

Lighted Pushbutton Switch

A3B

General Purpose and Micro-Voltage/Current Load Switch

- Requires only 22 mm mounting depth
- All LEDs, lamps, legends and pushbutton units replaceable without tools
- Oil-resistant version (satisfies IP65) also available, making it ideal for machine tools subject to oil splashes



Ordering Information

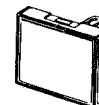
■ PUSHBUTTON UNITS

Lighted Switches

Round

Rectangular

Square



Switch Type	Degree of Sealing	Color	Part Number		
			Round	Rectangular	Square
LED	IP40	Red	A3BT-500R	A3BJ-500R	A3BA-500R
		Yellow	A3BT-500Y	A3BJ-500Y	A3BA-500Y
		Green*	A3BT-500GY	A3BJ-500GY	A3BA-500GY
		White	A3BT-500W	A3BJ-500W	A3BA-500W
	Oil-tight IP65	Red	A3BT-510R	A3BJ-510R	A3BA-510R
		Yellow	A3BT-510Y	A3BJ-510Y	A3BA-510Y
		Green*	A3BT-510GY	A3BJ-510GY	A3BA-510GY
		White	A3BT-510W	A3BJ-510W	A3BA-510W
Incandescent Lamps	IP40	Green*	A3BT-500G	A3BJ-500G	A3BA-500G
		Blue	A3BT-500A	A3BJ-500A	A3BA-500A
	Oil-tight IP65	Green*	A3BT-510G	A3BJ-510G	A3BA-510G
		Blue	A3BT-510A	A3BJ-510A	A3BA-510A

* Note: With the exception of green, all pushbutton units can be used with either LED or incandescent lamps. To avoid an undesirable hue change with green pushbutton units, use a green LED lamp with a green LED pushbutton and an incandescent lamp with a green incandescent pushbutton.

■ PUSHBUTTON UNITS

Non-Lighted/Mushroom Type Switches



Switch Type	Degree of Sealing	Color	Part Number		
			Round	Rectangular	Square
Convex	IP40	Red	A3BT-502R	A3BJ-502R	A3BA-502R
		Yellow	A3BT-502Y	A3BJ-502Y	A3BA-502Y
		Green	A3BT-502G	A3BJ-502G	A3BA-502G
		White	A3BT-502W	A3BJ-502W	A3BA-502W
		Blue	A3BT-502A	A3BJ-502A	A3BA-502A
		Black	A3BT-502B	A3BJ-502B	A3BA-502B
	Oil-tight IP65	Red	A3BT-512R	A3BJ-512R	A3BA-512R
		Yellow	A3BT-512Y	A3BJ-512Y	A3BA-512Y
		Green	A3BT-512G	A3BJ-512G	A3BA-512G
		White	A3BT-512W	A3BJ-512W	A3BA-512W
		Blue	A3BT-512A	A3BJ-512A	A3BA-512A
		Black	A3BT-512B	A3BJ-512B	A3BA-512B

■ LAMPS



Type	Color	Part Number		
		5 VDC	12 VDC	24 VDC
LED Light	Red	A3B-005R	A3B-012R	A3B-024R
	Yellow	A3B-005Y	A3B-012Y	A3B-024Y
	Green*	A3B-005G	A3B-012G	A3B-024G
	White	A3B-005W	A3B-012W	A3B-024W
Incandescent Lamp		14 V	28 V	
		A3B-014	A3B-028	

* Note: With the exception of green, all pushbutton units can be used with either LED or incandescent lamps. To avoid an undesirable hue change with green pushbutton units, use a green LED lamp with a green LED pushbutton and an incandescent lamp with a green incandescent pushbutton.

■ SWITCH UNITS

IP40 Cases



Application	Contacts	Switch Action	Terminal	Part Number				
				Rectangular			Square	Round
				Standard	Large flange	3-dir. barrier	Standard	Standard
General-purpose	SPST-NO + SPST-NC	Momentary	Solder	A3BJ-7011-1	A3BP-7011-1	A3BK-7011-1	A3BA-7011-1	A3BT-7011-1
		Alternate	—	A3BJ-7021-1	A3BP-7021-1	A3BK-7021-1	A3BA-7021-1	A3BT-7021-1
	DPST-NO + DPST-NC	Momentary	—	A3BJ-7031-1	A3BP-7031-1	A3BK-7031-1	A3BA-7031-1	A3BT-7031-1
		Alternate	—	A3BJ-7041-1	A3BP-7041-1	A3BK-7041-1	A3BA-7041-1	A3BT-7041-1
Micro-load	SPST-NO + SPST-NC	Momentary	Solder	A3BJ-7111-1	A3BP-7111-1	A3BK-7111-1	A3BA-7111-1	A3BT-7111-1
			PCB	A3BJ-7112-1	A3BP-7112-1	A3BK-7112-1	A3BA-7112-1	A3BT-7112-1
		Alternate	Solder	A3BJ-7121-1	A3BP-7121-1	A3BK-7121-1	A3BA-7121-1	A3BT-7121-1
			PCB	A3BJ-7122-1	A3BP-7122-1	A3BK-7122-1	A3BA-7122-1	A3BT-7122-1
	DPST-NO + DPST-NC	Momentary	Solder	A3BJ-7131-1	A3BP-7131-1	A3BK-7131-1	A3BA-7131-1	A3BT-7131-1
			PCB	A3BJ-7132-1	A3BP-7132-1	A3BK-7132-1	A3BA-7132-1	A3BT-7132-1
		Alternate	PCB	A3BJ-7141-1	A3BP-7141-1	A3BK-7141-1	A3BA-7141-1	A3BT-7141-1
			PCB	A3BJ-7142-1	A3BP-7142-1	A3BK-7142-1	A3BA-7142-1	A3BT-7142-1
For indication (without switch unit)			Solder	M2BJ-7001-1	M2BP-7001-1	M2BK-7001-1	M2BA-7001-1	M2BT-7001-1
			PCB	M2BJ-7002-1	M2BP-7002-1	M2BK-7002-1	M2BA-7002-1	M2BT-7002-1

Note: 1. Can be used for both lighted and non-lighted units, except indicator.
 2. Models A3BP and A3BK are available in micro-load and indication types.
 3. These switch units usually are mounted with a nut. However, an optional leaf spring for snap-in mounting is also available.
 4. The switch unit bears UL and CSA markings to indicate the standards by which the switch unit is recognized. The SEV marking can also be marked on the switch unit if requested.

