

**Laser Sensor Head
LS-H□**

CMJE-LSH100 No.0046-86V

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 INTENDED PRODUCTS FOR CE MARKING

- This product complies with the following standards / regulations.

<EU Directive>

EMC Directive

• Contact for CE

Panasonic Marketing Europe GmbH Panasonic Testing Center
Winsbergring 15, 22525 Hamburg, Germany



2 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 1 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.

• Label

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



Certification / Identification label



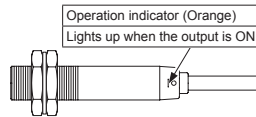
Warning label

• Label position

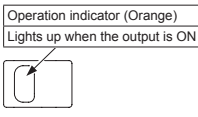


3 PART DESCRIPTION

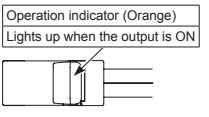
LS-H101□



LS-H102□



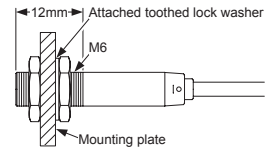
LS-H201□, LS-H901□



4 MOUNTING

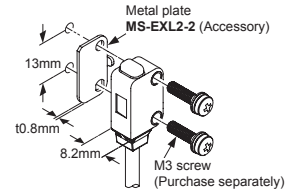
LS-H101□

- The tightening torque should be 0.98N·m or less.



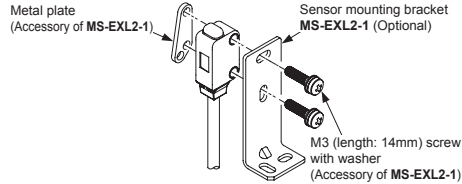
LS-H102□

- In case mounting this device, use a metal plate **MS-EXL2-2** (accessory).
- The tightening torque should be 0.5N·m or less with M3 screws.

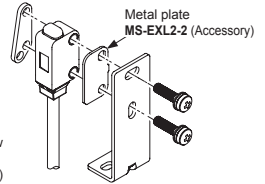


- In case using the dedicated sensor mounting bracket **MS-EXL2-1** (optional) when mounting this device, the metal plate **MS-EXL2-2** (accessory) is required depending on the mounting direction. Mount as the diagram below indicates.

<Not requiring the metal plate>

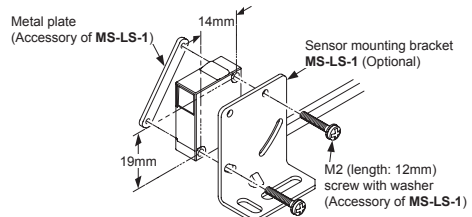


<Requiring the metal plate>



LS-H201□, LS-H901□

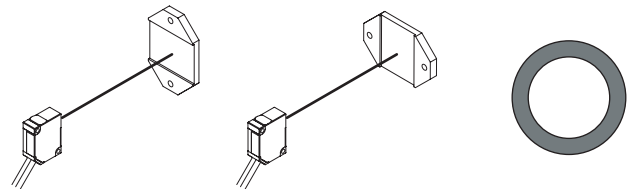
- The tightening torque should be 0.2N·m or less.



- 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.



<Fig. 2 Improper positioning>

- When placing the reflector tilted even when the sensor is positioned horizontally or vertically.



5 COAXIAL RETROREFLECTIVE TYPE LS-H901□

- In principle, the coaxial retroreflective type (LS-H901□) 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.

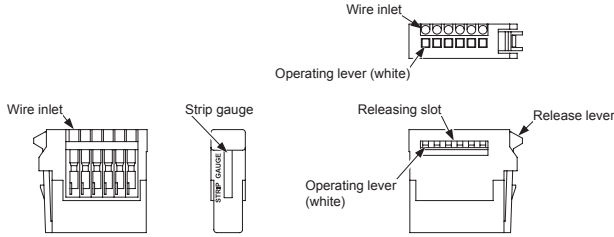
<Measures>

- Lower the receiving light sensitivity with the light-receiving sensitivity function of the amplifier.
- Change the response time.
- Make the distance between the sensor head and the sensing object farther.
- The receiving light sensitivity may change depending on the surface condition of the reflector. When a threshold value is set with the applicable amplifier LS-500 series, sufficient margin should be taken into account.

6 WIRE CONNECTION

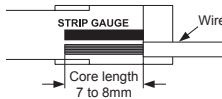
- The cable of sensor head can be shortened to your desired length. However, it cannot be extended.

