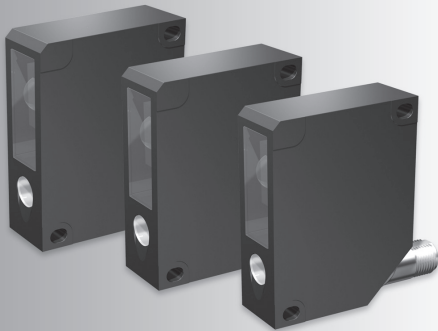


Long-Distance Laser Measurement Sensors



HLA Series

High accuracy distance measurement by the direct reflection method.



■ **Detection of a distant and very small spot**
1 to 2 mm in diameter within measuring range (HLA-D130A)

■ **High-accuracy distance measurement:**

HLA-D130A: Resolution of 0.06 mm in the 30 to 130 mm measuring range.

HLA-D250A: Resolution of 0.3 mm in the 50 to 250 mm measuring range.

HLA-D500A: Resolution of 0.5 mm in the 100 to 500 mm measuring range.

FEATURES

● Minute spot from a long distance

Ability to detect a spot 1 to 2 mm in diameter within the measuring range (HLA-D130A).

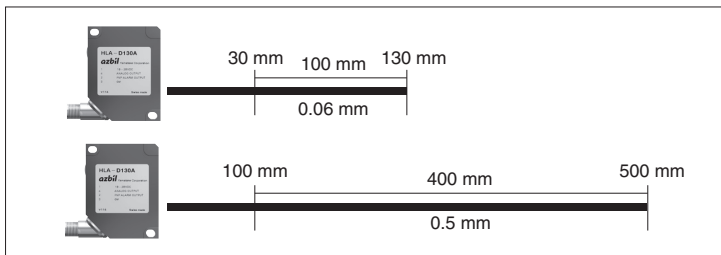


● High-accuracy distance measurement

Ability to measure distance from far away, with a long measuring range and high resolution.

Medium distance type (HLA-D130A): measuring range 30 to 130 mm, resolution 0.06 mm.

Long distance type (HLA-D500A): measuring range 100 to 500 mm, resolution 0.5 mm.



ORDER GUIDE

| Type | Measuring range | Power supply | Output | Actuation | Catalog listing |
|---|-----------------|--------------|--|---|-----------------|
| Reflective sensor, analog distance output | 30 to 130 mm | 18 to 28 Vdc | Current output: 4 to 20 mA, Voltage output: 0 to 10V, Alarm: PNP (Max. 100 mA) | <ul style="list-style-type: none"> ● Alarm ● Distance output 4 to 20 mA | HLA-D130A |
| | 50 to 250 mm | | | | HLA-D250A |
| | 100 to 500 mm | | | | HLA-D500A |
| Code with connector | — | — | — | — | HLA-CN5P |

SPECIFICATIONS

| Type | Distance output, reflective | | |
|--------------------------|---|--------------|---------------|
| Catalog listing | HLA-D130A | HLA-D250A | HLA-D500A |
| Power supply | 18 to 28 Vdc | | |
| Current consumption | 120 mA | | |
| Measuring range | 30 to 130 mm | 50 to 250 mm | 100 to 500 mm |
| Focal spot diameter | 1 to 2 mm | 2 mm | |
| Output | Alarm: PNP output with pull down resistor | | |
| Output | Current output: 4 to 20 mA (load resistance 400 Ωmax), Voltage output: 0 to 10V (load resistance 10 kΩmin), Alarm: 28 Vdc 100 mA max. | | |
| Resolution | 0.06 mm | 0.3 mm | 0.5 mm |
| Linearity | ±0.2 mm | ±0.9 mm | ±1.5 mm |
| Response time | 10 ms | | |
| Light source | Red semiconductor laser, wavelength 675 nm | | |
| Indicators | Power (green), insufficient light (red) | | |
| Ambient temperature | 0 to +50°C | | |
| Operating humidity range | 90 % RH or less (without condensation) | | |
| Laser class | Class 2 (21CFR1040.10) | | |
| Wiring | DIN connector: M12, 5 pins. (Brown: Vcc. Black: analog output. White: alarm output. Blue: 0V) | | |
| Protective structure | IP66 | | |
| Connection type | Connector | | |
| Shock resistance | Maximum acceleration 294 m/s ² (IEC 68-2-27) | | |
| Vibration resistance | Frequency 10 to 55 Hz, amplitude 0.5 mm (IEC 68-2-6) | | |
| Dielectric strength | 1000 VDC | | |
| Housing material | Die-cast zinc | | |

Notes 1: The alarm output provides a signal when either of the following two conditions occur:

*Unsafe or faulty measurements due to insufficient light conditions

*Out of range measuring

In the very close range, the state of the alarm output is undefined due to uncontrolled multiple laser beam reflections.

When the object is gone or positioned at out of sensing range output is set to followings if the last valid valve was below 4.1 mA/0.0625V then the output is set to 4 mA/0V until another measurement is valid.

If the last valid valve was above 4.1 mA/0.0625V then the output is set to 20 mA/10V until another measurement is valid.

