Chemically resistant models

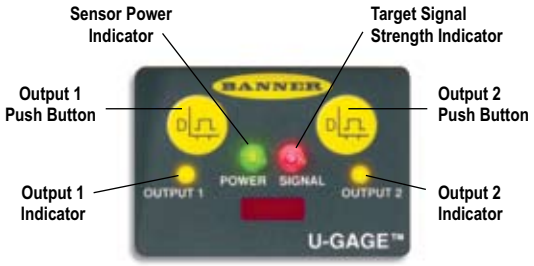
U-GAGE® QT50U
Long-Range Ultrasonic Sensor

- Senses extended range of up to 8 m
- Features ultrasonic dead-zone of only 2.5% of the total range—75% less than comparable products
- Available in analog or discrete dc models and in ac/dc universal voltage models with electromechanical relay output
- Offers retrosonic sensing mode
- Features a completely sealed, shock-resistant housing that is ideal for monitoring levels of liquids as well as solids
- Uses a narrow sensing beam to detect targets at long range within confined areas—such as a storage tank—without interference from the tank walls
- Available in a chemically resistant model with a Teflon® coating to protect the transducer
- Features push-button programing for easy setup
- Provides continuous monitoring (analog model)
- Offers dual-discrete option for setting independent near and far limits for both outputs, for applications requiring high and low-limit sensing
- Compensates for temperature for greatest sensing accuracy

Photoelectrics Sensors
Fiber Optic Sensors
Special Purpose Sensors
Measurement & Inspection Sensors
Vision
Wireless
Lighting & Indicators
Safety Light Screens
Safety Laser Scanners
Fiber Optic Safety Systems
Safety Controllers & Modules
Safety Two-Hand Control Modules
Safety Interlock Switches
Emergency Stop & Stop Control

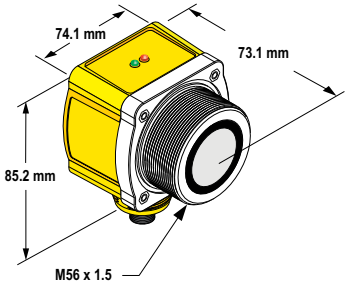
ACCESSORIES page 312

LIGHT GAUGING
ULTRASONIC
QT50U
S18U
QS18U
T30U/T30UX
M25U
T18U
Q45U
Q45UR
MEASURING ARRAYS
RADAR



DC and Universal Voltage Models

ONLINE
AUTOCAD, STEP, IGES & PDF



Teflon®-protected Models (Suffix -CRFV)

Teflon® is a registered trademark of Dupont™.

U-GAGE® QT50U, 10-30V dc

Range	Connection	Output	Models*
200 mm - 8 m	2 m	Selectable: 0 to 10V dc or 4 to 20 mA	**QT50ULB**
	5-pin Mini QD		**QT50ULBQ**
	5-pin Euro QD		**QT50ULBQ6**
200 mm - 8 m	2 m	Selectable Dual NPN or PNP	**QT50UDB**
	5-pin Mini QD		**QT50UDBQ**
	5-pin Euro QD		**QT50UDBQ6**

U-GAGE® QT50U Universal Voltage, 85-264V ac/24-250V dc

Range	Connection	Output Operation Mode	Output	Models*
200 mm - 8 m	2 m	Window-limit (complementary outputs)	SPDT e/m relay	**QT50UVR3W**
	5-pin Micro QD			**QT50UVR3WQ1**
	5-pin Mini QD			**QT50UVR3WQ**
200 mm - 8 m	2 m	Pump/level control (pump-in and pump-out logic)	SPDT e/m relay	**QT50UVR3F**
	5-pin Micro QD			**QT50UVR3FQ1**
	5-pin Mini QD			**QT50UVR3FQ**

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Connection options: A model with a QD requires a mating cordset (see page 312).

For 9 m cable, add suffix **W/30** to the 2 m model number (example, **QT50ULB W/30**).

* For sensors with Teflon®-protected face and transducer, add suffix **-CRFV** to the model number (example, **QT50ULB-CRFV**).
Teflon® is a registered trademark of Dupont™.

