Autonics Photoelectric Sensors - BTF Series

Overview

The BTF series ultra-compact, thin type photoelectric sensors are ideal for installation in limited spaces and compact applications. The sensors measure just 3.7mm in thickness, come equipped with built-in amplifiers, and are capable of detecting tiny objects including wires and semiconductor chips. The BTF series is also built with IP67 protection structure and stainless steel mounting brackets, providing durable and reliable sensing solutions in diverse environments.

Features

- IP67 protection rating
- Small target detection
- Ultra-thin size of only 3.7mm thickness, 4.6mm including lens
- Operation indicator (red) and stability indicator (green) show operation status
- Available models: diffuse, diffuse with background suppression, and through-beam pair
- Includes mounting hardware
- 3-year warranty

BTF15-BDTL

BTF1M-TDTL-P

3 YEAR WARRANTY

CE

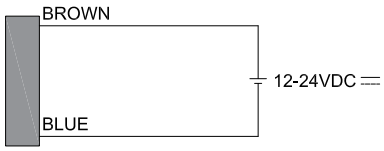
3.7mm Flat Rectangular Photoelectric Sensors - BTF Series

Part Number	Price	Sensing Distance	Switching Frequency	Light Emission	Logic	Output Function	Connection Type	Housing Dimensions (H x W x D) mm [in] *	Drawing Link
Diffuse With Background Suppression									
BTF15-BDTL	$98.00	1-15mm [0.03-0.59in]	1 kHz	Visible red 650nm	NPN	Light-on	6.5ft/2m pigtail	24 x 13 x 3.7 [0.94 x 0.51 x 0.14]	PDF
BTF15-BDTL-P	$98.00				PNP	Light-on			PDF
BTF15-BDTD	$98.00				NPN	Dark-on			PDF
BTF15-BDTD-P	$98.00				PNP	Dark-on			PDF
Diffuse									
BTF30-DDTL	$79.00	5-30mm [0.19-1.18in]	1 kHz	Visible red 650nm	NPN	Light-on	6.5ft/2m pigtail	24 x 13 x 3.7 [0.94 x 0.51 x 0.14]	PDF
BTF30-DDTL-P	$79.00				PNP	Light-on			PDF
BTF30-DDTD	$79.00				NPN	Dark-on			PDF
BTF30-DDTD-P	$79.00				PNP	Dark-on			PDF
Through-beam Pair									
BTF1M-TDTL	$98.00	0-1m [0-3.28ft]	1 kHz	Visible red 650nm	NPN	Light-on	6.5ft/2m pigtail	19 x 13 x 3.7 [0.74 x 0.51 x 0.14]	PDF
BTF1M-TDTL-P	$98.00				PNP	Light-on			PDF
BTF1M-TDTD	$98.00				NPN	Dark-on			PDF
BTF1M-TDTD-P	$98.00				PNP	Dark-on			PDF

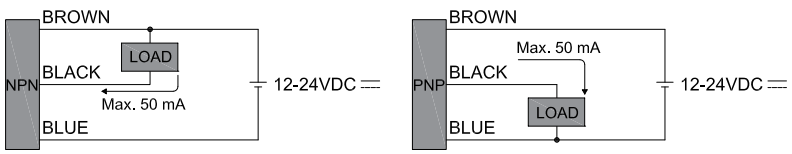
*** For complete drawing, please click on the Drawing Link PDF for each part number.**

Wiring Diagram

SENDER FOR BTF1M SERIES



RECEIVER, DIFFUSE REFLECTIVE, BACKGROUND REFLECTIVE TYPE



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Photoelectric Sensors - BTF Series

