Panasonic **INSTRUCTION MANUAL**

Laser Sensor Head

LS-H Series

MJE-LSH No.0042-11V

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 standards, such as OSHA, ANSI or IEC etc., for personnel protection applicable in each region or country.
- Do not view direct beam by the unprotected eye or with an optical instrument. Lasers are potentially hazardous.
- 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 6802-2005 "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 2 laser products**" according to IEC 60825-1-2007 (JIS C 6802-2005) "Safety of laser products".

- **Laser hazardous class**
  Classification according to IEC 60825-1-2007 (JIS C 6802-2005)

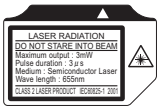
Class	Description of hazardous evaluation
Class 1	Safe under reasonably foreseeable conditions of operation
Class 1M	Safe under reasonably foreseeable conditions of operation, except for diverging or large area beams when collecting optics used. Hazardous when collecting optics used.
Class 2	Visible beam, low power. Blink response of eye affords protection.
Class 2M	Visible beam, low power. Blink response of eye affords protection. Hazardous when collecting optics used.
Class 3R	Direct intrabeam viewing is hazardous, but risk is lower than for 3B.
Class 3B	Direct intrabeam viewing is always hazardous.
Class 4	High power. Capable of producing hazardous diffuse reflections. Capable of producing skin burns and fire hazardous.

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

・ **Warning label**

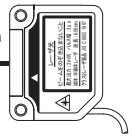
In Japanese (Based on JIS C 6802)

In English (Based on IEC 60825-1)

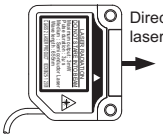


<Label position>

Direction of laser emission



Direction of laser emission



- 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)

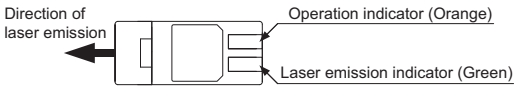
- If the affixed label on this product may not be visible after installation of the product, affix the accessory lable close to the product where you can see.

In Japanese

In English

In Chinese

・ **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 (Note 2)		Diffuse reflective type	
			Long sensing range	Long sensing range spot reflective	Long sensing range line reflective
Model No. (Note 1)		**LS-H91**	**LS-H92**	**LS-H21**	**LS-H22** (Note 3)
Applicable amplifier		**LS-400** series			
Sensing range (Note 4)	H-SP mode	0.1 to 3m	0.2 to 10m	30 to 300mm	30 to 300mm
	FAST mode	0.1 to 3m	0.2 to 10m	30 to 300mm	30 to 300mm
	STD mode	0.1 to 5m	0.2 to 20m	30 to 500mm	30 to 500mm
	U-LG mode	0.1 to 7m	0.2 to 30m	30 to 1,000mm	30 to 1,000mm
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 2 (IEC/JIS/GB standard) (Max. output: 3mW 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 (Japanese / English / Chinese) : 1 set	Connector for amplifier: 1 pc. **RF-230** (Reflector) : 1 pc. Warning label (Japanese / English / Chinese) : 1 set	Connector for amplifier: 1 pc. Warning label (Japanese / English / Chinese) : 1 set	Connector for amplifier: 1 pc. **LS-MR1** (Lens attachment for line reflective type): 1 pc. Warning label (Japanese / English / Chinese) : 1 set

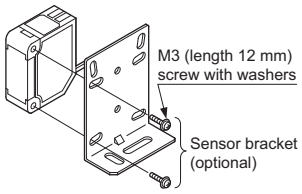
Notes: 1) The model No. with suffix '**-C5**' stands for the 5m cable length type.
(e.g.) **LS-H91-C5**
2) The model No. of retroreflective type sensor with the suffix '**-Y**' is the sensor without the **RF-330** and **RF-230** reflector. Arrange the reflector separately.
(e.g.) **LS-H91-Y**
3) **LS-H22** is the model No. for the long sensing range spot reflective type (**LS-H21**) with the lens attachment for line reflective type (**LS-MR1**). '**LS-H21**' is indicated on the actual product.
4) 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.

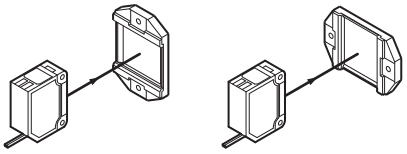
- This product has been developed / produced for industrial use only.
- Always use the sensor with the connector to be joined to the amplifier.
- Make sure that the power is off while wiring to the amplifier.
- In case noise generating equipment (switching regulator, inverter motor etc.) is used in the 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 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



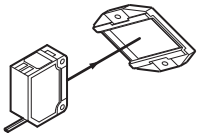
- The tightening torque should be 0.5N·m or less.
- When placing the sensor horizontally or vertically, the reflector must also be positioned horizontally or vertically as shown in Fig. 1 below.
  If the sensor is placed horizontally or vertically but the mirror is tilted as shown in Fig. 2 below, the reflection amount will decrease, which may cause unstable detection.

<Fig. 1 Proper positioning>
When placing the sensor horizontally or vertically, the reflector shall also be positioned horizontally or vertically.



Good

<Fig. 2 Improper positioning>
When placing the reflector tilted even when the sensor is positioned horizontally or vertically.



Not good

Note: The diagrams above are examples for the sensor head (**LS-H91**) with the reflector (**RF-330**).
For the sensor head (**LS-H92**) with the reflector (**RF-230**), take care of the posisioning as well.

5 COAXIAL RETROREFLECTIVE TYPE (Only for LS-H91 and LS-H92)

- In principle, the coaxial retroreflective type (**LS-H91** and **LS-H92**) 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 receiving light sensitivity with the 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 accout.
- **LS-H92** is in super high sensitivity setting. Thus, the output may be unstable since it can be easily affected by extraneous noise. In this case, lower the the receiving light sensitivity with the M.G.S. function. The sensing distance depends on the receiving light sensitivity as shown in the table below.

