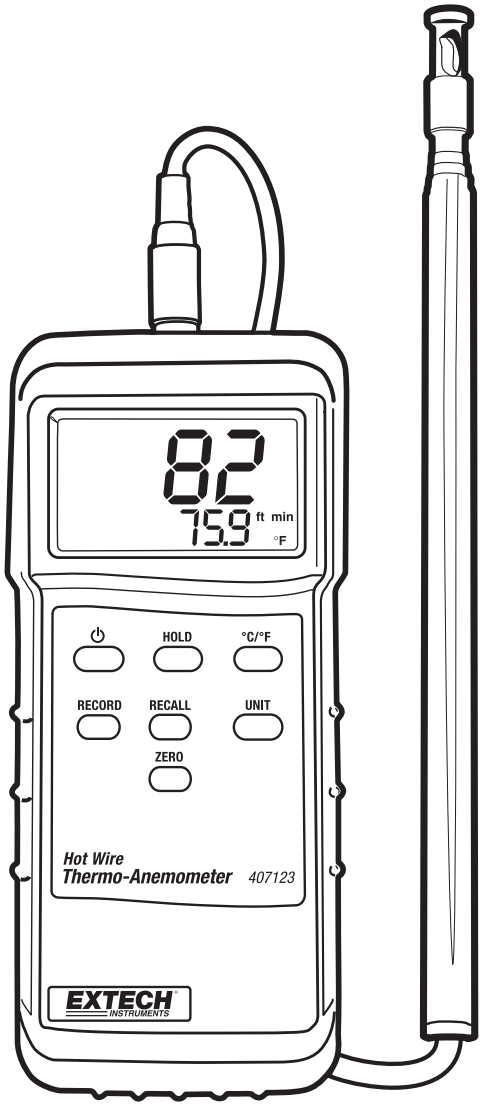
EXTECH INSTRUMENTS

User's Guide

Hot Wire Thermo-Anemometer

Model 407123

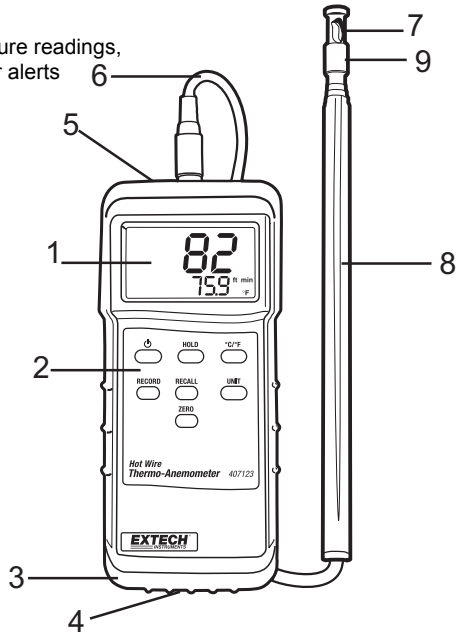


Introduction

Congratulations on your purchase of the Extech Hot Wire Anemometer. This instrument measures air flow and temperature by placing the sensor into an airway such as a duct or a vent. The sensor is situated at the end of the telescoping wand for convenience and has a protective sliding cover. The meter includes an RS-232 PC Interface jack for use with the Model 407001 Data Acquisition software and interface cable kit. This meter is shipped fully tested and calibrated and, with proper use, will provide years of reliable service.

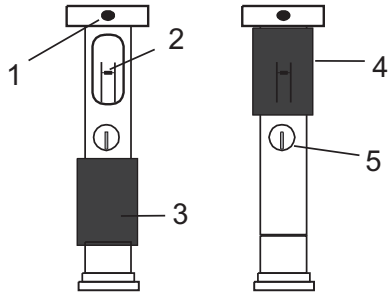
Description

Meter Description



1. LCD display – Indicates air velocity and temperature readings, units of measure, low battery icon, and other user alerts
2. Push-buttons:
   - POWER: Turn meter ON and OFF
   - HOLD: Freezes the displayed reading
   - C/F: Select the temperature units
   - RECORD: Press to track the highest (MAX) and lowest (MIN) reading
   - RECALL: Displays MAX/MIN readings
   - UNIT: Air velocity units of measure
   - ZERO: Press to zero the display (sensor cover must be closed)
3. Protective holster – Rubber jacket that surrounds the meter (must be removed to access battery compartment)
4. Battery compartment - Located on the lower back of the meter
5. PC Interface jack – Accepts a 3.5mm plug from a PC interface cable (cable and data acquisition software available using part number 407001)
6. Sensor input jack – Insert the sensor plug
7. Sensor opening – Air must flow through this opening for proper measurement
8. Telescoping sensor handle – Extends to 39” (1m)
9. Sensor protective cover – Slide DOWN to open when in use and slide UP to protect sensor when not in use (close the cover when zeroing the meter)

Sensor Tip Description



1. Air Direction indentation
2. Air Velocity Sensor
3. Sensor cover in lower (measurement) open position
4. Sensor cover in upper (zero) closed position
5. Temperature sensor

Operation

Initialization and Zero

The meter should always be zeroed at temperature before use using the ZERO button. Do not rely on the initial zero display.

Notes:

- The meter does not display negative numbers.
- Open antenna to desired length.