IP65 Cases (Oil Tight)

Application	Contacts	Switch Action	Terminal	Part Number				
				Rectangular			Square	Round
				Standard	Large flange	3-dir. barrier	Standard	Standard
General-purpose	SPST-NO +	Momentary	Solder	A3BJ-7011-3	A3BP-7011-3	A3BK-7011-3	A3BA-7011-3	A3BT-7011-3
	SPST-NC	Alternate	Solder	A3BJ-7021-3	A3BP-7021-3	A3BK-7021-3	A3BA-7021-3	A3BT-7021-3
	DPST-NO +	Momentary	Solder	A3BJ-7031-3	A3BP-7031-3	A3BK-7031-3	A3BA-7031-3	A3BT-7031-3
	DPST-NC	Alternate	Solder	A3BJ-7041-3	A3BP-7041-3	A3BK-7041-3	A3BA-7041-3	A3BT-7041-3
Micro-load	SPST-NO + SPST-NC	Momentary	Solder	A3BJ-7111-3	A3BP-7111-3	A3BK-7111-3	A3BA-7111-3	A3BT-7111-3
			PCB	A3BJ-7112-3	A3BP-7112-3	A3BK-7112-3	A3BA-7112-3	A3BT-7112-3
		Alternate	Solder	A3BJ-7121-3	A3BP-7121-3	A3BK-7121-3	A3BA-7121-3	A3BT-7121-3
			PCB	A3BJ-7122-3	A3BP-7122-3	A3BK-7122-3	A3BA-7122-3	A3BT-7122-3
	DPST-NO + DPST-NC	Momentary	Solder	A3BJ-7131-3	A3BP-7131-3	A3BK-7131-3	A3BA-7131-3	A3BT-7131-3
			PCB	A3BJ-7132-3	A3BP-7132-3	A3BK-7132-3	A3BA-7132-3	A3BT-7132-3
		Alternate	Solder	A3BJ-7141-3	A3BP-7141-3	A3BK-7141-3	A3BA-7141-3	A3BT-7141-3
			PCB	A3BJ-7142-3	A3BP-7142-3	A3BK-7142-3	A3BA-7142-3	A3BT-7142-3
For indication (without switch unit)			Solder	M2BJ-7001-3	M2BP-7001-3	M2BK-7001-3	M2BA-7001-3	M2BT-7001-3
			PCB	M2BJ-7002-3	M2BP-7002-3	M2BK-7002-3	M2BA-7002-3	M2BT-7002-3

- Note: 1. Can be used for both lighted and non-lighted pushbutton units, except indicator.
 2. Models A3BP and A3BK are available in micro-load and indication types.
 3. These switch units usually are mounted with a nut. However, an optional leaf spring for snap-in mounting is also available.
 4. The switch unit bears UL and CSA markings to indicate the standards by which the switch unit is recognized. The SEV marking can also be marked on the switch unit if requested.



■ ACCESSORIES

Part	Remarks	Classification	Part Number
Socket	Cannot be used with insulation cover.	Wire-wrap terminal	A3B-4101
		PCB terminal	A3B-4102
		Solder terminal	A3B-4103

Part	Remarks	Part Number		
		Round	Rectangular	Square
Switch Guard	Cannot be used with protective dust cover. Cannot be used for A3BP switch unit.	A3BT-5050	A3BJ-5050	A3BA-5050
Protective Dust Cover	Cannot be used with switch guard. Cannot be used for A3BP switch unit.	A3BT-5060	A3BJ-5060	A3BA-5060
Snap-in Mounting Leaf Spring	Cannot be used with mounting nut.	A3B-3001		
Insulation Cover	Cannot be used with socket.	A3B-3002		
Panel Plug	To reserve a hole cutout on a panel for future mounting.	A3BT-3003	A3BJ-3003	A3BA-3003
Tightening Tool	Convenient for ganged installation. Do not overtighten.	A3B-3004		
Extractor	Aids in getting a non-slip grip when removing keytops.	A3PJ-5080		

Part	Remarks	Type	Opacity	Part Number		
				Round	Rectangular	Square
Legend Panel	A single legend plate is included with the standard unit.	Dust Proof IP40	White	A3BT-5201	A3BJ-5201	A3BA-5201
			Transparent	A3BT-5202	A3BJ-5202	A3BA-5202
		Oil-resistant IP65	Transparent	A3BT-5203	A3BJ-5203	A3BA-5203

Specifications

■ CONTACT RATINGS

Type	AC Resistant Load	DC Resistant Load
General purpose load	0.5 A, 250 VAC 1 A, 125 VAC	1A, 30 VDC
Micro-voltage/current load	0.1 A, 125 VAC	0.1 A, 30 VDC

Note: The minimum applicable load is 1 mA at 5 VDC.

■ LED RATINGS

Rated Voltage	Rated Current	Operating Voltage
5 VDC	30 mA	5 VDC $\pm$ 5%
12 VDC	15 mA	12 VDC $\pm$ 5%
24 VDC	10 mA	24 VDC $\pm$ 5%

Note: All switch models listed have a built-in current limiting resistor (for use with LED).

■ LAMP RATINGS

Rated Voltage	Rated Current	Operating Voltage
14 V	40 mA	12 V
28 V	24 mA	24 V

■ APPROVALS

UL (File No. E41515) / CSA (File No. LR45258)

Type	Rating
General purpose load	3 A, 250 VAC 5 A, 125 VAC 1 A, 30 VAC
Micro-voltage/current load	0.1 A, 125 VAC 0.1 A, 30 VDC

SEV (File No. D2.21/407)

Type	Rating
—	5 A, 250 VAC

Note: The rated values approved by each of the safety standards (e.g. UL, CSA) may be different from the performance characteristics individually defined in this catalog.

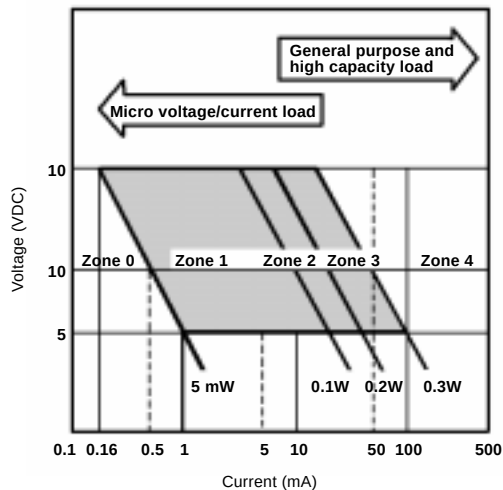
Characteristics

Operating frequency	Mechanical	Momentary action type: 120 operations per minute max. Alternate action type: 60 operations per minute max.
	Electrical	20 operations per minute max.
Insulation resistance		100 MΩ min. (at 500 VDC)
Contact resistance	General type	50 MΩ max. 6-8 VDC at rated current or 1A
	Micro-load type	100 MΩ max. 6-8 VDC/0.1A
Dielectric strength		1,000 VAC, 50/60 Hz for 1 minute between terminals of same polarity
		2,000 VAC, 50/60 Hz for 1 minute between terminals of different polarity and also between each terminal and ground
Vibration	Mechanical/ malfunction durability	10 to 55 Hz, 1.5 mm double amplitude
Shock	Mechanical durability	500 m/s ² approx. (50 G)
	Malfunction durability	50 m/s ² approx. (15 G)
Ambient temperature	Operating	-10° to 55° C
Humidity		35% to 85% RH
Service life	Mechanical	Momentary action type: 1,000,000 operations per min. Alternate action type: 100,000 operations per min.
		See "Characteristic Data"
	Electrical	See "Characteristic Data"
Weight (see note)		Approx. 7 g

