

Convergent Laser Measurement Sensor

Model HLB-D130DN | Very small or thin parts can be detected by differences in distance, unaffected by color or reflection rate of the target object.

PHOTOELECTRIC SENSORS & SWITCHES

MEASUREMENT SENSORS

PROXIMITY SWITCHES

LIMIT SWITCHES

SAFETY KEY SWITCHES

FIBER-OPTIC

WET PROCESSES SWITCHES AND FIBER UNITS

SELF-CONTAINED

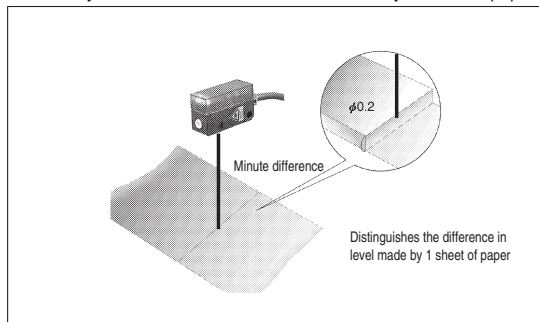
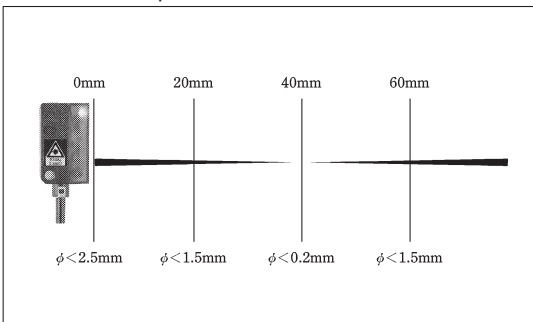
TECHNICAL GUIDE

- **Size (12 x 16.3 x 27 mm)**
- **Precise detection of minute differences in distance (or level)**
- **Easy mounting with a dedicated bracket**



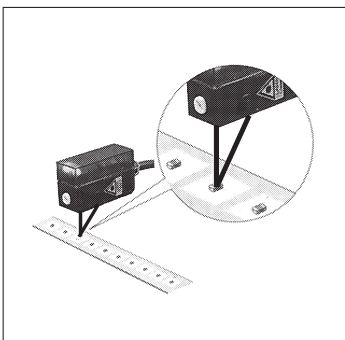
FEATURES

- **Laser beam spot diameter of 0.2 mm or less**
- **Reliably detects the difference in level made by a sheet of paper**

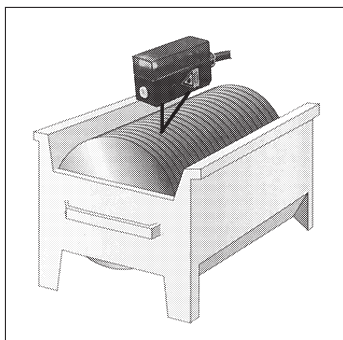


APPLICATIONS

Detecting the presence/absence of a very small part (chip) during the taping process

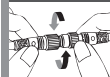


Detecting the presence/absence of a wafer disk based on the disk edge




Detecting the presence/absence of an inserted part





CATALOG LISTING

External appearance	Detection method	Detecting distance setting range	Power supply	Output	Actuation	Catalog listing
	Convergent laser type measurement	22 to 130mm (white paper)	11 to 30Vdc	NPN with pull-up resistor (18 kΩ)	Light ON/ dark ON (separate output)	HLB-D130DN

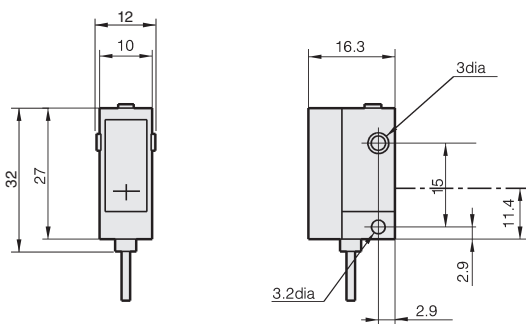
SPECIFICATIONS

Detection method	Convergent laser type measurement
Power supply	11 to 30Vdc
Consumption current	30mA
Detecting distance setting range	22 to 130mm (White Paper), 22 to 70mm (Black Paper)
Detecting distance range	3 to 130mm (White Paper)
Focal distance	40mm (max. 0.2mm spot diameter at focal distance)
Output	NPN (with 18 kΩ pull-up resistor)
Actuation	Light ON/Dark ON separate output
Control output	Switching current: 70 mA max. (resistive load) Output dielectric strength: 30Vdc Voltage drop: 1.8V max. (at 100mA switching current)
Response time	0.5ms max.
Light emitter	Pulse laser diode (wave length: 650nm)
Indicator	Power supply indicator (green) Output indicator (yellow) Unstable operation indicator (flashing yellow)
Distance setting	5-turn variable resistor potentiometer
Ambient temperature	-10 to +50°C (no icing nor condensation allowed)
Ambient light	Incandescent light : 10000 lx max.
Sealing	IP65 (IEC standard)
Laser class	Class 2 (IEC 825-1/1996, 21CFR1040. 10)
Protection structure	IP65 (IEC 144)
Connecting method	Pre-leaded
Shock	294 m/s ² 3times in each direction of X,Y,Z
Vibration	10 to 55 Hz, 0.5 mm Double amplitud 2 hours in each direction of X,Y,Z
Dielectric strength	1000 Vac 50/60 Hz, 1 minute
Material	Case : ASA, Lens : PMMA

