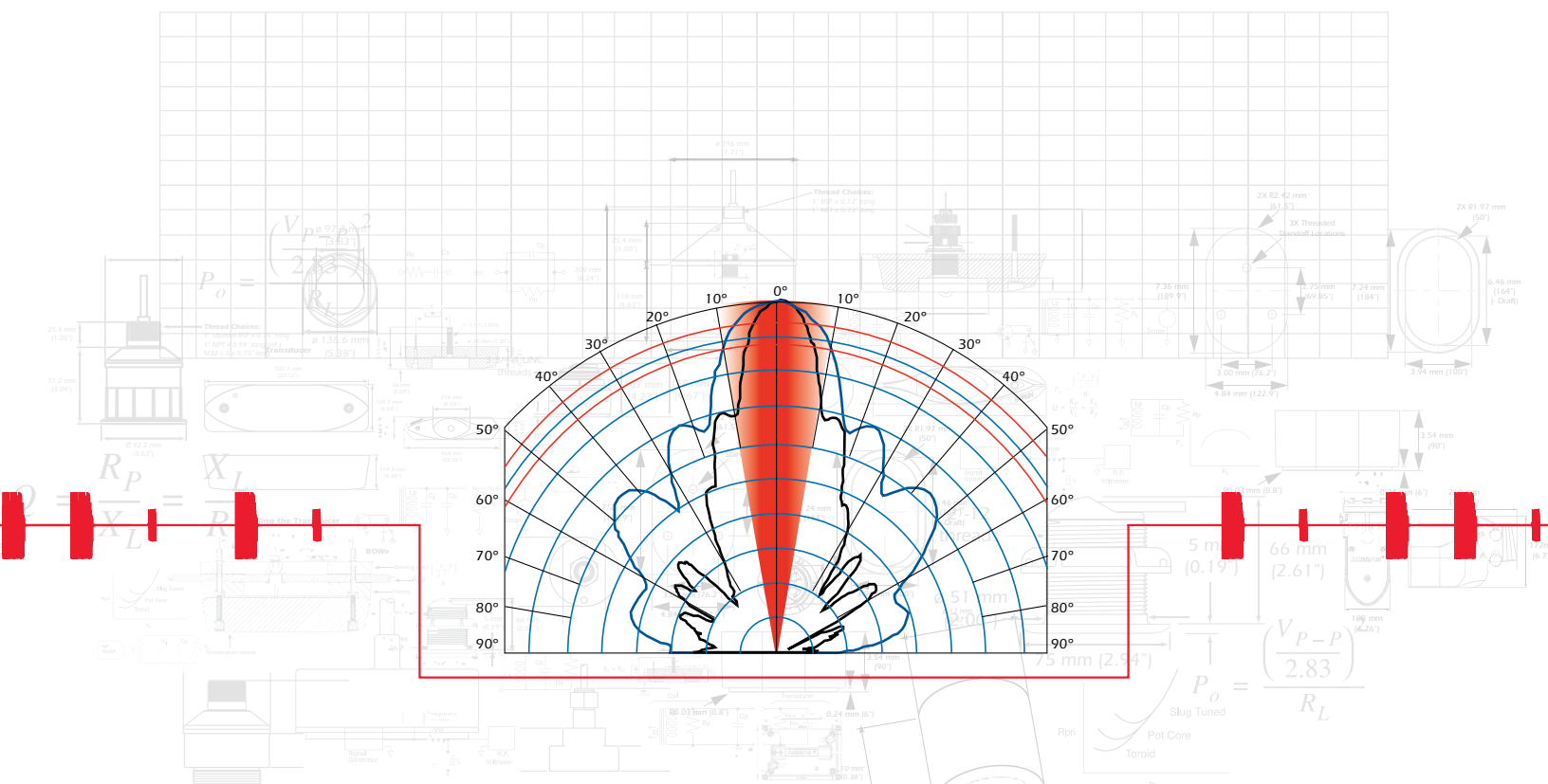




Sensing Technology

Experts in Design, Engineering & Manufacturing

Ultrasonic Transducers • Sensor Technology



President's Message



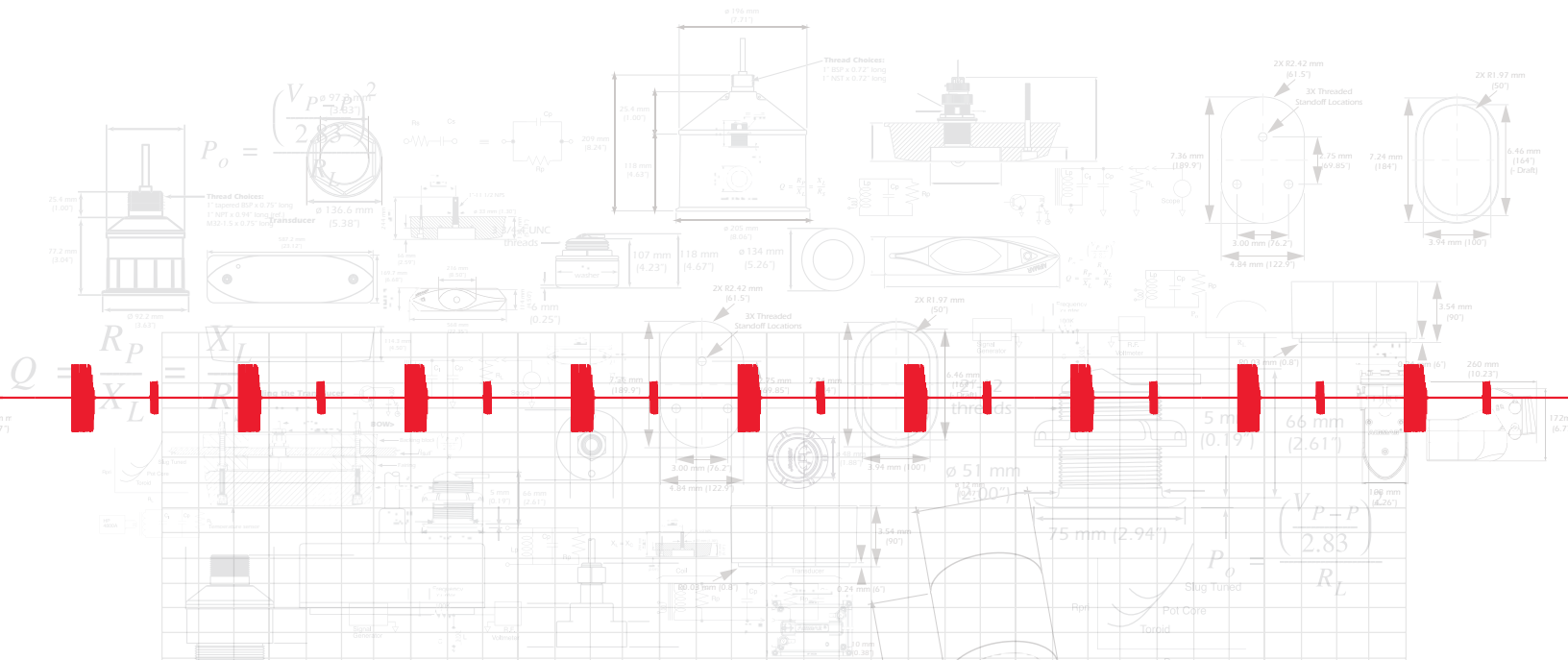
Since 1982, AIRMAR has been dedicated to developing innovative sensor technology with the result that our products are unsurpassed in design, quality and performance. From our initial focus on the recreational marine industry, we have evolved to become the premier supplier of ultrasonic transducers and sensors to OEMs worldwide for use on land, sea, and air.

At AIRMAR, we evaluate each application and identify products that will deliver the most cost-effective solution. We also work with our customers to develop products that meet an expressed need. Consequently, we understand the benefit of listening to our customers and providing them with innovative technology, value, and customer service.

As a world leader in virtually every market we serve, AIRMAR is committed to maintaining the high standards that our company was founded upon. Product integrity, continuous improvement, and customer satisfaction will remain our priorities for the future.

Steve Boucher, *CEO and Founder*

"Customer satisfaction and product quality are the benchmark to which every AIRMAR employee adheres."



AIRMAR Delivers a Winning Formula

AIRMAR's skilled team of world-renowned scientists, multidisciplinary engineers, designers, and technicians lead the company in research and development. In fact, 12 – 14% of the company's sales are reinvested in the company, allowing us to continue creating innovative products quickly. Our product lines include advanced ultrasonic transducers, flow sensors, WeatherStation® instruments, and electronic compasses used for a wide variety of applications including fishing, navigation, meteorology, survey, level measurement, process control, and proximity sensing.