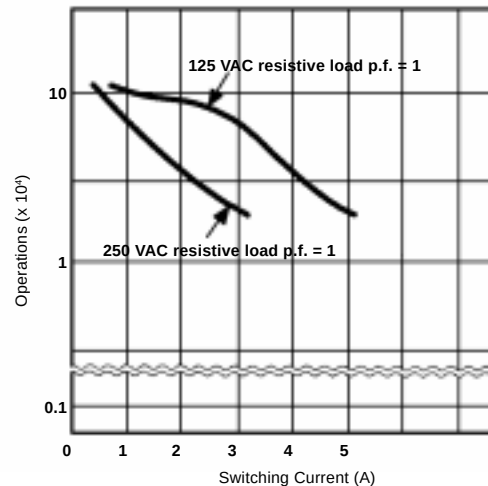
Note: The weight indicated is for the lighted type (DPST-NO + DPST-NC).

■ CHARACTERISTIC DATA

Applicable load range



Electrical service life



Note: The load range shown above is applicable only during the standard conditions.

■ OPERATING CHARACTERISTICS

	A3B□-7□□□-1		A3B□-7□□□-3	
	SPST-NO + SPST-NC	DPST-NO + DPST-NC	SPST-NO + SPST-NC	DPST-NO + DPST-NC
Contacts				
Operating force (OF) max.	250 g	350 g	400 g	500 g
Releasing force (RF) min.	30 g	30 g	30 g	30 g
Total Travel (TT)	Approx. 3.5 mm	Approx. 3.5 mm	Approx. 3.5 mm	Approx. 3.5 mm
Pretravel (PT) max.	2.5 mm	2.5 mm	2.5 mm	2.5 mm
Lock stroke (LTA) min. (see note)	0.5 mm	0.5 mm	0.5 mm	0.5 mm

Note: LTA denotes the distance from the free position (FP) to where the actuator locks after it reaches the operating position (OP).

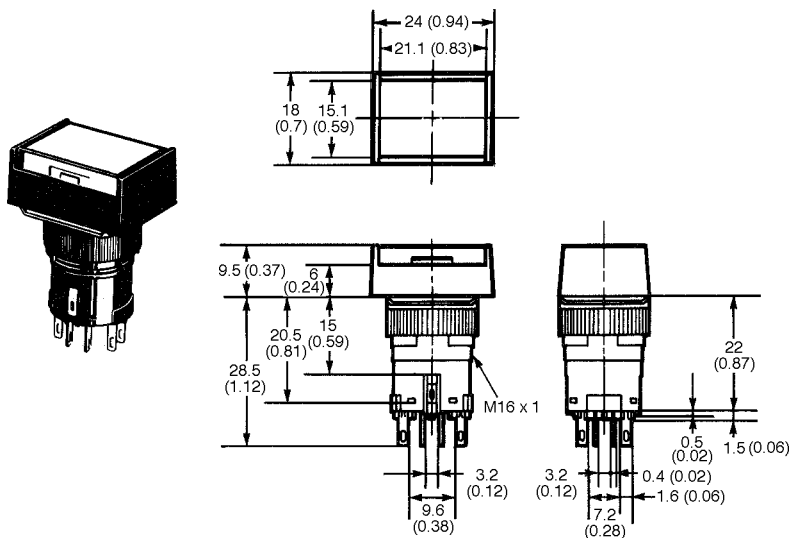
Dimensions

Unit: mm (inch)

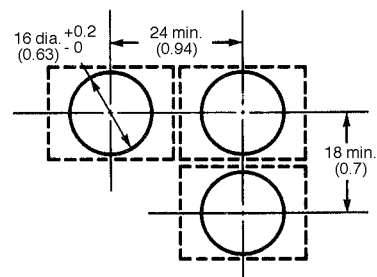
■ SWITCH UNITS

The following dimensions are applicable to the switch units with solder terminals and SPST-NO+SPST-NC contact configuration:

A3BJ (M2BJ), with standard pushbutton unit*

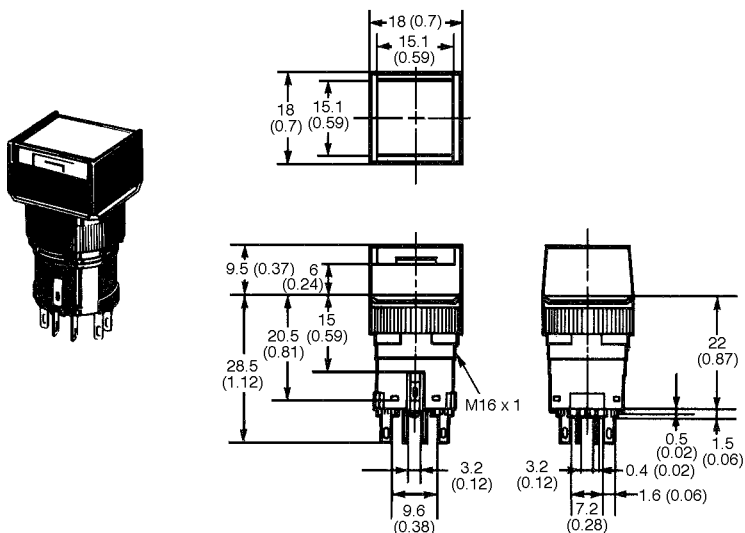


**Panel cutout (top view)
(for mounting switch unit only)**

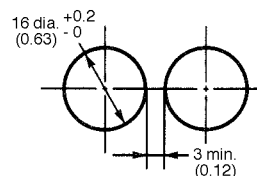


* Use an optional leaf spring to snap-in mount the switch unit. At this time, the panel cutout changes to 16.2 dia + 0.3, -0 mm.

