



FT TECHNOLOGIES

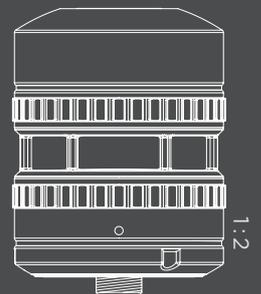
FT742 DATASHEET

NEW



SURFACE MOUNT DESIGNED FOR INTEGRATION

THE WORLD'S
TOUGHEST
WIND SENSORS



POWERED BY
**acur
res**
TECHNOLOGY

WWW.FTTECHNOLOGIES.COM

PROVEN

IT LOOKS DIFFERENT BECAUSE IT IS DIFFERENT

The FT742-SM (Surface Mount) ultrasonic anemometer is the latest addition to FT Technologies' FT7 Series - the world's toughest wind sensors. Measuring wind speeds up to 75m/s, the FT742-SM has been specifically designed to be integrated in to your equipment.

Powered by our Acu-Res® Technology the FT742-SM is unique in the market. Extremely small, with no moving parts to degrade, the FT742-SM is a very rugged wind sensor that is maintenance-free and delivers 99.9% data availability, for years on end, even in the harshest of conditions.

WATERPROOF SURFACE MOUNTING

The FT742-SM mounts directly on to a flat surface and with the mounting gasket is waterproof and dust tight to IP67.

BUILT-IN COMPASS

The new integrated compass provides wind data referenced to magnetic North.

MOBILE, COMPACT, LIGHTWEIGHT

The FT742-SM is small, only 71mm high, and weighs only 252g. This makes it suitable for portable equipment. The sensor can use either RS422 or RS485 and can be specified to output data in m/s, km/h or knots in NMEA 0183 mode.

MAINTENANCE-FREE

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

RUGGED AND SHOCK-RESISTANT

With no moving parts to degrade or damage, and resistant to shock and vibration, the FT742-SM is suitable for all mobile applications.

ALL OVER DE-ICING

The FT742-SM is fitted with a thermostatically controlled heating system. The sensor maintains its temperature at a user specified heater set point of between 0° and 55°C.

LOW POWER USAGE

The FT742-SM draws only 25mA at 24V DC with the heaters switched off (29mA with compass enabled). It can also run at voltages down to 6V DC making it ideal for use with batteries³. At 24V DC the heaters draw a maximum of 48W (60W @ 30V DC).

USED EVERYWHERE

FT anemometers have been used in meteorological applications all over the world including at both poles. Customers have used FT sensors in weather stations, hurricane research, cold climate weather oceanographic research and maritime navigation. For more information read the case studies on our website:

www.fttechnologies.com



RELIABLE

ENVIRONMENTAL PROTECTION SYSTEM

The Acu-Res EPS means the sensor works reliably in the most extreme conditions and helps to guarantee high data availability.

As part of the development programme the FT742-SM passed the FT Technologies HALT test. The sensor is heated to 125°C and cooled to -90°C whilst being vibrated at 30G. It continued to work throughout the test.

Like all FT7 Series sensors the FT742-SM will be externally certified to the following standards:



ROBUST, COMPACT FORM

Designed for: Impact

Tested and Proven: Drop resistant: EN 60068-2-31 (2008) dropped 6 times at different angles from 1 metre onto steel faced concrete.



Tested and Proven:

Hail resistant: EN 61215 (2005) 10 hail stones, 7.5 grams each shot at the sensor at 23 m/s.



HARD ANODISED ALLOY BODY

Designed for: Salt, sand and water

Tested and Proven:

Corrosion resistant: ISO 9227 (2006) & IEC12944 (1998) corrosion class C5M High corrosion test in Neutral salt spray atmosphere for 1440 hours.



Tested and Proven:

Sand and Dust resistant: DEF STAN 00-35 CL25 (2006) sand particles for 3 hours and dust particles for 3 hours, at 29 m/s air velocity, concentration 1.1g/m3.



SURGE PROTECTION ELECTRONICS

Designed for: Industrial environments

Tested and Proven:

- > Immunity for industrial environments EN 61000-6-2.
- > Electrostatic discharge immunity test EN 61000-4-2.
- > Electrical fast transient/burst immunity test EN 61000-4-4.
- > Surge immunity test EN 61000-4-5.
- > Pulse magnetic field immunity test EN 61000-4-9.
- > Voltage dips, short interruptions and voltage variations on d.c. input power port immunity tests EN 61000-4-29.³



Solar Radiation

24 hours of UV radiation with an ambient temperature of 55°C, irradiance of 1120 W/m2.

