

### Q08 Series Diffuse-Mode Sensor Features



- Miniature right-angle dc photoelectric sensors in rugged die-cast metal housings
- Ultra-thin; only 8 mm (0.3") deep
- Totally self-contained; 10 to 30V dc operation
- Easy mechanical alignment
- Circuitry is completely sealed and epoxy-encapsulated; rated IP67 and NEMA 6
- Select models with NPN (sinking) or PNP (sourcing) output
- Select light operate or dark operate models
- 3-wire hookup; output load capacity to 150 milliamps
- LED indicators for Power ON and Output ON; Output indicator may be used for alignment
- Choose 2 m (6.5') standard integral cable length; or 9 m (30') cable; quick-disconnect models with Pico-style connectors are also available. Mating cables are ordered separately (see page 4).

### Q08 Series Diffuse-Mode Models

Models*	Range	Cable	Supply Voltage	Output Type	Excess Gain	Beam Pattern
					Performance based on 90% reflective white test card	
<b>N05-Q08-AN7</b> <b>N05-Q08-AN7-V1131</b>	2.5 mm to 61 mm (0.1" to 2.4")	2 m (6.5') 3-Pin Pico QD	10-30V dc	NPN/LO		
<b>N05-Q08-RN7</b> <b>N05-Q08-RN7-V1131</b>		2 m (6.5') 3-Pin Pico QD		NPN/DO		
<b>N05-Q08-AP7</b> <b>N05-Q08-AP7-V1131</b>		2 m (6.5') 3-Pin Pico QD		PNP/LO		
<b>N05-Q08-RP7</b> <b>N05-Q08-RP7-V1131</b>		2 m (6.5') 3-Pin Pico QD		PNP/DO		

**\*NOTES:**

- 9 m (30') cables are available by adding suffix "W/30" to the model number of the cabled version (e.g., **N05-Q08-AN7 W/30**).
- A model with a QD connector (identified by the suffix V1131 in the model number) requires an accessory mating cable. See page 4 for more information.



#### **WARNING . . . Not To Be Used for Personnel Protection**

**Never use these products as sensing devices for personnel protection. Doing so could lead to serious injury or death.**

These sensors do NOT include the self-checking redundant circuitry necessary to allow their use in personnel safety applications. A sensor failure or malfunction can cause either an energized or de-energized sensor output condition. Consult your current Banner Safety Products catalog for safety products which meet OSHA, ANSI and IEC standards for personnel protection.

# Q08 Series Diffuse-Mode Sensors

## Q08 Series Diffuse-Mode Sensor Overview

This small, rugged infrared diffuse proximity mode sensor is contained within an 8-mm deep die-cast metal housing. It is totally self-contained, and is powered by 10 to 30V dc. It is ideal for sensing of *any reflective surface* at up to 2" from the sensor face. Typical applications include parts detection on small conveyors and in robot grippers, and other similar short-range sensing applications.

Q08 diffuse sensors have a solid-state output capable of switching loads of up to 150 mA dc, continuous. Four output types are available: NPN sinking/light operate, NPN sinking/dark operate, PNP sourcing/light operate, and PNP sourcing/dark operate.

A light-operate output conducts when the sensor sees the reflection of its own modulated light (an object is present). A dark-operate output conducts when the sensor does not see the reflection of its own modulated light (no object is present). A green LED indicator, visible from the front and left side of the sensor, lights whenever dc power is applied to the sensor. A yellow LED, visible from the front and right side of the sensor, lights whenever the sensor output is conducting.



