FT TECHNOLOGIES

THE FT 7 SERIES

POWERED BY acu res TECHNOLOGY

THE WORLD'S
TOUGHEST
WIND SENSORS

SPEED | DIRECTION | TEMPERATURE

THE WORLD'S TOUGHEST WIND SENSORS

They look different because they are different

Powered by our own Acu-Res® Technology, FT wind sensors are unique in the market. Resonating an acoustic wave inside a narrow cavity allows us to design compact wind sensors with a signal-to-noise ratio more than 40dB stronger than other ultrasonic technologies.

Extremely small, with no moving parts to degrade or damage, the sensors are rugged, maintenance-free and deliver over 99.9% data availability, for years on end, even in the harshest of environments.

New design delivers improved accuracy

The new, innovative design incorporates a series of "turbulators" which condition the air flow and improve accuracy. Along with updated software, and calibration in our new state-of-the-art wind tunnel, the FT7 Series wind sensors measure up to 75m/s and deliver our highest levels of accuracy in wind speed and direction measurement. A further upgrade means that the FT722 and FT742 models now also read the ambient air temperature within the measurement cavity.

Maintenance-free

The aluminium hard anodised body is highly resistant to corrosion, sand, dust, ice, solar radiation and bird attack. The sensor is sealed to IP66 and IP67 standards and inherently compensates for changes in air temperature, pressure and humidity.

Mobile, compact, lightweight

The FT7 Series wind sensors are small and lightweight, making them well suited for portability. The sensors are available with RS485 (half-duplex), RS422 or analogue 4-20mA output, and can be specified to output data in m/s, km/h or knots.

Rugged and shock-resistant

With no moving parts to degrade or damage, and resistant to shock and vibration, the FT7 Series is suitable for mobile applications.

Powerful de-icing

The FT7 Series are fitted with a thermostatically controlled heating system. The sensors maintain their temperature at a user specified heater set point of between 0° and 55°C.

Low power usage

In standard format the heaters draw up to a maximum of 99W, but this can be increased if necessary through a software interlock. If heating is not required, our sensors can be powered by a Vdc of 12V (DM, DM50) or 6V (SM) while drawing only 31mA. This makes them suitable for use with batteries in portable/mobile applications.

Used everywhere

The FT7 Series wind sensors have been used on wind turbines for over 15 years by the world's leading turbine manufacturers. FT anemometers are also used in meteorological applications all over the world including at both Poles. Customers use FT wind sensors in weather stations, meteorological research, defence applications, rail and infrastructure, and on drones and unmanned vehicles.

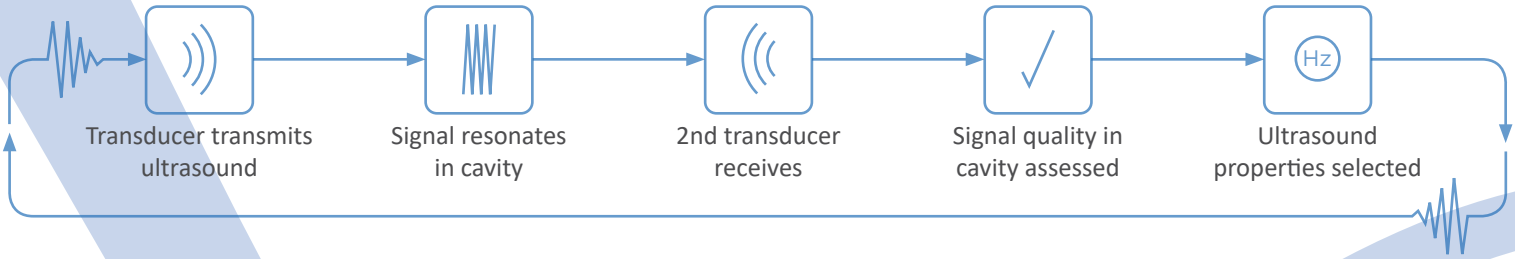
For more information read the case studies on our website:
www.fttechnologies.com/case-studies/