Located one hour north of Boston, AIRMAR's original 75,000 square foot facility was designed and custom-built to accommodate the company's stringent engineering and manufacturing disciplines. In 2012, sustained growth prompted expansion into a second facility adding another 72,000 square feet. Located across the street from the existing headquarters, both buildings have been executed following Lean Manufacturing principles, allowing for shorter lead times and less waste.

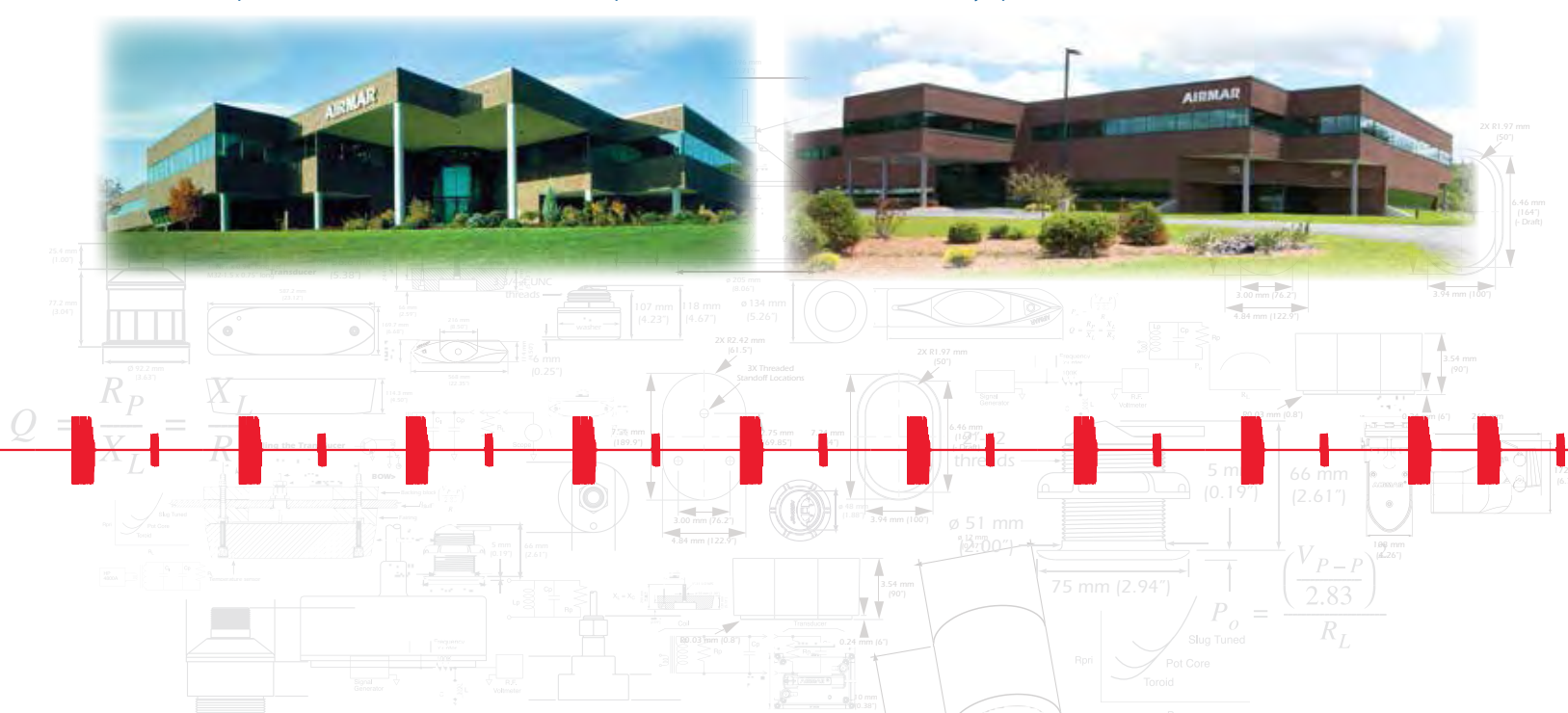
AIRMAR is home to over 250 employees and encompasses engineering, manufacturing, sales, and marketing. Outstanding personnel coupled with our state-of-the-art facilities featuring acoustic test tanks and cutting-edge testing equipment, allows us to develop and test new technologies quickly, accurately, and cost effectively. We are full-service experts in the design, engineering, and manufacturing of innovative sensors with over thirty years of successful OEM partnerships.

