



AIR TRANSDUCER SERIES

Process Instrumentation

Smart Ultrasonic Transmitter for Level, Volume, Flow & Pump Control

- **Non-contact Ultrasonic Level Measurement**
- **Open Channel Flow Measurement**
- **2 SPDT Relays for Alarm & Pump Control**
- **4-20 mA Output & 2 Modbus RS-485 Ports**
- **9-36 VDC Power Supply**
- **Included Software for User Programming**

ECHO's latest innovative design has redefined ultrasonic level measurement by packaging all the electronics inside the Air Transducer for a simple, yet powerful solution. It utilizes a state-of-the-art circuit board with "DSP" Digital Signal Processing, a built-in Transformer and a Precision Temperature Element for Speed-of-Sound Compensation. The Air Transducer comes standard with a 4-20mA output and 2 Modbus RTU RS-485 digital communication terminals.

The smart "ECHO LOGIC" algorithms process all echoes and automatically locks onto the true level while mapping out the false echoes. This provides a fit-and-forget transmitter for all liquid and solid level applications.

The Air Transducer has a special microballoon radiating material to transition the sound energy from the piezoelectric crystal to air with almost perfect impedance matching characteristics, which results in a very narrow beam angle. This transducer technology coupled with our "ECHO LOGIC" produces a 3° Effective Beam Angle.

The PVDF housing is corrosive resistant for almost all chemicals. The 3m version comes standard with a 1.5" NPT/BSP Bottom Thread and the 10m version with a 2" NPT/BSP Bottom Thread. A locking nut allows for flexible mounting options.

SIMPLE TO INSTALL

The self-contained Air Transducer simply screws into a 1.5" or 2" threaded fitting (model dependent).

SIMPLE TO PROGRAM

The ECHO PC Software allows for programming via the ECHO Adapter (USB to RJ11 converter). Calibration requires only setting the Empty Level (distance from transducer face to 0%) and Span (100% height). This automatically sets the 4-20 mA output. That's it, you're done.

MAINTENANCE-FREE

The Air Transducer has no moving parts and requires no maintenance. It will provide decades of reliable and accurate measurements.



POWER

Power Supply
Option

9 to 36 VDC, < 6 W (< 5 W with relays not energized)
Power Management option for extremely low battery consumption

GENERAL

Points of Measurement
Mode of Operation
Temp. Compensation

Single channel, up to 247 Air Transducers can be multi-dropped via RS-485
Level, Distance, Flow, Volume or Pump Control
Internal Precision Temperature Sensor ($\pm 0.1^\circ\text{C}$ precision)

Measurement Range
Near Blanking
Accuracy
Repeatability
Resolution
Frequency
Update Time
Effective Beam Angle¹
Mounting²

AT-3 Model

0.15 m to 3 m (0.5 to 10 ft)
0.15 m (0.5 ft)
 \pm the greater of 0.1% of range or 2 mm
 ≤ 1.5 mm
0.01 mm
125 kHz
 ≤ 0.5 seconds
3° inclusive
1.5" NPT, BSP, or G

AT-10 Model

0.3 m to 10 m (1 ft to 33 ft)
0.3 m (1 ft)
 \pm the greater of 0.25% of range or 6 mm
 ≤ 3 mm
 \pm the greater of 0.1% of range or 2 mm
50 kHz
 ≤ 0.5 seconds
3° inclusive
2" NPT, BSP, or G

CONFIGURATION

Digital Echo Processing
Analog Output
Relays
Communication
Programming

ECHO Logic, Smart Algorithms with Auto Mapping
1 4-20 mA or 0-20 mA (Active), 12 bit resolution
2 SPDT Relays, 5A @ 250 VAC/ 30VDC
2 RS-485 Modbus RTU Ports
Air PC Software for laptop programming via USB to RJ-11 adapter
Handheld programmer with display (available 1Q 2012)

ENVIRONMENT

Temperature Range
Pressure Range

-40°F to +185°F (-40°C to +85°C), process and storage areas
7 psi (0.5 bar)

PHYSICAL

Ingress Protection
Housing Material
Cable Entry

NEMA 4X (IP66 to EN 60529)
Wetted: PVDF, Electronics: Glassfiber-reinforced, duroplastic Polyester
2 Cable Glands 1/2" NPT (options: Liquid-tight or Conduit fittings)

1. EBA - "Effective Beam Angle" is the processed beam angle when using ECHO LOGIC algorithms.
2. Locking nut is included for mounting purposes.

Air Transducer	Wetted/ Electronics	Bottom Thread	Electronics	Total Height	Weight
AT-3	PVDF/ Fiberglass	1.5" NPT/BSP/G	4.72 x 4.80" (120 x 122 mm)	7.5" (190.5 mm)	3.2 lbs (1.45 kg)
AT-10	PVDF/ Fiberglass	2" NPT/BSP/G	4.72 x 4.80" (120 x 122 mm)	7.5" (190.5 mm)	3.4 lbs (1.54 kg)

Our policy is one of constant development and improvement. ECHO Process Instrumentation, Inc. reserves the right to amend details as necessary without notice.