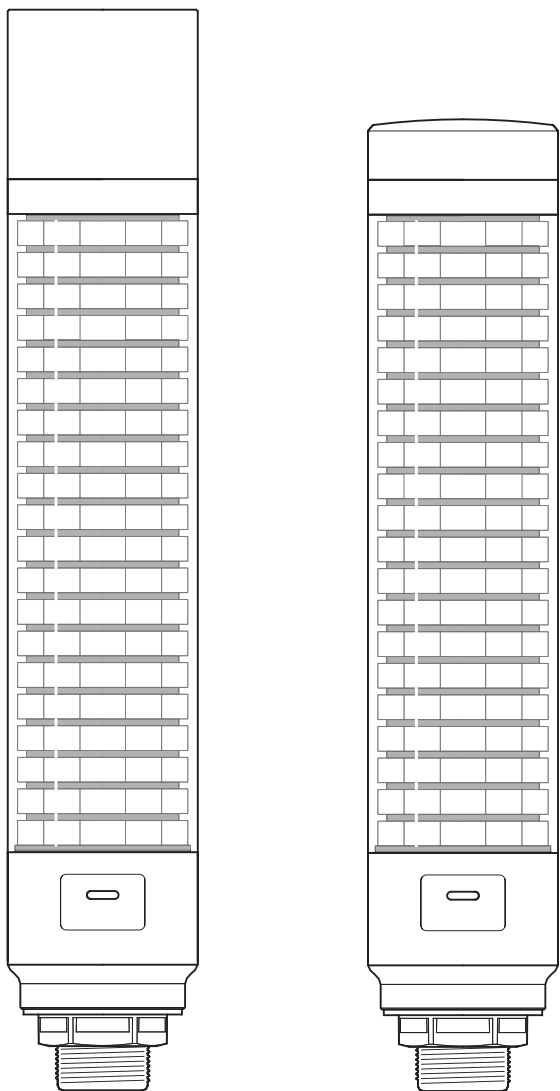


# PATLITE®



LB6-20ILWCBW

LB6-20ILWCNW


## Notice to Customer

Thank you very much for your purchasing our PATLITE products.

- Request the installation and wiring be performed by a professional contractor if construction work is involved.
- If there are any questions concerning this product, refer to the contact information at the end of this document and contact your nearest PATLITE Sales Representative.

## To the Contractor

- Read this manual carefully prior to installation.

Multi-color Signal Tower with  **IO-Link**

**TYPE** LB6-IL

## General Instruction Manual

Installation

Operation

Maintenance

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<b>2 Model Number Configuration</b>	<b>3</b>
<b>3 Names and Dimensions</b>	<b>4</b>
<b>4 Installation</b>	<b>5</b>
<b>5 Wiring</b>	<b>7</b>
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# 1 Read this First

## Safety Precautions

The safety precautions that should always be followed in order to prevent injury to user or other individuals as well as prevent damage to property are described below.

■ The level of injury or damage caused by ignoring these safety precautions and using the product improperly is categorized and described below.



### Warning

This icon indicates an action with the potential to cause death or serious injury.



### Caution

This icon indicates an action with the potential to cause injury, physical loss or damage.

### Warning

- Observe the following to prevent short-circuits and damage.
  - Turn off the power before wiring or repairs, including replacement of the fuse.
  - Install the product correctly. (Replacement in case of damage to glove or case.)
- Request the installation and wiring to be accompanied by a professional contractor.  
If installation is done improperly, it may result in fire, electric shock, falling, or malfunction.
- When this product is used for security purposes, it should be inspected daily. In case a malfunction should occur, it is recommended that you use this product together with other security products.
- After installation, do not use this product to climb up onto the equipment with.  
Failure to comply will result in product damage and/or falling off the machinery.

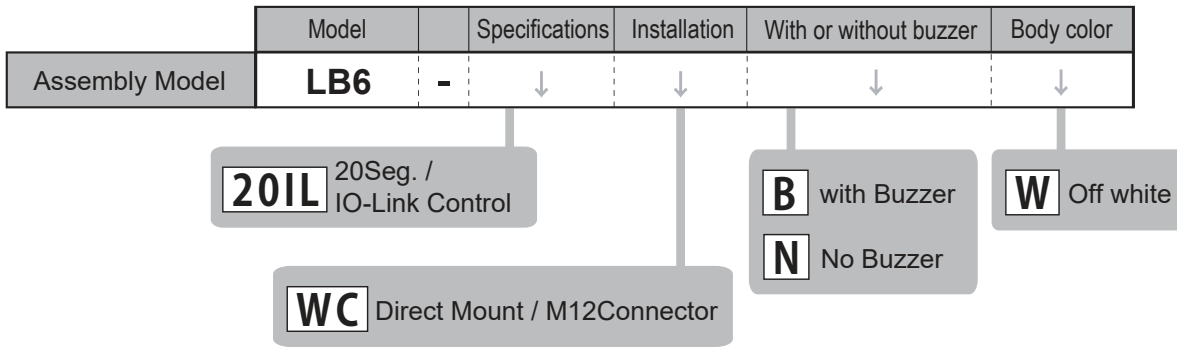
### Caution

- Before handling static-sensitive parts of this product, discharge any static electricity from the body.
- Do not disassemble or remove during operation.
- When you attach/detach the head cover and buzzer unit, do not touch the internal connector terminal.  
Failure to follow this instruction may cause a breakdown.

### Notice

- When using this product for security purposes, please observe the following.
  - Be sure to conduct **daily inspections**.
  - **Use in conjunction with other crises** in case of failure.
- Before handling static-sensitive parts of this product, **discharge any static electricity from the body**.  
(To prevent damage from static electricity, place your hand or other body part onto a metal object or to an earth ground.)
- Use a soft cloth moistened with water to wipe off any dirt or grime on the main unit.  
(Do not wipe with **thinners, benzine, gasoline, or oil**.)
- Observe the following when handling product parts.
  - Other than parts that you can remove, **do not disassemble any parts**.
  - **Do not modify** this product.
  - **Be sure to use the repair parts specified in this manual**.

