

Datasheet

Miniature Self-Contained DC Photoelectric Sensors



- Self-contained dc sensors in miniature right-angle housings; only 11 mm (0.43 in) thick
- Epoxy-encapsulated circuitry; IP54 (NEMA5) construction; hermetically-sealed optics
- 1.8 m (70 in) opposed range or 0.5 m (20 in) diffuse range
- Diffuse models have sensitivity adjustment
- Choose models for light operate or dark operate; choose either NPN (sinking) or PNP (sourcing) output models



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



Note: Models with a quick disconnect require a mating cordset.

Table 1: Q10 Opposed Mode Emitter (E) and Receiver (R)

Models	Range	Cable	Supply Voltage	NPN/ PNP	L.O./ D.O.
Q106E	1.8 m (70 in)	2 m (6.5 in)	10 V dc to 30 V dc	-	-
Q106EQ		3-Pin Pico-style 150 mm (6 in) QD			
Q10AN6R		2 m (6.5 in)		NPN	L.O.
Q10AN6RQ		3-Pin Pico-style 150 mm (6 in) QD			D.O.
Q10RN6R		2 m (6.5 in)		PNP	L.O.
Q10RN6RQ		3-Pin Pico-style 150 mm (6 in) QD			D.O.
Q10AP6R		2 m (6.5 in)		PNP	L.O.
Q10AP6RQ		3-Pin Pico-style 150 mm (6 in) QD			D.O.
Q10RP6R		2 m (6.5 in)			L.O.
Q10RP6RQ		3-Pin Pico-style 150 mm (6 in) QD			D.O.

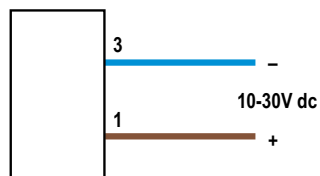
Table 2: Q10 Diffuse Mode

Models	Range	Cable	Supply Voltage	NPN/ PNP	L.O./ D.O.
Q10AN6D	0.5 m (20 in)	2 m (6.5 in)	10 V dc to 30 V dc	NPN	L.O.
Q10AN6DQ		3-Pin Pico-style 150 mm (6 in) QD			D.O.
Q10RN6D		2 m (6.5 in)		PNP	L.O.
Q10RN6DQ		3-Pin Pico-style 150 mm (6 in) QD			D.O.
Q10AP6D		2 m (6.5 in)		PNP	L.O.
Q10AP6DQ		3-Pin Pico-style 150 mm (6 in) QD			D.O.
Q10RP6D		2 m (6.5 in)			L.O.
Q10RP6DQ		3-Pin Pico-style 150 mm (6 in) QD			D.O.

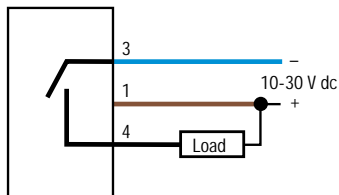


Wiring Diagrams

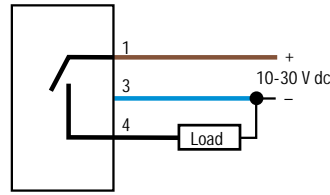
Emitters



NPN Receivers



PNP Receivers



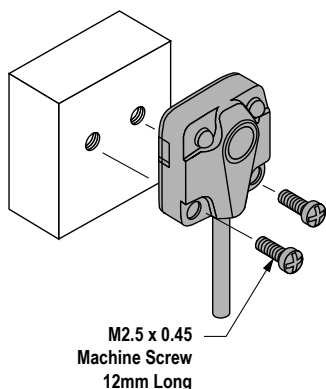
Key

- 1 = Brown
- 3 = Blue
- 4 = Black

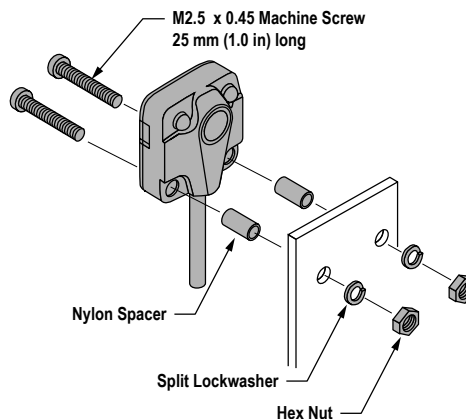
Quick disconnect (QD) wiring diagrams are functionally identical.