Figure 1. Q08 Series Diffuse-Mode features

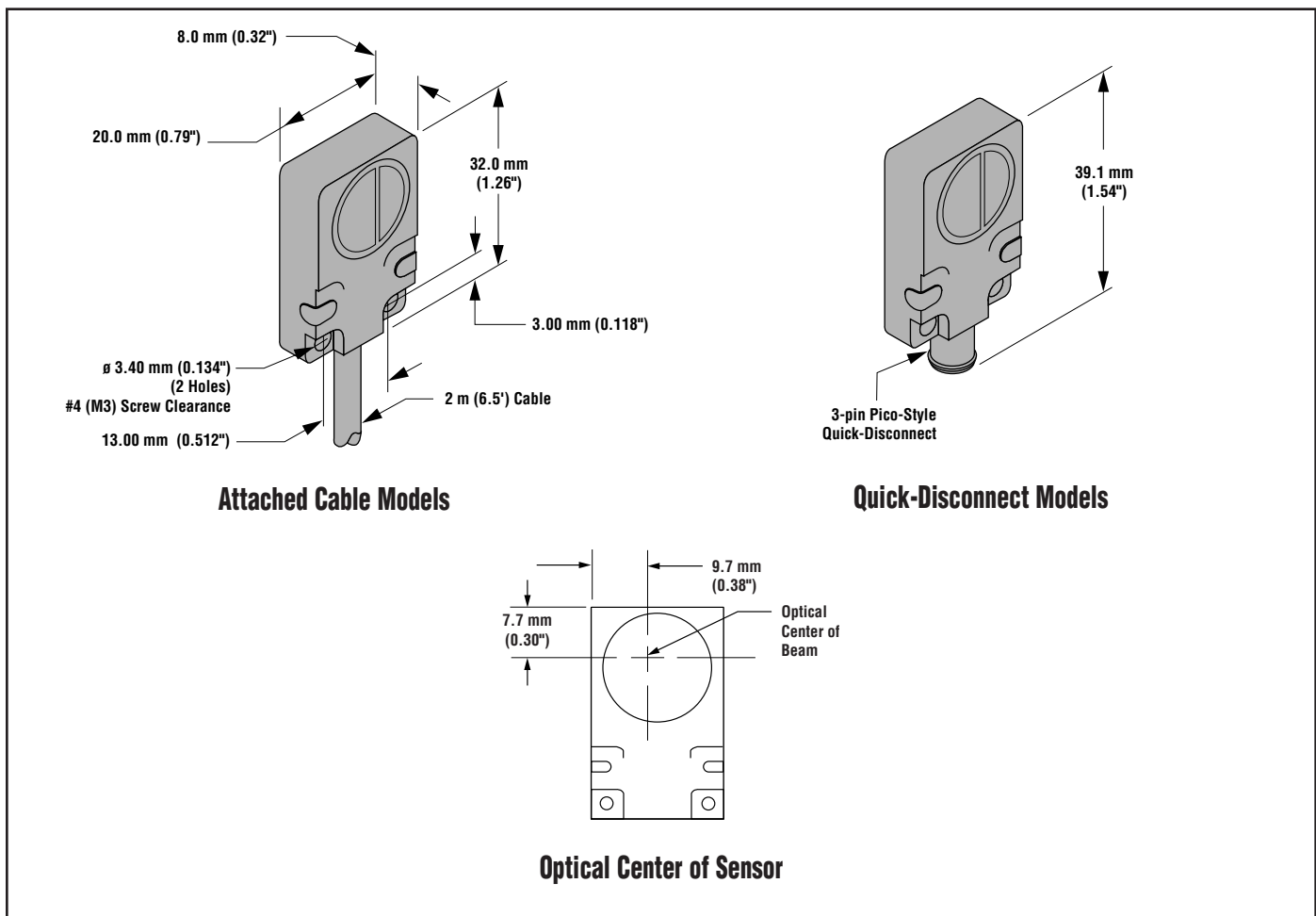



Figure 2. Q08 Series Diffuse-Mode Sensor dimensions

# Q08 Series Diffuse-Mode Sensors

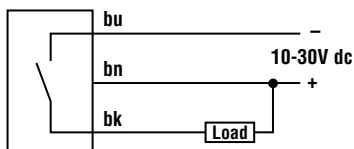
## Q08 Series Diffuse-Mode Sensor Specifications

