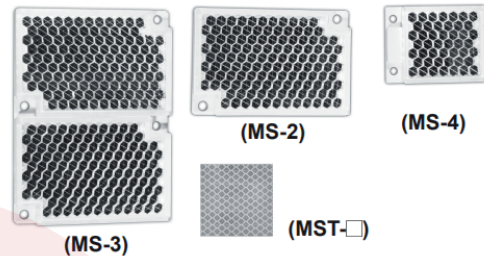


BX Series Long Sensing, Amplifier Built-in Type With Universal Voltage (terminal)

Terminal Type and Long Sensing Distance Type

■ Features

- Sensitivity adjuster
- Timer function: ON Delay, OFF Delay, One-shot Delay
- NPN/PNP open collector output (DC power type)
- Self-diagnosis function (green LED turns on in stable level)
- Wide power supply range: Universal 24-240VDC/24-240VAC
- Protection structure IP66 (IEC standard)




※MS-4, MST-□ is sold separately.

⚠ Please read "Safety Considerations" in operation manual before using.



■ Specifications

◎ Free power type, Relay contact output type

Model	Standard type	BX15M-TFR	BX5M-MFR	BX3M-PFR	BX700-DFR
	With Timer	BX15M-TFR-T	BX5M-MFR-T	BX3M-PFR-T	BX700-DFR-T
Sensing type		Through-beam	Retroreflective (standard type)	Retroreflective (built-in polarizing filter)	Diffuse reflective
Sensing distance		15m	5m ^{※1}	3m ^{※2}	700mm ^{※3}
Sensing target		Opaque materials of Min. Ø15mm	Opaque materials of Min. Ø60mm		Translucent, opaque material
Hysteresis		—			Max. 20% at rated setting distance
Response time		Max. 20ms			
Power supply		24-240VAC $\sim\pm 10\%$ 50/60Hz, 24-240VDC $\pm\pm 10\%$ (ripple P-P: max. 10%)			
Power consumption		Max. 3VA			
Light source		Infrared LED (850nm)		Red LED (660nm)	Infrared LED (940nm)
Sensitivity adjustment		Sensitivity adjuster			
Operation mode		Light ON/Dark ON operation mode switch			
Control output		Relay contact output (contact capacity: 30VDC \equiv 3A, 250VAC \sim 3A at resistive load, contact composition: 1c) ^{※4}			
Relay life cycle		Mechanically: min. 50,000,000, electrically: min. 100,000			
Self-diagnosis output		Self-diagnosis indicator (green LED) turns on at stable operation			
Timer function		Selectable ON delay, OFF delay, one shot delay by slide switch [delay time: 0.1 to 5sec (timer adjuster)]			
Indicator		Operation indicator: yellow LED, self-diagnosis indicator: green LED			
Connection		Terminal connection			
Insulation resistance		Over 20M Ω (at 500VDC megger)			
Insulation type		Double or strong insulation (mark:  , dielectric voltage between the measured input and the power: 1.5kV)			
Noise immunity		$\pm 1,000$ V the square wave noise (pulse width: 1 μ s) by the noise simulator			
Dielectric strength		1500VAC 50/60Hz for 1minute			
Vibration	Mechanical	1.5mm amplitude at frequency of 10 to 55Hz (for 1 min) in each X, Y, Z direction for 2 hours			
	Malfunction	1.5mm amplitude at frequency of 10 to 55Hz (for 1 min) in each X, Y, Z direction for 10 minutes			
Shock	Mechanical	500m/s ² (approx. 50G) in each X, Y, Z direction for 3 times			
	Malfunction	100m/s ² (approx. 10G) in each X, Y, Z direction for 3 times			
Environment	Ambient illumination	Sunlight: max. 11,000lx, incandescent lamp: max. 3,000lx (receiver illumination)			
	Ambient temperature	-20 to 55°C, storage: -25 to 70°C			
	Ambient humidity	35 to 85%RH, storage: 35 to 85%RH			
Protection structure		IP66 (IEC standard)			
Material		Case, lens cover: polycarbonate, sensing part: acrylic, bracket: steel plate cold commercial, bolt: steel chromium molybdenum, nut: steel chromium molybdenum			
Accessory	Individual	—	Reflector (MS-2)	Reflector (MS-3)	—
	Common	Adjuster driver, fixing bracket, bolts, nuts			
Approval		CE			
Unit weight	TFR: approx. 225g	MFR: approx. 130g	PFR: approx. 148g	DFR: approx. 115g	
	TFR-T: approx. 226g	MFR-T: approx. 131g	PFR-T: approx. 149g	DFR-T: approx. 116g	

