

# T30 Sensors DC-Voltage Series



## Quick Start Guide

### Self-Contained, DC-Operated Sensors

For complete technical information about this product, including installation instructions, application requirements and guidelines, EU Declaration of Conformity, technical specifications, and accessories, see [www.bannerengineering.com](http://www.bannerengineering.com) and search 121524.



#### WARNING: Not To Be Used for Personnel Protection

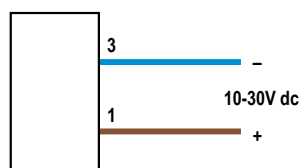
**Never use this device as a sensing device for personnel protection. Doing so could lead to serious injury or death.** This device does not include the self-checking redundant circuitry necessary to allow its use in personnel safety applications. A sensor failure or malfunction can cause either an energized or de-energized sensor output condition.

## Models

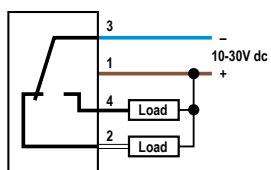
| Sensing Mode    | Model <sup>1</sup> | Output | Range                   | LED                 |
|-----------------|--------------------|--------|-------------------------|---------------------|
| <br>OPPOSED     | T306E              | -      | 60 m (196.8 ft)         | Infrared, 950 nm    |
|                 | T30SN6R            | NPN    |                         |                     |
|                 | T30SP6R            | PNP    |                         |                     |
| <br>POLAR RETRO | T30SN6LP           | NPN    | 6 m (19.7 ft)           | Visible red, 680 nm |
|                 | T30SP6LP           | PNP    |                         |                     |
| <br>FIXED-FIELD | T30SN6FF200        | NPN    | 200 mm (7.9 in) cutoff  | Infrared, 880 nm    |
|                 | T30SP6FF200        | PNP    |                         |                     |
|                 | T30SN6FF400        | NPN    | 400 mm (15.7 in) cutoff |                     |
|                 | T30SP6FF400        | PNP    |                         |                     |
|                 | T30SN6FF600        | NPN    | 600 mm (23.6 in) cutoff |                     |
|                 | T30SP6FF600        | PNP    |                         |                     |

## Wiring Diagrams

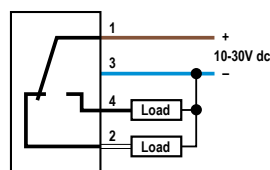
### Cabled Emitters



### NPN Standard



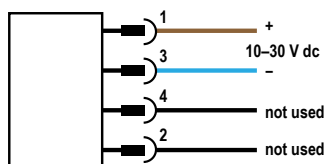
### PNP Standard



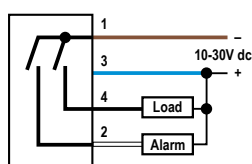
### Key:

Wire 1 = Brown  
Wire 2 = White  
Wire 3 = Blue  
Wire 4 = Black

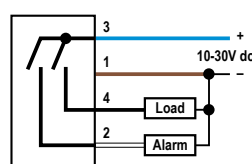
### Quick Disconnect Emitters



### NPN Alarm



### PNP Alarm



<sup>1</sup> Integral 2 m (6.5 ft) unterminated cable models are listed.

- To order the 9 m (30 ft) PVC cable model, add the suffix "W/30" to the cabled model number. For example, T306E W/30.
- To order the 4-pin M12/Euro-style integral quick disconnect model, add the suffix "Q" to the model number. For example, T306EQ.
- Models with a quick disconnect require a mating cordset.



## Specifications

### Supply Voltage and Current

10 V dc to 30 V dc (10% maximum ripple)  
 Supply current (exclusive of load current):  
**Emitters, Non-Polarized, Retro:** 25 mA  
**Receivers:** 20 mA  
**Polarized Retroreflective:** 30 mA  
**Fixed-Field:** 35 mA

### Output Configuration

SPDT solid-state dc switch; NPN or PNP outputs, depending on model  
**Light Operate:** N.O. output conducts when sensor sees its own (or the emitter's) modulated light  
**Dark Operate:** N.C. output conducts when the sensor sees dark; the N.C. output may be wired as a normally open marginal signal alarm output, depending on wiring to power supply

### Output Rating

150 mA maximum each  
 When wired for alarm output, the total load may not exceed 150 mA  
**OFF-state leakage current:** < 1  $\mu$ A at 30 V dc  
**ON-state saturation voltage:** < 1 V at 10 mA dc; < 1.5 V at 150 mA dc

### Required Overcurrent Protection



**WARNING:** Electrical connections must be made by qualified personnel in accordance with local and national electrical codes and regulations.

