



more sensors, more solutions

# WORLD-BEAM® QS18 Adjustable-Field Sensors

Miniature sensors with visible red LED or visible red laser



## Features

- Exceptional optical performance, comparable to larger sensors
- Simple multi-turn screw adjustment of cutoff distance
- 10 to 30V dc operation, with complementary (SPDT) NPN or PNP outputs, depending on model
- Less than 1 millisecond output response for excellent sensing repeatability

**Laser Models:**

- Narrow effective beam (approx. 1 mm spot size) for small-object detection and precise position control
- Crosstalk rejection algorithm to avoid optical disturbance from adjacent sensors
- Class 2 models have reduced excess gain within 20 mm of sensor for decreased susceptibility to the effects of lens contamination and to allow use of external lens shield.

## Models

Models	Sensing Beam and Range	Cable*	Supply Voltage	Output Type	Excess Gain	
					Performance based on 90% reflectance white test card	
QS18VN6AF100	660 nm Visible Red LED  Range: 1 mm (0.04") to cutoff point  Adjustable cutoff point, 20-100 mm (0.8"-4")	2 m (6.5') 4-wire	10 to 30V dc	NPN		
QS18VP6AF100	PNP					
QS18VN6LAF	650 nm Visible Red Class 1 Laser  Range: 1 mm (0.04") to cutoff point  Adjustable cutoff point, 30-150 mm (1.2"-6")			NPN		
QS18VP6LAF	PNP					
QS18VN6LAF250	658 nm Visible Red Class 2 Laser  Range: 20 mm (0.8") to cutoff point  Adjustable cutoff point, 50-250 mm (2"-10")			NPN		
QS18VP6LAF250	PNP					

\*Only standard 2 m (6.5') cable models are listed above. For other cable/connector options:

- 9 m (30') cables: add suffix "W/30" to the model number (e.g., QS18VN6AF100 W/30).
- 4-pin Pico-style pigtail QD: add suffix "Q" to the model number (e.g., QS18VN6AF100Q); accessory mating cordset required, see page 7.
- 4-pin Euro-style pigtail QD: add suffix "Q5" to the model number (e.g., QS18VN6AF100Q5); accessory mating cordset required, see page 7.

