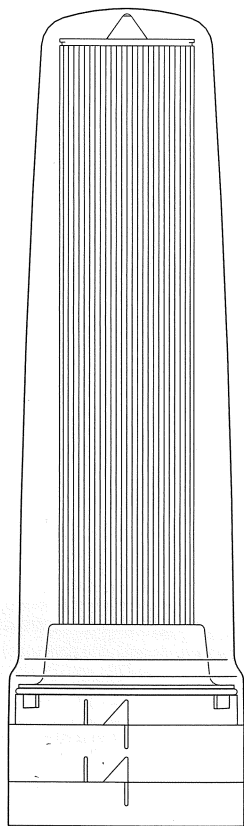


PATLITE®



Notice to Customer

Thank you very much for purchasing our PATLITE product.

- Request the installation and wiring be performed by a professional contractor if construction work is involved.
- Prior to installation, read this manual thoroughly before using this product to ensure correct use.
- After reviewing this manual, if there are any questions regarding this product, please contact the nearest PATLITE office listed on the back cover of this manual.

Notice to Contractor

- Read this manual carefully prior to installation.
- Be sure to return this manual to the customer.

SIGNAL TOWER

Model **LS7**

LED SIGNAL TOWER

INSTRUCTION MANUAL

[Maintenance Version]

Installation Operation Maintenance

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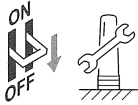
1 Safety Precautions

Safety Precautions



WARNING

Failure to observe the following may result in death or serious injury.

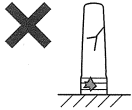


To prevent from **short-circuits, electric shock or damage**, observe the following:

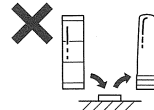
- Be sure the signal tower is **disconnected from the power supply** before wiring or performing repair work.



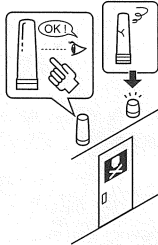
Request the installation and wiring be performed by a **professional contractor** if construction work is involved. Failure to comply may result in **fire, electric shock or falling from high places** may occur.



- Use the signal tower in a **properly maintained condition**. (If parts such as the base or outer cover are cracked, they should be repaired.)



Do not modify or disassemble the signal tower.



To ensure proper safety while using the signal tower, observe the following:

- Perform periodic **pre-maintenance**. (→ "10 Inspection" (P.21))
- As a precaution against problems occurring, use this product **together with other equipment**.



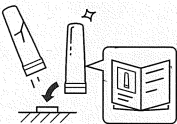
To ensure safety when the signal tower is installed onto equipment, observe the following.

- Do not use the signal tower as leverage** when climbing up onto the equipment. Failure to comply will result in falling from a high place, or damage to the product.
- When performing tasks such as opening the covers of the equipment, be careful **not to snag** anything on the signal tower. Failure to observe may result in damage.

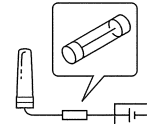


CAUTION

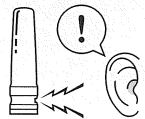
If the following are not observed, injury to personnel or physical damage may result.



Use only the **specified replacement parts** listed in this manual.



To protect the power supply and other internal circuitry, be sure to install an **external fuse**.



Avoid long exposure to the buzzer sound from a close distance. Failure to observe this may lead from irritation to permanent damage to the ears. (Buzzer included specifications)

Signal Tower Application

This product is a multipurpose signal tower, designed principally for giving notifications of the operating status for FA (Factory Automation) equipment in factories, etc., using LEDs and buzzers[※].

※ Buzzer included specifications only

Instruction Manual Objective

- The images in this manual may vary in comparison to the actual product and are only for the purpose of illustration.
- Store this manual in a location for future reference.

2 Model Number Configuration

	Model	Tiers	Rated Voltage	Body Color	Lighting	Buzzer	Mounting	Wiring	Color
Model no.	LS7-	5	02					W	-RYGBC

Common to all models 5 LED Tiers

Common to all models Rated Voltage : 24 V DC

(None) Off-white

D Dark Gray

S Silver

(None) Illumination Only

F Illumination and Flashing

(None) Buzzer not Included
B Buzzer Included

Common to all models
'Direct Installation' Only

Common to all models

LED colors in order from top to bottom: red, yellow, green, blue and white.

