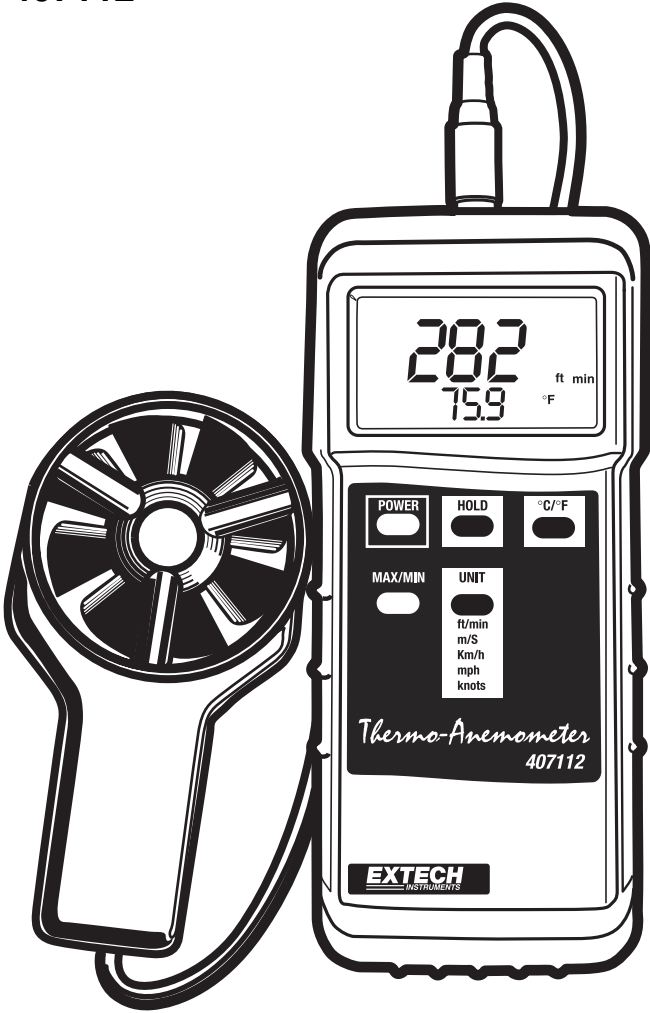


User's Guide



Heavy Duty Vane Thermo-Anemometer

Model 407112



Warranty

EXTECH INSTRUMENTS CORPORATION warrants this instrument to be free of defects in parts and workmanship for one year from date of shipment (a six month limited warranty applies on sensors and cables). If it should become necessary to return the instrument for service during or beyond the warranty period, contact the Customer Service Department at (781) 890-7440 ext. 210 for authorization or visit our website at www.extech.com for contact information. A Return Authorization (RA) number must be issued before any product is returned to Extech. The sender is responsible for shipping charges, freight, insurance and proper packaging to prevent damage in transit. This warranty does not apply to defects resulting from action of the user such as misuse, improper wiring, operation outside of specification, improper maintenance or repair, or unauthorized modification. Extech specifically disclaims any implied warranties or merchantability or fitness for a specific purpose and will not be liable for any direct, indirect, incidental or consequential damages. Extech's total liability is limited to repair or replacement of the product. The warranty set forth above is inclusive and no other warranty, whether written or oral, is expressed or implied.

Introduction

Congratulations on your purchase of the Extech 407112 Vane Anemometer. The 407112 measures air velocity in five units of measure: feet per minute (ft/min), meters per second (m/sec), miles per hour (MPH), kilometers per hour (km/hr), & nautical miles per hour (knots). The remote vane freely rotates in response to air flow. An internal thermistor allows the 407112 to measure air temperature in centigrade or Fahrenheit units. Careful use of this meter will provide years of reliable service.

Specifications

| | |
|------------------------------|-------------------------------------------------------------------------------------------------------------------------------|
| Circuit description | Custom LSI microprocessor design |
| Display | Dual function 9999 count LCD display |
| Measurement units | m/s, km/h, ft/min, knots , mph, Temperature °C/°F |
| Data hold | Freezes reading on the display |
| Sensor Structure | Air velocity sensor: Conventional twisted vane arm with low-friction ball-bearing Temperature sensor: Precision thermistor |
| Memory Recall | Record and Recall Maximum (MAX) and Minimum (MIN) readings |
| Auto Power off | After 15 minutes |
| Data Output | RS 232 PC serial interface for use with model 407001 data acquisition PC interface kit |
| Operating Temperature | 32 °F to 122 °F (0 °C to 50 °C) |
| Operating Humidity | Max. 80% RH |
| Power Supply | 9V battery |
| Power Consumption | Approx. 8.3mA DC |
| Weight | 0.84 lbs. (381g) |
| Dimensions | Main instrument: 7.1 x 2.8 x1.3" (180 x 72 x 32mm) Sensor Head: 2.8" (72 mm) diameter |

