User Manual

⟨Ď⟩ DIGI-SENSE™

Professional CFM/CMM
Vane Thermoanemometer

with NIST-Traceable Calibration

Model 20250-15

CE
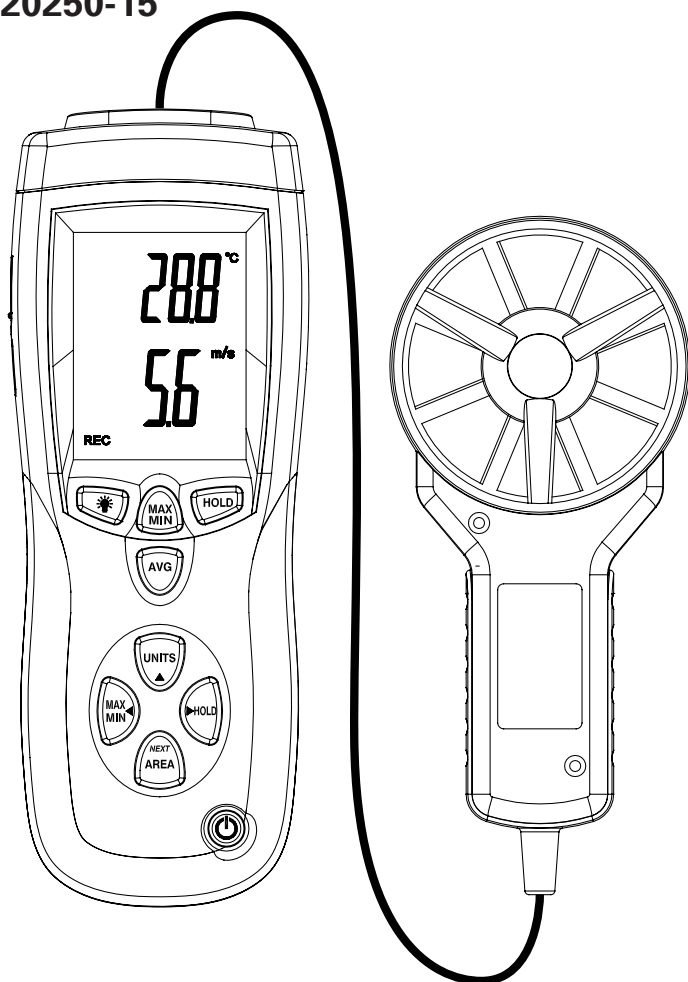
Introduction

The Digi-Sense Professional CFM/CMM Vane Thermoanemometer (Model 20250-15) provides precision air velocity, airflow (volume), and temperature measurements. The large, easy-to-read backlit LCD includes primary and secondary displays plus numerous status indicators. The meter features 16 memory locations (8 for CFM and 8 for CMM) to store and recall commonly used area sizes. 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 vane sensor on 3.9 ft (120 cm) cable

3. Hard carrying case

4. One 9 V battery

5. User manual

6. NIST-traceable calibration report with data

Meter Description

1. LCD
2. Vane sensor
3. Temperature buttons
4. Power On/Off button
5. Airflow/velocity buttons
6. AVG
7. Backlight
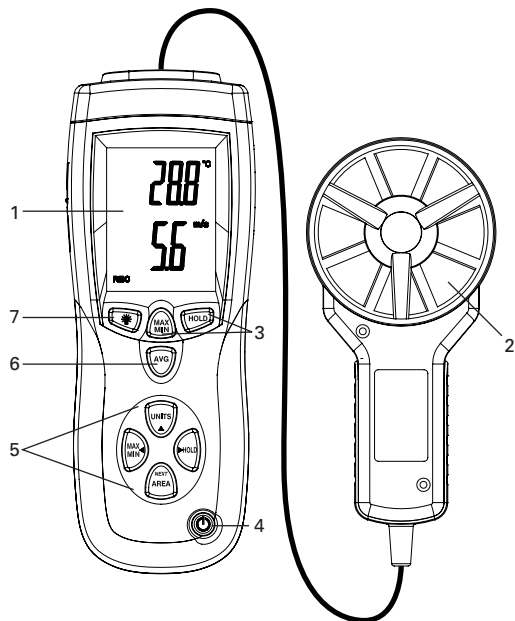
Keypad

- **POWER** Press to turn the meter ON or OFF

- **MAX/MIN** Used to record and store the highest, lowest and average air-flow or velocity readings. ◀(LEFT) also serves as change decimal point button in AREA mode

- **UNITS** Press to select the mode of operation. In FLOW mode, the meter displays air volume. In VELOCITY mode, the meter displays air speed. ▲(UP) also serves as increase number button in AREA mode.

