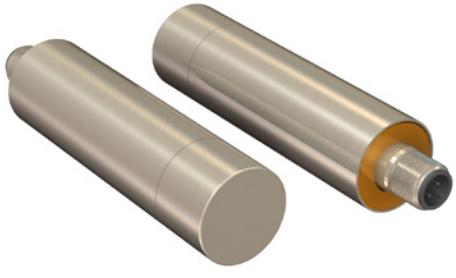
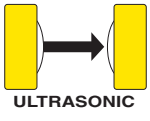
U-GAGE® M25U Series Sensor

Ultrasonic Opposed Mode Sensor Pairs



Features

- Smooth, hygienic design for easy cleaning in food processing and other washdown applications; rated IP69K, IEC IP67 (NEMA 6)
- Rugged stainless steel for use in demanding environments
- Dual range/dual speed opposed mode ultrasonic sensors; ideal for sensing clear objects or materials
- Highly immune to ambient sonic and electrical noise
- Optional IP68 rated washdown cordset
- 10 to 30V dc operating voltage



Models

Model	Range*	Supply Voltage	Output	Response Time
M25UEQ8	Normal Speed: 500 mm (19.7") High Speed: 250 mm (9.8") 140KHz	10 to 30V dc	—	—
M25URBQ8			Bipolar (1 NPN & 1 PNP)	Normal Speed: 4.0 milliseconds High Speed: 3.0 milliseconds

* M25U receivers may be wired for either of two speeds: Normal or High (see hookup diagrams, page 3). The Normal Speed mode offers a sensing range of 500 mm (19.7"). The Normal Speed mode maximizes sensing energy, as is required in demanding environments. The High Speed mode offers a sensing range of 250 mm (9.8"). The High Speed mode maximizes sensing response, as is needed in high-speed counting applications.

⚠ 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.

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Object Detection

Minimum Object Width (Typical)				
Speed	Emitter/Receiver Separation (D)	Velocity = 0 mm/sec (0 in/sec)	Velocity = 1.27 m/sec (50 in/sec)	Velocity = 2.5 m/sec (100 in/sec)
Normal	125 mm (4.9")	23 mm (0.90")	28 mm (1.10")	33 mm (1.30")
	250 mm (9.8")	26 mm (1.00")	31 mm (1.22")	36 mm (1.42")
	500 mm (19.7")	38 mm (1.50")	43 mm (1.69")	48 mm (1.89")
High	125 mm (4.9")	18 mm (0.71")	22 mm (0.87")	26 mm (1.00")
	250 mm (9.8")	20 mm (0.79")	24 mm (0.94")	28 mm (1.10")

Minimum Adjacent Object Spacing (Typical)				
Speed	Emitter/Receiver Separation (D)	Velocity = 0 cm/sec (0 in/sec)	Velocity = 1.27 m/sec (50 in/sec)	Velocity = 2.5 m/sec (100 in/sec)
Normal	125 mm (4.9")	0.5 mm (0.02")	1.0 mm (0.04")	1.5 mm (0.06")
	250 mm (9.8")	1.5 mm (0.06")	2.0 mm (0.08")	2.5 mm (0.10")
	500 mm (19.7")	4.0 mm (0.16")	4.5 mm (0.18")	5.0 mm (0.20")
High	125 mm (4.9")	1.0 mm (0.04")	1.5 mm (0.06")	3.0 mm (0.12")
	250 mm (9.8")	3.0 mm (0.12")	4.0 mm (0.16")	5.0 mm (0.20")

