EXTECH®
INSTRUMENTS
A FLIR COMPANY

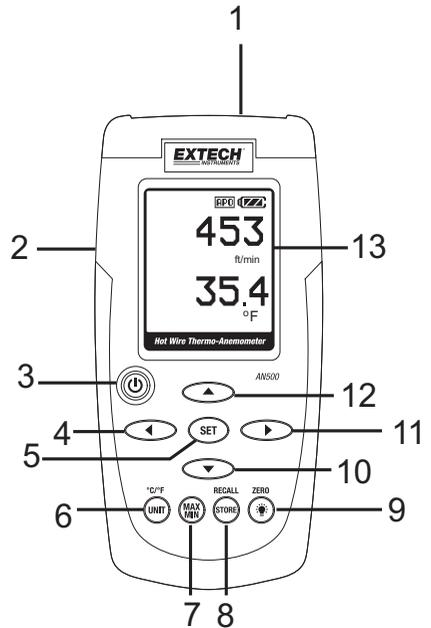# Hot Wire CFM/CMM Thermo-Anemometer

Model AN500

Introduction

Thank you for selecting the Extech Hot Wire CFM/CMM Thermo-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. This device is shipped fully tested and calibrated and, with proper use, will provide years of reliable service. Please visit our website (www.extech.com) to check for the latest version of this User Guide. The Extech Instruments brand, a wholly owned subsidiary of FLIR Systems, Inc., is ISO-9001 certified.

Description

Meter Description

1. Probe input jack (insert probe plug here)
2. AC adaptor jack
3. Power ON-OFF button
4. Left arrow button
5. SET button
6. UNIT button
7. MAX-MIN button
8. STORE-RECALL button
9. ZERO and Backlight button
10. Down arrow button
11. Right arrow button
12. Up arrow button
13. LCD display

Note: Battery compartment and Tilt Stand located on the back of the meter

Push-button Description

- Power: ⏻ Switches the meter ON and OFF

- C/F: Select the temperature units

- MAX/MIN: Press to Record and track the highest (MAX) and lowest (MIN) reading

- STORE: Store readings into memory

- RECALL: Display STORED readings

- UNIT: Air velocity units or airflow units of measure

- ZERO: Press to zero the display

- BACKLIGHT: ☀ Turn LCD backlight ON and OFF

- SET: Atmospheric compensation setting or airflow parameters setting

- ◄ ► ▲ ◄: Atmospheric compensation adjustment arrows (also used for general menu navigation)

Probe Description

1. Probe Connector
2. Probe cabling
3. Telescoping sensor handle - Extends to 39" (1m)
4. Sensor opening (Air must flow through this opening in the direction of the arrow shown in item 5 below for proper measurement)
5. Air direction arrow image
6. Ergonomic handle grip

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. Switch the meter ON using the Power button. The meter will perform a self-test during which the display will show SELF CHECK.
3. Select the desired temperature units by holding in 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 in the area to be measured and allow a short time for the sensor to reach the temperature of the air under test.
6. Press the ZERO button to zero the meter.

Taking Air Velocity Measurements

1. Zero the meter as described above.
2. Place the sensor in the air current to be measured. Have the air flow in the direction of the arrow shown on the top of the sensor head.
3. View the air velocity and temperature readings on the LCD Display. The top LCD display indicates the Air Velocity reading. The lower LCD display indicates the temperature reading.

MAX/MIN Function

1. To begin capturing the Minimum (MIN), Maximum (MAX), and Average (AVG) readings, press the MAX-MIN button momentarily. The RECORD icon will appear on the LCD (flashing on and off).
2. Take readings as described previously.
3. Press MAX/MIN button again to stop recording.
4. The MAX-MIN-AVG display screens will automatically scroll from one to the next showing the highest (MAX), lowest (MIN), and average (AVG) readings captured since the MAX-MIN button was first pressed.
5. Press the MAX-MIN button again to continue recording. The RECORD icon will continue flashing.
6. Press and hold the MAX-MIN button for 1 second to exit the MAX-MIN mode and return to the normal operating screen. The MAX-MIN-AVG readings will be reset.

Auto Power OFF

The meter is equipped with an Auto Power OFF (APO) feature. The meter will automatically switch OFF after 10 minutes of inactivity (no button pressed). Press and hold the POWER button for 1 second to disable the APO feature (the APO display icon will switch OFF). When the meter is powered ON for the next session, the Auto Power OFF feature will be engaged again.

Change Units of Measure

1. Press the CF/UNIT button momentarily to switch between units of measure (m/s, km/hr, MPH, ft/min, knots, CMM and CFM).

2. Press and hold CF/UNIT button for 1 second to switch between C and F temperature units.

Store Readings (Datalogging)

1. Press the RECALL/STORE button momentarily to store and hold the reading.

2. Press the RECALL/STORE button again to return to normal measurement mode.

Recall Readings

1. Press and hold the RECALL/STORE button for 1 second to enter recall mode.

2. Momentarily press the ►or ◄ button to scroll through the memory locations and view the stored data.

3. Press the RECALL/STORE button once more to exit recall mode. The meter will display 'END' and return to normal operation.

Up to 36 readings can be stored in the AN500

Clear Stored Readings

While in RECALL mode press and hold RECALL/STORE button for 1 second to clear stored data. The meter will display 'CLEAR MEM' then return to normal operation.

