

## Features and Models



- Easily fits or retrofits almost any mounting configuration
- Exceptional optical performance in a compact right-angle housing
- 20 V AC/DC to 140 V AC/DC or 20 V AC/DC to 270 V AC/DC operation with P-MOSFET or N-MOSFET output, depending on model (see Specifications)
- Bright LED operating status indicators, visible from 360°
- Rugged, sealed housing, protected circuitry, 1200 PSI washdown
- Versatile mounting: front- and base-mount (M18), side-mount, and retrofit brackets

**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.

Model	Sensing Mode / LED		Sensing Range	Output Type <sup>(1)</sup>		
QS18WE	940 nm Infrared Effective Beam: 10 mm (0.4 in)		20 m (66 ft)	N/A (Emitter)		
QS18ANWR				L.O.	N-MOSFET (Sinking)	
QS18RNWR				D.O.		
QS18APWR				L.O.	P-MOSFET (Sourcing)	
QS18RPWR				D.O.		
QS18ANWLP	660 nm Visible Red	 OPPOSED	3.5 m (12 ft)	L.O.	N-MOSFET (Sinking)	
QS18RNWLP				D.O.		
QS18APWLP				L.O.	P-MOSFET (Sourcing)	
QS18RPWLP				D.O.		
QS18ANWLV				L.O.	N-MOSFET (Sinking)	
QS18RNWLV	660 nm Visible Red	 POLAR RETRO	6.5 m (21 ft)	D.O.		
QS18APWLV				L.O.	P-MOSFET (Sourcing)	
QS18RPWLV				D.O.		
QS18ANWDL		 RETRO		L.O.	N-MOSFET (Sinking)	
QS18RNWDL				D.O.		
QS18APWDL				L.O.	P-MOSFET (Sourcing)	
QS18RPWDL				D.O.		
QS18ANWDXL	850 nm Infrared	 DIFFUSE	450 mm (18 in)	L.O.	N-MOSFET (Sinking)	
QS18RNWDXL				D.O.		
QS18APWDXL				L.O.	P-MOSFET (Sourcing)	
QS18RPWDXL				D.O.		
				L.O.	N-MOSFET (Sinking)	
				D.O.		
				L.O.	P-MOSFET (Sourcing)	
				D.O.		

The standard 2 m (6.5 ft) cable models are listed. To order the 9 m (30 ft) cable models, add the suffix "W/30" to the cabled model number. (for example, QS18WE W/30) QD models: To order models with a 150 mm (6 in) pigtail cable with 4-pin AC Micro-style QD, add suffix "Q2" to

<sup>(1)</sup> MOSFET: Metal oxide semiconductor field-effect transistor.

the model number (for example, QS18WEQ2). A model with a QD connector requires an accessory mating cordset. 600 V cable models: Standard models are supplied with 300 V cable. For 600 V cable, add suffix "C1" to the model number (for example, QS18WEC1).

In light operate (LO) mode, the output is ON when the target returns the same or more light to the sensor and OFF when the sensor detects less light than the configured/taught target. In **opposed and retroreflective sensing modes**, light operate is active when the beam is unblocked. In **diffuse, fixed field, and adjustable field sensor modes**, light operate is active when the target is present.

In dark operate (DO) mode, the output is ON when the target returns less light to the sensor than the configured target and OFF when the sensor detects more light than the configured/taught target. In **opposed and retroreflective sensing modes**, dark operate is active when the beam is blocked. In **diffuse, fixed field, and adjustable field sensor modes**, dark operate is active when the target is absent.