<b>Supply Voltage and Current</b>	10 to 30V dc at 25 mA; 10% maximum ripple
<b>Supply Protection Circuitry</b>	Protected against reverse polarity
<b>Output Configuration</b>	Solid-state dc output, with four output types available: NPN sinking/light operate                      PNP sourcing/light operate NPN sinking/dark operate                      PNP sourcing/dark operate  Light operate outputs conduct when the receiver sees the reflection of its own modulated light source; Dark operate outputs conduct when the sensor sees dark.
<b>Output Rating</b>	150mA maximum, continuous <b>Off-state leakage</b> current is 100 microamps at 30V dc <b>On-state saturation</b> voltage is < 200 millivolts at 10 mA dc and < 1 volt at 150 mA dc
<b>Output Response Time</b>	1 millisecond ON and OFF independent of signal strength
<b>Repeatability</b>	200 microseconds (0.2 milliseconds), independent of signal strength
<b>Indicators</b>	Two LED indicators: <b>Green:</b> Lights to indicate dc power ON <b>Yellow:</b> Lights when sensor output is conducting (in “light” condition for light operate models; in “dark” condition for dark operate models)
<b>Construction</b>	Black epoxy-painted die-cast zinc housing, polysulfone thermoplastic lens with two through-mounting holes to accommodate M3 (#4) hardware
<b>Environmental Rating</b>	Meets NEMA standards 1, 2, 4, 6, 12 and 13; IEC IP67
<b>Connections</b>	PVC-jacketed 2 m (6.5') or 9 m (30') cable or 3-pin Pico-style quick-disconnect (QD) fitting available. See page 4. Cable is 4.0 mm (0.16") in diameter.
<b>Operating Conditions</b>	<b>Temperature:</b> 0° to +50°C (+32° to +122°F) <b>Maximum relative humidity:</b> 90% at 50°C (non-condensing)
<b>Application Notes</b>	The horizontal axis of the beam pattern represents a line extending outward from the optical center of the Q08 sensor, and perpendicular to the sensor's lens. For purposes of mounting and alignment, note that the optical center of the Q08's lens is not the same as its mechanical center. The drawing in figure 2 shows the location of the Q08's optical center.
<b>Certifications</b>	

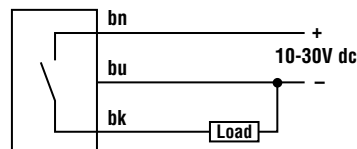
# Q08 Series Opposed-Mode Sensors

## Q08 Series Diffuse-Mode Sensor Hookups

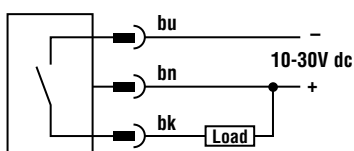
### Cabled Models NPN (Sinking)



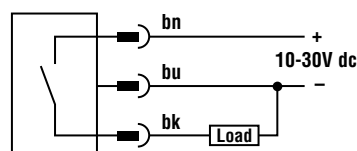
### Cabled Models PNP (Sourcing)



### QD Models NPN (Sinking) (3-Pin Pico-Style)



### QD Models PNP (Sourcing) (3-Pin Pico-Style)



## Accessories

### Quick-Disconnect Cables

The following cables are available for Q08 Series Diffuse-Mode QD models

Style	Model	Length	Dimensions	Pin-out
3-pin Pico-style straight	PKG3-2	2 m (6.5')		
3-pin Pico-style right-angle	PKW3-2	2 m (6.5')		



**WARRANTY:** Banner Engineering Corp. warrants its products to be free from defects for one year. Banner Engineering Corp. will repair or replace, free of charge, any product of its manufacture found to be defective at the time it is returned to the factory during the warranty period. This warranty does not cover damage or liability for the improper application of Banner products. This warranty is in lieu of any other warranty either expressed or implied.

