

Autonics

PHOTOELECTRIC SENSOR BUILT-IN AMPLIFIER BYD SERIES

M A N U A L



BYD30(50)-DDT-U

Thank you very much for selecting Autonics products.
For your safety, please read the following before using.

Caution for your safety

* Please keep these instructions and review them before using this unit.

* Please observe the cautions that follow:

Warning Serious injury may result if instructions are not followed.

Caution Product may be damaged, or injury may result if instructions are not followed.

* The following is an explanation of the symbols used in the operation manual.

Warning Injury or danger may occur under special conditions.

Warning

- In case of using this unit with machinery (nuclear power control, medical equipment, vehicle, train, airplane, combustion apparatus, entertainment or safety device etc.), it is required to install fail-safe device, or contact us for information required. It may cause a fire, human injury or property loss.
- Do not disassemble or modify this unit. Please contact us when required. It may give an electric shock and cause a fire.

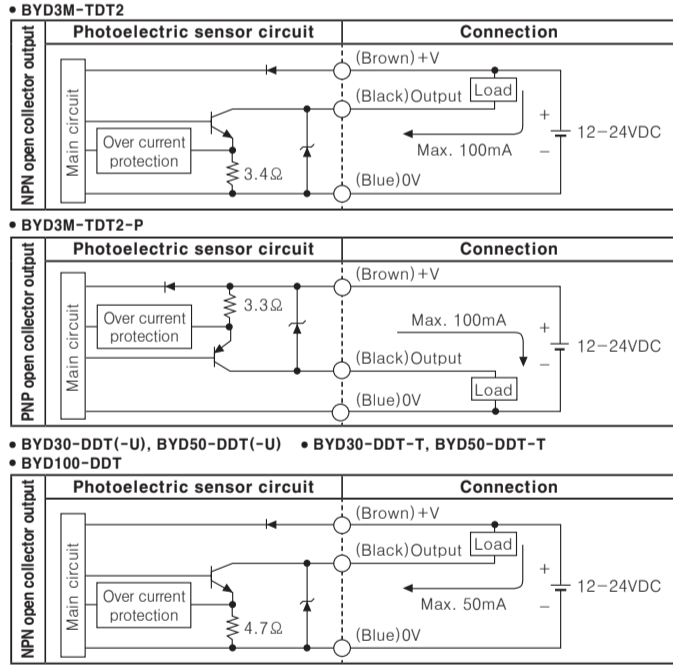
Caution

- This unit shall not be used outdoors. It might shorten the life cycle of the product or give an electric shock. Use this product indoors only. Do not use the product outdoors or at locations subject to the temperatures or humidity outside. (Example: rain, dirty, frost, sunlight, condensation, etc.)
- Do not use this unit where inflammable or explosive gas exists. It may cause a fire or explosion.
- Please check the polarity of power and wrong wiring. It may result in damage to the product.
- Do not use this unit where there is vibration or a chance of impact. It may result in damage to the product.
- When cleaning the unit, do not use water or an oil-based detergent. It might cause fire, give an electric shock or damage to the product.
- Do not short circuit the load. It may result in damage to the product.

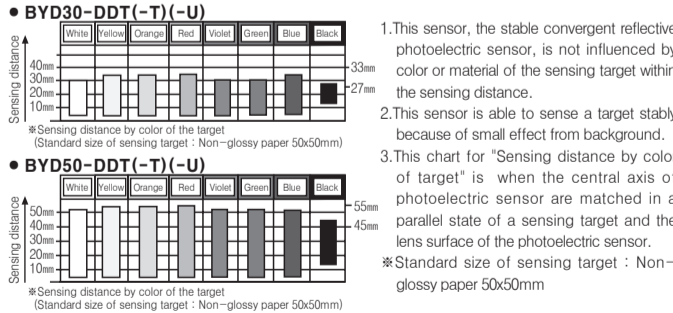
Ordering information

BYD	3M	T	D	T	-	P
Control output	No mark	NPN open collector output	No mark	Emitter and Receiver	Appearances	No mark
Output	P	PNP open collector output	1	Emitter	Power supply	D
Power supply	T	Built-in timer type	2	Receive	Sensing type	T
Sensing distance	No mark	Unit: mm	T	Solid-state output (TR)	Sensing distance	D
Item	Number M	Unit: m	BYD	Photoelectric sensor built-in amplifier		

