



**Introducing Full-featured Level Transmitters
with a User-friendly Price Point.**

MODEL
355
ULTRASONIC

MODEL
R82
RADAR



ANOTHER INNOVATION FROM

Magnetrol[®]
Worldwide Level and Flow SolutionsSM

The Model 355 with a Lexan® housing and polypropylene transducer; and a 355 with an XP aluminum housing and a Kynar® transducer.



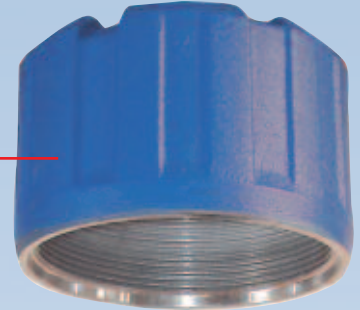
Echotel® Model 355 is a two-wire, loop-powered, non-contact ultrasonic transmitter that performs liquid level, volume, and open channel flow measurement. A powerful 60 kHz ultrasonic transducer and advanced digital signal processing is featured to reliably measure out to a 20 foot (6 meter) maximum range.

The Model 355 provides unsurpassed ease of configuration with either the menu-driven 4-pushbutton, 2-line x 16-character display, HART® digital communications, or PACTware™. The latter enables a complete configuration via the local user interface, or remotely with the added capability of capturing echo waveforms, and viewing trend data, diagnostic conditions and all transmitter configuration parameters.



Housing Covers

TOP LEFT: Cast aluminum with a tempered glass window for XP approval. TOP RIGHT: Lexan® plastic with a transparent cover.



Electronics Module

ABOVE: Module as positioned in compartment shows LCD and four-button keypad.



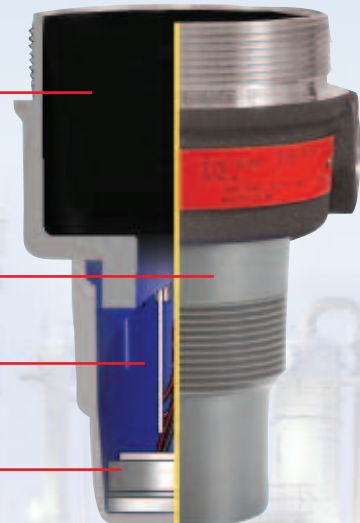
O-Ring

Aluminum Housing: Viton®
Lexan® Housing: Buna-N



Housing Compartment

Shown in aluminum; available in Lexan. Contains field wiring compartment and electronics.



Transducer Shown in Kynar; available in polypropylene.

Transducer Board

Piezoelectric Crystal Assembly

Operating Principle

Measurement is obtained by emitting an ultrasonic pulse from the transducer and measuring the time required for the echo to reflect from the liquid surface and return to the transducer.





Smart Signal Processing Overcomes Measurement Difficulties

355 Ultrasonic Transmitter

The intelligent electronics of the Model 355 Transmitter analyze the ultrasonic echo profile, apply temperature compensation, reject echoes from false targets, and then processes the true echo from the liquid surface. This results in an extremely reliable measurement even when application difficulties exist like turbulence or false echoes generated by agitator blades, fill pipes or other internal tank fittings.

The 60 kHz ultrasonic transducer is offered in polypropylene or Kynar for superior performance in harsh environments. These powerful transducers feature a 10° conical beam and 10" (255 mm) blocking distance to maximize measurement capabilities in a wide variety of applications.

- Chemical storage tanks
- Vessels with highly viscous media
- Paint, ink and solvent tanks
- Food and beverage vessels
- Batch and day tanks
- Open channel flow weirs and flumes

