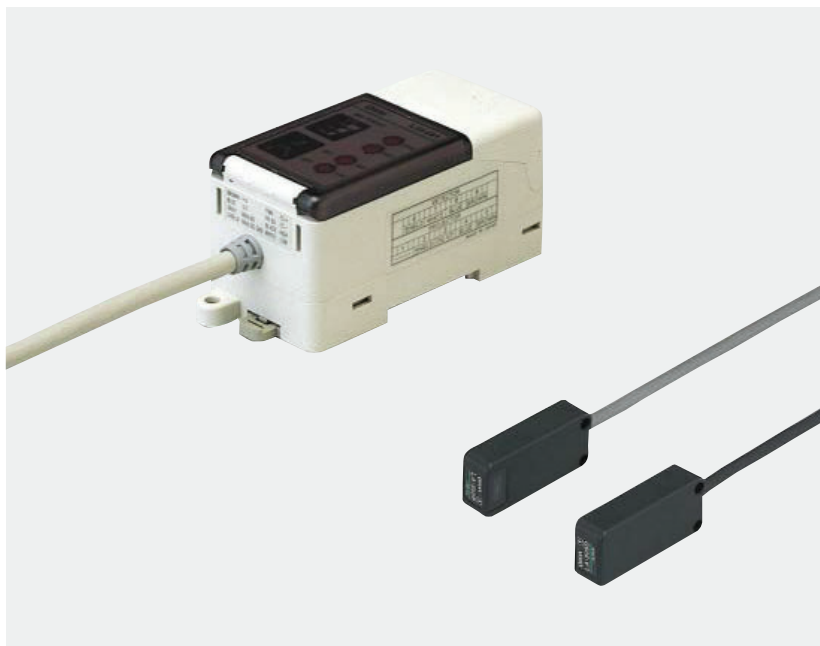


For complete technical and application support contact Ramco Innovations

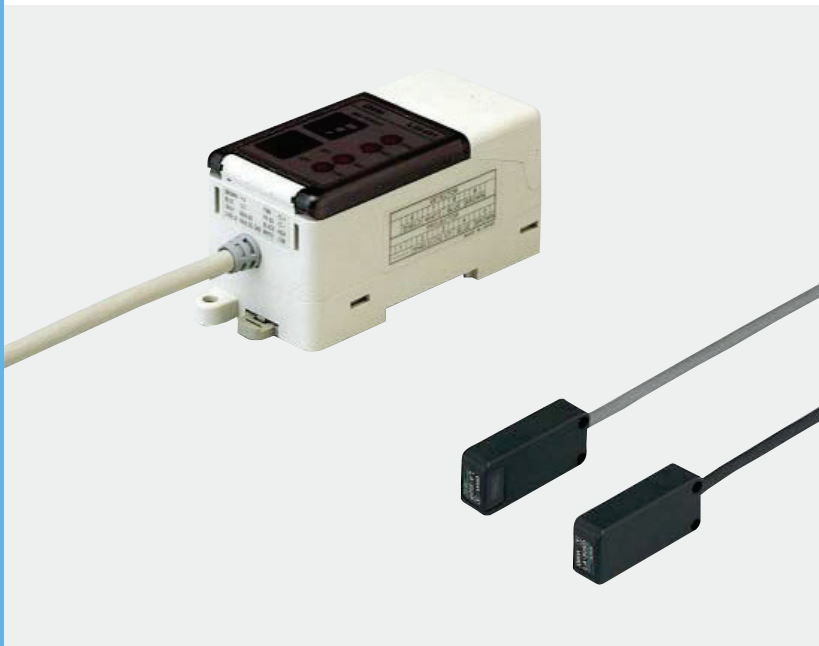
LED Collimated Beam Sensor

LA-300 SERIES



LA-300 SERIES

For complete technical and application support contact Ramco Innovations

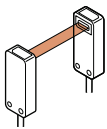



CE

LED collimated beam type which is as accurate as a laser sensor, but much safer

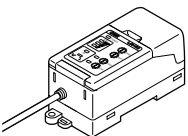
ORDER GUIDE

Sensor heads

Type	Appearance	Sensing range	Sensing width	Minimum sensing object	Model No. (Note)
Slim		 300 mm 11.811 in	5 mm 0.197 in	ø0.05 mm ø0.002 in opaque object	LA-305

Note: The model No. with suffix "P" shown on the label affixed to the product is the emitter, "D" shown on the label is the receiver.
(e.g.) Emitter of **LA-305**: **LA-305P**, Receiver of **LA-305**: **LA-305D**

Amplifiers

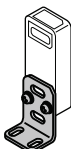
Type	Appearance	Model No.	Output
NPN output		LA-A1	NPN open-collector transistor (Judgment output) Analog voltage • Output voltage: 1 to 5 V

Always use the sensor head and the amplifier together as a set.

