BANNER®
more sensors, more solutions

WORLD-BEAM® QS30 – DC Voltage

Compact, self-contained photoelectric sensors in universal-style housing

Features

- Advanced one-piece photoelectric sensors with exceptional long-range optical performance
- Compact housing with mounting versatility, via its popular 30 mm threaded barrel or side-mount holes
- 10 to 30V dc operation with bipolar discrete outputs, NPN and PNP
- Selectable Light or Dark Operate, depending on hookup
- Tough ABS/polycarbonate blend housing is rated to IEC IP67; NEMA 6
- Easy-to-see sensor status indicators: two status LEDs visible from 360°; extra-large Output indicator on back of sensor housing (except emitters) visible from long distance
- Opposed, retroreflective, polarized retroreflective, diffuse and fixed-field (200, 400, or 600 mm cutoff) models available
- Retroreflective, polarized retroreflective, and diffuse models have potentiometer on back of housing for easy sensor range adjustment
- Choose 2 m integral cable or Euro-style integral QD models

Models

Sensing Mode		Model*	Range	Output
Opposed	875 nm Infrared Effective Beam: 18 mm (0.7")	**QS30E** emitter	60 m (200')	–
		QS30R receiver		Bipolar NPN/PNP
Polarized Retro	630 nm Visible Red	**QS30LP**	8 m (26')†	
Retro	630 nm Visible Red	**QS30LV**	12 m (40')†	

Sensing Mode		Model*	Range	Output
Diffuse	940 nm Infrared	**QS30D**	1 m (3.3')	Bipolar NPN/PNP
Fixed-Field	680 nm Visible Red	**QS30FF200**	200 mm (8")	
		QS30FF400	400 mm (16")	
		QS30FF600	600 mm (24")	

*Only standard 2 m (6.5') cable models are listed. For 9 m (30') integral cable, add suffix **"W/30"** to the model number (e.g., **QS30E W/30**).
QD models: For 5-pin integral Euro-style QD, add suffix "**Q**" (e.g., **QS30EQ**).
† Range is specified using a model **BRT-84** retroreflector.

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.

Fixed-Field Mode Overview

QS30 Series self-contained fixed-field sensors are small, powerful, visible red diffuse mode sensors with far-limit cutoff (a type of background suppression). Their high excess gain and fixed-field technology allow them to detect objects of low reflectivity that are directly in front of another surface, while ignoring the surface in the background.

The cutoff distance is fixed. Backgrounds and background objects must *always* be placed beyond the cutoff distance.

Fixed-Field Sensing – Theory of Operation

In operation, the QS30FF compares the reflections of its emitted light beam (E) from an object back to the sensor's two differently-aimed detectors R1 and R2 (see Figure 2). If the near detector (R1) light signal is stronger than the far detector (R2) light signal (see object A, closer than the cutoff distance), the sensor responds to the object. If the far detector (R2) light signal is stronger than the near detector (R1) light signal (see object B, object beyond the cutoff distance), the sensor ignores the object.

The cutoff distance for model QS30FF sensors is fixed at 200, 400 or 600 millimeters (8", 16", or 24"). Objects lying beyond the cutoff distance are ignored, even if they are highly reflective. However, it is possible to falsely detect a background object, under certain conditions (see Background Reflectivity and Placement).

In the drawings and discussion on these pages, the letters E, R1, and R2 identify how the sensor's three optical elements (Emitter "E", Near Detector "R1", and Far Detector "R2") line up across the face of the sensor. The location of these elements defines the sensing axis (see Figure 2). The sensing axis becomes important in certain situations, such as those illustrated in Figures 5 and 6.

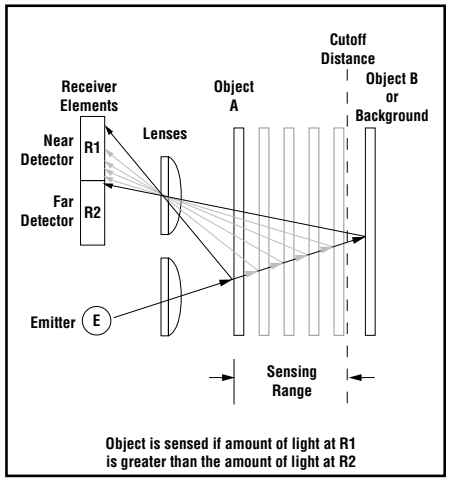

Figure 1. Fixed-field concept

Sensor Setup

Sensing Reliability

For best sensing reliability, the sensor-to-object distance should be positioned to maximize excess gain. The excess gain curves for these products are shown on page 5. Sensing at higher excess gains will make maximum use of each sensor's available sensing power. The background must be placed beyond the cutoff distance; more reflective backgrounds must be placed further back. Following these two guidelines will improve sensing reliability.

Background Reflectivity and Placement

Avoid mirror-like backgrounds that produce specular reflections. False sensor response will occur if a background surface reflects the sensor's light more strongly to the near detector, or "sensing" detector (R1) than to the far detector, or "cutoff" detector (R2). The result is a false ON condition (Figure 3). Use of a diffusely-reflective (matte) background will cure this problem. Other possible solutions are to angle the sensor or angle the background (in any plane) so the background does not reflect light back to the sensor (see Figure 4). Position the background as far beyond the cutoff distance as possible.

An object beyond the cutoff distance, either stationary (and when positioned as shown in Figure 5), or if it moves past the face of the sensor in a direction perpendicular to the sensing axis, can cause unwanted triggering of the sensor if it reflects more light to the near detector than to the far detector. The problem is easily remedied by rotating the sensor 90° (Figure 6). The object then reflects the R1 and R2 fields equally, resulting in no false triggering. A better solution, if possible, may be to reposition the object or the sensor.

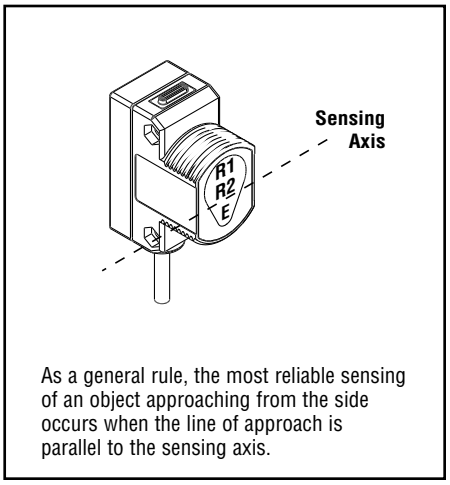

Figure 2. Fixed-field sensing axis

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