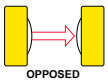
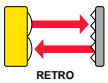
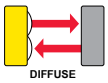
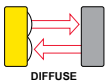
WORLD-BEAM® QS18 Universal Voltage Sensors

Datasheet

- 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: Not To Be Used for Personnel Protection

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

Model	Sensing Mode / LED		Sensing Range	Output Type [1]	
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		3.5 m (12 ft)	L.O.	N-MOSFET (Sinking)
QS18RNWLP				D.O.	
QS18APWLP				L.O.	P-MOSFET (Sourcing)
QS18RPWLP				D.O.	
QS18ANWLV	660 nm Visible Red		6.5 m (21 ft)	L.O.	N-MOSFET (Sinking)
QS18RNWLV				D.O.	
QS18APWLV				L.O.	P-MOSFET (Sourcing)
QS18RPWLV				D.O.	
QS18ANWDL	624 nm Visible Red		450 mm (18 in)	L.O.	N-MOSFET (Sinking)
QS18RNWDL				D.O.	
QS18APWDL				L.O.	P-MOSFET (Sourcing)
QS18RPWDL				D.O.	
QS18ANWDXL	850 nm Infrared		1 m (39 in)	L.O.	N-MOSFET (Sinking)
QS18RNWDXL				D.O.	
QS18APWDXL				L.O.	P-MOSFET (Sourcing)
QS18RPWDXL				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 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).

[1] MOSFET: Metal oxide semiconductor field-effect transistor.

Indicators

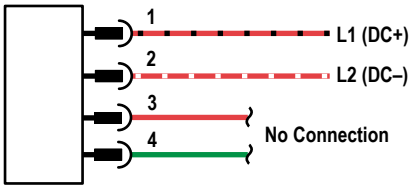
1. Green: Power Indicator
2. Amber: Output Indicator
3. Sensitivity (Gain) Potentiometer

Wiring Diagrams

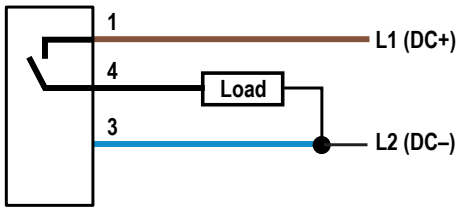
Cabled Models	Quick Disconnect (QD) Models
1 = Brown 3 = Blue 4 = Black (no connection for emitters)	1 = Red/Black 2 = Red/White 3 = Red (no connection for emitters) 4 = Green (no connection for emitters)

Emitter

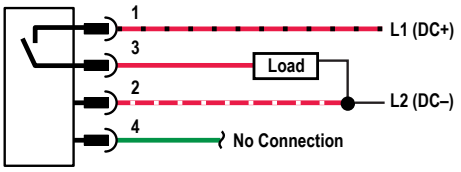
Emitter



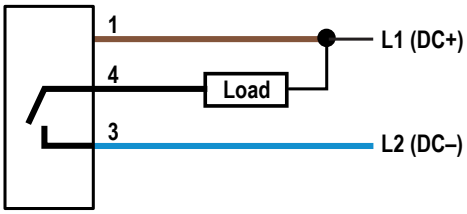
P-MOSFET



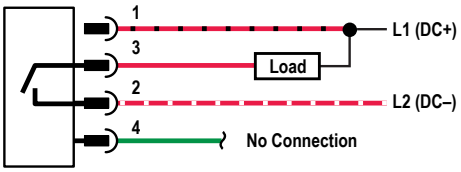
P-MOSFET



N-MOSFET



N-MOSFET



Specifications

Supply Voltage
P-MOSFET Models: 20 to 140 V ac/dc at less than 10 mA, exclusive of load
N-MOSFET Models: 20 to 270 V ac/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 µA
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 max. dc, 300 ms max. ac

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

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
2 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, Acetal Gain Adjuster

Connections
2 m (6.5 ft) 3-conductor, 22 AWG PVC cable (300 V ac), or 150 mm (6 in) pigtail 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 ac).

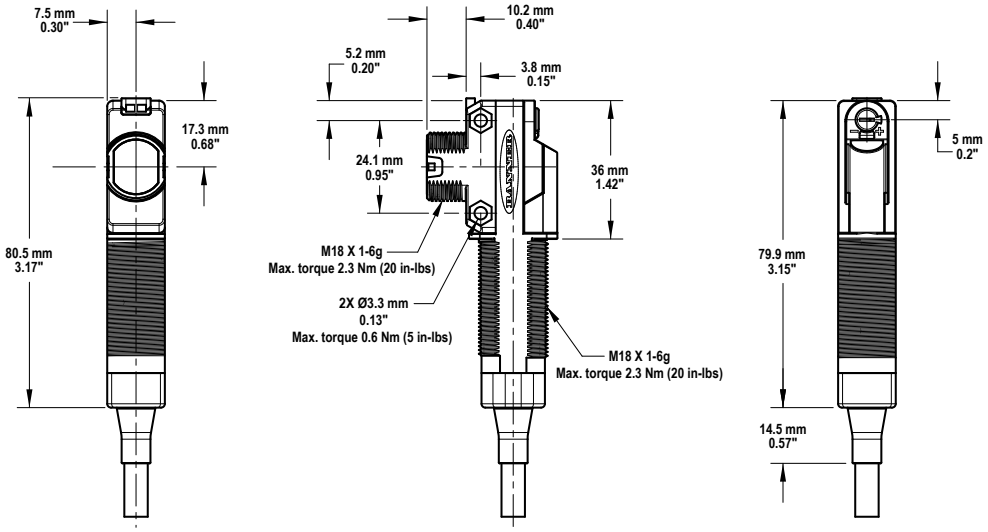
Environmental Rating
IEC IP67; NEMA 6; UL Type 1
1200 PSI washdown; NEMA ICS5, Annex F-2002 (PW12)