ORDER GUIDE

Accessories

- **MS-LA3-2**
(Sensor head mounting bracket for **LA-305**)
(Note)



Two M3 (length 15 mm 0.591 in)
screws with washers are attached.

Note: 2 sets are required to mount the emitter and the receiver.

OPTIONS

Designation	Model No.	Description
Digital panel controller (Note)	CA2-T2	<p>This is a very small controller which allows two independent threshold level settings.</p> <ul style="list-style-type: none"> • Supply voltage: 24 V DC $\pm 10\%$ • Output: NPN open-collector transistor • No. of inputs: 1 No. (sensor input) • Input range: 1 to 5 V DC • Main functions: Threshold value setting function, zero-adjust function, scale setting function, hysteresis setting function, start/hold function, auto-reference function, power supply ON-delay function, etc.

Digital panel controller

- **CA2-T2**



Note: If analog voltage output of **LA-A1** is shifted, the input range may be exceeded. In that case, use **CA2-T5** (input range ± 10 V).

SPECIFICATIONS

Sensor head

Item	Type	Slim
	Model No.	LA-305
CE marking directive compliance	EMC Directive, RoHS Directive	
Applicable amplifier	LA-A1	
Beam width	5 mm 0.197 in	
Sensing range	300 mm 11.811 in	
Min. sensing object	$\varnothing 0.05$ mm $\varnothing 0.002$ in opaque object	
Repeatability	Perpendicular to sensing axis: 0.01 mm 0.0004 in or less	
Temperature characteristics	0.2 % F.S./°C or less	
Emission indicator	—	
Environmental resistance	Pollution degree	3 (Industrial environment)
	Ambient temperature	0 to +40 °C +32 to +104 °F (No dew condensation), Storage: -20 to +70 °C -4 to +158 °F
	Ambient humidity	35 to 85 % RH, Storage: 35 to 85 % RH
	Ambient illuminance	Incandescent light: 10,000 lx or less at the light-receiving face
	Voltage withstandability	1,000 V AC for one min. between all supply terminals connected together and enclosure
	Insulation resistance	20 M Ω , or more, with 250 V DC megger between all supply terminals connected together and enclosure
	Vibration resistance	10 to 150 Hz frequency, 0.75 mm 0.030 in double amplitude in X, Y and Z directions for two hours each
Shock resistance	500 m/s ² acceleration (50 G approx.) in X, Y and Z directions three times each	
Emitting element	Red LED (Peak emission wavelength 650 nm 0.026 mil, modulated)	
Material	Enclosure: Heat-resistant ABS, Cover: Heat-resistant ABS, Front cover: Glass	
Cable	0.18 mm ² 3-core composite cable, 2 m 6.562 ft long	
Cable extension	Extension up to total 10 m 32.808 ft is possible, for both emitter and receiver, with 0.18 mm ² , or more, cable. (Shield wire must be extended with shield wire.)	
Net weight	Emitter: 70 g approx., Receiver: 70 g approx.	
Accessories	MS-LA3-2 (Sensor head mounting bracket): 1 set for emitter and receiver, Target label: 2 pcs.	

Note: Where measurement conditions have not been specified precisely, the conditions used were an ambient temperature of +20 °C +68 °F.

