

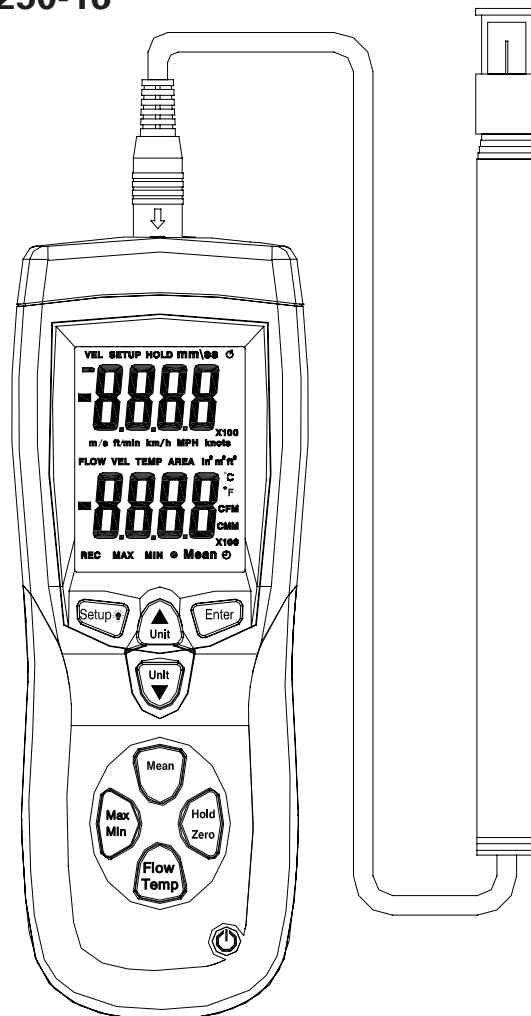
## User Manual



### CFM/CMM Hot-Wire Thermoanemometer

with NIST-Traceable Calibration

### Model 20250-16



THE STANDARD IN PRECISION MEASUREMENT

## **Introduction**

The Digi-Sense CFM/CMM Hot-Wire Thermoanemometer (Model 20250-16) provides precision air velocity, airflow, and temperature measurements. The large, easy-to-read backlit LCD includes primary and secondary readings plus numerous status indicators. The instrument is fully tested and calibrated to NIST-traceable standards. Careful use of this meter will provide years of reliable service.

## **Unpacking**

Check individual parts against the list of items below. If anything is missing or damaged, please contact your instrument supplier immediately.

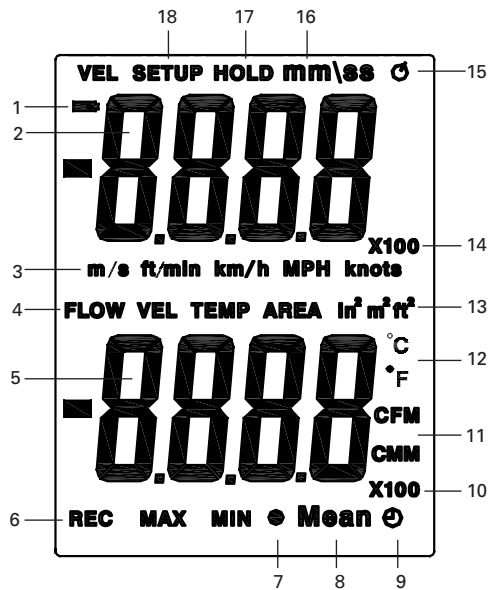
1. Meter
2. Anemometer telescoping hot-wire probe
3. USB cable
4. Software CD
5. Hard carrying case
6. AC/DC power adapter
7. One 9 V battery
8. User manual
9. NIST-traceable calibration report with data

## **Features**

- Thermal anemometer is capable of very low air velocity measurements
- Slim, telescoping hot-wire probe is ideal for grilles and diffusers
- Combination of hot wire and standard thermistor sensors delivers rapid and precise measurements
- Records Max and Min readings with a recall function
- Microprocessor circuit ensures maximum possible accuracy; provides special functions and features
- Super-large LCD with dual function allows air velocity and temperature to be shown at the same time
- Data Hold function
- Applications: environmental testing, air conveyors, flow hoods, clean rooms, air velocity, air balancing, fans/motors/blowers, furnace exhaust, paint spray booths