A3BA (M2BA), with standard pushbutton unit*



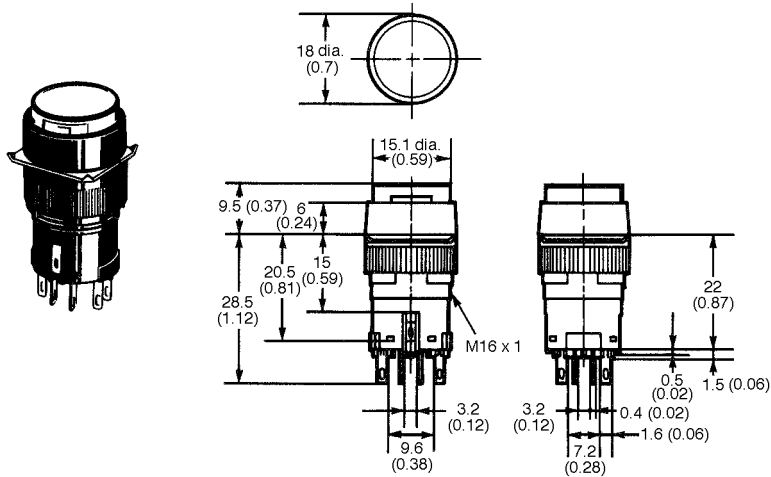
Panel cutout (top view)



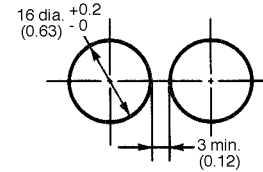
* Use an optional leaf spring to snap-in mount the switch unit. At this time, the panel cutout changes to 16.2 dia + 0.3, -0 mm.

- Note: 1. Unless otherwise specified, a tolerance of ± 0.4 mm applies to all dimensions.
2. Recommended panel thickness is 1.0 to 3.2 mm.
3. Use sockets when mounting many switch units in a matrix.

A3BT (M2BT), with standard pushbutton unit*

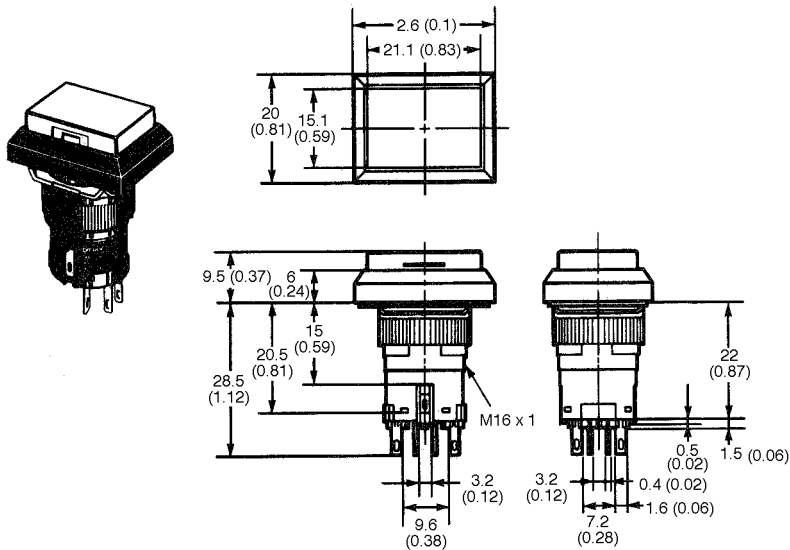


Panel cutout (top view)

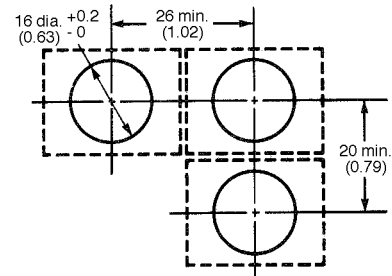


* Use an optional leaf spring to snap-in mount the switch unit. At this time, the panel cutout changes to 16.2 dia + 0.3, -0 mm.

A3BP, with large flange pushbutton unit*



Panel cutout (top view)

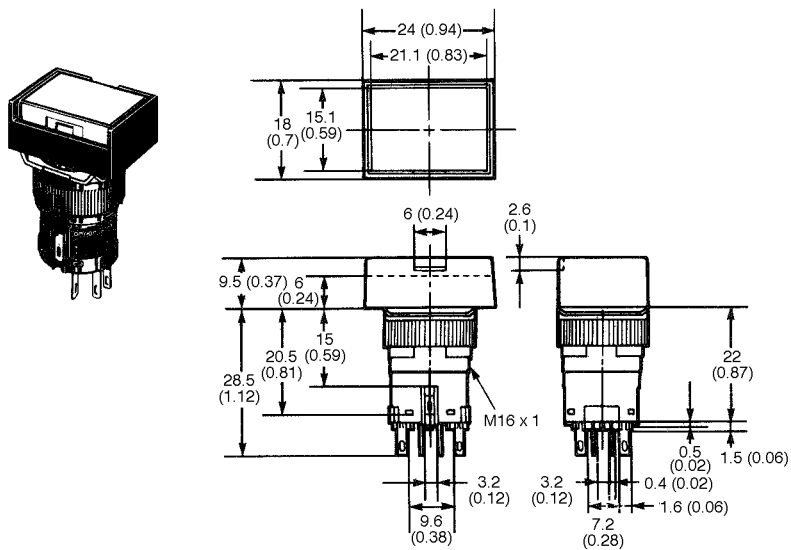


* A switch guard and dust-protective cover cannot be attached.

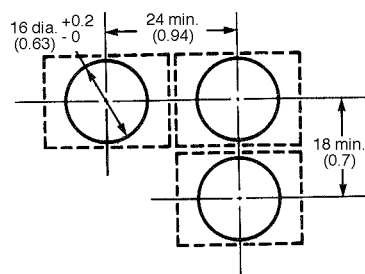
- Note: 1. Unless otherwise specified, a tolerance of ± 0.4 mm applies to all dimensions.
 2. Recommended panel thickness is 1.0 to 3.2 mm.
 3. Use sockets when mounting many switch units in a matrix.

Unit: mm (inch)

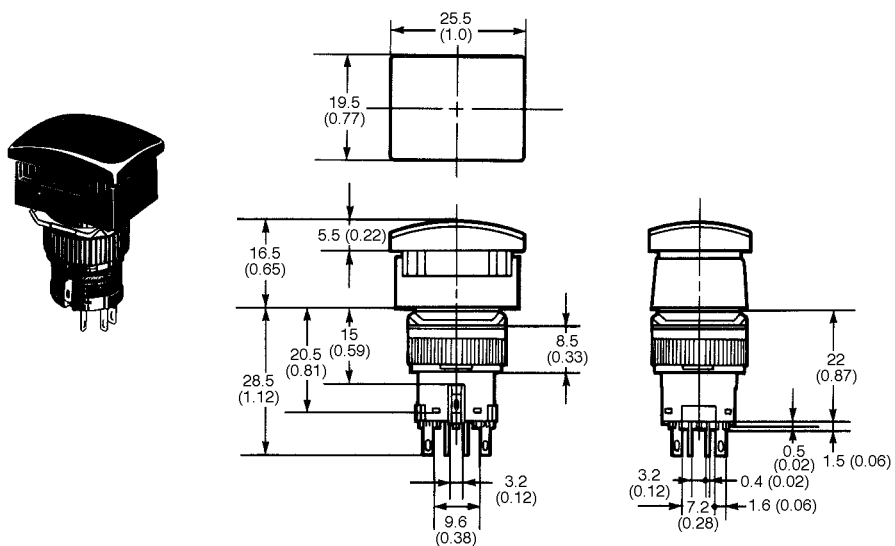
A3BK, with 3-direction pushbutton unit



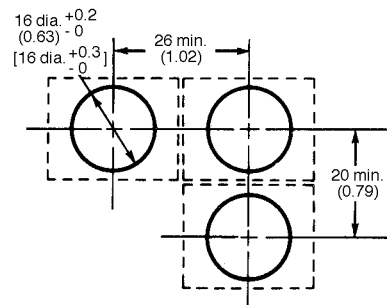
Panel cutout (top view)



