

# Universal AC / DC Photoelectric Sensors

## BEN Series



### Features

- Small and power supply built-in type
- Easy installation with indicators on product
- Light ON / Dark ON mode selectable by switch
- Status and output indication
- Built-in IC photo diode for disturbing light and electrical noise

### Specifications

Model	BEN10M-T	BEN5M-M	BEN3M-P	BEN300-D
Sensing type	Through-beam	Retroreflective	Polarized retroreflective	Diffuse reflective
Sensing distance	10 m	0.1 to 5 m <sup>01)</sup>	0.1 to 3 m <sup>01)</sup>	300 mm <sup>02)</sup>
Sensing target	Opaque materials	Opaque materials	Opaque materials	Opaque, translucent materials
Min. sensing target	≥ Ø 16 mm	≥ Ø 60 mm	≥ Ø 60 mm	-
Hysteresis	-	-	-	≤ 20 % of sensing distance
Response time	AC/DC power, relay contact output model: ≤ 20 ms DC power, solid state (transistor) output model: ≤ 1 ms			
Light source	Infrared	Infrared	Red	Infrared
Peak emission wavelength	850 nm	940 nm	660 nm	940 nm
Sensitivity adjustment	-	YES (Adjuster)	YES (Adjuster)	YES (Adjuster)
Operation mode	Light ON mode - Dark ON mode selectable (Adjuster)			
Indicator	Operation indicator (red), stability indicator (green), power indicator (red) <sup>03)</sup>			
Approval	CE ENEC			
Unit weight (AC/DC power)	≈ 354 g	≈ 208 g	≈ 208 g	≈ 195 g
Unit weight (DC power)	≈ 342 g	≈ 200 g	≈ 200 g	≈ 187 g

01) Reflector (MS-2)

02) Non-glossy white paper 100 × 100 mm

03) Only for the emitter

Output method	AC/DC power, relay contact output	DC power, solid state (transistor) output
Power supply	24-240 VAC ~ ± 10 % 50/60 Hz 24-240 VDC ~ ± 10 % (ripple P-P: ≤ 10 %)	12-24 VDC ~ ± 10 % (ripple P-P: ≤ 10 %)
Power / current consumption	≤ 4 VA	It depends on the sensing type
Through-beam	-	Emitter: ≤ 50 mA, receiver: ≤ 50 mA
Reflective	-	≤ 50 mA
Control output	Relay contact output	NPN open collector - PNP open collector simultaneous output
Contact capacity	250 VAC ~ 3 A of resistance load, 30 VDC ~ 3 A of resistance load	-
Contact composition	1c	
Relay life cycle	Mechanical: ≥ 50,000,000 Electrical: ≥ 100,000	
Load voltage	-	≤ 30 VDC ~
Load current	-	≤ 200 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)	
Insulation type	Double or strong insulation (dielectric voltage between the measured input and the power : 1 kV)	-
Noise immunity	± 1,000 VDC ~ the square wave noise	± 240 VDC ~ the square wave noise



View product detail

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<b>Dielectric strength</b>	1,000 VAC~ 50/60 Hz for 1 min
<b>Vibration</b>	1.5 mm double amplitude at frequency of 10 to 55 Hz (for 1 min) in each X, Y, Z direction for 2 hours
<b>Vibration (malfunction)</b>	1.5 mm double amplitude at frequency of 10 to 55 Hz (for 1 min) in each X, Y, Z direction for 10 min -
<b>Shock</b>	500 m/s <sup>2</sup> ( $\approx$ 50 G) in each X, Y, Z direction for 3 times
<b>Shock (malfunction)</b>	100 m/s <sup>2</sup> ( $\approx$ 10 G) in each X, Y, Z direction for 3 times -
<b>Ambient illuminance (receiver)</b>	Sunlight: $\leq$ 11,000 lx, incandescent lamp: $\leq$ 3,000 lx
<b>Ambient temperature</b>	-20 to 65 °C, storage: -20 to 70 °C (no freezing or condensation)
<b>Ambient humidity</b>	35 to 85 %RH, storage: 35 to 85 %RH (no freezing or condensation)
<b>Protection rating</b>	IP50 (IEC standard)
<b>Connection</b>	Cable type
<b>Cable spec.</b>	$\varnothing$ 5 mm, Emitter: 2-wire, AC/DC power: 5-wire, DC power: 4-wire, 2 m
<b>Wire spec.</b>	AWG22 (0.08 mm, 60-core), insulator outer diameter: $\varnothing$ 1.25 mm
<b>Material</b>	Case and case cover: heat resistant ABS, sensing part: PC (polarized retroreflective: PMMA)