- ※1: The sensing distance is specified with using the MS-2 reflector. It is the same when using the MS-4 reflector (sold separately). The sensor can detect under 0.1m.
- ※2: The sensing distance is specified with using the MS-3 reflector. When using the MS-2 reflector, the sensing distance is 0.1 to 2m. The sensor can detect under 0.1m. When using reflective tapes, the reflectivity will vary by the size of the tape. Please refer to the "Reflectivity By Reflective Tape Model" table before using the tapes.
- ※3: Non-glossy white paper 200×200mm.
- ※4: Relay contact output of 1a type is option.
- ※The temperature or humidity mentioned in Environment indicates a non freezing or condensation environment.

(A)	Photoelectric Sensors
(B)	Fiber Optic Sensors
(C)	Door/Area Sensors
(D)	Proximity Sensors
(E)	Pressure Sensors
(F)	Rotary Encoders
(G)	Connectors/ Connector Cables/ Sensor Distribution Boxes/ Sockets
(H)	Temperature Controllers
(I)	SSRs / Power Controllers
(J)	Counters
(K)	Timers
(L)	Panel Meters
(M)	Tacho / Speed / Pulse Meters
(N)	Display Units
(O)	Sensor Controllers
(P)	Switching Mode Power Supplies
(Q)	Stepper Motors & Drivers & Controllers
(R)	Graphic/ Logic Panels
(S)	Field Network Devices
(T)	Software

BX Series

■ Specifications

◎ DC power type, Solid state output type

Model	Standard type	BX15M-TDT	BX5M-MDT	BX3M-PDT	BX700-DDT
	With Timer	BX15M-TDT-T	BX5M-MDT-T	BX3M-PDT-T	BX700-DDT-T
Sensing type		Through-beam	Retroreflective (standard type)	Retroreflective (built-in polarizing filter)	Diffuse reflective
Sensing distance		15m	5m ^{※1}	3m ^{※2}	700mm ^{※3}
Sensing target		Opaque materials of Min. Ø15mm	Opaque materials of Min. Ø60mm		Translucent, opaque material
Hysteresis		—			Max. 20% at rated setting distance
Response time		Max. 1ms			
Power supply		12-24VDC \pm 10% (ripple P-P: max. 10%)			
Current consumption		Max. 50mA			
Light source		Infrared LED (850nm)		Red LED (660nm)	Infrared LED (940nm)
Sensitivity adjustment		Sensitivity adjuster			
Operation mode		Light ON/Dark ON operation mode switch			
Control output		NPN or PNP open collector output ●Load voltage: max. 30VDC \pm ●Load current: max. 200mA ●Residual voltage - NPN: max. 1VDC \pm , PNP: max. 2.5VDC			
Self-diagnosis output		NPN open collector output (green LED turns on at stable operation and output (transistor output) turns on) ●Load voltage: max. 30VDC \pm ●Load current: max. 50mA ●Residual voltage - max. 1VDC \pm (50mA), max. 0.4VDC(16mA)			
Protection circuit		Reverse polarity protection circuit, output overcurrent (short-circuit) protection circuit			
Timer function		Selectable ON delay, OFF delay, one shot delay by slide switch [delay time: 0.1 to 5sec (timer adjuster)]			
Indicator		Operation indicator: Yellow LED, Self-diagnosis indicator: Green LED			
Connection		Terminal connection			
Insulation resistance		Over 20M Ω (at 500VDC megger)			
Noise immunity		\pm 240V the square wave noise (pulse width: 1 μ s) by the noise simulator			
Dielectric strength		1500VAC 50/60Hz for 1minute			
Vibration	Mechanical	1.5mm amplitude at frequency of 10 to 55Hz (for 1 min) in each X, Y, Z direction for 2 hours			
	Malfunction	1.5mm amplitude at frequency of 10 to 55Hz (for 1 min) in each X, Y, Z direction for 10 minutes			
Shock	Mechanical	500m/s ² (approx. 50G) in each X, Y, Z direction for 3 times			
	Malfunction	100m/s ² (approx. 10G) in each X, Y, Z direction for 3 times			
Environment	Ambient illumination	Sunlight: Max. 11,000lx, Incandescent lamp: Max. 3,000lx (receiver illumination)			
	Ambient temperature	-20 to 55°C, storage: -25 to 70°C			
	Ambient humidity	35 to 85%RH, storage: 35 to 85%RH			
Protection structure		IP66 (IEC standard)			
Material		Case, Lens cover: polycarbonate, sensing part: acrylic, bracket: steel plate cold commercial, bolt: steel chromium molybdenum, nut: steel chromium molybdenum			
Accessory	Individual	—	Reflector (MS-2)	Reflector (MS-3)	—
	Common	Adjuster driver, fixing bracket, bolts, nuts			
Approval		CE			
Unit weight		TDT: approx. 211g TDT-T: approx. 212g	MDT: approx. 123g MDT-T: approx. 124g	PDT: approx. 141g PDT-T: approx. 142g	DDT: approx. 116g DDT-T: approx. 117g

