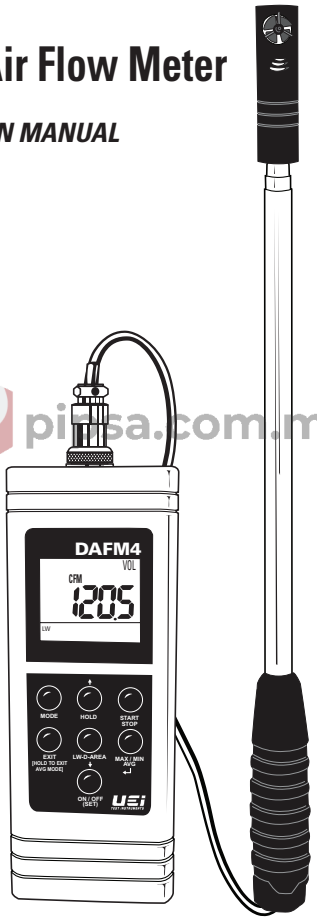
TEST iNSTRUMENTS™

DAFM4

Digital Air Flow Meter

INSTRUCTION MANUAL

ENGLISH



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1-800-547-5740 • Fax: (503) 643-6322
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INTRODUCTION

The DAFM4 Anemometer/Psychrometer is designed with 6 HVAC/R parameters in one instrument. These are included in a portable, battery-operated instrument for measuring humidity, air temperature, dew point, wet bulb, air velocity and air volume. The small vane probe includes sensors for velocity, temperature and humidity all on a telescoping extension, making in-duct and surface measurements possible.

FEATURES

- Measures air velocity, temperature, and relative humidity (RH%)
- Calculates wet-bulb temperature, dew point, and air volume (CFM, CMM)
- 0.7" Small diameter air vane on 39" long telescoping probe
- Timed accumulative average for air volume with one hour maximum
- Min/Max and Hold
- English/Metric Scales
- Fast response
- Auto-power off (can be disabled)
- Low battery indicator

INCLUDED

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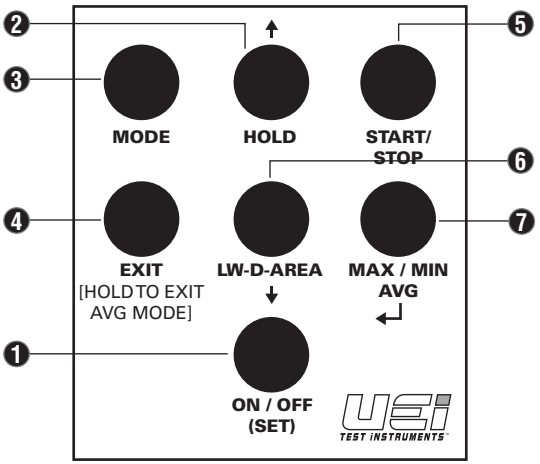
- DAFM4 Meter
- Remote telescoping mini-vane probe
- Battery (1 x 9V)
- User manual
- Hard carrying case

SAFETY NOTES

Before using this meter, read all safety information carefully. In this manual the word "**WARNING**" is used to indicate conditions or actions that may pose physical hazards to the user. The word "**CAUTION**" is used to indicate conditions or actions that may damage the instrument.

⚠ **CAUTION!** Do not strike the fan portion of the probe. Damage could result, reducing accuracy or functionality.

CONTROLS AND INDICATORS



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1. **On/Off (Setup):** Press briefly to power meter on. Press and hold to turn the meter off.
   - **Note:** *When the meter is OFF, press more than two seconds to enter SETUP mode.*
2. **HOLD**: Freezes display reading for current parameter
3. **MODE**: Press to scroll through available measurements of velocity, air flow, ambient temperature, relative humidity, wet-bulb temperature, and dew point temperature.
4. **EXIT**: Use to exit setup.
   - **Note**: *Press and hold to exit timed average display*
5. **START/STOP**: Press to begin timed average. Press a second time to pause timed average.
6. **LW-D-AREA**: Press when setting up area for calculation of air volume. Pressing repeatedly scrolls through the three options. *(LW-Length/Width, D-Diameter, A – Area)*
7. **MIN/MAX AVG (↵)**: Press to display minimum or maximum values for any measurement. Press when in timed average to display average, minimum or maximum air volume.