## 2 Model Number Configuration



Example **LB6-20ILWCBW**

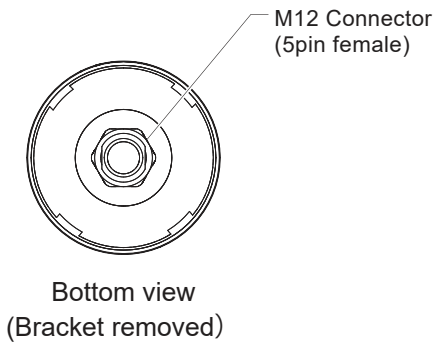
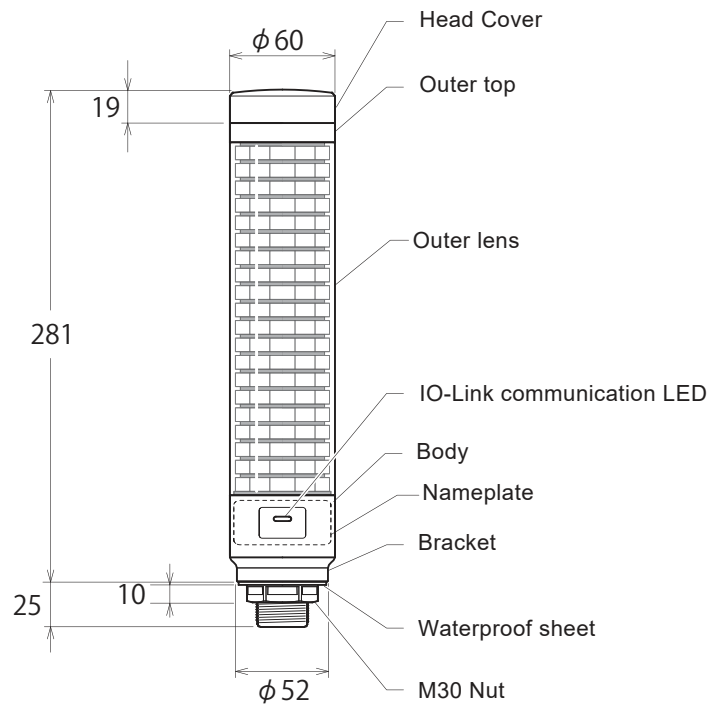
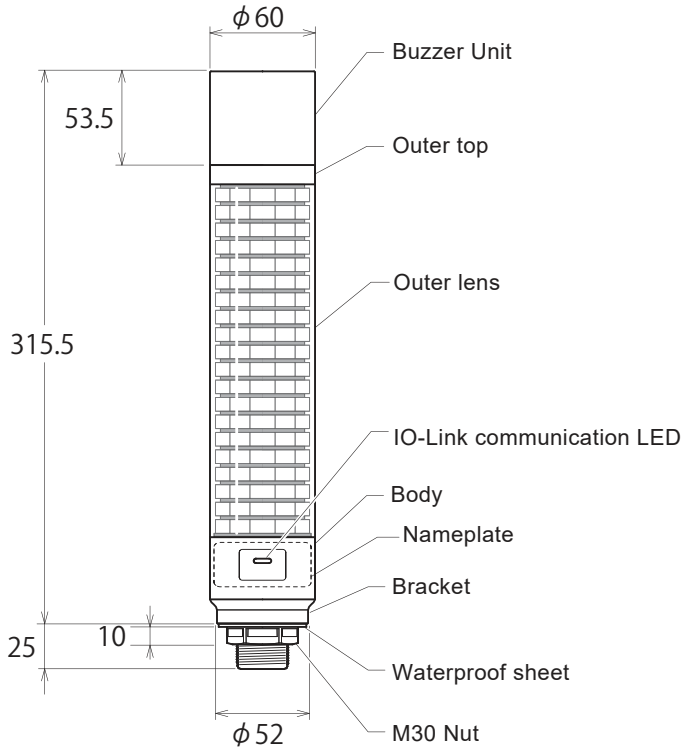
- 20Seg. / IO-Link Control
- Direct Mount / M12 Connector
- with Buzzer
- Off white

# 3 Names and Dimensions

LB6-20ILWCBW

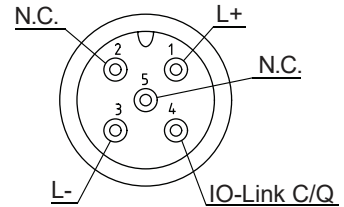
LB6-20ILWCNW

Unit : mm



## M12 Connector Pin Configuration

5pin male (plug)



# 4 Installation

## ⚠ Caution

- This product is for indoor use only.
- Do not use the product with the Head cover or Buzzer unit removed.
- Do not apply excessive force when installing or removing the head cover and buzzer unit. Failure to do could result in damage to the unit.
- When removing and reinstalling the head cover and buzzer unit, make sure there is no floating between them and the outer lens. Failure to do so may result in parts falling or flooding.
- Use a soft cloth moistened with water to wipe off any dirt or grime on the main unit.
- Be sure to install the provided waterproof sheet when installing the product.
- When the installation location is unavoidably irregular and waterproof performance is required, use a sealant between the product and the installation surface.

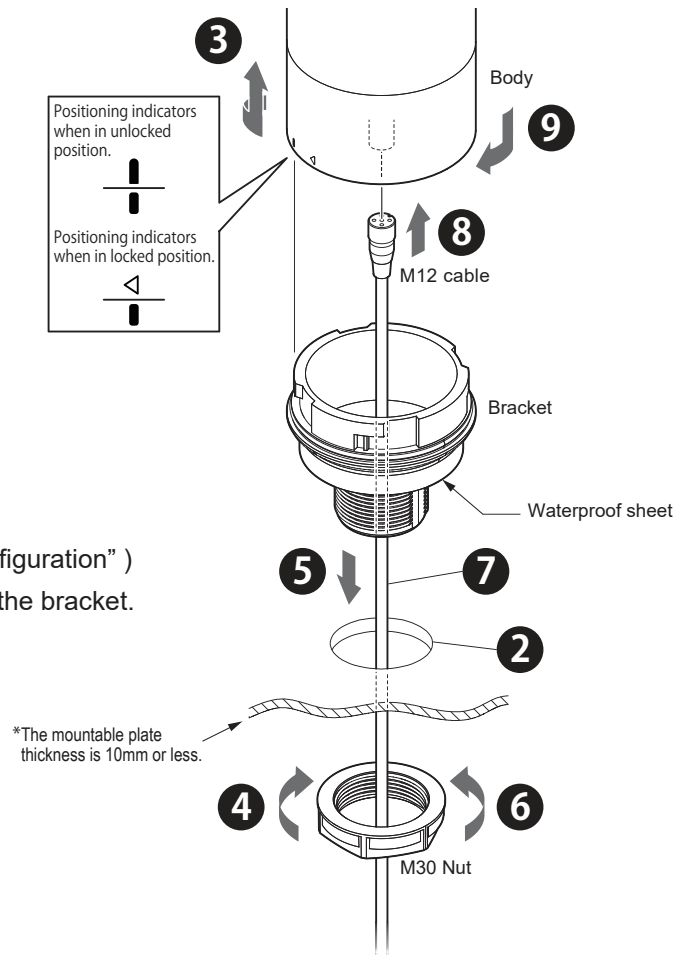
## Notice

- The following requirements are necessary for a proper mounting location.
  - Location with **strong** and **even surface** with **minimal vibration**.
- When the installation location is unavoidably irregular and waterproof performance is required, use a sealant between the product and the installation surface.