- **AVG** Used to Average multiple readings in FLOW or VELOCITY mode. Up to 20 readings can be averaged.

- **HOLD** Press to freeze the displayed reading. Press again to unlock display. This button also functions as the ▶(RIGHT) scroll button in AREA mode.

- **AREA/ NEXT** Press and hold to manually enter the area of a duct in CFM or CMM mode. In AREA mode, used to select memory locations 1 through 8.

- ☼ Press to turn the backlight on/off

- **MAX/MIN (Temperature)** Used to record and store the highest, lowest readings for air temperature.

- **HOLD (Temperature)** Press to freeze the displayed temperature reading. Press again to unlock the display. Press and hold for 3 seconds to switch between °C and °F. Meter will beep twice to indicate change.
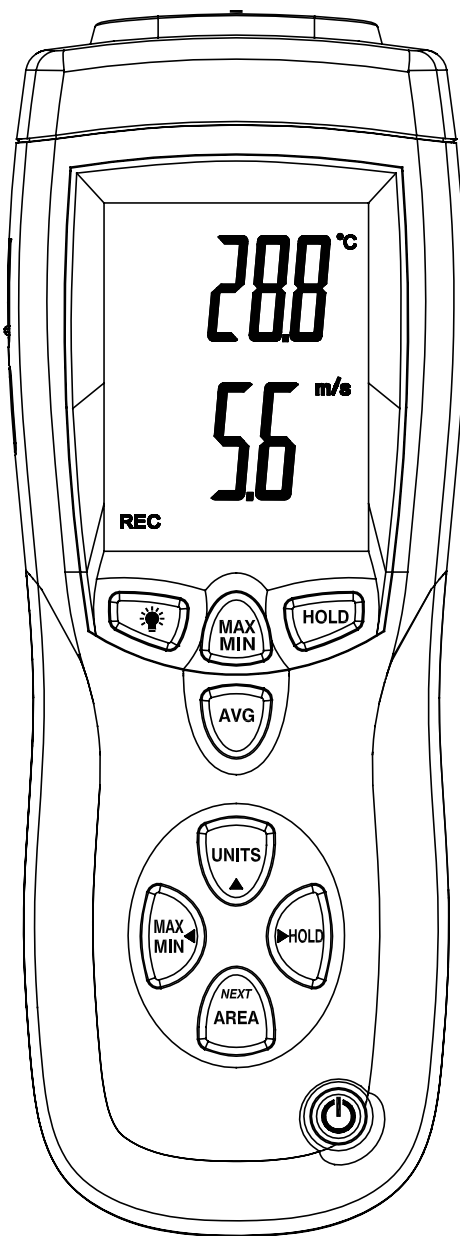
Display Layout

- **REC** (top of LCD): indicates that min/ max temperature function is running

- **MAX** (top of LCD): maximum hold function engaged for an air temperature measurement

- **MIN** (top of LCD): minimum hold function engaged for an air temperature measurement

- **HOLD** (top of LCD): data hold function engaged for an air temperature measurement

- **°C / °F:** temperature units of measure

- 🔋 : Low-battery indicator

- **AREA (ft^2, m^2):** units for area dimensions

- **VEL:** indicates that meter is in air velocity mode

- **FLOW:** indicates that meter is in airflow mode

- **CFM/CMM:** airflow units of measure

- **m/s, ft/min, km/h, MPH, knots:** air velocity units of measure

- **X10, X100:** multipliers for airflow readings

- **REC:** indicates that min/max function is running (top for temp, bottom for air)

- **MAX** (bottom of LCD): maximum hold function for an air velocity and airflow measurement

- **MIN** (bottom of LCD): minimum hold function for an air velocity and airflow measurement

- **AVG:** air averaging mode

- **HOLD** (bottom of LCD): Data Hold for an Air Velocity and Airflow function

Smaller LCD digits at top right of display for probe temperature
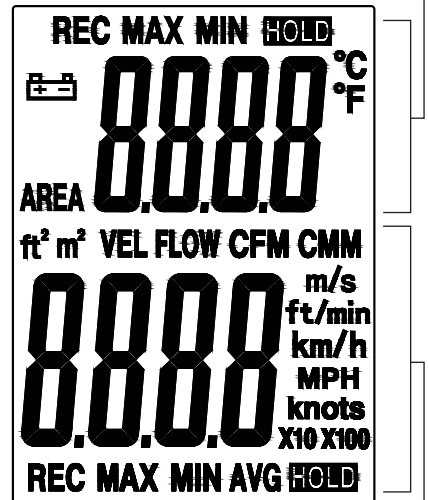
Large LCD digits at bottom of display for air velocity and airflow

Setup and Operation

Connecting the Vane

1. The vane plug is inserted in meter's sensor jack at the top of 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 into place. Do not apply undue force or try to twist the plug side-to-side.