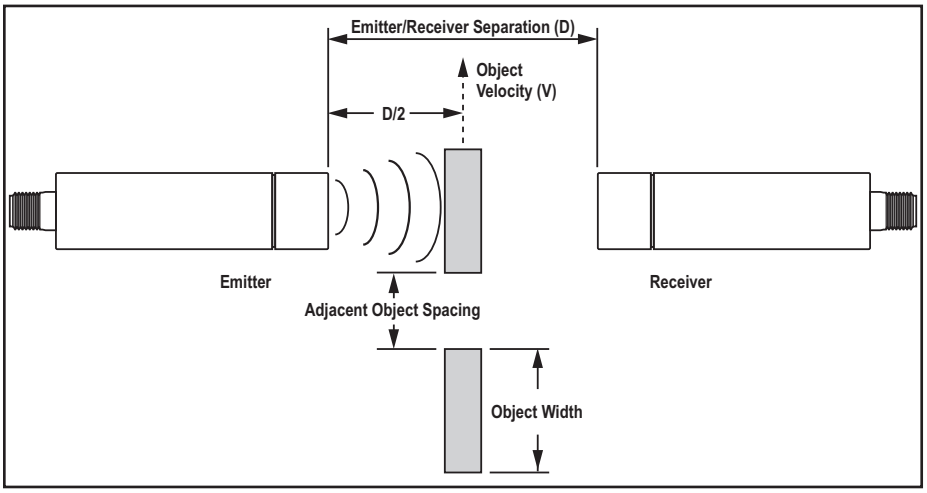


Figure 1. Object width and spacing

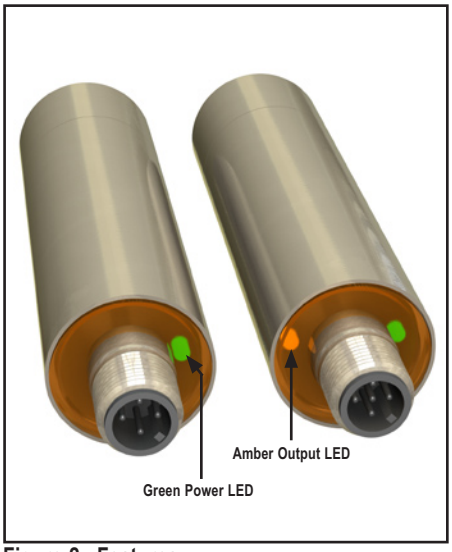
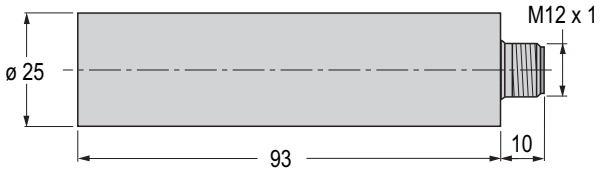


Figure 2. Features

Dimensions



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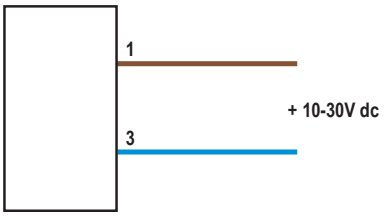
Specifications

Sensing Range	**Normal Speed:** 500 mm (19.7") **High Speed:** 250 mm (9.8") 140KHz
Supply Voltage and Current	Emitter: 10 to 30V dc (10% max. ripple) at less than 85 mA Receiver: 10 to 30V dc (10% max. ripple) at less than 38 mA (exclusive of load)
Supply Protection Circuitry	Protected against reverse polarity and transient voltages
Receiver Output Configuration	Bipolar (1 NPN & 1 PNP) solid-state output; Normally Closed (output is activated when an object blocks the sensing beam)
Output Rating	100 mA (each output) with short circuit protection; see Note 1 **OFF-state leakage current:** **NPN:** < 200 µA sinking **PNP:** < 10 µA sourcing **ON-state saturation voltage:** **NPN:** < 1.6V @ 100 mA **PNP:** < 3.0V @ 100 mA
Output Protection Circuitry	Protected against short circuit conditions
Output Response Time	**Normal Speed:** 4.0 milliseconds **High Speed:** 3.0 milliseconds
Repeatability	1 millisecond
Delay at Power-up	< 250 milliseconds
Delay for Switching Between Normal and High Speed	20 milliseconds
Indicators	**Green Power LED:** indicates Power ON **Amber Output LED:** indicates output activated
Construction	**Housing:** 316 Stainless Steel **LED window:** Polysulphone
Connections	**Emitter:** 4-pin Euro-Style QD **Receiver:** 5-pin Euro-Style QD
Environmental Rating	Leakproof design, rated IEC IP67 (NEMA 6), IP69K
Operating Conditions	**Temperature:** -20° to +70°C (-4° to +158° F) **Max. Relative Humidity:** 95% at 50°C non-condensing
Vibration and Mechanical Shock	All models meet Mil. Std. 202F requirements method 201A (vibration: 10 to 60 Hz max. amplitude 0.06", max. acceleration 10G). Also meets IEC 947-5-2; 30G 11 ms duration.
Certifications	CE
Notes	1. NPN < 200 µA for load impedance > 3 KΩ; for load current of 100 mA, leakage < 1% of load current 2. When mounting the M25U, care should be taken to acoustically isolate the emitter and receiver to eliminate sound energy coupling between the sensor pair. This is best accomplished with elastomeric materials between the sensor and rigid mounting brackets.