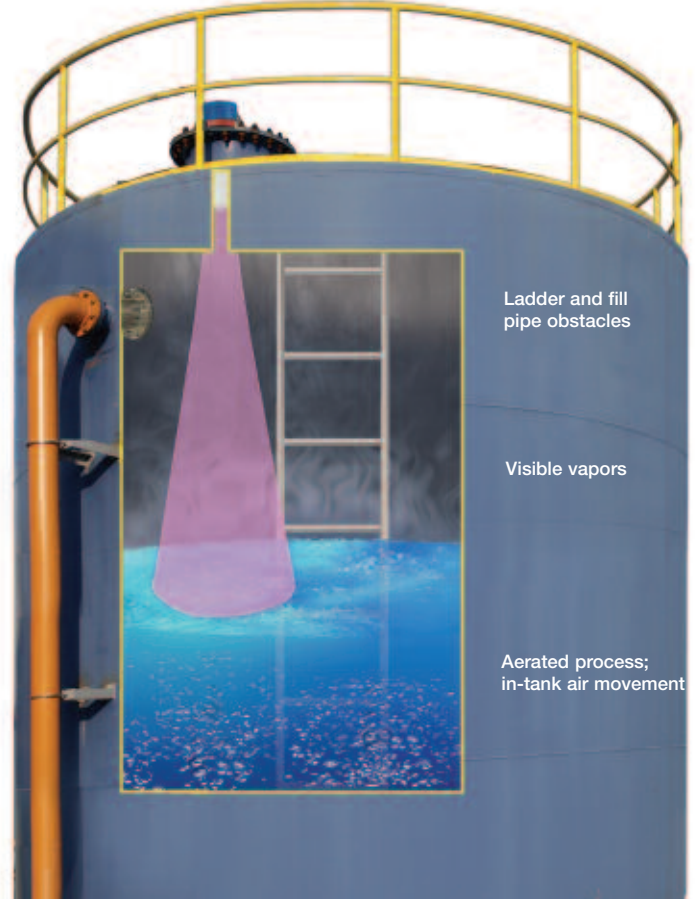
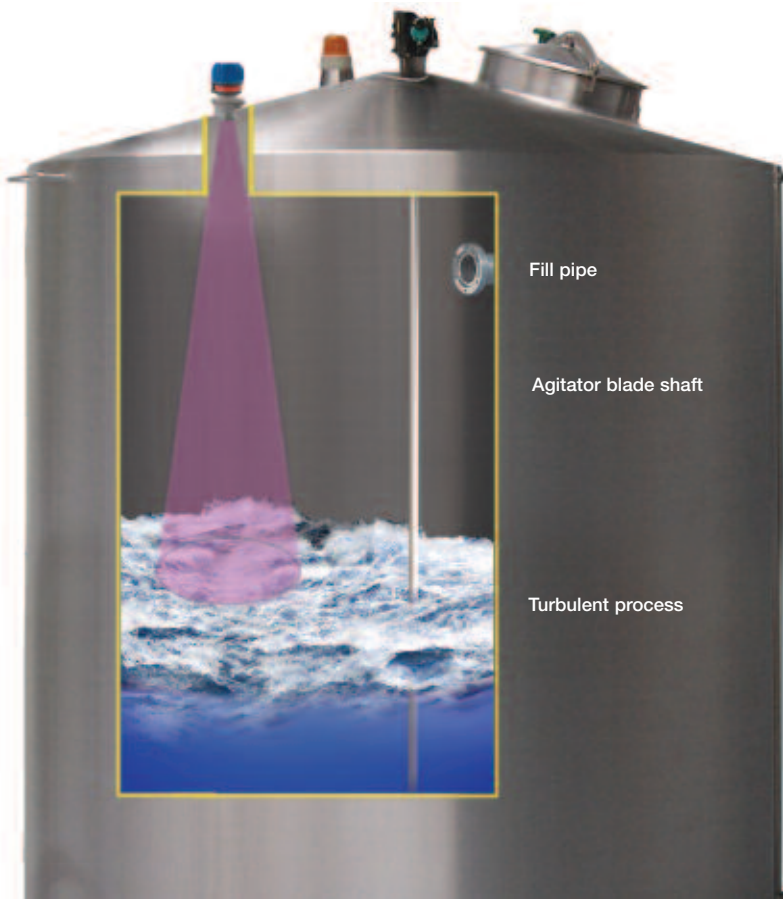


R82 Radar Transmitter

The sophisticated circuitry of the R82 transmits, receives and processes 1.8 million pulses per second to ensure reliable measurement. The R82 measures effectively even when atmospheres above the liquid are saturated with vapor. Pulse Burst technology and advanced signal processing manage common disturbances such as false echoes caused by obstructions, multi-path reflections from tank sidewalls or turbulence caused by agitators, aggressive chemicals, or aerators.

