Features



- 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.

Models

Opposed mode sensors (infrared, 940 nm)

Model	Output Type	Output Type[1]	Connector
QS18WE	NA (Emitter)	NA (Emitter)	2 m (6.5 ft) cable
QS18WE W/30	NA (Emitter)	NA (Emitter)	9 m cable
QS18WEQ2	NA (Emitter)	NA (Emitter)	150 mm (6 in) cable with 4-pin AC 1/2 in-20UNF (1/2-in Dual Key) QD
QS18RNWRQ2	Dark operate (DO)	N-MOSFET(sinking)	150 mm (6 in) cable with 4-pin AC 1/2 in-20UNF (1/2-in Dual Key) QD
QS18APWR	Light operate (LO)	P-MOSFET (sourcing)	2 m (6.5 ft) cable
QS18APWR W/30	LO	P-MOSFET (sourcing)	9 m cable
QS18APWRQ2	LO	P-MOSFET (sourcing)	150 mm (6 in) cable with 4-pin AC 1/2 in-20UNF (1/2-in Dual Key) QD
QS18RPWR	DO	P-MOSFET (sourcing)	2 m (6.5 ft) cable
QS18RPWRQ2	DO	P-MOSFET (sourcing)	150 mm (6 in) cable with 4-pin AC 1/2 in-20UNF (1/2-in Dual Key) QD

Polarized retroreflective mode sensors (visible red, 660 nm)

Model	Output Type	Output Type	Connector
QS18ANWLPQ2	LO	N-MOSFET (sinking)	150 mm (6 in) cable with 4-pin AC 1/2 in-20UNF (1/2-in Dual Key) QD
QS18RNWLP	DO	N-MOSFET (sinking)	2 m (6.5 ft) cable
QS18RNWLPQ2	DO	N-MOSFET (sinking)	150 mm (6 in) cable with 4-pin AC 1/2 in-20UNF (1/2-in Dual Key) QD
QS18APWLP	LO	P-MOSFET (sourcing)	2 m (6.5 ft) cable
QS18APWLPC1	LO	P-MOSFET (sourcing)	2 m 600 V cable
QS18APWLPQ2	LO	P-MOSFET (sourcing)	150 mm (6 in) cable with 4-pin AC 1/2 in-20UNF (1/2-in Dual Key) QD
QS18RPWLP	DO	P-MOSFET (sourcing)	2 m (6.5 ft) cable
QS18RPWLPQ2	DO	P-MOSFET (sourcing)	150 mm (6 in) cable with 4-pin AC 1/2 in-20UNF (1/2-in Dual Key) QD

Retroreflective mode sensors (visible red, 660 nm)

Model	Output Type	Output Type	Connector
QS18ANWLV	LO	N-MOSFET (sinking)	2 m (6.5 ft) cable
QS18ANWLVQ2	LO	N-MOSFET (sinking)	150 mm (6 in) cable with 4-pin AC 1/2 in-20UNF (1/2-in Dual Key) QD
QS18APWLV	LO	P-MOSFET (sourcing)	2 m (6.5 ft) cable
QS18APWLVC1 W/30	LO	P-MOSFET (sourcing)	9 m 600V cable
QS18APWLVQ2	LO	P-MOSFET (sourcing)	150 mm (6 in) cable with 4-pin AC 1/2 in-20UNF (1/2-in Dual Key) QD

Continued on page 2

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

Original Instructions
15-May-26

© Banner Engineering Corp. All rights reserved.
www.bannerengineering.com

136003
p/n: 136003 Rev. H

ПРОМЭЛЕКТРОНИКА/ sales@prom-elec.com

Continued from page 1

Model	Output Type	Output Type	Connector
QS18RPWLVQ2	DO	P-MOSFET (sourcing)	150 mm (6 in) cable with 4-pin AC 1/2 in-20UNF (1/2-in Dual Key) QD

Diffuse mode sensors (visible red, 624 nm)