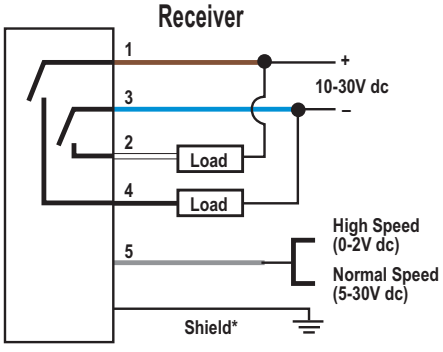
Hookups

Emitter



Key
1 = Brown
2 = White
3 = Blue
4 = Black
5 = Gray

Receiver

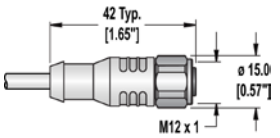
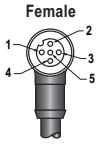


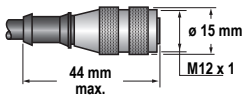
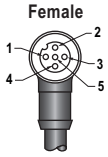
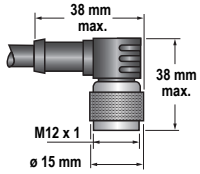
* It is recommended that the shield wire be connected to either earth ground or DC common.

U-GAGE® M25U Series Sensor

Accessories

Quick-Disconnect Cables

Washdown Models					
Style	**Model**	**Length**	**Description**	**Dimensions**	**Pinout**
5-Pin Euro-style Straight with shield	**MQDCWD-506** **MQDCWD-530**	2 m (6.5') 9 m (30')	**Cable:** polypropylene jacket and connector body, stainless steel coupling nut **Conductors:** 22 AWG gold-plated brass contacts **Voltage Rating:** 250V ac **Temperature:** -40° to +105° C **Environmental Rating:** IP68		 1 = Brown 2 = White 3 = Blue 4 = Black 5 = Gray

Standard Models					
Style	**Model**	**Length**	**Description**	**Dimensions**	**Pinout**
5-Pin Euro-style Straight with shield	**MQDEC2-506** **MQDEC2-515** **MQDEC2-530**	2 m (6.5') 5 m (15') 9 m (30')	**Cable:** PVC jacket, PUR (polyurethane) connector body, nickel-plated brass coupling nut **Conductors:** 22 or 20 AWG high-flex stranded, gold plated contacts **Voltage Rating:** 250V ac/300V dc **Temperature:** -40° to +90° C **Environmental Rating:** IP67		 1 = Brown 2 = White 3 = Blue 4 = Black 5 = Gray
5-Pin Euro-style Right-Angle with shield	**MQDEC2-506RA** **MQDEC2-515RA** **MQDEC2-530RA**	2 m (6.5') 5 m (15') 9 m (30')			

Mounting Brackets

	• Top mount • Swivel bracket with 25 mm mounting hole for sensor • Stainless steel with rounded edges for cleanliness in demanding environments • Non-metallic FDA compliant bushing for acoustically isolating M25U sensors • M10 x 1.5 mount on opposite side of clamping nuts	**SMBM25A**
	• Bottom mount • Swivel bracket with 25 mm mounting hole for sensor • Stainless steel with rounded edges for cleanliness in demanding environments • Non-metallic FDA compliant bushing for acoustically isolating M25U sensors • M10 x 1.5 mount on same side as clamping nuts	**SMBM25B**

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