

LBW-SERIES | Flush Silhouette Switches

Flush Silhouette Switches



Slim
Thinnest in the industry (as of May 2012)

Projects only 2mm from the panel. Removable contact blocks ideal for single board mounting. $\varnothing 26 / \square 26$ bezel size for easy operation.

point For sleek and refined style

* Panel cutout (mm)

- APEM
- Switches & Pilot Lights
- Control Boxes
- Emergency Stop Switches
- Enabling Switches
- Safety Products
- Explosion Proof
- Terminal Blocks
- Relays & Sockets
- Circuit Protectors
- Power Supplies
- LED Illumination
- Controllers
- Operator Interfaces
- Sensors
- AUTO-ID

- Flush Silhouette
- $\varnothing 16$
- $\varnothing 22$
- $\varnothing 30$
- Miniature
- Pilot Lights

- CW
- LW-F
- LB
- LBW**
- UP
- Flush Bezel



Illuminated Pushbuttons

Illuminated pushbuttons with switch guard available



Ring-illuminated Pushbuttons



Pushbuttons

Marking plates can be used with lens style pushbuttons

*Does not light on.



Pushbuttons with switch guard available



Pilot Lights



Selector Switches

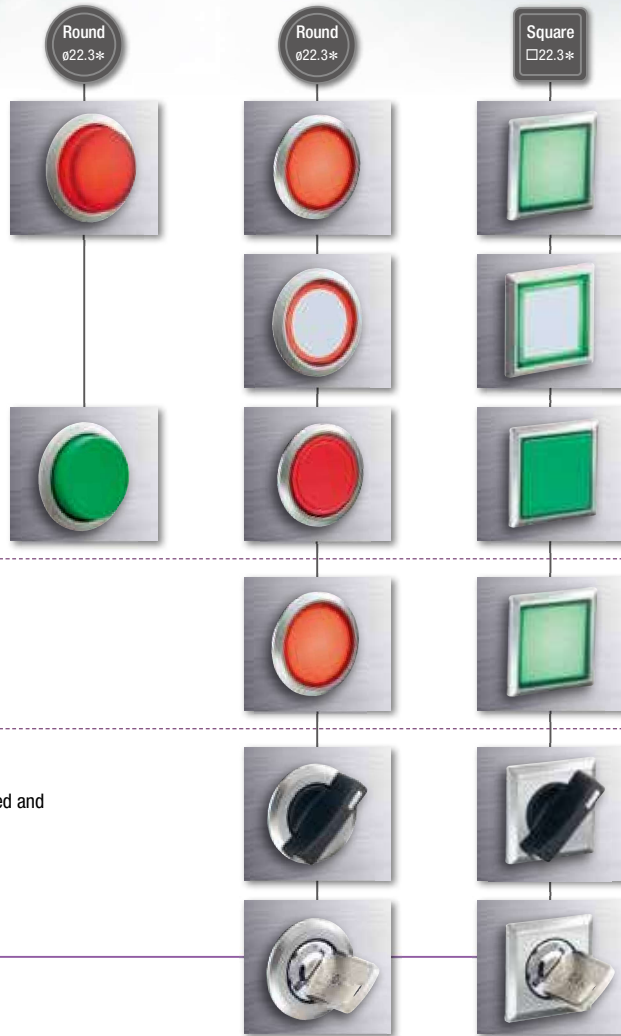
2-position and 3-position selector switches. Maintained and spring return actions available.



Key Selectors
ensure safety

Wave Key

Seven different keys to choose from. Key removable in desired positions.



Stylish Appearance with Advanced Functions

Operation status is easily visible due to illumination on the operator.



Illuminated Selector Switch (LB series only)



Switch guard prevents inadvertent switch operation



Illuminated Pushbutton Color Variations



Pushbutton Color Variations



Bezel Color Variations



Ring-Illuminated Pushbutton Color Variations



Ring-Illuminated Pushbutton Bezels



Flush Silhouette Switches LBW Series

Flush bezel projects only 2 mm from front of panel.

Contact Ratings

Gold Contact (switch base: blue)

Rated Insulation Voltage		250V	
Rated Thermal Current		3A	
Rated Operating Voltage		30V DC	125V AC
Rated Operating Current (electrical life: 100,000 operations)	Resistive Load	0.1A	0.1A
Contact Material		Gold plated silver	

- Minimum applicable load (reference value): 5V AC/DC, 1 mA
Applicable range is subject to the operating conditions and load.
- See electrical life in Specifications.

Silver Contact (switch base: gray)

Rated Insulation Voltage		250V				
Rated Operating Voltage		30V	125V	250V		
Rated Operating Current	Electrical Life 50,000 operations	AC 50/60Hz	Resistive load	—	5A	5A
			Inductive load	—	3A	1.5A
		DC	Resistive load	5A	1.1A	—
	Inductive load		2A	0.4A	—	
	Electrical Life 100,000 operations	AC 50/60Hz	Resistive load	—	5A	3A
			Inductive load	—	3A	1.5A
DC		Resistive load	3A	0.6A	—	
	Inductive load	1A	0.22A	—		
Rated Thermal Current		5A				
Contact Material		Silver				

- AC inductive load: PF=0.6 to 0.7 DC inductive load: L/R=7 ms max.