SPECIFICATIONS

Amplifier

Item	Type	NPN output type
	Model No.	LA-A1
Applicable CE marking directives	EMC Directive, RoHS Directive	
Applicable sensor head	LA-305	
Supply voltage	12 to 24 V DC $\pm 10\%$ Ripple P-P 10 % or less	
Current consumption	120 mA or less (including sensor heads)	
Comparative outputs (HIGH, LOW)	NPN open-collector transistor <ul style="list-style-type: none"> Maximum sink current: 100 mA Applied voltage: 30 V DC or less (between comparative output and 0 V) Residual voltage: 1.5 V or less (at 100 mA sink current) 0.5 V or less (at 16 mA sink current) 	
	Response time	0.5 ms or less
	Output operation	HIGH output: ON when the received beam level is equal to or lower than HIGH (Over-dark) level LOW output: ON when the received beam level is equal to or higher than LOW (Under-dark) level
	Short-circuit protection	Incorporated
Analog output	Analog voltage <ul style="list-style-type: none"> Output voltage: 1 V (Darkest) to 5 V (Lightest) Output impedance: 75 Ω 	
	Slew rate	8 V/ms or more
	Temperature characteristics	0.05 % F.S./°C or less
External synchronization	Incorporated (Either gate trigger or edge trigger is selectable)	
Indicators	Power	Green LED (lights up when the power is ON)
	Stable incident beam	Three green LEDs (light up in three stages in proportion to the amount of beam received)
	Operation	Two orange LEDs (light up when High and Low comparative outputs are ON, respectively)
	External synchronization	Green LED (lights up when the comparative outputs are effective)
Adjusters	Span	15-turn adjuster sets the span for the analog output voltage
	Shift	15-turn adjuster sets the offset for the analog output voltage
	HIGH (Over-dark) level	15-turn adjuster sets the HIGH output threshold level (Over-dark level)
	LOW (Under-dark) level	15-turn adjuster sets the LOW output threshold level (Under-dark level)
Environmental resistance	Ambient temperature	0 to +50 °C +32 to +122 °F (No dew condensation allowed), Storage: -20 to +70°C -4 to +158 °F
	Ambient humidity	35 to 85 % RH, Storage: 35 to 85 % RH
	Voltage withstandability	1,000 V AC for one min. between all supply terminals connected together and enclosure
	Insulation resistance	20 M Ω , or more, with 250 V DC megger between all supply terminals connected together and enclosure
	Vibration resistance	10 to 150 Hz frequency, 0.75 mm 0.030 in double amplitude in X, Y and Z directions for two hours each
	Shock resistance	500 m/s ² acceleration (50 G approx.) in X, Y and Z directions three times each
Material	Enclosure: Heat-resistant ABS, Terminal cover: Heat-resistant ABS, Front cover: Polycarbonate	
Cable	0.22 mm ² (shield wire: 0.15 mm ²) 7-core composite cabtyre cable, 2 m 6.562 ft long	
Cable extension (Note 2)	Extension up to total 50 m 164.042 ft is possible with 0.22 mm ² , or more, cable. (Shield wire must be extended with 0.15 mm ² , or more, shield wire.)	
Weight	Net weight: 200 g approx.	
Accessory	Adjusting screwdriver: 1 pc.	

Notes: 1) Where measurement conditions have not been specified precisely, the conditions used were an ambient temperature of +20 °C **+68 °F**.

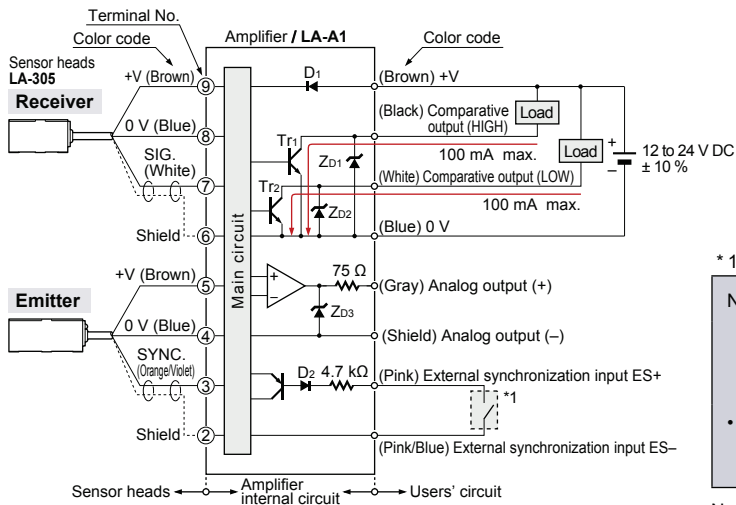
2) This product is CE compliant and complies with EMC directives. EN 61000-6-2 is the applicable standard that covers immunities relating to use of this product, but in order to comply with this standard, the following conditions must be satisfied.

Conditions

- The amplifier should be connected **less than 10 m 32.808 ft** from the power supply.
- The signal line to connect with the amplifier should be **less than 30 m 98.425 ft**.

