Quick Start Guide

Miniature Self-Contained Photoelectric Sensors In Universal-Mount Housing

This guide is designed to help you set up and install the WORLD-BEAM® QS18. For complete information on programming, performance, troubleshooting, dimensions, and accessories, please refer to the Instruction Manual at www.bannerengineering.com. Search for p/n 63908 to view the Instruction Manual. Use of this document assumes familiarity with pertinent industry standards and practices.

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.

### Models

<table>
<thead>
<tr>
<th>Model</th>
<th>Sensing Mode</th>
<th>Output Type</th>
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<th>Sensing Mode</th>
<th>Output Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>QS186E</td>
<td>20 m (66 ft) Opposed</td>
<td>Emitter</td>
<td>QS18VN6DB</td>
<td>450 mm (18 in) Diffuse</td>
<td>NPN</td>
</tr>
<tr>
<td>QS186EV</td>
<td>20 m (66 ft) Opposed</td>
<td>NPN</td>
<td>QS18VP6DB</td>
<td>450 mm (18 in) Diffuse</td>
<td>PNP</td>
</tr>
<tr>
<td>QS18VN6R</td>
<td>3 m (10 ft) Opposed</td>
<td>Emitter</td>
<td>QS18VN6DL</td>
<td>600 mm (24 in) Diffuse</td>
<td>NPN</td>
</tr>
<tr>
<td>QS18VP6R</td>
<td>3 m (10 ft) Opposed</td>
<td>NPN</td>
<td>QS18VP6DL</td>
<td>600 mm (24 in) Diffuse</td>
<td>PNP</td>
</tr>
<tr>
<td>QS18VPN6P</td>
<td>3.5 m (12 ft) Polarized Retro</td>
<td>NPN</td>
<td>QS18VN6W</td>
<td>100 mm (4 in) Divergent Diffuse</td>
<td>NPN</td>
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<td>QS18VPnP</td>
<td>3.5 m (12 ft) Polarized Retro</td>
<td>PNP</td>
<td>QS18VP6W</td>
<td>100 mm (4 in) Divergent Diffuse</td>
<td>PNP</td>
</tr>
<tr>
<td>QS18VN6L</td>
<td>6.5 m (21 ft) Non-Polarized Retro</td>
<td>NPN</td>
<td>QS18VN6FF5</td>
<td>50 mm (2 in) Fixed-Field</td>
<td>NPN</td>
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<td>QS18VP6L</td>
<td>6.5 m (21 ft) Non-Polarized Retro</td>
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</tr>
<tr>
<td>QS18VPN6V15</td>
<td>16 mm (0.63 in) Convergent</td>
<td>NPN</td>
<td>QS18VPN6F</td>
<td>220 mm (8.7 in) Individual (Opposed) 60 mm (2.4 in) Bifurcated (Diffuse)</td>
<td>NPN</td>
</tr>
<tr>
<td>QS18VP6V15</td>
<td>16 mm (0.63 in) Convergent</td>
<td>PNP</td>
<td>QS18VPN6F</td>
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<td>NPN</td>
</tr>
<tr>
<td>QS18VPN6C45</td>
<td>42 mm (1.7 in) Convergent</td>
<td>NPN</td>
<td>QS18VPN6F</td>
<td>500 mm (20 in) Individual (Opposed) 38 mm (1.5 in) Bifurcated (Diffuse)</td>
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<tr>
<td>QS18VP6C45</td>
<td>42 mm (1.7 in) Convergent</td>
<td>PNP</td>
<td>QS18VPN6F</td>
<td>500 mm (20 in) Individual (Opposed) 38 mm (1.5 in) Bifurcated (Diffuse)</td>
<td>NPN</td>
</tr>
<tr>
<td>QS18VPN6D</td>
<td>450 mm (18 in) Diffuse</td>
<td>NPN</td>
<td>QS18VPN6F</td>
<td>500 mm (20 in) Individual (Opposed) 38 mm (1.5 in) Bifurcated (Diffuse)</td>
<td>NPN</td>
</tr>
</tbody>
</table>