U-GAGE® QT50U DC Specifications

Effective Beam	See Charts EBPC-1, EBPC-2 and EBPC-3 on page 313.
Supply Voltage and Current	**Analog models:** 10 - 30V dc (10% max. ripple); 100 mA max @ 10V, 40 mA max. @ 30V (exclusive of load) **Dual-discrete models:** 10 to 30V dc (10% max. ripple); 100 mA max. @ 10V, 40 mA @ 30V (exclusive of load)
Ultrasonic Frequency	75 kHz burst, rep. rate 96 milliseconds
Supply Protection Circuitry	Protected against reverse polarity and transient overvoltages
Output Protection	Protected against short circuit conditions
Delay at Power-up	1.5 seconds
Output Configuration	**Analog models: Voltage sourcing:** 0 to 10V dc **Current sourcing:** 4 to 20 mA **Dual-discrete models:** Dual PNP or NPN, selectable using DIP switch
Output Ratings	**Analog Voltage Output:** 0 to 10V dc **Minimum load resistance** = 500 Ω **Minimum required supply voltage for full 0-10V output span** = $(\frac{1000}{RLOAD} + 13)$V dc **Analog Current Output:** 4 to 20 mA **Maximum load resistance** = 1 kΩ or $(\frac{V\ supply - 5}{0.02})$ Ω, whichever is lower **Minimum required supply voltage for full 4-20 mA output span** = 10V dc or [(RLoad x 0.02)+5]V dc, whichever is greater. 4-20 mA output calibrated at 25° C with 250 Ω load. **Discrete Output:** 150 mA max. **OFF-State leakage current:** less than 5 µA **Output saturation: NPN:** less than 200 mV @ 10 mA; less than 650 mV @ 150 mA **PNP:** less than 1.2V @ 10 mA; less than 1.65V @ 150 mA
Temperature Effect	**Uncompensated:** 0.2% of distance/° C **Compensated:** 0.02% of distance/° C

More on next page

U-GAGE® QT50U DC Specifications (cont'd)

Linearity (Analog Models)	+/- 0.2% of span from 200 to 8000 mm; +/- 0.1% of span from 500 to 8000 mm (1 mm minimum)
Resolution/Repeatability	1.0 mm
Hysteresis	5 mm
Output Response Time	**Analog models:** 100 to 2300 milliseconds **Dual-discrete models:** 100 to 1600 milliseconds
Minimum Window Size	20 mm
Adjustments	**Sensing window limits:** TEACH-Mode programming of near and far window limits may be set using the push buttons or remotely using TEACH input.
Indicators	**Green Power ON LED:** Indicates power is ON **Red Signal LED:** Indicates target is within sensing range, and the condition of the received signal. **TEACH/Output indicator (bicolor Yellow/Red):** **Yellow**–Target is within taught limits **Yellow OFF (Discrete)**–Target is outside taught window limits **Red**–Sensor is in TEACH mode **Yellow Flashing (Analog)**–Target is outside taught window limits
Remote TEACH	See data sheet
Construction	**Transducer:** Ceramic/Epoxy composite **Housing:** ABS/Polycarbonate **Membrane Switch:** Polyester **Lightpipes:** Acrylic
Environmental Rating	Leakproof design is rated IEC IP67; NEMA 6P
Connections	2 m or 9 m shielded 5-conductor (with drain) PVC jacketed attached cable, or 5-pin Euro-style quick-disconnect or 5-pin Mini-style quick-disconnect. QD cordsets are ordered separately. See page 312.
Operating Conditions	**Temperature:** -20° to +70° C **Relative humidity:** 100%
Vibration and Mechanical Shock	All models meet Mil Std. 202F requirements. Method 201A (vibration: 10 to 60Hz max., double amplitude 0.06", maximum acceleration 10G). Also meets IEC 947-5-2 requirements: 30G 11 milliseconds duration, half sine wave
Temperature Warmup Drift	Less than 0.8% of sensing distance upon power-up with Temperature Compensation enabled
Application Notes	• Objects passing inside the specified near limit (200 mm) may produce a false response • For best accuracy, allow 30 minute warm-up before programming or operating
Certifications	CE
Hookup Diagrams	**Analog Models:** MI09 (p. 760) **Discrete Models:** MI10 (p. 760)

U-GAGE® QT50U Universal Voltage Specifications

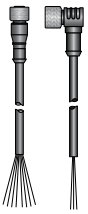
Effective Beam	See Charts EBPC-1, EBPC-2 and EBPC-3 on page 313.
Supply Voltage	85 to 264V ac, 50/60 Hz / 24 to 250V dc (1.5 watts max., exclusive of load)
Ultrasonic Frequency	75 kHz burst, rep. rate 96 milliseconds.
Supply Protection Circuitry	Protected against transient over voltages. DC hookup is without regard to polarity.
Output Protection	Protected against short circuit conditions
Delay at Power-up	1.5 seconds
Output Configuration	SPDT (Single-Pole, Double-Throw) electromechanical relay output. One normally open (NO) and one normally closed (NC).
Output Ratings	**Max. switching power (resistive load):** 2000 VA, 240 W (1000 VA, 120 W for sensors with Micro QD) **Max. switching voltage (resistive load):** 250V ac, 125V dc **Max. switching current (resistive load):** 8A @ 250V ac, 8A @ 30V dc derated to 200 mA @ 125V dc (4A max. for sensors with Micro QD) **Min. voltage and current:** 5V dc, 10 mA **Mechanical life of relay:** 50,000,000 operations **Electrical life of relay at full resistive load:** 100,000 operations NOTE: Transient suppression is recommended when switching inductive loads.
Temperature Effect	**Uncompensated:** 0.2% of distance/° C **Compensated:** 0.02% of distance/° C
Repeatability	1.0 mm