Model	Output Type	Output Type	Connector
QS18ANWDLQ2	LO	N-MOSFET (sinking)	150 mm (6 in) cable with 4-pin AC 1/2 in-20UNF (1/2-in Dual Key) QD
QS18APWDL	LO	P-MOSFET (sourcing)	2 m (6.5 ft) cable
QS18APWDLC1	LO	P-MOSFET (sourcing)	2 m 600 V cable
QS18APWDLQ2	LO	P-MOSFET (sourcing)	150 mm (6 in) cable with 4-pin AC 1/2 in-20UNF (1/2-in Dual Key) QD
QS18RPWDL	DO	P-MOSFET (sourcing)	2 m (6.5 ft) cable
QS18RPWDLQ2	DO	P-MOSFET (sourcing)	150 mm (6 in) cable with 4-pin AC 1/2 in-20UNF (1/2-in Dual Key) QD

Diffuse mode sensors (infrared, 850 nm)

Model	Output Type	Output Type	Connector
QS18ANWDXLQ2	LO	N-MOSFET (sinking)	150 mm (6 in) cable with 4-pin AC 1/2 in-20UNF (1/2-in Dual Key) QD
QS18RNWDXL	DO	N-MOSFET (sinking)	2 m (6.5 ft) cable
QS18APWDXL	LO	P-MOSFET (sourcing)	2 m (6.5 ft) cable
QS18APWDXLQ2	LO	P-MOSFET (sourcing)	150 mm (6 in) cable with 4-pin AC 1/2 in-20UNF (1/2-in Dual Key) QD
QS18RPWDXL	DO	P-MOSFET (sourcing)	2 m (6.5 ft) cable
QS18RPWDXLQ2	DO	P-MOSFET (sourcing)	150 mm (6 in) cable with 4-pin AC 1/2 in-20UNF (1/2-in Dual Key) QD

- Opposed mode sensing range: 20 m (66 ft); Effective beam: 10 mm (0.4 in)
- Polarized retroreflective mode sensing range: 3.5 m (12 ft)
- Retroreflective mode sensing range: 6.5 m (21 ft)
- Diffuse mode (visible red) sensing range: 450 mm (18 in)
- Diffuse mode (infrared) sensing range: 1 m (39 in)

A model with a QD connector requires an accessory mating cordset.

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.

For a list of discontinued models, see Discontinued Models.

QS18W 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)

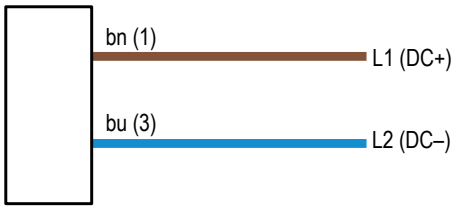
Continued on page 3

© Banner Engineering Corp. All rights reserved.
www.bannerengineering.com

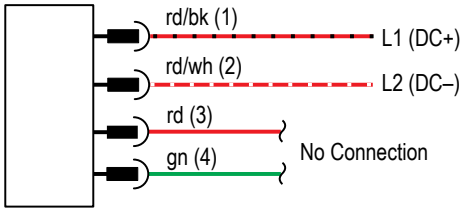
Continued from page 2

Cabled Models	Quick Disconnect (QD) Models

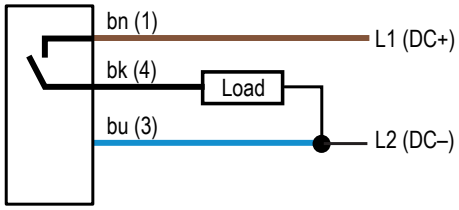
Emitter



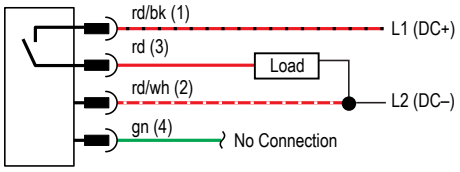
Emitter (QD models)



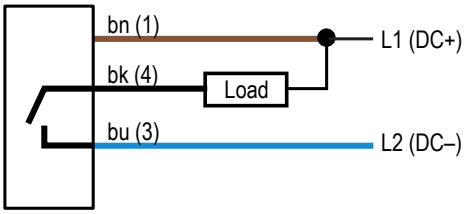
P-MOSFET



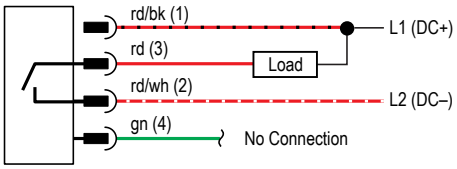
P-MOSFET (QD models)



N-MOSFET



N-MOSFET (QD models)



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 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 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).