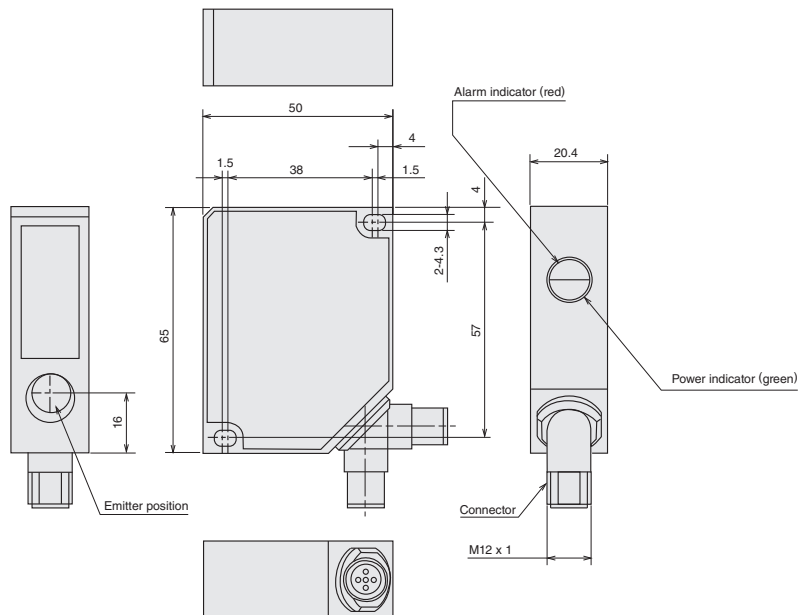
Notes 2: After power on the sensor checks the current output (BK, PIN 4) for current.

If positive, the current output is automatically activated.

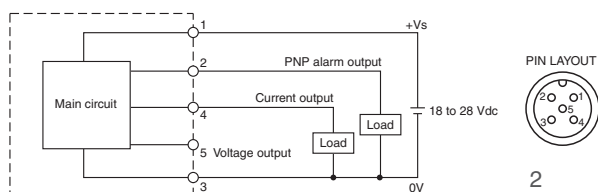
If negative, the sensor will automatically switch to the voltage output (GY, PIN 5) after 100 ms.

EXTERNAL DIMENSIONS

(unit: mm)

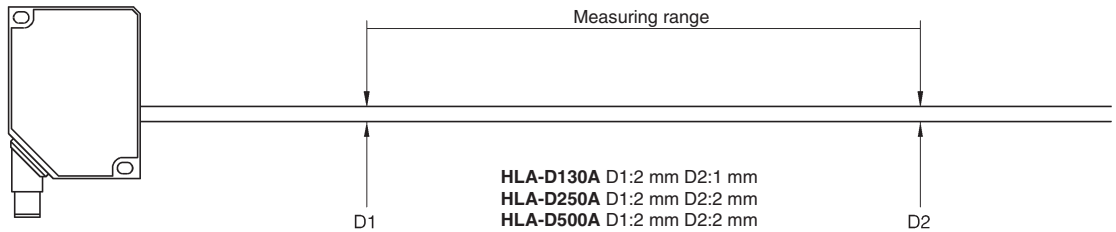


OUTPUT CIRCUIT



NOTES FOR USE OF HLA SERIES WITH ANALOG OUTPUT

1. Laser beam spot diameter



⚠ WARNING

Precautions related to laser light

- This is a JIS (Japan Industrial Standards) Class 2 laser product.
- Avoid looking directly at the laser beam or a specular reflection of the beam. Never point the beam toward someone's eye.
- Provide shielding so that the human body is not directly exposed to laser radiation.



- For safety, stop the laser beam at the end of its path with a diffuse reflecting or absorbing surface having suitable reflectance and temperature properties.
- If the installation conditions make the laser warning label difficult to read, before using the laser be sure to post the enclosed warning label in a place where its details can be read easily.

2. Precautions for use

2.1 Handling precautions

- Mount using M4 screws in the three mounting holes.
- Sensor requires about 75 ms to stabilize after power is supplied.
- If installed outdoors, the sensor should be placed in a housing to prevent direct exposure to the sun or rain.
- Avoid installing the sensor where there is strong vibration or impact, since they might shift the optical axis out of alignment.
- Shield the lens so that it is not directly exposed to water or oil. If it is splashed, malfunction could result.
- Where there is heavy interference from ambient light, shade the sensor with a hood or change the mounting direction to prevent malfunction.
- In the sensor is used in a dusty place, put it in a sealed case or use air purging or other countermeasures to prevent dust from accumulating on the lens.
- The laser sensor is assembled with high precision. Never strike it with another object. In particular, if the lens surface is scratched or cracked, its properties may be impaired.
- If the lens is dirty, wipe it with a soft, dry, clean cloth. If it is especially dirty, clean it with pure alcohol.
- If multiple sensors are used close together, performance may be adversely affected. After installing and before use, check carefully to be sure there is no mutual interference.
- Highly reflective metal surfaces near the laser sensor may cause malfunction. Dull or paint nearby metal surfaces so that they are not reflective.

2.2 Precautions for wiring

- Be sure to turn off the power before mounting the sensor.
- Route the laser sensor wiring separately or in its own conduit. If it is put in the same conduit with high voltage lines or power lines, induction may cause malfunction or damage.
- When using a commercially available switching regulator, ground the frame ground terminal. Otherwise, switching noise could cause a malfunction.
- When using a load that generates an inrush current, such as a capacitive load or lamp load, connect a current-limiting resistor between the load and the output terminal. (Otherwise, the output short-circuit protection may be activated.)
- This sensor has miswiring protection, but it may be damaged by incorrect wiring involving the I/O lines. Be sure to wire correctly.

Before use, thoroughly read the "Precautions for use" and "Precautions for handling" in the Technical Guide on pages B-009 to B-014 as well as the instruction manual and product specification for this sensor.