Operating Conditions
Relative Humidity: 95% at 55 °C (non-condensing)
Temperature: Less than 140 V ac/dc: −25 °C to 70 °C (−13 °F to 158 °F) (N-MOSFET and P-MOSFET models)
140 V ac/dc or greater: −25 °C to 55 °C (−13 °F to 131 °F) (N-MOSFET models only)

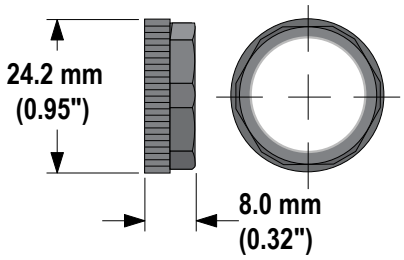
Certifications

c UL us LISTED 8N35 IND. CONT. EQ.

Dimensions



All measurements are listed in millimeters [inches], unless noted otherwise.



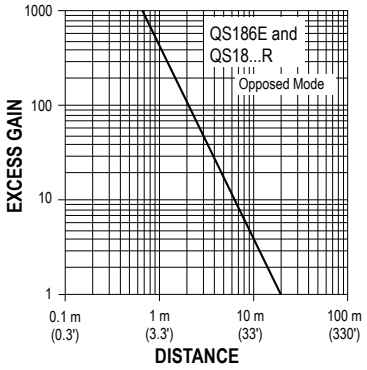
Packing List
- Sensor
- M18 × 1 jam nut
- M3 hardware packet
- Datasheet

M3 Hardware Packet Contents
- 2 – M3 × 0.5 × 20 mm SS Screw
- 2 – M3 × 0.5 SS Hex Nut
- 2 – M3 SS Washer