POWERED BY ACU-RES® TECHNOLOGY

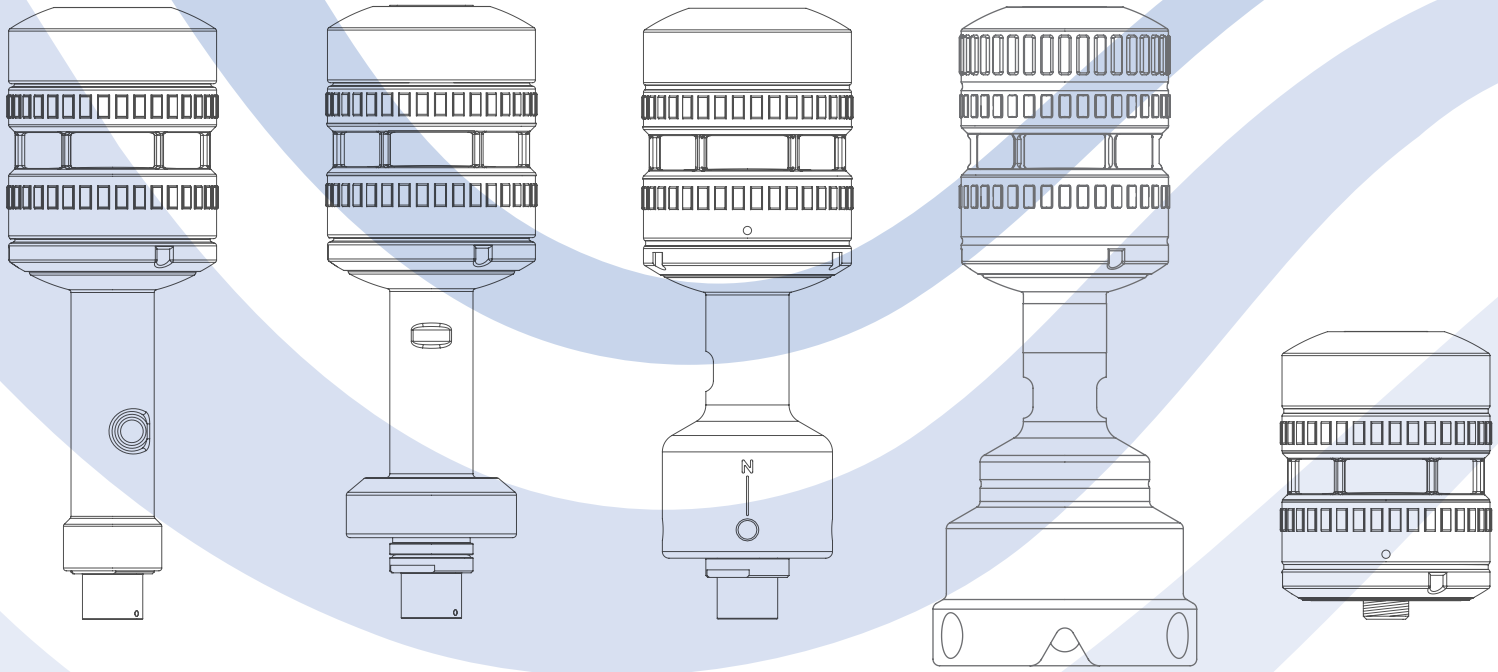
This is FT Technologies' acoustic resonance technology. Acu-Res® enables our sensors to take accurate measurements in a small space. This means our sensors are small, easy to heat, durable and strong. Acu-Res® sets FT sensors apart from mechanical and other ultrasonic wind sensing technologies to give a more robust and reliable measurement solution.

The sensor works by creating a resonating ultrasonic signal inside the sensor's measurement cavity. The motion of air is sensed by measuring the phase change in the ultrasonic signal caused by the wind as it passes through the cavity. The sensor has three transducers arranged in an equilateral triangle. The net phase difference between a transmitting and receiving transducer pair is indicative of the airflow along the axis of the pair. Therefore by measuring all three pairs the component vectors of the airflow along the sides of the triangle are determined.

These vectors are combined to give the overall speed and direction. The sensor uses complex signal processing and data analysis taking a sequence of multiple measurements to calculate regular wind readings.



The sensor inherently compensates for changes in the air's temperature, pressure or humidity. A strong resonating sound wave in a small space provides a large signal that is easy to measure. Acu-Res® has a signal to noise ratio more than 40db stronger than other ultrasonic technologies.



FT742-FF FLAT FRONT

Weight: 320g
Height: 161mm

FT742-PM PIPE MOUNT

Weight: 350g
Height: 161mm

FT742-DM DIRECT MOUNT

Weight: 380g
Height: 161mm

FT742-DM50 DIRECT MOUNT

Weight: 535g
Height: 174mm

FT742-SM SURFACE MOUNT

Weight: 252g
Height: 71.2mm

The Flat Front (FF) and Pipe Mount (PM) are generally used in wind turbine control. The Direct Mount (DM and DM50) and Surface Mount (SM) sensors are used on drones and unmanned vehicles, ground-based and handheld weather stations, ship and buoy-based meteorological systems, defence and other applications where the environment can be extreme. The Direct Mount (DM) fits directly onto a 33.7mm outer diameter pipe and the Direct Mount (DM50) onto a 50mm outer diameter pipe. The Surface Mount (SM) includes an electronic compass and provides maximum flexibility for a custom integration.