I/O CIRCUIT DIAGRAMS**LA-A1**

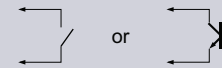
NPN output type



Symbols ... D1: Reverse supply polarity protection diode
D2: Input protection diode
ZD1, ZD2, ZD3: Surge absorption zener diode
Tr1, Tr2: NPN output transistor

* 1

Non-voltage contact or NPN open-collector transistor

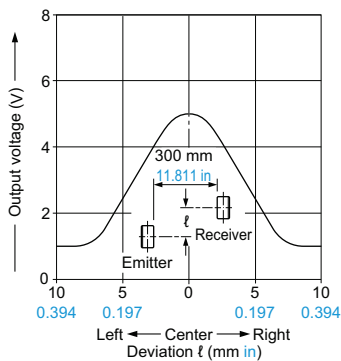
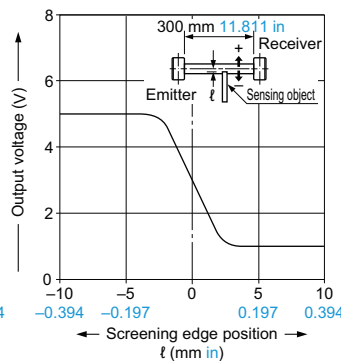
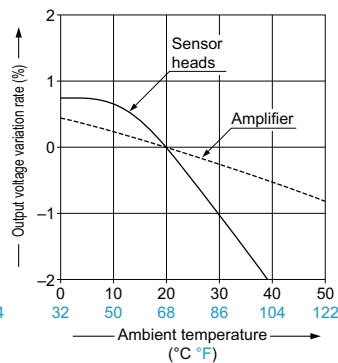


• External synchronization input (Voltage between ES+ and ES-)
Low: 0 to 1 V
High: +V or open

- Notes: 1) When ES+ (pink) and ES- (pink/blue) of external synchronization input are connected, both HIGH and LOW comparative outputs are triggered in the mode selected by the external synchronization selection switch.
If the external synchronization function is not used, always short-circuit ES+ and ES- and set the external synchronization selection switch to gate trigger.
- 2) To use the analog output (gray), choose a device with an input impedance of 1 M Ω , or more, and connect the shield wire of the analog output to 0 V (common input) of the device.
- 3) Insulate all unused wires individually to avoid miscontact.

SENSING CHARACTERISTICS (TYPICAL)**LA-305**

Slim type

Correlation between transverse deviation and output voltage**Correlation between interrupted beam width and output voltage****Correlation between ambient temperature and output voltage variation rate**

PRECAUTIONS FOR PROPER USE



- 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.

Others

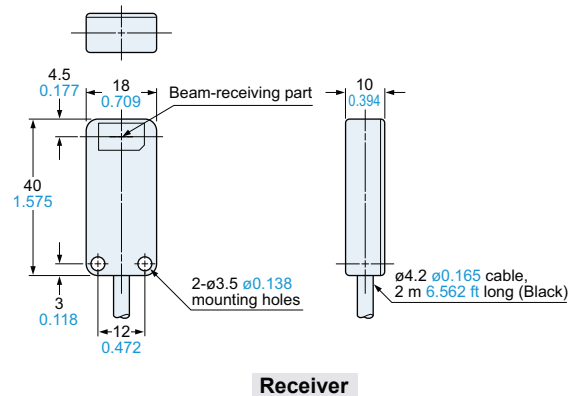
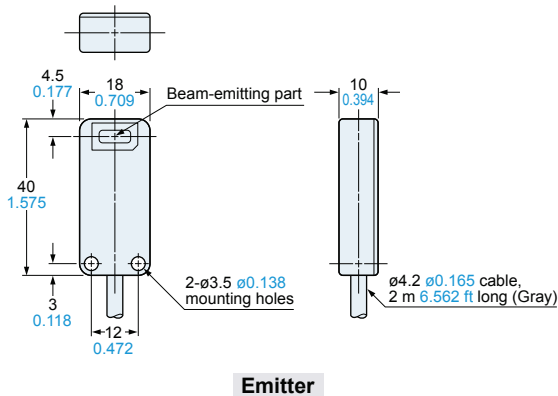
- The sensor's output is proportional to the amount of the LED light received. Since there is some variation in the light intensity at the center and the periphery of the sensing area, take care that "output = dimension" may not hold.
- For stable operation, use the sensor 10 min., or more, after switching on the power supply.
- Keep the front faces of the sensor heads free of dust, dirt, metal powder, etc. Should the faces be covered with it, deteriorating its performance, wipe them clean with a soft cloth or blown air.

