



# FT702

## Ultrasonic Anemometer

with patented *Acoustic Resonance* sensing technology

### Features

- High accuracy wind speed and direction sensing
- Compact, solid-state design with no moving parts
- Very low-power operation (100mW typ.)
- Digital and analogue interface options
- NMEA0183 output format supported
- Integral anti-icing heater as standard
- Continuous self-diagnostic test function
- Requires no routine maintenance
- ISO9001 designed and manufactured

### Applications

- Cost effective replacement for cup and vane anemometers
- Meteorological weather stations
- Wind stress monitoring for buildings and bridges
- Air pollution and chemical dispersion
- Wind speed and direction sensing for:
  - Ships and offshore platforms
  - Harbours and ports
  - Airports, airfields and heliports

### Description

The FT702 is a solid-state meteorological sensor, which uses a new, patented Acoustic Resonance airflow sensing technique to measure accurately both wind speed and direction.

The acoustic resonance sensing technique coupled with state-of-the-art signal processing gives the anemometer an unprecedented wind speed range of 0.01m/s to 125m/s (option E).

The anemometer has been specifically designed to be a cost-effective replacement for cup/vane and propeller devices. By eliminating the well-known limitations of conventional mechanical anemometers, the FT702 offers for the first time a high performance, affordable anemometer that requires no routine maintenance or calibration.

Comprehensive measurement data (up to 5 readings per second) is available via either a serial RS422 (option A) or serial RS485 (option B) interface.

The RS422 model has separate transmit and receive terminals for full-duplex operation whereas the RS485 has a single transmit/receive terminal. The RS485 model



allows up to 32 FT702s to be connected to a host terminal or data logger using a single twisted pair data link.

A third model (option C) is also available with dc outputs representing wind speed and direction.

The highly compact and symmetrical arrangement of the acoustic resonant cavity results in a physically small (50mm x 162mm), lightweight (0.5kgs) and robust anemometer. The FT702 is environmentally sealed to IP67 allowing it to be used in a wide range of demanding applications. Near-strike lightning protection is provided as standard on all signal and power lines.

An integral heater is incorporated to prevent icing. The heater can either be switched on or off as required (RS422 and RS485 options only) or it can be automatically controlled directly by the sensor.

DTI **SMART** Award Winner 1996  
DTI **SMART** Follow-On Award Winner 1998

The patented Acoustic Resonance technology incorporated in the FT702 anemometer has received two **SMART** awards from the UK Department of Trade and Industry. These prestigious awards are granted in recognition of new products or processes that involve a significant technological advance.

# FT702 Specification

## SENSOR PERFORMANCE<sup>1</sup>

<b>MEASUREMENT PRINCIPLE</b>	Acoustic Resonance (compensated against variations in temperature, pressure and humidity)
<b>WIND SPEED MEASUREMENT</b>	
RANGE	0-70m/s (options H,S)  0-125m/s (option E) <sup>2</sup>
ACCURACY	±4% (options H,S) of reading  ±2% (option E) of reading
RESOLUTION	0.1m/s (option S)  0.01m/s (options E,H)
ZERO ERROR	±0.1m/s (option S)  ±0.01m/s (options E,H)
<b>WIND DIRECTION MEASUREMENT</b>	
RANGE	0 to 360°
ACCURACY	±3° (option H,S)  ±2° (option E)
RESOLUTION	1°

## DATA I/O

<b>INTERFACE OPTIONS</b>	Digital (serial data - RS422 full duplex or RS485 half duplex) and Analogue
<b>DATA I/O</b>	
RS422/RS485	Full range of user programmable functions. Proprietary and NMEA 0183 (MWW sentence) ASCII data output formats. RS485 option allows up to 32 FT702s to be connected in a cluster.
ANALOGUE	Dual channel variable dc voltage proportional to wind speed and direction. Wind speed scaling 17.5m/s per V, 70m/s FS, (31.25m/s per V, 125m/s FS option E). Wind direction scaling 100° per V, 360° FS Minimum load 1kΩ per output. Output impedance 40Ω per output. 5 measurements per second
<b>DATA UPDATE RATE</b>	5 measurements per second

## POWER REQUIREMENTS

<b>ANEMOMETER</b>	7V to 28V ±5% dc @ 14mA (typical, excluding data output drive current)
<b>HEATER</b>	28V (0.56A) typ., 35V (0.7A) (max)

## PHYSICAL

<b>DIMENSIONS</b>	50mm x 162mm (dia. x height)
<b>WEIGHT</b>	500g
<b>MATERIAL</b>	Stainless steel
<b>I/O CONNECTOR</b>	Multipole connector (p/n 62GB-57A12-10PN). Mating connector p/n 62GB-16F12-10SN
<b>MOUNTING METHOD</b>	Thread or flange mounting (see outline drawings)

## ENVIRONMENTAL

<b>OPERATING TEMPERATURE RANGE<sup>3</sup></b>	-40° to +85°C
<b>STORAGE TEMPERATURE RANGE</b>	-30° TO +85°C
<b>HUMIDITY</b>	0-100%
<b>WATER INGRESS</b>	Sealed to IP67
<b>VOLTAGE TRANSIENT PROTECTION</b>	All signal and power supply lines protected against 1.5kV (peak) voltage transients (10/700µs waveform, 40Ω source)

### NOTES:

1. Specification valid for wind angle of incidence within ±10° of the horizontal
2. Enhanced specification version (Option E) specified over wind speed range 0-100m/s and operational up to 125m/s.
3. Heater must be used to maintain sensor head temperature at -30° minimum.
4. All specifications subject to change without notice

## Ordering Information

