

T18 Series Sensors (DC Voltage)



Installation Guide

For complete technical information about this product, including dimensions, accessories, and specifications, see www.bannerengineering.com and search for your model number. See also document number 121526.



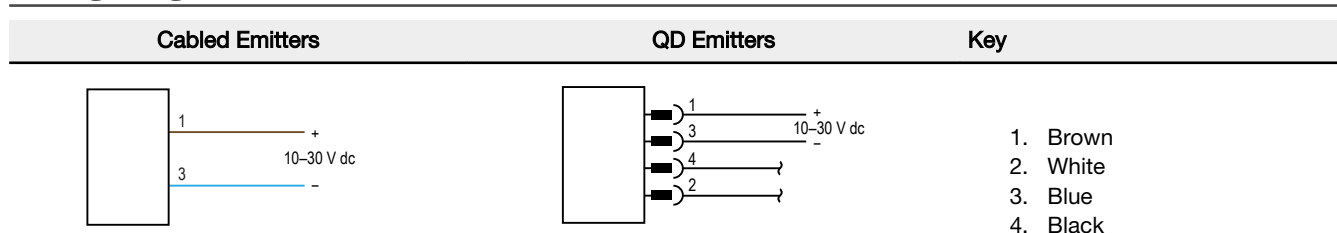
WARNING:

- **Do not use this device for personnel protection**
- Using this device for personnel protection could result in serious injury or death.
- This device does not include the self-checking redundant circuitry necessary to allow its use in personnel safety applications. A device failure or malfunction can cause either an energized (on) or de-energized (off) output condition.

Models

Models ¹	Sensing Mode	Range	LED	Output
T186E	Opposed	20 m (66 ft)	Infrared, 950 nm	-
T18SN6R				NPN
T18SP6R				PNP
T18SN6L	Retroreflective with Gain Control	2 m (79 in) ²	Visible Red, 680 nm	NPN
T18SP6L				PNP
T18SN6LP	Polarized Retroreflective			NPN
T18SP6LP				PNP
T18SN6D	Diffuse with Gain Control	500 mm (20 in)		NPN
T18SP6D				PNP
T18SN6FF25	Fixed Field	25 mm (1 in) Cutoff	Infrared, 880 nm	NPN
T18SP6FF25				PNP
T18SN6FF50		50 mm (2 in) Cutoff		NPN
T18SP6FF50				PNP
T18SN6FF100		100 mm (4 in) Cutoff		NPN
T18SP6FF100				PNP

Wiring Diagrams

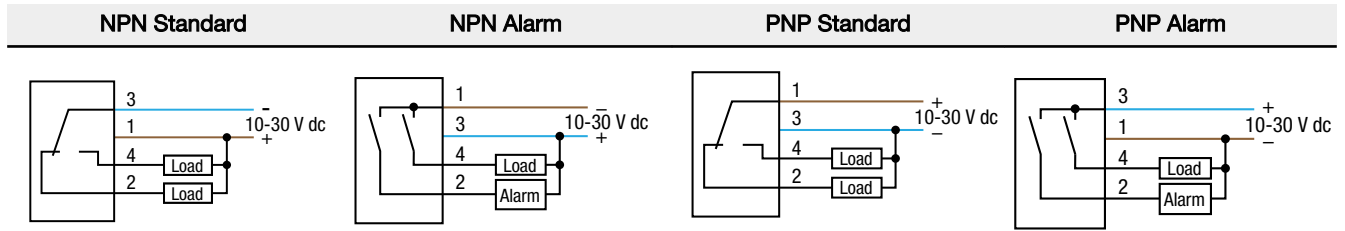


¹ Standard 2 m (6.5 ft) cable models are listed.

- To order the 9 m (30 ft) cable models, add suffix **W/30** (for example, **T186E W/30**).
- To order the 4-pin M12/Euro-style QD models, add suffix **Q** (for example, **T186EQ**). A model with a QD connector requires a mating cable.

