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Chapter 1 Features

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



- 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 V DC to 30 V DC operation with bipolar discrete outputs, NPN and PNP
- Selectable Light or Dark Operate, depending on wiring
- 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 mm, 400 mm, 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 M12 integral QD models

WARNING:



- **Do not use this device for personnel protection**
- Using this device for personnel protection could result in serious injury or death.
- This device does not include the self-checking redundant circuitry necessary to allow its use in personnel safety applications. A device failure or malfunction can cause either an energized (on) or de-energized (off) output condition.

Models

Model	Sensing Mode	Beam	Range ⁽¹⁾	Output
QS30E (emitter)	Opposed	875 nm Infrared	60 m (200 ft)	N/A
QS30R (receiver)		Effective Beam: 18 mm (0.7 in)		
QS30LP	Polarized Retroreflective	630 nm Visible Red	8 m (26 ft)	Bipolar NPN/PNP
QS30LV	Retroreflective		12 m (40 ft)	
QS30D	Diffuse	940 nm Infrared	1 m (3.3 ft)	
QS30FF200	Fixed Field	680 nm Visible Red	200 mm (8 in)	
QS30FF400			400 mm (16 in)	
QS30FF600			600 mm (24 in)	

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

- To order the 9 m (30 ft) integral cable model, add suffix “W/30” to the model number (for example, QS30E W/30).
- To order the 5-pin integral M12 quick disconnect (QD), add suffix “Q” (for example, QS30EQ).

⁽¹⁾ Polarized Retroreflective and Retroreflective ranges are specified using a model BRT-84 retroreflector.

Specifications

Supply Voltage

10 V DC to 30 V DC (10% max. ripple) at less than 40 mA, exclusive of load
Protected against reverse polarity and transient voltages

Output Response

Opposed Mode: 5 milliseconds ON and OFF
All others: 2 milliseconds
NOTE: 100 millisecond delay on power-up; outputs do not conduct during this time

Repeatability

Opposed Mode: not applicable
All others: 500 microseconds

Cutoff Point Tolerance

Fixed-Field only: ± 5% of nominal cutoff distance

Construction and Mounting

ABS housing, rated IEC IP67; NEMA 6; Acrylic lens cover
3 mm mounting hardware included

Connections

2 m (6.5 ft) unterminated 5-wire PVC-jacketed cable; 9 m (30 ft) unterminated 5-wire PVC-jacketed cable ; or Integral 5-pin M12 male quick-disconnect connector

Application Tip for the QS30LV Model

For best sensing reliability, targets should be a minimum of 0.5m from the sensor

Output Configuration

Bipolar: One current sourcing and one current sinking
Rating: 100 mA maximum each output at 25 °C
Off-state leakage current:
NPN: less than 50 µA
PNP: less than 40 µA
ON-state saturation voltage:
NPN: less than 3 V at 100 mA
PNP: less than 3 V at 100 mA
Protected against false pulse on power-up and continuous overload or short circuit of outputs

Adjustments

Selectable Light/Dark Operate is achieved via the gray wire.
Opposed, Retroreflective, and Polarized Retroreflective models:
Light Operate - Low (0 V to 3 V)*
Dark Operate - High (open or 5 V to 30 V)*
Diffuse and Fixed-Field models:
Light Operate - High (open or 5 V to 30 V)*
Dark Operate - Low (0 V to 3 V)*
Diffuse, Retroreflective, and Polarized Retroreflective mode models (only):
Single-turn Sensitivity (Gain) adjustment potentiometer
* Input impedance 10 kΩ

Indicators

2 LEDs on sensor top:
Green on: Power on
Green flashing: Output overloaded (except receivers)
Amber on: Light sensed
Amber flashing: Marginal excess gain (1–1.5× excess gain)
Large oval LED on sensor back (except emitters): Yellow on indicates the output is conducting

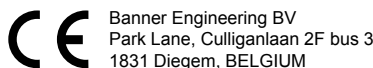
Operating Conditions

–20 °C to +70 °C (–4 °F to +158 °F)
95% at +50 °C maximum relative humidity (non-condensing)

Vibration and Mechanical Shock

All models meet MIL-STD-202F, Method 201A (Vibration: 10 Hz to 60 Hz maximum, 0.06 inch (1.52 mm) double amplitude, 10G maximum acceleration) requirements. Also meets IEC 60947-5-2 (Shock: 30G 11 ms duration, half sine wave) requirements.

