

# L 3.7 mm Flat Photoelectric Sensors



## BTF 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

- Ultra-thin size of only 3.7mm
  - W 13 × H 19 × L 3.7 mm (Through-beam type)
  - W 13 × H 24 × L 3.7 mm (Diffuse reflective type, BGS reflective type)
- Detection methods and minimum target size
  - Through-beam type (BTF1M): Ø 2 mm
  - Diffuse reflective type (BTF30): Ø 0.2 mm (sensing distance: 10 mm)
  - BGS reflective type (BTF15): Ø 0.2 mm (sensing distance: 10 mm)
- BGS (background suppression) minimizes detection errors from background objects and the color or material of target objects.
- Maximum sensing distance: 1 m (Through-beam type)
- Operation indicator (red) and stability indicator (green) show operation status
- Stainless steel (SUS304) mounting brackets
- IP67 protection rating (IEC standard)

### Ordering Information

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

**BTF** ① - ② **D T** ③ - ④

#### ① Sensing distance

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

#### ③ Operation mode

L: Light ON  
D: Dark ON

#### ② Sensing type

T: Through-beam  
D: Diffuse reflective  
B: BGS reflective

#### ④ Control output

No mark: NPN open collector output  
P: PNP open collector output

### Product Components

| Sensing type              | Through-beam                | Diffuse reflective | BGS reflective |
|---------------------------|-----------------------------|--------------------|----------------|
| <b>Product components</b> | Product, instruction manual |                    |                |
| Bracket                   | × 2                         | × 1                | × 1            |
| M2 bolt                   | × 4                         | × 2                | × 2            |

### Specifications

| Model                           | BTF1M-TDT□-□   | BTF30-DDT□-□                            | BTF15-BDT□-□                                      |
|---------------------------------|--|---|---|
| <b>Sensing type</b>             | Through-beam   | Diffuse reflective                      | BGS reflective                                    |
| <b>Sensing distance</b>         | 1 m  | 5 to 30 mm <sup>01)</sup>               | 1 to 15 mm <sup>01)</sup>                         |
| <b>Sensing target</b>           | Opaque materials                                       | Opaque materials, translucent materials | Opaque materials, translucent materials           |
| <b>Min. sensing target</b>      | ≥ Ø 2 mm   | ≥ Ø 0.2 mm <sup>02)</sup>               | ≥ Ø 0.2 mm non-illuminated objects <sup>02)</sup> |
| <b>Hysteresis</b>               | -  | ≤ 20% of sensing distance               | ≤ 5% of sensing distance                          |
| <b>Black/white difference</b>   | -  | -                                       | ≤ 15% of sensing distance                         |
| <b>Response time</b>            | ≤ 1 ms   |   |   |
| <b>Light source</b>             | Red  |   |   |
| <b>Peak emission wavelength</b> | 650 nm   |   |   |
| <b>Operation mode</b>           | Light ON mode / Dark ON mode model                     |   |   |
| <b>Indicator</b>                | Operation indicator (red), stability indicator (green) |   |   |
| <b>Approval</b>                 | CE ENEC  | CE ENEC                                 | CE ENEC   |
| <b>Unit weight (packaged)</b>   | ≈ 40 g (≈ 70 g)  | ≈ 25 g (≈ 40 g)                         | ≈ 25 g (≈ 40 g)                                   |

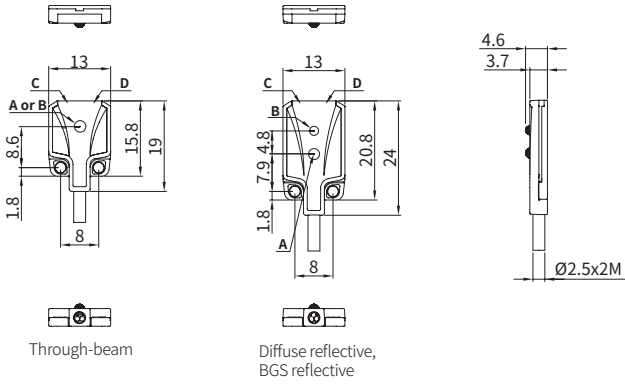
01) Non-glossy white paper 50 × 50 mm

02) Sensing distance 10 mm

|                                       |   |
|---------------------------------------|---|
| <b>Power supply</b>                   | 12-24 VDC≒ ± 10 % (ripple P-P: ≤ 10%)   |
| <b>Current consumption</b>            | It depends on the sensing type  |
| Through-beam                          | Emitter: ≤ 20 mA, receiver: ≤ 20 mA   |
| Reflective                            | ≤ 20 mA   |
| <b>Control output</b>                 | NPN open collector output / PNP open collector output model   |
| Load voltage                          | ≤ 26.4 VDC≒   |
| Load current                          | ≤ 50 mA   |
| Residual voltage                      | NPN: ≤ 1 VDC≒, PNP: ≤ 2 VDC≒  |
| <b>Protection circuit</b>             | Reverse power protection circuit, output short overcurrent protection circuit                         |
| <b>Insulation resistance</b>          | ≥ 20 MΩ (500 VDC≒ megger)   |
| <b>Noise immunity</b>                 | ± 240 VDC≒ the square wave noise (pulse width: 1 μs) by the noise simulator                           |
| <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>Shock</b>                          | 500 m/s <sup>2</sup> (≈ 50 G) in each X, Y, Z direction for 3 times                                   |
| <b>Ambient illuminance (receiver)</b> | Sunlight: ≤ 10,000 lx, incandescent lamp: ≤ 3,000 lx  |
| <b>Ambient temperature</b>            | -25 to 55 °C, storage: -40 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>              | IP67 (IEC standard)   |
| <b>Connection</b>                     | Cable type  |
| <b>Cable spec.</b>                    | Ø 2.5 mm, 3-wire (emitter: 2-wire), 2 m   |
| <b>Wire spec.</b>                     | AWG 28 (0.08 mm, 19-core), insulator outer diameter: Ø 0.9 mm   |
| <b>Material</b>                       | Case: PBT, sensing part: PMMA, bracket: SUS304, bolt: carbon steel, sleeve: SUS304                    |

## Dimensions

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



|          |                          |          |                             |
|----------|--------------------------|----------|-----------------------------|
| <b>A</b> | Optical axis of emitter  | <b>C</b> | Operation indicator (red)   |
| <b>B</b> | Optical axis of receiver | <b>D</b> | Stability indicator (green) |

### Bracket