Mounting Specifications

Flat Mounting



Stand-Off Mounting



Specifications

Sensing Beam

Infrared, 880 nm

Supply Voltage and Current

10 V dc to 30 V dc (10% maximum ripple)

Emitter or receiver: 15 mA

Diffuse models: 20 mA (exclusive of load)

Supply Protection Circuitry

Protected against reverse polarity

Output Configuration

SPST solid-state dc switch

Choose NPN (current sinking) or PNP (current sourcing) models

Choose light operate (N.O.) or dark operate (N.C.) models

Output Rating

150 mA maximum

Off-state leakage current: < 10 microamps at 30 V dc

On-state saturation voltage: < 0.5 V at 10 mA dc; < 1.5 V at 150 mA dc

Output Protection Circuitry

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

Overload trip point \geq 220 mA, typical, at 20 °C

Output Response Time

Opposed mode: 8 ms On, 4 ms Off

Diffuse mode: 3 ms On and Off

Repeatability

Opposed mode: 1.0 ms

Diffuse mode: 0.75 ms

Adjustments

Diffuse models (only): single-turn, top-mounted sensitivity control for adjustment of system gain (turn clockwise to increase)

Indicators

Opposed mode receivers and diffuse mode sensors have two LEDs: Green and Amber

Green on = power to the sensor is On

Green flashing = output is overloaded

Amber on = light is sensed

Amber flashing = marginal excess gain (1 to 1.5 \times) in light condition

Emitters have one Green LED; Green on = power to the sensor is On

Construction

Housings are black ABS; Rated UL 94V0

Lenses are hermetically-sealed glass; lens covers are clear acrylic

Circuitry is epoxy-encapsulated and completely sealed

Stainless steel M2.5 mounting hardware is included

Connections

2 m (6.5 ft) attached cable, or 3-pin pico-style quick-disconnect fitting

Cables for QD models are purchased separately

Environmental Rating

IEC IP54 (NEMA 5)

Operating Conditions

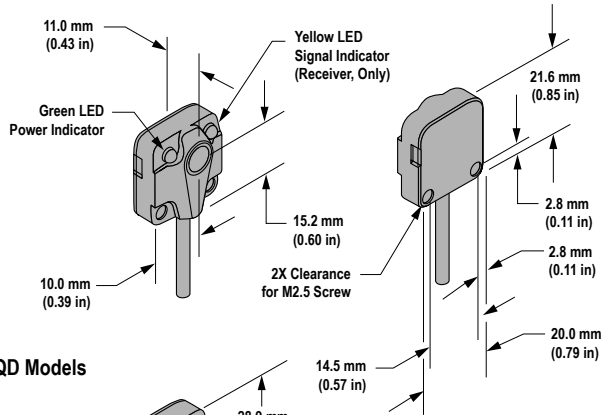
-40 °C to +70 °C (-40 °F to +158 °F)

90% at +50 °C maximum relative humidity (non-condensing)