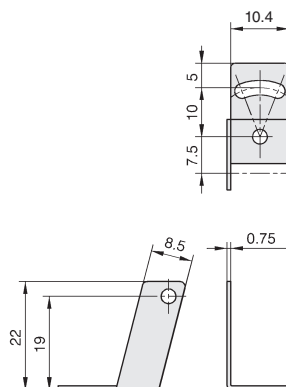
*The sensor can be connected to a voltage input device without the addition of a pull-up resistor to the input device side. Connecting the sensor to an input device whose power supply voltage is different from that of the sensor might create difficulties. In such a case, contact Azbil Corporation first.

EXTERNAL DIMENSIONS

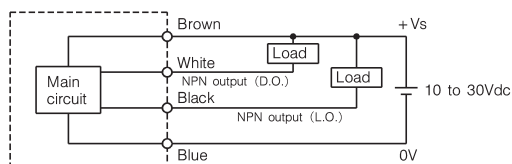
(unit: mm)



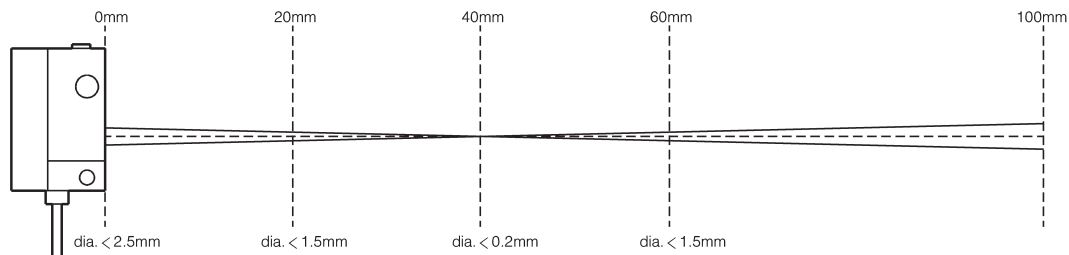
● Bracket



OUTPUT CIRCUIT



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.

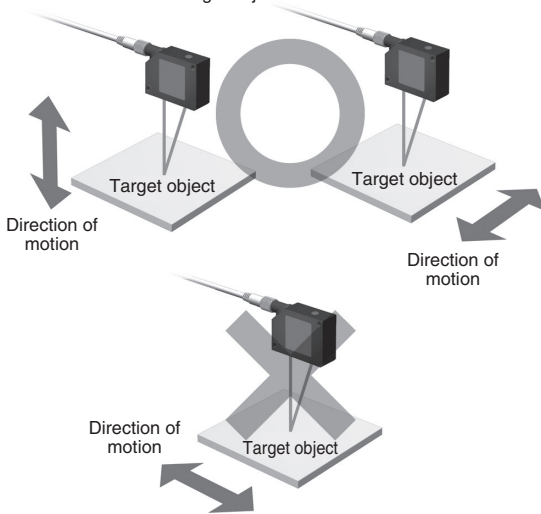
• If the installation conditions make the laser warning label difficult to read, before using the laser be sure to post the enclosed warning label in a place where its details can be read easily.



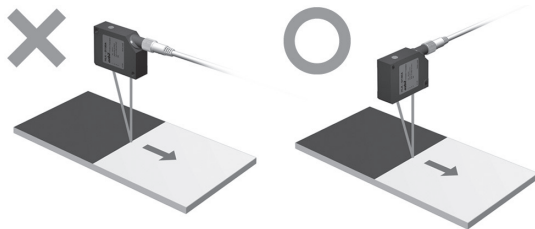
PRECAUTIONS FOR USE

1. Precautions for installation

- Make sure that the sensing surface is not exposed to strong light from the sun, fluorescent lights, incandescent lights, etc.
- Pay attention to the orientation of the sensor with respect to the direction of travel of target objects.



- Install the sensor in the same manner even if the color or surface condition of the target objects changes greatly.



- Make sure that the sensing surface of the sensor is parallel to the surface of the target object (so that the target object is not at an angle).

2. Handling precautions

- Mount using 3 mm 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.

3. 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.

ADJUSTMENT METHOD

Distance-based retroreflective sensing

- (1) Install the sensor pointing toward the detection position.
- (2) With no target object present, gradually turn the distance adjustment potentiometer from the MAX position toward MIN. The position where the yellow output indicator turns off is A. If the indicator is unlit even when the distance adjustment potentiometer is at MAX, MAX is A.
- (3) Place a target object in the detection position and gradually turn the distance adjustment potentiometer from MIN toward MAX. The position where the yellow output indicator turns on is B.
- (4) Set the distance adjustment potentiometer to C, the midpoint between A and B.

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<https://www.azbil.com/products/factory/order.html>

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Azbil Corporation

Advanced Automation Company

Yamatake Corporation changed its name to Azbil Corporation on April 1, 2012.

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