Air Velocity Range Specifications

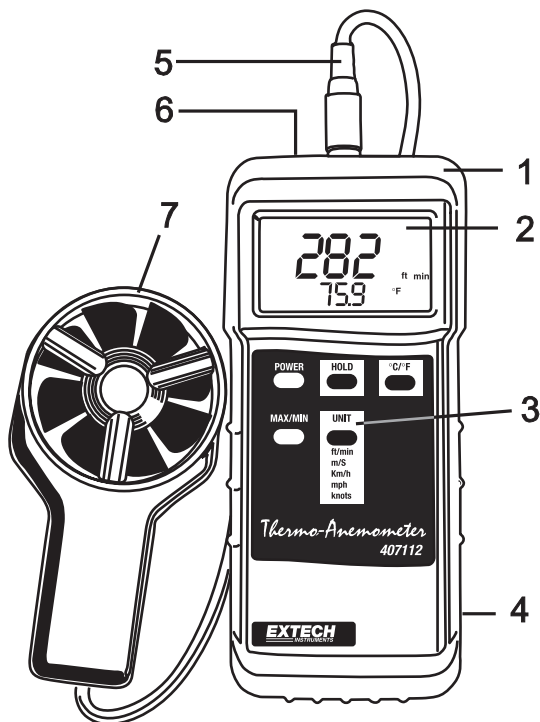
| Measurement | Range | Resolution | Accuracy (of reading) |
|---------------------------------|-------------------|----------------|-----------------------|
| ft/min (feet per minute) | 80 – 4930 ft/min | 1 ft/min | ± (2% + 40 ft/min) |
| m/s (meters per second) | 0.4 - 25.0 m/s | 0.01 m/s<10m/s | ± (2% + 0.2 m/sec) |
| km/h (kilometers per hour) | 1.4 - 90.0 km/h | 0.1 km/h | ± (2% + 0.8 km/hr) |
| mph (miles per hour) | 0.9 - 55.9 mph | 0.1 mph | ± (2% + 0.4 mph) |
| knots (nautical miles per hour) | 0.8 to 48.6 knots | 0.1 knots | ± (2% + 0.4 knots) |

Temperature Range Specifications

| Range (probe only) | Resolution | Accuracy |
|-----------------------------|---------------|-----------------|
| 32°F to 122°F (0°C to 50°C) | 0.1°F (0.1°C) | ± 1.5°F (0.8°C) |

Meter Description

1. Protective rubber holster (must be removed to open the meter case or to access the battery compartment)
2. LCD display for air velocity/temperature measurements and various status indicators
3. Push-buttons:
 - POWER – Press to turn the meter ON or OFF
 - HOLD – Press to freeze the displayed reading
 - °C/°F – Select unit of measure for temperature measurement displays
 - MAX/MIN - Press to record/recall highest (MAX) and lowest (MIN) readings
 - UNIT – Press to select the unit of measure for air velocity
4. Battery compartment on lower back of meter (remove protective holster to access)
5. Sensor input jack
6. PC Interface jack
7. Vane sensor



Operation

Connecting the sensor

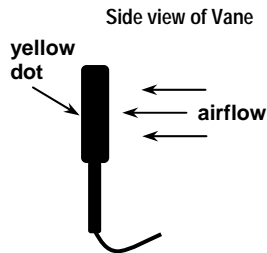
1. The sensor plug is inserted in the meter's sensor jack at the top of the meter. The plug and jack are keyed so that the plug can only fit in the jack one way.
2. Turn the plug carefully until it lines up with the jack and then firmly push the plug in place. Do not apply undue force or try to twist the plug side-to-side.
3. If the sensor is not connected to the meter or if the sensor is defective, the LCD display will indicate dashed lines in place of an air velocity reading.

Meter Power

1. Press the POWER button to turn the meter on. If the display does not switch on, check that a fresh 9V battery is installed. To access the rear battery compartment, first remove the meter's rubber protective holster.
2. Press the POWER button to turn the meter off.
3. The meter is equipped with an AUTO POWER OFF feature. The meter automatically shuts off after 10 minutes to conserve battery energy. To defeat this feature, press the MAX/MIN button. This will activate the Record / Recall feature.