C M12 Connector

H Lead Wires*

* **F** 'Illumination and Flashing' function is only available for the **H** Lead wires specifications.

Model Number Example

LS7-502WC-RYGBC

· Body color ... Off-white
· Buzzer ... Not Included
· Lighting ... Illumination only
· Input ... M12 connector

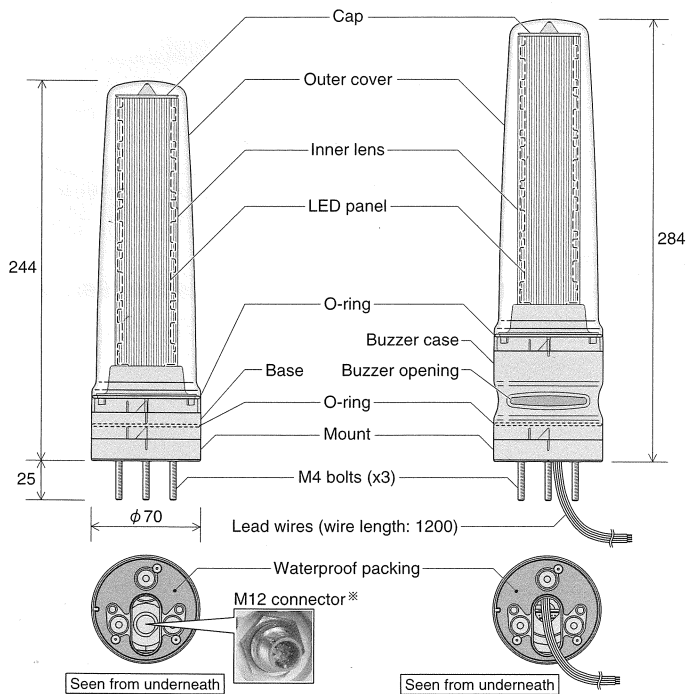
LS7-502SFBWH-RYGBC

· Body color ... Silver
· Buzzer ... Included
· Lighting ... Illumination and flashing
· Input ... Lead wires

3 Part Names and Outer Appearance



■ Buzzer not included **C** M12 connector specifications

■ **B** Buzzer included **H** Lead wires specifications



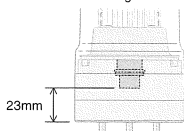
(Note) The Signal Tower LED array is not replaceable.

(Units: mm)

Accessories	
Nuts (M4)	x3
	
Mount cover	x1
	
→ S Post-installation Relocation* (P.21)	

* About the M12 connector

- It is recommended to use the optional connector with cable for wiring. (→ **14** Option Parts* (P.23))
- Because the M12 connector is inside the signal tower, be sure to allow a sufficient length of cable.



(For **B** Buzzer included specifications, the length is 55 mm.)

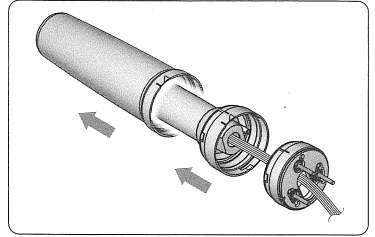
4 Stackable Tower Construction

What is a 'Stackable Structure'?

The 'stackable structure' is a feature which allows the main signal tower unit and the outer cover to be separated with just a single touch. (Previous signal towers require tools to disassemble, such as removing screws.)

The 'stackable structure' makes maintenance and inspection easier.

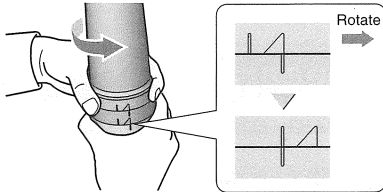
CAUTION Never disassemble or remove any parts outside the stackable parts.