LED Ratings

Rated Voltage	5V DC	12V AC/DC	24V AC/DC
Voltage Range	5V DC±5%	12V AC/DC ±10%	24V AC/DC ±10%
LED Part No.	LB9Z-LED5②	LB9Z-LED1②	LB9Z-LED2②
Current Draw	5 mA (typ.)		
Voltage Marking	Marked on the side of the LED unit		
LED Life (reference value)	Approx. 30,000 hours [until the brightness reduces to 50% of the initial value when lit at the rated voltage (direct current) under 25°C environment.]		
Internal Circuit	A, G, R, PW, S		

- ② (color code): A (amber), G (green), PW (pure white), R (red), S (blue)
- Use the pure white (PW) module for yellow illumination.
- LED lamp contains a current-limiting resistor.



Specifications

Operating Temperature	-25 to +60°C (no freezing) Illuminated units: -25 to +55°C	
Storage Temperature	-30 to +80°C (no freezing)	
Operating Humidity	45 to 85% RH (no condensation)	
Contact Resistance	50 mΩ maximum (initial value)	
Insulation Resistance	100 MΩ minimum (500V DC megger)	
Dielectric Strength	Switch Unit	Between live part and ground: 2,000V AC, 1 minute Between terminals of different poles: 2,000V AC, 1 minute Between terminals of the same poles: 1,000V AC, 1 minute
	Illumination Unit	Between live part and ground: 2,000V AC, 1 minute
Vibration Resistance	Operating extremes/Damage limits: 5 to 55 Hz, amplitude 0.5 mm	
Shock Resistance	Operating extremes: 100 m/s ² Damage limits: 1,000 m/s ²	
Mechanical Life (minimum operations)	Momentary: 2,000,000 Maintained: 250,000 Selector switches: 250,000 Key selector switches: 250,000	
Electrical Life (minimum operations)	Momentary: 50,000 / 100,000 (*1) Maintained: 50,000 / 100,000 (*2) Selector switches: 50,000 / 100,000 (*2) Key selector switches: 50,000 / 100,000 (*2)	
Degree of Protection	IP65 (IEC 60529)	
Terminal Style	Solder/tab terminal #110 PC board terminal	
Weight (approx.)	16g (LBW7L-M1T24) 14g (LBW7P-1T04) 15g (LBW7B-M1T2) 17g (LBW7S-2T2) 29g (LBW7K-2ST2A) 17g (LBW7GL-M1T24) 18g (LBW7GB-M1T2)	

*1: Switching frequency 1,800 operations/h.

*2: Switching frequency 1,200 operations/h.

APEM

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Control Boxes

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Enabling Switches

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ø16

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LB

LBW

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Flush Bezel

Pilot Lights

Solder/Tab Terminal

Package Quantity:1

Part No. / Shape	LBW①P-1T0②③*			
				
	Round / Black Bezel	Square / Black Bezel	Round / Metallic Bezel	Square / Metallic Bezel
① Shape	③ LED Operating Voltage	Part No.	* Illumination Color Code	
Black Bezel	24V AC/DC	LBW①P-1T04*	Specify the color code in place of * in the Part No. A: amber G: green PW: pure white R: red S: blue Y: yellow	
Metallic Bezel	24V AC/DC	LBW①P-1T04*		

- Pilot lights contain an LED unit. For maintenance LED units see **B-130**.
- Legends and symbols can be engraved on a marking plate or film to be inserted under the lens by users for labelling purposes. See **B-134** for details.
- PC board terminals available. To specify, see Part Number Development below.
- 5V DC and 12V AC/DC LED operating voltages also available.
- Other bezel sizes available (LB series). For details, see **B-077**.

Part Number Development

LBW①P-1T0②③*

① Shape

Code	Shape
6	Round / Black Bezel
7	Square / Black Bezel
6M	Round / Metallic Bezel
7M	Square / Metallic Bezel

② LED Operating Voltage

Code	Rated Operating Voltage
1	5V DC
3	12V AC/DC
4	24V AC/DC

③ Others

Code	Specification	Part No. Example
Blank	Solder/Tab Terminal	—
V	PC Board Terminal	LBW6P-1T04V*

- Specify the color code in place of * in the table above.