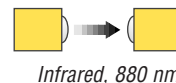
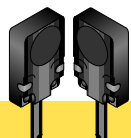
## Q08 Series Opposed-Mode Sensors

*Low-profile infrared sensors in rugged metal housings*

### Q08 Series Opposed-Mode Sensor Features



- Miniature right-angle dc photoelectric sensors in rugged die-cast metal housings
- Powerful 20" range
- Ultra-thin; only 8 mm (0.3") deep
- Pulse synchronization between emitter and receiver produces extremely high noise immunity
- Totally self-contained; 10 to 30V dc operation
- Easy mechanical alignment
- Circuitry is completely sealed and epoxy-encapsulated; rated IP67 and NEMA 6
- Select models with NPN (sinking) or PNP (sourcing) output
- Select light operate or dark operate models
- 3-wire hookup; output load capacity to 150 milliamps
- LED indicators for Power ON and Output ON; Output indicator may be used for alignment
- 2 m (6.5') standard integral cable length; 9 m (30') cable is also available



### Q08 Series Opposed-Mode Emitter (S) and Receiver (E) Models – Order Separately

Models*	Range	Cable	Supply Voltage	Output Type	Excess Gain	Beam Pattern
S060-Q08 EO60-Q08-AN6X	510 mm (20")	2 m (6.5')	10-30V dc	Receiver: NPN/LO		Effective Beam: 6.4 mm 
S060-Q08 EO60-Q08-RN6X				Receiver: NPN/DO		
S060-Q08 EO60-Q08-AP6X				Receiver: PNP/LO		
S060-Q08 EO60-Q08-RP6X				Receiver: PNP/LO		

\*NOTE: 9 m (30') cables are available by adding suffix "W/30" to the model number of the cabled version (e.g., **S060-Q08 w/30**).

**WARNING: SEE SAFETY USE WARNING ON BACK PAGE**

# Q08 Series Opposed-Mode Sensors

## Q08 Series Opposed-Mode Sensor Overview

Banner model Q08 emitters and receivers are very small, rugged, and powerful infrared opposed-mode (“through-beam”) sensor pairs contained within die-cast metal housings *only 8-mm deep*. Sensing range is 20". Q08 emitters and receivers are totally self-contained and are powered from 10 to 30V dc.

Q08 opposed sensor pairs are ideal for sensing of parts on small conveyors and for other similar short-range opposed-mode sensing uses. The size of these powerful compact sensors makes them especially useful in applications with limited space.

A synchronizing wire connecting the emitter and receiver “gates” the receiver to look for a light signal only during the instant when the emitter sends a light pulse from its infrared LED. This produces exceptionally high immunity to electrical noise and false signals. The modulated infrared sensing beam, along with polysulfone lenses on both the emitter and receiver, result in extremely high immunity to interference from visible ambient light.

Model Q08 receivers have a solid-state output capable of switching loads of up to 150 mA dc, continuous. Four output types are offered: NPN sinking/light operate, NPN sinking/dark operate, PNP sourcing/light operate, and PNP sourcing/dark operate. See the table of available models on page 1. A light-operate output conducts when the receiver sees the emitter's pulse-synchronized light source. A dark-operate output conducts when the receiver does not see the emitter's pulse-synchronized light source.

A green LED indicator on both the emitter and receiver units, visible from the front and left side of the sensor, lights whenever dc power is applied (see figure 1). A yellow LED (receiver units only), visible from the front and the right side of the receiver, lights whenever the receiver's output circuit is conducting.