Procedure for removing the stackable parts

Refer to the procedure below to remove the stackable parts. To reinstall, follow the procedure in the reverse order. (The following example is for a model without a buzzer included. The removal procedure is the same as for the outer cover.)

1 Unlocking

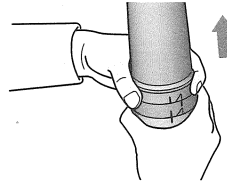


Hold the base and the mount, and rotate until the bar marks are aligned.

Tip

- The lock may be stiff.
- When reinstalling, fully rotate the base until the triangle mark and bar mark are aligned.

2 Remove the base.



Pull the base in the upward direction to remove it.

Tip

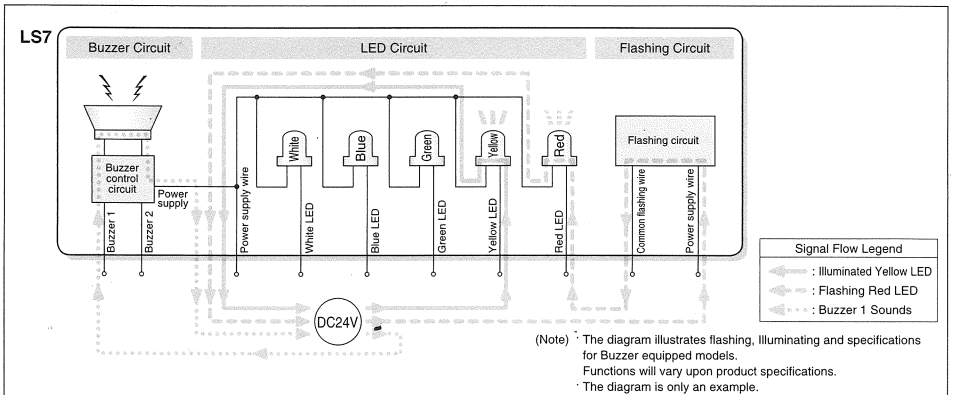
- Do not twist the base too hard when removing it.

Tip

The signal tower is equipped with a buzzer case instead of a base for the models equipped with the buzzer.

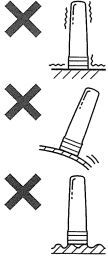
5 Block Diagram

The following illustrates the internal block diagram for the signal tower. Use it as reference when wiring.



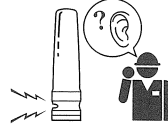
6 Installation

⚠ CAUTION



The following requirements are necessary for proper installation.

- Install the signal tower where excessive **vibration** is not present.
- Install the signal tower on a **sturdy surface**.
- Install the signal tower on a **level surface**.



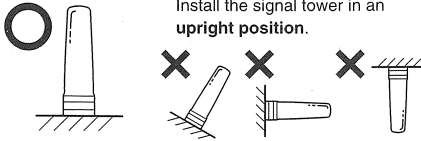
The buzzer is unidirectional, therefore it is most easily audible in the buzzer source direction. **Position the signal tower so that the buzzer diaphragm is facing in the desired sound direction.**

(**B** Buzzer included specifications)

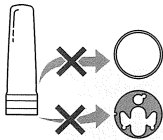
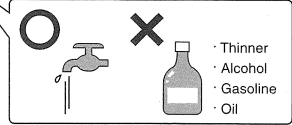


Use a soft cloth, etc., dampened with water to wipe the main signal tower unit.

(Do not use cleaners containing chemicals such as **thinner, alcohol, gasoline or oil.**)



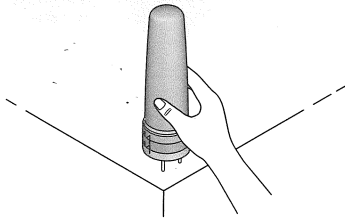
Install the signal tower in an **upright position**.



To ensure the waterproofing performance of this product, **do not remove the O-ring or the waterproof packing.**

General Installation

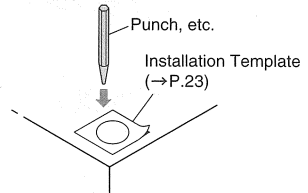
1 Verify the signal tower installation position.



