Make Life Easy

Precision at Its Finest

CE cULus

Measure Target Thickness, Width, Level, Curve and More

Laser Displacement Sensors

BD Series

The BD series laser displacement sensors can measure thickness, width, level difference, disparity, curve, evenness of target objects by detecting the amount of displacement. The sensors offer accurate and stable measurement regardless of target color or material. The sensor head and amplifier unit are detachable for easier maintenance and up to 8 sensor amplifier units can be interconnected with mutual interference prevention function.

Reference Distance | Detect Various Materials | Protection Rating | Mutual Interference Prevention | Easy Teaching Settings

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BD Specifications

Sensor Head											
Model		BD-030			BD-065			BD-100			
Spot diameter (unit: μm)		Near (25mm)	Reference (30mm)	Far (35mm)	Near (55mm)	Reference (65mm)	Far (75mm)	Near (80mm)	Reference (100mm)	Far (120mm)	
		Approx. 290×790	Approx. 240×660	Approx. 190×450	Approx. 360×1590	Approx. 290×1180	Approx. 210×830	Approx. 480×1870	Approx. 410×1330	Approx. 330×950	
Resolution※1		1μm			2μm			4μm			
Reference distance		30mm			65mm			100mm			
Maximum measurement range		20 to 40mm			50 to 80mm			70 to 130mm			
Linearity※1※2		0.1% F.S. (in 25 to 35mm)			0.1% F.S. (in 55 to 75mm)			0.15% F.S. (in 80 to 120mm)			
Temperature Characteristics※3		0.05% F.S./℃			0.06% F.S./℃						
Power supply※4		—									
Light Source		Red semiconductor laser (wavelength: 660nm, 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	Max. 300μW			Max. 1mW						
Operation indicators		Power indicator: red LED, Laser emission indicator: green LED, NEAR/FAR indicator: green LED									
Connection		Connector type									
Insulation resistance		Over 20MΩ (at 500VDC⎓ megger)									
Noise immunity		Square shaped noise by noise simulator (pulse width: 1μs) ±500V									
Dielectric strength		1,000VAC 50/60Hz for 1 minute									
Vibration		1.5mm amplitude at frequency of 10 to 55Hz (for 1 min) in each X, Y, Z direction for 2 hours									
Shock		300m/s² (Approx. 30G) in each X, Y, Z direction for 3 times									
Environment	Ambient illumination	Max. Incandescent lamp 10,000lx									
	Ambient temperature	-10 to 50℃, storage: -15 to 60℃									
	Ambient humidity	Under 85%RH, storage: under 85%RH									
Protection structure		IP67 (IEC Standards, except connector of extension cable)									
Material		Case: Polycarbonate, Sensing part: Glass, Cable: Polyvinyl chloride									
Amplifier unit compatibility		BD Series amplifier unit: 1									
Accessory		Ferrite core (made by TDK co. ZCAT2132-1130), Mounting bracket, Bolt, Nut									
Approval		CE c UL us									

※1: When measuring fixed non-glossy white paper (reference temperature: 25℃, reference distance, response time: 1ms, average 128 times).
※2: Value indicates the error with respect to the ideal straight line and the numbers in parentheses are the rated measurement ranges guarantee linearity.
※3: Value measured by using an aluminum jig fix the sensor head and non-glossy white paper.
※4: Using power from the amplifier unit.
※5: The weight is with packaging and the weight in parenthesis is only unit weight.
※The temperature or humidity mentioned in Environment indicates a non freezing or condensation environment.

