

Amplifier Built-in Type Laser sensor **EX-L200 Series**

MJE-EXL200 No.0075-89V

Thank you very much for purchasing Panasonic products. Please 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

- · 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.
- This product is classified as a "Class 1 laser product" by IEC / JIS standard, GB standard and FDA.
- Do not look the laser directly. Lasers are potentially hazardous. Furthermore, do not view the laser which is reflected at a specular object.
- Never disassemble, repair or modify the product.
- In case of control or adjustment using procedures other than those specified in this instruction manual, hazardous laser radiation exposure can result.

1 FOR SAFE USE OF A LASER PRODUCT

• In order to prevent user injury caused by a laser product, the following standards have been established in the IEC, JIS, GBand FDA standards.

This product are classified as "Class 1 laser products" according to The following standards. IEC: IEC 60825-1-2014 JIS: JIS C 6802-2014

- GB: GB 7247.1-2012
- This product complies with 21 CFR 1040.10 and 1040.11 based on Laser Notice No. 56, dated May 8, 2019, issued by CDRH (Center for Devices and Radiological Health) under FDA (Food and Drug Administration).

For details, refer to the Laser Notice No. 56.

• Laser hazardous class

Classification according to IEC 60825-1-2014 (JIS C 6802_{-2014}

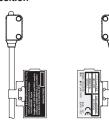
- Classification Description Class 1 Safe under reasonably foreseeable condition
- Label
- · Following labels are affixed on this product based on the IEC 60825-1-2014 standard

<Warning label>

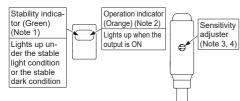


Certification / Identification label Warning label

<Label position>



2 PART DESCRIPTION

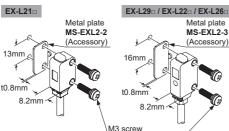


Notes: 1) Not incorporated on the emitter of thru-beam type. 2) It is the power indicator (Green: lights up when the power is ON) for the emitter of thru-beam type. It is not incorporated in emitter of EX-L211

It is not incorporated in EX-L212



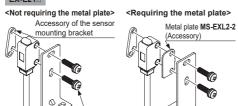
- . In case mounting this device, use a metal plate MS-EXL2-D (accessory). Without using the metal plate,beam misalignment may occur.Also,install the metal plate in between the sensor and the mouting surface.
- The tightening torque should be 0.5N·m or less with M3 screws



(Purchase separately)

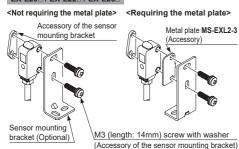
• In case using the dedicated sensor mounting bracket (optional) when mounting this device, the metal plate MS-EXL2 (accessory) is required depending on the mounting direction. Mount as the diagram below indicates

EX-L21

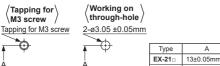


Sensor mounting M3 (length: 14mm) screw with washer bracket (Optional) sory of the sensor mounting bracket

EX-L290 / EX-L220 / EX-L260



 In case not using the metal plate MS-EXL2-□ (accessory) when mounting this product, work on the mounting hole as the diagram below indicates



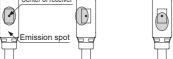
-





• After mounting the thru-beam type, be sure to adjust light axis of the emission spot to hit the center of the





4 WIRING

- · Make sure to use the cable with connector, CN-24A -C (optional), when connecting to the pigtailed type.
- Tighten the fixing ring of the cable with connector completely by hand when mounting. (The tightening torque: 0.2N·m) • If the fixing ring is tightened by a tool such as plires,
- it may cause connector damage.
- . If the tightening is not enough, the fixing ring may loosen due to vibration, etc.

Connecting method

· Insert the cable with connector into a connecting area of this product, and twist the fixing ring of the cable with connector to be fixed.



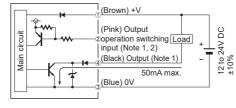
- Disconnecting method · Loosen the fixing ring and pull to separate the con-
- nector by holding the fixing ring.



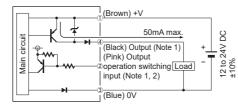
ing, be sure that the fixing ring is completely loo Note: Before disco ened. If the cable is pulled by excessive fo fixing ring is tightened, the cable may break ve force (15N or more) when the

5 I/O CIRCUIT DIAGRAMS

NPN output type



• PNP output type



Notes: 1) The emitter of thru-beam type dose not incorporate output (black) and output operation switching input (pink). 2) Be able to select either Light-ON or Dark-ON by wiring the output operation switching input (pink) as a following table

	Light-ON	Dark-ON
u-beam type or reflective type	Wire to 0V	Wire to +V or Open
t reflective type d-focus reflective Type	Wire to +V or Open	Wire to 0V

<Terminal arrangement>

Thru Mirro Spot



Note: The emitter of thru-beam type dose not incorporate output and output operation switching input

6 SENSITIVITY ADJUSTMENT Step

- 1. Turn the sensitivity adjuster fully counter-clockwise to the minimum sensitivity position (MIN).
- 2. In the light received condition, turn sensitivity adjuster slowly clockwise and confirm the point A where the sensor enters the "Light" state operation.
- 3. In the dark condition, turn sensitivity adjuster further clockwise until the sensor enters the "Light" state operation and then bring it back to confirm point B where the sensor just returns to the "Dark" state operation. / If the sensor does not enter the "Light" state operation even when the sensitivity adjuster is turned fully clockwise, this extreme position is point B.