Tip

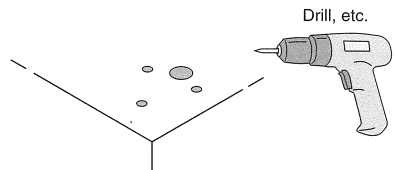
- Use the following tips to check the following:
 - Will it obstruct other equipment?
 - Can the wiring be routed properly?
 - Where is the buzzer direction facing?
- (**B** Buzzer included specifications)

2 Marking holes for wiring and installation.



Use the installation template located on P.23 and a punch, etc. to mark the places to make the holes.

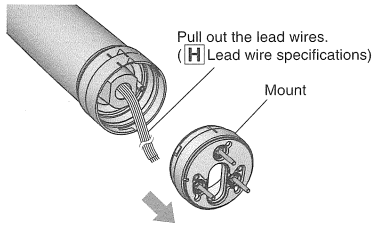
3 Making the installation and wiring holes.



Use a drill, etc., to make holes for installation and wiring.

Continued on next page →

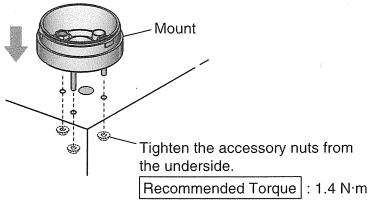
4 Remove the signal tower from the mount.



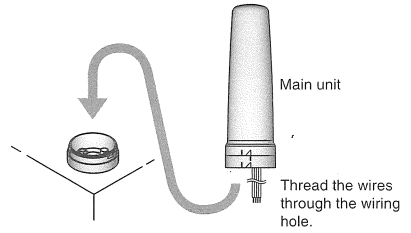
Tip

Refer to "4 Stackable Tower Construction" (→P.16) for details on how to remove the mount.

5 Place the mount in the installation holes.



6 Attach the main unit to the mount.



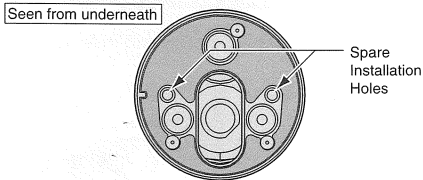
Thread the lead wires through the mount and wiring hole, before installing the main unit to the mount.

Tip

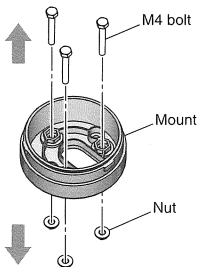
- For the [C] M12 connector option, thread the cable through the wiring hole and mount before connecting it to the main unit.
- Refer to "4 Stackable Tower Construction" (→P.16) for details on how to remove the mount.
- Be careful not to pinch the lead wires or cable.
- Adjust the sound to the desired level.
- (Refer to "B Volume Adjustment" (→P.21))
- ([B] Buzzer included specifications)
- Make sure to allow some slack for the lead wires or cable in order to adjust the volume.
- ([B] Buzzer included specifications)

Optional Installation Method

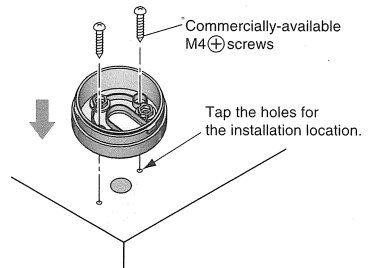
If it is difficult to work on the underside by tightening the nuts when installing the mount, use the spare installation holes.



1 Remove the existing bolts and nuts.



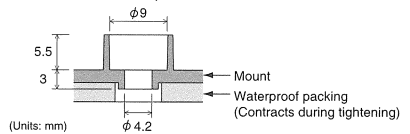
2 Install with commercially-available screws.



Tip

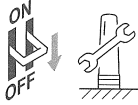
- Be sure to use screws long enough, keeping in mind the thickness of the mount, waterproof packing and mounting material's thickness, by referring to the illustration below.