Atmospheric Pressure Compensation Setting

1. Press and hold the SET button for 1 second to enter Atmospheric Pressure Compensation Adjustment mode.

2. Momentarily press the ▲ or ▼ button to adjust the PA from 500-1010 mbar.

3. Press the SET button to enter the next step.

4. Momentarily press the ▲ or ▼ button to adjust the GAIN from 0.00-2.00.

5. Press and hold the SET button for 1 second to store the settings in non-volatile memory and return to the normal measurement mode. Or press the SET to return normal operation. The atmospheric pressure compensation parameters will reset to the previous setting when next on.

6. While in atmospheric pressure setting, the unit will return to normal operation if no button is pressed for 8 seconds. The data will not be stored.

Zero Adjustment

Press and hold the ZERO button for 1 second to zero the reading.

Backlight

Press the Zero/BL button at any time to turn on/off the backlight.

Airflow Parameters Settings

1. While in airflow measurement mode press and hold SET for 1 second to enter next step.

2. Momentarily press the ►or ◄ button to choose circle or rectangle function.

3. Press SET to enter next step.

4. Press ▲ or ▼ to adjust R in circle mode or L and W in rectangle mode. Adjustment will be from 0.0-101.5 cm in CMM mode or 0.0-40.0 in CFM mode.

5. Press SET to enter next step.

6. Press ▲ or ▼ to adjust GAIN from 0.10-1.00.

7. Press and hold the SET button for 1 second to store the settings in non-volatile memory and return to the normal measurement mode. Or press the SET to return normal operation. The airflow parameters will reset to the previous setting when next on.

8. While in Airflow parameters setting, the unit will return to normal operation if no button is pressed for 8 seconds. The data will not be stored.

Battery Replacement

When the displayed battery symbol ▱ appears empty or begins to blink, replace the batteries as soon as practical. If battery voltage is too low the meter will not switch ON. The battery compartment is located on the rear of the instrument (behind the tilt stand) secured by one Phillips head screw.

1. Open the rear battery compartment by first swiveling out the tilt stand.
2. Remove the Phillips head screw.
3. List the compartment cover to access the batteries.
4. Replace the six 'AA' 1.5V batteries observing polarity.
5. Replace the battery compartment cover and secure with the Phillips head screw.

EU users are legally bound by the Battery Ordinance to return used batteries to community collection points or wherever batteries / accumulators are sold.
Disposal in household trash or refuse is prohibited.

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

Battery Safety Reminders

- Please dispose of batteries responsibly; always observe local, state, and federal regulations with regard to battery disposal.
- Never dispose of batteries in a fire. Batteries may explode or leak.
- Never mix battery types. Always install new batteries of the same type.

Specifications

General Specifications

Circuit configuration	Custom one-chip LSI microprocessor circuit
Display	Dot Matrix LCD backlit 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), CMM (m^3/min), and CFM (ft^3/min), Temperature: °C, °F
Temperature sensor	Two temperature sensors on glass pad
Min/Max Recording	Capture Maximum (MAX), Minimum (MIN), and Average (AVG) readings
Datalogger	36 readings can be stored and recalled
Operating Temperature	0 to 50 °C (32 to 122°F)
Operating Humidity	Max. 80% RH
Power Supply	Six (6) 1.5V 'AA' batteries
Power Consumption	Approx. 30 mADC
Weight	355g (0.78 lbs.) 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
	Telescoping handle with cable: 2.1m (7') max. length with cable

Range Specifications

Units	Range	Resolution	Accuracy
m/s	0.0 to 9.99 m/s	0.01 m/s	±(3.0%rdg+0.2m/s)
	10.0 to 20.0	0.1 m/s	
km/h	0.0 to 75.0 km/h	0.1 km/h	±(3.0%rdg+0.7km/h)
ft/min	0 to 4000 ft/min	1 ft/min	±(3.0%rdg+38ft/min)
MPH	0.0 to 45.0 MPH	0.1 MPH	±(3.0%rdg+0.4MPH)
knots	0.0 to 40.0 knots	0.1 knots	±(3.0%rdg+0.4knots)
Units	**Range**	**Resolution**	**Gain**
CMM (cubic meters per minute)	0 to 1298.0 m^3/min	0.1 m^3/min	0.10-1.00
CFM (cubic feet per minute)	45922 ft^3/min	1 ft^3/min	0.10-1.00
mbar	502-1012 mbar	2 mbar	0.00-2.00
Power Consumption'=(1+(1010/mbar-1)*gain)*power consumption			
CMM=(60*m/sec*R*R*PI*gain)/40000			Circle
CMM=(60*m/sec*L*W*gain)/10000			Rectangle
CFM=(ft/min*R*R*PI*gain)/576			Circle
CFM=(ft/min*L*W*gain)/144			Rectangle
R & L & W: 1.5-101.5cm (0.5) or 0.6-40.0in. (0.2)			
Temperature	0 to 60°C (0 to 140 °F)	0.1°F and °C	1.0 °C (1.8 °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; CMM: cubic meters per min; CFM: cubic ft per min
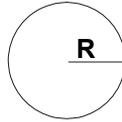
Useful Equations and Conversions

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)

H

W

R

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	196.85	1.944	3.6	2.237
1 ft/min	0.00508	1	0.00987	0.01829	0.01136
1 knot	0.5144	101.27	1	1.852	1.151
1 km/hr	0.2778	54.68	0.54	1	0.6214
1 MPH	0.447	88	0.869	1.6093	1