Flush Silhouette

ø16

ø22

ø30

Miniature

Pilot Lights

CW

LW-F

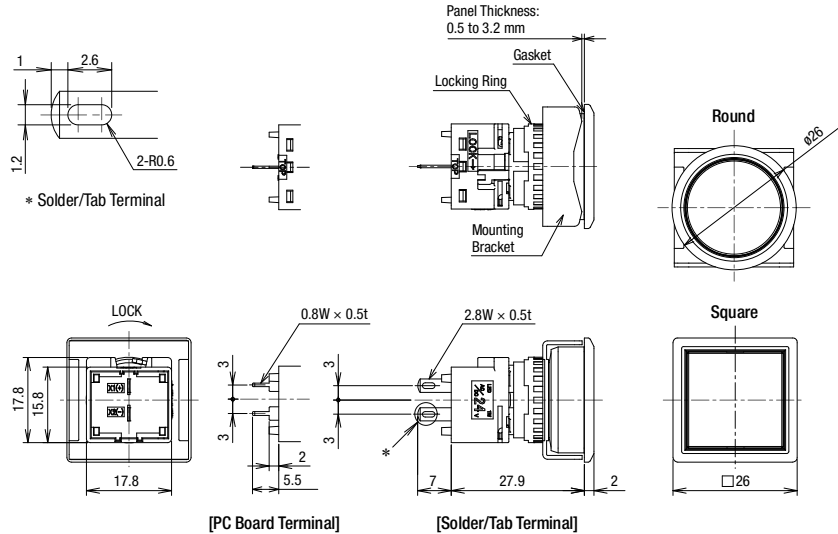
LB

LBW

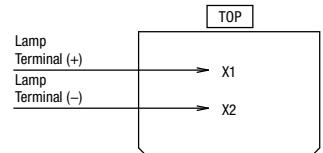
UP

Flush Bezel

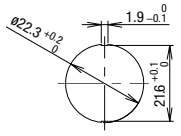
Dimensions All dimensions in mm.



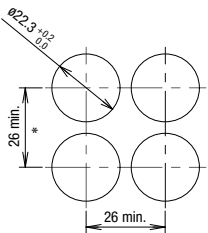
Terminal Arrangement (Bottom View)



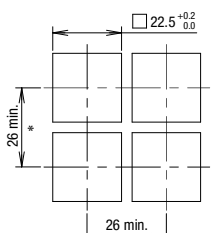
Panel Cut-out for Positioning
Round (LBW6P/LBW6MP)



Mounting Hole Layout
Round (LBW6P/LBW6MP)



Square (LBW7P/LBW7MP)



- For details on pc board and circuit design, see **B-121**.
- For details on single board mounting, see **B-122**.

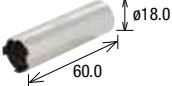
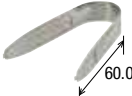






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Accessories

Package Quantity: 1

Shape	Specification	Part No.	Ordering No.	Package Quantity	Remarks	
	Metal (Nickel-plated brass)	MT-001	MT-001	1	Used to tighten the locking ring when installing the units on to the panel.	
	Stainless Steel	MT-101	MT-101	1	Used to remove the lens or button. (for standard bezels)	
	For round / square units (LB1/LB2)	Guard (Polyacetal)	AL-K6SP	AL-K6SP	Degree of protection: IP65 Used to protect pushbuttons and illuminated pushbuttons from inadvertent operation. See B-127 for dimensions. With the gasket mounted on the switch, attach the switch guard and mount on the panel.	
	For rectangular units (LB3/LB4)	Base (Polyarylate)	AL-KH6SP	AL-KH6SP		
	For rectangular units (LB3/LB4)	Guard (Polyacetal)	LA9Z-K3	LA9Z-K3	Degree of protection: IP65 With the gasket mounted on the switch, attach the switch guard and mount on the panel. See B-127 for dimensions.	
	For rectangular units (LB3/LB4)	Base (Polyarylate)				
	For round / square units (LB1/LB2)	Guard (Polyacetal)	LB9Z-K2	LB9Z-K2	Degree of protection: IP40 Used to protect pushbuttons and illuminated pushbuttons from inadvertent operation. See B-127 for dimensions. With the gasket mounted on the switch, attach the switch guard and mount on the panel. See B-136 for dimensions. When using for single board mounting, remove the rubber gasket from the switch.	
	For rectangular units (LB3/LB4)	Base (Polyarylate)	LB9Z-K3P	LB9Z-K3P		
	1. For round units (LB1)	Rubber (Transparent silicon rubber)	LB9Z-D1	LB9Z-D1	Degree of protection: IP65 See B-127 for dimensions. See B-135 for mounting.	
	2. For square units (LB2)		LB9Z-D2	LB9Z-D2		
	3. For rectangular units (LB3/LB4)		LB9Z-D3	LB9Z-D3		
	Metal	[Plug] Metal (Zinc diecast) [Locking nut] Polyacetal [Gasket] Nitrile rubber	AL-BM6	AL-BM6	1	Degree of protection: IP65 Tightening torque: 0.1 to 0.29 N·m See B-127 for dimensions.
	Rubber	Nitrile rubber (black)	AL-B6	AL-B6PN05	5	Degree of protection: IP65 See B-127 for dimensions.