■ Cross-section for the spare installation holes

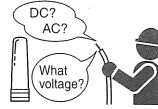


7 Wiring

⚠ WARNING



Prior to wiring, ensure the **power supply is disconnected** from the signal tower.

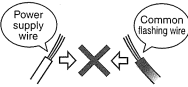


Verify the power supply voltage and whether it is **direct current** or **alternating current**.

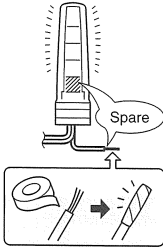
⚠ CAUTION



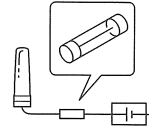
Never apply a voltage to the "flashing common" wire. Failure to observe will result in damage to the circuitry. ([F] Illumination and flashing specifications)



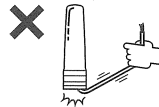
Never connect the power supply wire to the "flashing common" wire. Failure to observe will result in damage to the circuitry. ([F] Illumination and flashing specifications)



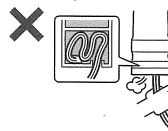
When there are unused lead wires for the LED tiers, be sure to **separately insulate** the ends of each unused lead wire.



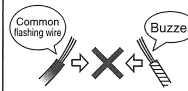
To protect the power supply and other internal circuitry, be sure to install an **external fuse**.



Do not pull on the lead wire.

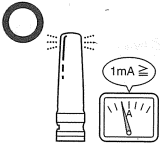


Do not push lead wires up into the main unit.

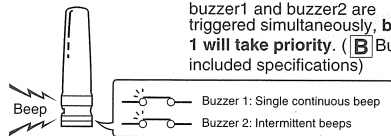


Do not connect the "flashing common" wire with the buzzer wire. ([B] Buzzer included specifications)

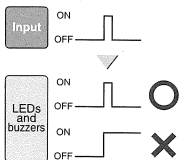
Quick Tips



If the leakage current from equipment, such as a PLC unit output, is **1mA or more**, the LEDs may show a dim illumination, **but it is not the sign of a problem.**



For models with the buzzer, if buzzer1 and buzzer2 are triggered simultaneously, **buzzer 1 will take priority.** ([B] Buzzer included specifications)



The LEDs and the buzzers will **only operate when a signal input is present.** (They do not operate on one-shot signal pulses.)

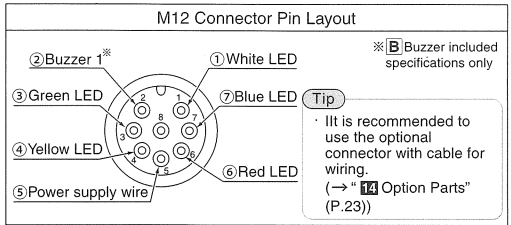
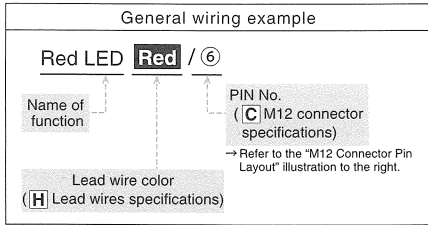


When adding an additional length of wire, use the **appropriate wire lengths and wire diameters** to ensure there are no voltage drops.

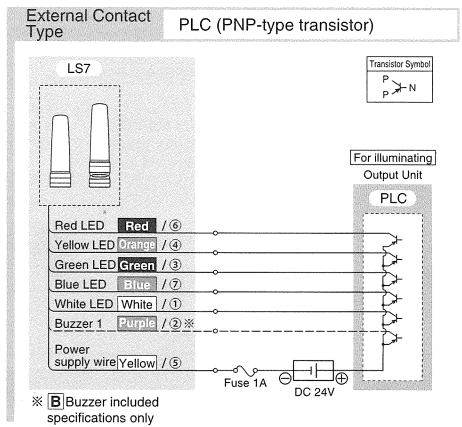
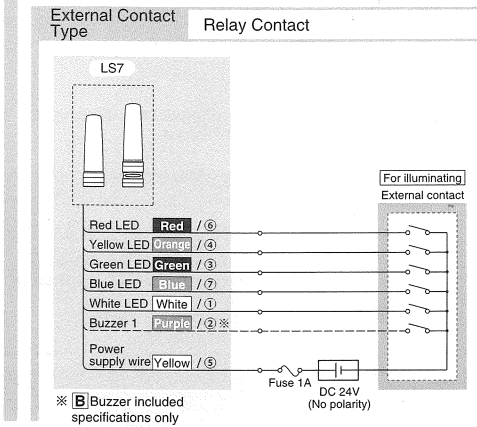
Wiring Examples