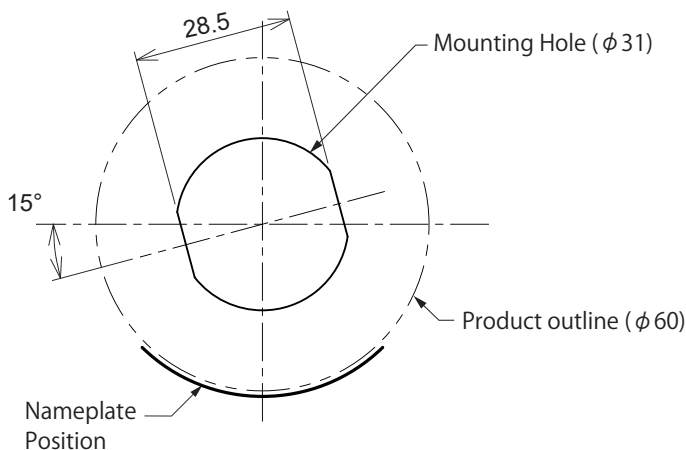
- ① Check the mounting position of the product.
- ② Make a mounting hole in the mounting position of the product.  
( See P.5 "■Mounting Surface Dimensions" )
- ③ Turn the body in the counterclockwise direction and remove the body from the bracket.
- ④ Remove the M30 nut from the bracket.
- ⑤ Attach the bracket to the mounting position.
- ⑥ Secure the bracket to the mounting position with the M30 nut.

Recommended tightening torque	4.5N·m
-------------------------------	--------

- ⑦ Pass the M12 cable through.
- ⑧ Align the M12 cable alignment with the M12 connector alignment to attach the M12 cable.  
( See P.4 "3 Names and Dimensions M12 Connector Pin Configuration" )
- ⑨ Turn the body in the clockwise direction and mount the body to the bracket.



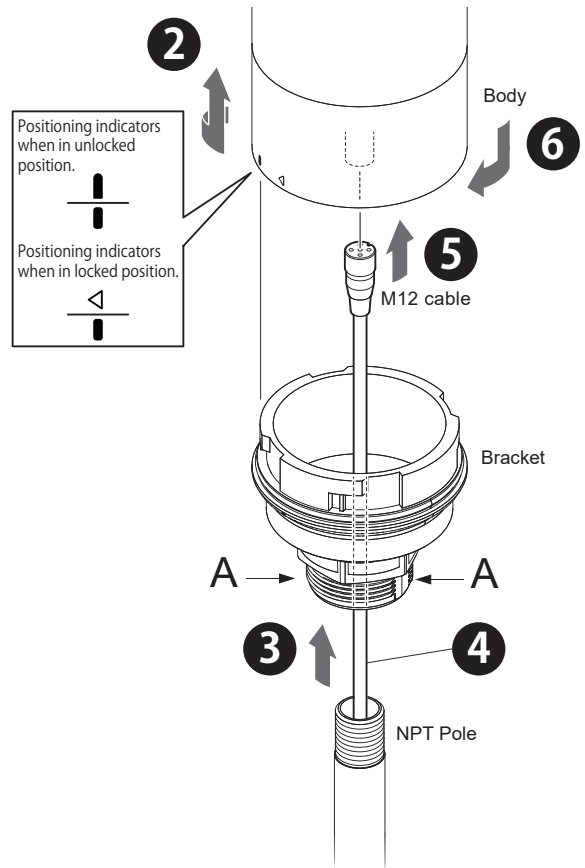
### ■ Mounting Surface Dimensions [Unit : mm]



- ① Check the mounting position of the product and the NPT pole.
- ② Turn the body in the counterclockwise direction and remove the Body from the bracket.
- ③ While holding part 'A', attach the Bracket to the NPT pole.

Recommended tightening torque	2.25N·m
-------------------------------	---------

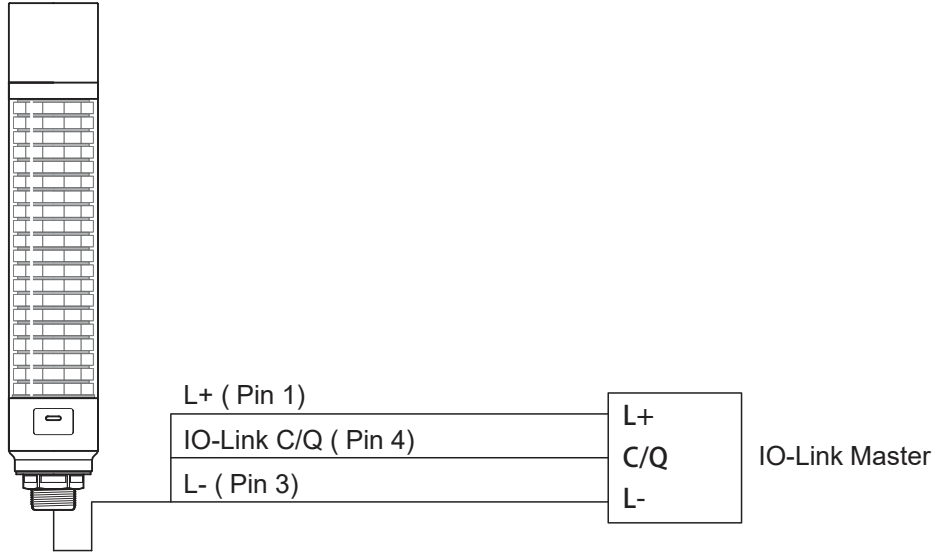
- ④ Pass the M12 cable through.
- ⑤ Align the M12 cable alignment with the M12 connector alignment to attach the M12 cable.  
( See P.4 “3 Names and Dimensions M12 Connector Pin Configuration ”)
- ⑥ Turn the body in the clockwise direction and mount the body to the bracket.



## 5 Wiring

### ⚠ Caution

- Turn off the power before wiring. There is a risk of short-circuiting and damage to the internal circuitry.
- Ensure the proper working voltage is used and that direct current or alternating current is properly applied.  
Any mistake in wiring may result in damage.
- Do not pull the wire. Possible cause of failure may occur.
- Be sure the wiring is done properly. Any mistake in wiring may result in damage.



## 6 How to Use

This product is IO-Link supported.

Wire according to P.6 "5 Wiring".

LED and buzzer can be controlled from the IO-Link master.