© Banner Engineering Corp. All rights reserved.
www.bannerengineering.com

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

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.

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.

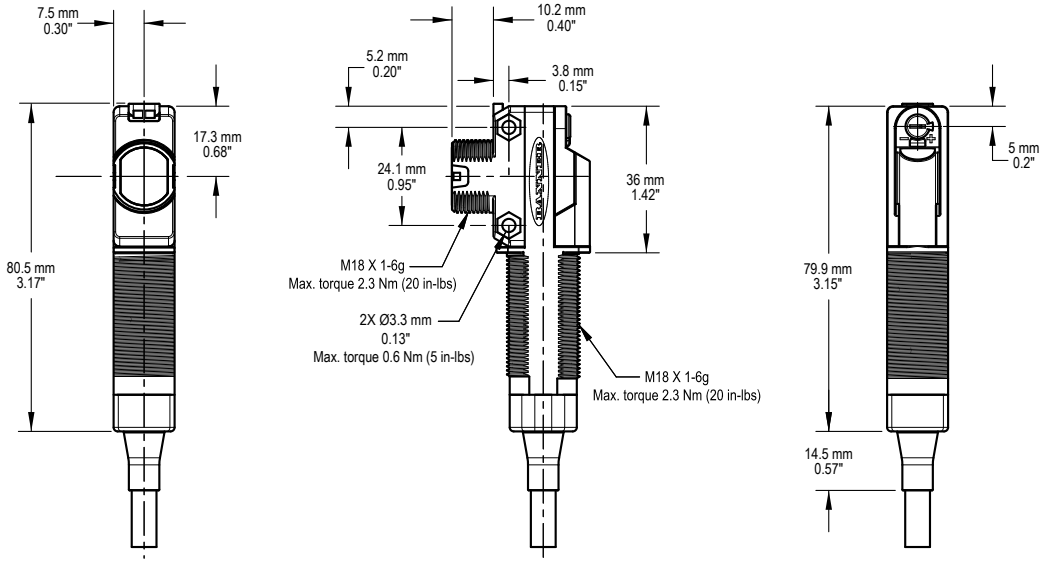
Industry Canada ICES-003(A)

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.

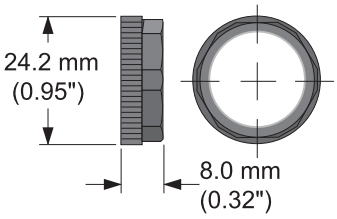
Cet appareil est conforme à la norme NMB-3(A). Le fonctionnement est soumis aux deux conditions suivantes : (1) ce dispositif ne peut pas occasionner d'interférences, et (2) il doit tolérer toute interférence, y compris celles susceptibles de provoquer un fonctionnement non souhaité du dispositif.

Dimensions

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



© Banner Engineering Corp. All rights reserved.
www.bannerengineering.com



Packing List

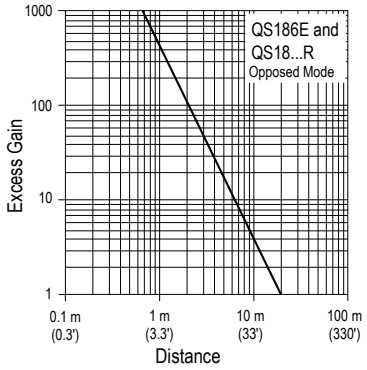
Sensor
M18 × 1 jam nut
M3 hardware packet
Datasheet