TESTED TO THE EXTREME

FT TECHNOLOGIES

The FT7 Series are probably the most tested wind sensors in the world. They have passed over 30 independent tests including sand, dust, ice, vibration, corrosion, hail and lightning protection. During design the FT7 Series has passed the FT Highly Accelerated Life Cycle test in which the sensor is temperature cycled from +125°C to -90°C whilst being vibrated at 30G RMS.

FT7 Series sensors have been externally certified to the following standards:

Drop and Topple Test Ec: EN 60068-2-31 (2008). Dropped 9 times at different angles from at least one metre onto concrete.

Anti-Icing Test: MIL-STD-810G. With the heater switched on, the sensor was exposed to freezing rain in an airflow of 15m/s at -15°C. Even when 37mm of ice had built up on the test bar the sensor itself remained ice-free.
De-Icing Test: MIL-STD-810G. The sensor was ice-free in under 5 minutes.

Corrosion: ISO 9227 (2006) & IEC12944 (1998). Tested to category C5-M High of BS EN ISO 12944 (1998) in a neutral salt spray atmosphere for 1440 hours.

Altitude: EN 60068-2-13 (1999). 4 hours at a constant low pressure typical to 3000 metres above sea level. Additional tests in a dedicated altitude wind tunnel have shown that the sensor measures accurately up to 4000m.

Solar Radiation: EN 60068-2-5 (2011). 24 hours of UV radiation with an ambient temperature of 55°C, irradiance of 1120 W/m².

Sinusoidal Vibration Test Fc: EN 60068-2-6 (2008). 5Hz to 500Hz, 1 octave/minute sweep rate, 5 sweep cycles, 3 axes
Random Vibration Test Fh: EN 60068-2-64 (2008). 5Hz to 500Hz, 90 minutes per axis, 0.0075g²/Hz severity over 3 axes.

Mist, Fog and Low Cloud Test CL26: DEF STAN 00-35 Test CL26. Fog intensity of 1.66ml/80cm² for one hour.
Driving Rain Test CL27: DEF STAN 00-35 Test CL27. Rain intensity of 200mm for one hour.

Stationary Temperature & Humidity Test Cab: EN 60068-2-78 (2013). Relative humidity +93% at +40°C for 240 hours.
Combined Temperature & Humidity Test Z/AD: EN 60068-2-38 (2009). Ten 24 hour cycles, upper temperature +65°C. Cold sub cycle: -10°C.
Cyclic humidity test: EN 60068-2-30 (2005). Six 24 hour cycles, upper temperature 55C°.

Hail: EN 61215-2 (2016). 50mm diameter ice balls, weighing 57g each, shot at the sensor at 31m/s. Hail withstand class HW 5.

Ingress Protection: EN 60529 (1992+A2:2013). Sealed to IP66 and IP67. Exposed to a dust chamber for 8 hours. Submerged in 1 metre depth of water for 30 mins. Powerful water jets, 100 litres per minute.

Wind Blown Sand & Dust Test: DEF STAN 00-35 CL25. Sand particles for three hours and then dust particles for three hours, at 29m/s air velocity, concentration 1.1g/m³.

Cold Temperature Test Ad: EN 60068-2-1 (2007). 16 hours of cold air at -40°C.
Dry Heat Test Bd: EN 60068-2-2 (2007). 16 hours dry heat at +85°C.
Thermal Cycling Test Nb: EN 60068-2-14 (2009). 16 temperature cycles from -40°C to +85°C.

Mechanical Shock Test Ea and CAF2656: EN 60068-2-27 (2009). Peak acceleration: 50G, duration: 11ms, pulse shape: half-sine.

EMC & RFI
EN 61000-6-2: Industrial environments
EN 61000-6-3: Residential, commercial and light-industrial environments
EN 61000-4-2: Electrostatic discharge
EN 61000-4-3: Radiated, radio-frequency, electromagnetic field
EN 61000-4-4: Electrical fast transient/burst
EN 61000-4-5: Surge
EN 61000-4-6: Conducted disturbances induced by RF fields
EN 61000-4-8: Power frequency magnetic field
EN 61000-4-9: Pulse magnetic field
EN 61000-4-10: Damped oscillatory magnetic field
EN 61000-4-29: Voltage dips, short interruptions and voltage variations on d.c. input power port

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MANAGEMENT SYSTEM CERTIFICATION
DNV·GL
ISO 9001 = ISO 14001

A4159-5-EN