## Display Elements

1. Low-battery indicator
2. Primary Display: air velocity, recording data, or time
3. Air velocity units
4. Secondary display units
5. Secondary display data
6. Record MAX, MIN display
7. Indicates multi-point mean calculation mode
8. Indicates Mean value input mode is active
9. Indicates Mean value over time mode is active
10. The multiplier of secondary display value
11. Flow units
12. Temperature units
13. Flow area units
14. The multiplier of primary display value
15. Indicates Auto power-off is active
16. Elapsed time
17. Indicates Data Hold mode is active
18. Indicates entering or exiting setup mode



## Setup Options

Use the **SETUP** button to change area unit, flow area, and sleep mode settings. The meter will store the newer settings in its memory. **Note:** Setup mode is disabled in MIN, MAX, and Mean modes.

### Changing a Setup Option

1. Press the **SETUP** button for 3 seconds to enter or exit Setup mode. When the meter is in Setup mode, the display shows **SETUP** (refer to Fig. 1).
2. Press **UNIT ▲** or **UNIT ▼** button to scroll to the setup option you want to change.
3. Press **ENTER** button to indicate that you want to change this setting.
4. Press **UNIT ▲** or **UNIT ▼** button until the setting you want to use appears on the display.
5. Press **ENTER** button to store the new setting into memory.

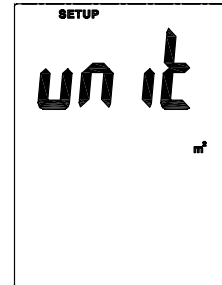


Fig. 1

### Change the Area Unit of Measure Setting

1. While in Setup mode, press **UNIT ▲** or **UNIT ▼** button to scroll to the area unit screen (refer to Fig. 2).
2. Press **ENTER** button. The string “AREA” and area unit of measure will be shown on the screen.
3. Press **UNIT ▲** or **UNIT ▼** button to scroll to your desired unit of measure (in<sup>2</sup>, m<sup>2</sup>, or ft<sup>2</sup>).
4. Press **ENTER** to store the new setting into memory.

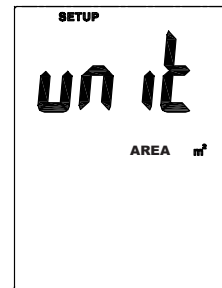


Fig. 2

### Change the Flow Area Setting

1. While in Setup mode, press **UNIT ▲** or **UNIT ▼** button to scroll to the AREA unit screen (refer to Fig. 2).
2. Press **ENTER** button to bring up the area value screen (refer to Fig. 3).
3. Press **ENTER** button again and the area numbers flash.
4. Press **UNIT ▲** or **UNIT ▼** button to select the placement of the decimal point.
5. Press **ENTER** button and the flashing digit will indicate the number ready to be changed. Press **UNIT ▲** or **UNIT ▼** button to change the flashing digit from 0 to 9.

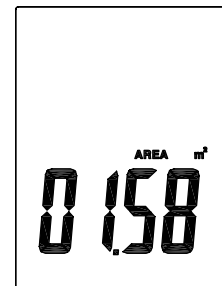


Fig. 3

6. Press the **MEAN** button to change the station of flashing digit. Press **UNIT ▲** or **UNIT ▼** button to change that flashing digit from 0 to 9.
7. Continue until all four numbers have been changed. Then press **ENTER** button to store the new setting into memory.

### Auto Power-Off Mode

The meter's default mode is to automatically shut off after 20 minutes of non-use. To disable the auto power-off mode, enter the Setup mode.

1. While in Setup mode, press **UNIT ▲** or **UNIT ▼** to scroll to the "SLP " screen (refer to Fig. 4). Press **ENTER** to display "On".
2. Press **UNIT ▲** or **UNIT ▼** button until your desired setting appears on the display. Press **ENTER** to store the new setting into memory. The Auto power-off icon will appear in the upper right-hand corner indicating that the auto power-off mode is activated.