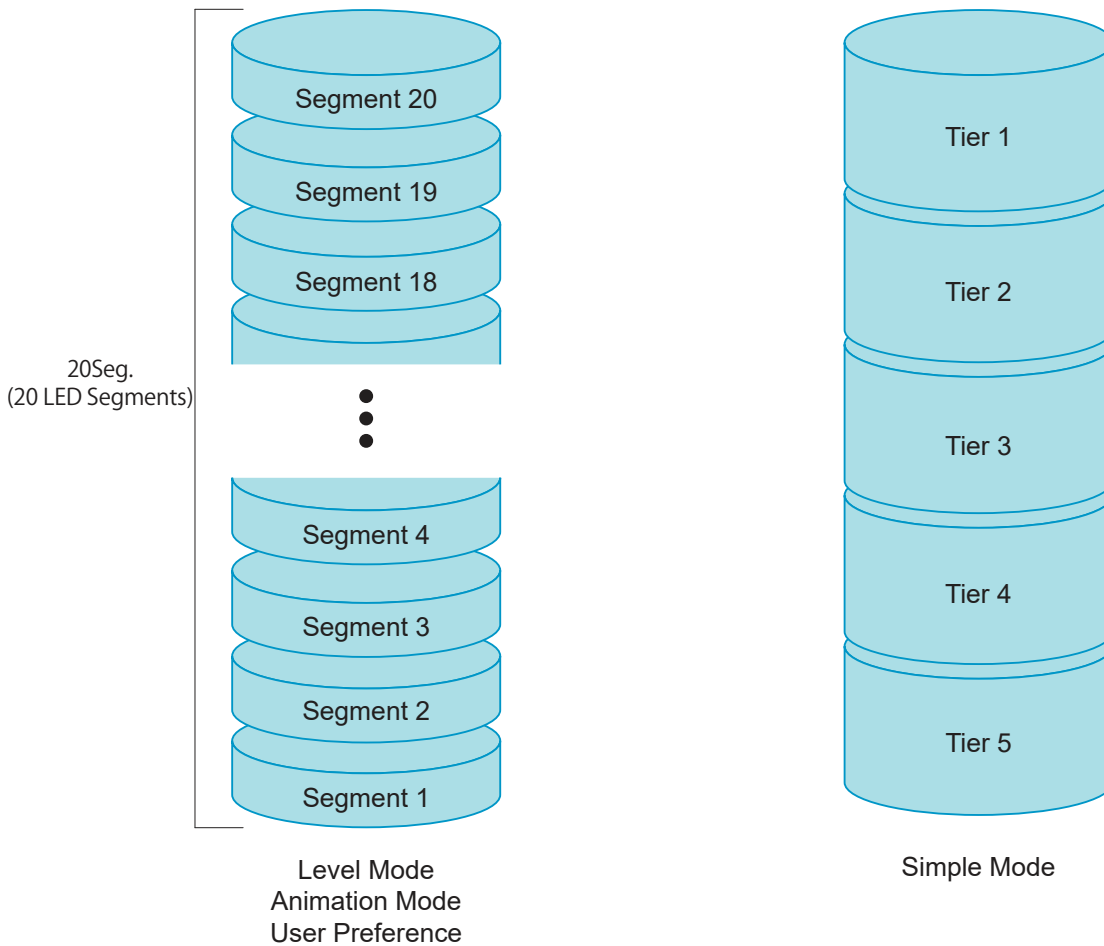
By changing the "Operating Mode" setting, the unit can operate in the following modes.

- Simple Mode
- Level Mode
- Animation Mode

In level mode, animation mode and user preferences, the LEDs are controlled segment by segment.

In simple mode, several segments are controlled as a single tier.

The number of segments per tier can be set arbitrarily. (See P.11 □Size of Tiers)





The parameters used in each mode are listed in the table below.  
 For common matters, see P.14 "■Matters common to all mode".

Parameter \ Mode	Simple	Level	Animation
2000: LED Intensity	○	○	○
2001: Buzzer Sound Level	○	○	○
2015: LED Pattern	○	-	-
2017: Select User Color	○	-	-
2018: Tier Color	○	-	-
2019: Size of Tiers	○	-	-
2020: Blank between Tiers	○	-	-
2021: Direction of Flow	-	○	○
2022: Level Meter Thresholds	-	○	-
2023: Segment Colors	-	○	○
2024: Segment Lightning Style	-	○	○
2025: Scope of Appearance	-	○	○
2026: Animation Ending	-	-	○
2027: User Preference Color Bank 1	○	○	○
2028: User Preference Color Bank 2	○	○	○
2029: User Preference Color Bank 3	○	○	○
2030: Buzzer Pattern	○	○	○

■ Parameter setting

For parameters, download and use the IOODs on the Type LB6 page of the website (<https://www.patlite.com>).

Also download and use the parameter sheet in the same way.

■ Simple Mode

This mode allows control by setting the contents of the LED and the buzzer.

Other settings are made via parameters.

Refer to the table below for process data transmission.

	bit7	bit6	bit5	bit4	bit3	bit2	bit1	bit0
Byte 0	User Preference Select		Buzzer ON/OFF	LED Tier 5 ON/OFF	LED Tier 4 ON/OFF	LED Tier 3 ON/OFF	LED Tier 2 ON/OFF	LED Tier 1 ON/OFF
Byte 1	Not used							

□ LED pattern

The "LED Pattern" used in simple mode corresponds to the table below.

Pattern		Set Value
Name	Flashing Rate	
Continuous	-	0
Blinking Slow	30 blinks per minute	1
Blinking Middle	90 blinks per minute	2
Blinking Fast	120 blinks per minute	3
Flashing Slow	60 flashes per minute	9
Flashing Middle	90 flashes per minute	10
Flashing Fast	120 flashes per minute	11
Gradation blinking Slow	60 blinks per minute	12
Gradation blinking Middle	90 blinks per minute	13
Gradation blinking Fast	120 blinks per minute	14

□Select User Color

"Select User Color" allows you to select an arbitrary LED colour to be used in Simple mode.

See P.14 "□About LED Color" for the color to be selected.

□Tier Color

"Tier Color" corresponds to the table below.

LED Color	Set Value
Off	0
Red	1
Green	2
Amber	3
Blue	4
Purple	5
Cyan	6
White	7
User Color*	8

\* Selected in "Select User Color" parameter

Default values are shown in the table below.

Tier	Set value
Tier 1	1 (Red)
Tier 2	3 (Amber)
Tier 3	2 (Green)
Tier 4	4 (Blue)
Tier 5	7 (White)

□Size of Tiers

The number of segments controlled as one tier can be changed using the "Size of Tiers".

Default values are all 4.

Set the total value to be 20.

■ Level Mode

In this mode, LED and buzzer contents are set by parameters and controlled by process data values.

Refer to the table below for process data transmission.

	bit7	bit6	bit5	bit4	bit3	bit2	bit1	bit0
Byte 0	User Preference Select		Buzzer ON/OFF	Not used				
Byte 1	Not used	Level value* 0x00 - 0x64 (0 - 100)						

\*Level values are valid from 0 to 100; for values greater than 100, the level value is 100.