Manufacturing and test capabilities include:

- Production capacity in excess of 960,000 units per year
- Complete transducer assemblies
- Connector and cable assemblies
- Piezoflex™ PVDF polymer
- Encapsulation
 - Atmospheric pressure
 - Under vacuum
- Solder robot
- Injection molding equipment
- Two acoustic test tanks and multiple production test tanks
- Test boats
- Wind tunnels
- Environmental test chambers

AIRMAR's headquarters are located in Milford, New Hampshire, USA.

AIRMAR's new facility opened in December 2013.



Recreational Boating & Fishing

AIRMAR is the primary supplier of ultrasonic transducers to manufacturers of marine electronics for recreational boating, sportfishing, and commercial fishing applications. From our small personal-watercraft sensors to our large ceramic arrays, AIRMAR products are synonymous with quality and performance. As the marine industry grows, AIRMAR continues to introduce new and innovative technology—including broadband transducers for next generation CHIRP (compressed high-intensity radar pulse) fishfinders. This is changing the world of fishing by delivering five to ten times greater sensitivity and target resolution than the current fishfinder technology on the market.

Products:

- A wide range of sensors from fundamental depth, speed, and temperature sensors to high-performance transducers
- CHIRP transducers featuring our exclusive broadband technology
- NMEA 2000® and NMEA 0183 Smart™ sensors
- Ultrasonic WeatherStation® instruments
- GPS and heading sensors

Applications:

- Recreational boating
- Sportfishing
- Commercial fishing
- Marine mammal acoustic deterrents

Customers currently using CHIRP fishfinders are reporting detection so exact that certain fish species can be identified at depths never before imaginable.

"CHIRP has changed the entire game—I'll never fish without it. With CHIRP, my time on the water is maximized 100%."

Capt. Bill Dobbelaer
General Manager
Gray Taxidermy

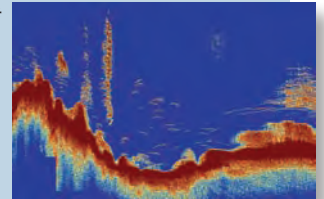
The Benefits of Broadband Technology

In the past, customers looking to integrate piezoceramic transducers into products were forced to sacrifice sensitivity for bandwidth. By incorporating advanced piezoelectric materials and proprietary manufacturing processes, AIRMAR's broadband transducer designs deliver excellent transmitting and receiving response, coupled with 50% bandwidth. In turn, these transducers enable breakthrough performance at an affordable price. Currently, AIRMAR manufactures more than thirty broadband transducers covering frequencies ranging from 10 kHz - 1 MHz.

Acoustic performance of AIRMAR's broadband transducers offer:

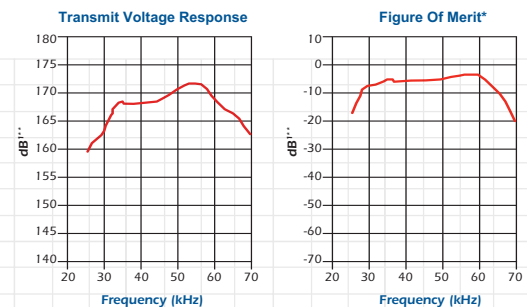
- Superior acoustic performance
- Wide bandwidths (35 - 60%)*
- Extremely low ringing
- Low sidelobes
- Low Q value (1.8 to 3)*
- Various mounting options
- Exclusive Transducer ID® technology

* depending on the model

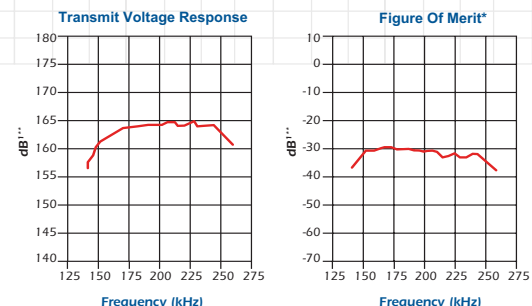


COMMON CHIRP FREQUENCIES

28 to 60 kHz



150 to 250 kHz



* Figure of Merit (insertion loss) is a measure of how well a transducer works when used for both transmitting and then receiving its own echoes.
**dB¹ = re₁μPa/v@1m

