Panasonic **INSTRUCTION MANUAL**

Laser Sensor Head

LS-H□-A

MJE-LSHA No.0084-52V

Thank you very much for purchasing Panasonic products.
Read this Instruction Manual carefully and thoroughly for the correct and optimum use of this product.
Kindly keep this manual in a convenient place for quick reference.

WARNING

- Never use this product as a sensing device for personnel protection.
- In case of using sensing devices for personnel protection, use products which meet laws and standards, such as OSHA, ANSI or IEC etc., for personnel protection applicable in each region or country.
- Although this product corresponds to a Class 1 laser product, it is dangerous to see the laser beam which has been passed through a viewing optical system such as a lens etc. Hence, please avoid this.
- Use of control or adjustment or performance of procedures other than those specified in this instruction manual may result in hazardous radiation expose.

1 FOR SAFE USE OF A LASER PRODUCT

- In order to prevent the accident by laser product and protect the users, JIS C 6802-2014 "Safety of laser products" was established based on the regulation of IEC (International electrotechnical Commission). This regulation classifies laser products according to the level of hazard, and provides the safety measures for respective classes.

  This product are classified as "**Class 1 laser products**" according to IEC 60825-1-2014 (JIS C 6802-2014) "Safety of laser products".

- **Laser hazardous class**
  Classification according to IEC 60825-1-2014 (JIS C 6802-2014)

Class	Description of hazardous evaluation
Class 1	Safe under reasonably foreseeable conditions of operation

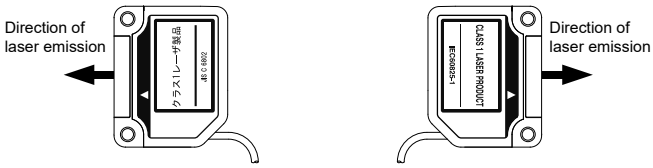
- The following label is affixed on this product in accordance with the Safety of laser product.

・ **Warning label**

In Japanese (Based on JIS C 6802)

In English (Based on IEC 60825-1)

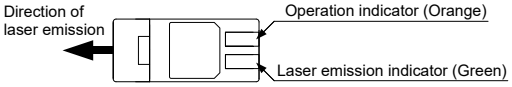
<Label position>



- When this product is used in China, affix the Chinese warning label (accessory) on the label in the product.

In Chinese (Based on GB 7247.1-2012)

・ **Laser emission indicator (green)**
While laser is emitted, the laser emission indicator (green) of the sensor head lights up.
This indicator is visible even when wearing laser protective glasses.



2 SPECIFICATIONS

Item \ Type		Coaxial retroreflective type	Diffuse reflective type
Model No. (Note 1)		**LS-H91-A** (Note 2)	**LS-H21-A**
Applicable amplifier		**LS-400** series	
Sensing range (Note 3)	H-SP mode	0.1 to 1m	30 to 150mm
	FAST mode	0.1 to 1m	30 to 150mm
	STD mode	0.1 to 3m	30 to 250mm
	U-LG mode	0.1 to 5m	30 to 500mm
Operation indicator		Orange LED (Lights up when amplifier output is ON)	
Laser emission indicator		Green LED (Lights up when laser is emitted)	
Ambient temperature		-10 to +55℃ (No dew condensation or icing allowed), Storage: -20 to +70℃	
Ambient humidity		35～85% RH, Storage: 35～85% RH	
Emitting element		Red semiconductor laser Class 1 (IEC / JIS / GB standard) (Max. output: 1mW or less, Peak emission wavelength: 655nm)	
Material		Enclosure: PBT (Attachment: PEI), Lens cover: Acrylic	
Cable		0.1mm² shielded cable, 2m long	
Weight		30g approx.	
Accessories		Connector for amplifier: 1 pc. **RF-330** (Reflector): 1 pc. Warning label: 1 pc. (Chinese)	Connector for amplifier: 1 pc. Warning label: 1 pc. (Chinese)

Notes: 1) The model No. with suffix '**-C5**' stands for the 5m cable length type.
(e.g.) **LS-H91A-C5**
2) The model No. of retroreflective type sensor with the suffix '**-Y**' is the sensor without the **RF-330** reflector. Arrange the reflector separately.
(e.g.) **LS-H91-A-Y**
3) Configure the mode settings in the applicable amplifier **LS-400** series.