## QS18W Indicators



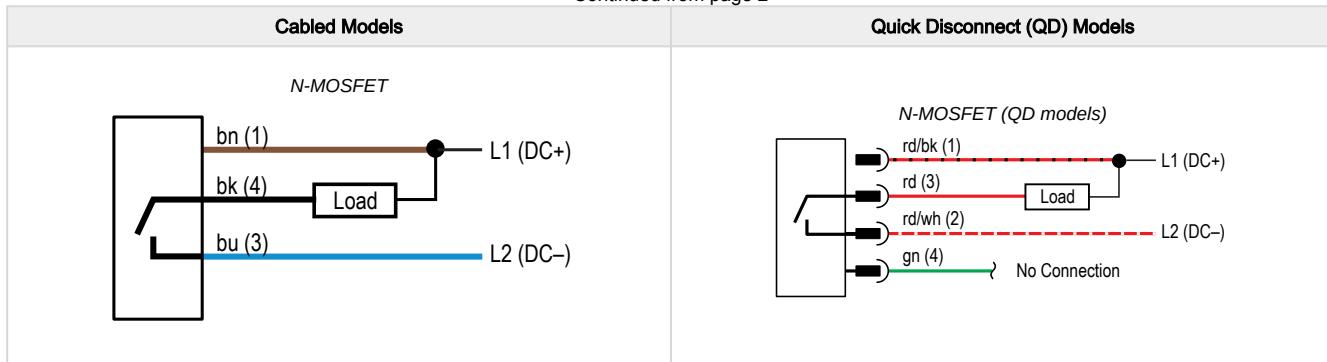
1. Green: Power Indicator
2. Amber: Output Indicator
3. Sensitivity (Gain) Potentiometer

## Wiring Diagrams

Cabled Models	Quick Disconnect (QD) Models
<p>1 = Brown 3 = Blue 4 = Black (no connection for emitters)</p>	<p>1 = Red/Black 2 = Red/White 3 = Red (no connection for emitters) 4 = Green (no connection for emitters)</p>
<p><i>P-MOSFET</i></p>	<p><i>P-MOSFET (QD models)</i></p>

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## Specifications

### Supply Voltage

P-MOSFET Models: 20 V /DC to 140 V /DC at less than 10 mA, exclusive of load  
 N-MOSFET Models: 20 V /DC to 270 V /DC at less than 10 mA, exclusive of load

### Supply Protection Circuitry

Protected against reverse polarity and transient voltages

### Output Configuration

Single Discrete Output, 100 mA load rating; N-MOSFET or P-MOSFET, depending on model number; Light Operate or Dark Operate, depending on model number

### Output Rating

Rating: 100 mA with short circuit protection

**Off-state leakage current:** less than 400  $\mu$ A

**ON-state saturation voltage:** P-MOSFET: 2.75 V; N-MOSFET: 2.5 V

### Output Protection Circuitry

Protected against output short-circuit and false pulse on power up.

Latching short-circuit protection; reset by cycling power.

Delay at power up; outputs do not conduct during this time: 100 ms maximum DC, 300 ms maximum AC

### Output Response

Opposed mode: 16.6 ms (1 cycle at 60 Hz)

All other modes: 8.3 ms (1/2 cycle at 60 Hz)

### Repeatability

1.5 ms

### Indicators

Two LED indicators on sensor top:

Green solid: Power on

Green flashing: Sensor output short circuit

Amber solid: Light sensed

Amber flashing: Marginal excess gain (1 to 1.5x excess gain)

### Adjustments

Diffuse, Retroreflective, and Polarized Retroreflective models only: 1-turn potentiometer Sensitivity (Gain) adjustment

### Construction

ABS housing, PMMA lens, metal Gain Adjuster

### Connections

2 m (6.5 ft) 3-conductor, 22 AWG PVC cable (300 V), or 150 mm (6 in) PVC cable with 4-pin threaded Micro-style connector; "C1" suffix models: 2 m (6.5 ft) 3-conductor, 22 AWG PVC cable (600 V).

### Environmental Rating

IEC IP67; NEMA 6; UL Type 1  
 1200 PSI washdown; NEMA ICS5, Annex F-2002 (PW12)

### Operating Conditions

Relative Humidity: 95% relative humidity at 55 °C (non-condensing)

Temperature: Less than 140 V /DC: -25 °C to 70 °C (-13 °F to 158 °F) (N-MOSFET and P-MOSFET models)

140 V /DC or greater: -25 °C to 55 °C (-13 °F to 131 °F) (N-MOSFET models only)

### Certifications



Banner Engineering BV  
 Park Lane, Culliganlaan 2F bus 3  
 1831 Diegem, BELGIUM



Turck Banner LTD Blenheim House  
 Blenheim Court  
 Wickford, Essex SS11 8YT  
 GREAT BRITAIN



LISTED 8N35 IND. CONT. EQ.

