WORLD BEAM® QS18U Series Ultrasonic Sensors

*Miniature Ultrasonic Sensors with TEACH-Mode Programming*

Features

- Fast, easy-to-use TEACH-Mode programming; no potentiometer adjustments
- Ultra-compact housing
- One discrete output: NPN or PNP, depending on model
- Two bi-colored status LEDs
- Rugged encapsulated version for harsh environments
- Choose 2 meter or 9 meter unterminated cable, 4-pin Euro-style or 4-pin Pico-style QD connectors (either integral or with 150 mm pigtail)
- Wide operating range of -20° to +60° C (-13° to +140° F)
- Temperature compensation
- Configurable for normally open or normally closed operation
- Fast response time (15 milliseconds)

Ultrasonic
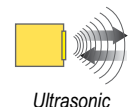
Models

Model	Sensing Range	TEACH Options	Cable*	Supply Voltage	Output
QS18UNA	50 mm to 500 mm (2" to 20")	Integral push button or remote TEACH (IP67, NEMA 6P)	4-wire, 2 m (6.5') cable with shield	12-30V dc	NPN
QS18UPA					PNP
QS18UNAE		Remote TEACH (epoxy-encapsulated, IP68, NEMA 6P)			NPN
QS18UPAE					PNP

*Only standard 2 m (6.5') cable models are listed. For 9 m (30') shielded cable, add suffix "**W/30**" to the model number (e.g., **QS18UNA W/30**).

QD models:
- For 4-pin integral Euro-style QD, add suffix "**Q8**" (e.g., **QS18UNAQ8**).
- For 4-pin integral Pico-style QD, add suffix "**Q7**" (e.g., **QS18UNAQ7**). A model with a QD connector requires a mating cable (see page 10).
- For 4-pin Euro-style 150 mm (6") pigtail QD, add suffix "**Q5**" (e.g., **QS18UNAQ5**).
- For 4-pin Pico-style 150 mm (6") pigtail QD, add suffix "**Q**" (e.g., **QS18UNAQ**).

⚠ **WARNING . . . Not To Be Used for Personnel Protection**

Never use these products as sensing devices for personnel protection. Doing so could lead to serious injury or death.

These sensors do NOT include the self-checking redundant circuitry necessary to allow their use in personnel safety applications. A sensor failure or malfunction can cause either an energized or de-energized sensor output condition. Consult your current Banner Safety Products catalog for safety products which meet OSHA, ANSI and IEC standards for personnel protection.

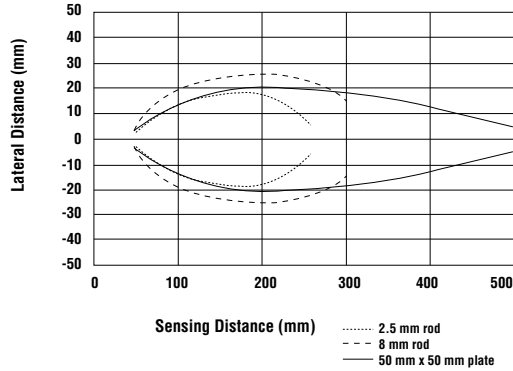# WORLD BEAM® QS18U Series Ultrasonic Sensors

Specifications	
Sensing Range	50 to 500 mm (2" to 20")
Supply Voltage	12 to 30V dc (10% maximum ripple); 25 mA max. (exclusive of load)
Ultrasonic Frequency	300 kHz, rep. rate 7.5 ms
Supply Protection Circuitry	Protected against reverse polarity and transient voltages
Output Configuration	SPST solid-state switch conducts when target is sensed within sensing window; one NPN (current sinking) or one PNP (current sourcing), depending on model.
Output Protection	Protected against short circuit conditions
Output Ratings	100 mA maximum **OFF-state leakage current:** < 10 microamps (sourcing); < 200 microamp (sinking) **NPN saturation:** < 1.6V @ 100 mA **PNP saturation:** < 2.0V @ 100 mA
Output Response Time	15 milliseconds
Delay at Power-Up	300 milliseconds
Temperature Effect	**Non-encapsulated models:** ± 0.05% per °C from -20° to +50° C, ± 0.1% per °C from +50° to +60° C **Encapsulated models:** ± 0.05% per °C from 0° to +60° C, ± 0.1% per °C from -20° to 0° C
Repeatability	0.7 mm
Minimum Window Size	5 mm
Hysteresis	1.4 mm
Adjustments	**Sensing window limits:** TEACH-Mode programming of near and far window limits may be set using the push button or remotely via TEACH input (see page 3).

