**Specifications**

<table>
<thead>
<tr>
<th>Model</th>
<th>Pipe diameter</th>
<th>Sensing type</th>
<th>Power supply</th>
<th>Control output</th>
<th>Sensing range</th>
<th>Power consumption</th>
<th>Response time</th>
<th>Power supply</th>
<th>Current consumption</th>
<th>Light source</th>
<th>Operation mode</th>
<th>Control output</th>
<th>Protection circuit</th>
<th>Indicator</th>
<th>Insulation resistance</th>
</tr>
</thead>
<tbody>
<tr>
<td>BL13-TDT</td>
<td>Ø6 to 13mm</td>
<td>Through-beam</td>
<td>12-24VDC</td>
<td>NPN open collector output</td>
<td>0.02 to 13mm</td>
<td>Max. 30mA</td>
<td>10 to 55 Hz</td>
<td>12-24VDC</td>
<td>Max. 30mA</td>
<td>500VAC</td>
<td>1000VAC</td>
<td>OFF</td>
<td>Reverse polarity protection circuit</td>
<td>OFF</td>
<td>Over 2000M (at 500VAC)</td>
</tr>
</tbody>
</table>

**Functions**

- **Operation mode switching**
  - Light ON: Press operation mode switching button once
  - Dark ON: Press operation mode switching button twice

- **Operation mode lock setting**
  - Light ON: Press operation mode switching button three times
  - Dark ON: Press operation mode switching button four times

**Operation Mode**

- **Light ON**
  - Receiver indicator (red LED) OFF
  - Transmitter output OFF
  - Locked operation

- **Dark ON**
  - Receiver indicator (red LED) ON
  - Transmitter output ON
  - Unlocked operation

**Operating Timing Diagram**

- **Stable Light ON area**
  - Operation mode: ON
  - Receivers OFF
  - Transmitter OFF

- **Stable Light OFF area**
  - Operation mode: OFF
  - Receivers OFF
  - Transmitter OFF

**Cautions during Use**

1. Follow instructions in ‘Cautions during Use’. Otherwise, it may cause unexpected accidents.
2. When connecting a DC relay or other inductive load to the output, remove surge by using diodes or varistors.
3. Use the product, 0.2 sec after supplying power. When using separate power supply for the sensor and load, supply power to sensor first.
4. 12-24VDC power supply should be insulated and limited voltage/current or Class 2, SELV power supply device.
5. Wire as short as possible and keep away from high voltage lines or power lines, to prevent inductions.
6. When using switching mode power supply to supply the power, ground F.G. terminal and connect a condenser between 0V and F.G. terminal to reduce the noise.
7. When using sensor with the equipment which generates noise (switching regulator, inverter, servo motor, etc.), ground F.G. terminal of the equipment.
8. This unit may be used in the following environments.
   - Installation category II
   - Pollution degree 3
   - Installation category II

**WARNING**

1. Failure of device must be installed when using the unit with machinery that may cause serious injury or substantial economic loss. (e.g. nuclear power control, medical equipment, ships, elevators, aircraft, combustion apparatus, safety equipment, crime/diaster prevention devices, etc.).

2. Do not use the unit in the place where flammable/explosive/corrosive gas, high humidity, direct sunlight, radiant heat, vibration, impact, or salinity may be present.

3. Do not disassemble or modify the unit.

4. Do not connect, repair, or inspect the unit while connected to a power source.

5. Check ‘Connections’ before wiring.

6. Failure to follow this instruction may result in fire.

7. Do not use the unit in the place where flammable/explosive/corrosive gas, high humidity, direct sunlight, radiant heat, vibration, impact, or salinity may be present.

8. This unit may be used in the following environments.

9. When using sensor with the equipment which generates noise (switching regulator, inverter, servo motor, etc.), ground F.G. terminal of the equipment.