2 m (6.5 ft) cable models are listed.
- To order the 9 m (30 ft) cable model, add the suffix "W/30" to the cable model number. For example, QS186E W/30.
- To order the 4-pin M12/Euro-style integral quick disconnect model, add the suffix "Q8" to the model number. For example, QS186EQ8.
- To order the 150 mm (6 in) PVC cable model with a 4-pin M12/Euro-style quick disconnect, add the suffix "Q5" to the model number. For example, QS186EQ5.
- To order the 4-pin M8/Pico-style integral quick disconnect model, add the suffix "Q7" to the model number. For example, QS186EQ7.
- To order the 150 mm (6 in) PVC cable model with a 4-pin M8/Pico-style quick disconnect, add the suffix "Q" to the model number. For example, QS186EQ.
Wiring Diagrams

Quick disconnect (QD) wiring diagrams are functionally identical.

Specifications

Supply Voltage
10 V to 30 V dc (10% maximum ripple) at less than 25 mA, exclusive of load
Protected against reverse polarity and transient voltages

Light Source
Glass Fiber Optic, Opposed and Diffuse mode models: Infrared, 940 nm
Plastic Fiber Optic, Retroreflective, Convergent and FF mode models: Visible red, 660 nm

Adjustments
Glass Fiber Optic, Plastic Fiber Optic, Convergent, Diffuse, and Retroreflective mode models (only): Single-turn sensitivity (Gain) adjustment potentiometer

Indicators
2 LED indicators on sensor top:
Green solid: Power on
Amber solid: Light sensed
Green flashing: Output overloaded
Amber flashing: Marginal excess gain (1 to 1.5 times excess gain)

NOTE: Prior to date code 0223, the output indicator was red.

Repeatability
Opposed Mode: 100 microseconds
FF Mode: 160 microseconds
DL Mode: 90 microseconds
All Other Modes: 150 microseconds

Output Configuration
Solid-state complementary (SPDT): NPN or PNP (current sinking or sourcing), depending on model;
Rating: 100 mA maximum each output at 25 °C
DL Mode ON-state Saturation Voltage: less than 1.5 V at 10 mA;
less than 3 V at 100 mA
All Other Modes: ON-state Saturation Voltage: less than 1 V at 10 mA;
less than 1.5 V at 100 mA
Protected against false pulse on power-up and continuous overload or short circuit of outputs

Output Response
Opposed Mode: 750 microseconds ON; 375 microseconds OFF
FF and DL Modes: 850 microseconds ON/OFF
All Other Modes: 600 microseconds ON/OFF
Note: 100 millisecond delay on power-up; outputs do not conduct during this time

Construction
ABS housing
3 mm mounting hardware included

Connections
2 m (6.5 ft) 4-wire PVC cable, 9 m (30 ft) 4-wire PVC cable, 4-pin Pico-style or Euro-style QD, 4-pin Pico-style or Euro-style 150 mm (6 in) QD, depending on model

Environmental
IEC IP67; NEMA 6

Operating Conditions
Temperature: -20 °C to 70 °C (-4 °F to 158 °F)
Relative Humidity: 99% at +50 °C maximum relative humidity (non-condensing)

Certifications

<table>
<thead>
<tr>
<th>Supply Wiring (AWG)</th>
<th>Required Overcurrent Protection (Amps)</th>
</tr>
</thead>
<tbody>
<tr>
<td>20</td>
<td>5.0</td>
</tr>
<tr>
<td>22</td>
<td>3.0</td>
</tr>
<tr>
<td>24</td>
<td>2.0</td>
</tr>
<tr>
<td>26</td>
<td>1.0</td>
</tr>
<tr>
<td>28</td>
<td>0.8</td>
</tr>
<tr>
<td>30</td>
<td>0.5</td>
</tr>
</tbody>
</table>

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.
Dimensions

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

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.

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