WORLD-BEAM® QS18E Series

Datasheet

- Easy-to-use Expert-style Static and Dynamic TEACH options, plus Window, Light, and Dark SET, via push button or remote input
- Smart power-control algorithm to maximize performance in low-contrast applications
- Easy push-button or remote sensor setup options:
  ◦ Dark-Operate/Light-Operate select
  ◦ Selectable 30 ms output OFF-delay
- Less than 1 millisecond output response for excellent sensing repeatability
- Tough ABS housing is rated IEC IP67; NEMA 6
- Bright LED operating status indicators are visible from 360°
- Discrete PNP or NPN output, depending on model
- Multiple connection options available (see Models)
- Compact housing, easy barrel-mount (some models) or side-mount installation

Model	Sensing Mode	Range	Output	Model	Sensing Mode	Range	Output
QS18EN6LP	660 nm Visible Red	3.5 m (12 ft) [1]	NPN	QS18EN6CV15	660 nm Visible Red	16 mm (0.65 in)	NPN
QS18EP6LP	**P** POLAR RETRO Polar Retro		PNP	QS18EP6CV15	CONVERGENT Convergent		PNP
QS18EN6D		800 mm (31.5 in)	NPN	QS18EN6CV45		43 mm (1.7 in)	NPN
QS18EP6D			PNP	QS18EP6CV45			PNP
QS18EN6DB	940 nm Infrared	500 mm (19.7 in)	NPN	QS18EN6FP	660 nm Visible Red	Varies by mode and fiber optics used	NPN
QS18EP6DB	DIFFUSE Diffuse		PNP	QS18EP6FP	PLASTIC FIBER Plastic Fiber		PNP
QS18EN6W		300 mm (11.8 in)	NPN	QS18EN6DV	660 nm Visible Red	600 mm (23.6 in)	NPN
QS18EP6W			PNP	QS18EP6DV	DIFFUSE Diffuse		PNP

Standard 2 m (6.5 ft) cable models are listed. To order the 9 m (30 ft) cable model, add suffix "W/30" to the cabled model number. For example, QS18EN6FP W/30. Models with a QD connector require a mating cable.

To order a model with a 4-pin QD 150 mm (6") Euro-style pigtail, add suffix "Q5" (e.g., QS18EN6FPQ5).
To order a model with a 4-pin 150 mm (6") Pico-style pigtail, add suffix "Q" (e.g., QS18EN6FPQ).
To order a model with a 4-pin Integral Euro-style QD, add suffix "Q8" (e.g., QS18EN6FPQ8).
To order a model with a 4-pin Integral Pico-style QD, add suffix "Q7" (e.g., QS18EN6FPQ7).

⚠️ 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.

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[1] Specified using BRT-84 reflector (sold separately)
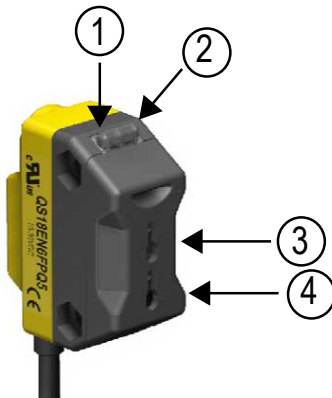
Overview of QS18E Expert Series Sensors

Figure 1. Sensor features

The QS18E Expert Sensors family of sensors provides high-performance sensing in a compact package. The sensors feature a discrete output (NPN or PNP, depending on model), two bright LEDs for easy status monitoring during configuration and operation, multiple configuration options, remote configuration, and security lockout options.

1. Amber output LED
2. Green power indicator LED
3. Receiver port
4. Emitter port
5. Configuration button

Indicators (Two LEDs: One Green, One Amber)		
Sensor Condition (Run Mode)	Green LED	Amber LED
Output OFF	ON	OFF
Output ON	ON	ON
Output ON, marginal signal	ON	Flashing
Output Short Circuit	Flashing	OFF

Sensor Configuration

Configure the sensor using any of five TEACH or Set options (by push button or the remote wire) to define the sensing limits. Use a Setup procedure to enable a 30 ms OFF-delay or to change the Light-/Dark-Operate setting (see *QS18Expert Sensor Setup*). Sensing limit configuration options include:

- Static TEACH: one switching threshold, determined by two taught conditions
- Dynamic (on-the-fly) TEACH: one switching threshold, determined by multiple sampled conditions
- Light Set and Dark Set: one switching threshold, offset from a single sensing condition (the "dark" condition or the "light" condition; see Figure)
- Window Set: a sensing window, centered around a single sensing condition

The sensor's output is disabled during all TEACH and Set procedures, and is enabled upon return to Run mode.