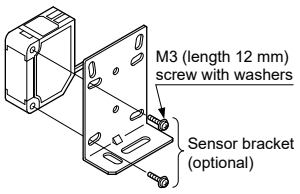
3 CAUTIONS

This product has been designed to meet the specifications when it is used along with the optional exclusive amplifier. If an amplifier other than the exclusive amplifier is used, not only the specifications may not be met, but it may also be a cause for malfunction or break down. Hence, please ensure to use this product along with the optional exclusive amplifier.

- This product has been developed / produced for industrial use only.
- Always use the sensor with the connector to be joined to the amplifier.
- Make sure that the power is off while wiring to the amplifier.
- In case noise generating equipment (switching regulator, inverter motor etc.) is used in the vicinity of this product, connect the frame ground (F.G.) terminal of the equipment to an actual ground.
- If power is supplied from a commercial switching regulator, ensure that the frame ground (F.G.) terminal of the power supply is connected to an actual ground.
- Do not use the sensor during the initial transient time (0.5 sec.) just after the power supply is switched on.
- Do not run the wires together with high-voltage lines or power lines or put them in the same raceway. This can cause malfunction due to induction.
- Take care that the sensor head is not directly exposed to fluorescent lamp from a rapid-starter lamp or a high frequency lighting device, as it may affect the sensing performance.
- The sensor head cable cannot be extended.
- Make sure that stress is not applied directly to the sensor head cable joint.
- This sensor is suitable for indoor use only.
- Do not allow any water, oil fingerprints, etc., which may refract light, or dust, dirt, etc., which may block light, to stick to the emitting / receiving surfaces of the sensor head. In case they are present, wipe them with a clean, soft cloth or lens paper.
- Do not use the sensor in vaporous, dusty or corrosive gas atmospheres.
- Take care that the sensor does not come in contact with water, oil, grease or organic solvents, such as, thinner, etc.
- Make sure that the power is off while cleaning the emitting / receiving windows of the sensor head.

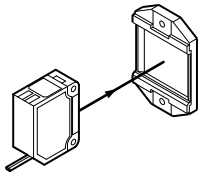
4 MOUNTING

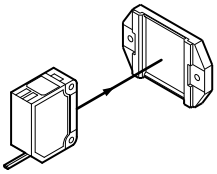
● The tightening torque should be 0.5N・m or less.



● When placing the sensor horizontally or vertically, the reflector must also be positioned horizontally or vertically as shown in Fig. 1 below. If the sensor is placed horizontally or vertically but the mirror is tilted as shown in Fig. 2 below, the reflection amount will decrease, which may cause unstable detection.

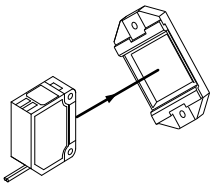
<Fig. 1 Proper positioning>
Mount the reflective mirror horizontally or vertically toward **LS-H□-A**.





Good

<Fig. 2 Improper positioning>
The reflective mirror must not be tilt toward the LS-H□-A.



Not good

5 COAXIAL RETROREFLECTIVE TYPE (Only for LS-H91-A)

● In principle, the coaxial retroreflective type (**LS-H91-A**) may be unable to detect a mirror object or an object which easily diffuses the receiving light at a short sensing distance since the polarized light becomes unstable. In this case, take the following measures.

<Measures>

- Lower the sensitivity of M.G.S. function of the amplifier.
- Change the response time.
- Make the distance between the sensor head and the sensing object farther.

● The receiving light intensity may change depending on the surface condition of the reflector. When a threshold value is set with the applicable amplifier **LS-400** series, sufficient margin should be taken into account.