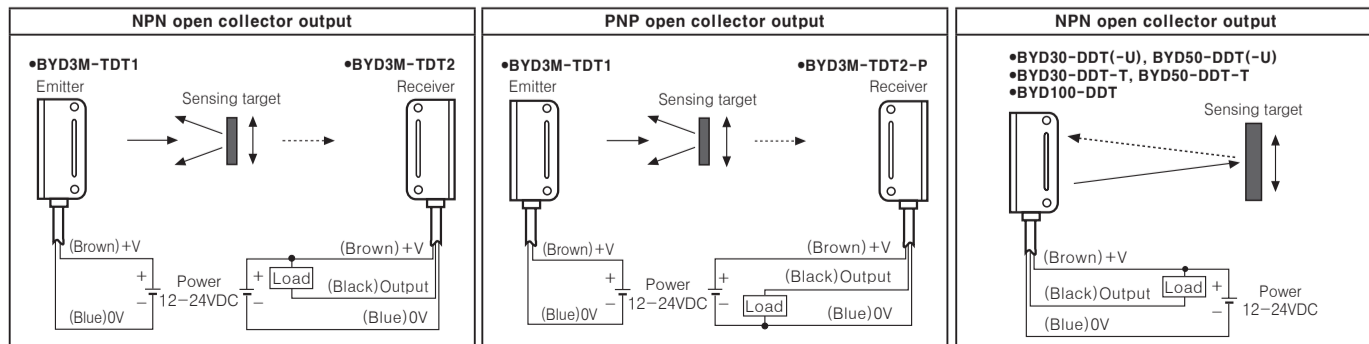
Control output circuit diagram



Sensing distance by color of the target (Convergent reflective type)



Connections



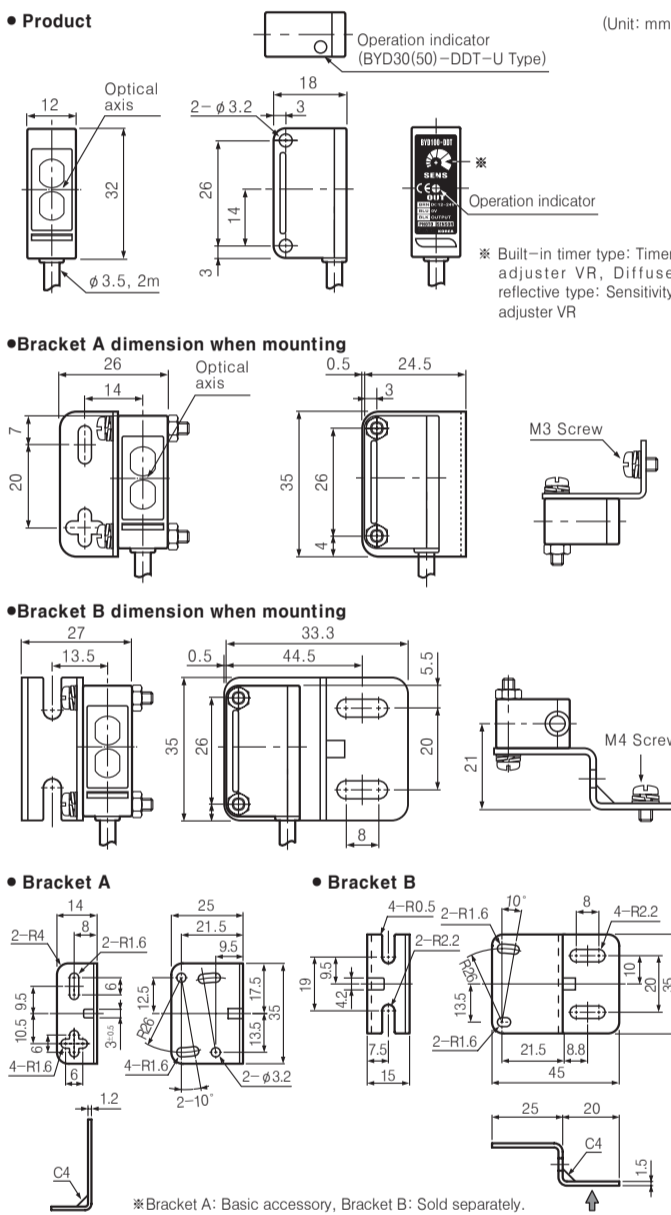
* The above specifications are subject to change without notice.

