

# 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 <sup>1</sup>
QS18WE	940 nm Infrared Effective Beam: 10 mm (0.4 in)	20 m (66 ft)	N/A (Emitter)
QS18ANWR			L.O.
QS18RNWR			D.O.
QS18APWR			L.O.
QS18RPWR	D.O.	P-MOSFET (Sourcing)	
QS18ANWLP	660 nm Visible Red	3.5 m (12 ft)	L.O.
QS18RNWLP			D.O.
QS18APWLP			L.O.
QS18RPWLP			D.O.
QS18ANWLV	660 nm Visible Red	6.5 m (21 ft)	L.O.
QS18RNWLV			D.O.
QS18APWLV			L.O.
QS18RPWLV			D.O.
QS18ANWDL	624 nm Visible Red	450 mm (18 in)	L.O.
QS18RNWDL			D.O.
QS18APWDL			L.O.
QS18RPWDL			D.O.
QS18ANWDXL	850 nm Infrared	1 m (39 in)	L.O.
QS18RNWDXL			D.O.
QS18APWDXL			L.O.
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).

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

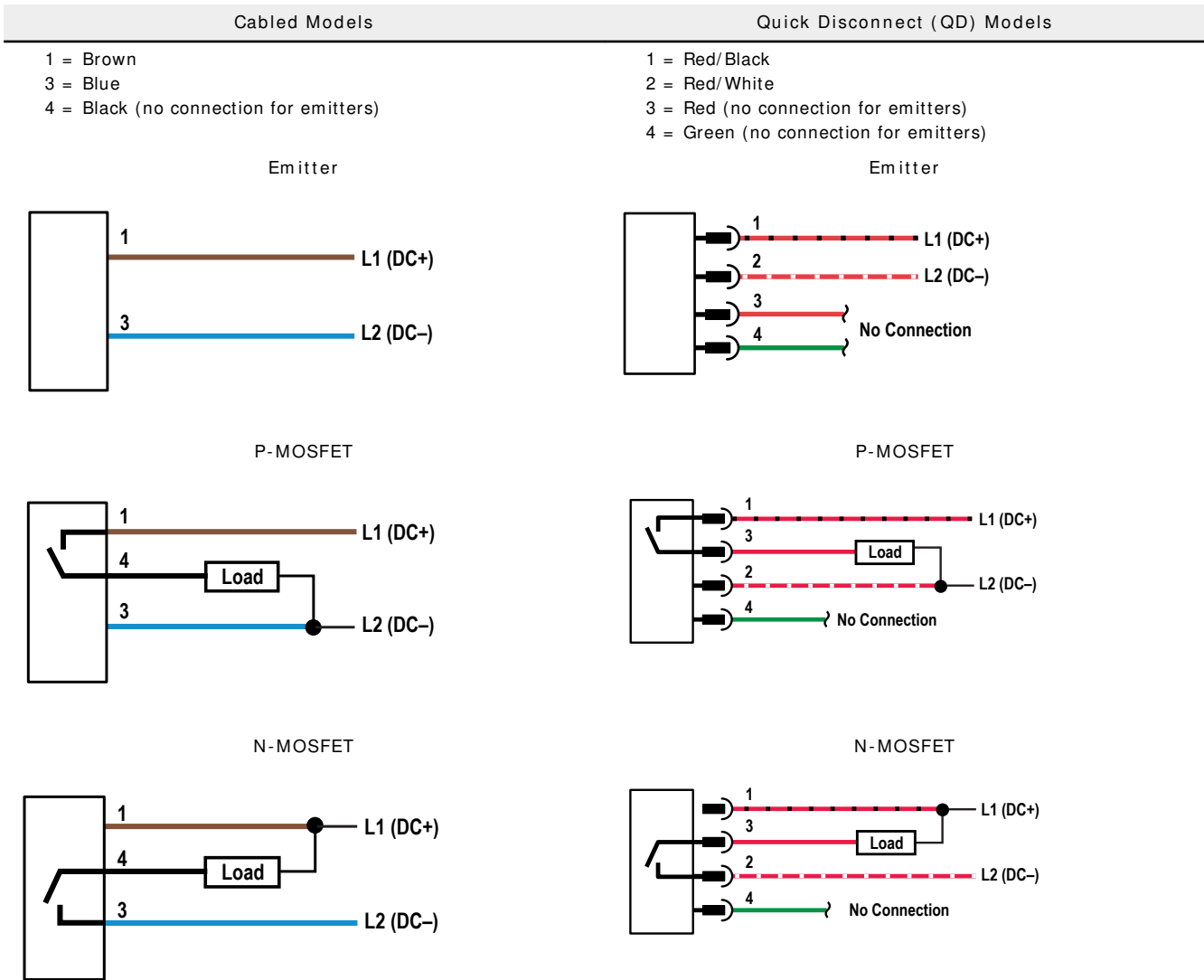


Indicators



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

Wiring Diagrams



# 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](http://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).

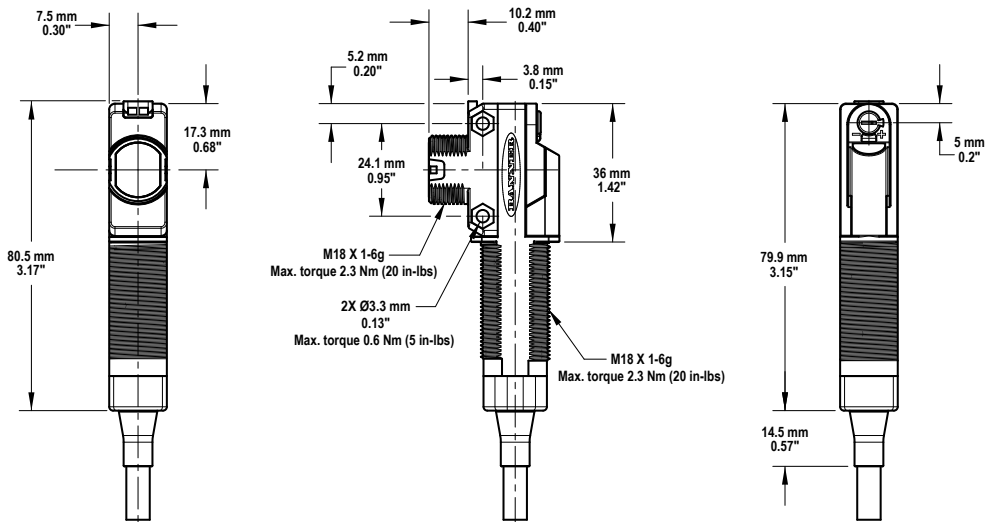
**Environmental Rating**  
 IEC IP67; NEMA 6; UL Type 1  
 1200 PSI washdown; NEMA ICS5, Annex F-2002 (PW12)

**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)

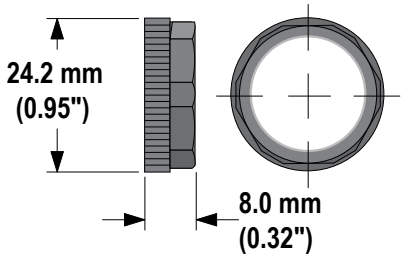
**Certifications**



## Dimensions



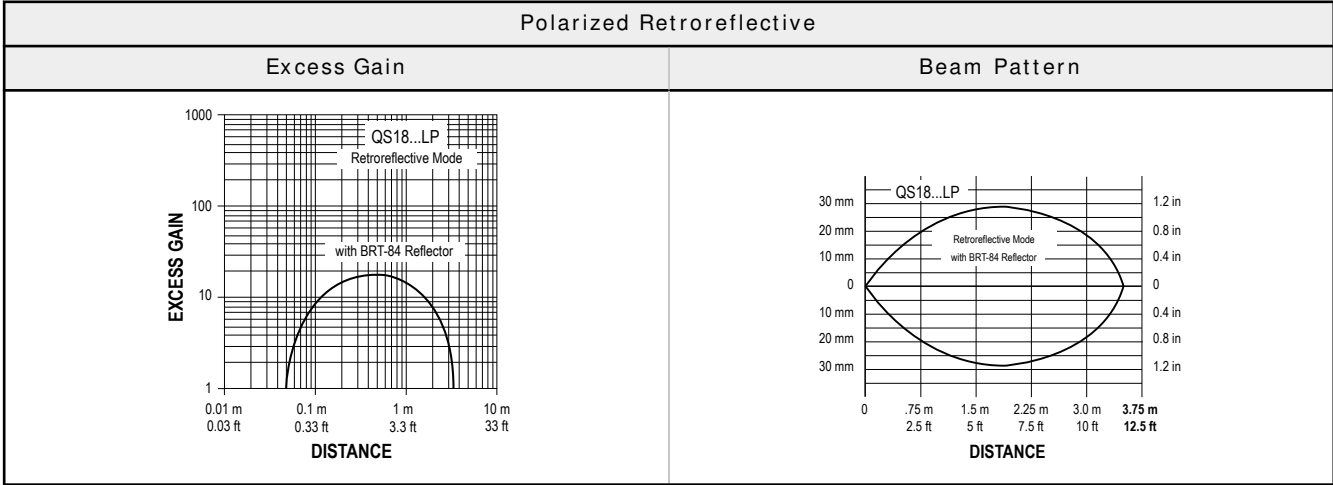
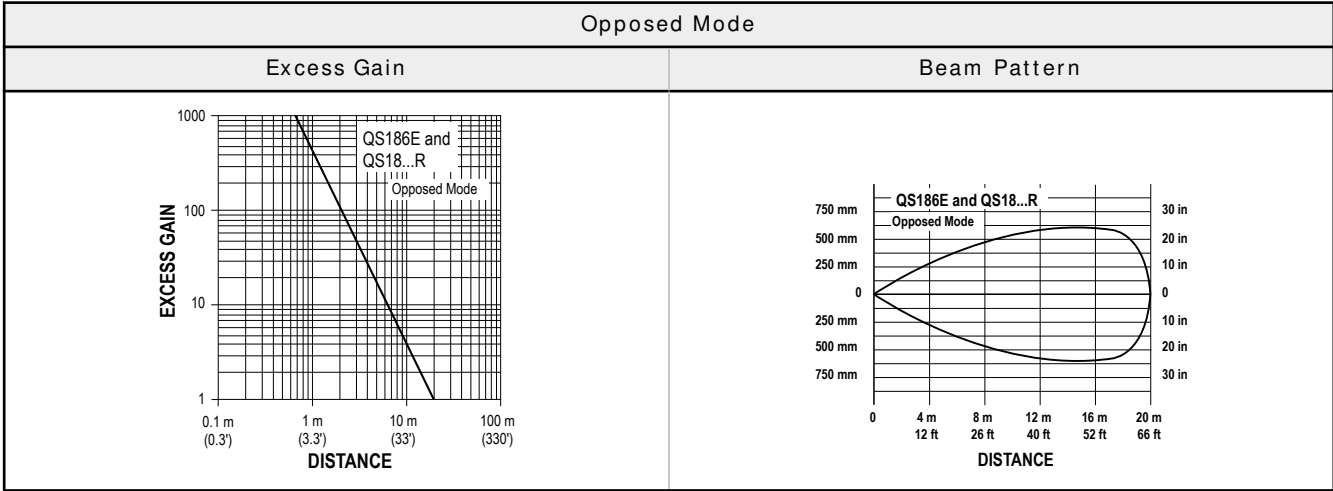
All measurements are listed in millimeters [inches], unless noted otherwise.

