Photoelectric Sensors with Built-in Timer

BYD 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 installation by compact size
- Superior detection not affected by color of target (convergent reflective type)
- Operation indicator is located on the top (BYD30-DDT-U, BYD50-DDT-U)
- Easy to adjust the response time via timer function (OFF Delay Time: 0.1 to 2 sec)
- Reverse power protection circuit, output short overcurrent protection circuit

Ordering Information

This is only for reference, the actual product does not support all combinations.
For selecting the specified model, follow the Autonics website.

BYD	❶	-	❷	D	T	-	❸	-	❹

❶ Sensing distance
Number: Sensing distance (unit: mm)
Number+M: Sensing distance (unit: m)

❷ Sensing type
T: Through-beam
D: Diffuse reflective
D: Convergent reflective

❸ Control output
No mark: NPN open collector output
P: PNP open collector output
(Through-beam type)

❹ Feature of convergent reflective type
No mark: Front operation indicator
U: Upper operation indicator
T: Built-in timer (OFF delay mode)

Product Components

Sensing type	Through-beam	Diffuse reflective	Convergent reflective
Product components	Product, instruction manual		
Adjustment screwdriver	-	× 1	× 1
Bracket A	× 2	× 1	× 1
M3 bolt / nut	× 4	× 2	× 2

Specifications

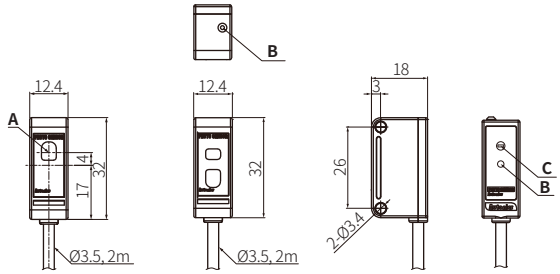
Model	BYD3M-TDT-□	BYD100-DDT	BYD□-DDT-□	
Sensing type	Through-beam	Diffuse reflective	Convergent reflective	
Sensing distance	3 m	100 mm 01)	10 to 30 mm ±10% 01)	10 to 50 mm ±10% 01)
Sensing target	Opaque materials	Opaque materials, translucent materials	Opaque materials, translucent materials	
Min. sensing target	≥ Ø 6 mm	-	-	
Hysteresis	-	≤ 25 % of sensing distance	≤ 10 % of sensing distance	
Response time	≤ 1 ms	Operation: ≤ 3 ms Return: ≤ 100 ms	Operation: ≤ 3 ms Return: ≤ 100 ms 02)	
Light source	Infrared	Infrared	Infrared	
Sensitivity adjustment	-	YES (Adjuster)	-	
Timer function	-	-	OFF delay mode: 0.1 to 2 sec (Adjuster)	
Operation mode	Dark ON mode	Light ON mode	Light ON mode	
Indicator	Front	Front	Front / Upper operation indicator model	
	Operation indicator (red)			
Approval	CE EAC	CE EAC	CE EAC	
Unit weight (packaged)	≈ 80 g (≈ 105 g)	≈ 38 g (≈ 75 g)	≈ 38 g (≈ 75 g)	

01) Non-glossy white paper 50 × 50 mm
02) When the timer adjuster is set to min (0.1 sec).

Power supply	12-24 VDC⎓ ±10 % (ripple P-P: ≤ 10 %)
Current consumption	It depends on the sensing type
Through-beam	Emitter: ≤ 30 mA, receiver: ≤ 30 mA
Reflective	≤ 35 mA
Control output	Through-beam type : NPN open collector output / PNP open collector output model Diffuse reflective, convergent reflective type : NPN open collector output
Load voltage	≤ 30VDC⎓
Load current	Through-beam type : ≤ 100 mA Diffuse reflective, convergent reflective type : ≤ 50 mA
Residual voltage	NPN: ≤ 1 VDC⎓, PNP: ≤ 2.5 VDC⎓
Protection circuit	Reverse power protection circuit, output short overcurrent protection circuit
Insulation resistance	≥ 20 MΩ (500 VDC⎓ megger)
Noise immunity	±240 VDC⎓ the square wave noise (pulse width: 1 μs) by the noise simulator
Dielectric strength	1,000 VAC~ 50/60 Hz for 1 min
Vibration	1.5 mm double amplitude at frequency of 10 to 55 Hz (for 1 min) in each X, Y, Z direction for 2 hours
Shock	500 m/s² (≈ 50 G) in each X, Y, Z direction for 3 times
Ambient illuminance (receiver)	Sunlight: ≤ 11,000 lx, incandescent lamp: ≤ 3,000 lx
Ambient temperature	-20 to 65 °C, storage: -25 to 70 °C (no freezing or condensation)
Ambient humidity	35 to 85 %RH, storage: 35 to 85 %RH (no freezing or condensation)
Protection rating	Through-beam, convergent reflective type (front operation indicator model) : IP64 (IEC standard), Others: IP50 (IEC standard)
Connection	Cable type
Cable spec.	Ø 3.5 mm, 3-wire (Emitter: 2-wire), 2 m
Wire spec.	AWG24 (0.08 mm, 40-core), insulator outer diameter: Ø 1 mm
Material	Case: ABS, sensing part: Acrylic, bracket: SPCC, bolt: SCM, nut: SCM, sleeve: Brass, Ni-plate

Dimensions

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

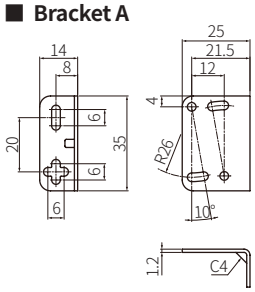


Through-beam

Diffuse reflective,
Convergent reflective

A	Optical axis
B	Upper operation indicator of convergent reflective type (red)
C	Sensitivity adjustment adjuster or timer adjuster of built-in timer model

■ Bracket A



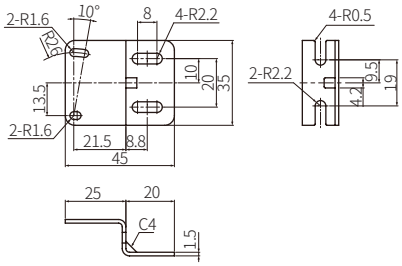
Sold Separately

• Bracket B

• Slit for through-beam type: BYD3M-ST (sticker)

Sold Separately: Bracket B

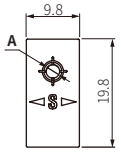
• Unit: mm, For the detailed drawings, follow the Autonics website.



Sold Separately: Slit for Through-beam Type

■ BYD3M-ST (sticker)

• Unit: mm



- Attach this slit at both an emitter and a receiver. (packaged unit: 2 pieces of each different Ø, total 8 pieces)
- Gently wipe the dirt on the lens of the sensor before using it.
- After attaching the slit, remove the front protection film.

A	Applied condition		Min. sensing target	Max. sensing distance
	Emitter	Receiver		
Ø 1.0 mm	○	○	≥ Ø 0.8 mm Opaque materials	500 mm
Ø 1.5 mm			≥ Ø 1.5 mm Opaque materials	700 mm
Ø 2.0 mm			≥ Ø 2.0 mm Opaque materials	1,200 mm
Ø 2.5 mm			≥ Ø 2.5 mm Opaque materials	2,300 mm