ECHOTEL® 335

Ultrasonic non contact transmitter for level, volume or open channel flow

DESCRIPTION

The Echotel® 335 is an integral mount, high performance ultrasonic non contact transmitter for liquid level, volume and open channel flow measurement.

The electronics are housed in a dual compartment housing seperating field wiring from user interface electronics.

Advanced digital signal processing routines enable the 335 to perform in applications involving in-tank obstructions, light foam and agitation.

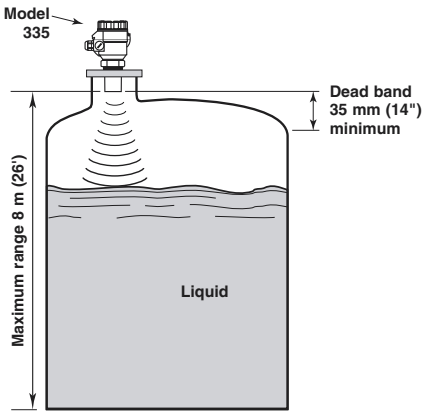
Non contact liquid level measurement

FEATURES

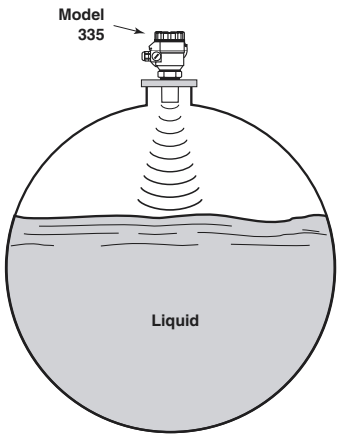
- Fast and easy calibration via 4 and 20mA magnetic touch points
- LED indication for
  - Echo validity
  - Relay status (energized/de-energized)
- Plug in custom / 6 digit LCD module (optional)
  - for easy set up
  - with bar graph display for liquid level % or echo strength
- IP 67, dual compartment (field wiring / user interface electronics) in cast aluminium
- Signal output: linearized 4-20mA and separate relay for level alarm or echo loss tracking
- 2 separate totalizers for flow:
  - daily resettable
  - continuous totalizer
- Max level range: 8m (26 ft)

APPLICATIONS

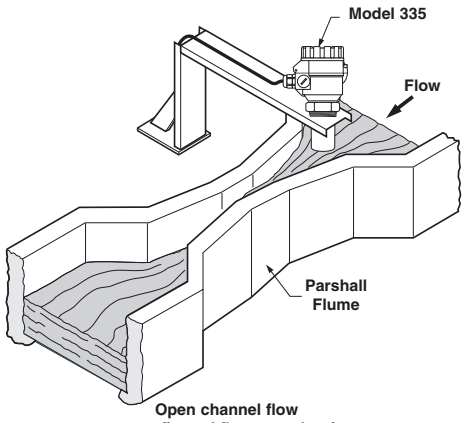
- Water and waste water: tank - open channel flow measurement
- Paper and pulp
- Paint, ink and solvent tanks
- General industry
- Oil and chemical storage
- Thick and viscous media
- Food and beverage
- Batch and day tanks



Level
4-20 mA



Volume
standard shapes and 32 point strapping table



Open channel flow
pre-configured flumes and weirs

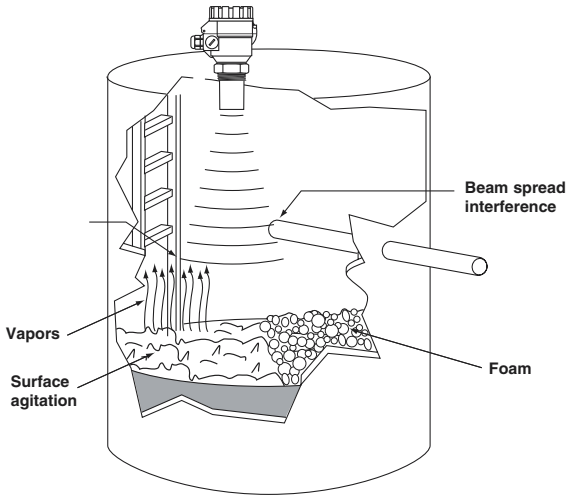
PRINCIPLE OF OPERATION

The level measurement is accomplished by emitting an ultrasonic pulse from the transducer face and measuring the travelling time between sending this pulse and its reflected echo from the liquid surface. Since the speed of sound is temperature dependant, the transducer also measures ambient temperature to compensate for the changing velocity.

