T18U Series Sensor

Features



- Dual range/dual resolution opposed mode ultrasonic sensors; ideal for reliable sensing of clear objects or materials
- Rugged design for use in demanding environments: rated IEC IP67, wide-operating temperature range of –40 °C to +70 °C (–40 °F to +158 °F)
- Alignment indicator flashes at a rate proportional to the received signal strength
- Highly immune to ambient sonic and electrical noise
- Popular T-style right-angle sensor package with 18 mm threaded mounting hub; cabled or quick disconnect models
- 12 to 30 V DC operation; choose receivers with either NPN (sinking) or PNP (sourcing) output; outputs are short-circuit protected

WARNING:

- **Do not use this device for personnel protection**
- Using this device for personnel protection could result in serious injury or death.
- This device does not include the self-checking redundant circuitry necessary to allow its use in personnel safety applications. A device failure or malfunction can cause either an energized (on) or de-energized (off) output condition.

Models

Model	Range [1]	Output	Response Time	Connection
T186UE	-	-	-	2 m (6.5 ft) cable
T186UE W/30				9 m (30 ft) cable
T186UEQ				4-pin M12 male quick disconnect (QD)
T18VN6UR	Normal Resolution: 600 mm (24 in) High Resolution: 300 mm (12 in)	NPN (sinking)	Normal Resolution: 2 ms High Resolution: 1 ms	2 m (6.5 ft) cable
T18VN6URQ				4-pin M12 male QD
T18VP6UR		PNP (sourcing)		2 m (6.5 ft) cable
T18VP6UR W/30				9 m (30 ft) cable
T18VP6URQ				4-pin M12 male QD

Models with a QD connector require a mating cable.

The following models are no longer available for order but are still covered by the information in this document.

- T18VN6UR W/30

Overview

T30U Series Sensor is an opposed-mode ultrasonic emitter/receiver pair. It uses an advanced built-in microprocessor to analyze the received ultrasonic signal and control an indicator LED located on the back of the receiver. The receiver LED flashes at a rate proportional to the received sonic signal strength. This indicator greatly simplifies sensor alignment and alerts personnel to marginal sensing conditions because of gradual misalignment or environmental factors. The receiver is precisely tuned to the ultrasonic emitter, making this sensor pair highly immune to both sonic and electrical ambient noise.

T30 receivers may be wired for either of two resolution modes: NORMAL or HIGH. The modes are selected by the polarity of the supply voltage.

- The NORMAL resolution mode offers a sensing range of 600 mm (24 in) and maximizes sensing energy, as is required in demanding environments.
- The HIGH resolution mode yields a sensing range of up to 300 mm (12 in) and maximizes sensing response, as is needed in high-speed counting applications.

Opposed-mode ultrasonics are very useful for highly reliable sensing of clear materials, which is always a challenge for photoelectric modes. T18U Series ultrasonic sensors are designed for demanding sensing environments. Housings are PBT, and electronics are epoxy encapsulated. The acoustic face of both emitter and receiver are epoxy-reinforced for extreme durability and moisture resistance.

[1] T18U receivers may be wired for either of two resolution modes: Normal or High.

Original Instructions
26-Jun-26

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40124
p/n: 40124 Rev D

ПРОМЭЛЕКТРОНИКА/ sales@prom-elec.com

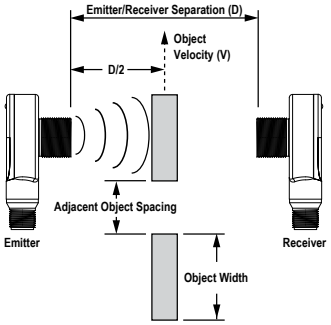
Installation Instructions

Objection Detection

These figures reflect the following assumptions:

- Objects have square (not radiused) corners,
- Sensors are optimally aligned,
- Objects pass through the sensing area midway between the emitter and receiver (i.e. at D/2)[(2)],
- Operating conditions are stable, with minimal air turbulence.

Individual results may differ based on ambient operating conditions, alignment, and the geometry of the objects to be detected.