Certifications



Required Overcurrent Protection

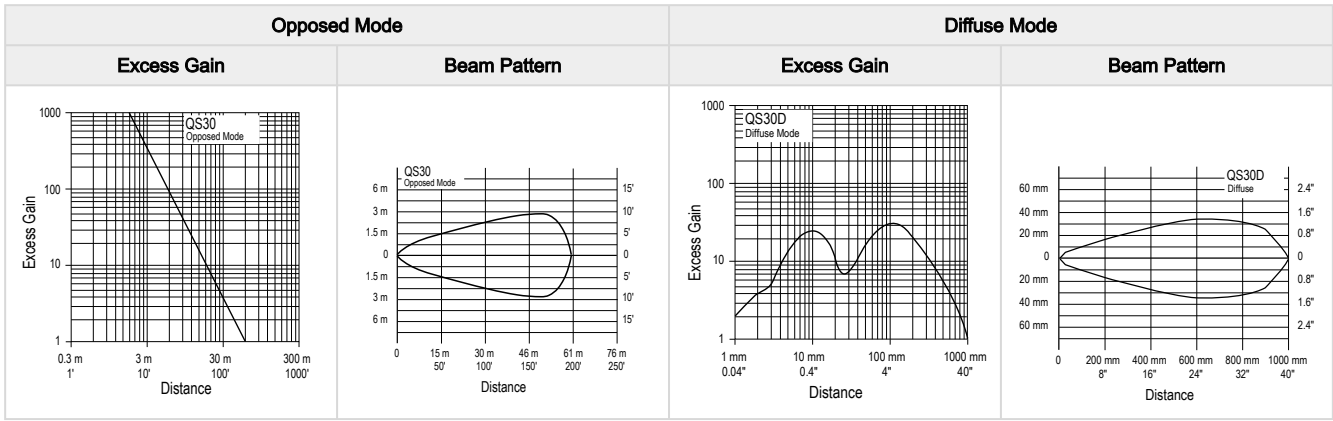
WARNING: Electrical connections must be made by qualified personnel in accordance with local and national electrical codes and regulations.

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.

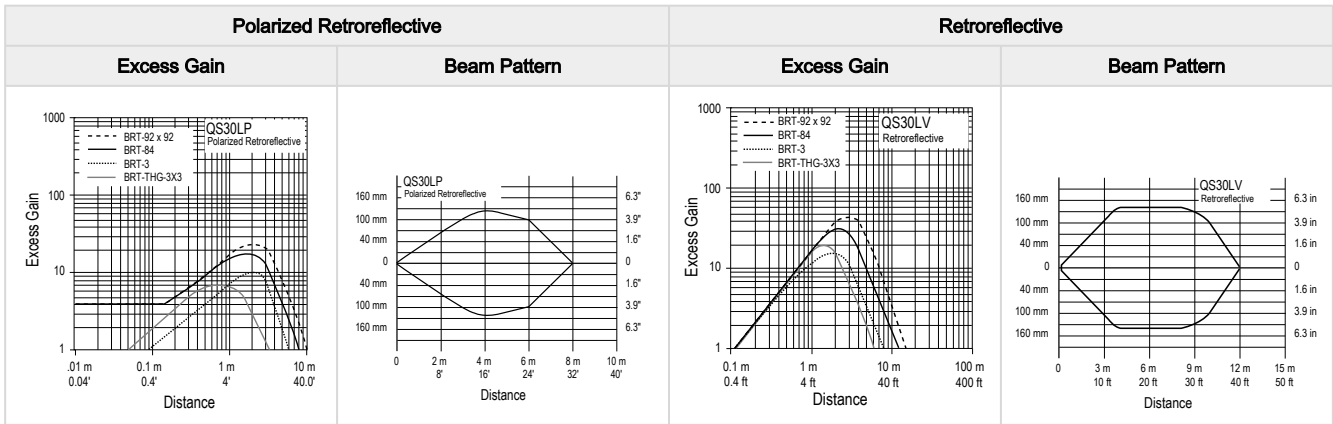
Supply Wiring (AWG)	Required Overcurrent Protection (A)	Supply Wiring (AWG)	Required Overcurrent Protection (A)
20	5.0	26	1.0
22	3.0	28	0.8
24	2.0	30	0.5

Performance Curves

For the diffuse models, the performance is based on using a 90% reflectance white test card.



For the polarized retroreflective and retroreflective models, the performance is based on using the specified retroreflector.



Fixed field performance is based on using a 90% reflectance white test card.