Measurement Range Calculations

Ultrasonic non-contact measurement transmitters are typically rated for their max. rangeability. Depending process conditions, their maximum range needs to be reduced for getting an optimal measuring result. Use below chart to calculate the realistic rangeability of your application.

8 m (26 ft) x Performance multiplier as per described process condition.



OPERATING PARAMETER	CONDITION	PERFORMANCE MULTIPLIER
SURFACE AGITATION: Surface agitation or waves can degrade the performance. Moderate agitation results in only slight degradation of performance. The worst case is when the surface is a good reflector, but in the wrong direction.	Smooth, glass-like surface	1.0
	Slight agitation, choppiness	0.9
	Heavy agitation	0.8
	Slight vortex	0.7
VAPORS AND STEAM: Vapors can cause problems when the liquid process temperature is well above the temperature of the airspace. The greater the difference, the more expected vapor problems. The problems result from condensation or layering in the sound path, both of which attenuate the sound signal, and degrade performance. If a vent is used, be sure that it is well away from the transducer.	No condensation	1.0
	Little condensation	0.9
	Much condensation/ foggy appearance	0.8
BEAM SPREAD INTERFERENCE: It is recommended that no obstructions, such as ladder rungs, fill pipes, support struts, etc, be allowed within the 7° ultrasonic beam. If an obstruction is unavoidable, make it as far as possible from the transducer. Interference from agitator blades is only an intermittent interference that usually has little effect on performance. A special software algorithm can also help suppress false echoes from agitator blades that are within the beam angle.	No interference within 3.5° half beam angle	1.0
	Agitator at speed less than 60 RPM	1.0
	Agitator at speed greater than 60 RPM	Consult factory
	Interference outside 2°, far from transducer (in bottom third of range)	0.8
	Interference outside 2°, near to transducer (in top third of range)	0.5
FOAM: Foam can attenuate the ultrasound and render the system inoperative. If possible, moving the transducer to an area in the tank where there is less foam will improve the performance. Thick, heavy-density foams can sometimes produce a reflection from the top of the foam. The multipliers shown at right are general guidelines. For further assistance consult the factory.	No foam	1.0
	Light froth, less than 6 mm (0.25") thick	0.8
	Light foam, less than 12 mm (0.5") thick	0.5
	Light foam, more than 25 mm (1") thick	0.1

EXAMPLE: A heavily agitated tank, without condensation, no interference and a light froth on the surface.

Max recommended range: 8m x 0.8 x 1.0 x 1.0 x 0.8 = 5.12 m

EXPEDITE SHIP PLAN (ESP)

Several Echotel 335 units are available for quick shipment, within max. 3 weeks after factory receipt of purchase order, through the Expedite Ship Plan (ESP).
Models covered by ESP service are conveniently grey coded in the selection data charts.
To take advantage of ESP, simply match the colour grey model number codes (standard dimensions apply).
ESP service may not apply to orders of ten units or more. Contact your local representative for lead times on larger volume orders, as well as other products and options.

SELECTION DATA

A complete measuring system consists of:

1. One order code for Echotel 335 transmitter.
2. Optional:
   - spare magnetic calibration tool: order code: 013-6165-001
   - plug in display: order code: 046-8108-001
   - polypropylene flanges upon request

1. Order code for Echotel 335 transmitter

BASIC MODEL NUMBER

3 3 5	Echotel 335, ultrasonic non contact transmitter - 8 m (26 ft) range

POWER

A D 1	10.5 to 40 V DC and 10.5 to 28 V AC
A A 1	85 to 255 V AC

ACCESSORIES

A	Plug in LCD / programming module
0	Blind transmitter (plug in LCD can be ordered seperately – one module can be used over several transmitters)

TRANSDUCER

G 5 P	Polypropylene (PP) sensor	- 2" NPT process connection
G B P	Polypropylene (PP) sensor	- 2" BSP (G2) process connection
G 5 K	Kynar (PVDF) sensor	- 2" NPT process connection
G B K	Kynar (PVDF) sensor)	- 2" BSP (G2) process connection