Wiring examples are shown in accordance to the signal tower model and external contact type. If the signal tower is being used under special conditions and there are any questions, contact our PATLITE office prior to performing any wiring.

CAUTION Do not connect unused lead wires to external contacts when unnecessary. Insulate all unused lead wires with insulation tape, etc.

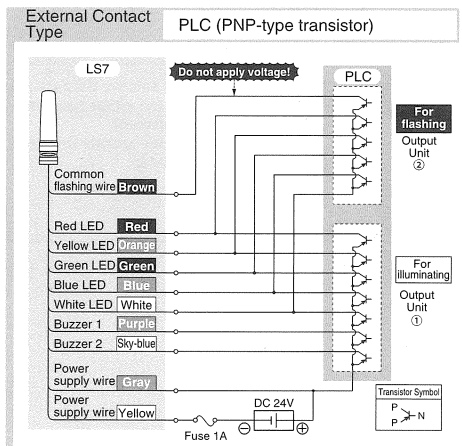
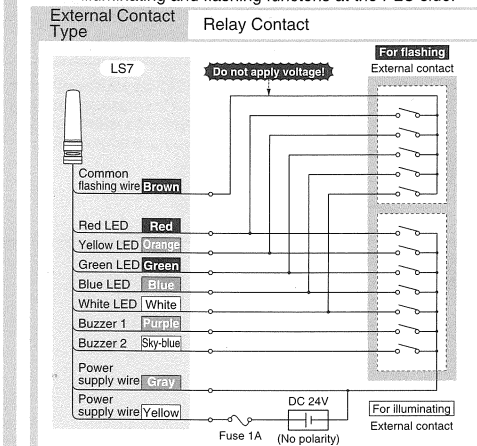


Product specifications: Illumination only / Buzzer not included / (B) Buzzer included Model: **LS7-502 □ (B) W □**



Product specifications: Illumination and flashing / Buzzer included Model: **LS7-502 □ FBW H**

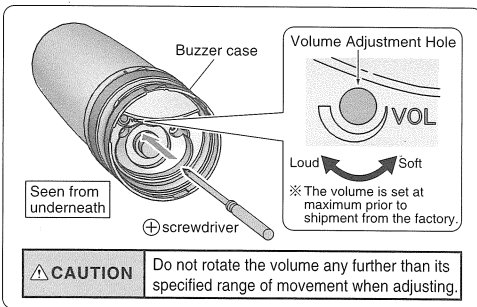
(Note) When using illuminating and flashing features together, it is necessary to have separate output units for the illuminating and flashing functions at the PLC side.



8 Volume Adjustment

The volume adjustment of the buzzer is done by inserting a screwdriver into the volume adjustment hole of the buzzer case.

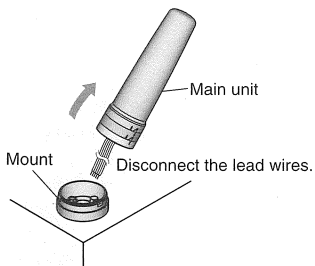
Refer to "4 Stackable Tower Construction" (→P.16) for details on removing the buzzer case.



9 Post-installation Relocation

When installing the signal tower to equipment which is portable, observe the following when moving the equipment.

1 Detach the main unit from the mount.

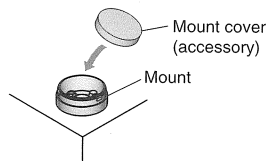


Remove the main unit from the mount.