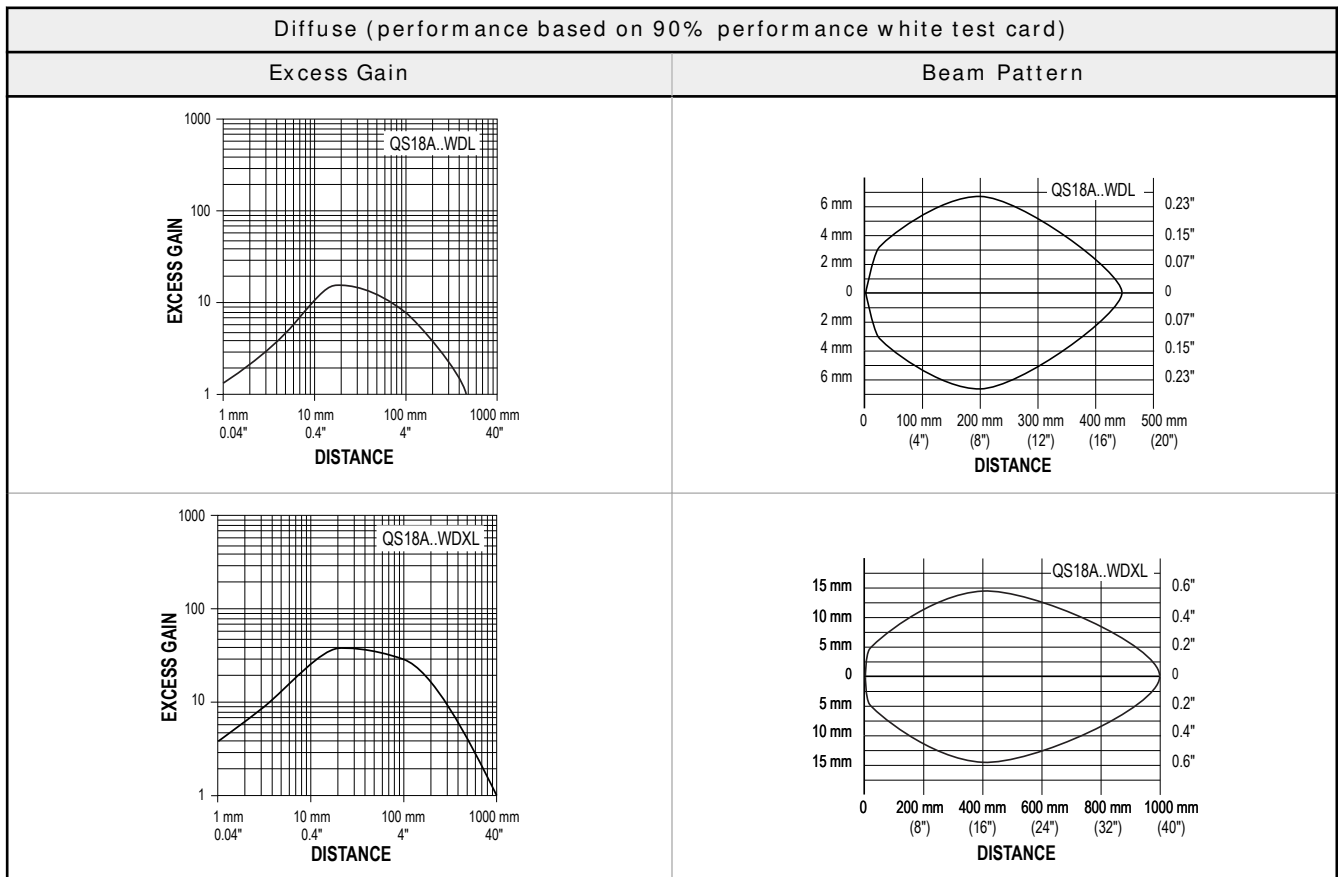
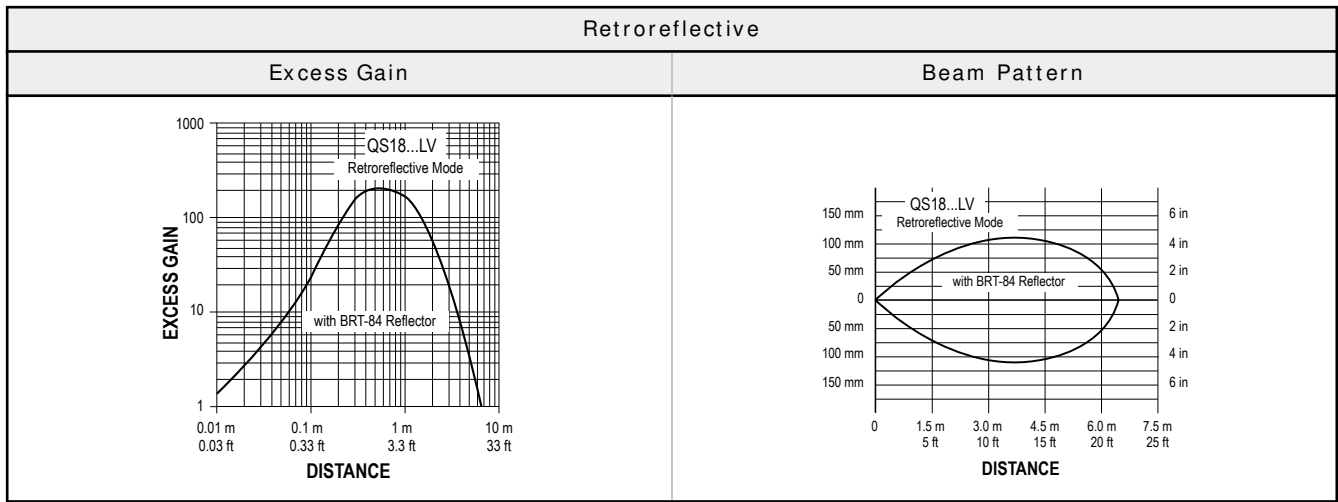


- Packing List**  
 Sensor  
 M18 x 1 jam nut  
 M3 hardware packet  
 Datasheet

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

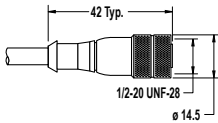
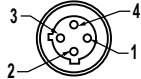
Performance Curves



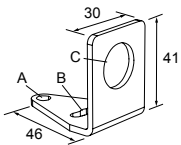



# Accessories

## Cordsets

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

## Mounting Brackets

<p><b>SMB18A</b></p> <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>Hole center spacing: A to B = 24.2 Hole size: A = <math>\varnothing</math> 4.6, B = 17.0 x 4.6, C = <math>\varnothing</math> 18.5</p>		<p><b>SMBQS18WRS</b></p> <ul style="list-style-type: none"> <li>• Retrofit bracket for Universal voltage models; sensor base threads into bracket, bracket bolts to flat surface</li> <li>• PBT construction</li> <li>• Clearance for M3 or #6-32 hardware</li> </ul>	
<p>Other sensor model shown with bracket above. Refer to your current Banner catalog for more mounting bracket options, including: SMB312S, SMB18SF, SMB3018SC, SMB18FA.</p>			

## 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	
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	

### 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](http://www.bannerengineering.com).