M.G.S. function / Response time	Level 4	Level 3	Level 2	Level 1
H-SP, FAST	—	10m	4m	3m
STD	—	20m	8m	5m
U-LG	30m	20m	10m	7m

Note: The value above is with the reflector (**RF-230**).

6 SPOT-SIZE ADJUSTER (Only for LS-H21 and LS-H22)

- The diffuse reflective type (**LS-H21** and **LS-H22**) incorporates the spot-size adjuster to adjust the size of spot diameter.

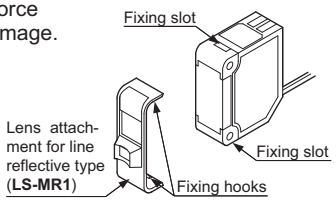
Spot-size adjuster	Description
	Turn the spot-size adjuster clockwise or counterclockwise to adjust the spot diameter at your desired detecting distance. However, if the adjuster is over turned, it may be damaged.

7 LENS ATTACHMENT FOR LINE REFLECTIVE TYPE (LS-MR1) (Only for LS-H21 and LS-H22)

- The lens attachment for line reflective type (**LS-MR1**) mounted in the long sensing range line reflective type (**LS-H22**) is removable.
  When **LS-H22** is used without **LS-MR1**, it will provide the equivalent performance to the long sensing range spot reflective type (**LS-H21**). In addition, the optional **LS-MR1** can be attached to **LS-H21** to obtain the performance equivalent to **LS-H22**.
- Keep the lens from dust, dirt, water, oil, grease, etc.
- Do not apply any excessive bending force to **LS-MR1**. Such force may cause damage.

Removing method

① Insert a screwdriver into the fixing slot located at the top of sensor.
② Tilt the screwdriver inserted in Step ① to remove **LS-MR1**.



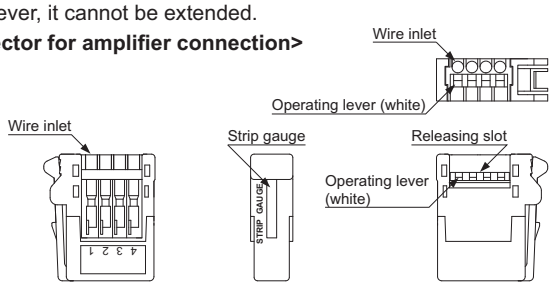
Mounting method

① The size of upper fixing hook of **LS-MR1** is not same as lower fixing hook.
After confirming upper and lower fixing hooks, insert **LS-MR1** upper fixing hook into the fixing slot at the top of sensor and then insert **LS-MR1** lower fixing hook into the fixing slot at the bottom of sensor.
② After mounting, check that **LS-MR1** is properly fixed to the sensor.

8 WIRE CONNECTION

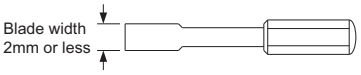
- The cable of sensor head can be shortened to your desired length. However, it cannot be extended.

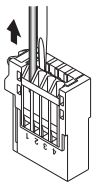
<Connector for amplifier connection>



Releasing procedure

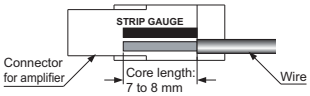
① Use a flat-head screwdriver (Blade width: 2mm or less) to push the operating lever (white) located at the wire inlet and remove the wire.



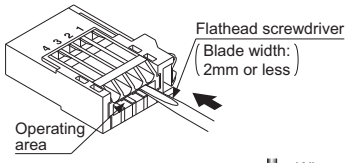


Wire connecting procedure

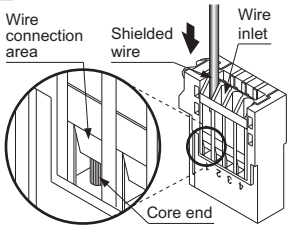
① Process the core length to 7 to 8 mm in accordance with '**STRIP GAUGE**' indicated on the side of this unit, and twist the core several times.
When using shielded wires, twist the wire until obtaining the diameter of ϕ1.2 mm or less.

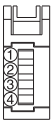


② Use a flathead screwdriver (Blade width: 2 mm or less) to push the operating lever (white) located at the operating area until it is locked.



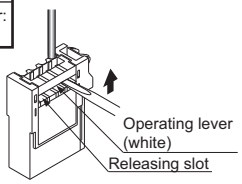
③ Insert the wire to the innermost of the wire inlet.
Check that the shielded wire is properly inserted into the wire inlet as well as that the core end has passed through the wire connection area as shown in the right figure.



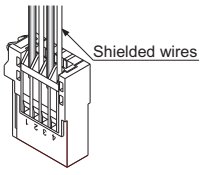


Terminal No.	Connecting cable	
①	Conductive core: Brown	Cable color: Gray
②	Shielded wire	
③	Conductive core: Yellow	Cable color: Black
④	Shielded wire	

④ Place the head of a flathead screwdriver underneath the operating lever (white) through the releasing slot, and lift the screwdriver 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.



9 INTENDED PRODUCTS FOR CE MARKING

- The models listed under "**2 SPECIFICATIONS**" come with CE Marking.
  As for all other models, please contact our office.
- **Contact for CE**
  Panasonic Marketing Europe GmbH Panasonic Testing Center
  Winsbergring 15, 22525 Hamburg,Germany

Panasonic Industrial Devices SUNX Co., Ltd.

http://panasonic.net/id/pidsx/global

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