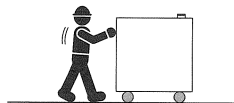
Tip

- Refer to "4 Stackable Tower Construction" (→P.16) for reattaching the main unit to its original position.
- For models with the [C] M12 connector, disconnect the cable from the main unit.

2 Install the optional mount cover.



3 Transport the equipment.



After relocating, remove the mount cover and reinstall the main unit in its original position.

Tip

- Store the mount cover in a safe place after using it.

10 Inspection

To ensure safe operation, it is recommended to perform the following:

Inspection Item	Inspection Repair
Are all the LEDs illuminated?	Refer to the "11 Troubleshooting" section (→P.22) if they do not illuminate.
Are all the buzzer functions sounding? (For models equipped with the Buzzer function, only)	Refer to the "11 Troubleshooting" section (→P.22) if they do not sound.
Check the outside appearance. Is there any damage?	If there is any external damage such as cracks, or missing parts, stop using the signal tower and replace the necessary parts or the main unit. (Refer to "13 Replacement Parts" (→P.23))

11 Troubleshooting

If a problem occurs, check the following table to remedy the problem before calling for service.

Problem	Where to Check	Solution
The LEDs do not illuminate.	Is the wiring properly connected?	Refer to " 7 Wiring" (→P.19) to double-check the wiring connection.
	Is the power supply at the correct voltage?	Be sure to use a 24V DC power supply.
	Is the fuse blown?	If the fuse is blown, replace it.
The buzzer does not sound.	Is the wiring properly connected?	Refer to " 7 Wiring" (→P.19) to double-check the wiring connection.
	Is the power supply at the correct voltage?	Be sure to use a 24V DC power supply.
	Is the fuse blown?	If the fuse is blown, replace it.
	Double-check the product model.	Only signal towers with a B in the model type are equipped with a buzzer function.
The LEDs do not flash.	Is the wiring properly connected?	Refer to " 7 Wiring" (→P.19) to double-check the wiring connection.
	Double-check the product model.	Only signal towers with an F in the model type are equipped with a flashing function.
How is the outer cover and base (buzzer case) removed?	Only designated parts of the signal tower's stackable structure allows removable parts.	Refer to " 4 Stackable Tower Construction" (→P.16) for proper assembly and dis-assembly. (Never disassemble or remove any parts other than the stackable parts.)

(Note) The above describes the most common troubleshooting problems and possible solutions. To view more troubleshooting problems, download the web version of the instruction manual from our company website.

If the problem is not corrected, even after the above remedies have been performed, use the table below to make detailed notes of the product, its problem, and then contact either the place of purchase or your nearest PATLITE Sales Representative.

- The place of purchase ● A PATLITE office (→ back cover)

Product Details			
Product name	LED SIGNAL TOWER	Purchase Date	/ /
Model	(→ " 2 Model Number Configuration" (P.15))	Symptoms of Problem	With as much detail as possible

12 Specifications

Product specifications

Model	Rated voltage	Installation Location	Power consumption		Weight	Buzzer Duration	Sound Pressure	Inrush current	Flashing frequency	Wire type	Wire diameter
			LED	Buzzer							
-502 (None/D/S)W(C/H)	DC 24V	Indoor use only	30 mA per tier	—	Approx.320g	—	—	—	—	UL1007	AWG22
-502 (None/D/S) BWC				40mA	Approx.350g	520msec.	Approx.85dB (at 1m)	150mA	—		
-502 (None/D/S) FBWH				60±12 times/min.	—	—	—	—	—		

- This product conforms to the RoHS directive (DIRECTIVE 2002/95/EC).
- This product complies with EN regulations and shows the CE symbol. (EN61000-6-4 : 2007, EN61000-6-2 : 2005)

External Contact Specifications

■ Contact-type relay (Switch)