M3 Hardware Packet Contents

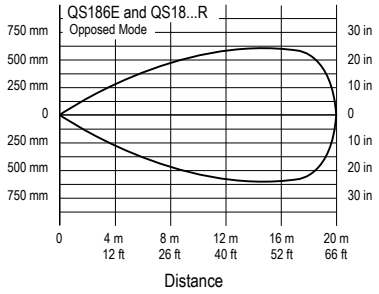
Two M3 × 0.5 × 20 mm SS screws
Two M3 × 0.5 SS hex nuts
Two M3 SS washers

Performance Curves

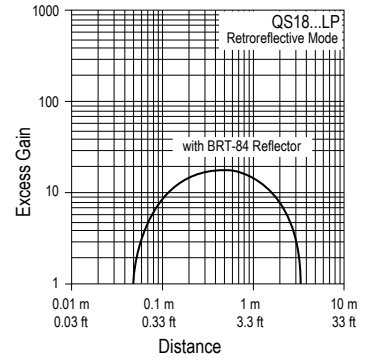
Excess Gain - Opposed Models



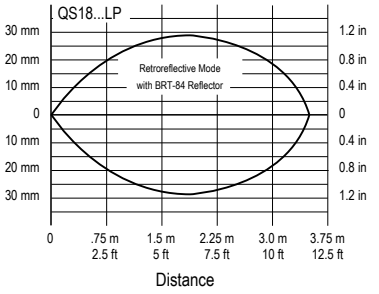
Beam Pattern - Opposed Models



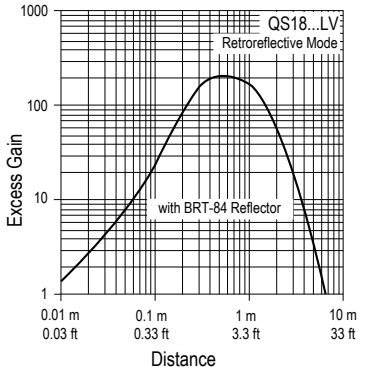
Excess Gain - Polarized Retroreflective Models



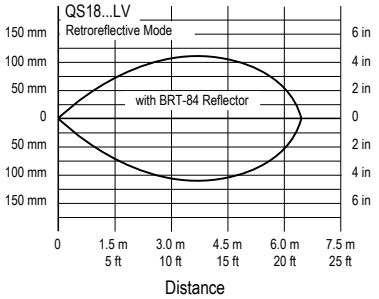
Beam Pattern - Polarized Retroreflective Models