□ Default value

The default values of the parameters in level mode are shown in the table below.

Segment	Threshold	LED Color	LED Pattern
20	95	Red	Flashing Fast
19	90	Red	Flashing Fast
18	85	Red	Flashing Fast
17	80	Red	Flashing Fast
16	75	Amber	Flashing Middle
15	70	Amber	Flashing Middle
14	65	Amber	Flashing Middle
13	60	Amber	Flashing Middle
12	55	Green	Blinking Fast
11	50	Green	Blinking Fast
10	45	Green	Blinking Fast
9	40	Green	Blinking Fast
8	35	Cyan	Blinking Slow
7	30	Cyan	Blinking Slow
6	25	Cyan	Blinking Slow
5	20	Cyan	Blinking Slow
4	15	Blue	Continuous
3	10	Blue	Continuous
2	5	Blue	Continuous
1	0	Blue	Continuous

■ Animation Mode

In this mode, the LED and buzzer contents are set by parameters, and the level mode is displayed sequentially.

Refer to the table below for process data transmission.

	bit7	bit6	bit5	bit4	bit3	bit2	bit1	bit0
Byte 0	User Preference Select		Buzzer ON/OFF	Not used			Animation Reset	Animation Enable
Byte 1	Not used						Animation Speed	

□ Animation Ending

"Animation Ending" selects the motion after all segments are lighting up in animation mode.

Refer to the table below to set this parameter.

Motion	Set value
All segments turn off and animation starts again	0
Segments turn off in the opposite order of lights on, and animation starts again	1

□ Animation Reset

Stops the running animation and plays it back from the start.



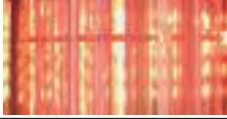




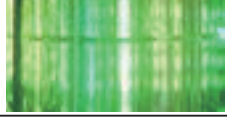
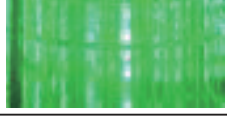

If this bit is set, the animation is reset and does not start.












■ Matters common to all mode

□LED Color

The "LED Color" used in each mode corresponds to the table below.

Color images may differ from actual colors due to screen conditions or printing conditions.

Set value	Color image
0 (Off)	—
1 (Red)	
2	
3	
4	
5 (Amber)	
6	
7 (Lemon)	
8	
9 (Green)	
10	

Set value	Color image
11 (Cyan)	
12	
13 (Blue)	
14	
15	
16 (Purple)	
17	
18	
19	
20	
21 (White)	

□Buzzer Pattern

"Buzzer Pattern" used in each mode corresponds to the table below.

Pattern	Set value
Off	0
Continuous Beep Sound	1
Rapid Intermittent Beep	2
Rapid Hi-Low	3
Sweep Sound	4
Continuous Beep Sound 500ms ON / 500ms OFF	5
Rapid Intermittent Beep 500ms ON / 500ms OFF	6
Rapid Hi-Low 500ms ON / 500ms OFF	7
Sweep Sound 500ms ON / 500ms OFF	8

□LED Intensity

"LED Intensity" used in each mode can be set from 0 to 100% in 10% increments.

□Buzzer Sound Level

"Buzzer Sound Level" used in each mode can be set from 0 to 100% in 10% increments.

□Direction of Flow (Level Mode, Animation Mode)

"Direction of Flow" sets the starting position of the lighting.

Refer to the table below for the setting.

Starting position	Set value
Starts lighting from segment 1	0
Starts lighting from segment 20	1

□Scope of Appearance (Level Mode, Animation Mode)

Each segment lights up with the LED color/LED pattern set.

Except for the top segment, the color and pattern of the LEDs in the illuminated segments change according to the "Scope of Appearance" setting.

Refer to the table below for the settings.

Motion	Set value
Lighting with the same LED color/pattern as the top segment	0
Lighting with set LED colors/pattern	1
Continuous lighting with set LED color	2

□User Preference

Set a value of 1~3 in "User Preference" in the process data,  
and the operation set in User Preference Color1~3 will be performed.

Regardless of each mode or process data value (except the buzzer setting),  
the display set in the user preferences takes priority.



# 7 Troubleshooting

Troubleshoot problems that occur by following the instructions in the table below.

No.	Problem	Confirmation	Remedy
1	<b>The LED does not light.</b>	Is the processing data correct?	Please check " <b>6</b> How to Use" (P.8) before submitting your process data.
		Are the parameters correct?	Please check " <b>6</b> How to Use" (P.8) before set value.
		Is the electric wiring connected correctly?	Refer to " <b>5</b> Wiring" (P.7) for proper wiring.
		Is the power supply applied at the correct voltage?	Check voltage output from the connected IO-Link master.
2	<b>The color of the LED differs from the desired color.</b>	Is the processing data correct?	Please check " <b>6</b> How to Use" (P.8) before submitting your process data.
		Are the parameters correct?	Please check " <b>6</b> How to Use" (P.8) before set value.
3	<b>The buzzer does not sound.</b>	Is the processing data correct?	Please check " <b>6</b> How to Use" (P.8) before submitting your process data.
		Are the parameters correct?	Please check " <b>6</b> How to Use" (P.8) before set value.
		Is the electric wiring connected correctly?	Refer to " <b>5</b> Wiring" (P.7) for proper wiring.
		Is the power supply applied at the correct voltage?	Check voltage output from the connected IO-Link master.

# 8 Specifications

## General Specifications

Product Name		Multi-color Signal Tower with IO-Link	
Model		LB6-20ILWCNW	LB6-20ILWCBW
Rated Voltage		24V DC	
Operating Voltage Range		18V - 30V DC	
Current Consumption	Std.	200mA	250mA
	Max.	250mA	300mA
	Condition	At rated voltage, with IO-Link communication. All LED segments continuously illuminate in white. Dimming:100% (Only LB6-20ILBW)Buzzer Sound "Continuous Beep Sound" Volume:100%	
Inrush Current		None	
Operating Ambient Temperature		-20°C ~ +50°C	
Operating Ambient Humidity		Less than 90% (No condensation)	
Storage Ambient Temperature		-30°C ~ +60°C	
Storage Ambient Humidity		Less than 90% (No condensation)	
Mounting Location		Indoor	
Mounting Direction		Upright	
Protection Rating		IP65	
Environmental Condition		Upright	
Insulation Resistance		More than 5MΩ at 500VDC between live part and non-current carrying metallic part	
Withstand Voltage		500VAC applied for 1min between live part and non-current carrying metallic part without breaking insulation	
Dimensions		See "3 Names and Dimensions"	
Mass(Tolerance:±10%)		0.54kg	0.59kg
Conformity Standards		UL 508, CSA-C22.2 No. 14	
		EN 61000-6-4, EN 61000-6-2, EN IEC 63000	
		FCC Part 15 SubpartB Class A	
		ICES-003 Class A	
Remarks		<ul style="list-style-type: none"> <li>• Due to the characteristics of the LED elements, there may be a slight variation in color tone and brightness between products.</li> <li>• UL Recognized Component(File No.E215660)</li> <li>• Comforms to the CE requirements.</li> <li>• Comforms to the UKCA requirements.</li> </ul>	

- The requirements in each law and regulation are only included in the language designated by each law and regulation. Check the instruction manuals published in each language.