FIGURES AND COMPONENTS



OPERATING INSTRUCTIONS

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DISABLE AUTO POWER OFF

With the meter off, press and hold ON/OFF and HOLD for more than two seconds. The display will show an "n" indicating that auto power off is disabled.

SELECTING UNITS

- With the meter off press and hold **ON/OFF (Set)** button for more than two seconds.
- Press **MIN/MAX AVG (↵)** to select unit (P10)
- Press ↑ or ↓ to switch units
- Press **MIN/MAX AVG (↵)** to select choice
- Press **EXIT** to return to normal operation

BASIC MEASUREMENT

When the DAFM4 is first powered on, air velocity is the default display. To view other parameters press "**MODE**" key. Each parameter will be displayed in turn.

- **VEL** – Air Velocity

- **VOL** – Air volume in CFM or CMM, based on dimensions entered

  Note: *Icon at bottom of screen will indicate the method used to calculate volume (LW-Length/Width, D-Diameter, A – Area).*
- **AT** – Ambient Temperature measured at the probe tip
- **RH** – Relative Humidity measured at the probe tip
- **WBT** – Wet Bulb Temperature calculated from measured temperature and RH%
- **DP** – Dew Point Temperature calculated from measured temperature and humidity

MEASURING AIR VOLUME (CFM OR CMM)

Measuring air volume with the DAFM4 has two steps. The first step is to enter the characteristics of the area being measured. There are three methods to enter this and depend on the location of your measurement. If measuring square duct work (in-duct or exit) you would enter **Length and Width (LW)**. For round duct you would enter **Diameter (D)**. If measuring the exit with a grill it is recommended to use the effective area or free area **(A)** from the grill manufacturer. If this is not known, the air volume measurement will be an estimate. (See P. 9-10)

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Note: *Grill manufacturers often provide engineering data on effective or free area. This is indicated as the Ak value.*

ENTERING DUCT INFORMATION

1. Press **MODE** until VOL is showing in the upper right corner of the display
2. Press **LW-D-AREA** until the desired method is showing in the lower left corner of the display
3. Press **MIN/MAX AVG (↵)** to select this mode
   a. Press **↑ (HOLD)** to increase the value
   b. Press **↓ (LW-D-AREA)** to decrease the value
   c. Press **MIN/MAX AVG (↵)** to accept the displayed value

   Note: *Press and hold to scroll through the values quickly. Release and then press briefly to increase or decrease one digit at a time.*

After entering the duct characteristics you will be taken back to the display for Air Volume. Hold the probe in the area to be measured for a direct display of air volume.

MEASURING AIR VOLUME (CFM OR CMM) CONT.

TIMED AVERAGE AIR VOLUME

1. Press **MODE** until VOL is showing in the upper right corner of the display
2. Enter duct dimensions using the method described on page 6
3. Extend the probe to the width of the duct or more
4. Verify that you are aiming the "Air In" into the air flow. This is the side opposite of the inch/cm markings on the probe extension. The grooves of the probe should be perpendicular to the air flow direction
5. Insert probe into duct access hole (3/4" hole required)
   a. See "Measurement Location and Method" for instructions on where to measure
6. Start with the probe inserted just inside the access hole
7. Press "**START**" to begin timed average
8. Slowly move probe into the duct until it crosses the duct and contacts the far side
9. Press "**STOP**" to interrupt timed average. The cumulative timer will stop when the DAFM4 is not capturing data
10. Move to the next access hole and repeat steps 6~9.
11. Press **MIN/MAX AVG (↵)** after capturing data on all access holes to view average volume
    a. AVG flashing and elapsed time will show when displaying average
    b. AVG flashing, elapsed time and MIN will show minimum measured volume
    c. AVG flashing, elapsed time, and MAX will show maximum measured volume
12. Press and hold **EXIT** to end test

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MEASUREMENT LOCATION AND METHOD

There are recommended methods to traverse a duct in order to collect sufficient data for an accurate average. Using a timed average increases the number of data points for a much more accurate result. It is still recommended to use the approach taken by the Log-Tchebycheff Rule for access hole spacing, but the number of data points is not needed. By utilizing a timed average you will capture these locations, plus data from the entire width of the duct being measured.

MEASURING AIR VOLUME CONT.

We recommend the following number of access holes depending on duct size;

- 18" or less – Two access holes 6" apart
- 18"~30" – Five access holes
- 30"~36" – Six access holes
- Greater than 36" – Seven access holes

ACCESS HOLE SPACING

Use the Log-Tchebycheff Rule for rectangular ducts to determine spacing for access holes.