A3BJ, with mushroom pushbutton unit

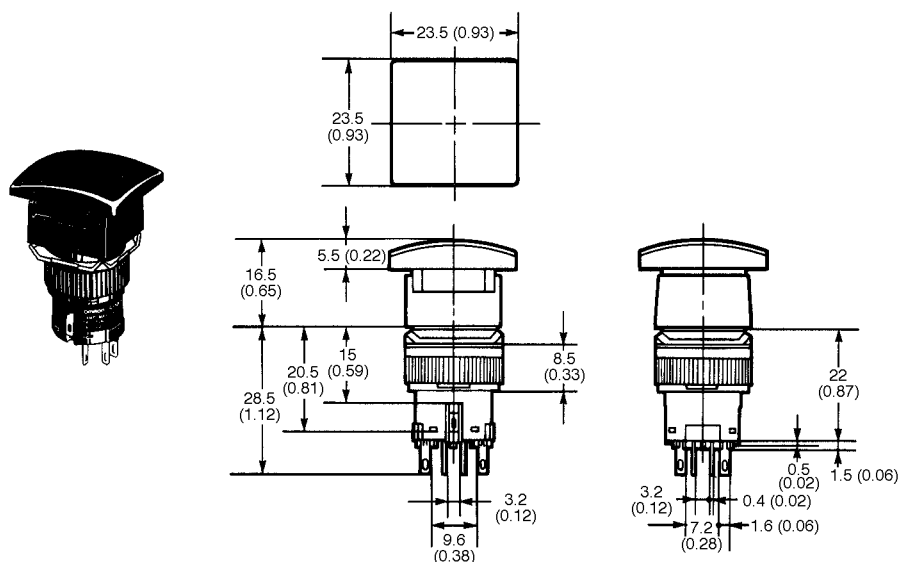


Panel cutout (top view)

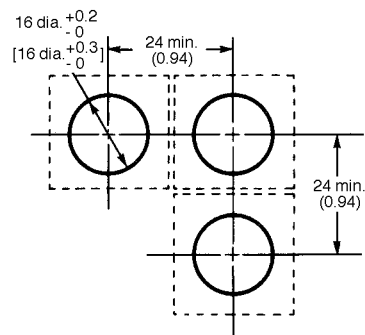


- Note: 1. Unless otherwise specified, a tolerance of ± 0.4 mm applies to all dimensions.
 2. Recommended panel thickness is 1.0 to 3.2 mm.
 3. Use sockets when mounting many switch units in a matrix.

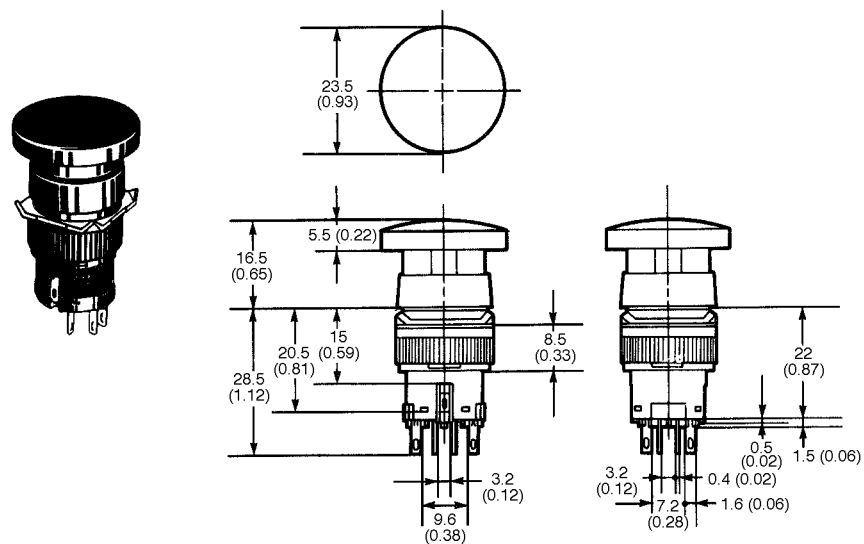
A3BA, with mushroom pushbutton unit



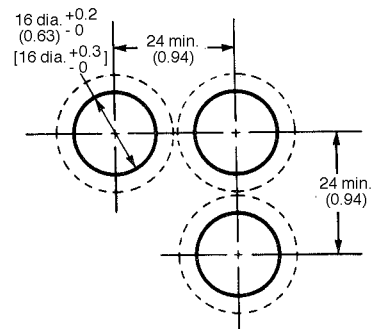
Panel cutout (top view)



A3BT, with mushroom pushbutton unit



Panel cutout (top view)



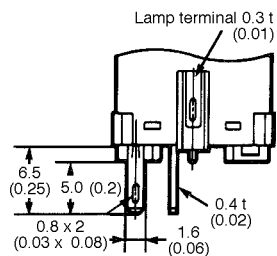
- Note: 1. Unless otherwise specified, a tolerance of ± 0.4 mm applies to all dimensions.
 2. Recommended panel thickness is 1.0 to 3.2 mm.
 3. Use sockets when mounting many switch units in a matrix.

Unit: mm (inch)

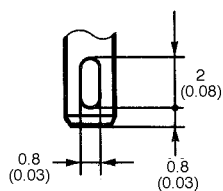
■ SOLDER TERMINALS

SPST-NO+SPST-NC

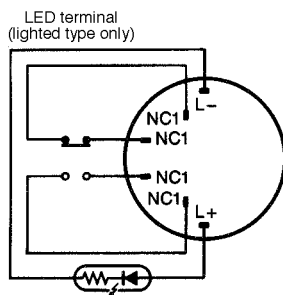
Lighted type



Dimensions of terminal holes

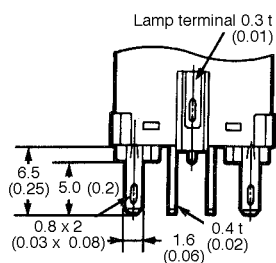


Terminal arrangement
(bottom view)