The R82 launcher orientation and echo-rejection profiling are simplified for easy use. The microwave beam is rotatable for optimized operation. The fully-encapsulated horn antenna offers high performance and is chemically resistant to nearly all standard process media. Applications include:

- Liquids, slurries and viscous media
- General chemical storage
- Day, batch and feed tanks
- Food and beverage vessels
- Water/Wastewater tanks and sumps





R82

RADAR TRANSMITTER

Model R82 with a thermoplastic housing and a polypropylene antenna; and a Model R82 with a cast aluminum housing and a Tefzel® antenna



Model R82 is a loop-powered, 26 GHz, non-contact radar transmitter that performs liquid level and volume measurements in enclosed vessels. The R82 offers high-performance at an economical price point to reliably measure out to a 40 foot (12 meter) maximum range.

The Model R82 provides unsurpassed ease of configuration with either the menu-driven 4-pushbutton, 2-line x 16-character display, HART digital communications, or PACTware. This allows complete configuration via the local user interface, or remotely with the added capability of capturing echo waveforms, and viewing trend data, diagnostic conditions and all transmitter configuration parameters.



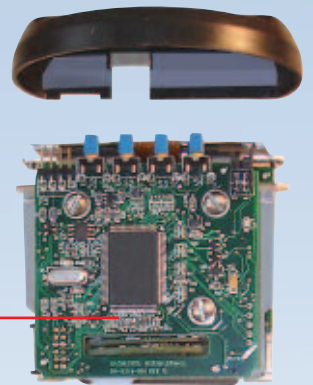
Housing Covers

TOP LEFT: Cast aluminum with a tempered glass window.
TOP RIGHT: Lexan plastic with a transparent cover.



Electronics Module

ABOVE: Module as positioned in compartment shows LCD and four-button keypad.



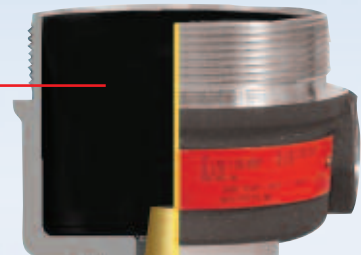
O-Ring

Aluminum Housing: Viton®
Lexan® Housing: Buna-N



Housing Compartment

Shown in aluminum; available in Lexan. Contains field wiring compartment and electronics.



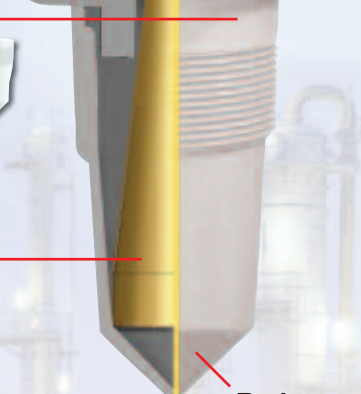
Radar Antenna

Shown in Tefzel; available in polypropylene. Available in two lengths.



Antenna

horn is encapsulated within polypropylene or Tefzel.



Operating Principle

The R82 is based on pulse burst radar technology together with equivalent time sampling circuitry. Short bursts of 26 GHz microwave energy are emitted and subsequently reflected from the liquid level surface.