Excess Gain - Retroreflective Models



Beam Pattern - Retroreflective Models

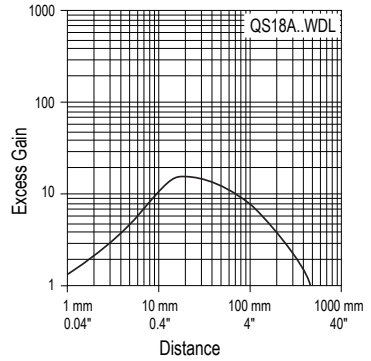


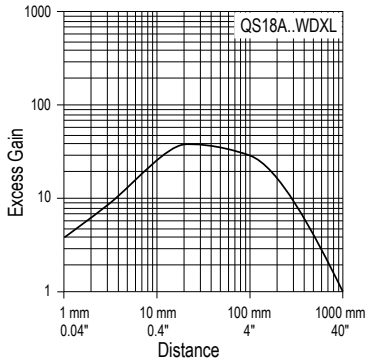
Continued on page 6

© Banner Engineering Corp. All rights reserved.
www.bannerengineering.com

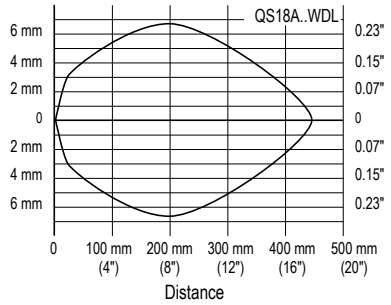
Continued from page 5

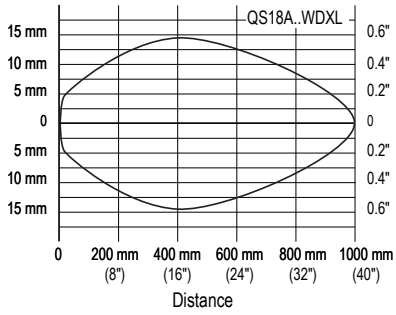
Excess Gain - Diffuse Models





Beam Pattern - Diffuse Models

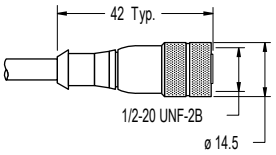




Diffuse performance is based on a 90% performance white test card.

Accessories

Cordsets

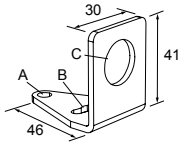
4-Pin Single-Ended 1/2-in Dual Key Female Cordsets				
Model	**Length**	**Style**	**Dimensions**	**Pinout (Female)**
MQAC-406	2 m (6.56 ft)	Straight		 1 = Red/Black 2 = Red/White 3 = Red 4 = Green
MQAC-415	5 m (16.4 ft)			
MQAC-430	9.14 m (30 ft)			

Mounting Brackets

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
- CAD Files: DXF, PDF, IGS, STP

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



© Banner Engineering Corp. All rights reserved.
www.bannerengineering.com

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
- CAD Files: DXF, PDF, IGS, STP



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

Retroreflective Targets

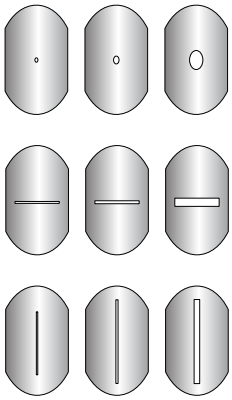
Banner offers a wide selection of high-quality retroreflective targets. See www.bannerengineering.com for complete information.

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 mm × 6.4 mm	6	
APQS18-040H	1 mm × 6.4 mm	6	
APQS18-100H	2.5 mm × 6.4 mm	6	
Vertical Slot			
APQS18-020V	0.5 mm × 12.7 mm	6	
APQS18-040V	1 mm × 12.7 mm	6	
APQS18-100V	2.5 mm × 12.7 mm	6	
Kit			
APQS18-DVHX2	2 of each aperture	18	



Product Support and Maintenance

Discontinued Models

The following models are no longer available for order but are still covered by the information in this document.

Model	Sensing mode	Output Type	Connector
QS18WEC1	Opposed mode	NA (Emitter)	2 m (6.5 ft) 600 V cable
QS18WEC1 W/30	Opposed mode	NA (Emitter)	9 m 600 V cable

