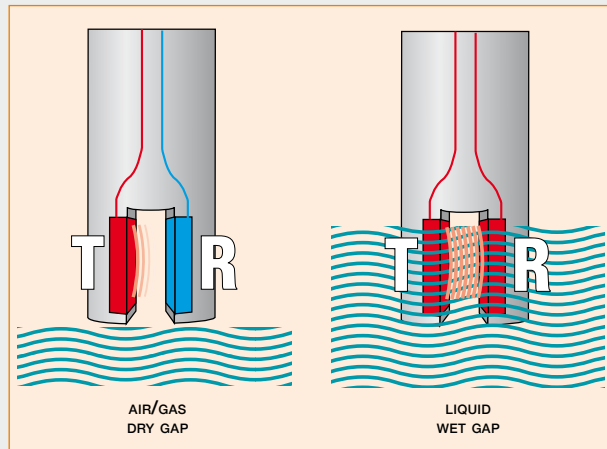


ULTRASONIC CONTACT



Echotel® ultrasonic contact operates on a two crystal pulsed or “transmit-receive” principle which applies a high frequency electronic burst to the transmit crystal. The signal is then converted into ultrasonic energy and transmitted across the sensing gap towards the receiver crystal. When there is air in the gap, the high frequency ultrasonic energy will be attenuated, thereby not allowing the energy to be received. When there is liquid in the gap, the ultrasonic energy will propagate across the gap and the current shift or relay output will indicate a reception of the signal.



echotel.magnetrol.com

ECHOTEL® 961/962**Ultrasonic level switch****DESCRIPTION**

The Echotel® 961/962 series is used to detect high or low level alarm(s) in a broad range of liquids. Pulsed signal technology provides superior performance in applications suffering from foam, aeration, heavy turbulence and suspensions containing solids.

ECHOTEL 961 has a tip sensitive setpoint and is ideally used as high or low level alarm.

ECHOTEL 962 offers two setpoints on the same transducer, a tip sensitive setpoint and a second setpoint via a flow-through upper gap. The unit is used for level alarm or to control a pump in an auto fill/empty mode.

ECHOTEL 961/962 is equipped with advanced diagnostics that continuously check the transducer and electronics. The diagnostics also alarm for electrical noise interference from external sources.

FEATURES

No calibration required.

Two-wire loop-powered with mA output or AC/DC line-powered with integrated relay(s)

Continuous self test with selectable error output

LED identification for:

- process alarm
- error of transducer, electronics or electrical noise interference
- wet/dry status of transducer

Push buttons for manual testing of alarm and error signals

Adjustable time delay up to 10 s.

Process temperature from -80 to +165 °C (-110 to +325 °F)

Process pressure up to 138 bar (2000 psi)

Metal and plastic transducers

Suited for SIL 2 loops (full FMEDA report available)

Remote electronics up to 45 m (150 feet)

APPLICATIONS

VESSELS: Top or side mounted directly into the vessel or in an external chamber

CONDITIONS: Unaffected by

- shifting dielectric, density or pH
- presence of foam, turbulence, visible vapors
- fast drain/fill rates
- vacuum conditions

AGENCY APPROVALS

	Ex d	Ex ia	Ex n	Ex t	XP	IS	NI	Other
ATEX	•	•						
CCOE	•	•						
CSA					•	•	•	
FM					•	•	•	
EAC (GOST)	•	•						
IEC	•							
Inmetro	•	•						
SIL	SIL 2 (1001)							
TÜV/DIBt	WHG § 63, overfill prevention							
Other approvals are available; consult factory for more details.								

ECHOTEL® 910
Ultrasonic tip sensitive
level control



DESCRIPTION

The Echotel® 910 is an integral mounted ultrasonic tip sensitive level switch with integrated DPDT relay. ECHOTEL 910 is ideally suited for seal pots, OEMs, overflow prevention, high or low level alarm in clean liquid applications with or without foam.

FEATURES

- No calibration required.
- Dual electrical entries and various housings.
- Actuation is determined by the length of the transducer and is available in lengths between 3 cm (1") and 254 cm (96").
- Process pressure/temperature: 55.2 bar at -40 to +120 °C (800 psi at -40 to +250 °F).
- All materials exposed to process in 316/316L SST (1.4401/1.4404).
- Field selectable high/low level failsafe.
- Optional universal nameplate.