Navigation & Survey

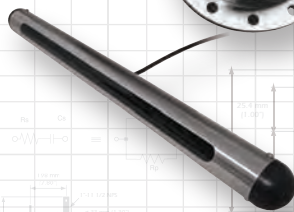
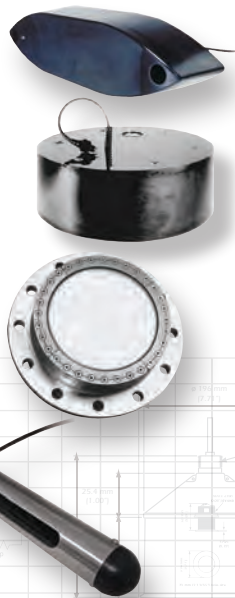
AIRMAR offers a full line of transducers for hydrographic survey and scientific applications including models suitable for shallow water, harbor survey, deep ocean survey, and sub-bottom profiling. AIRMAR's high-performance, broadband transducers are supplied as original equipment with many commercial fishing and survey echosounder systems from industry-leading manufacturers. When used as replacement transducers for already installed systems, they make the perfect, low-priced, high value, performance enhancement.

Products:

- Broadband, CHIRP, IMO and doppler transducers
- Single and multi-beam transducers
- Smart™ digital sensors
- Hydrophones (manufactured with exclusive Piezoflex™ polymer)
- Underwater modem transducers
- Correlation speed logs

Applications:

- Shallow and deep water survey
- River, port and harbor survey
- Portable hydrographic survey
- Sub-bottom profiling
- Acoustic profiling and backscatter
- Trawl monitoring
- Bridge scour inspection
- Doppler speed logs
- Interferometry



Custom Configurations

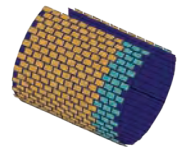
AIRMAR specializes in OEM partnerships and has a proven record of providing customized product solutions. OEMs depend on AIRMAR for exactly the right combination of sensing technology tailored to your application.

Together, AIRMAR's patented, low-Q, Piezoflex™ PVDF receive array technology and unique broadband CHIRP transducers create the ideal acoustic receiver technology for your hydrographic needs. With this combination, AIRMAR achieves products that are:

- low-cost
- lightweight and flexible
- impact resistant
- customizable—allowing you to create your own shapes, tailor the beam patterns to your specifications and ultimately design the perfect polymer hydrophone for your application



PVDF material



PVDF Array Layout



AN/AQS-20A
Minehunting Sonar

"AIRMAR's unique low frequency (10 kHz to 20 kHz) broadband, CHIRP-ready projector, and Piezoflex™ receive array are the enabling technologies for our new PINGER SBP system. In addition to the advantages of a wider bandwidth and excellent resolution, the Pinger is a portable solution at a modest cost. Having partnered with AIRMAR for over 15 years, we continue to work together on the design of new products and customized sensing technology solutions."

Judith Knudsen
V.P. Operations / Marketing
Knudsen Engineering Limited

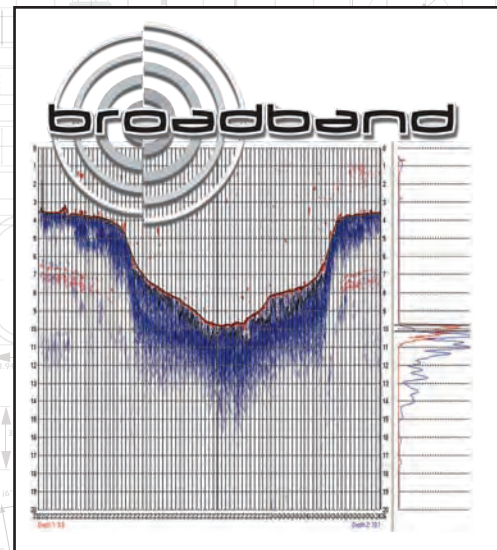


Image courtesy of Teledyne Odom Hydrographic

Industrial

Building on the company's core business and strength in underwater applications for the marine industry, AIRMAR has successfully expanded its product line to include standard and custom ultrasonic transducers for a wide variety of industrial applications.

