

## Ordering Information

This is only for reference.

For selecting the specified model, follow the Autonics website .

## ■ Sensor head

Model	Reference distance (Maximum measurement range)
BD-030	30 mm (20 to 40 mm)
BD-065	65 mm (50 to 80 mm)
BD-100	100 mm (70 to 130 mm)

## ■ Amplifier unit

Model	Compatible sensor head
BD-A1	BD Series sensor head: 1

## Laser Displacement Sensors

BD Series  
CATALOG

For your safety, read and follow the considerations written in the instruction manual, other manuals and Autonics website.

The specifications, dimensions, etc are subject to change without notice for product improvement. Some models may be discontinued without notice.

## Features

- Easy maintenance with detachable sensor head/amplifier unit
- Maximum resolution: 1 μm (vary by model)
- Accurate measurement with minimal influence from target color or material
- Interconnection of up to 8 sensor Amplifier units  
: Mutual interference prevention function and auto channel sorting
- Various calculation functions supported (addition, subtraction, average)
- Various filter functions for stable measurement (movement average, differential, median)
- Auto sensitivity adjustment (1-point, 2-point teaching)
- DIN rail and wall mount support (bracket accessory required for wall mount)
- Sensor head: IP67 protection structure  
\*Korea Patent Application 10-2017-0043925
- Extension cables available for various moving applications (sold separately)

## Specifications

## ■ Sensor head

Model	BD-030	BD-065	BD-100
<b>Beam shape</b>	Standard		
Spot diameter (near)	≈ 290×790 μm (25 mm)	≈ 360×1,590 μm (55 mm)	≈ 480×1,870 μm (80 mm)
Spot diameter (reference)	≈ 240×660 μm (30 mm)	≈ 290×1,180 μm (65 mm)	≈ 410×1,330 μm (100 mm)
Spot diameter (far)	≈ 190×450 μm (35 mm)	≈ 210×830 μm (75 mm)	≈ 330×950 μm (120 mm)
<b>Resolution</b> <sup>01)</sup>	1 μm	2 μm	4 μm
<b>Reference distance</b>	30 mm	65 mm	100 mm
<b>Maximum measurement range</b>	20 to 40 mm	50 to 80 mm	70 to 130 mm
<b>Rated measurement ranges</b> <sup>02)</sup>	25 to 35 mm	55 to 75 mm	80 to 120 mm
<b>Linearity</b> <sup>01) 03)</sup>	± 0.1% of F.S.	± 0.1% of F.S.	± 0.15% of F.S.
<b>Temperature characteristic</b> <sup>04)</sup>	0.05% F.S./°C	0.06% F.S./°C	
<b>Power supply</b> <sup>05)</sup>	-		
<b>Light source</b>	Red semiconductor laser (wavelength: 660 nm, IEC 60825-1:2014)		
Optical method	Diffuse reflection		
Laser class	Class 1 (IEC/EN), Class I (FDA (CDRH) CFR Part 1002)	Class 2 (IEC/EN), Class II (FDA (CDRH) CFR Part 1002)	
Output	≤ 300 μW	≤ 1 mW	
<b>Operation Indicator</b>	Power Indicator (red), Laser emission indicator (green), NEAR/FAR indicator (green)		
<b>Connection</b>	Connector type		
<b>Insulation resistance</b>	≥ 20 MΩ (500 VDC ≡ megger)		
<b>Noise immunity</b>	Square shaped noise by noise simulator (pulse width: 1μs) ±500V		
<b>Dielectric strength</b>	1,000 VAC ~ 50/60 Hz for 1 minute		
<b>Vibration</b>	1.5 mm amplitude at frequency of 10 to 55Hz (for 1 min) in each X, Y, Z direction for 2 hours		
<b>Shock</b>	300 m/s <sup>2</sup> (≈ 30 G) in each X, Y, Z direction for 3 times		
<b>Ambient illumination</b>	≤ 10,000 lx Incandescent lamp		
<b>Ambient temperature</b>	-10 to 50 °C, Storage: -15 to 60 °C (no freezing or condensation)		
<b>Ambient humidity</b>	≤ 85%RH, Storage: ≤ 85%RH (no freezing or condensation)		
<b>Protection structure</b>	IP67 (IEC Standards, except connector of extension cable)		
<b>Material</b>	Case: Polycarbonate, Sensing part: Glass, Cable: Polyvinyl chloride		
<b>Amplifier unit compatibility</b>	BD Series amplifier unit: 1		
<b>Accessory</b>	Ferrite core (made by TDK co. ZCAT2132-1130), Mounting bracket, Bolt, Nut		
<b>Approval</b>	CE, RoHS, ENEC		
<b>Unit weight (packaged)</b>	≈ 56 g (≈ 209 g)	≈ 68 g (≈ 233 g)	≈ 68 g (≈ 233 g)

01) When measuring fixed non-glossy white paper (reference temperature: 25°C, reference distance, response time: 1ms, average 128 times).