### 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](http://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

## FCC Part 15 Class A for Unintentional Radiators

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

(Part 15.21) Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

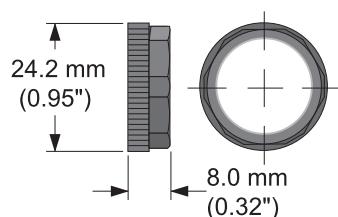
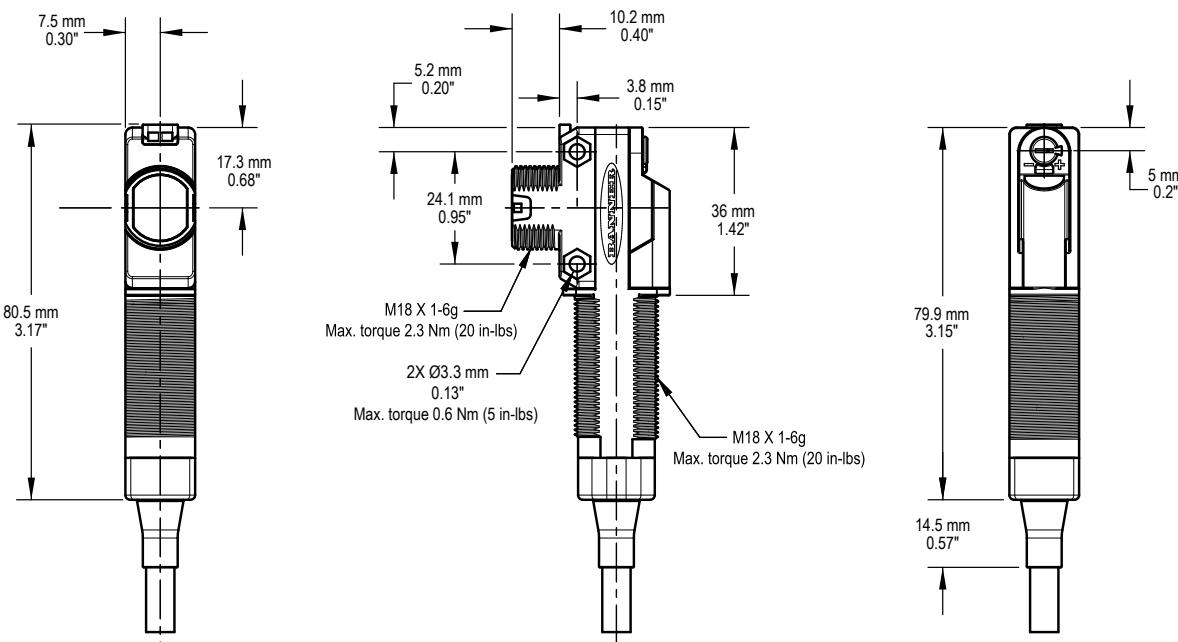
## Industry Canada ICES-003(A)

This device complies with CAN ICES-3 (A)/NMB-3(A). Operation is subject to the following two conditions: 1) This device may not cause harmful interference; and 2) This device must accept any interference received, including interference that may cause undesired operation.

Cet appareil est conforme à la norme NMB-3(A). Le fonctionnement est soumis aux deux conditions suivantes : (1) ce dispositif ne peut pas occasionner d'interférences, et (2) il doit tolérer toute interférence, y compris celles susceptibles de provoquer un fonctionnement non souhaité du dispositif.

## Dimensions

All measurements are listed in millimeters [inches], unless noted otherwise. The measurements provided are subject to change.



