ULTRASONIC TRANSDUCERS

Dependable. Durable.

Your Partner from Prototype to Production

Precision Tuned Products for Maximum Performance

Level and Flow  Automation  Proximity  Inventory Control

Email: INDUSTRIAL@AIRMAR.COM
www.airmar.com
<table>
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<tr>
<th>Model</th>
<th>Frequency</th>
<th>Diameter</th>
<th>Typical Range</th>
<th>Beamwidth</th>
</tr>
</thead>
<tbody>
<tr>
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<td>7°</td>
</tr>
<tr>
<td>AR30</td>
<td>30 kHz</td>
<td>Ø 106 mm</td>
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<tr>
<td>ARK30</td>
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<td>AR41</td>
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<td>35 cm to 15 m</td>
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<tr>
<td>ARK41</td>
<td>41 kHz</td>
<td>Ø 92.2 mm</td>
<td>35 cm to 15 m</td>
<td>14°</td>
</tr>
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<td>AR50</td>
<td>50 kHz</td>
<td>Ø 92.2 mm</td>
<td>30 cm to 10 m</td>
<td>12°</td>
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<tr>
<td>AR50CH</td>
<td>50 kHz</td>
<td>Ø 57 mm</td>
<td>30 cm to 10 m</td>
<td>12°</td>
</tr>
<tr>
<td>ARK50</td>
<td>50 kHz</td>
<td>Ø 92.2 mm</td>
<td>30 cm to 10 m</td>
<td>12°</td>
</tr>
<tr>
<td>ARK50-THD</td>
<td>50 kHz</td>
<td>Ø 51 mm</td>
<td>35 cm to 10 m</td>
<td>10°</td>
</tr>
<tr>
<td>ART20</td>
<td>75 kHz</td>
<td>Ø 38 mm</td>
<td>25 cm to 7 m</td>
<td>15°</td>
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<tr>
<td>ART25</td>
<td>75 kHz</td>
<td>Ø 38 mm</td>
<td>25 cm to 7 m</td>
<td>15°</td>
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<tr>
<td>ART225</td>
<td>225 kHz</td>
<td>Ø 13 mm</td>
<td>10 cm to 1.5 m</td>
<td>15°</td>
</tr>
<tr>
<td>ART300</td>
<td>300 kHz</td>
<td>Ø 12 mm</td>
<td>5 cm to 50 cm</td>
<td>10°</td>
</tr>
</tbody>
</table>

As Airmar constantly improves its products, all specifications are subject to change without notice. All specifications typical at 22°C (72°F). Pulse-Echo Mode. Minimum and maximum ranges are best case scenarios. Actual range may vary, depending on drive circuitry and signal processing. Factory Mutual approved models suitable for: Class I, Division 1, Hazardous Locations. AIRDUCER® is a registered trademark of Airmar Technology Corporation. Other company or product names mentioned in this document may be trademarks or registered trademarks of their respective companies, which are not affiliated with Airmar.
Airmar Technology Corporation designs and manufactures the most advanced ultrasonic transducers on the market today. Pushing the boundaries of technology and delivering creative solutions that meet customers’ unique demands has made us a world leader in the advancement of ultrasonic sensor technology.

The Company
Founded in 1982, Airmar has grown to employ over 400 employees at our 11 global locations, 3 of which are state-of-the-art facilities capable of executing every stage of the design and manufacturing process. From 3D modeling to injection molding, and from encapsulation to environmental testing, all work is completed in-house, allowing for end-to-end control and ISO 9001:2015 Certification. Airmar holds dozens of U.S. and foreign patents.

The Products
Airmar’s teams of scientists, engineers and technicians design our multi-use ultrasonic transducers for a wide variety of applications and environments. Our transducers deliver proven non-contact sensing performance from equipment such as asphalt pavers, agricultural machinery and water/wastewater systems, as well as many other challenging applications.

Safe, compact and reliable, Airmar’s ultrasonic transducers serve as critical components in the development of a myriad of sensors and measurement systems in fields requiring liquid or solid levels, flow control, automation control, proximity sensing, obstacle avoidance, distance measurement, inventory control and more.

The Ultrasonic Advantage
Manufactured and factory-tuned in the U.S.A., Airmar’s ultrasonic transducers are built for lasting durability and function well in harsh environments. They are rated IP68 and have no moving parts to wear out, so no maintenance is needed. Unlike most alternative measurement solutions, ultrasonic transducers can detect clear, transparent or shiny objects, and are unaffected by color.

Airmar’s highly accurate ultrasonic transducers are available in various diameters with and without threads. They operate within a frequency range of 15 kHz to 1 MHz and achieve a sensing range from 5 cm (2 in) to 60 m (196.85 ft). Airmar also offers customized designs to bring your innovative products from concept to production.

The Measuring Principle of Airducer® Ultrasonic Sensors
Sound generated above the human hearing range (typically above 20 kHz) is called ultrasonic. The frequencies of Airmar’s standard product line range from 19.5 kHz to 300 kHz. Ultrasonic transducers operate by emitting short bursts of high-frequency sound waves in a cone-shaped pattern (also known as a beam). The echoes reflected by the target are received by the transducer and are used to determine position or measure distance. The distance can be computed using the speed of sound in the transmission medium by measuring the time it takes for the echo to return to the transducer. Using air as an example, at 22°C sound travels at an approximate rate of 345 meters per second. Changes in environmental conditions such as temperature, humidity and pressure can cause a change in the speed of sound in air.