<Connector for amplifier connection>

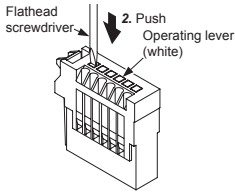
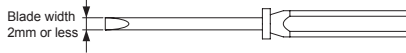


Wire connecting procedure

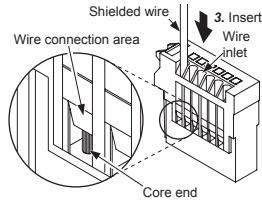
- Process the core length to 7 to 8mm in accordance with "STRIP GAUGE" indicated on the side of this unit, and twist the core several times. When using shielded wires, twist the wire until obtaining the diameter of $\phi 1.2\text{mm}$ or less.



- 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.

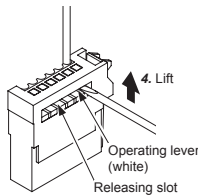


- Insert the wire to the innermost of the wire inlet. Check that the shielded wire is properly inserted into the wire inlet as well as that the core end has passed through the wire connection area as shown in the right figure.

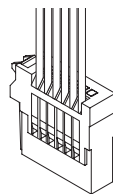


Terminal No.	Color	Connecting cable
1	Purple	Thru-beam type · Emitter: Gray Coaxial retroreflective type, Diffuse reflective type: Black (with gray stripe)
2	White	
3	Shield	
4	Shield	Thru-beam type · Receiver: Black Coaxial retroreflective type, Diffuse reflective type: Black
5	Black	
6	Pink	

- Place the head of a flathead screw-driver 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.

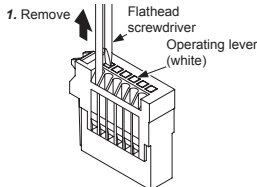


- Lightly pull the wire to ensure that wire is not loose.



Releasing procedure

- 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.



7 SPECIFICATIONS

Type	Thru-beam type		Coaxial retroreflective type (Note 1)	Diffuse reflective type	
	Cylindrical	Small			
Model No. (Note 2)	LS-H101	LS-H102	LS-H901	LS-H201	
Applicable amplifier	LS-500 series				
Sensing range (Note 3)	STD mode	0 to 1m	0 to 1m	0.01 to 1m	
	LONG mode			0 to 300mm	
	U-LG mode			0.01 to 1.5m	
	HYPR mode			0 to 450mm	
	H-SP mode			0.01 to 2m	
FAST mode	0.01 to 2.5m	0 to 600mm	0 to 750mm	0 to 150mm	0 to 200mm
Ambient temperature	-10 to +55°C (No dew condensation or icing allowed), Storage: -20 to +70°C				
Ambient humidity	35 to 85% RH, Storage: 35 to 85% RH				
Emitting element	Red semiconductor laser Class 1 (IEC / JIS / GB standard) (Max. output: 2mW or less, Peak emission wavelength: 660nm)				
Material	Enclosure: Stainless steel Front cover: Polycarbonate	Enclosure: Polyethylene terephthalate Front cover: Acrylic	Enclosure: Polybutylene terephthalate Front cover: Glass		
Cable	0.11mm ² (shielded wire: 0.16mm ²) shielded cable, 2m long				
Weight	Each emitter and receiver: Approx. 50g		Approx. 50g		
Accessories	M6 nut: 4 pcs. Toothed lock washer: 2 pcs.	MS-EXL2-2 (Metal plate): 2 pcs.	RF-330 (Reflector): 1 pc. MS-LS-1 (Metal plate): 1 pc.	MS-LS-1 (Metal plate): 1 pc.	

- Notes: 1) 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-H901-Y
- 2) The model No. with suffix "-C5" stands for the 5m cable length type. (e.g.) LS-H101-C5
- 3) Configure the mode settings in the applicable amplifier LS-500 series.

8 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 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.
- When using the thru-beam type LS-H101 or LS-H102, do not set the receiving light sensitivity (gctL) of the applicable LS-500 series amplifier to level 2 or less. This is because there is a possibility of sensing becoming unstable.
- 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.
- When carrying out teaching using the applicable LS-500 series amplifier, set a threshold which provides a reasonable margin. If there is insufficient margin, sensing will become unstable.
- This device is using a laser which has high directional quality. Therefore the beam possibly be out of alignment by the mounting condition of this device or distortion of housing etc. Make sure to adjust the beam axis alignment before use.
- Since vibration, impact and ambient temperature affect the sensitivity, the installation and the sensitivity adjustment must have some margins.

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PRINTED IN JAPAN

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