Passed: EN 60068-2-5 (2000)



Altitude

4 hours at a constant low pressure typical to 3000 metres above sea level. Passed: EN60068-2-13 (1999) Additional tests in a dedicated altitude wind tunnel have shown that the Acu-Res technology measures accurately up to 4000m.



Heat and Cold

16 hours of cold air at -40°C. 16 hours dry heat at +85°C. 74 hours of heat and cold, 16 temperature cycles from -40°C to +70°C.

Passed: EN 60068-2-1 (2007), EN 60068-2-2 (2007), EN 60068-2-14 (2009)



3 axis Sinusoidal & Random Vibration

5-500 Hz, 1 octave/min sweep range for sinusoidal 5-500 Hz, 90 mins per axis, 0.0075g2/Hz for random. Passed: EN 60068-2-6 (2008), EN 60068-2-64 (2008)



Water and Dust Protection

Exposed to a dust chamber for 8 hours. Submerged in 1 metre depth of water for 30 mins. Passed: EN 60529 (2000) - Sealed to IP67



Stationary & Cyclic Humidity

Stationary relative humidity +93% for 240 hours. Six 24 hour cycles, upper temperature 55°C.

Passed: EN 60068-2-78 (2002), EN 60068-2-30 (2005)



Fog and Rain

Fog intensity of 1 to 2 ml/80cm2 for 1 hour. Rain at 200 ±50 mm for 1 hour.

Passed: DEF STAN 00-35 Test CL26, DEF STAN 00-35 Test CL27

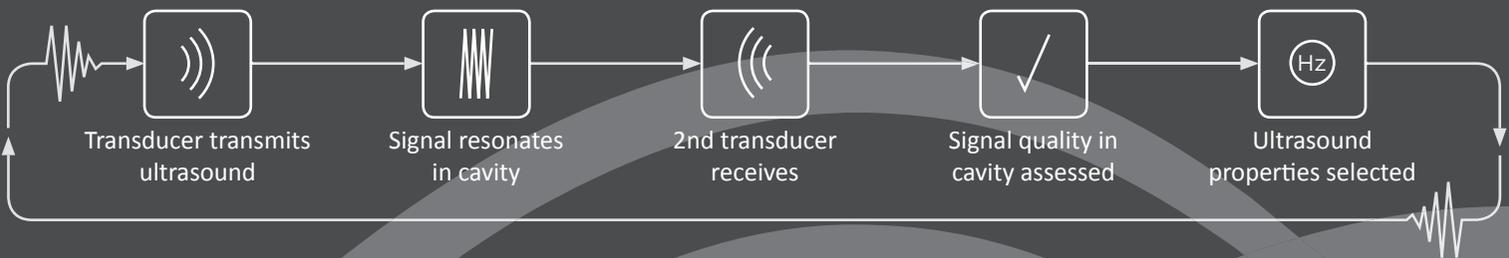
TECHNOLOGY



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.

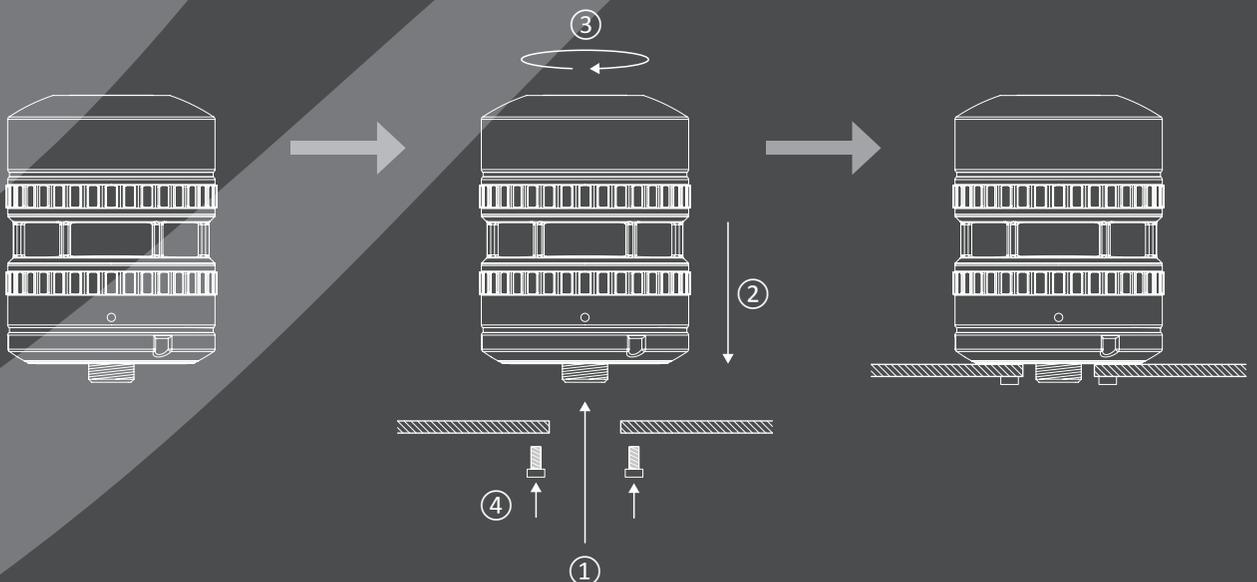
These vectors are combined to give the overall speed and direction. The sensor uses complex signal processing and data analysis taking a sequence of multiple measurements to calculate regular wind readings.