Typical Applications
For AIRDUCER® Ultrasonic Sensors
Level and Flow Measurement and Control
- Liquids, bulk solids, or grains
- In pipe and open channel flow

Process Control
- Distance measurement
- Web tension, roll diameter, web edge, or break detection
- Counting, sorting, or monitoring parts
- Determining loop measurement
- Collision avoidance or proximity sensing
- Robotics

Medical Applications
- Bubble detection
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**ART15**

<table>
<thead>
<tr>
<th>SPECIFICATIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Best operating frequency:</strong> 15 kHz +/-0.5 kHz</td>
</tr>
<tr>
<td><strong>Minimum Transmit Sensitivity at Best Transmit Frequency:</strong> 123 dB re 1μPa/V at 1 m</td>
</tr>
<tr>
<td><strong>Minimum Receive Sensitivity at Best Receive Freq.</strong> -148 dB re 1V/μPa</td>
</tr>
<tr>
<td><strong>Minimum Parallel Resistance @15kHz:</strong> 100 Ohm</td>
</tr>
<tr>
<td><strong>Beamwidth (@ -3 dB Full Angle):</strong> 6° +/-2°</td>
</tr>
<tr>
<td><strong>Maximum Driving Voltage (2% Duty Cycle Tone Burst):</strong> 900 Vpp</td>
</tr>
<tr>
<td><strong>Operating Temperature:</strong> -30°C to 60°C</td>
</tr>
<tr>
<td><strong>Thermistor Operating Range:</strong> -20°C to 60°C</td>
</tr>
<tr>
<td><strong>Weight:</strong> 2.6 lbs / 1.18 kg</td>
</tr>
<tr>
<td><strong>Cable Length:</strong> 10 m</td>
</tr>
<tr>
<td><strong>Housing Material:</strong> Aluminum, static dissipative Kynar, static dissipative PE</td>
</tr>
<tr>
<td><strong>Acoustic Window:</strong> LDPE</td>
</tr>
</tbody>
</table>

*Pulse-Echo Mode: Minimum and maximum ranges are best case scenarios. Actual range may vary, depending on drive circuitry and signal processing.

**Note:** Optimally, performance measurements should be taken when the transducer reaches a steady state.

**Applications**
- Silos
- Wells
- Wastewater facilities
- Large capacity tanks
- River crossings/bridges

**Features**
- Delivers long range level measurements up to 60 m (197’)
- Extended range without the cost of radar
- Built-in thermistor

**Options**
- Cable length can be customized
- Also available without thermistor
- Optional cable, cap and thermistor

**Dimensions**

**Directivity Pattern**

**Transmit & Receive Voltage Response**

**Impedance Magnitude & Phase**

**Figure of Merit** (Sum of TVR & RVR)

**Additional Resources**

**Theory of Operations**

**Applying Ultrasonic Technology**

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AIRMAR TECHNOLOGY CORPORATION

Ultrasonic Air Transducer
Technical Data Sheet

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AR20

19.5 kHz
AIRDUCER® Ultrasonic Transducer

Applications
- Long-range level measurement
- Powder, granular, and liquid, (40 m slurry tanks)

Features
- Long-term reliability
- Low maintenance
- Non-contact
- No moving parts

Options
- Cap with stainless steel 1" NPT or BSP thread mounts
- Cable length can be customized

Dimensions

SPECIFICATIONS
Best Operating Frequency: 19.5 kHz, ±4%
Typical Sensing Range: 80 cm to 40 m
Beamwidth (@ -3 dB Full Angle): 7°, ±2°
Operating Temperature: -40°C to 60°C
Weight: 7.25 kg
Housing Material: Glass filled polyester
Acoustic Window: Glass reinforced epoxy

Note: Optimally, performance measurements should be taken when the transducer reaches a steady state.

Directivity Pattern
Transmit & Receive Voltage Response
Impedance Magnitude & Phase
Figure of Merit

Additional Resources
Theory of Operations
Applying Ultrasonic Technology

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AR20_rR 10/09/23
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### AR30

**Optional cap kit**

### 30 kHz

**AIRDUCER® Ultrasonic Transducer**

#### Applications
- Level measurement
- Proximity
- Obstacle avoidance
- Traffic control

#### Features
- Rugged sealed construction
- Housing design will accommodate transceiver and signal processing electronics
- Standard internal shielding

#### Options
- Cylinder housing available with mounting cap kit
- Cable length can be customized
- Mounting cap available in BSP, NPT, or M32 threads
- 10 KΩ thermistor available for temperature compensation
- Available in PVDF housing for use in chemically aggressive environments (ARK30)
- Cap kit sold separately

#### Dimensions

- **Directivity Pattern**
- **Transmit & Receive Voltage Response**
- **Impedance Magnitude & Phase**
- **Figure of Merit (Sum of TVR & RVR)**

**Note:** Optimally, performance measurements should be taken when the transducer reaches a steady state.

**Additional Resources**

- Theory of Operations
- Applying Ultrasonic Technology
- T1 Developer Board

Airmar’s T1 Developer’s Transceiver Module can be used for evaluation of AIRDUCER® Transducers.
ARK30

30 kHz

AIRDUCER® Ultrasonic Transducer

Applications
- Level measurement
- Level measurement in chemically aggressive environments
- Food and beverage processing
- Proximity sensing
- Obstacle avoidance

Features
- Rugged sealed construction
- Housing design will accommodate transceiver and signal processing electronics
- Standard internal shielding

Options
- Cable length can be customized
- 10 KΩ thermistor available for temperature compensation
- Mounting caps available in BSP, NPT, or M32 threads
- Available in alternate housing material (AR30)