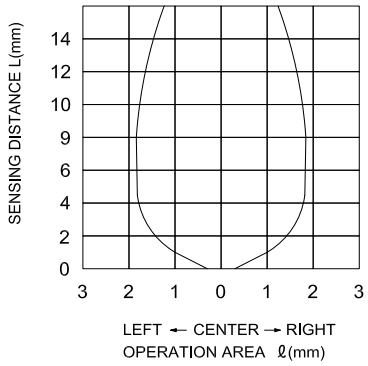
3.7mm Flat Rectangular Photoelectric Sensors Specifications - BTF Series			
Sensor Type	***Diffuse With Background Suppression BTF15***	***Diffuse BTF30***	***Through-beam Pair BTF1M***
Sensing Distance	1-15mm [0.03-0.59in]	5-30mm (1) [0.19-1.18in]	0-1m (1) [0-3.28ft]
Sensing Target	Opaque materials	Opaque and translucent materials	
Sensing Target Minimum	≥ Ø 2mm	≥ Ø 0.2mm (02)	≥ Ø 0.2mm non-illuminated objects (02)
Hysteresis	—	≤ 20% of sensing distance	≤ 5% of sensing distance
Response Time	≤ 1ms		
Indicators	Operation indicator (red), stability indicator (green)		
Operating Voltage	12-24 VDC ± 10		
Maximum Residual Ripple	P-P: ≤ 10%		
Current Consumption	≤ 20mA		
Load Voltage	≤ 26.4VDC		
Load Current	≤ 50mA		
Residual Voltage	NPN: ≤ 1VDC, PNP: ≤ 2VDC		
Reverse Power Protection	Yes		
Output Short Overcurrent Protection	Yes		
Insulation Resistance	≥ 20MΩ (500VDC megger)		
Noise Immunity	±240 VDC the square wave noise (pulse width: 1 μs by the noise simulator		
Dielectric Strength	Between the charging part and the case: 1,000 VAC 50/60Hz for 1 min		
Vibration	1.5mm double amplitude at frequency of 10 to 55Hz in each X, Y, Z direction for 2 hours		
Shock	500 m/s² (≈ 50G) in each X, Y, Z direction for 3 times		
Ambient Illuminance (Receiver)	Sunlight: ≤ 10,000 lx, incandescent lamp: ≤ 3,000 lx		
Operating Temperature	-25 to 55°C [-13 to 131°F]		
Storage Temperature	-40 to 70°C [-40 to 158°F]		
Ambient Humidity	35 to 85%RH, storage: 35 to 85%RH (no freezing or condensation)		
Protection Rating	IP67		
Housing Material	Case: Polybutylene terephthalate (PBT), sensing part: Poly(methyl methacrylate) (PMMA), bracket: SUS304, bolt: carbon steel, sleeve: SUS304		
Tightening Torque	0.3 N•m		
Weight	25g [0.88oz]		40g [1.41oz]
Connection	Cable Type Ø 2.5 mm, 3-wire (emitter: 2-wire), 2m [6.5ft]		
Wire	AWG 28 (0.08mm, 19-core), insulator outer diameter: Ø 0.9mm		
Agency Approvals	CE, UKCA		

Notes (1) Non-glossy white paper 50 × 50mm
(2) Sensing distance 10mm

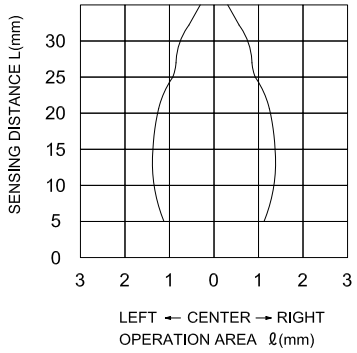
Photoelectric Sensors - BTF Series

Characteristic Curves

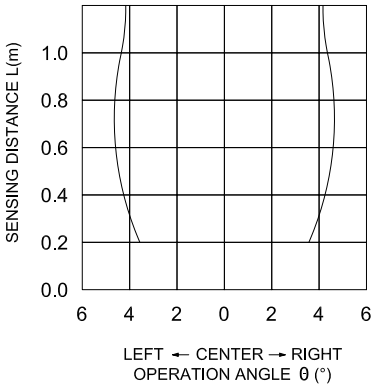
● BTF15-BDTL



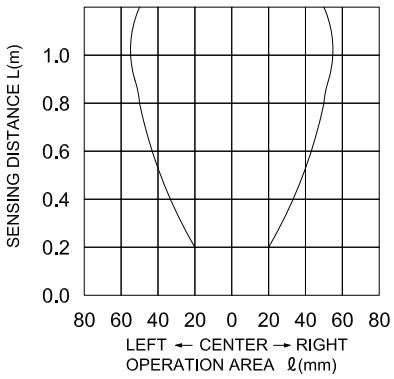
● BTF30-DDTL



● BTF1M-TDTL



● BTF1M-TDTL



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Photoelectric Sensors - BTS Series

Overview

The BTS series ultra-compact, slim type photoelectric sensors are ideal for installation in limited spaces and compact applications. The sensors measure just 7.2mm wide, come equipped with built-in amplifiers and are capable of detecting tiny objects including metallic wires and semiconductor chips. The BTS Series is also built with IP67 protection structure and stainless steel mounting brackets, providing durable and reliable sensing solutions in diverse environments.