※1: The sensing distance is specified with using the MS-2 reflector. It is the same when using the MS-4 reflector (sold separately).
The sensor can detect under 0.1m.

※2: The sensing distance is specified with using the MS-3 reflector. When using the MS-2 reflector, the sensing distance is 0.1 to 2m.
The sensor can detect under 0.1m.

When using reflective tapes, the reflectivity will vary by the size of the tape. Please refer to the "■ Reflectivity By Reflective Tape Model" table before using the tapes.

※3: Non-glossy white paper 200×200mm.

※The temperature or humidity mentioned in Environment indicates a non freezing or condensation environment.

Long Sensing, Amplifier Built-in Type With Universal Voltage (terminal)

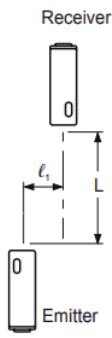
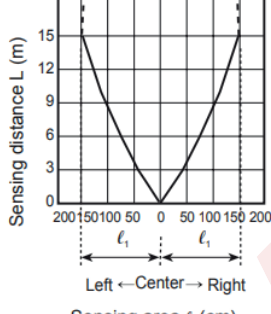
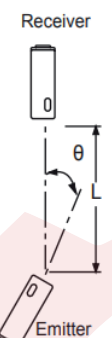
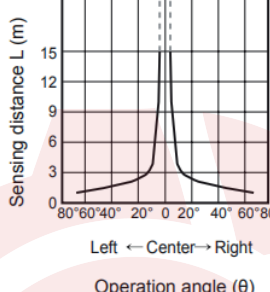

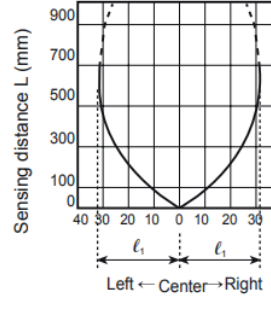
■ Feature Data

◎ Through-beam type

- BX15M-TFR / BX15M-TFR-T
- BX15M-TDT / BX15M-TDT-T

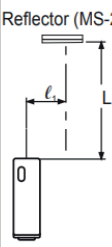
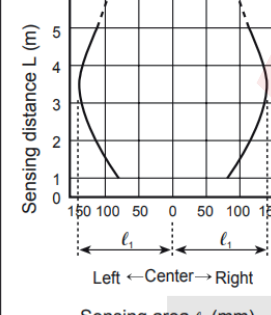
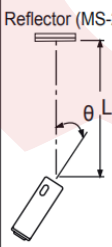
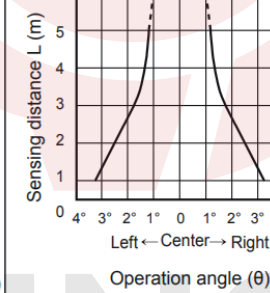
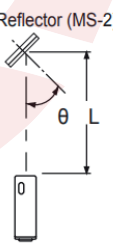
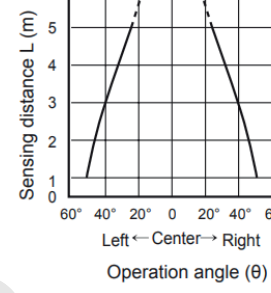
◎ Diffuse reflective type