SPECIFICATIONS

Best Operating Frequency: 30 kHz, ±4%
Minimum Transmit Sensitivity at Best Transmit Frequency:
105 dB re 1μPa/V at 1 m
Minimum Receive Sensitivity at Best Receive Frequency:
-155 dB re 1V/μPa
Minimum Parallel Resistance: 700 Ω, ±30%
Minimum and Maximum Sensing Range*: 60 cm to 30 m
Typical Sensing Range: 80 cm to 25 m
Free (1 kHz) Capacitance: 5,700 pF; ±20% pF
Beamwidth (@ -3 dB Full Angle): 12°, ±2°
Maximum Driving Voltage (2% Duty Cycle Tone Burst): 2,200 V
Operating Temperature: -40°C to 90°C
Weight: 800 g
Housing Material: Kynar® 720
Acoustic Window: Kynar® 720

*Pulse-Echo Mode: Minimum and maximum ranges are best case scenarios. Actual range may vary, depending on drive circuitry and signal processing.

Note: Optimally, performance measurements should be taken when the transducer reaches a steady state.

Dimensions

May be shown with optional equipment.

Thread Choices:
1” tapered BSP x 0.75” long
1” NPT x 0.94” long (ref.)
M32-1.5 x 0.75” long

Additional Resources

Theory of Operations
Applying Ultrasonic Technology
T1 Developer Board

Airmar’s T1 Developer’s Transceiver Module can be used for evaluation of AIRDUCER® Transducers.
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AR41

41 kHz

AIRDUCER® Ultrasonic Transducer

Applications
- Level measurement
- Proximity
- Obstacle avoidance
- Traffic control
- Flow measurement

Features
- Rugged sealed construction
- Housing design will accommodate transceiver and signal processing electronics
- Standard internal shielding

Options
- Cable length can be customized
- Mounting cap available in BSP, NPT, or M32 threads
- Available in PVDF housing for use in chemically aggressive environments (ARK41)
- 10 KΩ thermistor available for temperature compensation

Dimensions

Additional Resources

Airmar’s T1 Developer’s Transceiver Module can be used for evaluation of AIRDUCER® Transducers.
**ARK41**

**SPECIFICATIONS**

- **Best Operating Frequency:** 41 kHz, ±4%
- **Minimum Transmit Sensitivity at Best Transmit Frequency:** 108 dB re 1μPa/V at 1 m
- **Minimum Receive Sensitivity at Best Receive Frequency:** -175 dB re 1V/μPa
- **Minimum Parallel Resistance:** 200 Ω, ±30%
- **Minimum and Maximum Sensing Range**: 30 cm to 20 m
- **Typical Sensing Range**: 35 cm to 15 m
- **Free (1 kHz) Capacitance**: 5,000 pF, ±20%
- **Beamwidth (@ -3 dB Full Angle)**: 14°, ±2°
- **Maximum Driving Voltage (2% Duty Cycle Tone Burst)**: 1,800 Vpp
- **Operating Temperature**: -40°C to 90°C
- **Weight**: 560 g
- **Housing Material**: Kynar® 720
- **Acoustic Window**: Kynar® 720

- **Pulse-Echo Mode**: Minimum and maximum ranges are best case scenarios. Actual range may vary, depending on drive circuitry and signal processing.

**Note**: Optimally, performance measurements should be taken when the transducer reaches a steady state. transducer reaches a steady state.

**Options**

- Cable length can be customized
- 10 KΩ thermistor available for temperature compensation
- Mounting caps available in BSP, NPT, or M32 threads
- Available in alternate housing material (AR41)

**Dimensions**

- **Thread Choices**: 1” tapered BSP x 0.75” long
- 1” NPT x 0.94” long (ref.)
- M32-1.5 x 0.75” long

**Directivity Pattern**

**Transmit & Receive Voltage Response**

**Impedance Magnitude & Phase**

**Figure of Merit**

- (Sum of TVR & RVR)

**Additional Resources**

Airmar’s T1 Developer’s Transceiver Module can be used for evaluation of AIRDUCER® Transducers.

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AR50

**SPECIFICATIONS**

- **Best Operating Frequency:** 50 kHz, ±4%
- **Minimum Transmit Sensitivity at Best Transmit Frequency:** 106 dB re 1µPa/V at 1 m
- **Minimum Receive Sensitivity at Best Receive Freq.:** -162 dB re 1V/µPa
- **Minimum Parallel Resistance:** 450 Ω, ±30%
- **Minimum and Maximum Sensing Range**: 25 cm to 15 m
- **Typical Sensing Range:** 30 cm to 10 m
- **Free (1 kHz) Capacitance:** 5,700 pF, ±20% pF
- **Beamwidth (@ -3 dB Full Angle):** 12°, ±2°
- **Maximum Driving Voltage (2% Duty Cycle Tone Burst):** 1,500 Vpp
- **Operating Temperature:** -40°C to 90°C
- **Weight:** 560 g
- **Housing Material:** Glass filled polyester
- **Acoustic Window:** Glass reinforced epoxy

*Pulse-Echo Mode: Minimum and maximum ranges are best case scenarios. Actual range may vary, depending on drive circuitry and signal processing.

**Features**

- Rugged sealed construction
- Housing design will accommodate transceiver and signal processing electronics
- Standard internal shielding

**Options**

- Cable length can be customized
- Mounting cap available in BSP, NPT, or M32 threads
- 10 KΩ thermistor available for temperature compensation
- Available in PVDF housing for use in chemically aggressive environments (ARK50)

**Dimensions**

- **Thread Choices:**
  - 1” tapered BSP x 0.75” long
  - 1” NPT x 0.94” long (ref.)
  - M32-1.5 x 0.75” long

Airmar’s T1 Developer’s Transceiver Module can be used for evaluation of AIRDUCER® Transducers.