MAX

[>] Max

> MIN

MIN

MIN

- 🖓 MAX IJ
- The position at the middle of point A and B is the optimum sensing position. Note: Use the flathead screwdriver (please arrange separately) to turn the adjust er slowly. Turning with excessive strength will cause damage to adjuste

7 AUTOMATIC INTERFERENCE PREVENTION FUNCTION

 Retororeflective type Spot reflective type and convergent type sensor incorporate this function. Up to two sets of sensor can be mounted closely. (Thrubeam type sensor does not 2 sensor heads can be have this function.)

mounted adjacently Note: If two spot reflective type sensor are mounted facing each other, they should be angle



8 POLARIZING FILTER PF-EXL2-1 (Optional) (Only for mirror reflective type EX-L291)

- By installing the polarizing filter PF-EXL2-1 (optional) to the mirror reflective type EX-L291, mirror surface object and glossy object are not detected.
- Install the polarizing filter to EX-L291 before mounting EX-L291 ...

Receiving section

Emitting section

Slide

Slide

Not Good

È

Receiving

section

Emitting

tab

Sliahtly

open

section

inting method

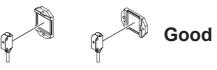
- 1. Face up a large window of front side of the polarizing filter 2. Slide from sensing side
- and push until it clicks.

Removing method

- 1 Open the side (tabs on the side) of the polarizing filter with flat-blade screwdriver and push the the polarizing filter.
- Notes: 1) When removing the polarizing filter, opening widely makes the filter lose original form and it cannot be use again.
 2) Be sure not open the polarizing filter by flinger, it may lead injury. 3) Be sure not contacting with water etc. when the polarizing filter is mo
 - Be sure not contacting with water etc. when the polarizing filter is mounted.
 Do not contaminate with fingerprints or skin oil on the polarizing filter
 In case mounting polarizing filter, make sure leave 400mm or more between this product and the reflective mirror RF-330 (optional.)
 In case installing the reflective mirror at close distance, the angular characteristic becomes narrow. Conduct fine adjustment of angle for this product or the reflective mirror.
- · When using the polarizing filter (optional), need attention to mount reflective mirror shown below.

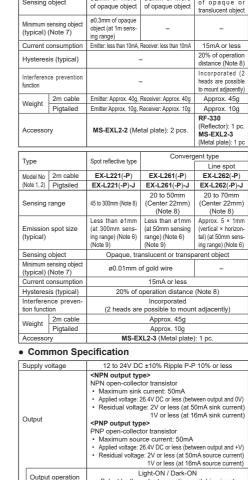
<Correct mounting method>

 Mount the reflective mirror horizontally or vertically toward EX-L291



<Correct mounting method>

The reflective mirror must not be tilt toward the EX-L291



Short-circuit protectio

mbient temperature

Ambient humidity

Emitting element

100mm).

Material

Cable

Response time

Protection

9 SPECIFICATIONS

Individual Specification

(Note 1, 2) Pigtailed EX-L211(-P)-J

Model No 2m cable

ensing range

typical)

mission spot size

sing object

EX-I 211(-P)

nrox 6 x 4mr

(vertical × horizor tal) (at 1m sensin

range) (Note 4)

ø2mm or mo

m type	Retroreflective type		
Long distance	iven oreliective type		
EX-L212(-P)	EX-L291(-P)		
EX-L212(-P)-J	EX-L291(-P)-J		
	4m [with reflective		
3m	mirror RF-330 (ac-		
	cessory)] (Note 3)		
Approx. 8 × 5.5mm	Approx. 6 × 4mm		
(vertical × horizon-	(vertical × horizon-		
tal) (at 1m sensing	tal) (at 1m sensing		
range) (Note 4, 5)	range) (Note 6) ø25mm or more		
ø3mm or more	of opaque or		
of opaque object	translucent object		
-	_		
eceiver: less than 10mA	15mA or less		
	20% of operation		
	distance (Note 8)		
	Incorporated (2		
	heads are possible		
	to mount adjacently)		
eceiver: Approx. 40g	Approx. 45g		
eceiver: Approx. 10g	Approx. 10g		
	RF-330		
al plate): 2 pcs.	(Reflector): 1 pc. MS-EXL2-3		
	(Metal plate): 1 pc		
Convergent type			
	Line spot		
EX-L261(-P)	EX-L262(-P)		
EX-L261(-P)-J	EX-L262(-P)-J		
20 to 50mm	20 to 70mm		
(Center 22mm)	(Center 22mm)		
(Note 8)	(Note 8)		
Less than ø1mm	Approx. 5 × 1mm		
(at 50mm sensing range) (Note 6)	(vertical × horizon- tal) (at 50mm sens-		
(Note 9)	ing range) (Note 6)		
slucent or transparent object			
gold wire	-		
15mA or less			
peration distance (Note 8)			
Incorporated			
possible to mount adjacently)			
Approx. 45g			
Approx. 10g			
2-3 (Metal plate): 1 pc.			
· /			