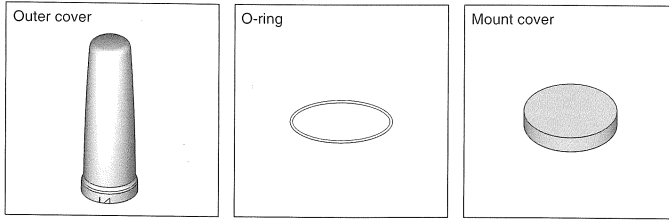
Rated Voltage Load	Rated Current	
	LED	Buzzer
DC24V	100 mA or more per level	200 mA or more

■ PLC output unit

Rated Voltage Load	Rated Current		Leakage Current
	LED	Buzzer	
DC24V	100 mA or more per level	200 mA or more	0.1 mA or less

13 Replacement Parts

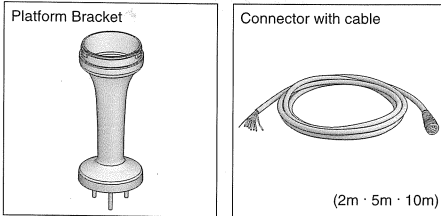
The following are replacement parts available for this product. For further details, refer to our company website.



(Note) When replacing the outer cover, replace the O-ring at the same time.

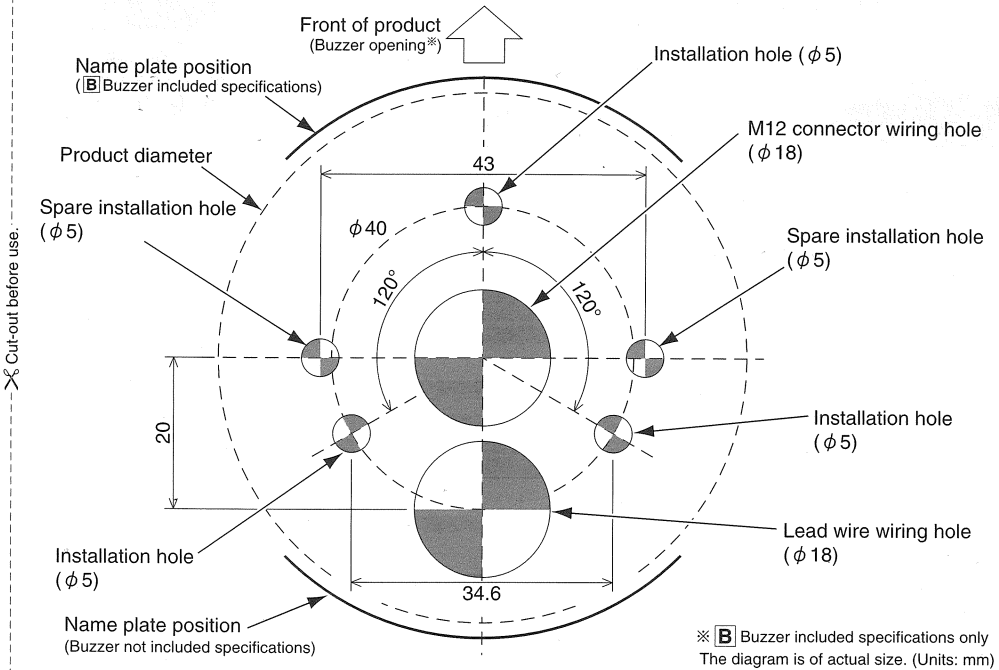
14 Option Parts

This product includes the following option parts. For details, refer to our company website.



LS7 Installation Template

Make the necessary holes according to the product model and installation method. (For more details on installation, refer to P.17)



✂ Cut-out before use.

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Y1X

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※電話番号などは、変更されることがあります。あらかじめご了承ください。

受付時間 9:00~17:00 土/日/祝日と夏期/年末年始の休日は、留守番電話でお受けいたします。

●技術相談窓口 ■  0120(497)090 ■FAX. 079(568)6604

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最新の製品情報などがホームページでご覧になれます。

The latest product information can be viewed on our company's website.

<http://www.patlite.co.jp>

(注) 寸法・仕様および構造などは、改善のため予告なく変更することがあります。

(Note) Dimensions, specifications and structure are subject to change for improvement without notice.

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'11.4.UMC

(Installation template)

Do not write here.