Specifications

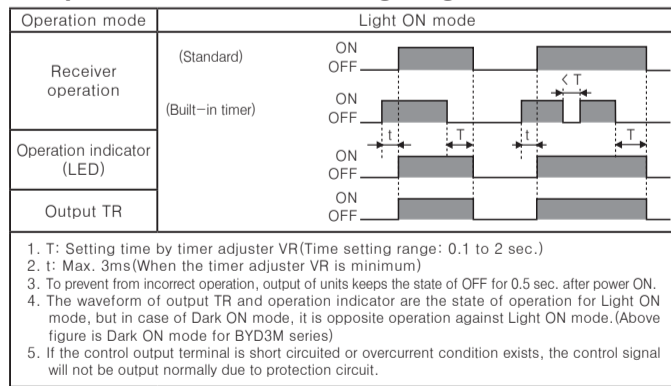
Type	Convergent reflective		Diffuse reflective	Through beam	
	BYD30-DDT BYD30-DDT-U (*1) BYD30-DDT-T (*2)	BYD50-DDT BYD50-DDT-U (*1) BYD50-DDT-T (*2)	BYD100-DDT	NPN output type BYD3M-TDT	PNP output type BYD3M-TDT-P
Sensing distance	10 to 30mm (Non-glossy white paper 50x50mm)	10 to 50mm (Non-glossy white paper 50x50mm)	100mm (Non-glossy white paper 50x50mm)	3m	
Sensing target	Transparent, Translucent, Opaque materials			Opaque materials of Min. φ6mm	
Hysteresis	Max. 10% at sensing distance		Max. 25% at sensing distance		
Response time	Operation: Max. 3ms Return: Max. 100ms(When the time adjuster VR is minimum)		Operation: Max. 3ms Return: Max. 100ms	Max. 1ms	
Power supply	12 - 24 VDC ±10% (Ripple P-P: Max. 10%)				
Current consumption	Max. 35mA			Max. 30mA	
Light source	Infrared LED(modulated)				
Sensitivity adjustment	Fixed		Adjuster VR	Fixed	
Operation mode	Light ON mode fixed			Dark ON(Light ON: Option)	
Control output	NPN open collector output ⇨ Load voltage: Max. 30VDC, Load current: Max. 50mA, Residual: Max. 1V			NPN open collector output ⇨ Load voltage: Max. 30VDC, Load current: Max. 100mA, Residual: Max. 1V PNP open collector output ⇨ Output voltage: ~2.5V, Load current: Max. 100mA	
Protection circuit	Reverse polarity protection, Short-circuit protection				
Timer function	Built-in(OFF delay) delay Time: Max. 0.1 to 2 sec.(adjuster VR)				
Indication	Operation indicator: Red LED				
Connection	Outgoing cable(2m)				
Insulation resistance	Min. 20MΩ(at 500VDC megger)				
Noise strength	±240V the square wave noise(pulse width: 1μs) by the noise simulator				
Dielectric strength	1,000VAC 50/60Hz for 1 minute				
Vibration	1.5mm amplitude at frequency of 10 to 55Hz in each of X, Y, Z directions for 2 hours				
Shock	500m/s ² (50G) in X, Y, Z directions for 3 times				
Environment	Ambient illumination	Sunlight: Max. 11,000lx, Incandescent lamp: Max. 3,000lx(Receiver illumination)			
	Ambient temperature	-20 to 65°C, Storage: -25 to 70°C			
	Ambient humidity	35 to 85%RH, Storage: 35 to 85%RH			
Protection	Standard type: IP64(IEC standards)/(*1),(*2): IP50(IEC standards)		IP50(IEC standards)	IP64(IEC standards)	
Material	Case: ABS, Lens: Acryl				
Cable	AWG 24, Core wire diameter: 0.08mm, No. of core wire: 40, Insulator out diameter: 1mm, φ3.5, Length: 2m, 3P(Emitter of through beam type: 2P)				
Accessory	Driver, Mounting bracket A, M3 Screws, Nuts			Mounting bracket A, M3 Screws, Nuts	
Unit weight	Approx. 70g			Approx. 150g	

* 1: Operation indicator is on top. * 2: OFF delay timer is built-in.
* Environment resistance is rated at no freezing or condensation.