# WORLD-BEAM® QS18 Adjustable-Field Sensors

## Specifications

	QS18AF Models	QS18LAF Models	QS18LAF250 Models
<b>Supply Voltage</b>	10 to 30V dc (10% maximum ripple) at less than 25 mA, exclusive of load; Protected against reverse polarity and transient voltages	10 to 30V dc (10% maximum ripple) at less than 15 mA, exclusive of load; Protected against reverse polarity and transient voltages	
<b>Sensing Beam</b>	Visible red LED, 660 nm	Visible red laser (see below)	
<b>Laser Characteristics</b>	N/A	<b>Wavelength:</b> 650 nm visible red Class 1 laser <b>Pulse Width:</b> 7 microseconds <b>Rep Rate:</b> 130 microseconds <b>Average Output Power:</b> 0.065 mW	<b>Wavelength:</b> 658 nm visible red Class 2 laser <b>Pulse Width:</b> 7 microseconds <b>Rep Rate:</b> 130 microseconds <b>Average Output Power:</b> 0.2 mW
<b>Output Configuration</b>	<b>Solid-state complementary (SPDT);</b> NPN or PNP (current sinking or sourcing), depending on model; <b>Rating:</b> 100 mA maximum each output at 25° C <b>Off-state leakage current:</b> less than 50 $\mu$ A @ 30V dc <b>ON-state saturation voltage:</b> less than 1V @ 10 mA; less than 1.5V @ 100 mA Protected against false pulse on power-up and continuous overload or short circuit of outputs	<b>Solid-state complementary (SPDT);</b> NPN or PNP (current sinking or sourcing), depending on model; <b>Rating:</b> 100 mA maximum each output at 25° C <b>Off-state leakage current:</b> NPN: less than 200 $\mu$ A @ 30V dc PNP: less than 10 $\mu$ A @ 30V dc <b>ON-state saturation voltage:</b> NPN: less than 1.6V @ 100 mA PNP: less than 2.0V @ 100 mA Protected against false pulse on power-up and continuous overload or short circuit of outputs	
<b>Output Response</b>	700 microseconds ON/OFF; 100 ms delay on power-up; outputs do not conduct during this time	700 microseconds ON/OFF; 200 ms delay on power-up; outputs do not conduct during this time	
<b>Repeatability</b>	175 microseconds	130 microseconds	
<b>Sensing Hysteresis</b>	0.5% of range typical at 20 mm cutoff 1% of range typical at 50 mm cutoff 3% of range typical at 100 mm cutoff	1% of range typical at 30 mm cutoff 2% of range typical at 75 mm cutoff 5% of range typical at 150 mm cutoff	1% of range typical at 50 mm cutoff 2% of range typical at 150 mm cutoff 5% of range typical at 250 mm cutoff
<b>Adjustments</b>	Five-turn adjustment screw sets cutoff distance between min. and max. positions, clutched at both ends of travel		
<b>Indicators</b>	<b>2 LED indicators on sensor top:</b> Green ON steady: Power ON Green flashing: Output overloaded	<b>Yellow ON steady:</b> Light sensed <b>Yellow flashing:</b> Marginal excess gain (1 to 1.5x excess gain)	
<b>Construction</b>	ABS housing, acrylic lens cover; 2.5 mm and 3 mm mounting hardware included		
<b>Environmental Rating</b>	IEC IP67; NEMA 6		
<b>Connections</b>	2 m (6.5') 4-wire PVC cable, 9 m (30') PVC cable, or 4-pin Pico-style or Euro-style 150 mm (6") pigtail QD, depending on model		
<b>Operating Conditions</b>	<b>Temp:</b> 0° to +55° C (+32° to 131° F) <b>Relative Humidity:</b> 95% @ 50° C (non-condensing)	<b>Temp:</b> -10° to +50° C (+14° to 122° F)	
<b>Laser Classification</b>	N/A	Class 1 laser product Complies with IEC 60825-1:2001 and 21 CFR 1040.10, except for deviations pursuant to Laser Notice 50, dated 7-26-01	Class 2 laser product
<b>Certifications</b>	 		approval in process

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## Description of Laser Classes

### Class 1 Lasers

Lasers that are safe under reasonably foreseeable conditions of operation, including the use of optical instruments for intrabeam viewing.

Reference IEC 60825-1:2001, section 8.2.

**Class 1 Laser Characteristics:** See specifications on page 5.

### Class 2 Lasers

Lasers that emit visible radiation in the wavelength range from 400 nm to 700 nm, where eye protection is normally afforded by aversion responses, including the blink reflex. This reaction may be expected to provide adequate protection under reasonably foreseeable conditions of operation, including the use of optical instruments for intrabeam viewing.

Reference IEC 60825-1:2001, section 8.2.

**Class 2 Laser Characteristics:** See specifications on page 5.

### For Safe Laser Use (Class 1 or Class 2):

- Do not permit a person to stare at the laser from within the beam.
- Do not point the laser at a person's eye at close range.
- Terminate the beam emitted by a Class 2 laser product at the end of its useful path. Locate open laser beam paths either above or below eye level, where practical.

### CLASS 1 LASER PRODUCT

Complies with 21 CFR 1040.10 and 1040.11 except for deviations pursuant to Laser Notice No. 50, dated 7-26-01.

**BANNER**

Pulse Power < 5.6 mW, 650 - 670 nm, 15 kHz, 4.5  $\mu$ s Pulse. Complies to 21 CFR 1040.10 & EN60825-1:2001 except for deviations pursuant to laser notice No. 50, dated 7-26-01.  
**LASER LIGHT - DO NOT STARE INTO BEAM**  
**CLASS 2 LASER PRODUCT**



### ! CAUTION . . . Do Not Disassemble for Repair

Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure. **Do NOT attempt to disassemble this sensor for repair.** A defective unit must be returned to the manufacturer.

## Dimensions

