QT50U Series

Long-Range Ultrasonic Sensors

- Features a small ultrasonic dead zone of 200 mm
- Available in a chemically resistant model with a Teflon® flange
- Detects targets at long ranges within confined areas, such as a storage tank, without interference from the tank walls
- Push-button and remote TEACH-mode programming with an external switch, computer or controller for added security and convenience

QT50U, 10-30 V DC

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

QT50U Universal Voltage, 85-264 V AC/48-250 V DC

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

For more specifications see page 220-221.

Connection options: A model with a QD requires a mating cordset.

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**).

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5-Pin

Euro-Style with Shield
Straight connector models listed; for right-angle, add **RA** to the end of the model number (example, **MQDEC2-506RA**)

MQDEC2-506
2 m (6.5')
MQDEC2-55
5 m (15')
MQDEC2-530
9 m (30')

5-Pin

Micro-Style
Straight connector models listed; for right-angle, add **RA** to the end of the model number (example, **MQVR3S-506RA**)

MQVR3S-506
2 m (6.5')
MQVR3S-515
5 m (15')
MQVR3S-50
9 m (30')

5-Pin

Mini-Style
Straight connector models only

MBCC2-506
2 m (6.5')
MBCC2-512
4 m (15')
MBCC2-530
9 m (30')

Additional cordset information is available
See page 758

SMB30A

SMB30MM

SMB30SC

Additional bracket information is available
See page 725

DC and Universal Voltage Models

Teflon®-protected Models
(Suffix -CRFV)

QT50U DC Specifications

Supply Voltage and Current	**Analog models:** 10 to 30 V dc (10% max. ripple); 100 mA max @ 10 V, 40 mA max. @ 30 V (exclusive of load) **Dual-discrete models:** 10 to 30 V dc (10% max. ripple); 100 mA max. @ 10 V, 40 mA @ 30 V (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 10 V 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 10 V dc Minimum load resistance = 500 Ω Minimum required supply voltage for full 0-10 V output span = $\left(\frac{1000}{RLOAD} + 13\right)$ V dc **Analog Current Output:** 4 to 20 mA Maximum load resistance = 1 kΩ or $\left(\frac{\text{V supply} - 5}{0.02}\right)$ Ω, whichever is lower Minimum required supply voltage for full 4-20 mA output span = 10 V 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 1.2 V @ 10 mA; less than 1.65 V @ 150 mA
Temperature Effect	**Uncompensated:** 0.2% of distance/° C **Compensated:** 0.02% of distance/° C
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 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
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	1. Objects passing inside the specified near limit (200 mm) may produce a false response 2. For best accuracy, allow 30 minute warm-up before programming or operating
Certifications	CE

QT50U Universal Voltage Specifications

Supply Voltage	85 to 264 V ac, 50/60 Hz/48 to 250 V 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):** 250 V ac, 125 V dc **Max. switching current (resistive load):** 8A @ 250 V ac, 8A @ 30 V dc derated to 200 mA @ 125 V dc (4A max. for sensors with Micro QD) **Min. voltage and current:** 5 V 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
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
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