DIMENSIONS (Unit: mm in)

The CAD data can be downloaded from our website.

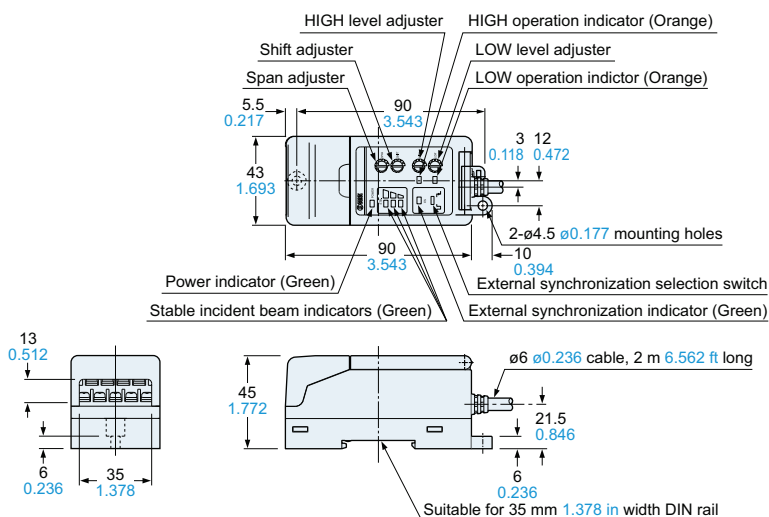
LA-305

Sensor head



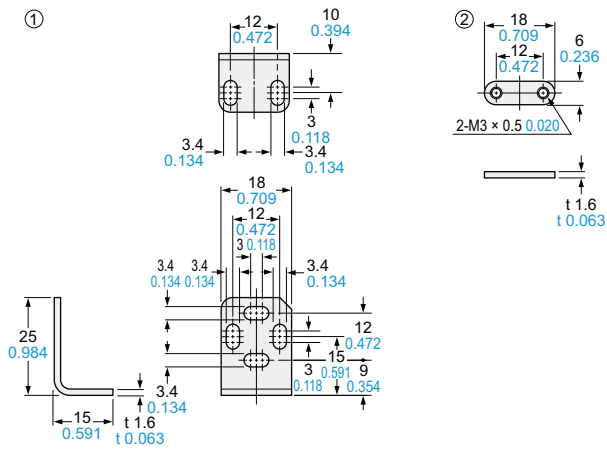
LA-A1

Amplifier



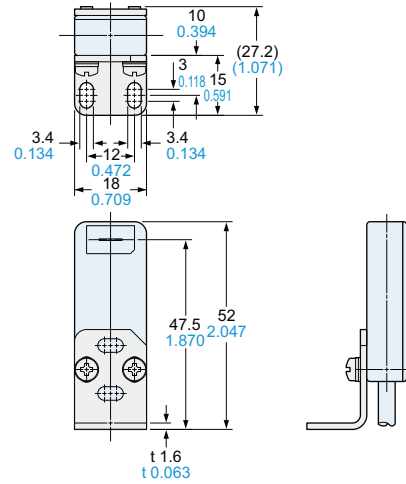
DIMENSIONS (Unit: mm in)

The CAD data can be downloaded from our website.

MS-LA3-2Sensor head mounting bracket for **LA-305** (Accessory for **LA-305**)**Assembly dimensions**

Material: Cold rolled carbon steel (SPCC-P3)
(Uni-chrome plated)

Two M3 (length 15 mm 0.591 in) screws with washers are attached.



Disclaimer

The applications described in the catalog are all intended for examples only. The purchase of our products described in the catalog shall not be regarded as granting of a license to use our products in the described applications. We do NOT warrant that we have obtained some intellectual properties, such as patent rights, with respect to such applications, or that the described applications may not infringe any intellectual property rights, such as patent rights, of a third party.

Panasonic
INDUSTRY

Panasonic Industry Co., Ltd.

Industrial Device Business Division

7-1-1, Morofuku, Daito-shi, Osaka 574-0044, Japan

industrial.panasonic.com/ac/e/