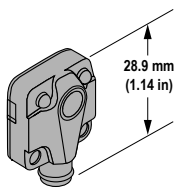
Dimensions

Opposed Mode Models

Cabled Models

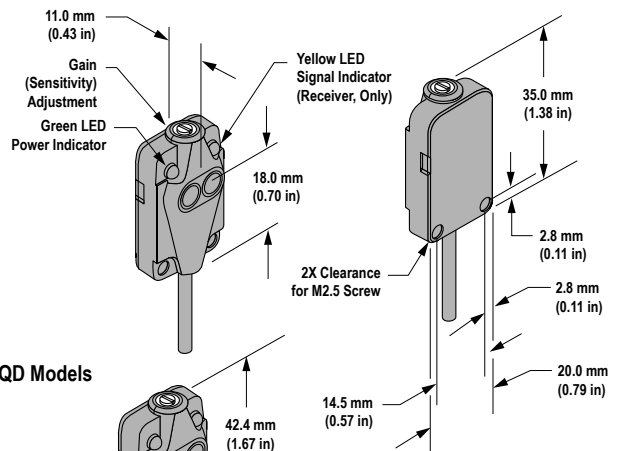


QD Models

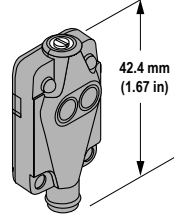


Diffuse Mode Models

Cabled Models

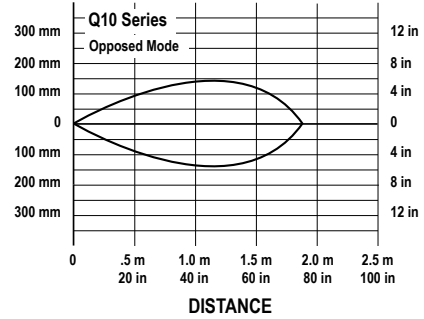
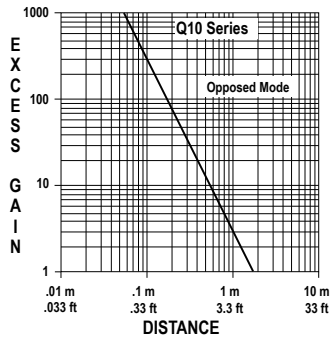


QD Models



Performance Curves

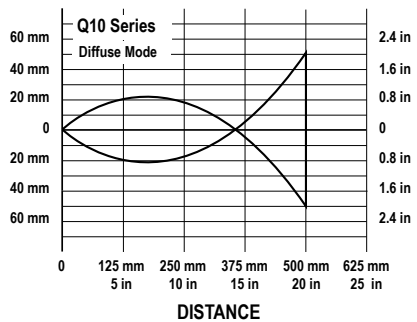
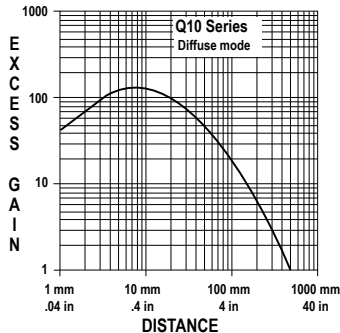
Opposed Mode



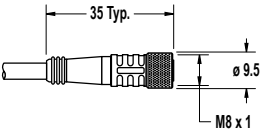
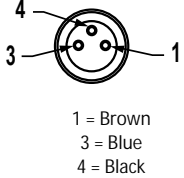
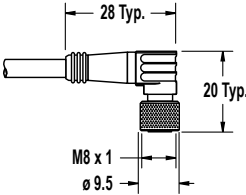
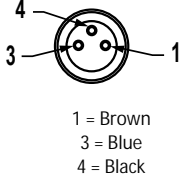
Effective Beam: 5 mm

Diffuse Mode

Performance based on a 90% reflectance white test card.



Cordsets

3-Pin Threaded M8/Pico-Style Cordsets				
Model	Length	Style	Dimensions	Pinout (Female)
PKG3M-2	2 m (6.56 ft)	Straight		
PKG3M-5	5 m (16.40 ft)			
PKG3M-7	7 m (22.97 ft)			
PKG3M-9	9 m (29.53 ft)			
PKG3M-10	10 m (32.81 ft)			
PKW3M-2	2 m (6.56 ft)	Right-Angle		
PKW3M-5	5 m (16.40 ft)			
PKW3M-9	9 m (29.53 ft)			

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.