Following any TEACH or Set procedure other than Static TEACH, the Output ON condition (Light- or Dark-Operate setting) remains as it was last configured. To change that setting or the OFF-delay setting, see *QS18Expert Sensor Setup*.
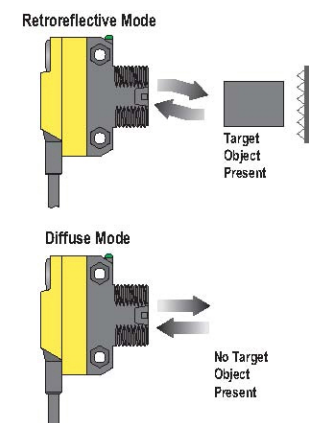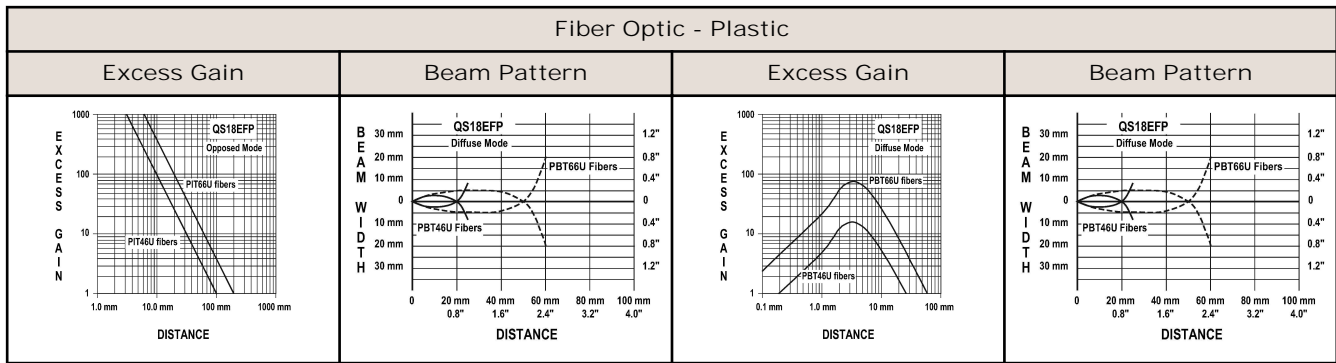

Figure 2. Dark Sensing Condition

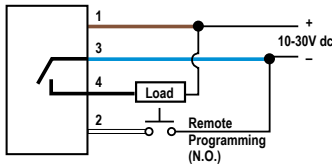| Fiber Optic - Plastic			
Excess Gain	Beam Pattern	Excess Gain	Beam Pattern

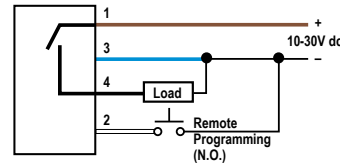Performance using Dark Set, performed in no-light condition.

Wiring Diagrams

Cabled wiring diagrams are shown. Quick disconnect (QD) wiring diagrams are functionally identical.

NPN (Sinking) Outputs

PNP (Sourcing) Outputs

Specifications

Supply Voltage
10 to 30 V dc (10% maximum ripple) at less than 35 mA, exclusive of load; 10 to 24 V dc at > 55° C

Supply Protection Circuitry
Protected against reverse polarity and transient voltages

Output Configuration
Current sourcing (PNP) or current sinking (NPN), depending on model; Light- or dark-operate selectable; Selectable 30 ms output OFF-delay
Rating: 100 mA max
Off-state leakage current: less than 50 µA @ 30 V dc (see Application Note 1)
ON-state saturation voltage: less than 1.5 V @ 100 mA (1.7V for 30 ft cable models)

Output Protection Circuitry
Protected against false pulse on power-up and continuous overload or short-circuit of output

Output Response
NOTE: Momentary delay on power-up; output does not conduct during this time
600 µs ON/OFF

Repeatability
75 µs

Construction
ABS housing, PMMA lens

Connections
PVC-jacketed 4-conductor 2 m (6.5 ft) or 9 m (30 ft) unterminated cable, or 4-pin Euro-style or 4-pin Pico-style quick-disconnect (QD), either integral or 150 mm (6 in) pigtail, are available. QD cordsets are ordered separately.