More on next page

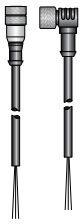
U-GAGE® QT50U Universal Voltage Specifications (cont'd)	
Hysteresis	**Window-limit sensor models:** 5 mm **Fill-level control sensor models:** 0 mm
Output Response Time	Selectable 1600, 400 or 100 milliseconds
Minimum Window Size	20 mm
Adjustments	**Sensing limits:** TEACH-Mode programming of near and far limits may be set using the TEACH push button. **Sensor configuration:** Output response time and temperature compensation mode may be set using the Speed push button. **Factory default settings:** 400 milliseconds output response time; temperature compensation enabled
Indicators	**Green Power ON LED:** Indicates power is ON **Red Signal LED**: Indicates target is within sensing range, and the condition of the received signal. **Output indicator (bicolor Yellow/Red):** Indicates output status or TEACH mode **Response indicator (bicolor Yellow/Red):** Indicates output response time selection
Construction	**Transducer:** Ceramic/Epoxy composite **Housing:** ABS **Membrane Switch:** Polyester
Environmental Rating	Leakproof design is rated IEC IP67; NEMA 6P
Connections	2 m or 9 m shielded 5-conductor (with drain) PVC jacketed attached cable, or 5-pin Micro-style quick-disconnect or 5-pin Mini-style quick-disconnect. QD cordsets are ordered separately. See page 312.
Operating Conditions	**Temperature:** -20° to +70° C **Relative humidity:** 100%
Vibration and Mechanical Shock	All models meet Mil Std. 202F requirements. Method 201A (vibration: 10 to 60Hz max., double amplitude 0.06", maximum acceleration 10G). Also meets IEC 947-5-2 requirements: 30G 11 milliseconds duration, half sine wave
Temperature Warmup Drift	Less than 1.0% of sensing distance upon power-up with Temperature Compensation enabled
Application Notes	Objects passing inside the specified minimum sensing distance (200 mm) may produce a false response.
Certifications	CE
Hookup Diagrams	UN09 (p. 755)

Cordsets

Euro QD (With Shield)		
See page 687		
	Threaded 5-Pin	
Length	Straight	Right-Angle
2 m	MQDEC2-506	MQDEC2-506RA
5 m	MQDEC2-515	MQDEC2-515RA
9 m	MQDEC2-530	MQDEC2-530RA



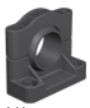
Micro QD (With Shield)		
See page 699		
	Threaded 5-Pin	
Length	Straight	Right-Angle
2 m	MQVR3S-506	MQVR3S-506RA
5 m	MQVR3S-515	MQVR3S-515RA
10 m	MQVR3S-530	MQVR3S-530RA



Mini QD (With Shield)	
See page 701	
	Threaded 5-Pin
Length	Straight
2 m	MBCC2-506
4 m	MBCC2-512
10 m	MBCC2-530

Additional cordset information available. See page 679.

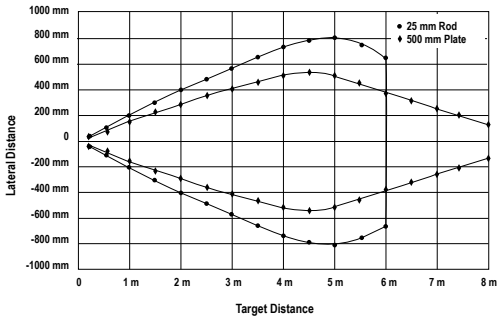
Brackets

QT50U		
		
pg. 639	pg. 640	pg. 641
SMB30A	SMB30MM	SMB30SC

Additional brackets and information available. See page 620.

Effective Beam Patterns

QT50U (Typical)

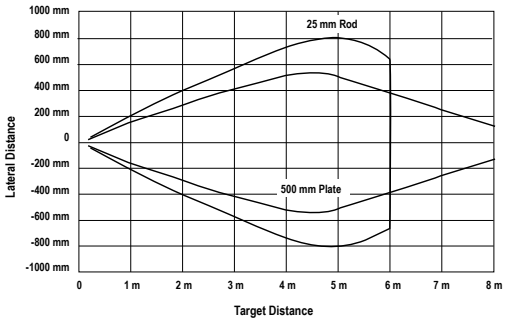


EBPC-1

QT50U (with 500 mm Plate) Maximum Target Rotation Angle

EBPC-2

QT50U Teflon®-Encapsulated (Typical)



EBPC-3