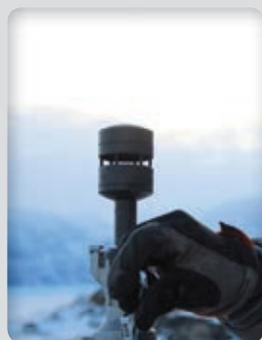
The sensor inherently compensates for changes in air temperature, pressure or humidity. A strong resonating sound wave in a small space provides a large signal that is easy to measure. Acu-Res has a signal to noise ratio more than 40db stronger than other ultrasonic technologies.

INSTALLATION

- 1 - Pass the cable through the mounting surface and attach it to the sensor.
- 2 - Place the sensor down onto the mounting surface ensuring the gasket is in place.
- 3 - Rotate the sensor to align the datum (N) and ensure the 5 fixing holes are in the correct position.
- 4 - Insert and tighten the screws one at a time to ensure there is an even distribution of pressure.



SPECIFICATION



WIND SPEED⁴

Range.....	0-75m/s.....	0-270km/h.....	0-145knots
Resolution.....	0.1m/s.....	0.36km/h.....	0.19knots
Accuracy.....	±0.3m/s (0-16m/s).....	±1.08km/h (0-57km/h).....	±0.58knots (0-31knots)
	±2% (16-40m/s).....	±2% (57-144km/h).....	±2% (31-78knots)
	±4% (40-75m/s).....	±4% (144-270km/h).....	±4% (75-145knots)

WIND DIRECTION

Range.....	0 to 360°
Resolution.....	1°
Accuracy.....	±4° RMS
Compass accuracy.....	±5° RMS

SENSOR PERFORMANCE

Measurement principle.....	Acoustic Resonance (automatically compensates for variations in temperature, pressure & humidity).
Units of measure.....	metres per second, kilometres per hour or knots
Altitude.....	0-4000m operating range
Temperature range.....	-40° to +85°C (operating and storage)
Humidity.....	0-100%
Heater settings.....	0° to 55°C (factory and user configurable)

POWER REQUIREMENTS

Supply voltage.....	20V to 30V DC (24V DC nominal). Supports battery operation with reduced heater capacity (≥6V DC, up to 30V DC). ³
Supply current (heater off).....	25mA typical (29mA with compass enabled)
Supply current (heater on).....	Up to 2A ^{1,2}
Power consumption with heater disabled (for battery use):	

	Battery Supply Voltage.....	Compass Disabled.....	Compass Enabled
24V.....	600mW.....	696mW	
12V.....	300mW.....	348mW	
9V.....	225mW.....	261mW	
6V.....	150mW.....	174mW	

PHYSICAL

I/O connector.....	Universal M12 8-pole circular connector
Sensor weight.....	252g

DIGITAL SENSOR

Interface.....	RS422 (full-duplex). RS485 (half-duplex).
Format.....	ASCII data, polled or continuous output modes, NMEA 0183.
Data update rate.....	10Hz
Error handling.....	When the sensor detects an invalid reading an error flag is included in the wind velocity output message (see user manual for further details).
Overspeed Warning.....	The sensor has an optional overspeed warning scheme. This scheme is disabled by default but can be enabled at the factory if requested. With the scheme enabled, if the sensor detects a wind speed greater than 75m/s a character is set in the wind velocity output message (see user manual for further details).