1. Connect the sensor to the input jack on top of the meter and open antenna to desired length.
2. Turn on the meter using the Power button. The meter will perform a self-test during which the display will count down from 9 to 0.
3. Select the desired temperature units using the C/F select button. The LCD will reflect the selection.
4. Select the desired air velocity units using the UNIT button. The LCD will reflect the selection.
5. Place the sensor cover in the UP (ZERO) position.
6. Place the sensor in the area to be measured and allow a short time for the sensor to reach the temperature of the air under test.
7. Press the ZERO button to zero the meter.

Taking Measurements

1. Zero the meter as described above.
2. Slide the air velocity sensor cover down.
3. Place the sensor in the air current to be measured. Have the air flow meet the sensor head in the direction of the indentation on the sensor head.
4. View the air velocity and temperature readings on the LCD Display. The large main LCD display indicates the Air Velocity reading. The lower LCD sub-display indicates the temperature reading.

MIN and MAX Function

1. To begin capturing the Minimum (MIN) and Maximum (MAX) readings, press the RECORD button. The ‘REC’ icon will appear on the LCD.
2. Take readings as described previously.
3. Press the RECALL button to view the Maximum reading encountered since the RECORD button was pressed. The ‘MAX’ display icon will appear along with the maximum reading.
4. Press RECALL again to view the minimum reading (MIN).
5. Press the RECORD button to exit this mode and return to normal operation.

Data Hold

To freeze the LCD display, press the HOLD button. The 'DH' display icon will appear on the LCD. Press the HOLD button again to return to normal operation (the 'DH' hold icon will switch off).

Battery Replacement

When the low battery indicator (LBT) appears on the LCD or if the LCD does not switch on when the POWER button is pressed, replace the batteries.

1. Remove the protective rubber holster that encapsulates the meter.
2. Open the rear battery compartment by prying the compartment off with a flat-head screwdriver or a coin.
3. Replace the six ‘AAA’ 1.5V batteries observing polarity.
4. Replace the battery compartment cover and the protective holster.
5.

You, as the end user, are legally bound (**EU Battery ordinance**) to return all used batteries, **disposal in the household garbage is prohibited!** You can hand over your used batteries / accumulators at collection points in your community or wherever batteries / accumulators are sold!

Disposal: Follow the valid legal stipulations in respect of the disposal of the device at the end of its lifecycle

PC Interface

The meter is equipped with an RS-232 PC Interface jack at the top of the meter (next to the sensor input jack). For streaming of data to a PC via the RS232 Output jack, the optional 407001-USB kit (RS232 to USB cable and driver CD) along with the 407001 software.

Specifications

General Specifications

Circuit configuration	Custom one-chip LSI microprocessor circuit
Display	3-1/2 digit (2000 count) dual LCD display
Measurements	m/s (meters per second), km/h (kilometers per hour), ft/min (feet/per minute), knots (nautical miles per hour), MPH (miles per hour), Temperature: °C, °F
Data hold	Freezes reading on display
Sensor Structure	Air velocity sensor: Glass bead thermistor Temperature sensor: Precision thermistor
Min/Max Recording	Record and Recall Maximum (MAX) and Minimum (MIN) readings
PC Interface	RS 232 PC serial interface jack for use with Model 407001 software and interface cable kit
Operating Temperature	0 to 50 °C (32 to 122°F)
Operating Humidity	Max. 80% RH
Power Supply	Six (6) 1.5V 'AAA' batteries
Power Consumption	Approx. 30 mA DC
Weight	355 g (0.78 lb) including batteries & probe
Dimensions	Main instrument: 180 x 72 x 32 mm (7.1 x 2.8 x 1.3") Sensor: 12mm (0.5") diameter Telescope: 2.1m (7') maximum length with cable

Range Specifications

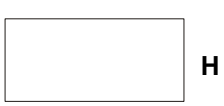
Units	Range	Resolution	Accuracy
m/s	0.2 to 20.0 m/s	0.1 m/s	±(3.0%rdg+0.3m/s)*
km/h	0.7 to 72.0 km/h	0.1 km/h	±(3.0%rdg+1.1km/h)*
ft/min	40 to 3940 ft/min	1 ft/min	±(3.0%rdg+59ft/min)*
MPH	0.5 to 45.0 MPH	0.1 MPH	±(3.0%rdg+0.67MPH)*
knots	0.4 to 38.8 knots	0.1 knots	±(3.0%rdg+0.58knots)*
*or, ±(1.0%FS+3d) whichever is greater			
Temperature	0 to 50°C (32 to 122 °F)	0.1 °F and °C	0.8 °C (1.5 °F)

Note: m/s: meters per second; km/h: kilometers per hour; ft/min: feet per minute; Knots: nautical miles per hour; MPH: miles per hour

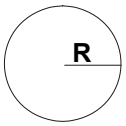
Useful Equations and Conversions

Area equations

The volume of air flowing through a duct or vent can be determined by taking the area of the duct in square units (i.e. square feet) and multiplying this value by the measured linear velocity (i.e., feet per minute). This gives: ft/min x ft^2 = ft^3/min (CFM)



A = W x H



A = pi x R^2

Cubic equations

CFM (ft^3/min) = Air Velocity (ft/min) x Area (ft^2)
CMM (m^3/min) = Air Velocity (m/sec) x Area (m^2) x 60

Units Conversion Table

	m/s	ft/min	knots	km/hr	MPH
1 m/s	1	196.87	1.944	3.6	2.24
1 ft/min	0.00508	1	0.00987	0.01829	0.01138
1 knot	0.5144	101.27	1	1.8519	1.1523
1 km/hr	0.2778	54.69	0.54	1	0.6222
1 MPH	0.4464	87.89	0.8679	1.6071	1