# W 7.2 mm Photoelectric Sensors

# BTS 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

- W 7.2 mm Photoelectric Sensors
  - W 7.2 × H 18.6 × L 9.5 mm (Through-beam type)
  - W 7.2 × H 24.6 × L 10.8 mm (Retroreflective, convergent reflective type)
- Detection methods and minimum target size
  - Through-beam type (BTS1M): Ø 2 mm
  - Retroreflective type (BTS200): Ø 2 mm (sensing distance: 100 mm)
  - Convergent reflective type (BTS15/BTS30): Ø 0.15 mm (sensing distance: 10 mm)
- 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.

| BTS | ❶ | - | ❷ | D | T | ❸ | - | ❹ |
|---|---|---|---|---|---|---|---|---|

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

**❷ Sensing type**
T: Through-beam
M: Retroreflective
L: Convergent reflective

**❸ Operation mode**
L: Light ON
D: Dark ON

**❹ Control output**
No mark: NPN open collector output
P: PNP open collector output

## Product Components

| Sensing type | Through-beam | Retroreflective | Convergent reflective |
|---|---|---|---|
| **Product components** | Product, instruction manual | | |
| Reflector | - | MS-6 | - |
| Bracket A | × 2 | × 1 | × 1 |
| Sub bracket | × 2 | × 1 | × 1 |
| M2 bolt | × 4 | × 2 | × 2 |

## Specifications

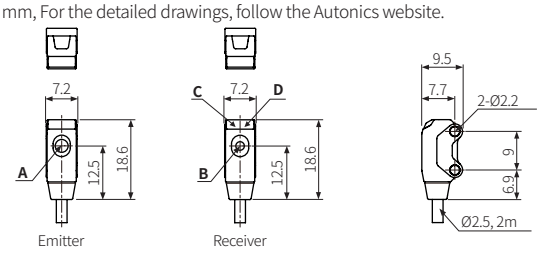
| Model | BTS1M-TDT□-□ | BTS200-MDT□-□ | BTS□-LDT□-□ | |
|---|---|---|---|---|
| **Sensing type** | Through-beam | Retroreflective | Convergent reflective | |
| **Sensing distance** | 1 m | 10 to 200 mm [01] | 5 to 15 mm [02] | 5 to 30 mm [02] |
| **Sensing target** | Opaque materials | ≥ Ø 27 mm Opaque materials | Opaque materials, translucent materials | |
| **Min. sensing target** | ≥ Ø 2 mm | ≥ Ø 2 mm [03] | ≥ Ø 0.15 mm [04] | |
| **Hysteresis** | - | - | ≤ 15 % of sensing distance | |
| **Response time** | ≤ 1 ms | | | |
| **Light source** | Red | | | |
| **Peak emission wavelength** | 650 nm | | | |
| **Operation mode** | Light ON mode / Dark ON mode model | | | |
| **Indicator** | Operation indicator (red), stability indicator (green) | | | |
| **Approval** | CE EAC | CE EAC | CE EAC | |
| **Unit weight (packaged)** | ≈ 40 g (≈ 65 g) | ≈ 25 g (≈ 45 g) | ≈ 25 g (≈ 45 g) | |

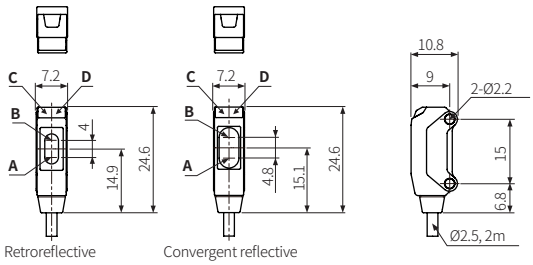
01) Reflector (MS-6)
02) Non-glossy white paper 50 × 50 mm
03) Sensing distance 100 mm
04) Sensing distance 10 mm

| | |
|---|---|
| **Power supply** | 12-24 VDC⎓ ±10 % (ripple P-P: ≤ 10%) |
| **Current consumption** | It depends on the sensing type |
| Through-beam | Emitter: ≤ 20 mA, receiver: ≤ 20 mA |
| Reflective | ≤ 20 mA |
| **Control output** | 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⎓ |
| **Protection circuit** | Reverse power protection circuit, output short overcurrent protection circuit |
| **Insulation resistance** | ≥ 20 MΩ (500 VDC⎓ megger) |
| **Noise immunity** | ±240 VDC⎓ the square wave noise (pulse width: 1 μs) by the noise simulator |
| **Dielectric strength** | 1,000 VAC~ 50/60 Hz for 1 min |
| **Vibration** | 1.5 mm double amplitude at frequency of 10 to 55 Hz (for 1 min) in each X, Y, Z direction for 2 hours |
| **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 |
| **Ambient temperature** | -20 to 55 °C, storage: -30 to 70 °C (no freezing or condensation) |
| **Ambient humidity** | 35 to 85 %RH, storage: 35 to 85 %RH (no freezing or condensation) |
| **Protection rating** | IP67 (IEC standard) |
| **Connection** | Cable type |
| **Cable spec.** | Ø 2.5 mm, 3-wire (emitter: 2-wire), 2 m |
| **Wire spec.** | AWG 28 (0.08 mm, 19-core), insulator outer diameter: Ø 0.9 mm |
| **Material** | Case: PBT, sensing part: PMMA, bracket: SUS304, bolt: SWCH10A |

## Dimensions

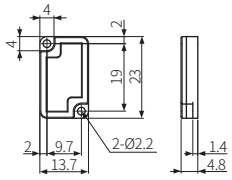
• Unit: mm, For the detailed drawings, follow the Autonics website.