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**AR50CH**

<table>
<thead>
<tr>
<th><strong>SPECIFICATIONS</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Best Operating Frequency: 50 kHz, ±4%</td>
<td></td>
</tr>
<tr>
<td>Minimum Transmit Sensitivity at Best Transmit Frequency: 106 dB re 1µPa/V at 1 m</td>
<td></td>
</tr>
<tr>
<td>Minimum Receive Sensitivity at Best Receive Freq.: -162 dB re 1V/µPa</td>
<td></td>
</tr>
<tr>
<td>Minimum Parallel Resistance: 450 Ω, ±30%</td>
<td></td>
</tr>
<tr>
<td>Minimum and Maximum Sensing Range*: 25 cm to 15 m</td>
<td></td>
</tr>
<tr>
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<td></td>
</tr>
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<td>Free (1 kHz) Capacitance: 5,700 pF, ±20% pF</td>
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<td>Beamwidth (@ -3 dB Full Angle): 12°, ±2°</td>
<td></td>
</tr>
<tr>
<td>Maximum Driving Voltage (2% Duty Cycle Tone Burst): 1,500 Vpp</td>
<td></td>
</tr>
<tr>
<td>Operating Temperature: -40°C to 90°C</td>
<td></td>
</tr>
<tr>
<td>Weight: 160 g</td>
<td></td>
</tr>
<tr>
<td>Housing Material: Glass filled polyester</td>
<td></td>
</tr>
<tr>
<td>Acoustic Window: Glass reinforced epoxy</td>
<td></td>
</tr>
</tbody>
</table>

*Pulse-Echo Mode: Minimum and maximum ranges are best case scenarios. Actual range may vary, depending on drive circuitry and signal processing.

**Note:** Optimally, performance measurements should be taken when the transducer reaches a steady state.

**50 kHz**

**AIRDUCER® Ultrasonic Transducer**

**Applications**
- Level measurement
- Open channel flow
- Obstacle avoidance
- Proximity
- Robotics

**Features**
- Improved deadband performance as compared to AT50
- Rugged sealed construction
- Cylindrical design allows for installation in various applications

**Options**
- 10 KΩ thermistor available for temperature compensation
- Available in alternate housing material (ATK50)

**Dimensions**

<table>
<thead>
<tr>
<th><strong>Directivity Pattern</strong></th>
<th><strong>Transmit &amp; Receive Voltage Response</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>30°, 30°, 60°</td>
<td>130, 120, 110, 100, 90, 80, 70, 60, 50, 40, 30, 20, 10, 0, -10, -20, -30, -40, -50, -60, -70, -80, -90, -100, -110, -120, -130</td>
</tr>
</tbody>
</table>

**Impedance Magnitude & Phase**

<table>
<thead>
<tr>
<th><strong>Figure of Merit</strong> (Sum of TVR &amp; RVR)</th>
</tr>
</thead>
<tbody>
<tr>
<td>10%, 20%, 30%, 40%, 50%, 60%, 70%, 80%, 90%, 100%</td>
</tr>
</tbody>
</table>

**Additional Resources**

Airmar's T1 Developer's Transceiver Module can be used for evaluation of AIRDUCER® Transducers.
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**ARK50-THD**

**50 kHz**

**AIRDUCER® Ultrasonic Transducer**

**Applications**
- Level measurement in chemically aggressive environments
- Food and beverage processing
- Flow monitoring

**Features**
- Rugged one-piece PVDF housing is U.S. FDA compliant
- Threaded design allows for installation in various applications
- Standard internal shielding

**Options**
- Nut—2” BSP thread
- Complete assembly available with standard cable lengths
- 10 KΩ thermistor available for temperature compensation
- 12 mm extension sleeve
- Mounting caps available in BSP, NPT, or M32 threads
- Optional PCB standoff configuration lengths available

**Dimensions**

<table>
<thead>
<tr>
<th>Thread Options:</th>
</tr>
</thead>
<tbody>
<tr>
<td>1” tapered BSP x 0.75” long</td>
</tr>
<tr>
<td>1” NPT x 0.94” long</td>
</tr>
<tr>
<td>M32-1.5 x 0.75” long</td>
</tr>
</tbody>
</table>

**Theory of Operations**

Airmar’s T1 Developer’s Transceiver Module can be used for evaluation of AIRDUCER® Transducers.

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AT50

**SPECIFICATIONS**

- **Best Operating Frequency:** 50 kHz, ±4%
- **Minimum Transmit Sensitivity at Best Transmit Frequency:** 106 dB re 1µPa/V at 1 m
- **Minimum Receive Sensitivity at Best Receive Freq.:** -162 dB re 1V/µPa
- **Minimum Parallel Resistance:** 450 Ω, ±30%
- **Minimum and Maximum Sensing Range**: 30 cm to 15 m
- **Typical Sensing Range:** 35 cm to 10 m
- **Free (1 kHz) Capacitance:** 5,700 pF, ±20%
- **Beamwidth (@ -3 dB Full Angle):** 12°, ±2°
- **Maximum Driving Voltage (2% Duty Cycle Tone Burst):** 1,500 Vpp
- **Operating Temperature:** -40°C to 90°C
- **Weight:** 160 g
- **Housing Material:** Glass filled polyester
- **Acoustic Window:** Glass reinforced epoxy

*Pulse-Echo Mode: Minimum and maximum ranges are best case scenarios. Actual range may vary, depending on drive circuitry and signal processing.