Our air-ranging transducers provide non-contact solutions for customers' toughest sensing problems. Unlike other sensing techniques, ultrasonic sensors can detect clear, transparent or shiny objects and are not affected by color.

Engineered to meet the most demanding applications, AIRMAR's air transducers are rated IP68 and have no movable parts which translates into low maintenance and long-term reliability. The AR series meets Factory Mutual (FM) approval, suitable for Class 1, Division 1, hazardous locations.

Our broadband transducers for flow measurement (such as doppler speed logs, time of flight, correlation and flow meters) are also available in standard and custom housings. By operating over a wide frequency range (15 kHz - 1 MHz) these transducers achieve superior results.



Products:

- Ultrasonic transducers for use in air and water

Applications:

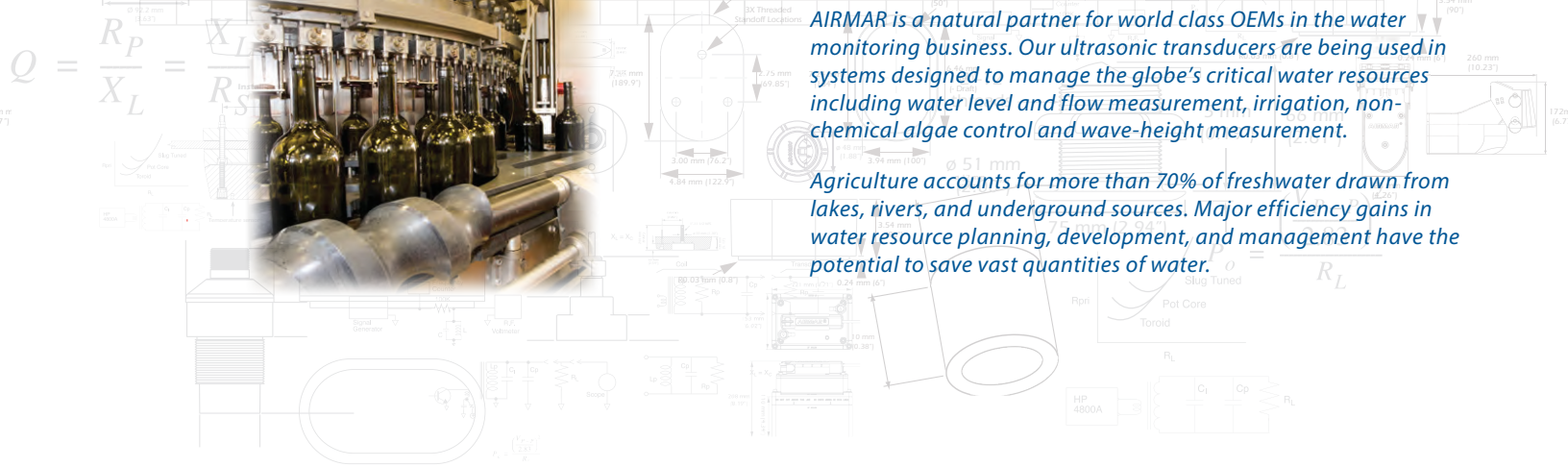
- Level measurement
- Open and closed channel flow
- Inventory control
- Process automation
- Proximity and position sensing
- Distance measurement
- Obstacle avoidance
- Food processing
- Web-tension control



Where there is water, there is AIRMAR.

AIRMAR is a natural partner for world class OEMs in the water monitoring business. Our ultrasonic transducers are being used in systems designed to manage the globe's critical water resources including water level and flow measurement, irrigation, non-chemical algae control and wave-height measurement.

Agriculture accounts for more than 70% of freshwater drawn from lakes, rivers, and underground sources. Major efficiency gains in water resource planning, development, and management have the potential to save vast quantities of water.