Indicators	**Range Indicator (Red/Green)** **Green** — Target is within sensing range **Red** — Target is outside sensing range **OFF** — Sensing power is OFF	**Teach/Output Indicator (Yellow/Red)** **Yellow** — Target is within taught limits **OFF** — Target is outside taught window limits **Red** — Sensor is in TEACH mode
Construction	**Housing:** ABS **Push Button:** TPE	**Push Button Housing:** ABS **Lightpipes:** Polycarbonate

Operating Conditions	**Temperature:** -20° to +60° C (-4° to +140° F) **Maximum relative humidity:** 100%, non-condensing
Connections	2 m (6.5') or 9 m (30') 4-conductor PVC jacketed attached cable or 4-pin Euro-style integral QD (**Q8**), or 4-pin Pico-style integral QD (**Q7**), or 4-pin Euro-style 150 mm (6") pigtail QD (**Q5**), or 4-pin Pico-style 150 mm (6") pigtail QD (**Q**)
Environmental Rating	Leakproof design, rated NEMA 6P; IEC IP67 or IP68, depending on model (see page 1)
Vibration and Mechanical Shock	All models meet Mil. Std. 202F requirements method 201A (vibration: 10 to 60 Hz max., double amplitude 0.06", maximum acceleration 10G). Also meets IEC 947-5-2 requirements: 30G 11 ms duration, half sine wave.
Temperature Warmup Drift	See Temperature Compensation, page 2
Application Notes	Objects passing inside the specified near limit may produce a false response.
Certifications	Approvals are pending

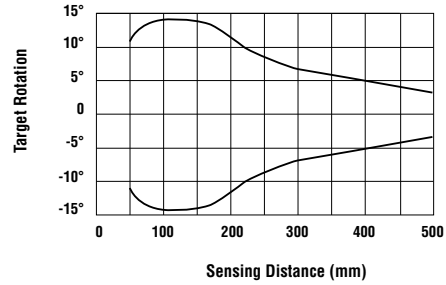# WORLD BEAM® QS18U Series Ultrasonic Sensors

Sensor Response Curves
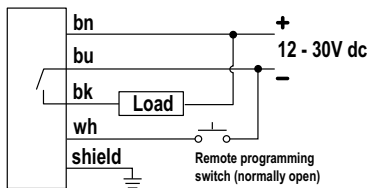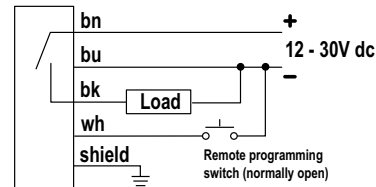
QS18U Effective Beam Pattern (Typical)

Lateral Distance (mm) vs Sensing Distance (mm)

.... 2.5 mm rod
– – – 8 mm rod
——— 50 mm x 50 mm plate

QS18U Maximum Target Rotation Angle

Target Rotation vs Sensing Distance (mm)

Hookups

NPN (Sinking) Output Models

bn
bu
bk — Load
wh
shield

+
12 - 30V dc
−

Remote programming switch (normally open)

PNP (Sourcing) Output Models

bn
bu
bk — Load
wh
shield

+
12 - 30V dc
−

Remote programming switch (normally open)

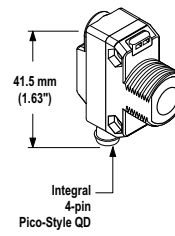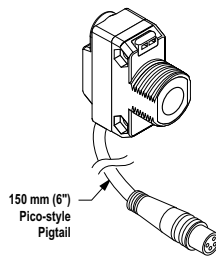**Cable and QD hookups are functionally identical.**

It is recommended that the shield wire be connected to earth ground. Shielded cordsets are recommended for all QD models.
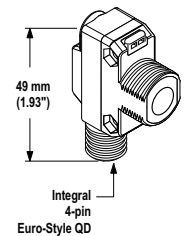
Dimensions

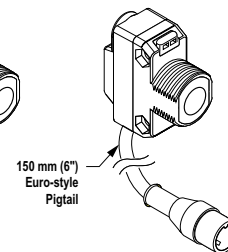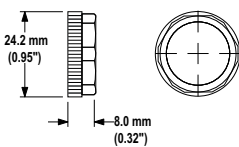### Cabled Models

15.0 mm (0.59")
17.1 mm (0.67")
33.5 mm (1.32")
3 mm (0.12")
24.1 mm (0.95")
35.0 mm (1.38")
M18 x 1 Thread (max. torque 32 in-lbs)
ø 3.3 mm (0.13") (max. torque 8 in-lbs)

Pico-Style QD Models

41.5 mm (1.63")
150 mm (6") Pico-style Pigtail
Integral 4-pin Pico-Style QD

Euro-Style QD Models

49 mm (1.93")
150 mm (6") Euro-style Pigtail
Integral 4-pin Euro-Style QD
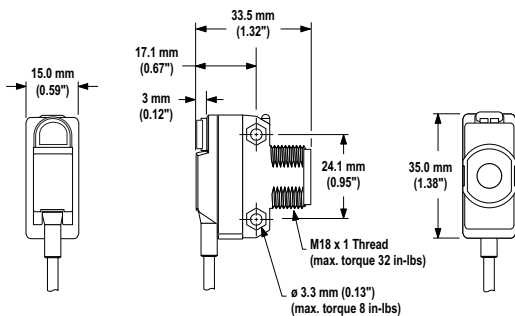
Locknut (Included with All Models)

24.2 mm (0.95")
8.0 mm (0.32")

Washer (Included with All Models)

Ø 23.9 mm (0.94")
Ø 17.8 mm (0.70")
1.6 mm (0.06")
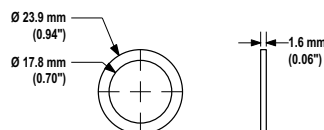
M3 Hardware Packet Contents:

2 – M3 x 0.5 x 20 mm SS Screw
2 – M3 x 0.5 SS Hex Nut
2 – M3 SS Washer