## LED Specifications

Lighting color	No.1	Red	No.8	(Lemon to Green Gradation)	No.15	(Blue to Purple Gradation)
	No.2		No.9	Green	No.16	Purple
	No.3	(Red to Amber Gradation)	No.10	(Green to Cyan Gradation)	No.17	
	No.4		No.11	Cyan	No.18	
	No.5	Amber	No.12	(Cyan to Blue Gradation)	No.19	(Purple to White Gradation)
	No.6	(Amber to Lemon Gradation)	No.13	Blue	No.20	
	No.7	Lemon	No.14	(Blue to Purple Gradation)	No.21	White
Lighting pattern		Continuous, Blinking, Gradation blinking, Flash				
Flashing Rate (Typ.)		Blinking		30 / 90 / 120 times/min		
		Gradation blinking		30 / 90 / 120 times/min		
		Flash		60 / 90 / 120 times/min		

## Buzzer Specifications

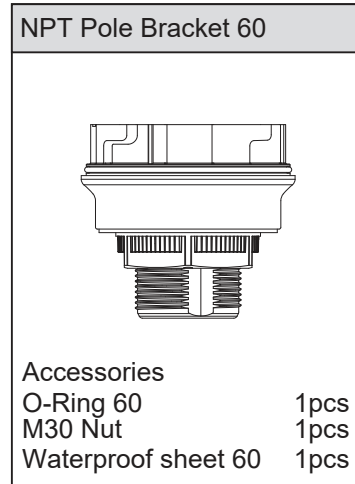
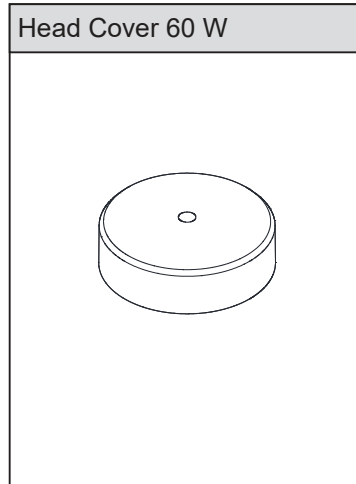
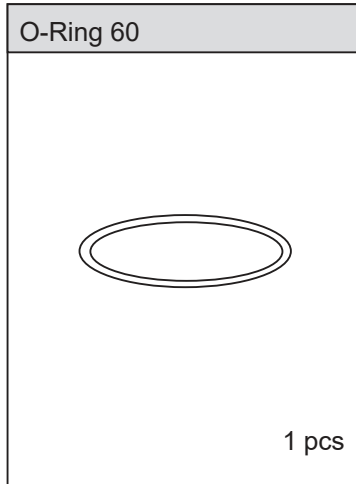
Buzzer Sound / Typical Frequency	No.1	OFF
	No.2	Continuous beep sound / 3,378Hz
	No.3	Rapid intermittent beep / 3,378Hz
	No.4	Rapid Hi-Lo / 2,016Hz & 3,012Hz
	No.5	Sweep sound / 1,000Hz - 4,032Hz
	No.6	Continuous beep sound / 3,378Hz 500ms ON / 500ms OFF
	No.7	Rapid intermittent beep / 3,378Hz 500ms ON / 500ms OFF
	No.8	Rapid Hi-Lo / 2,016Hz & 3,012Hz 500ms ON / 500ms OFF
	No.9	Sweep sound / 1,000Hz - 4,032Hz 500ms ON / 500ms OFF
	Setting	Depending on IO-Link parameters
	Sound Pressure Level (Typ.)	88dB
	Environmental Condition	Buzzer sound No.5 is measured from the total circumference of the buzzer Unit at 1m. (Volume:100%)

## IO-Link Specifications

Function	LED Segment Control	Operation Mode	Simple Mode/ Level Mode / Animation Mode
		Lighting Color	Total 21 colors
		Lighting Control	Total 10 patterns
		Dimming	0% to 100% (10% step)
	Buzzer Control	Buzzer Style	Total 9 styles (Including "OFF")
Volume		0% to 100% (10% step)	
Communication specification	IO-Link revision	1.1.3	
	Transmission rate	COM2	
	Minimum Cycle time	2.7ms	
	Process data length	PD out : 2byte PD in : 0byte	
ID	Vendor	763d(0x2FB)	
	Device	524290d(0x80002)	

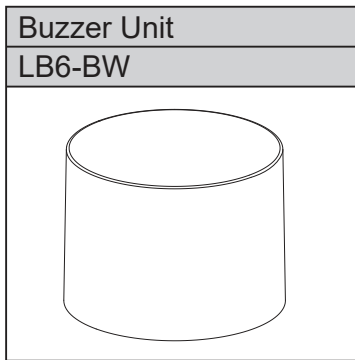
## 9 Replacement Parts

The following replacement parts for this product are available for customer to change or replace.

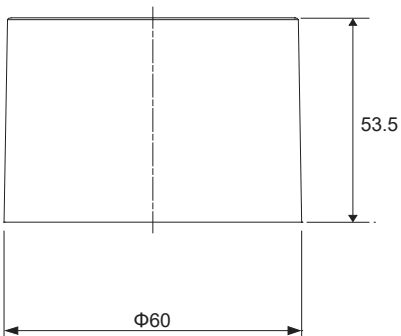


# 10 Option Parts

The optional parts for this product are listed below. (Top line: Part Name; Bottom: Model)



### External Diagram (Unit : mm)



### Model Number Configuration

	Model			Body Color
Model Number	LB6	—	B	W

**W** : Off-White

### General Specifications

Model	LB6-B	
Ambient operating temperature	-20°C ~ +50°C	
Ambient operating humidity	Less than 90 % (No condensation)	
Mass(Tolerance±10%)	0.06kg	
Buzzer Sound / Typical Frequency	No.1	OFF
	No.2	Continuous beep sound / 3,378Hz
	No.3	Rapid intermittent beep / 3,378Hz
	No.4	Rapid Hi-Lo / 2,016Hz & 3,012Hz
	No.5	Sweep sound / 1,000Hz - 4,032Hz
	No.6	Continuous beep sound / 3,378Hz 500ms ON / 500ms OFF
	No.7	Rapid intermittent beep / 3,378Hz 500ms ON / 500ms OFF
	No.8	Rapid Hi-Lo / 2,016Hz & 3,012Hz 500ms ON / 500ms OFF
	No.9	Sweep sound / 1,000Hz - 4,032Hz 500ms ON / 500ms OFF
Setting	Depending on IO-Link parameters	
Sound Pressure Level (Typ.)	88dB	
Environmental Condition	Buzzer sound No.5 is measured from the total circumference of the buzzer Unit at 1m (Volume:100%)	

# 11 Attach/detach the Buzzer Unit

Follow the instruction below when attaching and detaching the buzzer unit.