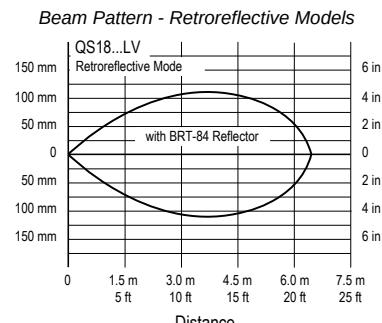
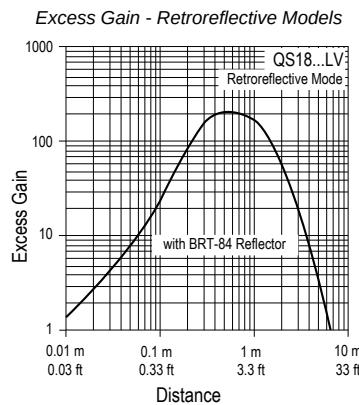
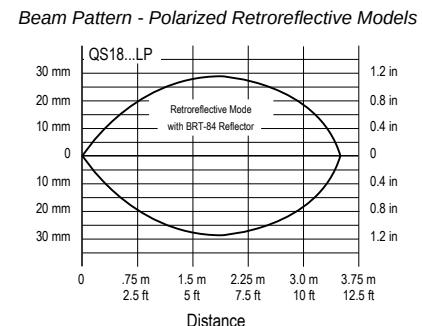
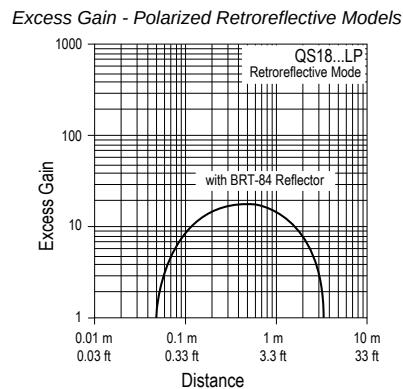
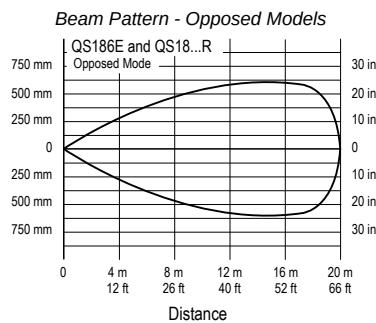
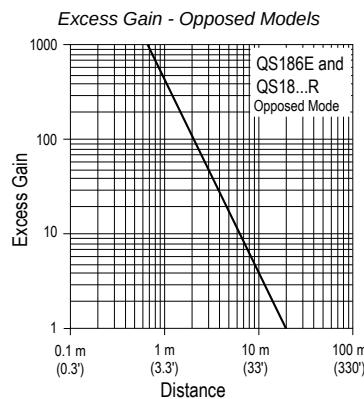
### Packing List

Sensor  
 M18 x 1 jam nut  
 M3 hardware packet  
 Datasheet

### M3 Hardware Packet Contents

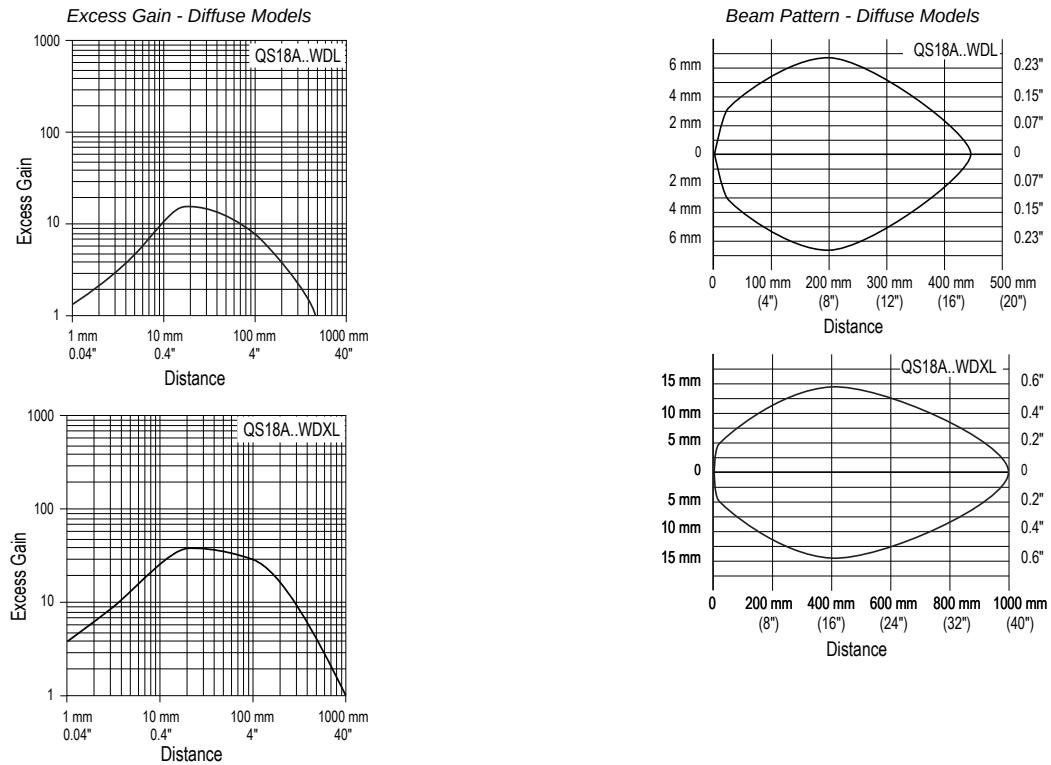
Two M3 x 0.5 x 20 mm SS screws  
 Two M3 x 0.5 SS hex nuts  
 Two M3 SS washers