For Standard Bezels

Flush Silhouette

ø16

ø22

ø30

Miniature

Pilot Lights

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LB

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Flush Bezel

Accessories

Shape	Material / Dimensions (W×H×D)	Part No.	Ordering No.	Package Quantity	Remarks	
	1. For round units	Polyarylate ø15.4 H4	AL6M-L*	AL6M-L*PN05	5	Specify the color code in place of * in the part no. A: Amber, C: Clear, G: Green, R: Red, S: Blue, Y: Yellow Note: Use a clear lens for pure white (PW) illumination.
	2. For square units	Polyarylate □15.4 H4	AL6Q-L*	AL6Q-L*PN05	5	
	3. For rectangular units	Polyarylate W21.4 H4 D15.4	AL6H-L*	AL6H-L*PN05	5	
	4. For dome units	Polyarylate ø16 H9.4	AL6D-L*	AL6D-L*PN05	5	
	1. For round units	Polyarylate ø15.4 H4	AB6M-B*	AB6M-B*PN05	5	Specify the color code in place of * in the part no. B: Black, G: Green, R: Red, S: Blue W: White, Y: Yellow
	2. For square units	Polyarylate □15.4 H4	AB6Q-B*	AB6Q-B*PN05	5	
	3. For rectangular units	Polyarylate W21.4 H4 D15.4	AB6H-B*	AB6H-B*PN05	5	
	1. For round units	Acrylic ø13.7 H0.8	AL6M-*	AL6M-*PN05	5	Specify the color code in place of * in the part no. B: Black, W: White See B-133 for dimensions and engraving area.
	2. For square units	Acrylic □13.7 H0.8	AL6Q-*	AL6Q-*PN05	5	
	3. For rectangular units	Acrylic W19.7 H0.8 (0.4) D13.7	AL6H-*	AL6H-*PN05	5	
	For dome units	Acrylic ø13.6 H2.8	AL6D-W	AL6D-WPN05	5	White
	Standard bezel	Metal (Stainless steel) □17.9 t0.6	LB9Z-LP1	LB9Z-LP1PN10	10	
	Flush bezel	Metal (Stainless steel) 21×8.2×20.6 t0.8	LB9Z-LP6	LB9Z-LP6PN10	10	
	1. For round flush units	Polyarylate ø20 H4	HA9Z-L11*	HA9Z-L11*PN05	5	Specify the color code in place of * in the part no. A: Amber, C: Clear, G: Green, R: Red, S: Blue, Y: Yellow Note: Use a clear lens for pure white (PW) illumination.
	2. For square flush units	Polyarylate ø20 H4	HA9Z-L21*	HA9Z-L21*PN05	5	
	3. For round extended units	Polyarylate ø20.2 H7.8	LBW9Z-L12*	LBW9Z-L12*PN05	5	Specify the color code in place of * in the part no. A: Amber, G: Green, R: Red, S: Blue, W: clear, Y: Yellow Note: Use a clear lens for pure white (PW) illumination.
	Buttons	1. For round flush units	Polyacetal ø20 H3.2 (L5)	HA9Z-B11*	HA9Z-B11*PN05	
2. For square flush units	Polyacetal ø20 H3.9 (L5)	HA9Z-B21*	HA9Z-B21*PN05	5		
3. For round extended units	Polyacetal ø19.8 H7.3 (L9.1)	HA9Z-B12*	HA9Z-B12*PN05	5		
4. For square extended units	Polyacetal ø19.8 H8 (L9.1)	HA9Z-B22*	HA9Z-B22*PN05	5		
	1. For round flush units	Acrylic ø17 t0.85 (L1.1)	HA9Z-P1*	HA9Z-P1*PN05	5	Specify the color code in place of * in the part no. B: Black, W: White See B-134 for dimensions and engraving area.
	2. For square units	Acrylic □18.4 t0.85	HA9Z-P2*	HA9Z-P2*PN05	5	
	LBW series	Metal (Stainless steel) 25×8.2×24.8 t0.8	LBW9Z-LP6	LBW9Z-LP6PN10	10	
	All models	Polyamide ø17.9 H3.9	LB9Z-LN	LB9Z-LNPN10	10	
	Illuminated selector switches	<For operator> Polyarylate Waterproof O-gasket Nitril rubber ø15.4 H13	LA1A-F*	LA1A-F*PN02		Specify the color code in place of * in the part no. G: green, R: red, W: white

⚠ Safety Precautions

- Turn off the power to the LB/LBW series before installation, removal, wiring, maintenance, and inspection. Failure to turn power off may cause electrical shocks or fire hazard.
- To avoid burning your hand, use the lamp holder tool when replacing the lamps.
- For wiring, use wires of a proper size to meet voltage and current requirements. Solder correctly according to the instructions in "Wiring" and "Notes on Terminal Cover." Improper soldering may cause overheating and create a fire hazard. Also, when using tab terminals, use receptacles of appropriate size.

APEM

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Flush Bezel

Instructions

Wiring

- 1) Solder the terminals at 350°C within 3 seconds using a 60W soldering iron. Sn-Ag-Cu type is recommended when using leadfree solder. When soldering, do not touch the LB series 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.
- 2) Use non-corrosive liquid flux.

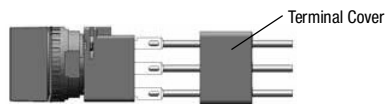
Terminal Cover

Solder/tab terminal

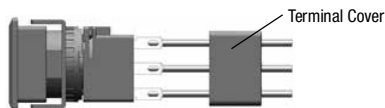
Insert the terminal cover into the contact block with the TOP markings on the contact block and the terminal cover in the same direction.

Note: When wiring, insert the lead wires into the terminal cover holes before soldering.
After wiring, the terminal covers cannot be installed.

Standard Bezel



Flush Bezel



Operating Environment

- Do not use the LB/LBW series where corrosive gases exist or under an environment exceeding the operating temperature and humidity ranges. Otherwise, damages due to contact failure or change of surface color may occur.
- Major parts of the switch are plastic. Scratches or damages may occur when scraped with a sharp object or applied with excessive load or shock. Note that this may cause operation and appearance failure of the operator and bezel.
- Adherence of detergent, cutting oil, or special chemicals to the switch may result in operation failures and appearance failures such as change of surface color.

