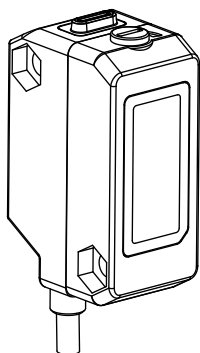


WORLD-BEAM® QS18 Adjustable-Field Sensors

Miniature sensors with visible red LED or visible red laser



CE cULus (some models)

Features

- Exceptional optical performance, comparable to larger sensors
- Simple multi-turn screw adjustment of cutoff distance
- 10 to 30V dc operation, with complementary (SPDT) NPN or PNP outputs, depending on model
- Less than 1 millisecond output response for excellent sensing repeatability

Laser Models:

- Narrow effective beam (approx. 1 mm spot size) for small-object detection and precise position control
- Crosstalk rejection algorithm to avoid optical disturbance from adjacent sensors
- Class 2 models have reduced excess gain within 20 mm of sensor for decreased susceptibility to the effects of lens contamination and to allow use of external lens shield

Models

| Models | Sensing Beam | Range | Cordset* | Supply Voltage | Output Type |
|---------------|----------------------------------|--|---------------------|----------------|-------------|
| QS18VN6AF100 | 660 nm Visible Red LED | 1 mm (0.04 in) to cutoff point; Adjustable cutoff point, 20-100 mm (0.8 in-4 in) | 2 m (6.5 ft) 4-wire | 10 to 30V dc | NPN |
| QS18VP6AF100 | | | | | PNP |
| QS18VN6LAF | 650 nm Visible Red Class 1 Laser | 1 mm (0.04 in) to cutoff point; Adjustable cutoff point, 30-150 mm (1.2 in-6 in) | | | NPN |
| QS18VP6LAF | | | | | PNP |
| QS18VN6LAF250 | 658 nm Visible Red Class 2 Laser | 20 mm (0.08 in) to cutoff point; Adjustable cutoff point, 50-250 mm (2 in-10 in) | | | NPN |
| QS18VP6LAF250 | | | | | PNP |

* Only standard 2 m (6.5 ft) cable models are listed.

For 9 m (30 ft) cables: add suffix "W/30" to the model number (e.g., **QS18VN6AF100 W/30**).

For 4-pin Pico-style pigtail QD: add suffix "Q" to the model number (e.g., **QS18VN6AF100Q**); accessory mating cordset required, see [Quick-Disconnect \(QD\) Cordsets](#) on page 9.

For 4-pin Euro-style pigtail QD: add suffix "Q5" to the model number (e.g., **QS18VN6AF100Q5**); accessory mating cordset required, see [Quick-Disconnect \(QD\) Cordsets](#) on page 9.



WARNING: Not To Be Used for Personnel Protection

Never use this product as a sensing device for personnel protection. Doing so could lead to serious injury or death. This product 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.

Overview

The QS18 Adjustable-Field Sensors are a full-featured sensor in a miniature package. It provides background suppression sensing capability for small or difficult-to-reach areas. Models are available with a visible red LED sensing beam, or one of two visible red lasers (see [Models](#) on page 1).

These adjustable-field sensors are able to detect objects of relatively low reflectivity, while ignoring other objects in the background (beyond the cutoff point). The cutoff distance is mechanically adjustable, using the 5-turn adjustment screw on the sensor top (see [Figure 1. Sensor features](#) on page 2). Backgrounds and background objects must *always* be placed beyond the cutoff distance.

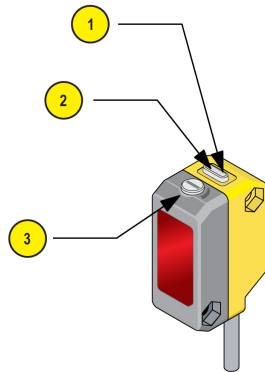


Figure 1. Sensor features

| | |
|---|--|
| 1 | Green: Power Indicator (Flashes for Output Overload) |
| 2 | Yellow: Light Sensed Indicator (Flashes for Low Gain Conditions) |
| 3 | Cutoff Point Adjustment Screw |

Adjustable-Field Sensing — Theory of Operation

The sensor 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. Adjustable field sensing concept](#) on page 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 these sensors is adjustable. 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](#) on page 3).

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 3. Sensing Axis](#) on page 3). The sensing axis becomes important in certain situations, such as those illustrated in [Figure 7. Object beyond cutoff – problem](#) on page 4 and [Figure 8. Object beyond cutoff – solution](#) on page 4.

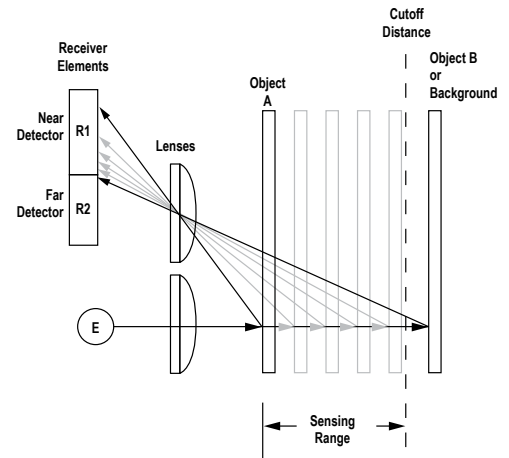


Figure 2. Adjustable field sensing concept