Features

- IP67 protection rating
- Small target detection
- Ultra-compact slim sensors are only 7.2mm wide
- Operation indicator (red) and stability indicator (green) show operation status
- Available models: diffuse, retroreflecftive, and through-beam pair
- Includes mounting hardware
- 3-year warranty

BTS15-LDTL

BTS1M-TDTL

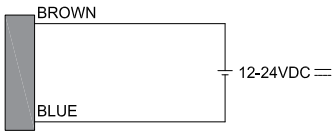
7.2mm Slim Rectangular Photoelectric Sensors - BTS Series

Part Number	Price	Sensing Distance	Switching Frequency	Light Emission	Logic	Output Function	Connection Type	Housing Dimensions (H x W x D) mm [in] **	Drawing Link
Diffuse									
BTS15-LDTL	$98.00	5-15mm [0.19-0.59in]	1 kHz	Visible red 650nm	NPN	Light-on	6.5ft/2m pigtail	24.6 x 7.2 x 10.8 [0.96 x 0.28 x 0.42]	PDF
BTS15-LDTL-P	$98.00				PNP	Light-on			PDF
BTS15-LDTD	$98.00				NPN	Dark-on			PDF
BTS15-LDTD-P	$98.00				PNP	Dark-on			PDF
BTS30-LDTL	$98.00	5-30mm [0.19-1.18in]	1 kHz	Visible red 650nm	NPN	Light-on			PDF
BTS30-LDTL-P	$98.00				PNP	Light-on			PDF
BTS30-LDTD	$98.00				NPN	Dark-on			PDF
BTS30-LDTD-P	$98.00				PNP	Dark-on			PDF
*Retroreflective **									
BTS200-MDTL	$84.00	10-200mm [0.39-7.87in]	1 kHz	Visible red 650nm	NPN	Light-on	6.5ft/2m pigtail	24.6 x 7.2 x 10.8 [0.96 x 0.28 x 0.42]	PDF
BTS200-MDTL-P	$84.00				PNP	Light-on			PDF
BTS200-MDTD	$84.00				NPN	Dark-on			PDF
BTS200-MDTD-P	$84.00				PNP	Dark-on			PDF
Through-beam Pair									
BTS1M-TDTL	$98.00	0-1m [0-3.28ft]	1 kHz	Visible red 650nm	NPN	Light-on	6.5ft/2m pigtail	18.6 x 7.2 x 9.5 0.73 x 0.28 x 0.37]	PDF
BTS1M-TDTL-P	$98.00				PNP	Light-on			PDF
BTS1M-TDTD	$98.00				NPN	Dark-on			PDF
BTS1M-TDTD-P	$98.00				PNP	Dark-on			PDF

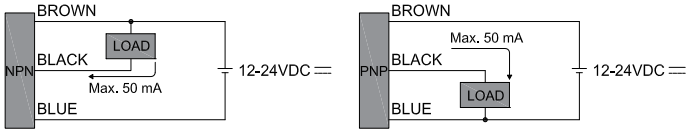
*** Purchase reflector separately.**
**** For complete drawing, please click on the Drawing Link PDF for each part number.**

Wiring Diagrams

Sender for BTS1M Series



Receiver Retroreflective Convergent Reflective Type



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Photoelectric Sensors - BTS Series