**Note:** Optimally, performance measurements should be taken when the transducer reaches a steady state.

**Applications**

- Level measurement
- Open channel flow
- Proximity
- Obstacle avoidance
- Robotics

**Features**

- Rugged sealed construction
- Cylindrical design allows for installation in various applications

**Options**

- 10 KΩ thermistor available for temperature compensation

**Dimensions**

Airmar’s T1 Developer’s Transceiver Module can be used for evaluation of AIRDUCER® Transducers.

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**ATK50**

**50 kHz**

**AIRDUCER® Ultrasonic Transducer**

**Applications**
- Level measurement in chemically aggressive environments
- Food and beverage processing
- Proximity sensing
- Obstacle avoidance

**Features**
- Rugged one-piece PVDF housing is U.S. FDA compliant
- Cylindrical design allows for installation in various applications

**Options**
- 10 KΩ thermistor available for temperature compensation

**Dimensions**

**Directivity Pattern**

**Transmit & Receive Voltage Response**

**Impedance Magnitude & Phase**

**Figure of Merit** (Sum of TVR & RVR)

*Pulse-Echo Mode: Minimum and maximum ranges are best case scenarios. Actual range may vary, depending on drive circuitry and signal processing. Note: Optimally, performance measurements should be taken when the transducer reaches a steady state.
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**ARK50**

Optional cap kit

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### SPECIFICATIONS

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
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<tbody>
<tr>
<td>Best Operating Frequency:</td>
<td>50 kHz, ±4%</td>
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<tr>
<td>Minimum Transmit Sensitivity at Best Transmit Freq.:</td>
<td>105 dB re 1µPa/V at 1 m</td>
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<td>-170 dB re 1V/µPa</td>
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<tr>
<td>Minimum Parallel Resistance:</td>
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<tr>
<td>Minimum and Maximum Sensing Range*:</td>
<td>30 cm to 15 m</td>
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<tr>
<td>Typical Sensing Range:</td>
<td>35 cm to 10 m</td>
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<tr>
<td>Free (1 kHz) Capacitance:</td>
<td>5,000 pF, ±20% pF</td>
</tr>
<tr>
<td>Beamwidth (@ -3 dB Full Angle):</td>
<td>10°, ±2°</td>
</tr>
<tr>
<td>Maximum Driving Voltage (2% Duty Cycle Tone Burst):</td>
<td>1,000 Vpp</td>
</tr>
<tr>
<td>Operating Temperature:</td>
<td>-40°C to 90°C</td>
</tr>
<tr>
<td>Weight:</td>
<td>250 g</td>
</tr>
<tr>
<td>Housing Material:</td>
<td>Kynar® 720</td>
</tr>
<tr>
<td>Acoustic Window:</td>
<td>Kynar® 720</td>
</tr>
</tbody>
</table>

*Pulse-Echo Mode: Minimum and maximum ranges are best case scenarios. Actual range may vary, depending on drive circuitry and signal processing.  

**Features**

- Rugged one-piece PVDF housing is U.S. FDA compliant  
- Housing design will accommodate transceiver and signal processing electronics  
- Standard internal shielding

**Options**

- Cable length can be customized  
- 10 KΩ thermistor available for temperature compensation  
- Mounting cap available in BSP, NPT or M32 threads  
- Available in alternate housing (AR50)

**Dimensions**

Thread Choices:  
1" tapered BSP x 0.75" long  
1" NPT x 0.94" long (ref.)  
M32-1.5 x 0.75" long

May be shown with optional equipment.

---

**50 kHz**

### AIRDUCER® Ultrasonic Transducer

#### Applications

- Level measurement in chemically aggressive environments  
- Food and beverage processing  
- Flow monitoring  
- Proximity sensing

#### Features

- Rugged one-piece PVDF housing is U.S. FDA compliant  
- Housing design will accommodate transceiver and signal processing electronics  
- Standard internal shielding

#### Options

- Cable length can be customized  
- 10 KΩ thermistor available for temperature compensation  
- Mounting cap available in BSP, NPT or M32 threads  
- Available in alternate housing (AR50)

---

### Additional Resources

Airmar's T1 Developer's Transceiver Module can be used for evaluation of AIRDUCER® Transducers.

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**75 kHz AIRDUCER® Ultrasonic Transducer**

**Applications**
- Level measurement in chemically aggressive environments
- Food and beverage processing
- Flow monitoring

**Features**
- Rugged one-piece PVDF housing is U.S. FDA compliant
- Threaded design allows for installation in various applications
- Standard internal shielding

**Options**
- Nut—1.5” BSP thread
- Cable length can be customized
- 10 KΩ thermistor available for temperature compensation
- 12 mm extension sleeve
- Mounting caps available in BSP, NPT, or M32 threads
- Optional PCB standoff configuration lengths available

**Dimensions**

**Impedance Magnitude & Phase**

**Directivity Pattern**

**Transmit & Receive Voltage Response**

**Figure of Merit (Sum of TVR & RVR)**

**Directivity Pattern Transmit & Receive**

**Voltage Response**

**Impedance**

**Figure of Merit**

**Theory of Operations**

**Applying Ultrasonic Technology**

**T1 Developer Board**

Airmar’s T1 Developer’s Transceiver Module can be used for evaluation of AIRDUCER® Transducers.
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AT75

75 kHz

AIRDUCER® Ultrasonic Transducer

Applications
- Level measurement
- Open channel flow
- Proximity
- Obstacle avoidance
- Robotics

Features
- Rugged sealed construction
- Cylindrical design allows for installation in various applications

Options
- Complete assembly or kit versions
- Available in PVDF housing for use in chemically aggressive environments (ATK75)
- 10 KΩ thermistor available for temperature compensation