APPLICATION SUITABILITY

355

Ultrasonic Transmitter

R82

Radar Transmitter

MEASUREMENT CAPABILITY	Level, Volume, or Open Channel Flow	Level or Volume
VESSEL TYPES	Open or Closed	Closed only
VOLUME	Selectable from stored tank shapes	Utilizes 20-point table
RANGE 13" to 20 feet (0.3 to 6 meters)	Recommended	Recommended
20 to 40 feet (6 to 12 meters)	Not Recommended	Recommended
NARROW SHOT w/ OBSTRUCTIONS	Recommended	Not Recommended
PLASTIC STILLWELL	Recommended	Not Recommended
STEEL STILLWELL	Recommended	Recommended
TEMPERATURE GRADIENTS	Not Recommended	Recommended
PRESSURE Vacuum	Not Recommended	Recommended
Atmospheric to 43.5 psig (3 bar)	Recommended	Recommended
43.5 psig (3 bar) to 200 psig (13.8 bar)	Not Recommended	Recommended
VAPORS	Not Recommended	Recommended
AGGRESSIVE MEDIA	Recommended with Kynar® transducer	Recommended with Tefzel® antenna
CO₂ GAS	Not Recommended	Recommended
HYGIENIC, CIP/SIP APPLICATIONS	Not Recommended	Recommended





SPECIFICATIONS

355

PERFORMANCE

Linearity $\pm 0.4"$ (± 10 mm)

Resolution $0.1"$ (2.5 mm)

Repeatability $\pm 0.125"$ (± 3 mm)

Response Time < 1 second

Warm-up Time 30 seconds

FUNCTIONAL

Measurement Principle Non-Contact Ultrasonic

Transducer Frequency 60 kHz

Range 13 inches to 20 feet (0.3 to 6.0 meters)

Output Range Analog 3.8 to 20.5 mA useable
(NAMUR 43); with HART

Loop Resistance GP/IS: 400Ω @ 24 VDC/20 mA,
 350Ω @ 24 VDC/22 mA

Damping 1–60 units

Keypad 4-button menu-driven data entry and system security

Indication 2-line x 16-character LCD

Power XP & GP: 16 to 36 VDC
IS: 16 to 28.6 VDC

Housing Material Lexan base and cover;
Cast aluminum A356T6 ($< 0.2\%$ copper)

Cable Entry Two $\frac{3}{4}"$ NPT or M20 entries

Ingress Protection Type 6P (IP 68) – Aluminum housing

Transducer Encapsulated piezoelectric crystal,
polypropylene, Kynar (optional)
 -40° to $+175^\circ$ F (-40° to $+80^\circ$ C)

Wetted Surfaces Polypropylene or Kynar (PVDF)

PHYSICAL

Operating Temperature -40° to $+175^\circ$ F (-40° to $+80^\circ$ C)

Operating Pressure 0 to 43.5 psig (0 to 3 bar)

Humidity 0 to 99%, non-condensing

R82

PERFORMANCE

Linearity ± 0.2 inch (± 5 mm) or 0.05% of tank height
(whichever is greater)

Measured Error Same as above

Repeatability $< 0.1"$ (2.5 mm) or 0.03% of tank height

Response Time < 1 second

Maximum Rate of Change 180" (460 cm)/minute

Minimum Dielectric 1.7

FUNCTIONAL

Measurement Principle Pulse Burst Radar at 26 GHz

Range 15 inches to 40 feet (0.4 to 12 meters)

Output Range Analog 3.8 to 20.5 mA useable
(NAMUR 43); with HART

Loop Resistance GP/IS: 400Ω @ 24 VDC/20 mA,
 350Ω @ 24 VDC/22 mA

Damping Adjustable 0–45 units

Output @ Antenna < 0.01 mW (avg.), < 2 mW (max.)

Keypad 4-button menu-driven data entry and system security

Indication 2-line x 16-character LCD

Power GP/IS 16 to 36 VDC

Housing Material Lexan base and cover;
Cast aluminum A356T6 ($< 0.2\%$ copper)

Cable Entry Two $\frac{3}{4}"$ NPT or M20 entries

Ingress Protection Type 6P (IP 68) – Aluminum housing

Antenna Encapsulated horn, polypropylene, Tefzel (optional)
 -40° to $+200^\circ$ F @ atmos (-40° to 95° C)

Wetted Surfaces Polypropylene or Tefzel

PHYSICAL

Operating Temperature -40° to $+175^\circ$ F (-40° to $+80^\circ$ C)

Operating Pressure Vacuum to 200 psig @ $+70^\circ$ F
(-1 to 13.8 bar) – Tefzel

Humidity 0 to 99%, non-condensing



Worldwide Level and Flow SolutionsSM

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