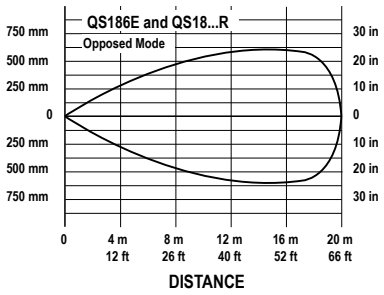
Performance Curves

Opposed Mode

Excess Gain

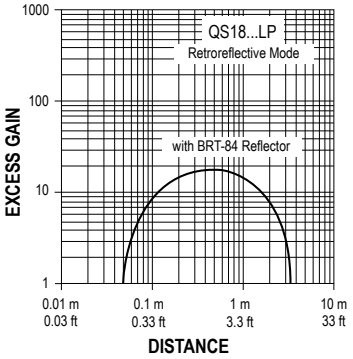


Beam Pattern

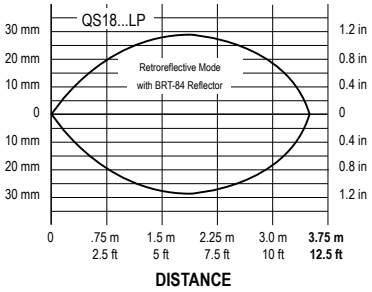


Polarized Retroreflective

Excess Gain

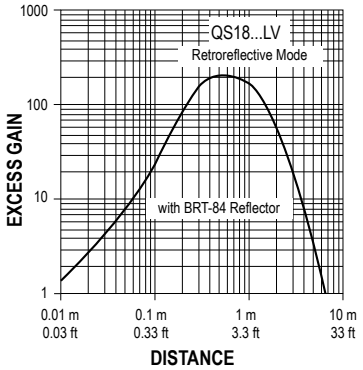


Beam Pattern

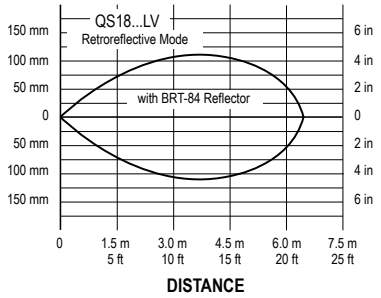


Retroreflective

Excess Gain

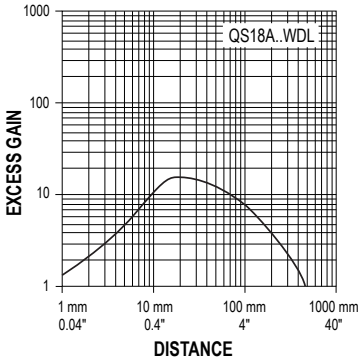


Beam Pattern

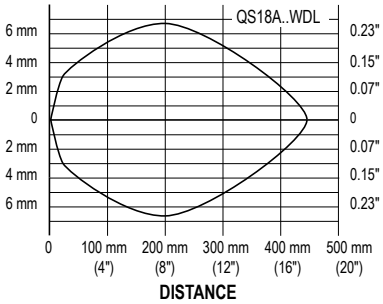


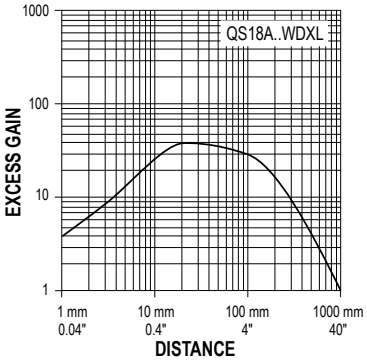
Diffuse (performance based on 90% performance white test card)

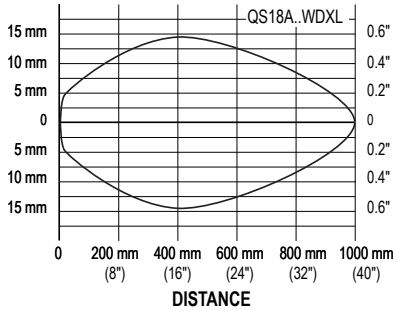
Excess Gain



Beam Pattern

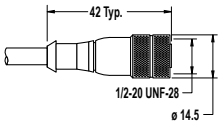
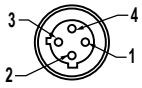






Accessories

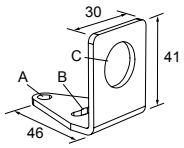
Cordsets

4-Pin Micro-Style Cordsets				
Model	Length	Style	Dimensions	Pinout (Female)
MQAC-406	1.83 m (6 ft)	Straight		 1 = Red/Black 2 = Red/White 3 = Red 4 = Green
MQAC-415	4.57 m (15 ft)			
MQAC-430	9.14 m (30 ft)			

Mounting Brackets

SMB18A

- Right-angle mounting bracket with a curved slot for versatile orientation
- 12-ga. stainless steel
- 18 mm sensor mounting hole
- Clearance for M4 (#8) hardware



Hole center spacing: A to B = 24.2
Hole size: A = ø 4.6, B = 17.0 × 4.6, C = ø 18.5

SMBQS18WRS

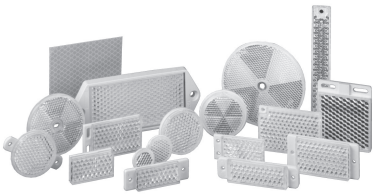
- Retrofit bracket for Universal voltage models; sensor base threads into bracket, bracket bolts to flat surface
- PBT construction
- Clearance for M3 or #6-32 hardware

Other sensor model shown with bracket above. Refer to your current Banner catalog for more mounting bracket options, including: SMB312S, SMB18SF, SMB3018SC, SMB18FA.

Retroreflective Targets

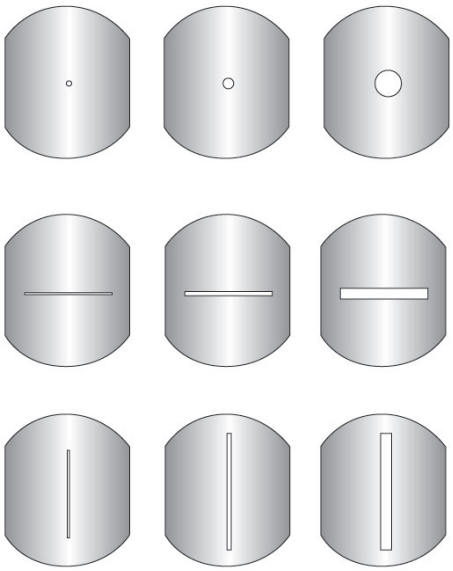
Banner offers a wide selection of high-quality retroreflective targets. See *www.bannerengineering.com* for complete information.

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



Apertures

Model	Description	Pieces
Circular		
APQS18-020	0.5 mm dia.	6
APQS18-040	1.0 mm dia.	6
APQS18-100	2.5 mm dia.	6
Horizontal Slot		
APQS18-020H	0.5 × 6.4 mm	6
APQS18-040H	1.0 × 6.4 mm	6
APQS18-100H	2.5 × 6.4 mm	6
Vertical Slot		
APQS18-020V	0.5 × 12.7 mm	6
APQS18-040V	1.0 × 12.7 mm	6
APQS18-100V	2.5 × 12.7 mm	6
Kit		
APQS18-DVHX2	2 of each aperture	18



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