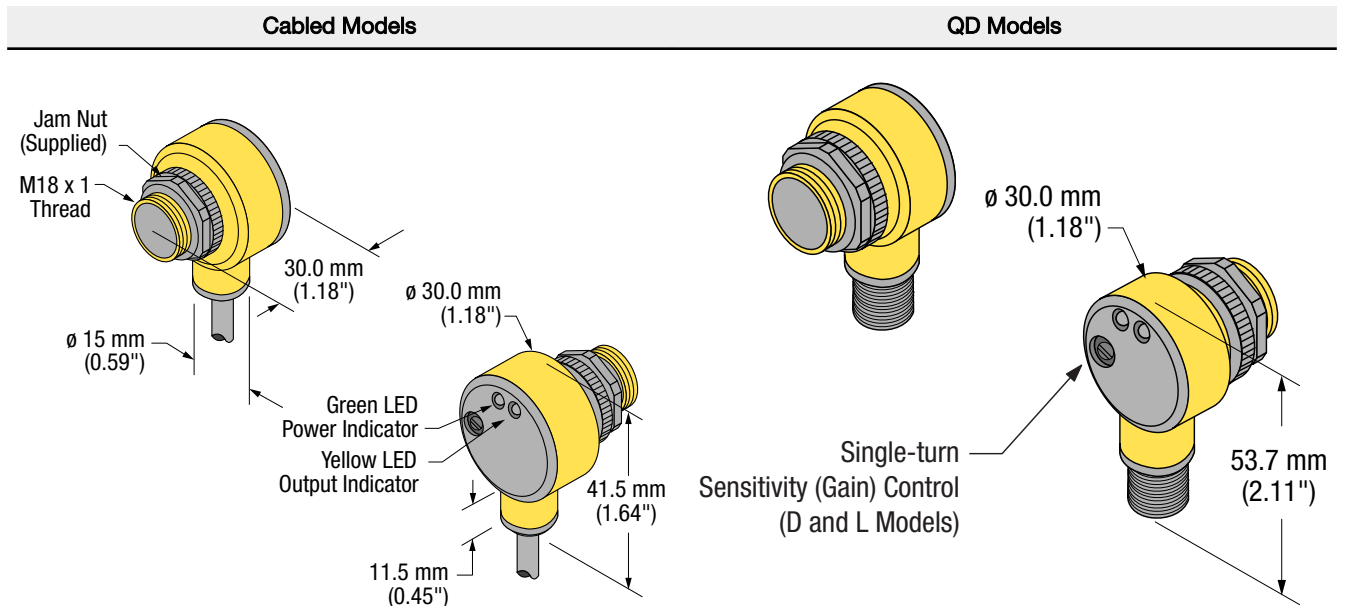
² Use polarized models when shiny objects will be sensed.





Wiring for the quick disconnect (QD) models is functionally identical.

Dimensions



Specifications

Supply Voltage and Current

- 10 to 30 V dc (10% maximum ripple)
- Supply current (exclusive of load current):
 - Emitters, non-polarized retroreflective, retroreflective, diffuse models: 25 mA
 - Receivers: 20 mA
 - Polarized retroreflective models: 30 mA
 - Fixed-field models: 35 mA

Supply Protection Circuitry

Protected against reverse polarity and transient voltages

Output Configuration

SPDT solid-state dc switch; Choose NPN (current sinking) or PNP (current sourcing) models
 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. (normally closed) output may be wired as a normally open marginal signal alarm output, depending upon wiring to power supply (U.S. patent 5087838)

Output Rating

150 mA maximum (each) in standard wiring. When wired for alarm output, the total load may not exceed 150 mA.
 OFF-state leakage current: < 1 microamp at 30 V dc
 ON-state saturation voltage: < 1 V at 10 mA dc; < 1.5 V at 150 mA dc

Output Protection Circuitry

Protected against false pulse on power-up and continuous overload or short circuit of outputs

Output Response Time

Opposed mode models: 3 ms ON, 1.5 ms OFF
 Retroreflective, fixed-field, and diffuse mode models: 3 ms ON and OFF
 NOTE: 100 ms delay on power-up; outputs do not conduct during this time.

Repeatability

Opposed mode models: 375 μ s
 Retroreflective, fixed-field, and diffuse mode models: 750 μ s
 Repeatability and response are independent of signal strength.

Adjustments

Non-polarized retroreflective and diffuse models (only) have a single-turn rear-panel sensitivity control (turn clockwise to increase gain)

Indicators

Two LEDs (green and amber):
 Green on: power to sensor is on
 Green flashing: output is overloaded
 Amber on: N.O. output is conducting
 Amber flashing: excess gain marginal (1 to 1.5x) in light condition

Construction

Housing: PBT polyester housing
 Lens: polycarbonate (opposed-mode) or acrylic (other models)

Connections

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

Environmental Rating

Leakproof design rated NEMA 6P and IEC IP67 per IEC 60529
 IP69K per DIN40050 for quick disconnect and cable models when the cables are protected from direct spray

Operating Conditions

-40 °C to +70 °C (-40 °F to +158 °F)
 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 device operating; 100G for non-operation

Certifications



All models, except T186E are UL approved.

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.

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

Accessories

Cordsets

4-Pin Threaded M12/Euro-Style Cordsets—Single Ended				
Model	Length	Style	Dimensions	Pinout (Female)
MQDC-406	1.83 m (6 ft)	Straight		<p>1 = Brown 2 = White 3 = Blue 4 = Black</p>
MQDC-415	4.57 m (15 ft)			
MQDC-430	9.14 m (30 ft)			
MQDC-450	15.2 m (50 ft)			
MQDC-406RA	1.83 m (6 ft)	Right-Angle		
MQDC-415RA	4.57 m (15 ft)			
MQDC-430RA	9.14 m (30 ft)			
MQDC-450RA	15.2 m (50 ft)			

Sensor Status Indicators

S15L Series In-Line Sensor Status Indicator						
Model	Input Type	LED Color	Dimensions	Female	Male	Wiring
S15LGYPQ	PNP	Power ON = Green Input Active = Yellow				1 = Brown, 10 V dc to 30 V dc 2 = White 3 = Blue, dc common 4 = Black, Sensor Input
S15LGYNQ	NPN					

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.

For patent information, see www.bannerengineering.com/patents.