10. This unit may be used in the following environments.

11. Installation category II

12. Pollution degree 3

13. Installation category II

**Cable**

- AWG26, Core diameter: 0.08mm, Number of cores: 19, Insulator diameter: Ø0.9mm

**Accessory**

- Binding band, 2.5mm, 1m

**Approval**

- UL508, Safety standard of American National Standards Institute

**Material**

- Case: Poly碳酸ate

**Protection**

- Anti-slip tube

**Weight**

- Approx. 22g (max. 50g)

**Noise immunity**

- ±300VAC (max. 300VDC) at 50/60Hz

**Core diameter**

- 0.08mm, 0.1mm

**Input impedance**

- 0.08mm by the noise simulator

**Dielectric strength**

- 1,000VAC 50/60Hz for 1 minute

**Residual voltage**

- Max. 1VDC

**Operation mode switching**

- Light ON: Press operation mode switching button once
  - Dark ON: Press operation mode switching button twice

- Lock operation mode: Press operation mode switching button three times
  - Unlock operation mode: Press operation mode switching button four times

**Model**

- BL13-TDT-P

**Sensor circuit**

- Display Units

**Control Output Circuit Diagram**

- Transmitter output OFF

**Connections**

- Operation mode indicator (red LED)

1. Use the unit within the rated specifications.
2. Do not use the unit in the place where flammable/explosive/corrosive gas, high humidity, direct sunlight, radiant heat, vibration, impact, or salinity may be present.
3. Do not disassemble or modify the unit.
4. Do not connect, repair, or inspect the unit while connected to a power source.
5. Check ‘Connections’ before wiring.

**Installation**

- Fitting binding band and anti-slip tubes as the right figure and the protection bracket.

**Dimensions**

- Using binding band: Ø6 to 13mm,
  - Using protection bracket: Ø12.7mm (1/2 inch)

**Applicable pipe**

- 1. Forged pipe: 2.5, 1m

**Applicable sensing area**

- 1. Use the unit within the rated specifications.

**Protection structure**

- Dielectric strength: ±10% (IEC standard)

**Specifications**

- Sensing range: 0.02 to 13mm

**Protection bracket (sold separately)**

- For using the protection bracket,
  - Ø12.7mm (1/2 inch)

**Cable**

- AWG26, Core diameter: 0.08mm, Number of cores: 19, Insulator diameter: Ø0.9mm

**Accessory**

- Binding band, 2.5mm, 1m

**Approval**

- UL508, Safety standard of American National Standards Institute

**Material**

- Case: Poly碳酸ate

**Protection**

- Anti-slip tube

**Weight**

- Approx. 22g (max. 50g)

**Noise immunity**

- ±300VAC (max. 300VDC) at 50/60Hz

**Core diameter**

- 0.08mm, 0.1mm

**Input impedance**

- 0.08mm by the noise simulator

**Dielectric strength**

- 1,000VAC 50/60Hz for 1 minute

**Residual voltage**

- Max. 1VDC

**Operation mode switching**

- Light ON: Press operation mode switching button once
  - Dark ON: Press operation mode switching button twice

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  - Unlock operation mode: Press operation mode switching button four times

**Model**

- BL13-TDT-P

**Sensor circuit**

- Display Units

**Control Output Circuit Diagram**

- Transmitter output OFF

**Connections**

- Operation mode indicator (red LED)

1. Use the unit within the rated specifications.
2. Do not use the unit in the place where flammable/explosive/corrosive gas, high humidity, direct sunlight, radiant heat, vibration, impact, or salinity may be present.
3. Do not disassemble or modify the unit.
4. Do not connect, repair, or inspect the unit while connected to a power source.
5. Check ‘Connections’ before wiring.

**Installation**

- Fitting binding band and anti-slip tubes as the right figure and the protection bracket.

**Dimensions**

- Using binding band: Ø6 to 13mm,
  - Using protection bracket: Ø12.7mm (1/2 inch)

**Applicable pipe**

- 1. Forged pipe: 2.5, 1m

**Applicable sensing area**

- 1. Use the unit within the rated specifications.

**Protection structure**

- Dielectric strength: ±10% (IEC standard)