Environmental Monitoring

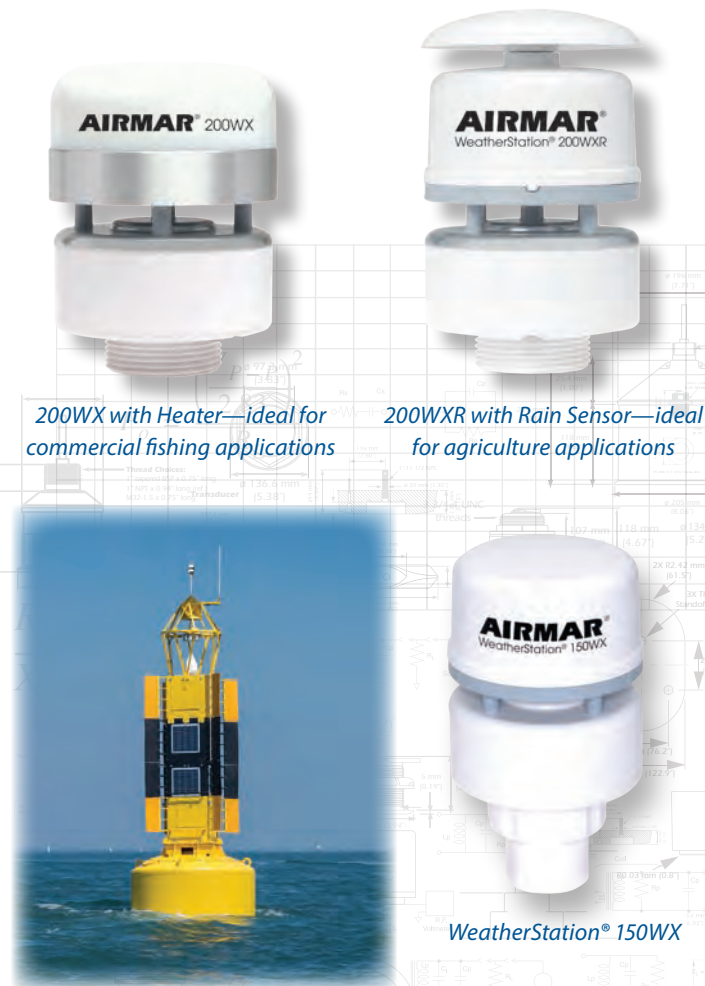
AIRMAR has grown its business in the agriculture and meteorological markets with the ultrasonic WeatherStation® instruments. These best-in-class products meet a growing need for real-time, site-specific weather information. The all-in-one weather sensors measure apparent wind speed and direction, barometric pressure, air temperature, relative humidity, dew point, and wind chill temperature. And, with the optional internal compass and GPS, true wind speed and direction can also be calculated. AIRMAR combines up to seven sensors, all with no moving parts, into one compact unit saving customers money, installation time, and repairs.

Products:

- WeatherStation® instruments

Applications:

- Harbor and port security
- Offshore weather monitoring (oil and drilling rigs, buoys)
- Emergency responders (police, fire, rescue, hazmat)
- Agricultural spraying
- Government, military and defense
- Meteorology



Renewable Energy

AIRMAR's participation in the growing renewable energy industry—particularly wind energy—has opened doors for new partnerships. Energy suppliers depend on accurate wind statistics in determining the best sites to locate wind farms according to sufficient wind resources. This same information influences how wind turbines (ranging from 10 to 100 kW) should be positioned in relation to each other. AIRMAR's WeatherStation® instruments and ultrasonic transducers have proven to be invaluable to manufacturers demanding accurate and instantaneous data when monitoring weather conditions on-site or in remote locations.



Products:

- WeatherStation® instruments
- Ultrasonic transducers
- Compass and GPS heading sensors

Applications:

- Wind resource management
 - Onshore and offshore wind energy
 - Site monitoring
 - Wind farms
- Remote sensing devices
 - Lidar and sodar systems



"We chose to incorporate AIRMAR's 150WX WeatherStation® into our ZephIR 300 remote wind lidar system. In addition to providing a quality product at a reasonable price, AIRMAR worked closely with the ZephIR team to ensure that our customers are guaranteed a quality system out of the box... every time."

Alex Woodward
Marketing & Product Development Manager
Natural Power, Renewable Energy Consultants



Sensing Technology

As Airmar constantly improves its products, all specifications are subject to change without notice. All Airmar products are designed to provide high levels of accuracy and reliability, however they should only be used as aids to navigation and not as a replacement for traditional navigation aids and techniques. WeatherStation®, Airducer®, WeatherCaster™, Piezoflex™, and Smart™ Sensors are registered trademarks and trademarks 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.

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