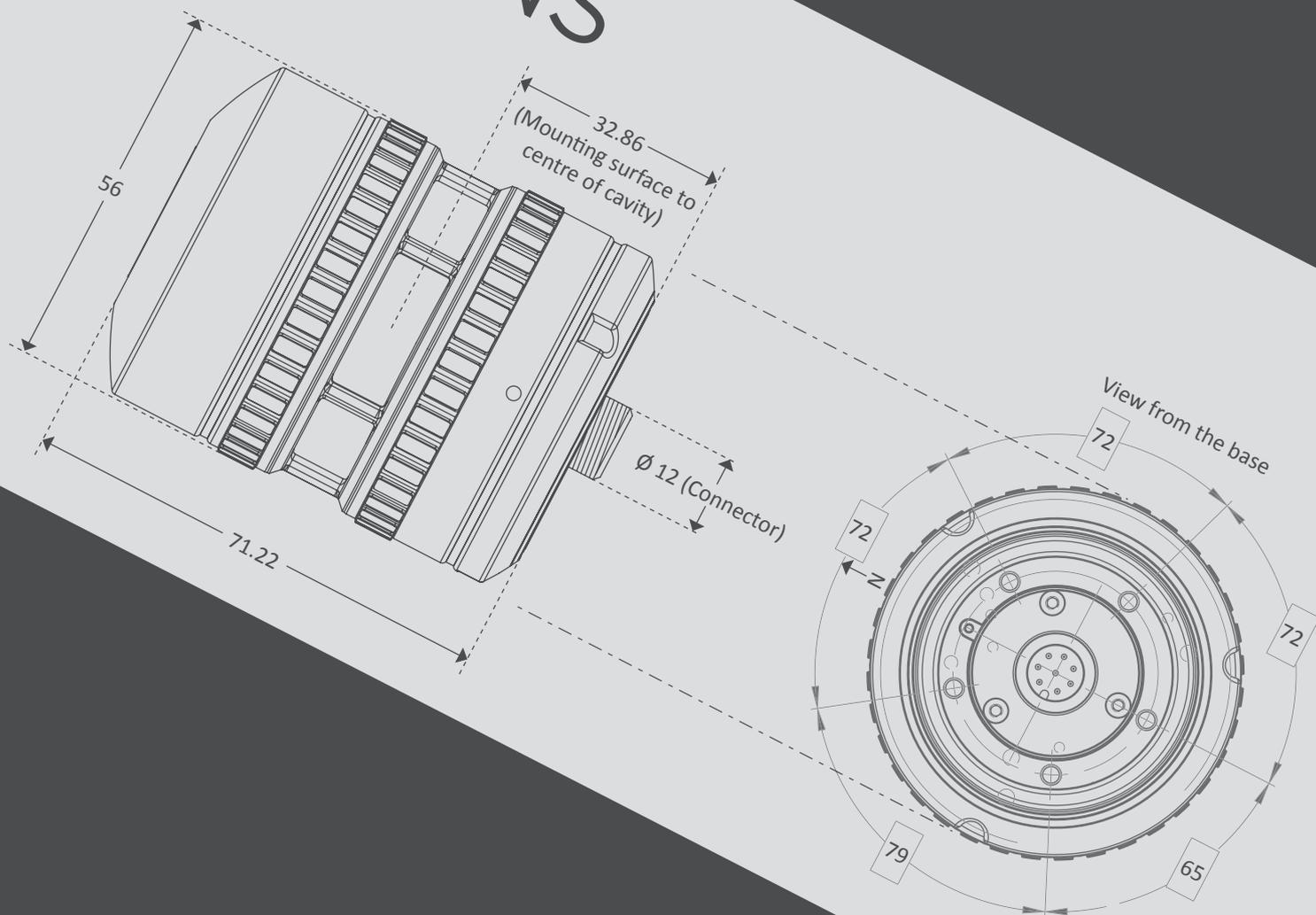
¹ This is the default heater current limit, if higher currents are required, please contact FT Technologies.

² Heater control is achieved through a closed loop system, therefore the power consumption of the heater is a function of the applied cooling load on the sensor and the user temperature set point. Maximum heating power is 60 W at 30 V.

³ EN 61000-4-29 only applicable when the sensor power supply is between 20V to 30V DC.

⁴ km/h & knots only available when operating the sensor in NMEA 0183 mode.

DIMENSIONS



All dimensions shown in mm

CONNECTOR AND ACCESSORIES



DIGITAL SENSOR

FT742-D-SM
RS422 / RS485
8 pin
Connector image left

FT009

1.5m digital cable
Power and data

Contact:
Tel: +44 (0)20 8943 0801
Fax: +44 (0)20 8943 3283
sales@fttech.co.uk
www.fttechnologies.com

FT Technologies
18 Church Road
Teddington
TW11 8PD
England

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