Dimensions

Additional Resources

Airmar’s T1 Developer’s Transceiver Module can be used for evaluation of AIRDUCER® Transducers.
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**ATK75**

**SPECIFICATIONS**

- **Best Operating Frequency**: 75 kHz, ±4%
- **Minimum Transmit Sensitivity at Best Transmit Frequency**: 111 dB re 1µPa/V at 1 m
- **Minimum Receive Sensitivity at Best Receive Frequency**: -162 dB re 1V/µPa
- **Minimum Parallel Resistance**: 170 Ω, ±30%
- **Minimum and Maximum Sensing Range**: 20 cm to 10 m
- **Typical Sensing Range**: 25 cm to 7 m
- **Free (1 kHz) Capacitance**: 1,850 pF, ±20%
- **Beamwidth (@ -3 dB Full Angle)**: 15°, ±2°
- **Maximum Driving Voltage (2% Duty Cycle Tone Burst)**: 1,000 Vpp
- **Operating Temperature**: -40°C to 90°C
- **Weight**: 45 g
- **Housing Material**: Glass filled polyester
- **Acoustic Window**: Glass reinforced epoxy

*Pulse-Echo Mode: Minimum and maximum ranges are best case scenarios. Actual range may vary, depending on drive circuitry and signal processing. Note: Optimally, performance measurements should be taken when the transducer reaches a steady state.

**75 kHz**

**AIRDUCER® Ultrasonic Transducer**

**Applications**

- Level measurement in chemically aggressive environments
- Automation control
- Food and beverage processing
- Proximity sensing
- Obstacle avoidance

**Features**

- Rugged one-piece PVDF housing is U.S. FDA compliant
- Cylindrical design allows for installation in various applications

**Options**

- 10 KΩ thermistor available for temperature compensation
- Available in alternate housing (AT75)

**Dimensions**

![Dimension Diagram](38 mm)

**Additional Resources**

Airmar’s T1 Developer’s Transceiver Module can be used for evaluation of AIRDUCER® Transducers.

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**AT120**

**125 kHz**

**AIRDUCER® Ultrasonic Transducer**

**Applications**
- Level measurement
- Automation control
- Proximity
- Obstacle avoidance
- Robotics

**Features**
- Rugged sealed construction
- Cylindrical design allows for installation in various applications

**Options**
- Available in PVDF housing for use in chemically aggressive environments (ATK120)
- 10 KΩ thermistor available for temperature compensation

**Dimensions**

**Impeadence Magnitude & Phase**

**Figure of Merit** (Sum of TVR & RVR)

**Additional Resources**

Airmar’s T1 Developer’s Transceiver Module can be used for evaluation of AIRDUCER® Transducers.

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**SPECIFICATIONS**

- Best Operating Frequency: 125 kHz, ±4%
- Minimum Transmit Sensitivity at Best Transmit Frequency: 107 dB re 1µPa/V at 1 m
- Minimum Receive Sensitivity at Best Receive Freq.: -169 dB re 1V/µPa
- Minimum Parallel Resistance: 420 Ω, ±30%
- Minimum and Maximum Sensing Range*: 15 cm to 7 m
- Typical Sensing Range: 20 cm to 3 m
- Free (1 kHz) Capacitance: 1,000 pF, ±20% pF
- Beamwidth (@ -3 dB Full Angle): 12°, ±2°
- Maximum Driving Voltage (2% Duty Cycle Tone Burst): 800 Vpp
- Operating Temperature: -40°C to 90°C
- Weight: 20 g
- Housing Material: Glass filled polyester
- Acoustic Window: Glass reinforced epoxy

*Pulse-Echo Mode: Minimum and maximum ranges are best case scenarios. Actual range may vary, depending on drive circuitry and signal processing.

Note: Optimally, performance measurements should be taken when the transducer reaches a steady state.

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**Directivity Pattern**

**Transmit & Receive Voltage Response**

**Theory of Operations**

Applying Ultrasonic Technology

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**ATK120**

### 125 kHz

**AIRDUCER® Ultrasonic Transducer**

**Applications**
- Level measurement in chemically aggressive environments
- Automation control
- Food and beverage processing
- Proximity sensing
- Obstacle avoidance

**Features**
- Rugged one-piece PVDF housing is U.S. FDA compliant
- Cylindrical design allows for installation in various applications

**Options**
- 10 KΩ thermistor available for temperature compensation
- Available in alternate housing (AT120)

**Dimensions**

**Specifications**

- **Best Operating Frequency:** 125 kHz, ±4%
- **Minimum Transmit Sensitivity at Best Transmit Frequency:** 102 dB re 1µPa/V at 1 m
- **Minimum Receive Sensitivity at Best Receive Freq.** -172 dB re 1V/µPa
- **Minimum Parallel Resistance:** 500 Ω, ±30%
- **Minimum and Maximum Sensing Range**: 15 cm to 5 m
- **Typical Sensing Range**: 20 cm to 3 m
- **Free (1 kHz) Capacitance**: 1,000 pF, ±20% pF
- **Beamwidth (@ -3 dB Full Angle)**: 10°, ±2°
- **Maximum Driving Voltage (2% Duty Cycle Tone Burst)**: 800 Vpp
- **Operating Temperature**: -40°C to 90°C
- **Weight**: 30 g
- **Housing Material**: Kynar® 720
- **Acoustic Window**: Kynar® 720

*Pulse-Echo Mode*: Minimum and maximum ranges are best case scenarios. Actual range may vary, depending on drive circuitry and signal processing.