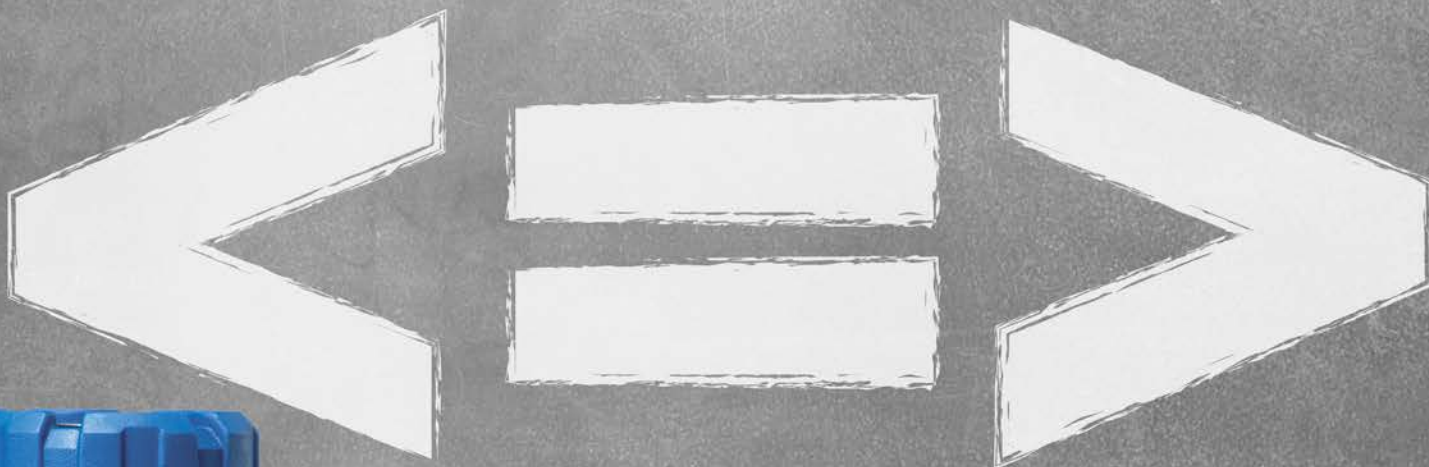
APPLICATIONS

- LIQUIDS:** Any clean liquids.
- VESSELS:** Top or side mounted directly into the vessel or in an external chamber.
- PROCESS CONDITIONS:** Unaffected by
 - shifting dielectric, density or pH
 - presence of foam, turbulence, visible vapors
 - fast drain/fill rates
 - vacuum conditions.

AGENCY APPROVALS

	Ex d	Ex ia	Ex n	Ex t	XP	IS	NI	Other
ATEX	•							
CCOE	•							
CSA					•		•	
FM					•		•	
EAC (GOST)	•							

Other approvals are available, consult factory for more details.



(Less is more)



Echotel® Ultrasonic Level Switches

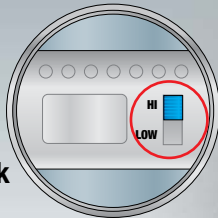
The more you rely on Echotel ultrasonic level switches, the less you will worry if a tuning fork is up to the job of providing the outstanding quality, reliability and overfill prevention your facility needs.

Echotel® ultrasonic switches provide continuously accurate and reliable level control that outperforms tuning fork technology. While tuning forks have been widely adapted by the industry, the fact is Echotel ultrasonic switches offer more benefits.

More Performance



Echotel®



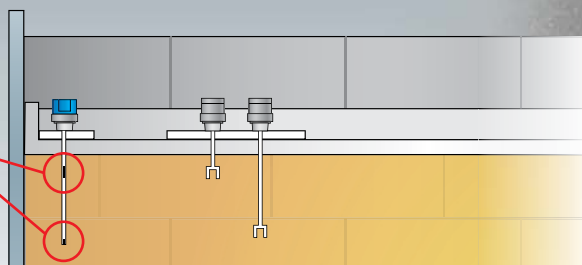
Tuning Fork

Reads All Liquid Densities

- Echotel can read any liquid density, even below 0.6 SG, to provide continuously accurate and reliable level control – and superior overflow prevention.
- Unlike tuning forks, which require you to configure a DIP switch to ensure density calibration – and may not be able to measure low-density liquids – no density adjustments are required with Echotel.