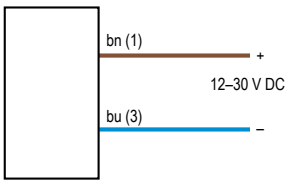


Minimum Object Width (Typical)				
Resolution Mode	**Emitter/Receiver Separation (D)**	**Velocity = 0 mm/sec (0 in/sec)**	**Velocity = 1270 mm/sec (50 in/sec)**	**Velocity = 2540 mm/sec (100 in/sec)**
Normal	150 mm (6 in)	25.4 mm (1 in)	35.6 mm (1.40 in)	38.1 mm (1.5 in)
	300 mm (12 in)	31.8 mm (1.25 in)	50.8 mm (2 in)	50.8 mm (2 in)
	600 mm (24 in)	25.4 mm (1 in)	44.5 mm (1.75 in)	44.5 mm (1.75 in)
High	150 mm (6 in)	15.2 mm (0.60 in)	19.1 mm (0.75 in)	20.3 mm (0.80 in)
	300 mm (12 in)	12.7 mm (0.50 in)	19.1 mm (0.75 in)	25.4 mm (1 in)

Minimum Adjacent Object Spacing (Typical)				
Resolution Mode	**Emitter/Receiver Separation (D)**	**Velocity = 0 mm/sec (0 in/sec)**	**Velocity = 1270 mm/sec (50 in/sec)**	**Velocity = 2540 mm/sec (100 in/sec)**
Normal	150 mm (6 in)	0.8 mm (0.03 in)	1 mm (0.04 in)	1.3 mm (0.05 in)
	300 mm (12 in)	2.5 mm (0.1 in)	3.8 mm (0.15 in)	5.1 mm (0.2 in)
	600 mm (24 in)	8.9 mm (0.35 in)	10.2 mm (0.4 in)	12.7 mm (0.5 in)
High	150 mm (6 in)	3.3 mm (0.13 in)	3.8 mm (0.15 in)	4.3 mm (0.17 in)
	300 mm (12 in)	10.2 mm (0.4 in)	11.4 mm (0.45 in)	11.4 mm (0.45 in)

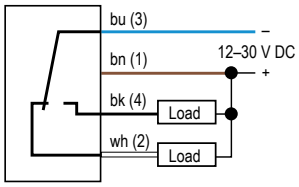
Wiring

Emitter

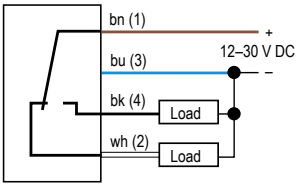


1. Brown
2. White
3. Blue
4. Black

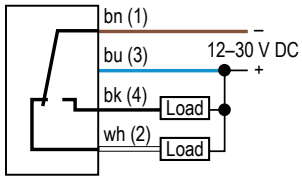
NPN (normal resolution)



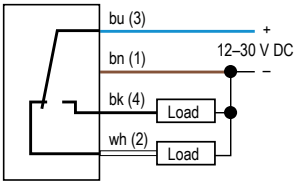
PNP (normal resolution)



NPN (high resolution)



PNP (high resolution)



(2) In general, the minimum object width and minimum object spacing will decrease if the object (or space) to be detected is passed closer to the emitter or the receiver.

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Specifications

Supply Voltage

12 to 30 V DC (10% maximum ripple)

Supply Current

Emitters: 50 mA

Receivers: 35 mA, exclusive of output load

Output Protection Circuitry

Protected against overload and short circuit conditions. No false pulse upon receiver power-up.

Delay at Power-up

100 milliseconds

Beam Angle (-3dB full angle)

15 ± 2°

Sensing Range

Normal Resolution: 600 mm (24 in)

High Resolution: 300 mm (12 in)

Ultrasonic Frequency

230 kHz

Minimum Spacing (adjacent pairs)

50 mm for emitter-to-receiver separations of up to 150 mm

Add 10 mm of adjacent pair spacing for every 100 mm of emitter-to-receiver spacing beyond 150 mm

Receiver Output Configuration

NPN (sinking) or PNP (sourcing), depending on model; Normally Open (NO) and Normally Closed (NC) (complementary)

Output Rating

150 mA max. (each output) at 25°C, derated to 100 mA at 70°C (derate ≈ 1 mA per °C). Both outputs may be used simultaneously.

ON-state saturation voltage: < 1.5 V at 10 mA; < 2.0 V at 150 mA

OFF-state leakage current: < 1 microamp at 30 V DC

Rep Rate

Normal Resolution Mode: 125 Hz maximum

High Resolution Mode: 200 Hz maximum

Indicators

Emitters have a green LED for Power ON

Receivers have one green Power LED and one amber Signal LED

Green Power LED: ON indicates power on; Flashing indicates output overload

Amber Signal LED: sonic signal received (flash rate is proportional to received signal strength; flash is from full to half intensity)

Output Response Time

Normal Resolution Mode: 2 milliseconds ON and OFF

High Resolution Mode: 1 millisecond ON and OFF

Mechanical Sensing Repeatability at 300 mm (12 in)

Range

Normal Resolution Mode: < 2 mm (< 0.08 in)

High Resolution Mode: < 1 mm (< 0.04 in)

Construction

Patented T-style yellow PBT housing with black PBT back cover. Transducer housing is threaded M18 x 1. Mating jam nut is supplied for mounting. Acoustic face is epoxy reinforced. Circuitry is epoxy encapsulated.

