min. must be used.

After wiring the Switch, maintain an appropriate clearance and creepage distance.

### Operating Environment

The IP65 model is designed with a protective structure so that it will not sustain damage if it is subjected to water from any direction to the front of the panel.

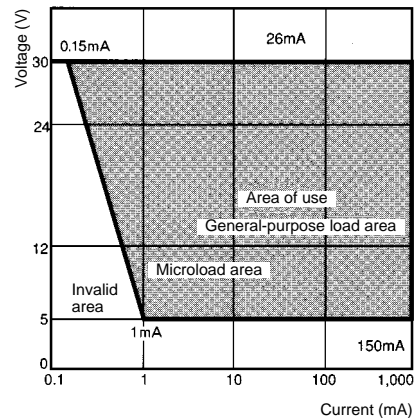
### Using the Microload

Insert a contact protection circuit, if necessary, to prevent the reduction of life expectancy due to extreme wear on the contacts caused by loads where inrush current occurs when the contact is opened and closed.

The A16 allows both a general-purpose load (125 V at 5A, 250 V at 3 A) and a microload. If a general-purpose load is applied, however, the microload area cannot be used. If the microload area is used with a general-purpose load, the contact surface will become rough, and the opening and closing of the contact for a microload may become unreliable.

The minimum applicable load is the N-level reference value. This value indicates the malfunction reference level for the reliability level of 60% ( $\lambda$  60) (conforming to JIS C5003).

The equation,  $\lambda$  60 =  $0.5 \times 10^{-4}$ /time indicates that the estimated malfunction rate is less than 1/2,000,000 with a reliability level of 60%.



### LEDs

The LED current-limiting resistor is built-in, so internal resistance is not required.

| Rated voltage | Internal limiting resistor |
|---------------|----------------------------|
| 5 VDC         | 33 Ω                       |
| 12 VDC        | 270 Ω                      |
| 24 VDC        | 1600 Ω                     |

### Others

The oil-resistant IP65 uses NBR rubber and is resistant to general cutting oil and cooling oil. Some particular oils cannot be used with the oil-resistant IP65, however, so contact your OMRON representative for details.

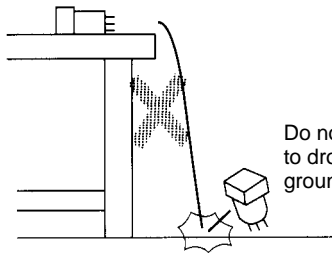
If the panel is to be finished with coating, etc., make sure that the panel meets the specified dimensions after the coating.



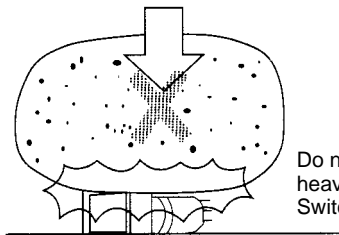
Do not subject the Switch to extreme shock or vibration. Doing so will cause malfunctions and damage to the Switch.

Do not let sharp objects come into contact with the Switches that are made of resin. Doing so will damage the Switches, causing scratches on the outside of the operating parts, and malfunction.

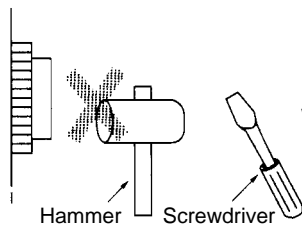
When handling the Switches, do not throw or drop them.



Do not allow the Switch to drop and hit the ground.



Do not place or drop heavy objects on the Switch.



Do not operate the Switch with hard or sharp objects.

**ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.**

To convert millimeters into inches, multiply by 0.03937. To convert grams into ounces, multiply by 0.03527.

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