3	3	5	A				G			**complete order code for Echotel 335 transmitter**

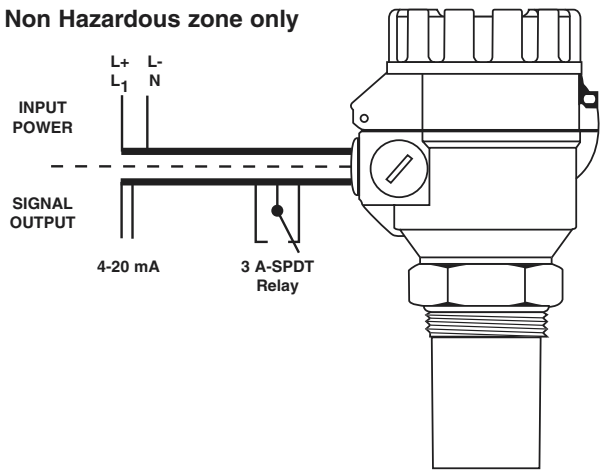
PHYSICAL/ELECTRICAL SPECIFICATIONS

Description	Specification
Power	10.5 to 40 V DC or 10.5 to 28 V AC 85 to 255 V AC
Signal output	4-20 mA / 20-4 mA and 3 A SPDT alarm relay (configurable as diagnostic alarm)
Measuring range	8 m (26') with 350 mm (14") dead zone
Damping	0, 3, 6, 10, 30 or 60 s – field selectable
Diagnostic alarm	3.6 mA or 22 mA or Hold last value or relay output
User interface	Hand held magnet or 4 button keypad on LCD module (see photo on front page)
Indication/Display	3 LED's (for Echo validity, relay status and programming mode) Custom 6 digit display with bar graph – configurable for % reading or echo strength
Menu language	English (only for plug in module)
Housing material	IP 67, cast aluminium – dual compartment enclosure 4 cable entries (2 x 1/2" NPT / 2 x PG 16) – all plugged
Net and gross weight	1,6 kg (3.5 lbs)
Overall dimensions	Height: 228 mm (8.98") x dia: 128 mm (5.04")

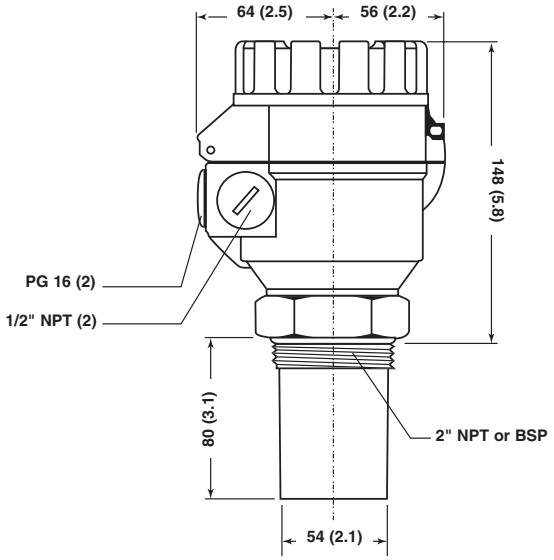
PERFORMANCE/TRANSDUCER SPECIFICATIONS

Description		Specification
Resolution	< 2 m > 2 m & < 5 m > 5 m & < 8 m	± 1 mm ± 2 mm ± 5 mm
Accuracy		± 0.2 % of the measured distance + 0.05 % of the range (under optimal conditions)
Transducer materials		IP 68, Polypropylene (PP) or Kynar (PVDF)
Beam angle		7° – radius at 5 m = 22 cm (16.4' = 8.7") / at 10 m = 44 cm (32.8' = 17.32")
Ambient temperature		- 30 °C to + 60 °C (- 22 °F to 140 °F)
Max process temperature		- 30 °C to + 90 °C (- 22 °F to 195 °F)

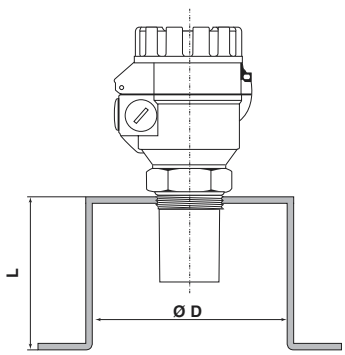
ELECTRICAL CONNECTION



DIMENSIONS in mm (inch)



The inside of the nozzle should be smooth. The inner rim at the end of the nozzle should be rounded.



L (in mm)	D min (mm)
150	60
200	75
250	90
300	105
350	120

ISO-9001 REGISTERED FIRM
DNV Certification B.V., THE NETHERLANDS
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QUALITY ASSURANCE - ISO 9001

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