3. If the vane is not connected to the meter properly or if the sensor is defective, the LCD will indicate **OL** in place of a Temperature reading.

Air Velocity Measurements (Single Point)

1. Turn on the meter using the **On/Off** button.

2. Press **UNITS** button to select the desired unit of measure. **Note:** At power-up the meter will display the last unit of measure previously entered.

3. Place the sensor in the air stream. Ensure that the air enters the vane as indicated by the arrow sticker placed inside the vane.

4. View the readings on the LCD. The large main bottom display shows the air velocity reading. The upper right subdisplay shows the temperature reading.

Side view of Vane

Arrow

Airflow
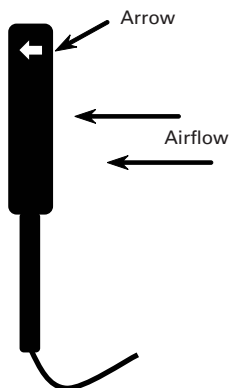
Air Velocity Measurement Averaging Mode

1. To enter 20 point averaging mode, press and hold the **AVG** button until it beeps twice. The **AVG** icon will be displayed.

2. Take a measurement and press the **AVG** button. A single beep will sound and the **HOLD** icon will appear briefly in the display.

3. The average reading will be displayed and number of readings measured will appear in the upper right-hand corner of the display. After 5 seconds, the display will return to the current reading.

4. Repeat steps 2–3 until the desired number of points have been measured.

5. To return to standard velocity measuring mode, press and hold **AVG** button until meter beeps twice.

Note: In the standard velocity measuring mode, press the **AVG** button once to recall the previous average. The average will be cleared when you enter the averaging mode again.

Setup and Operation (continued)

Airflow Measurements (CFM / CMM)

1. Turn on the meter using the **On/Off** button.

2. Press the **UNITS** button to select the desired airflow units: CFM (cubic feet per minute) or CMM (cubic meters per minute). **Note:** At power-up the meter will display the last unit of measure previously entered.

3. To begin entering the area in ft^2 or m^2, press and hold the **AREA** button until it beeps twice. The leftmost digit of the bottom display will begin to flash.

4. Use the ▲(UP) button to change the flashing digit.
   Use the ◄(LEFT) button to move the decimal.
   Use ►(RIGHT) button to select the other digits.

5. After all of the digits are entered, press and hold the **AREA** button (until meter beeps twice) to save the area into memory and return to CFM or CMM measuring mode.

6. Place the sensor in the air stream. Ensure that the air enters the vane as indicated by the arrow sticker placed inside the vane. Refer to the diagram. The large main bottom LCD display shows the airflow reading. The upper right LCD subdisplay shows the temperature reading.

Side view of Vane

Arrow

Airflow

The meter has 16 memory locations (8 for CFM and 8 for CMM) that can be used to store commonly used area sizes that you can recall at any time.

1. Press the **AREA** button until meter beeps twice. A memory location number will appear in the top right of the display indicating the memory location.

2. Push the **NEXT** button to scroll through and select the desired location. Once you have selected the desired memory location enter your dimension:

   Use the ▲(UP) button to change the flashing digit
   Use the ◄(LEFT) button to move the decimal
   Use ►(RIGHT) button to select the other digits.

3. After all of the digits are entered, press and hold the **AREA** button (until it beeps twice) to save the area into memory and return to CFM or CMM measuring mode.

To select and use a previously stored dimension, press and hold the **AREA** button until it beeps twice.

1. Press **NEXT** to scroll through the 8 memory locations. Press and hold the **AREA** button until it beeps twice to return to CFM or CMM measuring mode.
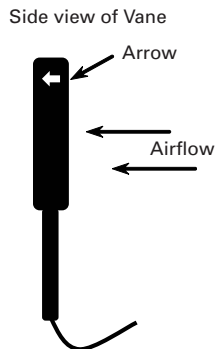
Airflow Averaging Mode

1. To enter the 20-Point Averaging Mode, press and hold the **AVG** button until it beeps twice. The **AVG** icon will be displayed.

2. Take a measurement and press the **AVG** button. A single beep will sound and the **HOLD** icon will appear briefly in the display.