Handling

Contacts (micro switch)

When using NC (normally closed) and NO (normally open) contacts of the same microswitch, avoid connections of different voltages, or connections of different types of power supplies. Failure to observe this instruction may cause a short-circuit.

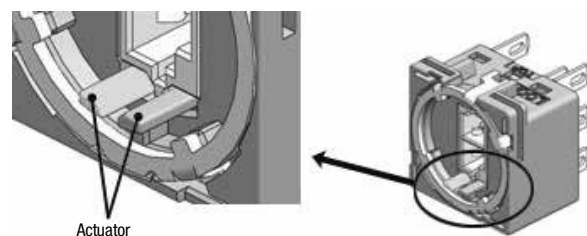
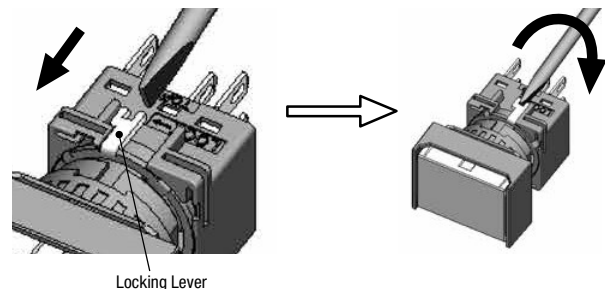
Protection against oil (IP65)

The LB series has been tested according to JIS C 0920: Appendix 1 by using water insoluble cutting oil Class N3, No. 8 (JIS K 2241) to prove that the switches will not be damaged by oil drops or splashes. This may not apply to special types of oils. Contact IDEC for details.

Removing and Installing the Contact Block

- 1) Turn the locking lever on the contact block in the direction opposite to the arrow on the housing. Then the contact block can be removed.
- 2) Insert the contact block with the TOP markings on the contact block and the operator placed in the same direction. Then lock the units, turning the locking lever in the direction of the arrow.

Note: When removing/installing the contact block, or when using the contact block alone, do not apply excessive force on the actuator. Deformed actuator may affect contact operation.

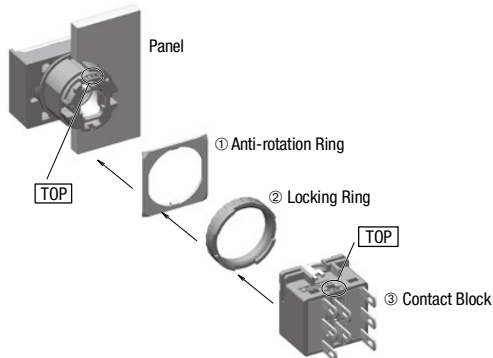


Instructions

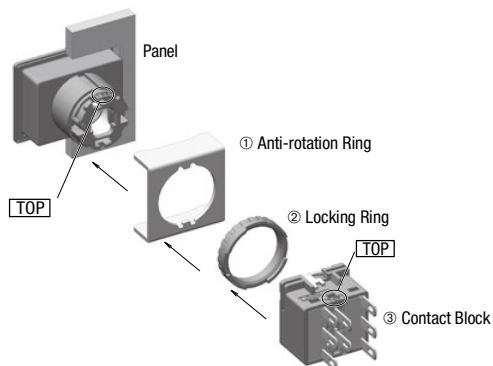
Panel Mounting

Remove the contact block from the operator. Insert the operator into the panel cut-out from the front, then install the contact block to the operator.

(For Standard Bezel)



(For Flush Bezel)



Notes on Mounting

Use the optional ring wrench (MT-001) to mount the operator onto the panel. The recommended tightening torque is 0.5 to 0.7 N·m. Do not use pliers. Excessive tightening will damage the locking ring.

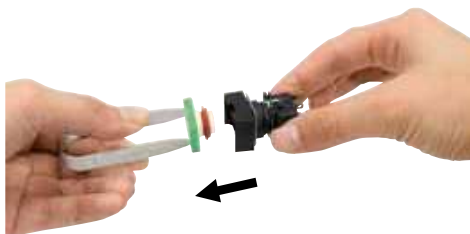
Replacing the Lens and Marking Plate

Removing

[Removing the operator]

Standard Bezel

- 1) From the opposite side of the TOP marking, remove the operator (lens, marking plate, and lens holder) using the optional lens removal tool (MT-101) by gripping the recesses of the color lens.



Flush Bezel

- 1) From the opposite side of the TOP marking, push the tip (width: 3 mm, thickness: 0.5 mm) of the flat screwdriver to the groove of the color lens and pull out the operator (lens, marking plate, lens holder).

Note: For metallic bezels, the bezel may be damaged if the screwdriver is inserted from the TOP side or inserted deeply or with force into the groove of the lens.



[Removing the Operator]

- 2) Remove the marking plate by pushing the lens from the rear to disengage the latches between the lens and holder, using the screwdriver as shown below.



Note: The translucent in the lens holder cannot be removed because this filter is sealed to make the unit waterproof and oiltight.

LBW Series Pushbutton (button style)

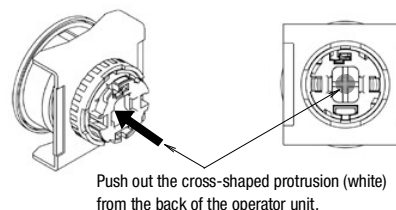
LBW series pushbuttons (button style, see B-097) can be removed according to the following procedure. LBW series pushbuttons (button style) cannot be removed from the front of the panel.