- BX700-DFR / BX700-DFR-T
- BX700-DDT / BX700-DDT-T

Parallel shifting characteristic		Angle Characteristic		Sensing area	
Measuring method	Data	Measuring method	Data	Measuring method	Data
 <p>Receiver</p> <p>Emitter</p>	 <p>Sensing distance L (m)</p> <p>Left ← Center → Right</p> <p>Sensing area ℓ_1 (cm)</p>	 <p>Receiver</p> <p>Emitter</p>	 <p>Sensing distance L (m)</p> <p>Left ← Center → Right</p> <p>Operation angle (θ)</p>	 <p>Standard sensing target: non-glossy white paper 200×200mm</p> <p>Diffuse reflective</p>	 <p>Sensing distance L (mm)</p> <p>Left ← Center → Right</p> <p>Sensing area ℓ_1 (mm)</p>

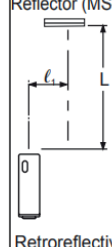
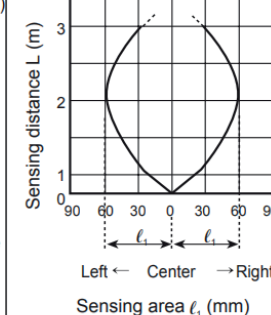
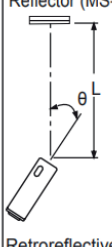
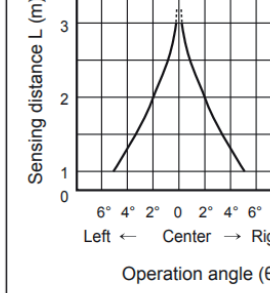
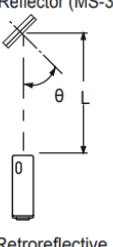
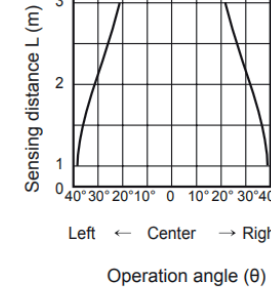
◎ Retroreflective type

- BX5M-MFR / BX5M-MFR-T
- BX5M-MDT / BX5M-MDT-T

Parallel shifting characteristic		Angle Characteristic		Reflector angle characteristic	
Measuring method	Data	Measuring method	Data	Measuring method	Data
 <p>Reflector (MS-2)</p> <p>Retroreflective type (standard type)</p>	 <p>Sensing distance L (m)</p> <p>Left ← Center → Right</p> <p>Sensing area ℓ_1 (mm)</p>	 <p>Reflector (MS-2)</p> <p>Retroreflective type (standard type)</p>	 <p>Sensing distance L (m)</p> <p>Left ← Center → Right</p> <p>Operation angle (θ)</p>	 <p>Reflector (MS-2)</p> <p>Retroreflective type (standard type)</p>	 <p>Sensing distance L (m)</p> <p>Left ← Center → Right</p> <p>Operation angle (θ)</p>

◎ Retroreflective type (Built-in polarizing filter)

- BX3M-PFR / BX3M-PFR-T
- BX3M-PDT / BX3M-PDT-T

Parallel shifting characteristic		Sensor angle characteristic		Reflector angle characteristic	
Measuring method	Data	Measuring method	Data	Measuring method	Data
 <p>Reflector (MS-3)</p> <p>Retroreflective type (built-in polarizing filter)</p>	 <p>Sensing distance L (m)</p> <p>Left ← Center → Right</p> <p>Sensing area ℓ_1 (mm)</p>	 <p>Reflector (MS-3)</p> <p>Retroreflective type (built-in polarizing filter)</p>	 <p>Sensing distance L (m)</p> <p>Left ← Center → Right</p> <p>Operation angle (θ)</p>	 <p>Reflector (MS-3)</p> <p>Retroreflective type (built-in polarizing filter)</p>	 <p>Sensing distance L (m)</p> <p>Left ← Center → Right</p> <p>Operation angle (θ)</p>

- (A) Photoelectric Sensors
- (B) Fiber Optic Sensors
- (C) Door/Area Sensors
- (D) Proximity Sensors
- (E) Pressure Sensors
- (F) Rotary Encoders
- (G) Connectors/ Connector Cables/ Sensor Distribution Boxes/ Sockets
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- (I) SSRs / Power Controllers
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