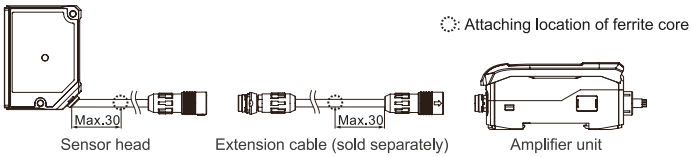
BD-A1 Specifications

Amplifier unit		
Model		BD-A1
Power supply		10-30VDC⎓ ±10% (When connecting BD-C Series communication converter, 12-30VDC⎓)
Power consumption※1		Max. 2800mW (30VDC⎓)
Control input※2	Timing	No-voltage input
	Output reset	
	Laser OFF	
	Zero adjustment	
	Bank change	
Judgment output (HIGH/GO/LOW)		NPN or PNP open collector output (Load current: Max. 100mA)
Alarm output		NPN or PNP open collector output (Load current: Max. 100mA)
Analog output※3		Voltage: -5-5V, 0-5V, 1-5V (Resistance: 100Ω, ± 0.05% F.S., at 10V)
		Current: 4-20mA (Max load resistance: 350Ω, ± 0.2% F.S., at 16mA)
Residual voltage		NPN: Max. 1.5V, PNP: Max. 2.5V
Protection circuit		Reverse polarity protection circuit, output overcurrent (short-circuit) protection circuit
Response time		0.33, 0.5, 1, 2, 5 ms (5-step adjustment)
Min. display unit		1μm
Display method		Dual display by 6-digit, 11-segment LED
Display range※4		±99.999mm to ±99mm (4-step adjustment)
Display period		Approx. 100ms
Insulation resistance		Over 20MΩ (at 500VDC⎓ megger)
Noise immunity		Square shaped noise by noise simulator (pulse width: 1μs) ±500V
Dielectric strength		1,000VAC 50/60Hz for 1 minute
Vibration		1.5mm amplitude at frequency of 10 to 55Hz (for 1 min) in each X, Y, Z direction for 2 hours
Shock		300m/s² (Approx. 30G) in each X, Y, Z direction for 3 times
Environment	Ambient temperature	-10 to 50℃, storage: -15 to 60℃
	Ambient humidity	Under 85%RH, Storage: under 85%RH
Protection structure		IP40 (IEC Standards)
Material		Case: Polycarbonate, Cover: Polycarbonate, Cable: Polyvinyl chloride
Connection		Connector type
Sensor head compatibility		BD Series sensor head: 1
Accessory		Mounting bracket, Side connector
Approval		CE c UL us

※1: Power to the load is not included.
※2: Use after assigning to external input line. For the details, refer to the item in '▣ Parameter group'.
※3: It is possible to use among -5-5V, 0-5V, 1-5V, 4-20mA by parameter setting.
※4: Setting range is assigned automatically when connecting sensor head.
※5: The weight is with packaging and the weight in parenthesis is only unit weight.
※The temperature or humidity mentioned in Environment indicates a non freezing or condensation environment.

Model

(unit: mm)



◎Sensor head

Model	Beam shape	Reference distance (Maximum measurement range)	Spot diameter		
			Near	Reference	Far
BD-030	Standard	30mm (20-40mm)	Approx. 290×790μm (at 25mm)	Approx. 240×660μm (at 30mm)	Approx. 190×450μm (at 35mm)
BD-065	Standard	65mm (50-80mm)	Approx. 360×1590μm (at 55mm)	Approx. 290×1180μm (at 65mm)	Approx. 210×830μm (at 75mm)
BD-100	Standard	100mm (70-130mm)	Approx. 480×1870μm (at 80mm)	Approx. 410×1330μm (at 100mm)	Approx. 330×950μm (at 120mm)

◎Amplifier unit

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

◎Extension cable (sold separately)

Model	Length
CID6P-1-SI-BD	1m
CID6P-2-SI-BD	2m
CID6P-5-SI-BD	5m
CID6P-10-SI-BD	10m

BD-C Specifications

BD-C Series Communication Converter		
Model		BD-CRS
Power supply※1		—
Power consumption		Max. 2.3W
Communication function		RS-232C, RS-485
Communication speed		9600, 19200, 38400, 115200bps (default)
Indication		4 LED status indicators
Function		• Real-time monitoring • Executes every BD-Series feature and sets parameter by external device (Master)
Environment	Ambient temperature	-10 to 50℃, Storage: -15 to 60℃
	Ambient humidity	Under 85%RH, Storage: under 85%RH
Vibration		1.5mm amplitude at frequency of 10 to 55Hz (for 1 min) in each X, Y, Z direction for 2 hours
Shock		300m/s² (approx. 50G) in each X, Y, Z direction for 3 times
Protection structure		IP40 (IEC Standards)
Material		Case: Polycarbonate
Accessory		Side connector, Connector for RS485
Sold separately		Communication converter (SCM-38I, SCM-US48I, SCM-WF48)
Approval		CE c UL us

※1: Using power from the amplifier unit. To use BD-C Series communication converter, the amplifier unit needs 12-30VDC⎓ power supply.
※2: This weight is with packaging and the weight in parentheses is only unit weight.
※The temperature or humidity mentioned in Environment indicates a non freezing or condensation environment.

* Dimensions or specifications on this catalogue might be changed without prior notice.

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