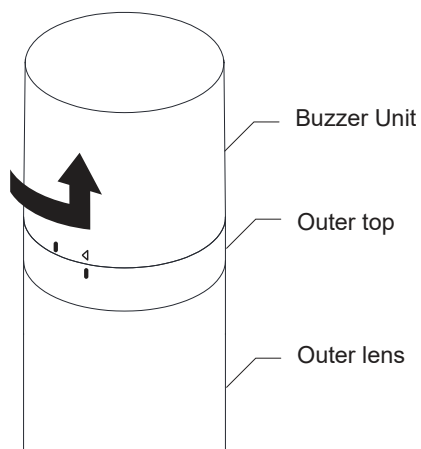
## Warning

- Be sure that it is disconnected from the power source before working on it

## Caution

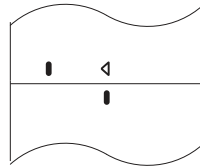
- Do not apply excessive torque or strong shock to each unit or body. Failure to comply will result in damage or malfunction.
- Do not touch the connector area or the inside of the body. Failure to comply will result in damage or malfunction.
- Be sure to lock buzzer unit securely when attaching. Failure to comply will result in damage or malfunction.
- The buzzer unit must be removed by holding the product body. Failure to comply will result in damage.

### ■ Detachment

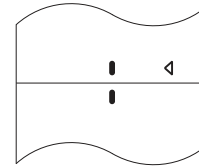


While holding the outer top or outer lens, turn the buzzer unit counter-clockwise to unlock it and lift it upward.

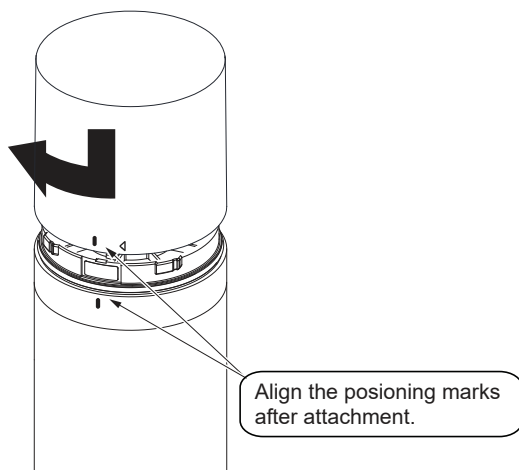
#### ■ Positioning Mark <Locked>



#### <Unlocked>

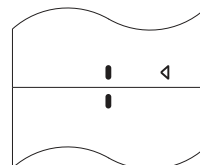


### ■ Attachment

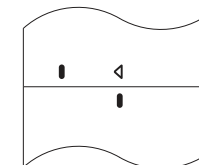


Align the Positioning Mark after insertion, then turn the unit clockwise to lock it.

#### ■ Positioning Mark <Locked>

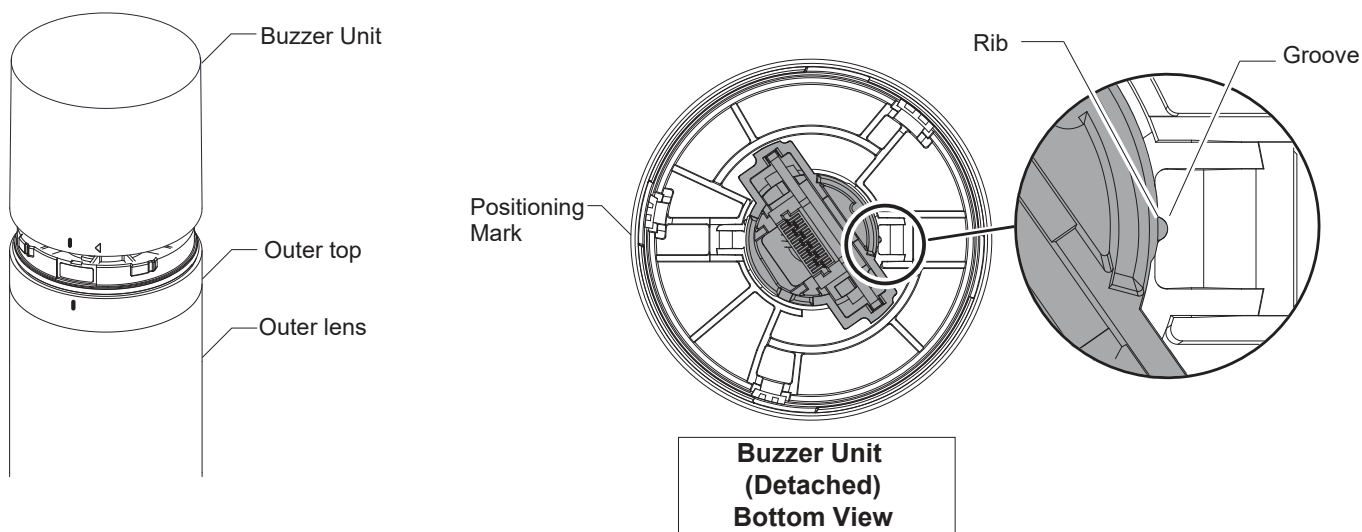


#### <Unlocked>



## <Troubleshooting the Buzzer Unit Attachment>

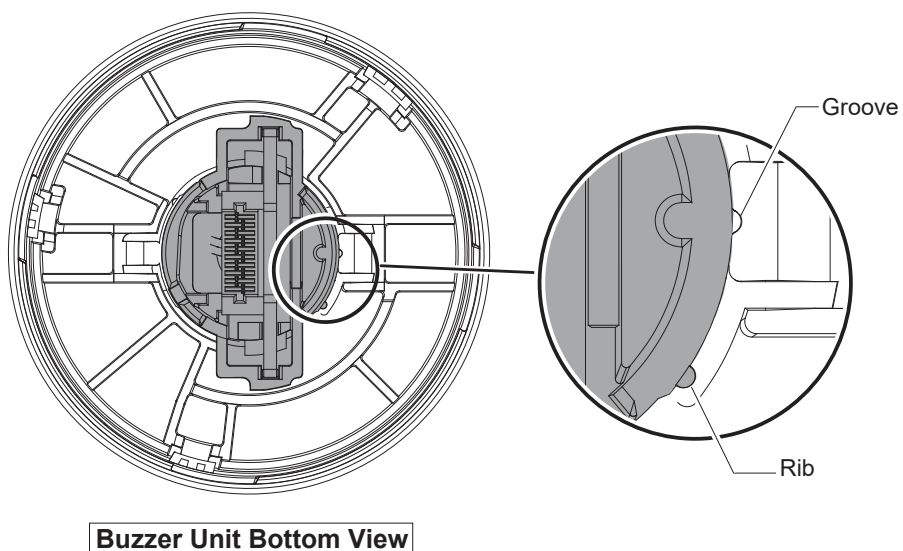
The Buzzer Unit is generally in the status shown in the diagram below after removal.