## Performance Curves



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Diffuse performance is based on a 90% performance white test card.

## Accessories

### Cordsets

4-Pin Single-Ended 1/2-in Dual Key Female Cordsets				
Model	Length	Style	Dimensions	Pinout (Female)
MQAC-406	2 m (6.56 ft)	Straight		 1 = Red/Black 2 = Red/White 3 = Red 4 = Green
MQAC-415	5 m (16.4 ft)			
MQAC-430	9.14 m (30 ft)			

### Mounting Brackets

<b>SMB18A</b> <ul style="list-style-type: none"> <li>Right-angle mounting bracket with a curved slot for versatile orientation</li> <li>12-ga. stainless steel</li> <li>18 mm sensor mounting hole</li> <li>Clearance for M4 (#8) hardware</li> </ul> <p><b>Hole center spacing:</b> A to B = 24.2  <b>Hole size:</b> A = Ø 4.6, B = 17.0 × 4.6, C = Ø 18.5</p>	
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**SMBQS18WRS**

- Retrofit bracket for Universal voltage models; sensor base threads into bracket, bracket bolts to flat surface
- PBT construction
- Clearance for M3 or #6-32 hardware



Other sensor models are shown with the bracket above. Refer to [www.bannerengineering.com](http://www.bannerengineering.com) for more mounting bracket options, including: SMB312S, SMB18SF, SMB3018SC, SMB18FA.

## Retroreflective Targets

Banner offers a wide selection of high-quality retroreflective targets. See [www.bannerengineering.com](http://www.bannerengineering.com) for complete information.

**NOTE:** Polarized sensors require corner cube-type retroreflective targets. Non-polarized sensors may use any retroreflective target.



## Apertures

Model	Description	Pieces	
<b>Circular</b>			
APQS18-020	0.5 mm dia.	6	
APQS18-040	1.0 mm dia.	6	
APQS18-100	2.5 mm dia.	6	
<b>Horizontal Slot</b>			
APQS18-020H	0.5 x 6.4 mm	6	
APQS18-040H	1.0 x 6.4 mm	6	
APQS18-100H	2.5 x 6.4 mm	6	
<b>Vertical Slot</b>			
APQS18-020V	0.5 x 12.7 mm	6	
APQS18-040V	1.0 x 12.7 mm	6	
APQS18-100V	2.5 x 12.7 mm	6	
<b>Kit</b>			
APQS18-DVH2	2 of each aperture	18	

## Banner Engineering Corp Limited Warranty

Banner Engineering Corp. warrants its products to be free from defects in material and workmanship for one year following the date of shipment. Banner Engineering Corp. will repair or replace, free of charge, any product of its manufacture which, at the time it is returned to the factory, is found to have been defective during the warranty period. This warranty does not cover damage or liability for misuse, abuse, or the improper application or installation of the Banner product.

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