**Note**: Optimally, performance measurements should be taken when the transducer reaches a steady state.

**Directivity Pattern**

**Transmit & Receive Voltage Response**

**Impedance Magnitude & Phase**

**Figure of Merit** (Sum of TVR & RVR)

**Additional Resources**

Airmar’s T1 Developer’s Transceiver Module can be used for evaluation of AIRDUCER® Transducers.
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**ARK120-THD**

**125 kHz AIRDUCER® Ultrasonic Transducer**

**Applications**
- Level measurement in chemically aggressive environments
- Food and beverage processing

**Features**
- Rugged one-piece PVDF housing is U.S. FDA compliant
- Threaded design allows for installation in various applications
- Standard internal shielding

**Options**
- Nut—1.5” BSP thread
- Complete assembly available with standard cable lengths
- 10 KΩ thermistor available for temperature compensation
- 12 mm extension sleeve
- PCB standoff configuration lengths available

**Dimensions**

**Additional Resources**

Airmar’s T1 Developer’s Transceiver Module can be used for evaluation of AIRDUCER® Transducers.

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*A pulse-echo mode: Minimum and maximum ranges are best case scenarios. Actual range may vary, depending on drive circuitry and signal processing. Note: Optimally, performance measurements should be taken when the transducer reaches a steady state.*
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**AT200**

**SPECIFICATIONS**

- Best Operating Frequency: 200 kHz, ±4%
- Minimum Transmit Sensitivity at Best Transmit Frequency: 105 dB re 1µPa/V at 1 m
- Minimum Receive Sensitivity at Best Receive Freq.: -174 dB re 1V/µPa
- Minimum Parallel Resistance: 180 Ω, ±30%
- Minimum and Maximum Sensing Range*: 10 cm to 3 m
- Typical Sensing Range: 12 cm to 2 m
- Free (1 kHz) Capacitance: 500 pF, ±20% pF
- Beamwidth (@ -3 dB Full Angle): 12°, ±2°
- Maximum Driving Voltage (2% Duty Cycle Tone Burst): 500 Vpp
- Operating Temperature: -40°C to 90°C
- Weight: 6 g
- Housing Material: Glass filled polyester
- Acoustic Window: Glass reinforced epoxy

*Pulse-Echo Mode: Minimum and maximum ranges are best case scenarios. Actual range may vary, depending on drive circuitry and signal processing.

**Features**

- Rugged sealed construction
- Cylindrical design allows for installation in various applications
- Available in PVDF housing for use in chemically aggressive environments (ATK200)

**Dimensions**

- Ø 16 mm
- 19 mm

**Applications**

- Level measurement
- Automation control
- Proximity
- Obstacle avoidance
- Robotics

**Directivity Pattern**

**Transmit & Receive Voltage Response**

**Impedance Magnitude & Phase**

**Figure of Merit (Sum of TVR & RVR)**

**Additional Resources**

Airmar’s T1 Developer’s Transceiver Module can be used for evaluation of AIRDUCER® Transducers.

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www.airmar.com
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**ATK200**

**SPECIFICATIONS**

- **Best Operating Frequency:** 200 kHz, ±4%
- **Minimum Transmit Sensitivity at Best Transmit Frequency:** 102 dB re 1µPa/V at 1 m
- **Minimum Receive Sensitivity at Best Receive Freq.:** -180 dB re 1V/µPa
- **Minimum Parallel Resistance:** 300 Ω, ±30%
- **Minimum and Maximum Sensing Range**: 10 cm to 3 m
- **Typical Sensing Range:** 12 cm to 2 m
- **Free (1 kHz) Capacitance:** 500 pF, ±20% pF
- **Beamwidth (@ -3 dB Full Angle):** 10°, ±2°
- **Maximum Driving Voltage (2% Duty Cycle Tone Burst):** 500 Vpp
- **Operating Temperature:** -40°C to 60°C
- **Weight:** 6 g
- **Housing Material:** Kynar® 720
- **Acoustic Window:** Kynar® 720

*Pulse-Echo Mode: Minimum and maximum ranges are best case scenarios. Actual range may vary, depending on drive circuitry and signal processing.

**Note:** Optimally, performance measurements should be taken when the transducer reaches a steady state.

**200 kHz AIRDUCER® Ultrasonic Transducer**

**Applications**

- Level measurement in chemically aggressive environments
- Automation control
- Food and beverage processing
- Proximity sensing
- Obstacle avoidance
- Flow monitoring

**Features**

- Rugged one-piece PVDF housing is U.S. FDA compliant
- Cylindrical design allows for installation in various applications

**Options**

- Available in alternate housing (AT200)

**Dimensions**

**Directivity Pattern**

**Transmit & Receive Voltage Response**

**Impedance Magnitude & Phase**

**Figure of Merit (Sum of TVR & RVR)**

**Theory of Operations**

Applying Ultrasonic Technology

**Additional Resources**

Airmar’s T1 Developer’s Transceiver Module can be used for evaluation of AIRDUCER® Transducers.

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**AT225**

**228 kHz**

**AIRDUCER® Ultrasonic Transducer**

**Applications**
- Level measurement
- Automation control
- Proximity
- Obstacle avoidance
- Robotics
- Flow

**Features**
- Rugged sealed construction
- Cylindrical design allows for installation in various applications

**Options**
- Optional circuit board mounting pins
- 2 wire version is standard. Also available with coaxial cable.

**Dimensions**

**Directivity Pattern**

**Transmit & Receive Voltage Response**

**Impedance Magnitude & Phase**

**Figure of Merit (Sum of TVR & RVR)**

**Additional Resources**

Airmar’s T1 Developer’s Transceiver Module can be used for evaluation of AIRDUCER® Transducers.