Figure 1. Q08 Series Opposed-Mode emitter and receiver features

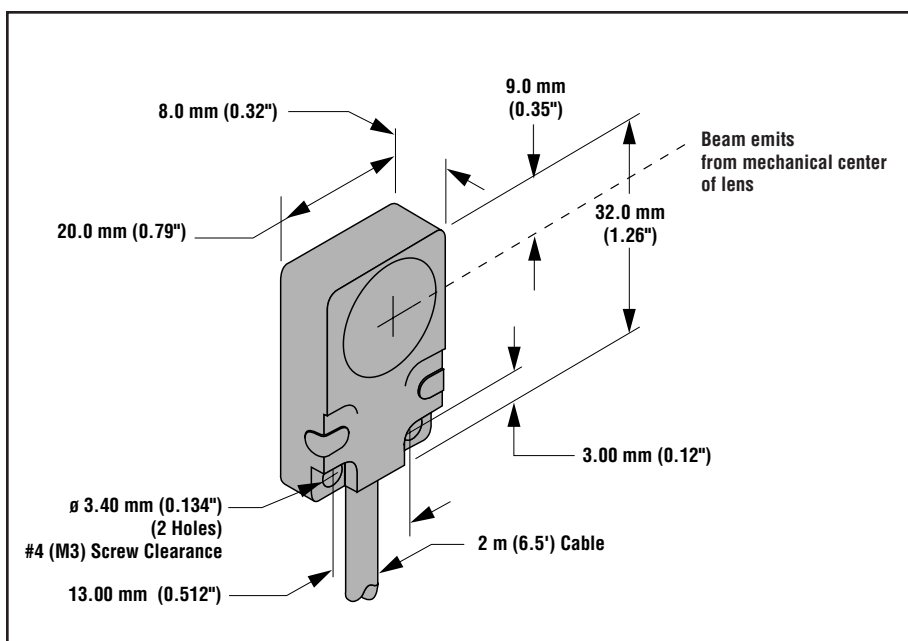



Figure 2. Q08 Opposed-Mode Sensor dimensions (attached cable version only)

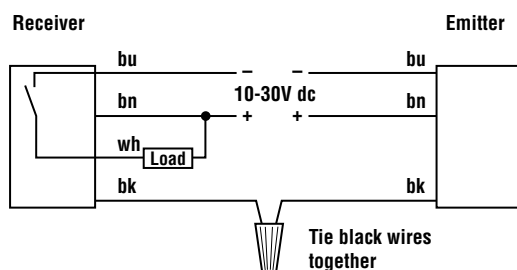
# Q08 Series Opposed-Mode Sensors

## Q08 Series Opposed-Mode Sensor Specifications

<b>Supply Voltage and Current</b>	10 to 30V dc at 30 mA total maximum; 15 mA for emitter, 15 mA for receiver (exclusive of load); 10% maximum ripple
<b>Supply Protection Circuitry</b>	Protected against reverse polarity
<b>Output Configuration</b>	Solid-state dc output, with four output types available: NPN sinking/light operate                      PNP sourcing/light operate NPN sinking/dark operate                      PNP sourcing/dark operate Light operate outputs conduct when the receiver sees the emitter's pulse-synchronized light source; Dark operate outputs conduct when the receiver does not see the emitter's pulse-synchronized source.
<b>Output Rating</b>	150mA maximum, continuous <b>Off-state leakage</b> current is 100 microamps at 30V dc <b>On-state saturation</b> voltage is < 200 millivolts at 10 mA dc and < 1 volt at 150 mA dc
<b>Output Protection Circuitry</b>	Protected against false pulse on power-up and continuous overload or short circuits of outputs. Overload trip point $\geq 220$ mA, typical, at 20°C.
<b>Output Response Time</b>	1 millisecond ON and OFF independent of signal strength
<b>Repeatability</b>	200 microseconds (0.2 milliseconds), independent of signal strength
<b>Indicators</b>	Two LED indicators: <b>Green:</b> Lights to indicate dc power ON <b>Yellow:</b> Lights (except opposed emitters) when sensor output is conducting (in "light" condition for light operate models; in "dark" condition for dark operate models)
<b>Construction</b>	Black epoxy-painted die-cast zinc housing, polysulfone thermoplastic lens with two through-mounting holes to accommodate M3 (#4) hardware
<b>Environmental Rating</b>	Meets NEMA standards 1, 2, 4, 6, 12 and 13; IEC IP67
<b>Connections</b>	PVC-jacketed 2 m (6.5') or 9 m (30') cable. Cable is 4.0 mm (0.16") in diameter.
<b>Operating Conditions</b>	<b>Temperature:</b> 0° to +50° C (+32° to +122°F) <b>Maximum relative humidity:</b> 90% at 50°C (non-condensing)
<b>Certifications</b>	

## Q08 Series Opposed-Mode Sensor Hookups

### Emitter and NPN (Sinking) Receiver



### Emitter and PNP (Sourcing) Receiver