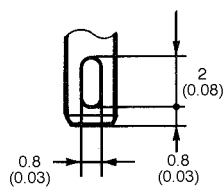


DPST-NO+DPST-NC

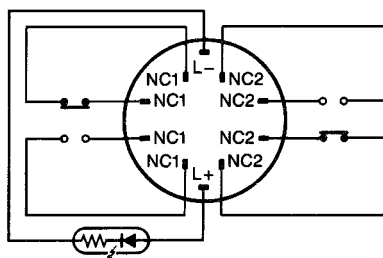
Lighted type



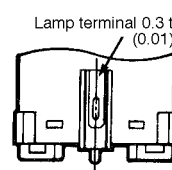
Dimensions of terminal holes



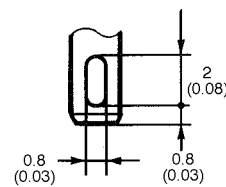
Terminal arrangement
(bottom view)



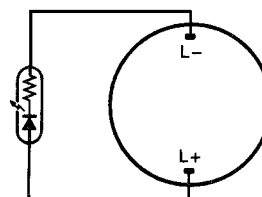
Indicator



Dimensions of terminal holes



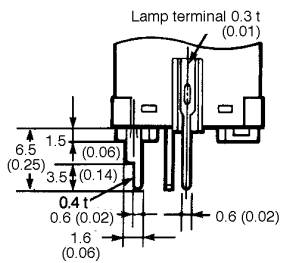
Terminal arrangement
(bottom view)



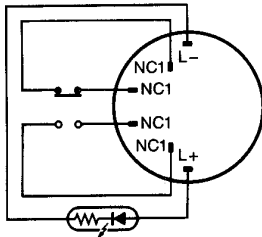
PCB TERMINALS

SPST-NO+SPST-NC

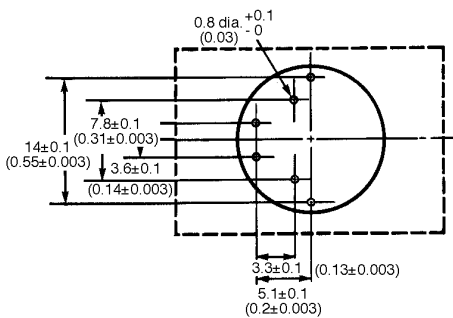
Lighted/Non-lighted type



Terminal arrangement
(bottom view)

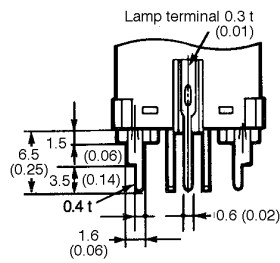


Mounting hole
(bottom view)

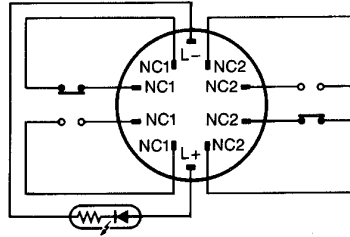


DPST-NO+DPST-NC

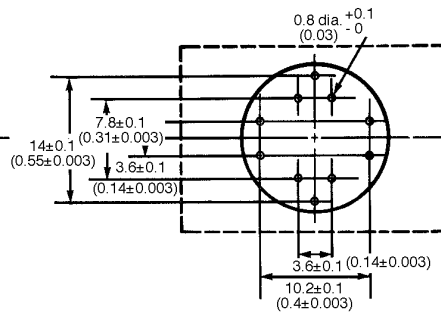
Lighted/Non-lighted type



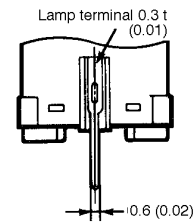
Terminal arrangement
(bottom view)



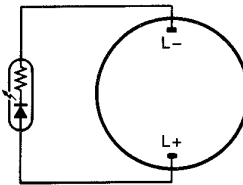
Mounting hole
(bottom view)



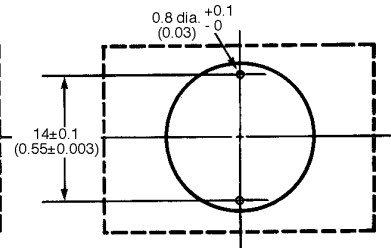
Indicator



Terminal arrangement
(bottom view)

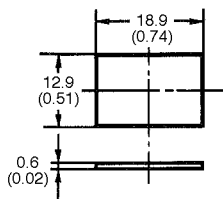


Mounting hole
(bottom view)

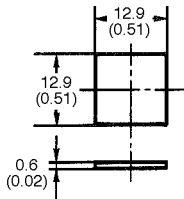


LEGEND PLATE

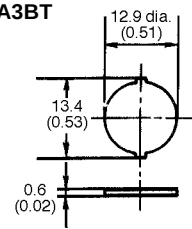
A3BJ



A3BA



A3BT



Note: 1. Unless otherwise specified, a tolerance of ± 0.4 mm applies to all dimensions.

2. Recommended panel thickness is 0.6 mm.

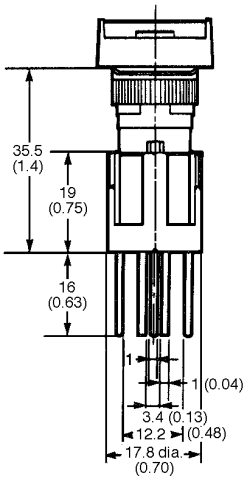
3. The materials used in the switches are polycarbonate resin in products satisfying P40, and polyarylate resin in products satisfying P65.

Unit: mm (inch)

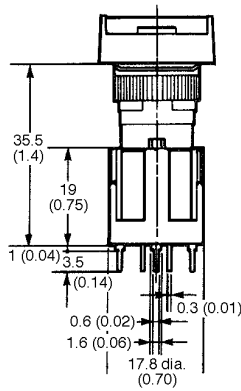
■ WITH SOCKET MOUNTED

(The following dimensions are applicable to the rectangular type.)

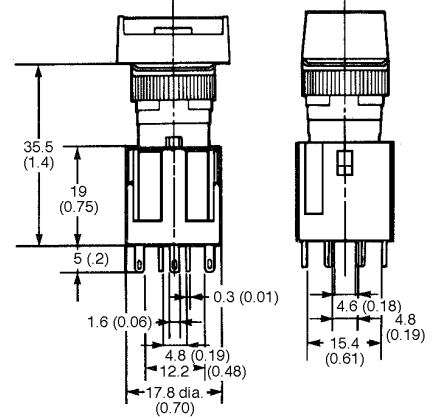
Wire-wrap terminal



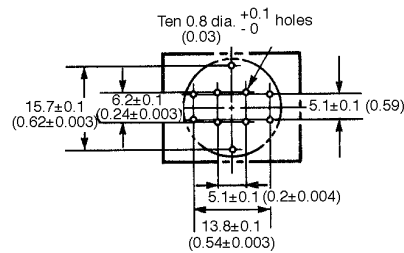
PCB terminal



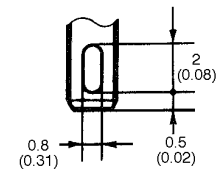
Solder terminal



Mounting hole (bottom view)



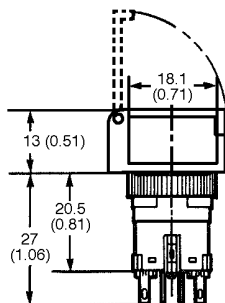
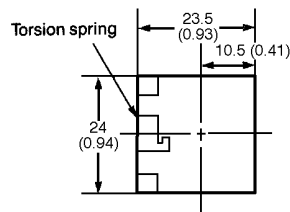
Terminal hole



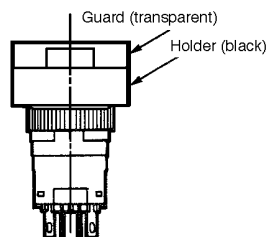
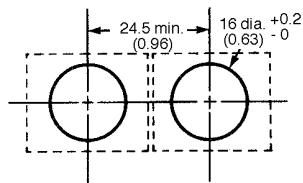
Note: When mounting the socket, the side of the socket groove is the L+ terminal side.