3. The average reading will be displayed and number of readings measured will appear in the upper right-hand corner of the display. After 5 seconds, the display will return to the current reading.

4. Repeat steps 2–3 until the desired number of points have been measured.

5. To return to standard airflow measuring mode, press and hold **AVG** button until meter beeps twice.

Note: In the standard velocity measuring mode, press the **AVG** button once to recall the previous average. The average will be cleared when you enter the averaging mode again.

Data Hold (Air Velocity/Airflow)

1. While taking measurements, press the **HOLD** button to freeze the air velocity/airflow reading.

2. The **HOLD** indicator will appear in the bottom of the LCD.

3. Press the **HOLD** button again to return to normal operation.

MAX/MIN/AVG Record (Air Velocity/Airflow)

This allows the user to record and view the highest (MAX), lowest (MIN), and average (AVG) readings.

1. Press **MAX/MIN** button. The **MAX** indicator and **RECORD** indicator along with the maximum reading will appear on the LCD and the meter will begin keeping track of the MAX, MIN and Average values.

2. Press the **MAX/MIN** button again to view the minimum reading. The **MIN** indicator along with the minimum reading will appear on the LCD.

3. Press the **MAX/MIN** button again to view the average reading. The **AVG** indicator along with the average reading will appear on the LCD.
Note: Average recording will stop automatically after 2 hours, and the upper LCD subdisplay will show OFF (only in the average mode).

4. Press the **MAX/MIN** button again to display current readings. **Note:** Meter will keep recording MAX/MIN/AVG readings.

5. To clear and stop **MAX/MIN/AVG** recording and return to normal operation, press and hold the **MAX/MIN** button until the meter beeps twice.

<u>Setup and Operation</u> (continued)

Automatic Power-Off

To conserve battery life, the meter automatically turns off after 20 minutes. To disable this feature:

1. Turn the meter OFF.

2. Press and hold the **Backlight** button while turning the meter on.

3. "dis APO" will appear in the display. The Auto power-off feature will now be disabled.

4. Note that Auto power-off is re-enabled each time the meter is turned on.

5. Also note that Auto power-off is disabled in CFM/CMM or average mode.

<u>Battery Replacement</u>

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

1. Disconnect the sensor.

2. Remove the meter's battery cover.

3. Replace the 9 V battery.

4. Close the battery compartment cover.

Specifications

Air velocity	Range	Resolution	Accuracy
m/s (meters per sec)	0.40 to 30.00 m/s	0.01 m/s	±(3% + 0.20 m/s)
ft/min (feet per minute)	80 to 5900 ft/min	1 ft/min	±(3% + 40 ft/m)
km/h (kilometers per hour)	1.4 to 108.0 km/h	0.1 km/h	±(3% + 0.8 km/h)
MPH (miles per hour)	0.9 to 67.0 MPH	0.1 MPH	±(3% + 0.4 MPH)
knots (nautical MPH)	0.8 to 58.0 knots	0.1 knots	±(3% + 0.4 knots)
Airflow	**Range**	**Resolution**	**Area**
CFM (cubic feet per min)	0 to 999,900 ft^3/min	0.001 to 100	0.000 to 999.9 ft^2
CMM (cubic meters per min)	0 to 999,900 m^3/min	0.001 to 100	0 .000 to 999.9 m^2
Air temperature	**Range**	**Resolution**	**Accuracy**
	14 to 140°F (−10 to 60°C)	0.1°F/C	4.0°F (2.0°C)

Circuit	Custom LSI microprocessor circuit
Display	Dual-function 16 mm 4-digit LCD
Sampling rate	Approximately 1 reading per second
Sensors	Air velocity/flow sensor: Conventional angled vane arms with low-friction ball bearing Temperature sensor: NTC-type precision thermistor
Automatic power-off	Unit shuts off automatically after 20 minutes to preserve battery life
Operating temperature	32 to 122°F (0 to 50°C)
Operating humidity	<80% RH, noncondensing
Storage temperature	14 to 140°F (−10 to 60°C)
Storage humidity	<80% RH, noncondensing
Weight	1.6 lb (725 g) including battery and probe
Dimensions	Main instrument: 8" x 3" x 2" (20.3 x 7.5 x 5 cm) Vane sensor head: 2¾" (7 cm) diameter Cable length: 3.9 ft (1.2 m)
Power	One 9 V battery
Battery life	Typically 80 hrs. Battery life will be reduced significantly if the backlight is used continuously.
Battery current	Approximately 8.3 mA DC

Maintenance, Recalibration, and Repair

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.

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