Operating Conditions
Temperature: −20 °C to 70 °C (−4 °F to 158 °F)
Relative Humidity: 90% @ 50 °C (non-condensing)
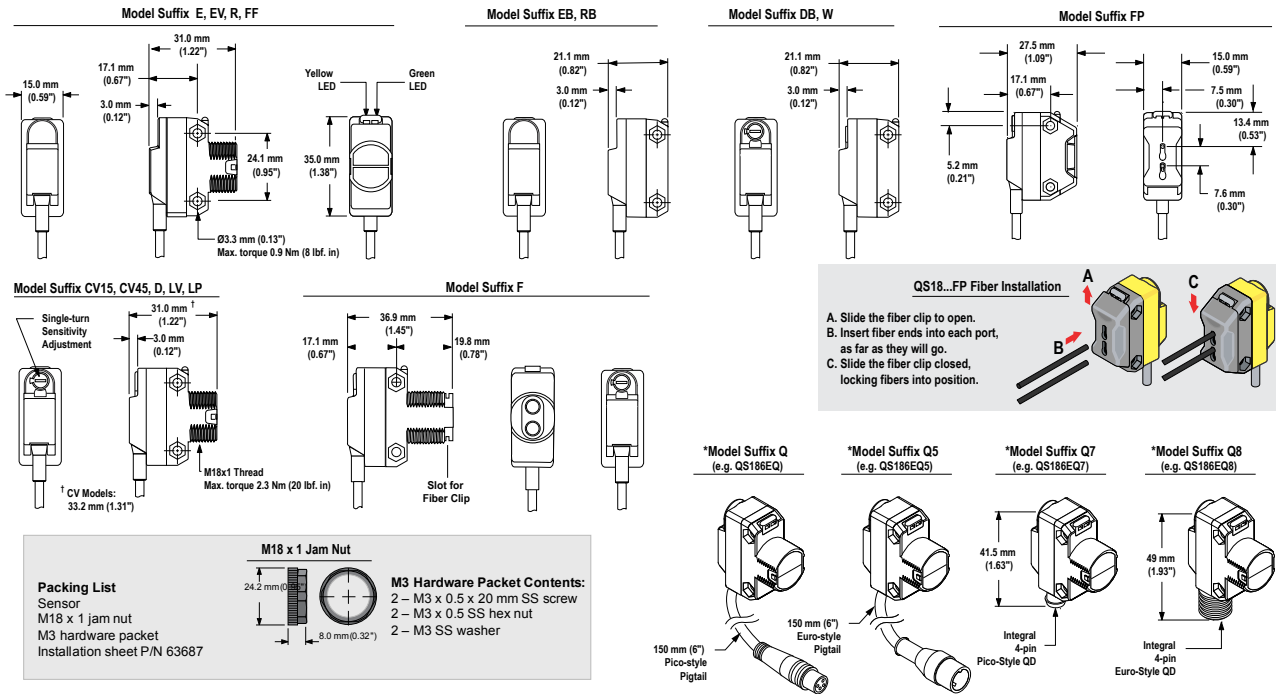
Application Notes
If the push button does not appear to be responsive, perform the push button enable procedure
To maintain backwards compatibility with earlier models, 3 remote line pulses or a push button hold followed by 3 push button clicks will perform a Dark SET.

Certifications

Dimensions

All measurements are listed in millimeters (inches).

Model Suffix E, EV, R, FF

31.0 mm (1.22")
17.1 mm (0.67")
3.0 mm (0.12")
15.0 mm (0.59")
Yellow LED
Green LED
24.1 mm (0.95")
35.0 mm (1.38")
Ø3.3 mm (0.13") Max. torque 0.9 Nm (8 lbf. in)

Model Suffix EB, RB

21.1 mm (0.82")
3.0 mm (0.12")

Model Suffix DB, W

21.1 mm (0.82")
3.0 mm (0.12")

Model Suffix FP

27.5 mm (1.09")
17.1 mm (0.67")
5.2 mm (0.21")
15.0 mm (0.59")
7.5 mm (0.30")
13.4 mm (0.53")
7.6 mm (0.30")

Model Suffix CV15, CV45, D, LV, LP

Single-turn Sensitivity Adjustment
31.0 mm (1.22")
3.0 mm (0.12")
M18x1 Thread Max. torque 2.3 Nm (20 lbf. in)
† CV Models: 33.2 mm (1.31")

Model Suffix F

17.1 mm (0.67")
36.9 mm (1.45")
19.8 mm (0.78")
Slot for Fiber Clip

M18 x 1 Jam Nut

24.2 mm (0.
8.0 mm (0.32")

Packing List
Sensor
M18 x 1 jam nut
M3 hardware packet
Installation sheet P/N 63687

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

QS18...FP Fiber Installation

A. Slide the fiber clip to open.
B. Insert fiber ends into each port, as far as they will go.
C. Slide the fiber clip closed, locking fibers into position.

*Model Suffix Q
(e.g. QS186EQ)
150 mm (6") Pico-style Pigtail

*Model Suffix Q5
(e.g. QS186EQ5)
150 mm (6") Euro-style Pigtail

*Model Suffix Q7
(e.g. QS186EQ7)
41.5 mm (1.63")
Integral 4-pin Pico-Style QD

*Model Suffix Q8
(e.g. QS186EQ8)
49 mm (1.93")
Integral 4-pin Euro-Style QD

Accessories

4-Pin Snap-on M8/Pico-Style Cordsets				
Model	Length	Style	Dimensions	Pinout
PKG4-2	2.00 m (6.56 ft)	Straight	32 Typ. / ø 9.0	4 2 / 3 1
PKW4Z-2	2.00 m (6.56 ft)	Right-Angle	29 Typ. / 15 Typ. / ø 10.9	1 = Brown 2 = White 3 = Blue 4 = Black