6 SPOT-SIZE ADJUSTER (Only for LS-H21-A)

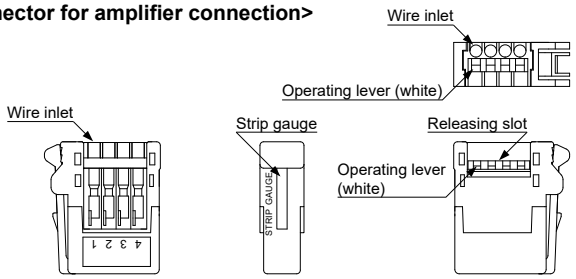
● The diffuse reflective type (**LS-H21-A**) incorporates the spot-size adjuster to adjust the size of spot diameter.

Spot-size adjuster	Description
	Turn the spot-size adjuster clockwise or counterclockwise to adjust the spot diameter at your desired detecting distance. However, if the adjuster is over turned, it may be damaged.

7 WIRE CONNECTION

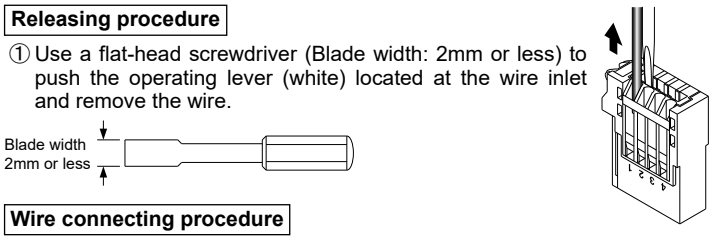
● The cable of sensor head can be shortened to your desired length. However, it cannot be extended.

<Connector for amplifier connection>



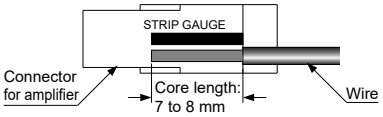
Releasing procedure

① Use a flat-head screwdriver (Blade width: 2mm or less) to push the operating lever (white) located at the wire inlet and remove the wire.

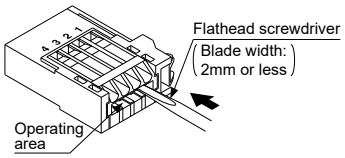


Wire connecting procedure

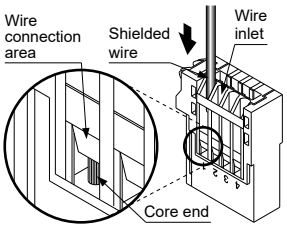
① Process the core length to 7 to 8 mm in accordance with '**STRIP GAUGE**' indicated on the side of this unit, and twist the core several times.
When using shielded wires, twist the wire until obtaining the diameter of ϕ1.2 mm or less.

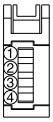


② Use a flathead screwdriver (Blade width: 2 mm or less) to push the operating lever (white) located at the operating area until it is locked.



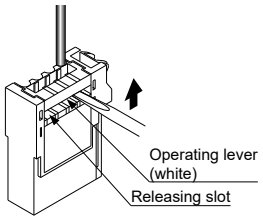
③ Insert the wire to the innermost of the wire inlet.
Check that the shielded wire is properly inserted into the wire inlet as well as that the core end has passed through the wire connection area as shown in the right figure.



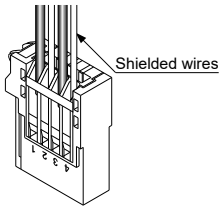


Terminal No.	Connecting cable	
①	Conductive core: Brown	Cable color: Gray
②	Shielded wire	
③	Conductive core: Yellow	Cable color: Black
④	Shielded wire	

④ Place the head of a flathead screw-driver underneath the operating lever (white) through the releasing slot, and lift the screw-driver head.
If you hear a snap, the operating lever (white) is returned and the wire is fixed.



⑤ Lightly pull the wire to ensure that wire is not loose. When using shielded wires, also check that they do not contact each other.



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