More Efficiency and Versatility

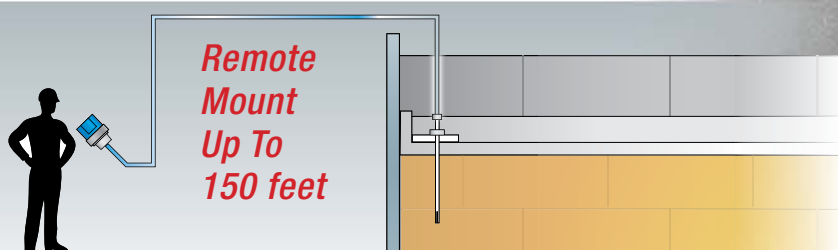
Dual-Point Capability



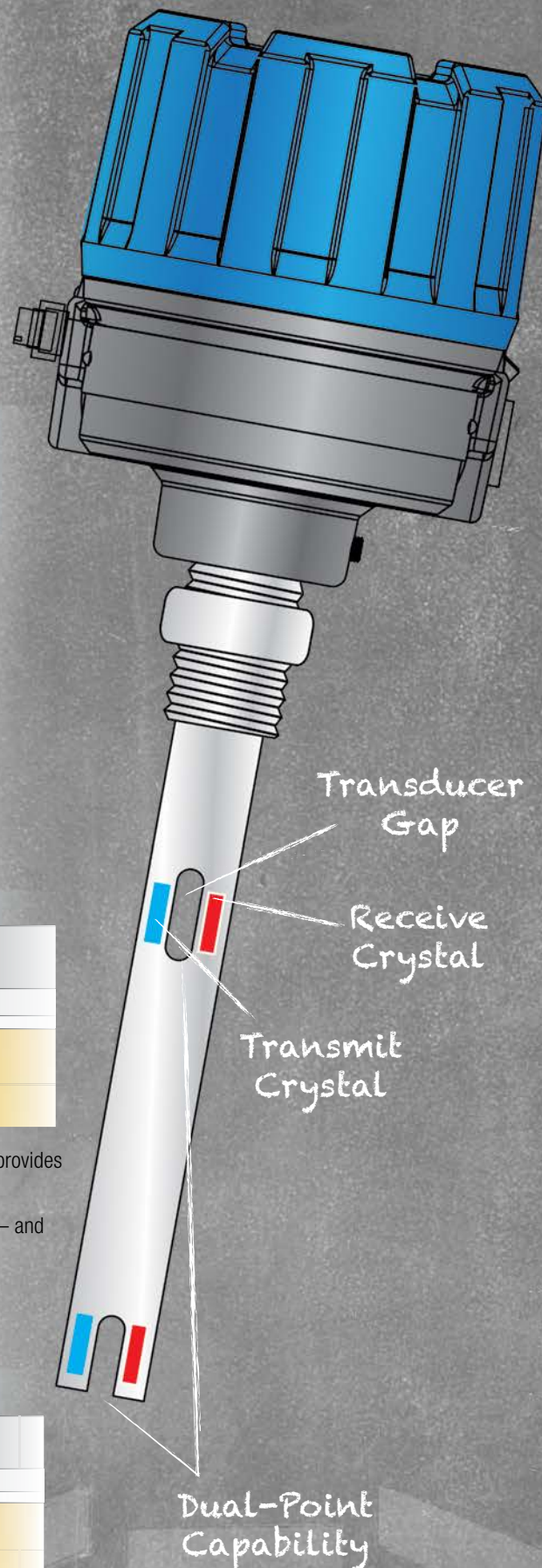
Dual-Point Capability

- In addition to the Echotel Model 961 single-point option, the Echotel Model 962 provides dual-point capability to give you two-point measurement from the same unit.
- In contrast to tuning forks that require the purchase and installation of two units – and two separate tank openings – you only need one switch and one tank opening to measure dual-point level with Echotel.

Remote Mount Capable



- While tuning forks require top-of-tank switch modification, Echotel gives you versatile access and ease of control, with remote mounting capability that can be up to 150 feet away from the transducer.



With Echotel® ultrasonic level control, you'll be assured of superior overfill prevention across your tank inventory. It's a simple equation of more performance and less worry that you can count on from AMETEK LMS – the level control experts.