[Removing the Operator]

- 1) Detach the operator unit and contact block. (See Removing and Installing the Contact Block on B-131)
- 2) Remove the button unit (button, button holder) by pushing out the cross-shaped protrusion (white) at the back of the operator with a screwdriver.

LBW Series Illuminated Pushbutton (round extended)

Screw-in lens. The lens can be removed by turning anticlockwise.



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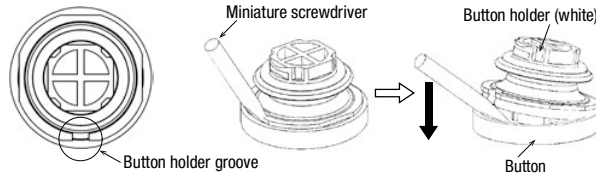
Flush Bezel



Instructions

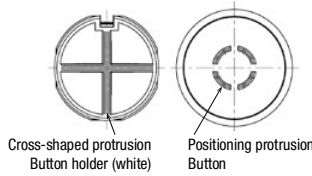
Removing the Button

The button can be removed by inserting a small screwdriver into the groove of the button holder.



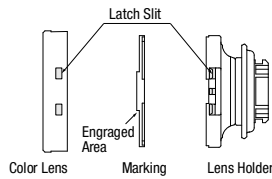
To attach the button to the button holder, align the groove on cross-shaped protrusion with the positioning protrusion on the button and insert securely.

Installing

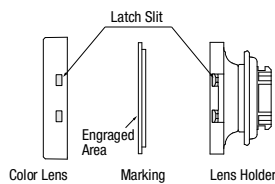


Insert the marking plate into the color lens, and press the lens onto the lens holder to engage the latches. Pay attention to the orientation of the marking plate.

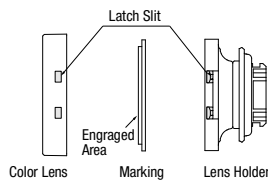
LB/LBW Series Round



LB Series Square/Rectangular

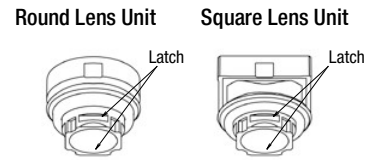


LBW Series Square

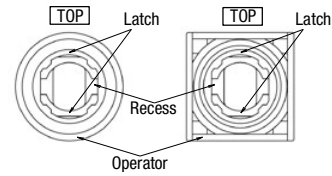


Installing the Lens Unit and Contact Block

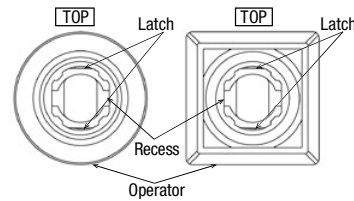
To insert the lens unit into the operator, press in the lens unit by making sure that the latch on the operator is aligned with the latch on the lens unit.



Standard Bezel



Flush Bezel



Marking Plates and Films

For illuminated pushbuttons, pushbuttons with lens, and pilot lights, legends and symbols can be engraved on the marking plates, or printed film can be inserted under the lens for labelling purposes.

Marking Plate and Marking Film Size

LB Series (flush bezel / standard bezel)

Lens	Round	Square	Rectangular
Built-in Marking Plate			
Applicable Marking Film			

- Engraving must be made on the engraving area within 0.5 mm deep.
- The marking plate is made of white acrylic resin.

- Film thickness: 0.1 mm per film
- Marking film is not included.
- Recommended marking film: Polyester film

Flush Silhouette

ø16

ø22

ø30

Miniature

Pilot Lights

CW

LW-F

LB

LBW

UP

Flush Bezel

Instructions

LBW Series

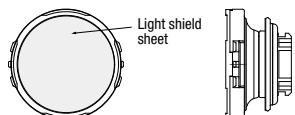
Lens	Round Flush	Square	Round Extended
Built-in Marking Plate	<ul style="list-style-type: none"> Engraving thickness: 0.5 mm max. The marking plate is made of white acrylic resin. 		
Applicable Marking Film	<ul style="list-style-type: none"> Film thickness: 0.1 mm per 2 films or 0.2 mm per film. Marking film is not included. Recommended marking film: Polyester film 		

LBW Series (ring-illuminated model)

Lens	Round (Note)	Square
Applicable Marking Film	<ul style="list-style-type: none"> Film thickness: 0.1 mm max. 	

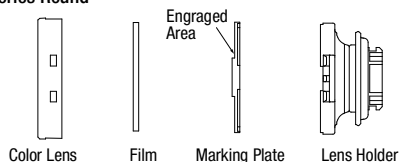
Note: Use a film with adhesive and attach on the light shield sheet. Make sure that the marking film is properly installed and does not protrude from the edge of light shield sheet.