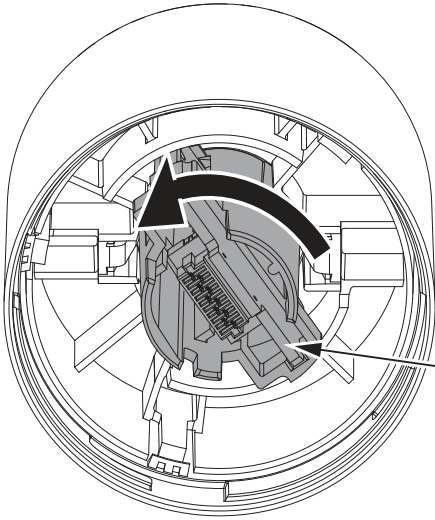
The rib inside of the Buzzer Unit fits into the groove when the Buzzer Unit has been removed from the product.

### **⚠ Caution**

Check to make sure the rib inside of the Buzzer Unit fits into the groove if the Buzzer Unit does not attach properly. Attach the Buzzer Unit by referring to the next page if the rib does not fit into the groove as shown in the diagram below. In addition, the rib may slide out of the groove during removal as shown in the diagram below depending on how the Buzzer Unit was removed. Attaching the Buzzer Unit to the product again in this state may result in damage.

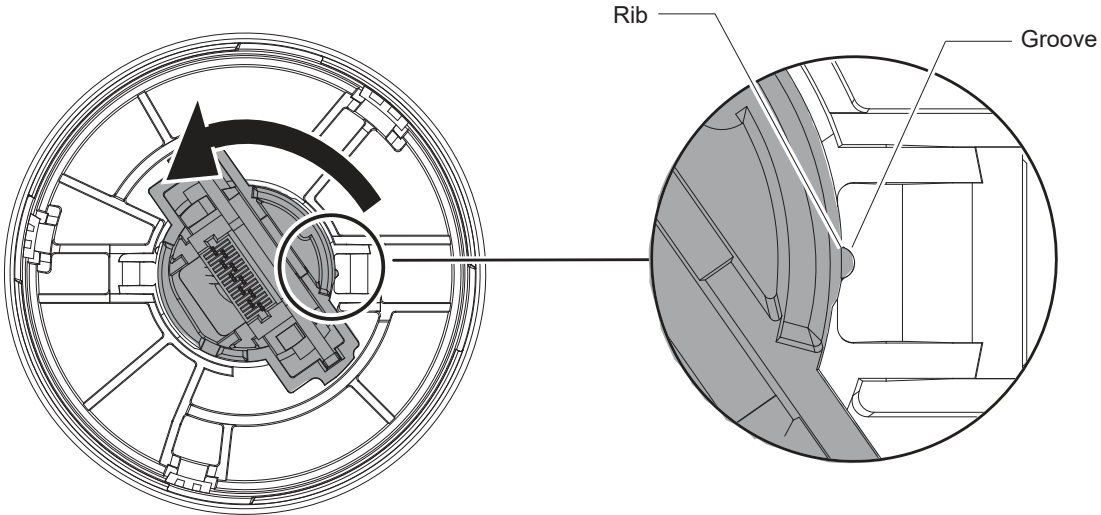


Use the procedure below if the Buzzer Unit does not attach properly.



Turn the part inside the Buzzer Unit in the counter-clockwise direction. Turn until the rib fits into the groove, then attach the Buzzer Unit to the product.

Turn this part in the counter-clockwise direction.



**Buzzer Unit Bottom View**



# 11 Attach/detach the Head Cover

Follow the instruction below when attaching and detaching the buzzer unit.

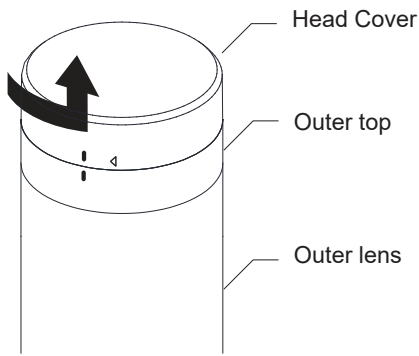
## Warning

- Be sure that it is disconnected from the power source before working on it

## Caution

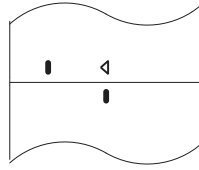
- **Do not apply excessive torque or strong shock** to each unit or body. Failure to comply will result in damage or malfunction.
- **Do not touch the connector area or the inside of the body.** Failure to comply will result in damage or malfunction.
- **Be sure to lock** buzzer unit securely when attaching. Failure to comply will result in damage or malfunction.
- The buzzer unit must be removed by holding the product body. Failure to comply will result in damage.

### ■ Detachment

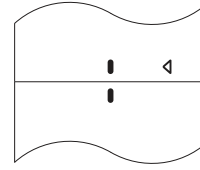


While holding the outer top or outer lens, turn the head cover counter-clockwise to unlock it and lift it upward.

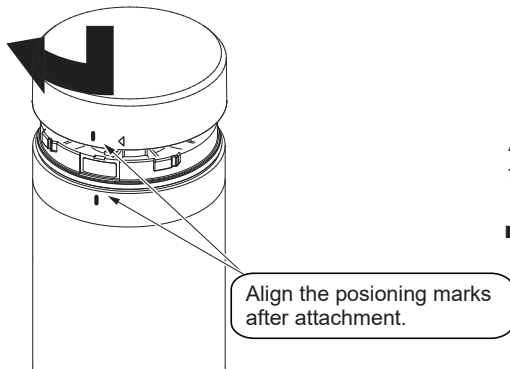
#### ■ Positioning Mark <Locked>



#### <Unlocked>

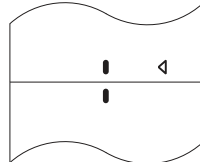


### ■ Attachment

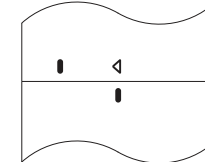


Align the Positioning Mark after insertion, then turn the unit clockwise to lock it.

#### ■ Positioning Mark <Locked>



#### <Unlocked>





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