Measuring Air Velocity and Temperature

1. Determine if the vane sensor will be held or placed on a tripod; a threaded tripod mounting hole is located on the vane sensor handle.
2. Place the sensor in the air stream under test. Ensure that the air enters the vane on the opposite side of the yellow dot. Refer to the diagram.
3. Read the Air Velocity and Temperature measurements directly on the LCD.
4. To calculate Air Volume in CFM (cubic feet per minute) or CMM (cubic meters per minute) refer to the 'Useful Equations and Conversions' section.



Selecting the Temperature unit of measure (°C/°F)

Press the °C/°F key to select the temperature unit of measure. The display will indicate the currently selected unit of measure.

Selecting the Air Velocity unit of measure

Press the UNIT button to change the unit of measure for Air Velocity measurements. The display will reflect the current selection. A list of measurement units is printed on the meter faceplate beneath the UNIT button and in the specifications earlier in this manual.

Data Hold

To freeze the LCD display, momentarily press the HOLD button. The 'DH' icon will appear on the LCD and the reading will remain unchanged. Momentarily press the HOLD button again to return to normal operation (the 'DH' icon will switch off).

Record and Recall MIN / MAX Function

1. To begin capturing the Minimum (MIN) and Maximum (MAX) air velocity and temperature readings, press the MIN/MAX key.
2. Now, use the MIN/MAX button to toggle the view from MIN to MAX and from MAX to MIN readings. The 'MAX' or 'MIN' will appear along with the recalled reading for convenience.
3. To return to normal operation, press and hold the MIN/MAX button until the 'MAX', and 'MIN' icons switch off.

RS-232 PC Interface

The 407112 includes an RS-232 PC interface serial data port. This port is located on the top of the meter next to the sensor input jack. The interface port is a 3.5mm phone jack (mono). This port is intended for use with Extech's Data Acquisition Software/Hardware kit which includes a cable for connection between PC and meter. The interface permits the capture, storage and display of measurements on a PC. Refer to the software User's Manual for detailed instructions.

Maintenance

Battery Replacement

The 407112 is powered by one 9V battery. When the 'LBT' low battery icon appears on the LCD or if the display does not switch on when the POWER button is pressed, replace or install a 9V battery.

1. Remove the protective rubber jacket surrounding the meter
2. Open the rear battery compartment using a coin or a wide blade flat-head screwdriver
3. Replace the battery and carefully pack the connected battery into the compartment
4. Close the compartment and replace the holster

Cleaning and Storage

Wipe the meter and vane with a damp cloth as needed. Do not apply abrasive, solvents, or other cleaners to the surface of the meter or vane. Store with the battery removed and avoid extreme temperature and humidity.

Useful Equations and Conversions

Volume Measurements

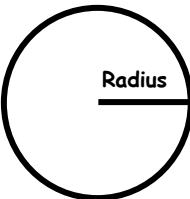
To determine CFM (cubic feet per minute) or CMM (cubic meters per minute) in a duct, the area of the duct must first be measured (use the equations below). Then multiply an air velocity measurement by the area measurement to obtain CFM or CMM.

Area equation for rectangular or square ducts



Area (A) = Width (W) x Height (H)

Area equation for circular ducts



Area (A) = $\pi \times r^2$
Where $\pi = 3.14$ and $r^2 = \text{radius} \times \text{radius}$

Cubic equations

CFM (ft³/min) = Air Velocity (ft/min) x Area (ft²)
CMM (m³/min) = Air Velocity (m/sec) x Area (m²) x 60

NOTE: Measurements made in *inches*
must be converted to feet or meters before using the above formulae.

Unit of Measure Conversion Table

| | m/s | ft/min | knots | km/h | 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/h | 0.2778 | 54.69 | 0.54 | 1 | 0.6222 |
| 1 MPH | 0.4464 | 87.89 | 0.8679 | 1.6071 | 1 |

Calibration and Repair Services

Extech offers repair and calibration services for the products we sell. Extech also provides NIST certification for most products. Call the Customer Service Department for information on calibration services available for this product. Extech recommends that annual calibrations be performed to verify meter performance and accuracy.



Support Hotline (781) 890-7440

Tech support: Ext. 200; Email: support@extech.com

Repair>Returns: Ext. 210; Email: repair@extech.com

Website: www.extech.com

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