Continued on page 8

© Banner Engineering Corp. All rights reserved.
www.bannerengineering.com

Continued from page 7

Model	Sensing mode	Output Type	Connector
QS18ANWR, ...Q2, and ...C1	Opposed mode	Light operate (LO); N-MOSFET(sinking)	All connector options
QS18RNWR and ...C1	Opposed mode	Dark operate (DO); N-MOSFET(sinking)	All connector options except Q2 models
QS18APWRC1	Opposed mode	LO; P-MOSFET (sourcing)	2 m and 9 m 600 V cable
QS18RPWR W/30 and ...C1	Opposed mode	DO; P-MOSFET (sourcing)	9 m 300 V cable and 2 m and 9 m 600 V cable options
QS18ANWLP and ...C1	Polarized retroreflective mode	LO; N-MOSFET (sinking)	2 m cable, 9 m cable, and 600 V cable options
QS18RNWLP W/30 and ...C1	Polarized retroreflective mode	DO; N-MOSFET (sinking)	9 m cable and 600 V cable options
QS18APWLP	Polarized retroreflective mode	LO; P-MOSFET (sourcing)	9 m 300 V cable and 600 V cable options
QS18RPWLP W/30 and ...C1	Polarized retroreflective mode	DO; P-MOSFET (sourcing)	9 m 300 V cable, 2 m and 9 m 600 V cable options
QS18ANWLV W/30 and ...C1	Retroreflective mode	LO; N-MOSFET (sinking)	3 m 300 V cable, 2 m and 9 m 600 V cable
QS18RNWLV	Retroreflective mode	DO; N-MOSFET (sinking)	All connector options
QS18APWLV W/30 and ...C1	Retroreflective mode	LO; P-MOSFET (sourcing)	9 m 300 V cable and 2 m 600 V cable
QS18RPWLV, ... W/30, and ...C1	Retroreflective mode	DO; P-MOSFET (sourcing)	2 m and 9m 300 V cable, 2 m and 9 m 600 V cable
QS18ANWDLQ2	Diffuse mode (visible red, 624 nm)	LO; N-MOSFET (sinking)	All models except Q2
QS18RNWDL	Diffuse mode (visible red, 624 nm)	DO; N-MOSFET (sinking)	All models
QS18APWDL W/30 and ...C1 W/30	Diffuse mode (visible red, 624 nm)	LO; P-MOSFET (sourcing)	9 m cables (both 300 V and 600 V models)
QS18RPWDL W/30, ...C1, ...C1 W/30	Diffuse mode (visible red, 624 nm)	DO; P-MOSFET (sourcing)	9 m 300 V cable, 2 m and 9 m 600 V cable
QS18ANWDXL	Diffuse mode (infrared, 850 nm)	LO; N-MOSFET (sinking)	All models except Q2
QS18RNWDXL W/30, ...C1, ...C1 W/30	Diffuse mode (infrared, 850 nm)	DO; N-MOSFET (sinking)	All models except 2 m cable
QS18APWDXL W/30, ...C1, ...C1 W/30	Diffuse mode (infrared, 850 nm)	LO; P-MOSFET (sourcing)	All models except 2 m cable and Q2
QS18RPWDXL W/30, ...C1, ...C1 W/30	Diffuse mode (infrared, 850 nm)	DO; P-MOSFET (sourcing)	All models except 2 m cable and Q2

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.

THIS LIMITED WARRANTY IS EXCLUSIVE AND IN LIEU OF ALL OTHER WARRANTIES WHETHER EXPRESS OR IMPLIED (INCLUDING, WITHOUT LIMITATION, ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE), AND WHETHER ARISING UNDER COURSE OF PERFORMANCE, COURSE OF DEALING OR TRADE USAGE.

This Warranty is exclusive and limited to repair or, at the discretion of Banner Engineering Corp., replacement. **IN NO EVENT SHALL BANNER ENGINEERING CORP. BE LIABLE TO BUYER OR ANY OTHER PERSON OR ENTITY FOR ANY EXTRA COSTS, EXPENSES, LOSSES, LOSS OF PROFITS, OR ANY INCIDENTAL, CONSEQUENTIAL OR SPECIAL DAMAGES RESULTING FROM ANY PRODUCT DEFECT OR FROM THE USE OR INABILITY TO USE THE PRODUCT, WHETHER ARISING IN CONTRACT OR WARRANTY, STATUTE, TORT, STRICT LIABILITY, NEGLIGENCE, OR OTHERWISE.**

Banner Engineering Corp. reserves the right to change, modify or improve the design of the product without assuming any obligations or liabilities relating to any product previously manufactured by Banner Engineering Corp. Any misuse, abuse, or improper application or installation of this product or use of the product for personal protection applications when the product is identified as not intended for such purposes will void the product warranty. Any modifications to this product without prior express approval by Banner Engineering Corp will void the product warranties. All specifications published in this document are subject to change; Banner reserves the right to modify product specifications or update documentation at any time. Specifications and product information in English supersede that which is provided in any other language. For the most recent version of any documentation, refer to: www.bannerengineering.com.

For patent information, see www.bannerengineering.com/patents.

© Banner Engineering Corp. All rights reserved.
www.bannerengineering.com