12 to 24V DC ±10% Ripple P-P 10% or less

Maximum source current: SUMA Applied voltage: 26.4V DC or less (between output and +V) Residual voltage: 2V or less (at 50mA source current) 1V or less (at 16mA source current)

Light-ON / Dark-ON

Select by the output operation switching input

Incorporated

0.5ms or les IP67(IEC)

10 to +55°C (No dew condensation or no icing condi torage: -30 to +70°C

35 to 85% RH, Storage: 35 to 85% RH conductor laser class 1 (IEC / JIS / GB / FDA Peak emission wavelength: 655nm,

ximm output: 0.39mW for EX-L21a, 0.5mW for EX-L291a 2mW for EX-L221a, 1mW for EX-L261a 1.3mW for EX-L262a

Enclosure: PBT, Front cover / Light-receiving lens: Acyli Light-emitting lens: Glass, Indicator: Polyarylate 2m cable 0.15mm² 4-core (emitter: 2-core) cabtyre cable, 2m long

Pigtailed 0.15mm² 4-core (emitter: 2-core) cabtyre cable, 0.2m long Notes: 1) The model No. with suffix "E" shown on the label affixed is the emitter,

"D" shown on the label is the receiver Emitter: EX-I 211E Receiver: EX-I 211D

Emitter: Ex-L211E, Receiver: Ex-L211D 2) The model No. with suffix "P" is PNP output model. <Example> PNP output model of EX-L211 is "EX-L211-P." The model No. with suffix "C5" is 5m cable model. <Example> Sm cable model of EX-L211-P is "EX-L211-P.C5." The model No. with suffix "Y" is no reflector type. <Example> No reflector type of EX-L291-P is "EX-L291-P.Y." Note: Sm Cable Sm C

3) Make sure leave 200mm or more between this product and the reflective

Make sure leave 200mm or more between this product and the reflective mirror RF-330 (accessory.)
 The beam of emitter may enter receiver even if it is out of the range of the emission spot. In case using this devices as cascaded, we recom-mend to mount emitters and receivers alternately. In case mounting this devices in another method, be sure to check the operation with this devices.

5) In case the sensing distance is 3m, the emission spot size is 17 × 11mm

In case the sensing distance is 3m, the emission spot size is 1/ × 11mm (vertical × horizontal) (visual reference value.)
 in case high reflective object is existing between this product and the sensing object, this product may detect it.
 Make sure to confirm detection with an actual sensor before use.
 The sensing distance and the hysteresis of spot refractive type and fixed-focus reflective type is value for non-gloss white paper (100 × 100 m)

9) The value is defined based on 1/e2 (13.5%) of the center light intensity

<Elbow cable> CN-24AL-C2 (Cable length : 2m), CN-24AL-C5 (Cable length : 5m)

10 CAUTIONS

- This product has been developed / produced for industrial use only.
- Make sure to carry out wiring in the power supply OFF condition.
- Take care that if a voltage exceeding the rated range is applied, or if an AC power supply is directly connected, the product may get burnt or damaged
- Take care that short circuit of the load or wrong wiring may burn or damage the product. 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.
- · Verify that the supply voltage variation is within the rating.
- 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 around.
- In case equipment generating noise (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.
- · Do not use during the initial transient time (approx 50ms) after the power supply is switched ON.
- . In case the load and this sensor are connected to different power supplies, be sure to turn ON the power from the sensor.
- Extension up to total 100m or less, is possible with more than 0.3mm² of electric conductor cross-sectional area cable. However, in order to reduce noise. make the wiring as short as possible
- Make sure that stress by forcible bend or pulling is not applied to the sensor cable joint.
- The cable may break by applying excess stress in low temperature.
- Take care that the sensor is not directly exposed to fluorescent lamp from a rapid-starter lamp, a high frequency lighting device or sunlight etc., as it may affect the sensing performance.
- In case of mounting the fixed-focus reflective type, the sensing may be influenced from reflective object in the back ground of the sensing object such as conveyor. In case of sensing the reflective object, mount the senor with some angles or keep distance from the reflective object when mounting the sensor.
- This product 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 this sensor in places having excessive vapor, dust, etc., or where it may come in contact with corrosive gas, etc.
- Take care that the sensor does not come in contact with oil, grease, organic solvents such as thinner, etc., strong acid, or alkaline.
- Make sure that the power is OFF while cleaning the emitting / receiving windows of the sensor head.
- 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 axe alignment before use.
- Since vibration, impact and ambient temperature affect the sensitivity, the insulation and the sensitivity adjustment must have some margins.

III CE MARKED PRODUCT

• The model listed under "9 SPECIFICA-TIONS" comes with CE Marking. As for all other models, please contact our sales office



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