7.2mm Slim Rectangular Photoelectric Sensors Specifications - BTS Series			
Sensor Type	***Diffuse BTS15 and BTS30***	***Retroreflective BTS200***	***Through-beam Pair BTS1M***
Sensing Distance	BTS15 models: 5-15mm [0.19-0.59in]1-15mm BTS30 models:5-30mm [0.19-1.18in] (2)	10-200mm [0.39-7.87in](1)	0-1m [0-3.28ft]
Sensing Target	Opaque and translucent materials	≥ Ø 27 Opaque and translucent materials	Opaque materials
Sensing Target Minimum	≥ Ø 0.15mm (4)	≥ Ø 2mm (3)	≥ Ø 0.2mm
Hysteresis	≤ 15 % of sensing distance	—	—
Response Time	≤ 1ms		
Indicators	Operation indicator (red), stability indicator (green)		
Operating Voltage	12-24 VDC ± 10		
Maximum Residual Ripple	P-P: ≤ 10%		
Current Consumption	≤ 20mA		
Load Voltage	≤ 26.4VDC		
Load Current	≤ 50mA		
Residual Voltage	NPN: ≤ 1VDC, PNP: ≤ 2VDC		
Reverse Power Protection	Yes		
Output Short Overcurrent Protection	Yes		
Insulation Resistance	≥ 20MΩ (500VDC megger)		
Noise Immunity	±240 VDC the square wave noise (pulse width: 1 μs) by the noise simulator		
Dielectric Strength	Between the charging part and the case: 1,000 VAC 50/60 Hz for 1 min		
Vibration	1.5mm double amplitude at frequency of 10 to 55Hz in each X, Y, Z direction for 1 min		
Shock	500 m/s² (≈ 50 G) in each X, Y, Z direction for 3 times		
Ambient Illuminance (Receiver)	Sunlight: ≤ 10,000 lx, incandescent lamp: ≤ 3,000 lx		
Operating Temperature	-25 to 55°C [-13 to 131°F]		
Storage Temperature	-30 to 70°C [-22 to 158°F]		
Ambient Humidity	35 to 85%RH, storage: 35 to 85%RH (no freezing or condensation)		
Protection Rating	IP67		
Material	Case: Polybutylene terephthalate (PBT), sensing part: Poly(methyl methacrylate) (PMMA), bracket: SUS304, bolt: SWCH10A		
Tightening Torque	0.3 N•m		
Weight	25g [0.88oz]		40g [1.41oz]
Connection	Cable Type Ø 2.5mm, 3-wire (emitter: 2-wire), 2m [6.5ft]		
Wire	AWG 28 (0.08mm, 19-core), insulator outer diameter: Ø 0.9mm		
Agency Approvals	CE, UKCA		

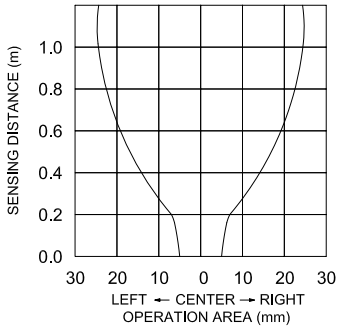
Notes (1) Reflector (MS-6)
(2) Sensing distance 10mm
(3) Sensing distance 100mm
(4) Sensing distance 10mm

Autonics Photoelectric Sensors - BTS Series

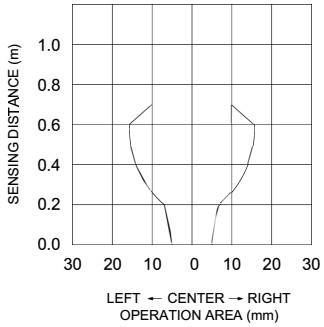
Characteristic Curves

Slit Diameter Ø	Applied Condition		Minimum Sensing Target	Maximum Sensing Distance	Characteristic Curve
	Sender	Receiver			
Ø 1mm	O	—	≥ Ø 1.6 mm Opaque materials	500mm	1
	—	O			
	O	O	≥ Ø 1.2 mm Opaque materials	300mm	2
Ø 0.5mm	O	—	≥ Ø 1.2 mm Opaque materials	300mm	3
	—	O			
	O	O	≥ Ø 0.8 mm Opaque materials	100mm	4

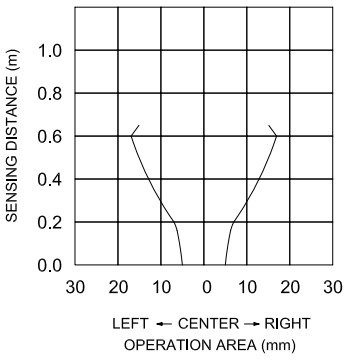
Characteristic Curve 1



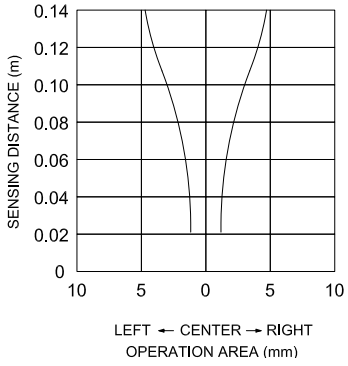
Characteristic Curve 2



Characteristic Curve 3



Characteristic Curve 4



Autonics Photoelectric Sensors - BPS Series

Overview

The BPS series compact photoelectric sensors are easy to install with a compact, thin and flat design. These through-beam sensors use infrared light to attain extra long sensing ranges.