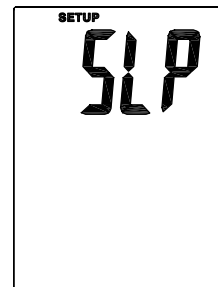


Fig. 4

### Software Installation

- Insert the CD into a PC.
- Double click the setup.exe file to launch the software installation program.
- Follow the installation wizard to complete the installation.
- If the USB driver needs to be updated, please go to the folder /driver on the CD and double click the file CP210xVCPInstaller.exe to update the driver.

### Setup and Operation

#### Connecting the Vane

1. The vane 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.

## Setup and Operation (continued)

### Taking Single-Point Measurements

1. Press the **On/Off** button to turn the meter on and allow 5 seconds for the thermal sensor to warm up.
2. Setting the meter to zero:
  - a. On the probe's head, slide the sensor cover to the up position to isolate the air velocity sensor from the environment (refer to Fig. 5).
  - b. Press **HOLD/ZERO** button until the reading value of air velocity shows zero.
3. Slide the sensor cover to the down position to let the air velocity sensor come in contact with the air (refer to Fig. 6).
4. Extend the telescoping probe to your desired length, up to 41"/104 cm (refer to Fig. 7).
5. Select the desired air velocity units and temperature units. Press the **UNIT ▲** button to scroll through the air velocity units of measure. Press the **UNIT ▼** button to select either °C or °F for temperature units.
6. Press the **FLOW/TEMP** button to bring up the airflow display, then press **UNIT ▼** button to select either CFM or CMM for airflow units.
7. Place the probe head in the air stream. There are two white arrows on each side of the probe head (refer to Fig. 8). These arrows should point in the same direction as the airflow.
8. View the readings on the LCD. The upper display shows the Air Velocity reading. The lower display shows the Temperature reading. Press the **FLOW/TEMP** button to toggle between viewing the Temperature reading and the Airflow reading.
9. Press **SETUP** button to turn on the backlight; press again to turn off.

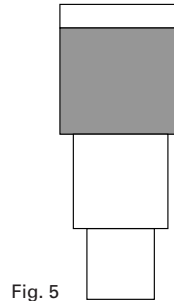


Fig. 5

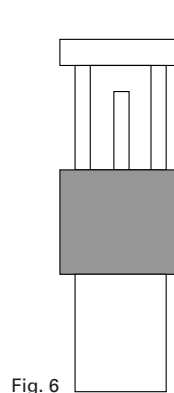


Fig. 6

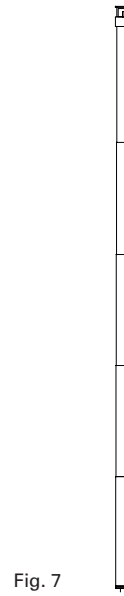


Fig. 7

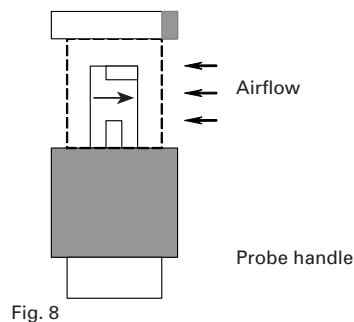


Fig. 8

### Taking an Averaged Measurement Over Multiple Points

1. Press **MEAN** button quickly and the **•MEAN** icon will appear at the bottom of screen. In this mode, the upper display shows the value of the most recent data point captured and the lower display shows the real-time probe measurement.
2. Press **ENTER** button to take a data point. The captured data value is shown on the upper display while the lower display continues to show the real-time probe measurement. A data point is captured whenever the **ENTER** button is pressed.
3. To stop data collection and calculate the mean value, press **MEAN** button. The **•MEAN** icon flashes at the bottom of screen and the lower display will indicate the calculated average value of the data taken.
4. To return to measurement mode, press **MEAN** button.
5. To toggle between the parameters displayed (temperature, flow velocity, and calculated volumetric flow rate), press the **FLOW/TEMP** button.
6. To change the units of the reading displayed, press **UNIT ▼** button.