■ WITH INSTALLED SWITCH GUARD

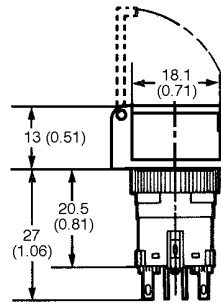
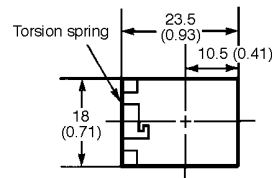
Rectangular



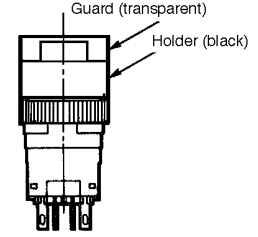
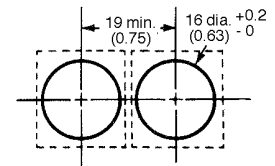
Panel cutout



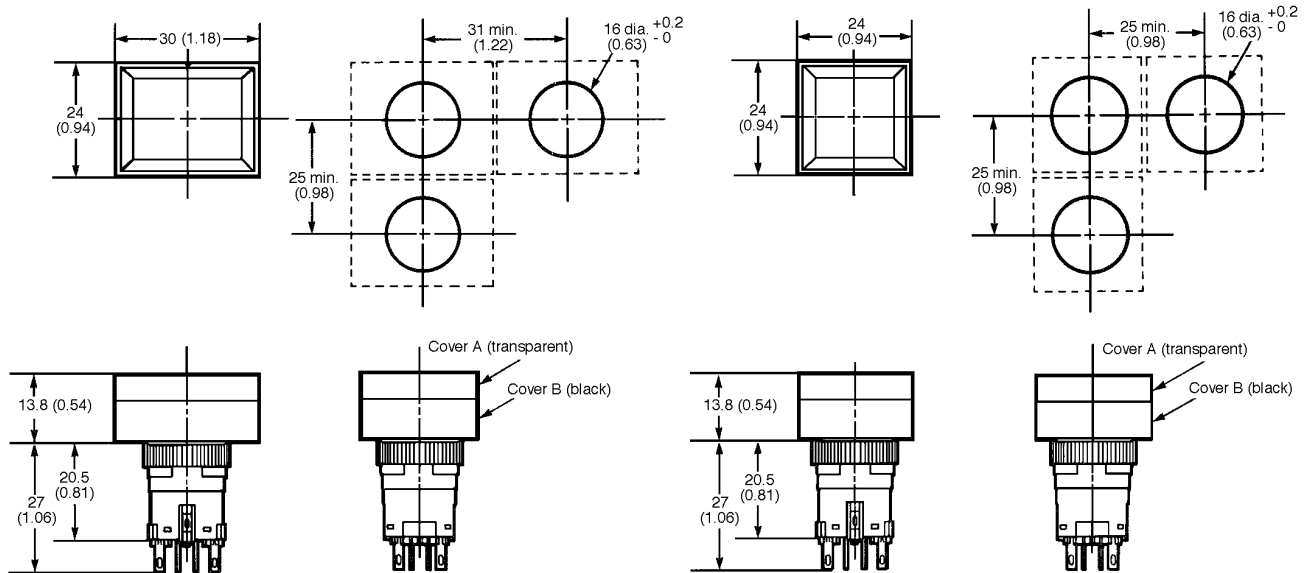
Square, Round



Panel cutout



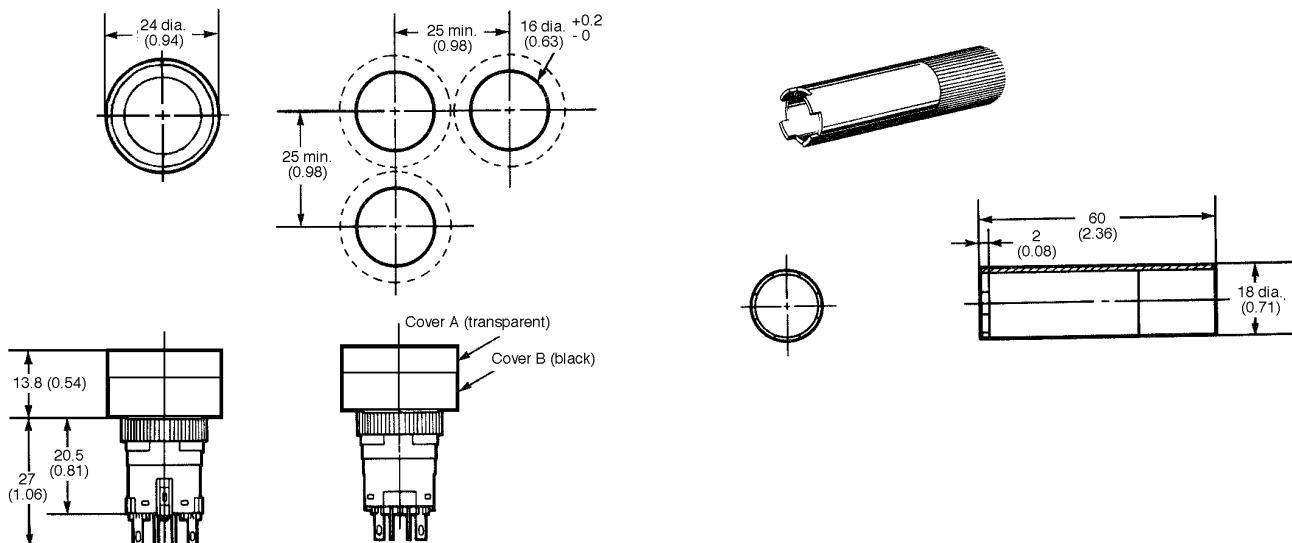
■ WITH MOUNTED DUST COVER



Round

Panel cutout

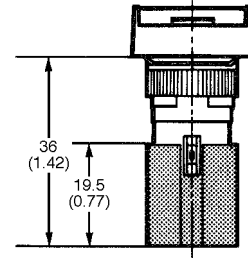
Tightening tool A3B-3004



■ WITH ATTACHED INSULATION COVER

(The following dimensions are applicable to the rectangular pushbutton unit.)

