

Figure 3. Reflective Background - Problem

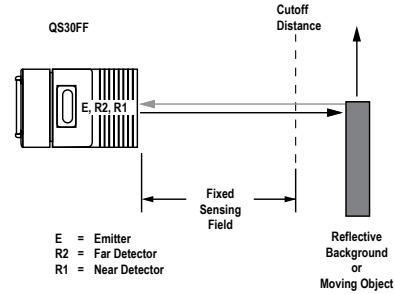
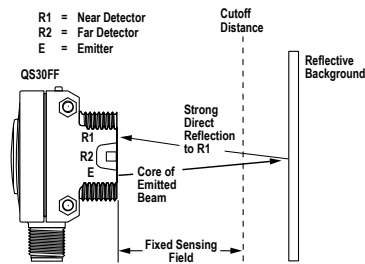
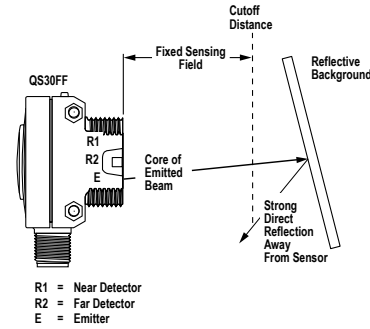


Figure 4. Reflective Background - Solution



A reflective background object in this position or moving across the sensor face in this axis and direction may cause a false sensor response.

Figure 5. Object Beyond Cutoff - Problem



A reflective background object in this position or moving across the sensor face in this axis is ignored.

Figure 6. Object Beyond Cutoff - Solution

Color Sensitivity

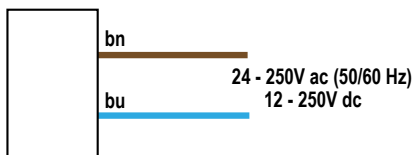
The effects of object reflectivity on cutoff distance, though small, may be important for some applications. It is expected that at any given cutoff setting, the actual cutoff distance for lower reflectance targets is slightly shorter than for higher reflectance targets. This behavior is known as color sensitivity.

For example, an excess gain of 1 for an object that reflects 1/10 as much light as the 90% white card is represented by the horizontal graph line at excess gain = 10. An object of this reflectivity results in a far limit cutoff of approximately 190 mm (7.5 in) for the 200 mm (8 in) cutoff model, for example; and 190 mm represents the cutoff for this sensor and target.

These excess gain curves were generated using a white test card of 90% reflectance. Objects with reflectivity of less than 90% reflect less light back to the sensor, and thus require proportionately more excess gain in order to be sensed with the same reliability as more reflective objects. When sensing an object of very low reflectivity, it may be especially important to sense it at or near the distance of maximum excess gain.

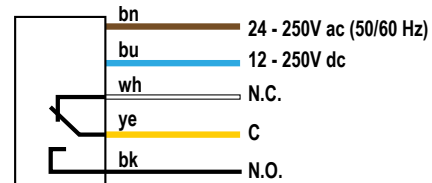
Wiring Diagrams

Cabled Emitters



Other Cabled Models

Cable and QPMA hookups are functionally identical.



Specifications

Supply Voltage

Universal Voltage: 24 V to 250 V ac (50 Hz/60 Hz) or 12 V to 250 V dc (1.0 watt maximum)

Supply Protection Circuitry

Protected against transient voltages

Output Configuration

SPDT (Single-Pole Double-Throw) electromechanical relay output (all models except emitters)

Output Rating

Max. Switching Power (resistive load): 150 W, 1250 VA
 Max. Switching Voltage (resistive load): 250 V ac; 125 V dc
 Max. Switching Current (resistive load): 5 A at 250 V ac; 5 A at 30 V dc derated to 200 mA at 125 V dc
 Min. Voltage and Current: 5 V dc, 10 mA
 Mechanical life of relay: 50 million operations
 Electrical life of relay at full resistive load: 100,000 operations

Output Response

15 milliseconds ON and OFF



NOTE: 100 millisecond delay on power-up; output does not conduct during this time.

Cutoff Point Tolerance

Fixed-Field Only: $\pm 5\%$ of nominal cutoff distance

Indicators

Two LEDs (Green and Amber) on top of sensor

Green ON: power to sensors is ON

Amber ON: light sensed

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

Large, oval LED indicator on sensor back (except emitters)

Amber ON: normally open output is conducting

Construction

ABS housing, rated IEC IP67, NEMA 6; acrylic lens cover

Connections

2 m (6.5 in) or 9 m (30 in) 5-wire PVC cable

Operating Conditions

$-20\text{ }^{\circ}\text{C}$ to $+70\text{ }^{\circ}\text{C}$ ($-4\text{ }^{\circ}\text{F}$ to $+158\text{ }^{\circ}\text{F}$)

95% at $+50\text{ }^{\circ}\text{C}$ maximum relative humidity (non-condensing)

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

Certifications



Performance Curves

Table 1: Opposed Mode Sensors