### Taking an Average Measurement Over Elapsed Time

1. Press **MEAN** button for 2 seconds. The **MEAN⌚** icon will appear at the bottom of screen.
2. Press **ENTER** button to begin timing a measurement. The elapsed time (mm:ss) is shown in the upper display, while the current reading is shown in the lower display.
3. Press **ENTER** button again to stop the timing cycle. Press **ENTER** button again to resume the timing cycle.
4. To end the measurement and calculate the average value, press **MEAN** button. The **MEAN⌚** icon will flash and the calculated average value is shown in the lower display.
5. To return to the measurement mode, press the **MEAN** button.
6. To toggle between the parameters displayed (temperature, flow velocity, and calculated volumetric flow rate), press the **FLOW/TEMP** button.
7. To change the units of the reading displayed, press **UNIT ▼** button.

### Holding the Displayed Readings

1. Press **HOLD/ZERO** button to freeze the readings on the display. The **HOLD** icon will appear at top of screen, indicating that the meter is in Hold mode and the measurement will remain unchanged.
2. To toggle between the parameters displayed (flow or temperature), press the **FLOW/TEMP** button.
3. Press **HOLD/ZERO** button again to turn off the Hold mode.

## **Setup and Operation (continued)**

### **Viewing the MAX and MIN Readings**

1. Press **MAX/MIN** button to enter the Max/Min mode. The **REC MAX** icon will appear at bottom of screen.
2. Press **MAX/MIN** button again to toggle between the maximum displayed values (**REC MAX** icon) and the minimum displayed values (**REC MIN** icon).
3. To toggle between the parameters displayed (flow or temperature), press the **FLOW/TEMP** button.
4. Press **MAX/MIN** button and hold for 2 seconds to exit Max/Min mode.

## Specifications

Air velocity	Range	Resolution	Accuracy
m/s (meters per sec)	0.1 to 25.0 m/s	0.01 m/s	±(5% + 1 digit) reading or ±(1%+1 digit) full scale, whichever is greater
ft/min (feet per min.)	20 to 4925 ft/min	1 ft/min	
km/h (kilometers per hour)	0.3 to 90.0 km/h	0.1 km/h	
MPH (miles per hour)	0.2 to 55.8 MPH	0.1 MPH	
knots (nautical MPH)	0.2 to 48.5 knots	0.1 knots	
Airflow	Range	Resolution	Area
CFM (cubic feet per min)	0 to 99,999 ft <sup>3</sup> /min	0.001 to 100	—
CMM (cubic meters per min)	0 to 99,999 m <sup>3</sup> /min	0.001 to 100	—
Air temperature	Range	Resolution	Accuracy
	32 to 122°F (0 to 50°C)	0.1°F/C	±1.8°F (1°C)
CFM (ft <sup>3</sup> /min) = Air velocity (ft/min) × Area (ft <sup>2</sup> )    CMM (m <sup>3</sup> /min) = Air velocity (m/s) × Area (m <sup>2</sup> ) × 60			

Display	1 <sup>7</sup> / <sub>8</sub> " x 2 <sup>3</sup> / <sub>8</sub> " (4.7 × 6 cm) LCD, dual function
Memory	Max and Min with recall
Sampling	Approximately every 0.8 second
Operating temperature	32 to 122°F (0 to 50°C)
Operating humidity	<80% RH, noncondensing
Weight	10 oz (280 g)
Dimensions	8 <sup>1</sup> / <sub>4</sub> " x 3" x 2" (21 × 7.5 × 5 cm)
Power supply	9 V battery or 100 to 240 V, 50/60 Hz
Power current	Approximately 60 to 90 mA DC

## **Maintenance, Recalibration, and Repair**

### **Battery Replacement**

When low-battery icon appears on LCD, the 9 V battery must be replaced.

1. Disconnect the probe.
2. Remove the meter's battery cover.
3. Replace the 9 V battery.
4. Close the battery compartment cover.

**It is recommended that Digi-Sense products are calibrated annually** to ensure proper function and accurate measurements; however, your quality system or regulatory body may require more frequent calibrations. To schedule your recalibration, please contact InnoCal, an ISO 17025 calibration laboratory accredited by A2LA.