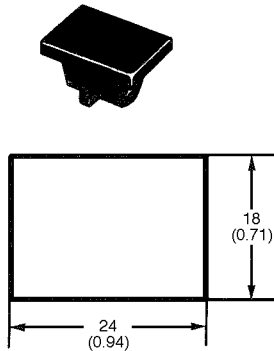
After mounting the switch unit on a panel, and after tightening the mounting nut, insert the lead wires into the hole on the insulation cover before wiring. Align the insulation cover so that the cylindrical portion of the insulation cover will face the switch unit. This means that the lead wires will be inserted from the barrier side of the insulation cover. After wiring has been completed, slide the insulation cover over the switch unit.



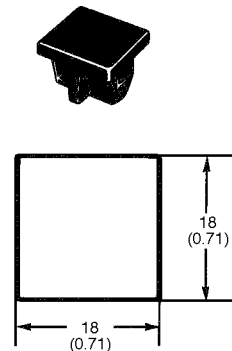
■ PANEL PLUG

Select the panel plug which best compliments the design of the mounting panel. The dimensions of the hole cutout for the panel plugs are the same as those of the switch unit.

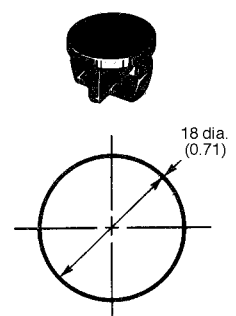
Rectangular



Square



Round



Assembly/Disassembly

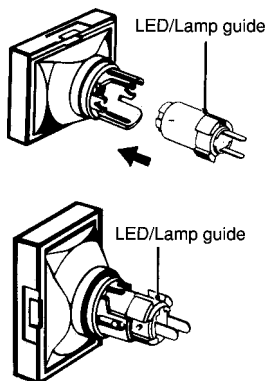
■ MOUNTING AND REPLACING THE PUSHBUTTON UNIT

Mounting directions of the LED/lamp and pushbutton unit

The Omron pushbutton unit doubles the roles in which a pushbutton switch is normally used. The pushbutton unit may be inserted one of two ways:

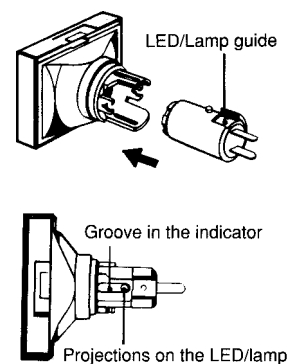
- (1) For operation as a lighted pushbutton switch:

Fit the LED/lamp so that its guide projection is inserted into the wider opening in the receptacle of the pushbutton unit.



- (2) For operation as an indicator unit:

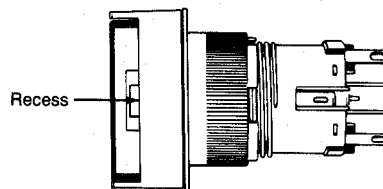
Insert the LED/lamp guide into the narrower opening in the indicator's receptacle.



■ REMOVING THE PUSHBUTTON UNIT

With your thumb and forefinger, while holding the recessed portions on both sides, firmly and steadily pull out the top of the pushbutton unit.

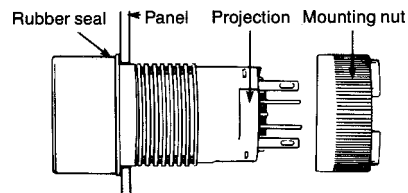
Pulling out the cap with pliers or a similar tool will damage the cap.



Mounting

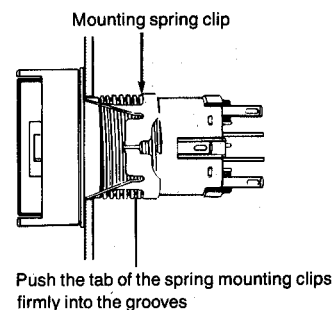
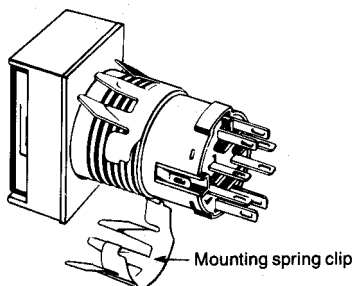
■ NUT MOUNTING

- Insert the switch unit from the front of the panel (a rubber seal is provided for the IP65 type only) and tighten the mounting nut inserted from the rear of the panel.
- Since a projection exists on the rear portion of the switch unit, if the mounting nut cannot be fitted into position, turn the nut slightly.
- The tightening torque of the mounting nut should be less than 5kg-cm.
- Solder the terminals after mounting the nut. Otherwise, the terminals when thickened by solder, may prevent the nut from being screwed down onto the switch unit.



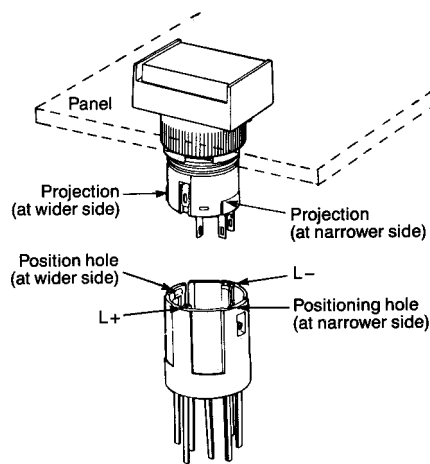
■ SNAP-IN MOUNTING

- Fit the spring mounting clip for snap-in mounting to the switch unit.
- Insert the tab of the spring mounting clip into the two grooves on the threaded part of the switch unit.
- Be sure to use the two spring mounting clips. Ensure that each tab is firmly inserted onto the grooves.
- Do not use the spring mounting clips for the switch unit conforming to IP65. The rubber seal may not be held in close enough contact to prevent the inflow of liquid. Use a nut to secure the switch.
- Insert the switch unit from the front of the panel, and push until you hear the clips snap into place.



■ SOCKET MOUNTING

- After mounting the switch unit on the panel, secured by the mounting nut, attach the socket to the switch unit.
- In doing so, make sure that the projection on the switch unit fits in the positioning hole (at the wider side) of the socket.



Hints on Correct Use

Refer to HINTS ON CORRECT USE under the General Information section.



OMRON ELECTRONICS, INC.
One East Commerce Drive
Schaumburg, IL 60173
1-800-55-OMRON

OMRON CANADA, INC.
885 Milner Avenue
Scarborough, Ontario M1B 5V8
416-286-6465