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**AT225**

**SPECIFICATIONS**

- **Best Operating Frequency:** 228 kHz, ±4%
- **Minimum Transmit Sensitivity at Best Transmit Frequency:** 101 dB re 1µPa/V at 1 m
- **Minimum Receive Sensitivity at Best Receive Freq.:** -180 dB re 1V/µPa
- **Minimum Parallel Resistance:** 400 Ω, ±30%
- **Minimum and Maximum Sensing Range**: 8 cm to 2.5 m
- **Typical Sensing Range**: 10 cm to 1.5 m
- **Free (1 kHz) Capacitance**: 450 pF, ±20% pF
- **Beamwidth (@ -3 dB Full Angle)**: 15°, ±2°
- **Maximum Driving Voltage (2% Duty Cycle Tone Burst)**: 500 Vpp
- **Operating Temperature**: -40°C to 90°C
- **Weight**: 4 g
- **Housing Material**: Glass filled polyester
- **Acoustic Window**: Glass reinforced epoxy

*Pulse-Echo Mode: Minimum and maximum ranges are best case scenarios. Actual range may vary, depending on drive circuitry and signal processing.

Note: Optimally, performance measurements should be taken when the transducer reaches a steady state.

---

**Applications**
- Level measurement
- Automation control
- Proximity
- Obstacle avoidance
- Robotics
- Flow

**Features**
- Rugged sealed construction
- Cylindrical design allows for installation in various applications

**Options**
- Optional circuit board mounting pins
- 2 wire version is standard. Also available with coaxial cable.

**Dimensions**

**Directivity Pattern**

**Transmit & Receive Voltage Response**

**Impedance Magnitude & Phase**

**Figure of Merit (Sum of TVR & RVR)**

**Additional Resources**

Airmar’s T1 Developer’s Transceiver Module can be used for evaluation of AIRDUCER® Transducers.

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**AT225**

**SPECIFICATIONS**

- **Best Operating Frequency:** 228 kHz, ±4%
- **Minimum Transmit Sensitivity at Best Transmit Frequency:** 101 dB re 1µPa/V at 1 m
- **Minimum Receive Sensitivity at Best Receive Freq.:** -180 dB re 1V/µPa
- **Minimum Parallel Resistance:** 400 Ω, ±30%
- **Minimum and Maximum Sensing Range**: 8 cm to 2.5 m
- **Typical Sensing Range**: 10 cm to 1.5 m
- **Free (1 kHz) Capacitance**: 450 pF, ±20% pF
- **Beamwidth (@ -3 dB Full Angle)**: 15°, ±2°
- **Maximum Driving Voltage (2% Duty Cycle Tone Burst)**: 500 Vpp
- **Operating Temperature**: -40°C to 90°C
- **Weight**: 4 g
- **Housing Material**: Glass filled polyester
- **Acoustic Window**: Glass reinforced epoxy

*Pulse-Echo Mode: Minimum and maximum ranges are best case scenarios. Actual range may vary, depending on drive circuitry and signal processing.

Note: Optimally, performance measurements should be taken when the transducer reaches a steady state.

---

**Applications**
- Level measurement
- Automation control
- Proximity
- Obstacle avoidance
- Robotics
- Flow

**Features**
- Rugged sealed construction
- Cylindrical design allows for installation in various applications

**Options**
- Optional circuit board mounting pins
- 2 wire version is standard. Also available with coaxial cable.

**Dimensions**

**Directivity Pattern**

**Transmit & Receive Voltage Response**

**Impedance Magnitude & Phase**

**Figure of Merit (Sum of TVR & RVR)**

**Additional Resources**

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**AT300**

### SPECIFICATIONS

**Best Operating Frequency:** 300 kHz, ±4%

**Minimum Transmit Sensitivity at Best Transmit Frequency:**
95 dB re 1µPa/V at 1 m

**Minimum Receive Sensitivity at Best Receive Frequency:** -180 dB re 1V/µPa

**Minimum Parallel Resistance:** 650 Ω, ±30%

**Minimum and Maximum Sensing Range**: 4 cm to 1 m

**Typical Sensing Range:** 5 cm to 50 cm

**Free (1 kHz) Capacitance:** 450 pF, ±20% pF

**Beamwidth (@ -3 dB Full Angle):** 10°, ±2°

**Maximum Driving Voltage (2% Duty Cycle Tone Burst):** 200 Vpp

**Operating Temperature:** -40°C to 70°C

**Weight:** 4 g

**Housing Material:** Glass filled polyester

**Acoustic Window:** Glass reinforced epoxy

*Note: Optimally, performance measurements should be taken when the transducer reaches a steady state.*

**Applications**

- Level measurement
- Automation control
- Proximity
- Obstacle avoidance
- Robotics

**Features**

- Rugged sealed construction
- Cylindrical design allows for installation in various applications
- Short-range measurement capabilities

### Dimensions

- ø 12 mm
- 10 mm

### Directivity Pattern

- TVR
- RVR

### Transmit & Receive Voltage Response

- Frequency in kHz
- TVR (V/V) re 1µPa/V at 1 m
- RVR (V/V) re 1V/µPa

### Impedance Magnitude & Phase

- Frequency in kHz
- Magnitude in Ω
- Phase (°)

### Figure of Merit (Sum of TVR & RVR)

- Frequency in kHz
- Phases in Degrees
- Magnitude in Ω

### Additional Resources

Airmar’s T1 Developer’s Transceiver Module can be used for evaluation of AIRDUCER® Transducers.