02) The rated measurement range guarantees linearity.

03) Value indicates the error with respect to the ideal straight line.

04) Value measured by using an aluminum jig fix the sensor head and non-glossy white paper.

05) Using power from the amplifier unit.

## ■ Amplifier unit

<b>Model</b>	BD-A1
<b>Power supply</b>	10 - 30 VDC $\pm$ 10% (when connecting BD-C Series communication converter, 12-30 VDC $\pm$ )
<b>Power consumption<sup>1)</sup></b>	$\leq$ 2,800 mW (30 VDC $\pm$ )
<b>Control Input<sup>2)</sup></b>	Timing / Output reset / Laser OFF / Zero-point adjustment / Bank change: No-voltage input
<b>Judgment output (HIGH/GO/LOW)</b>	NPN or PNP open collector output (load current: $\leq$ 100 mA)
<b>Alarm output</b>	NPN or PNP open collector output (load current: $\leq$ 100 mA)
<b>Analog voltage output<sup>3)</sup></b>	-5 - 5V, 0 - 5V, 1 - 5V (resistance: 100 $\Omega$ , $\pm$ 0.05% F.S., at 10V)
<b>Analog current output<sup>3)</sup></b>	4 - 20 mA (load resistance: $\leq$ 350 $\Omega$ , $\pm$ 0.2% F.S., at 16 mA)
<b>Residual voltage</b>	NPN: $\leq$ 1.5V, PNP: $\leq$ 2.5V
<b>Protection circuit</b>	Reverse polarity protection circuit, output over current (short-circuit) protection circuit
<b>Response Time</b>	0.33 / 0.5 / 1 / 2 / 5 ms
<b>Min. display unit</b>	1 $\mu$ m
<b>Display type</b>	11 segment (red, green), 6-digit, LED
<b>Display range<sup>4)</sup></b>	$\pm$ 99.999 mm to $\pm$ 99 mm (4-step adjustment, parameter)
<b>Display period</b>	$\approx$ 100 ms
<b>Insulation resistance</b>	$\geq$ 20 M $\Omega$ (500 VDC $\pm$ megger)
<b>Noise immunity</b>	Square shaped noise by noise simulator (pulse width: 1 $\mu$ s) $\pm$ 500 V, 1,000 VAC $\sim$ 50/60 Hz for 1 minute
<b>Dielectric strength</b>	
<b>Vibration</b>	1.5 mm amplitude at frequency of 10 to 55 Hz (for 1 min) in each X, Y, Z direction for 2 hours
<b>Shock</b>	300 m/s <sup>2</sup> (approx. 30 G) in each X, Y, Z direction for 3 times
<b>Ambient temperature</b>	-10 to 50 $^{\circ}$ C, Storage: -15 to 60 $^{\circ}$ C (no freezing or condensation)
<b>Ambient humidity</b>	$\leq$ 85%RH, Storage: $\leq$ 85%RH (no freezing or condensation)
<b>Material</b>	Case: PC, Cover: PC, cable: PVC
<b>Connection</b>	Connector type
<b>Sensor head compatibility</b>	BD series sensor head: 1
<b>Accessory</b>	Mounting bracket, Side connector
<b>Protection structure</b>	IP40 (IEC standard)
<b>Approval</b>	CE, RoHS, ENEC
<b>Unit weight (packaged)</b>	$\approx$ 126 g ( $\approx$ 228 g)

01) Power to the load is not included.

02) Use after assigning to external input line.

03) It is possible to use among -5.5V, 0-5V, 1-5V, 4-20mA by parameter setting.

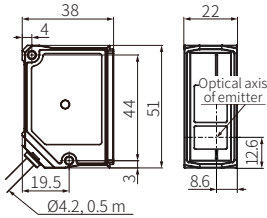
04) Setting range is assigned automatically when connecting sensor head.

## Dimensions

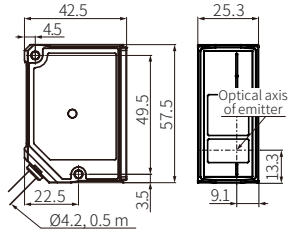
• Unit: mm, For the detailed drawings, follow the Autonics website.