More Information and Diagnostics

Malfunction

Level Alarm



Two Separate Relay Outputs

- Echotel ultrasonic units allow you to configure two separate relay outputs for diagnostics and level alarms to give you more information – and ensure compliance with industry safety guidelines.

Advanced Diagnostics Capabilities

Red Light Indicates Fault

Green Light Indicates Normal Operation



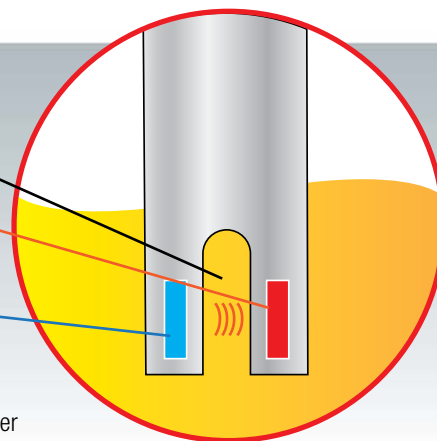
- Echotel also offers advanced diagnostics capabilities compared to tuning forks, with thorough testing of electronics, transducer, piezoelectric crystals and for the presence of electromagnetic noise.

More Advanced Technology

Transducer Gap

Receive Crystal

Transmit Crystal



Ultrasonic Gap Technology

- Echotel uses pulsed signal technology that only transmits pulsed sound waves across the transducer gap when liquid media is present, so density does not matter.
- When liquid is present in the transducer gap, a receive crystal senses the ultrasonic signal from the transmit crystal and converts it to an electrical signal to indicate liquid is present.

Get More Performance and Less Worry with Echotel

	Echotel	Tuning Forks
Dual-Point	✓	✗
Remote Mounting	✓	✗
Switch Point < 6"	✓	Limited
Extensive Selection of Transducer Materials	✓	✗
Advanced Self-Testing	✓	✗
No Density Calibration Required	✓	✗

Echotel® Ultrasonic Level Switches Technical Specifications

Electronics Specifications

Model 961 / 962 with Relay Output

Supply Voltage	18 to 32 VDC, or 102 to 265 VAC, 50/60 Hz
Relay Outputs	961: One DPDT level relay and one SPDT malfunction relay 962: Two SPDT level relays and one SPDT malfunction relay
Relay Ratings	DPDT: 5 amps @ 120 VAC, 250 VAC, and 30 VDC, 0.4 amp @ 110 VDC SPDT: 5 amps @ 120 VAC, 250 VAC, and 30 VDC, 0.15 amp @ 125 VDC
Fail-safe	Selectable for high or low level
Power Consumption	961/962: Less than 3 watts
Ambient Temperature	-40 to +160 °F (-40 to +70 °C)

Model 961 / 962 with Current Shift Output

Supply Voltage	11 to 35 VDC
Current Shift Output	961: 8 mA normal operation, 16 mA level alarm (± 1 mA) 962: 8 mA normal operation, 12 mA lower gap alarm, 16 mA upper gap alarm (± 1 mA) 961/962: 3.6 mA or 22 mA selectable fault signal (± 1 mA)
Loop Resistance	104 ohms with 11 VDC input, 1100 ohms with 35 VDC input
Fail-safe	Selectable for high or low level
Power Consumption	961/962: Less than 1 watt
Ambient Temperature	-40 to +160 °F (-40 to +70 °C)

Transducer Specifications

Materials	316 Stainless steel, Hastelloy C-276, Monel, Kynar (PVDF), CPVC
Maximum Pressure	2000 PSI (138 bar) material dependent
Activation Lengths	1 to 130 inches (2.5 to 330 cm)

Performance Specifications

Repeatability	± 0.078 inch (2 mm)
Response Time	½ second typical
Time Delay Variable	Adjustable between 0.5 – 45 seconds on rising and falling levels
Self-Test	Automatic: Continuously verifies operation of electronics, transducer, piezoelectric crystals and electrical noise Manual: Push button verifies operation of electronics, transducer and piezoelectric crystals
Shock Class	ANSI/ISA-S71.03 Class SA1
Vibration Class	ANSI/ISA-S71.03 Class VC2
Humidity	0 - 99%, non-condensing
Electromagnetic Compatibility	Meets CE requirements EN 61326

Rely on Echotel ultrasonic level switches.
For more information contact your AMETEK LMS representative



U.S. FACILITY

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