Features

- IP67 protection rating
- Low profile, flat sensors are only 7.5mm thick (8.1mm including lens)
- 3m sensing range
- Compact housing for easy mount
- 1kHz switching frequency
- Includes mounting hardware
- 3-year warranty

BPS3M-TDT

BPS3M-TDTL

3 YEAR WARRANTY

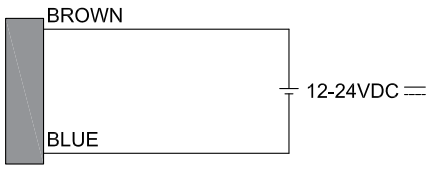
CE

7.5mm Flat Rectangular Photoelectric Sensors BPS Series									
Part Number	*Price*	*Sensing Distance*	*Switching Frequency*	*Light Emission*	*Logic*	*Output Function*	*Connection Type*	*Housing Dimensions (H x W x D) mm [in] **	*Drawing Link*
Through-beam Pair									
BPS3M-TDT	$91.00	0-3m [0-9.84ft]	1 kHz	Infrared 850nm	NPN	Dark-on	6.5ft/2m pigtail	12 x 16.0 x 7.5 [0.47 x 0.62 x 0.29]	PDF
BPS3M-TDT-P	$91.00				PNP	Dark-on			PDF
BPS3M-TDTL	$91.00				NPN	Light-on			PDF
BPS3M-TDTL-P	$91.00				PNP	Light-on			PDF

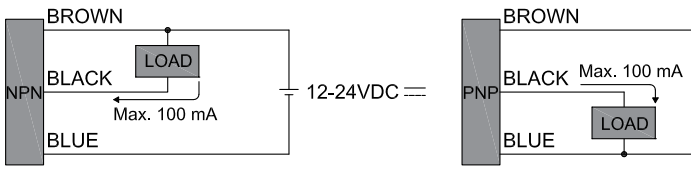
*** For complete drawing, please click on the Drawing Link PDF for each part number.**

Wiring Diagrams

Sender



Receiver



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Photoelectric Sensors - BPS Series

7.5mm Flat Rectangular Photoelectric Sensors Specifications BPS Series	
Sensor Type	***Through-beam Pair***
Sensing Distance	0-3m [0-9.84ft]
Sensing Target	Opaque materials
Sensing Target Minimum	≥ Ø 5mm
Hysteresis	—
Response Time	≤ 1ms
Indicators	Power Indicator of emitter (red), operation indicator of receiver (red)
Power Supply	12-24 VDC ± 10
Maximum Residual Ripple	P-P: ≤ 10%
Current Consumption	≤ 20mA
Load Voltage	≤ 30VDC
Load Current	≤ 100mA
Residual Voltage	NPN: ≤ 1VDC, PNP: ≤ 2.5 VDC
Reverse Power Protection	Yes
Output Short Overcurrent Protection	Yes
Insulation Resistance	≥ 20MΩ (500VDC megger)
Noise Immunity	±240 VDC the square wave noise (pulse width: 1 μs) by the noise simulator
Dielectric Strength	Between the charging part and the case: 1,000 VAC 50/60Hz for 1 min
Vibration	1.5mm double amplitude at frequency of 10 to 55 Hz in each X, Y, Z direction for 2 hours
Shock	500 m/s² (≈ 50G) in each X, Y, Z direction for 3 times
Ambient Illuminance (Receiver)	Sunlight: ≤ 11,000 lx, incandescent lamp: ≤ 3,000 lx
Operating Temperature	-25 to 65°C [-13 to 149°F]
Storage Temperature	-25 to 70°C [-13 to 158°F]
Ambient Humidity	35 to 85%RH, storage: 35 to 90%RH (no freezing or condensation)
Protection Rating	IP67
Material	Case: Polycarbonate (PC), bolt and nut: Supplementary cementitious materials (SCM)
Tightening Torque	0.39 N•m
Weight	66g [2.32oz]
Connection	Cable Type Ø 3mm, 3-wire (emitter: 2-wire), 2m [6.56ft]
Wire	AWG 24 (0.08mm, 40-core), insulator outer diameter: Ø 1mm
Agency Approvals	CE, UKCA

Notes (1) Non-glossy white paper 50 × 50mm
(2) Sensing distance 10mm

Photoelectric Sensors - BPS Series

Characteristic Curves