### ■ Sensor head

#### • BD-030

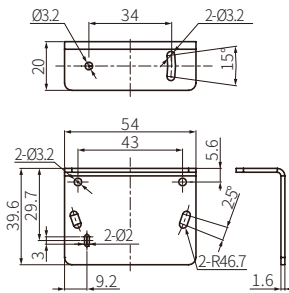


#### • BD-065 / 100

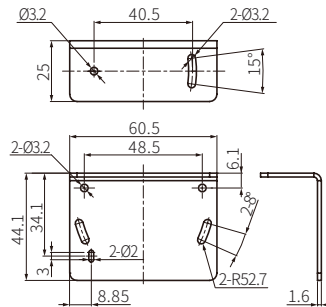


### - Bracket

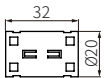
#### • BD-030



#### • BD-065 / 100

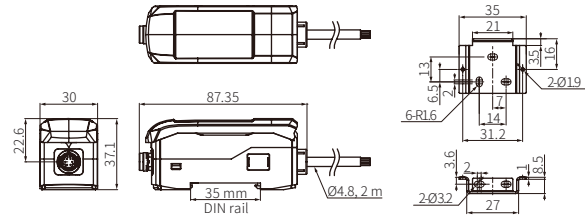


### - Ferrite core



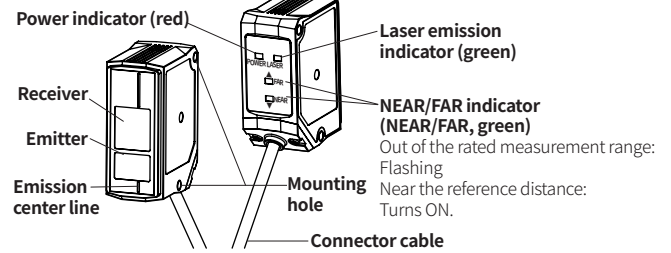
## ■ Amplifier unit

### • BD-A1



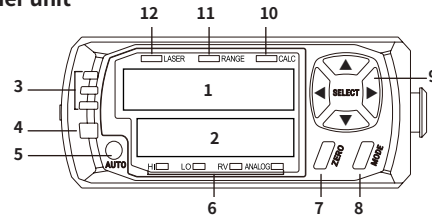
## Unit Descriptions

### ■ Sensor head



- Emission center line and the object should be aligned because the laser is emitted along the line.
- For the details about indicators, refer to 'Indicator display'.

### ■ Amplifier unit



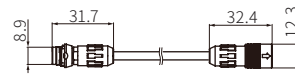
<b>1</b>	<b>PV (present value) display (red)</b> Displays PV (present value), calculating result (when using calculation), parameter name (when setting parameter).	<b>6</b>	<b>SV display recognition lamp (green)</b> - HI: HIGH judgment value - LO: LOW judgment value - RV: Real distance value - ANALOG: Analog output
<b>2</b>	<b>SV (setting value) display (green)</b> Displays SV (HIGH, LOW, RV, Analog output, Bank), parameter setting value (when setting parameter). The type of displaying SV can be recognized by SV display recognition lamp.	<b>7</b>	<b>Zero-point adjustment setting key [ZERO]</b>
<b>3</b>	<b>Judgment indicator: HI/LO (red), GO (green)</b>	<b>8</b>	<b>Mode setting key [MODE]</b>
<b>4</b>	<b>Alarm indicator (red)</b>	<b>9</b>	<b>Direction key [◀], [▶], [▲], [▼]</b>
<b>5</b>	<b>Optimization setting key [AUTO]</b>	<b>10</b>	<b>Calculation Indicator (CALC, green)</b>
		<b>11</b>	<b>Measurement range Indicator (RANGE, green)</b>
		<b>12</b>	<b>Laser emission indicator (LASER, green)</b>

## Sold Separately

- General type extension cable: CID6P-□-SI-BD
- Robot type extension cable: CIDR6P-□-SI-BD
- Laser displacement sensor communication converter: BD-C Series

## Sold Separately: Extension Cable

- Unit: mm, For the detailed drawings, follow the Autonics website.
- The connectors of general and robot type have a same dimension.



Model	General type	Robot type	Cable length
CID6P-1-SI-BD		CIDR6P-1-SI-BD	1 m
CID6P-2-SI-BD		CIDR6P-2-SI-BD	2 m
CID6P-5-SI-BD		CIDR6P-5-SI-BD	5 m
CID6P-10-SI-BD		CIDR6P-10-SI-BD	10 m