Ring Illuminated Model Lens Holder

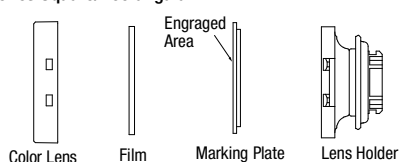


Insertion Order of Marking Plate and Film

LB/LBW Series Round



LB/LBW Series Square/Rectangular



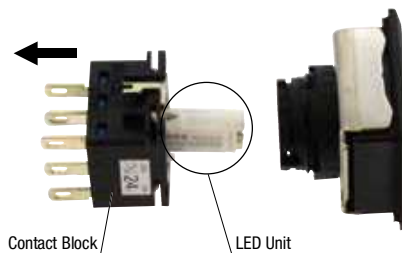
Note: Film is not included.

The marking plate must be engraved on the specified side as shown above. Pay attention to the orientation of the marking plate. When inserting a film, make sure to insert between the color lens and marking plate.

Note: Marking plate is not supplied with ring-illuminated model.

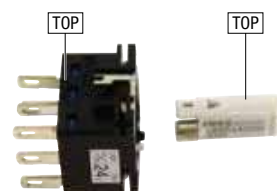
Replacing the LED Unit

The LED unit can be replaced without tools by pulling out the lens unit from the contact block.



Orientation of the LED unit

Insert the LED unit into the contact block with the TOP markings on the contact block and LED unit in the same orientation.



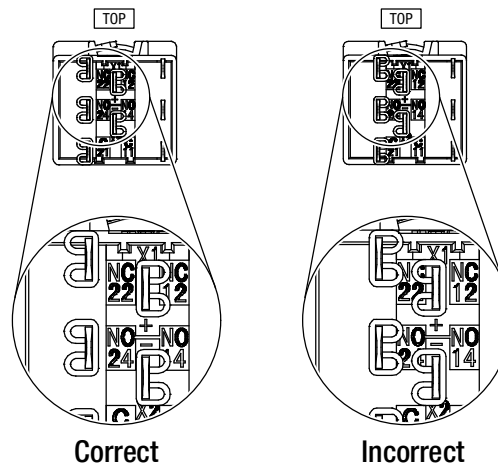
Notes on replacing the LED Unit

When replacing the LED unit, make sure that static electricity is not applied.

Make sure that the LB/LBW series has cooled down before replacing the LED unit. To avoid burn injuries, be careful not to touch the unit while it is still hot.

Notes on Using Quick Connect Terminals

- 1) Use #110 tab quick connects, 0.5 mm-thick.
- 2) When connecting the terminals on the left and center, make sure that surfaces of the quick connects face each other. Otherwise, short-circuit may occur.



- 3) Apply only horizontal force against the panel to the tab. The switch may be damaged if a force other than a horizontal force is applied.

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Miniature

Pilot Lights

CW

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LB

LBW

UP

Flush Bezel

Instructions

Installing the Rubber Boot

When using in places where the switches are subjected to water splash or an excessive amount of dust, make sure to use the optional rubber boot.

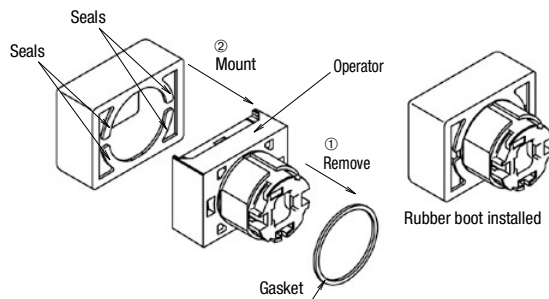
As shown in the drawing below, ① remove the gasket from the operator, and ② attach the rubber boot from the front (button side).

Standard Bezel

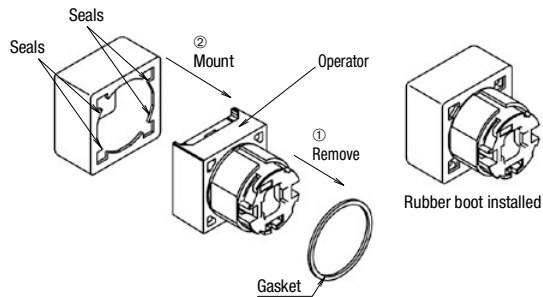
For rectangular and square units, pull out the seals of the rubber boot and place them around the operator sleeve as shown below. Make sure that the seals are not twisted or tucked inside and that the gasket is removed, otherwise waterproof and dustproof characteristics are not ensured.

How to Install the Rubber Boot

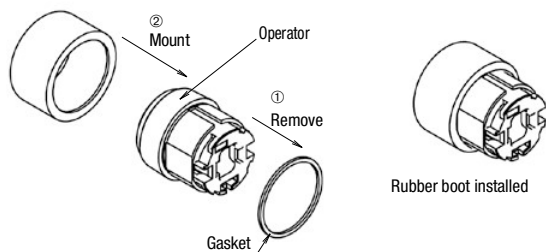
Rectangular



Square



Round

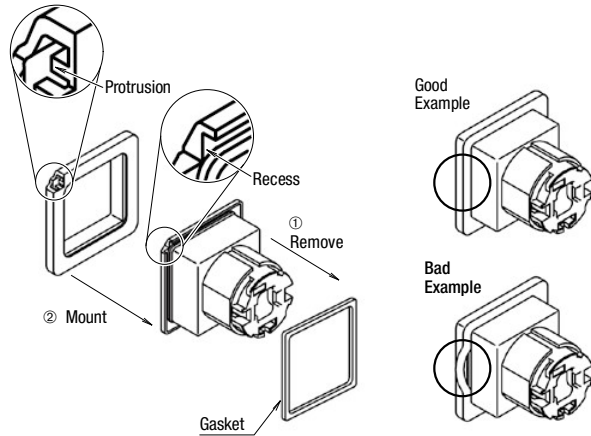


Flush Bezel

Mount the rubber boot so that the protrusion at the bottom surface of the operator fits with the recess on the operator, placing the rubber boot all around the operator sleeve.