Connections

Emitter: 2 m (6.5 ft) attached PVC-covered 2-wire cable or 4-pin M12 quick disconnect fitting

Receiver: 2 m (6.5 ft) attached PVC-covered 4-wire cable or 4-pin M12 quick disconnect fitting

9 m (30 ft) cables available by request.

A model with a QD connector requires a mating cable

Environmental Rating

IP67

Operating Conditions

–40 °C to +70 °C (–40 °F to +158 °F)

Vibration and Mechanical Shock

All models meet MIL-STD-202F, Method 201A (Vibration: 10 Hz to 60 Hz maximum, 0.06 inch (1.52 mm) double amplitude, 10G maximum acceleration) requirements. Also meets IEC 60947-5-2 (Shock: 30G 11 ms duration, half sine wave) requirements.

Method 213B conditions H&I.

Shock: 75G with device operating; 100G for non-operation

Certifications

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.

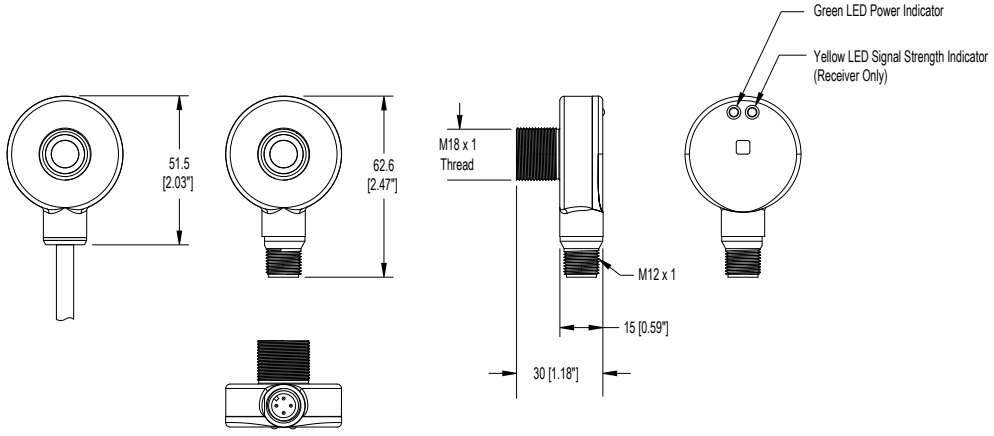
Supply wiring leads < 24 AWG shall not be spliced.

For additional product support, go to www.bannerengineering.com.

Supply Wiring (AWG)	Required Overcurrent Protection (A)	Supply Wiring (AWG)	Required Overcurrent Protection (A)
20	5.0	26	1.0
22	3.0	28	0.8
24	2.0	30	0.5

Dimensions

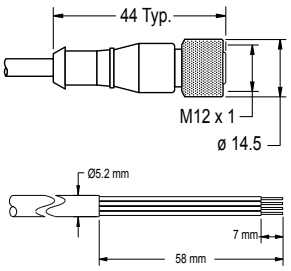
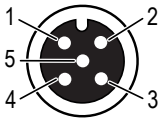
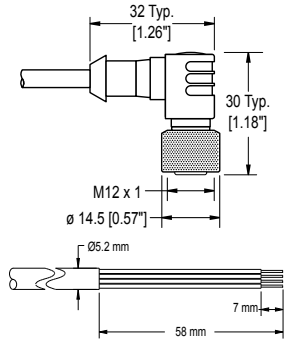
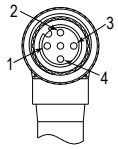
All measurements are listed in millimeters [inches], unless noted otherwise. The measurements provided are subject to change.



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Accessories

Cordsets

4-Pin Single-Ended M12 Female Cordsets					
Model	**Length**	**Style**	**Dimensions**	**Pinout (Female)**	
MQDC-406	2 m (6.56 ft)	Straight			1 = Brown 2 = White 3 = Blue 4 = Black 5 = Not used c UL us
MQDC-415	5 m (16.4 ft)				
MQDC-430	9 m (29.5 ft)				
MQDC-450	15 m (49.2 ft)				
MQDC-406RA	2 m (6.56 ft)	Right-Angle			
MQDC-415RA	5 m (16.4 ft)				
MQDC-430RA	9 m (29.5 ft)				
MQDC-450RA	15 m (49.2 ft)				

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