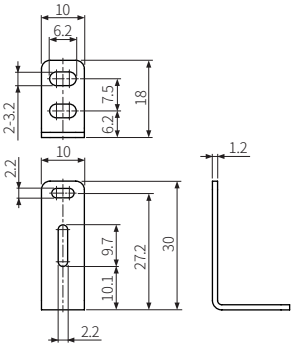




| | | | |
|---|---|---|---|
| **A** | Optical axis of emitter | **C** | Operation indicator (red) |
| **B** | Optical axis of receiver | **D** | Stability indicator (green) |

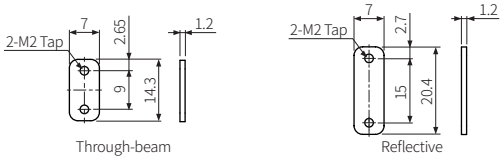
### ■ Reflector (MS-6)




### ■ Bracket A




### ■ Sub-bracket

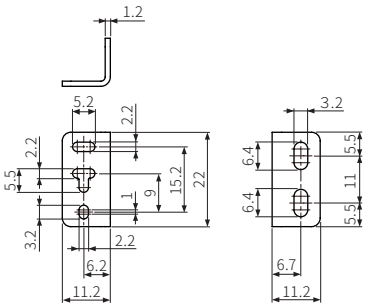



## Sold Separately

- Reflector: MS Series
- Retroreflective tape: MST Series
- Bracket B
- Slit for through-beam type: BTS1M-ST (sticker), BTS1M-ST-T (SUS material)

## Sold Separately: Bracket B

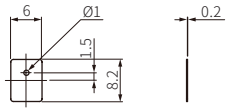
• Unit: mm, For the detailed drawings, follow the Autonics website.




## Sold Separately: Slit for Through-beam Type

### ■ BTS1M-ST (sticker)

• Unit: mm

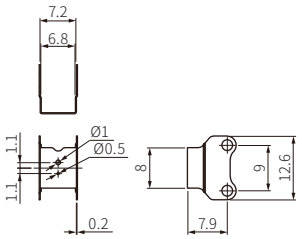



- Be sure to attach for the emitter of through-beam type (packaged unit: 4 pieces).
- Gently wipe the dirt on the lens of the sensor before using it.
- After attaching the slit, remove the front protection film.

| Slit Ø | Applied condition | | Min. sensing target | Max. sensing distance |
|---|---|---|---|---|
| | Emitter | Receiver | | |
| Ø 1 mm | ○ | - | ≥ Ø 1.6 mm Opaque materials | 500 mm |

### ■ BTS1M-ST-T (SUS Material)

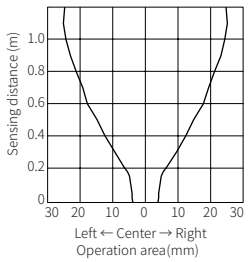
• Unit: mm



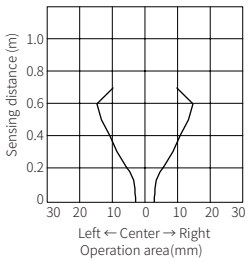

- This slit is available for the emitter and receiver of through-beam type (packaged unit: 2 pieces)
- Ø of slit is depending on the installation direction.
- After covering the sensor with the slit, fix them with the bolts and sub-bracket.

| Slit Ø | Applied condition | | Min. sensing target | Max. sensing distance | Feature data |
|---|---|---|---|---|---|
| | Emitter | Receiver | | | |
| Ø 1 mm | ○ | - | ≥ Ø 1.6 mm Opaque materials | 500 mm | ① |
| | - | ○ | | | |
| | ○ | ○ | ≥ Ø 1.2 mm Opaque materials | 300 mm | ② |
| Ø 0.5 mm | ○ | - | ≥ Ø 1.2 mm Opaque materials | 300 mm | ③ |
| | - | ○ | | | |
| | ○ | ○ | ≥ Ø 0.8 mm Opaque materials | 100 mm | ④ |

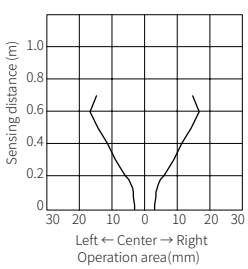
**Feature data ①**



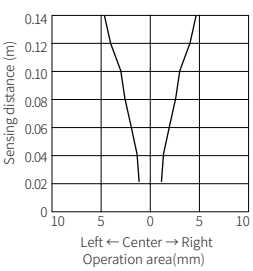

**Feature data ②**




**Feature data ③**




**Feature data ④**




18, Bansong-ro 513Beon-gil, Haeundae-gu, Busan, Republic of Korea, 48002
**www.autonics.com | +82-2-2048-1577 | sales@autonics.com**

Autonics