Make sure that the protrusion on the rubber boot and the recess on the operator is properly fitted, otherwise, the waterproof and dustproof characteristics are not ensured.

How to Install the Rubber Boot



Note: Install the rubber boot before mounting the unit to the panel.

Maintained Pushbuttons

Observe the following instructions to prevent malfunction or damage.

- Do not stop halfway when operating pushbuttons or illuminated pushbuttons. Make sure to push the button fully.
- Do not replace the operator or lens unit with the pushbutton in a locked status.
- Do not remove the contact unit with the pushbutton in a locked status.
- Do not operate the pushbutton without the contact unit.

Pushbuttons and Illuminated Pushbuttons with Switch Guard

Do not apply force to the switch guard when the switch guard is not attached to a panel. When opening the switch guard, do not open more than 180°. The hinge may break.

Selector Switches

When turning the operator or key, make sure that they are properly turned to each position.

Selector Switches with Key

Observe the following instructions to prevent malfunction or damage.

- Insert the key to the bottom of the key hole.
- Do not remove the key from any key retained position.
- Besides the standard key (key number 0H), six other key numbers are available. Use a key of the matching number with the key cylinder. The standard key does not have a key number indication.
- Keys are available in two types. Key numbers 0H (standard), 1H, and 2H are reversible keys which can be inserted in two ways. Key numbers 3H, 4H, 5H, and 6H are non-reversible keys. Make sure of correct insertion direction.

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Miniature

Pilot Lights

CW

LW-F

LB

LBW

UP

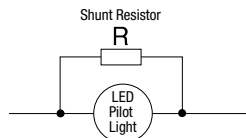
Flush Bezel

Instructions

Countermeasures against Dim Lighting

Leakage currents through transistors or a contact protection circuit may cause the LED lamp to illuminate dimly even when the output is off.

When the LED lamp is illuminated by a transistor output, take the following measure.

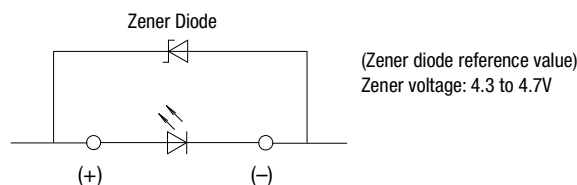


Leakage Current Shunt Resistor Allotment Table (Recommended)

Leakage Current I_o	Shunt resistance R			
	Red (R), White (W)		Green (G)	
	Resistance	Rated Power	Resistance	Rated Power
0.1 mA max.	13k Ω	0.25W	18k Ω	0.25W
0.1 to 0.7 mA	2k Ω	0.25W	2.7k Ω	0.25W

Noise

LED elements deteriorate due to extraneous noise, resulting in significant decrease in luminance, hue change, or failure of lighting. When such effects are anticipated, take a protection measure shown below. However, measures may differ according to operating environment and condition



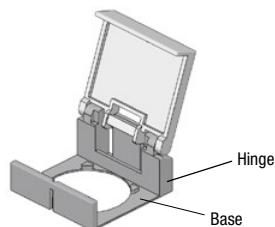
Static Electricity (UP Series)

UP series are delicate products that may be damaged by static electricity. Make sure to take measures to prevent static electricity.

Switch Guards

Opening/closing the Switch Guard

When opening/closing the switch guard while the switch guard is not installed on a panel, make sure to hold the hinge. Holding the base might result in damage. Also do not apply force on the guard in other than open/close directions, otherwise the hinge may be damaged.

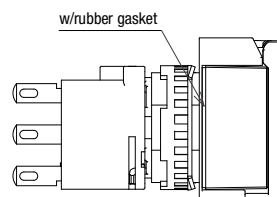


Rubber Gasket when using LB9Z-K2 Switch Guard (remains open) for Round/Square Units

Choose to use or not to use the rubber gasket for the switch referring to the conditions described below. Note that the degree of protection is IP40 with or without the rubber gasket.

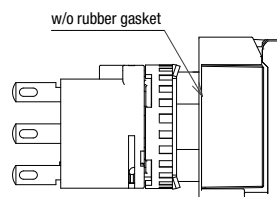
• When the panel thickness is up to 2.8mm

Install the switch onto the switch guard with rubber gasket, and mount on the panel.



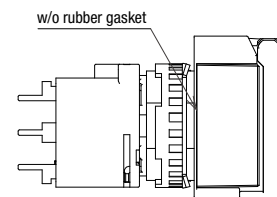
• When the panel thickness is 2.8 to 3.2mm

Remove the rubber gasket from the switch and install the switch onto the switch guard, and mount on the panel (discard the rubber gasket).



• Single board mounting

Remove the rubber gasket from the switch and install the switch onto the switch guard, and mount on the panel (discard the rubber gasket).



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