

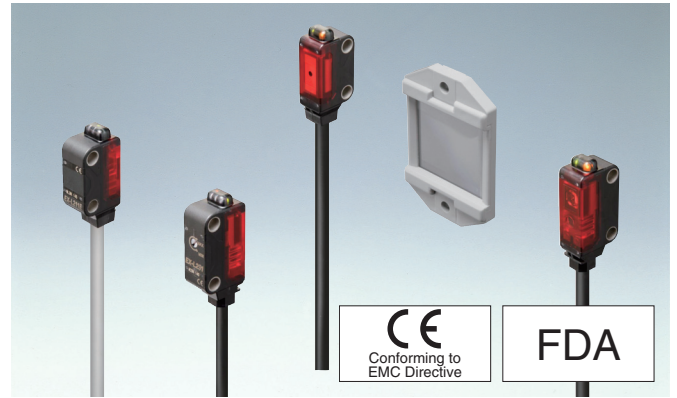
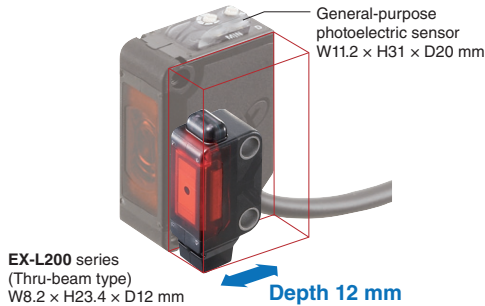
# Laser Sensors

## Amplifier Built-in • Ultra-compact Laser Sensor **New** EX-L200 SERIES

### Built-in amplifier in this size?

#### Ultra-compact

The customized IC and the new structural design pursue a compact size. With its volume being approx. 67 % decreased (thru-beam type) and approx. 58 % decreased (reflective type) from general photoelectric sensors, an amplifier built-in laser sensor is now offered in a compact body that is in the range of conventional ultra-compact photoelectric sensors.



### Strong against water and dust with protection structure IP67

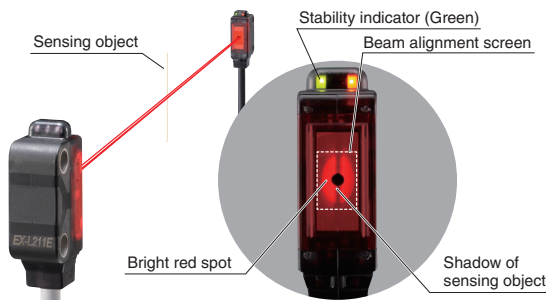


### M3 screw used for secure tightening

The mounting holes have metal sleeves inserted to prevent damage to the sensor due to over tightening of the screws. It is possible to tighten securely with M3 screws. (Tightening torque: 0.5 N·m)

### Beam alignment is easy EX-L211 EX-L212

Beam alignment is carried out by looking at the red spot reflected on the beam alignment screen to match with the actual object. The optimum position can be understood at a glance by looking at the beam alignment screen and stability indicator (green).



Even the shadow of the sensing object is reflected to make alignment effortless!

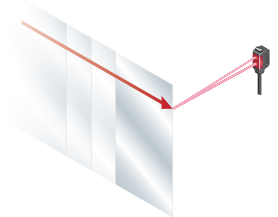
### Min. sensing object $\phi$ 0.3 mm (typical) EX-L211

The  $\phi$ 0.5 mm light receiving slit cuts out any unnecessary beam. As only the beam which enters into the slit becomes valid, an accurate and precise detection is possible. This is effective for minute object detection or small difference in level detection.



### Suitable for positioning and minute object detection EX-L221

A repeatability of 0.02 mm or less at a range of from 100 mm to 200 mm makes this type best suitable for positioning applications. Moreover, it boasts a top-class detection precision in the compact laser sensor category with its min. sensing object being  $\phi$ 0.01 mm.

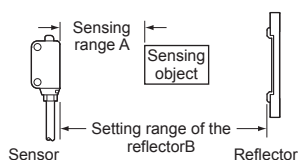


### Sensitivity adjuster EX-L211 EX-L291 EX-L221

A sensitivity adjuster of world smallest size is incorporated to offer strong performance in minute detection or high precision detection.

Item	Type		Thru-beam		Retroreflective	Spot reflective
			Minute object detection	Long sensing range	Long sensing range	Minute object detection
	Model No.	NPN output PNP output	EX-L211 EX-L211-P	EX-L212 EX-L212-P	EX-L291 EX-L291-P	EX-L221 EX-L221-P
Sensing range			1 m	3 m	4 m (Note 3)	45 to 300 mm (for non-gloss white paper 100 × 100mm)
Emission spot size (Typical)			6 × 4 mm (vertical × horizontal) (at a sensing distance of 1 m)	8 × 5.5 mm (vertical × horizontal) (at a sensing distance of 1 m)	6 × 4 mm (vertical × horizontal) (at a sensing distance of 1 m)	$\phi$ 1 mm or less (at a sensing distance of 300 mm)
Sensing object			Opaque object of $\phi$ 2 mm or more	Opaque object of $\phi$ 3 mm or more	Opaque or translucent object of $\phi$ 2.5 mm or more	Opaque, translucent or transparent object
Minimum sensing object (Typical)			Opaque object of $\phi$ 0.3 mm	—	—	Gold wire of $\phi$ 0.01 mm
Repeatability			Perpendicular to sensing axis: 0.05 mm or less		Perpendicular to sensing axis: 0.2 mm or less	
Supply voltage			12 to 24 V DC $\pm$ 10 % Ripple P-P 10 % or less			
Output			NPN open-collector transistor or PNP open-collector transistor			
Response time			0.5 ms or less			
Interference prevention function			—		Incorporated (Two sensors can be mounted close together.)	
Ambient temperature			-10 to +55 °C			
Emitting element			Red semiconductor laser class 1 (IEC / JIS), Class I (FDA) (Maximum output (EX-L211/212) $\square$ 390 $\mu$ W, EX-L291 $\square$ 0.5 mW, EX-L221 $\square$ 2 mW), Peak emission wavelength: 655 nm)			

- Notes: 1) In the case sensing distance is 3 m, the emission spot size is 17 × 11 mm (vertical × horizontal)(visual reference value).  
2) This product complies with 21 CFR 1040.10 and 1040.11 Laser Notice No. 50, dated June 24, 2007, issued by CDRH (Center for Devices and Radiological Health) under the FDA (Food and Drug Administration). For details, refer to the Laser Notice No. 50.  
3) The sensing range is the value for RF-330 reflector (accessory). The sensing range represents the actual sensing range of the sensor. The sensing ranges itemized in "A" of the table below may vary depending on the shape of sensing object. Be sure to check the operation with the actual sensing object.



	EX-L291	
		With PF-EXL2-1 polarizing filters (optional)
A	0 to 4 m	0 to 4 m
B	0.2 to 4 m	0.4 to 4 m