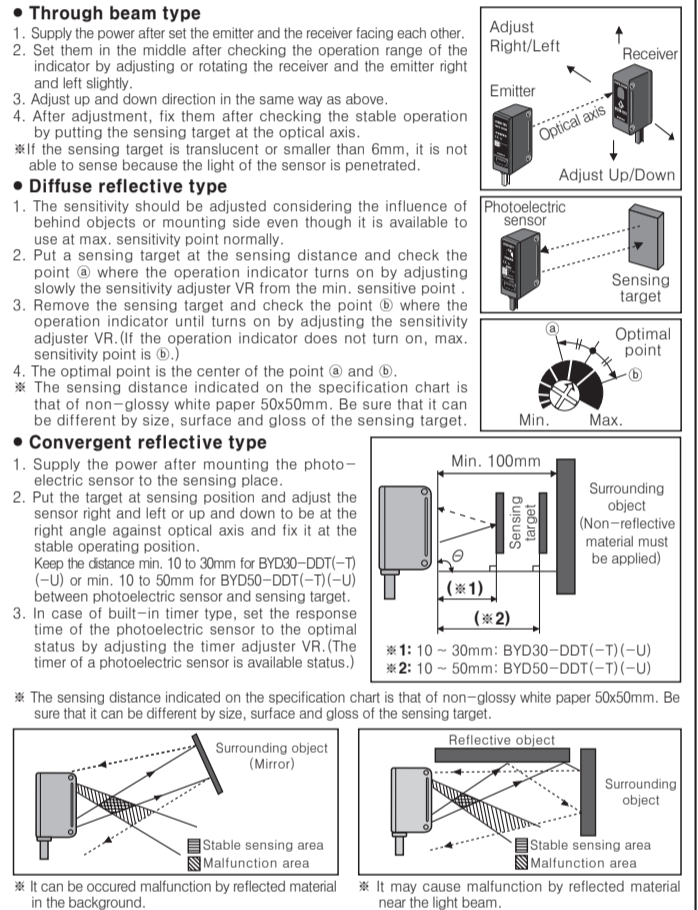
Dimension



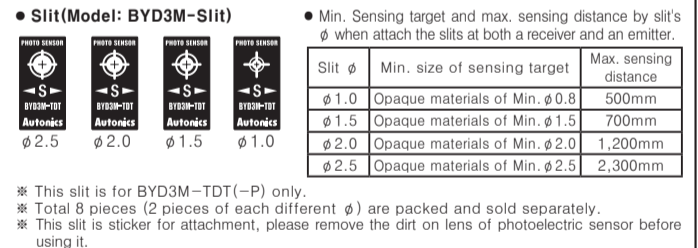
Operation mode and timing diagram



Mounting & Adjustment



Accessory (Sold separately)



Caution for using

- Intercept a strong source of light as like sunlight, spotlight within inclination angle range of photoelectric sensor.
 - The photoelectric sensor may cause malfunction under the fluorescent lamp light, so be sure to use cut-off light with panel.
 - When more than 2 sets of Through beam type sensor are used closely, it might cause interference each other. Be sure to put enough space between them in order to avoid malfunction.
 - When more than 2 sets of diffuse reflection types are installed adjacently, it can be occurred malfunction by light beam from the other target. So it must be installed at an enough interval.
 - Tighten strength of installing screws should be under 10kgf·m.
 - If photoelectric sensor is installed at flat part, it might cause malfunction by reflection light from flat part. Be sure to put space between photoelectric sensor and ground.
 - When wire the photoelectric sensor with high voltage line, power line in the same conduit, it may cause malfunction or mechanical trouble. Therefore please wire separately or use different conduit.
 - Avoid installing the unit as following place.
Where corrosive gas, oil or dust, strong flus, noise, sunlight, strong alkali, acid exist.
 - In case of connect DC relay as inductive load to output please remove surges by using diode or varistor.
 - The photoelectric sensor cable shall be used as short as possible, because it may cause malfunction by noise through the cable.
 - When it is stained by dirt at lens, please clean the lens with dry cloth, but do not use an organic materials such as alkali acid, chromic acid.
 - When use switching power supply as the source of supplying power, F.G. terminal shall be good earth ground and condenser for removing noise shall be installed between 0V and F.G. terminal.
 - Installation environment.
① It shall be used indoor
② Altitude Max. 2,000m
③ Pollution Degree 3
④ Installation Category II
- * It may cause malfunction if above instructions are not followed.

Main products

- Proximity sensors
- Area sensors
- Photoelectric sensors
- Fiber optic sensors
- Door/Door side sensors
- Rotary encoders
- Sensor controllers
- Tachometer/Pulse(Rate) meters
- Temperature/Humidity transducers
- Switching power supplies
- Stepping motors/drivers/motion controllers
- Field network devices
- Laser marking system(CO₂, Nd:YAG)
- Laser welding/soldering system
- Counters
- Timers
- Display units
- Panel meters
- Pressure sensors
- Power controllers
- Graphic/Logic panels
- Temperature controllers

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Satisfiable Partner For Factory Automation

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