Overcurrent protection is required to be provided by end product application per the supplied table.  
 Overcurrent protection may be provided with external fusing or via Current Limiting, Class 2 Power Supply.  
 Supply wiring leads < 24 AWG shall not be spliced.  
 For additional product support, go to [www.bannerengineering.com](http://www.bannerengineering.com).

| Supply Wiring (AWG) | Required Overcurrent Protection (Amps) |
|---------------------|----------------------------------------|
| 20                  | 5.0                                    |
| 22                  | 3.0                                    |
| 24                  | 2.0                                    |
| 26                  | 1.0                                    |
| 28                  | 0.8                                    |
| 30                  | 0.5                                    |

### Supply Protection Circuitry

Protected against reverse polarity and transient voltages

### Output Protection Circuitry

Protected against output short-circuit, continuous overload, and false pulse on power-up

### Output Response Time

**Opposed mode:** 3 ms ON, 1.5 ms OFF  
**Retro, Fixed-Field and Diffuse:** 3 ms ON and OFF



**Note:** 100 ms delay on power-up; outputs do not conduct during this time

### Repeatability

**Opposed mode:** 375  $\mu$ s  
**Retro, Fixed-Field and Diffuse:** 750  $\mu$ s  
 Repeatability and response are independent of signal strength

### Indicators

Two LEDs (Green and Amber)  
**Green ON steady:** power to sensor is ON  
**Green flashing:** output is overloaded  
**Amber ON steady:** N.O. output is conducting  
**Amber flashing:** excess gain marginal (1 to 1.5 times) in light condition

### Construction

**Housing:** PBT polyester  
**Lens:** Polycarbonate (opposed-mode) or acrylic

### Environmental Rating

Leakproof design rated NEMA 6P, DIN IP69K

### Connections

2 m (6.5 ft) or 9 m (30 ft) integral PVC cable or Integral 4-pin M12/Euro-style quick disconnect

### Operating Conditions

**Temperature:** -40 °C to +70 °C (-40 °F to +158 °F)  
**Humidity:** 90% at +50 °C maximum relative humidity (non-condensing)

### Vibration and Mechanical Shock

All models meet MIL-STD-202F, Method 201A (Vibration: 10 Hz to 60 Hz maximum, 0.06 inch (1.52 mm) double amplitude, 10G acceleration) requirements. Method 213B conditions H&I. (Shock: 75G with unit operating; 100G for non-operation)

### Certifications



## Banner Engineering Corp. Limited Warranty

Banner Engineering Corp. warrants its products to be free from defects in material and workmanship for one year following the date of shipment. Banner Engineering Corp. will repair or replace, free of charge, any product of its manufacture which, at the time it is returned to the factory, is found to have been defective during the warranty period. This warranty does not cover damage or liability for misuse, abuse, or the improper application or installation of the Banner product.

**THIS LIMITED WARRANTY IS EXCLUSIVE AND IN LIEU OF ALL OTHER WARRANTIES WHETHER EXPRESS OR IMPLIED (INCLUDING, WITHOUT LIMITATION, ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE), AND WHETHER ARISING UNDER COURSE OF PERFORMANCE, COURSE OF DEALING OR TRADE USAGE.**

This Warranty is exclusive and limited to repair or, at the discretion of Banner Engineering Corp., replacement. **IN NO EVENT SHALL BANNER ENGINEERING CORP. BE LIABLE TO BUYER OR ANY OTHER PERSON OR ENTITY FOR ANY EXTRA COSTS, EXPENSES, LOSSES, LOSS OF PROFITS, OR ANY INCIDENTAL, CONSEQUENTIAL OR SPECIAL DAMAGES RESULTING FROM ANY PRODUCT DEFECT OR FROM THE USE OR INABILITY TO USE THE PRODUCT, WHETHER ARISING IN CONTRACT OR WARRANTY, STATUTE, TORT, STRICT LIABILITY, NEGLIGENCE, OR OTHERWISE.**

Banner Engineering Corp. reserves the right to change, modify or improve the design of the product without assuming any obligations or liabilities relating to any product previously manufactured by Banner Engineering Corp. Any misuse, abuse, or improper application or installation of this product or use of the product for personal protection applications when the product is identified as not intended for such purposes will void the product warranty. Any modifications to this product without prior express approval by Banner Engineering Corp will void the product warranties. All specifications published in this document are subject to change; Banner reserves the right to modify product specifications or update documentation at any time. Specifications and product information in English supersede that which is provided in any other language. For the most recent version of any documentation, refer to: [www.bannerengineering.com](http://www.bannerengineering.com).

For patent information, see [www.bannerengineering.com/patents](http://www.bannerengineering.com/patents).