Number of access holes per side	Position relative to inner wall (multiplier)
5	0.074, 0.288, 0.500, 0.712, 0.926
6	0.061, 0.235, 0.437, 0.563, 0.765, 0.939
7	0.019, 0.153, 0.217, 0.361, 0.639, 0.783, 0.847, 0.923, 0.981

Example – for a 20" inside dimension select 5 access holes.

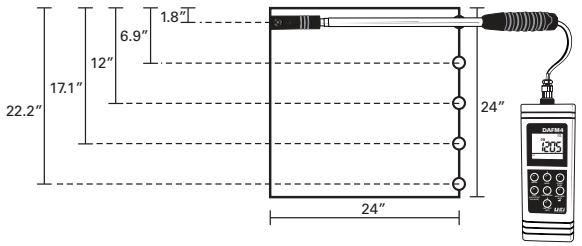
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- Access 1, 20 x 0.074 = 1.48" from wall (use 1 ½")
- Access 2, 20 x 0.288 = 5.76" from wall (use 5 ¾")
- Access 3, 20 x 0.500 = 10" from wall (use 10")
- Access 4, 20 x 0.712 = 14.24" from wall (use 14 ¼")
- Access 5, 20 x 0.926 = 18.52" from wall (use 18 ½")

SAMPLE CALCULATED LOCATIONS

Access Holes	5	Access Holes	6	Access Holes	7
Width	24	Width	30	Width	36
0.074	1.8	0.061	1.8	0.053	1.9
0.288	6.9	0.235	7.1	0.203	7.3
0.500	12.0	0.437	13.1	0.366	13.2
0.712	17.1	0.563	16.9	0.500	18.0
0.926	22.2	0.765	23.0	0.634	22.8
		0.939	28.2	0.797	28.7
				0.947	34.1

DIAGRAM OF LOCATIONS



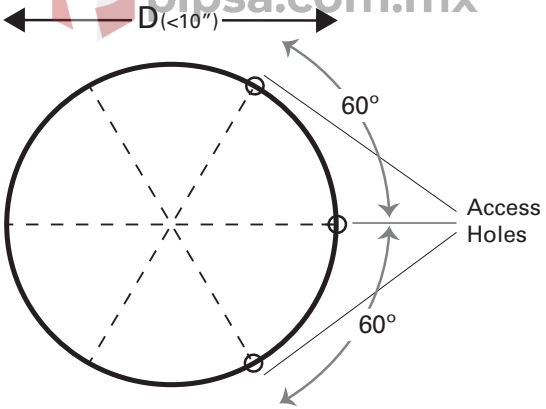
Access Hole Location

ROUND DUCT ACCESS HOLE LOCATION

For round ducts drill three holes at 60 degrees separation. This will allow you to cover all locations recommended using the log-Tchebycheff method for round ductwork.

Locate all access holes in a straight section of ductwork.

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Log-Tchebycheff Rule for Round ducts

ESTIMATING FREE AREA (EFFECTIVE AREA) OF A GRILL

To obtain air volume on a grill with unknown effective or free area you must estimate the free area. This is difficult, but can provide an estimate of the volume for comparison testing. If multiple grills of the same design are compared using this method, you will have an accurate relative comparison, although the actual value may not be known.

Method 1

- Measure length and width in inches.
- Obtain overall area in square inches by multiplying length times width.
- Divide square inches by 144 to convert to square feet.
- Multiply the result by 0.70 (70%) to estimate the actual open area.

Note: *For return registers that are more open, increase the factor to 0.9 (90% open). For louvered registers with much more covered area decrease to 0.5 or 0.6 (50~60% open).*

Example – 4"x10" residential floor register

- Step 1 – 4" and 10"
- Step 2 – 4 x 10 = 40 square inches
- Step 3 – 40 ÷ 144 = 0.2777 square feet
- Step 4 – 0.277 x 0.70 = 0.194 square feet
  (use this when entering free area "A" on the DAFM4)

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Method 2

Measure the grill area inside the frame of the register, calculate area in square inches and convert to square feet using the method 1 steps. You do not need to perform step 4.

Example – 4"x10" floor register

- Step 1 – actual louver area dimensions are 9" x 3.5"
- Step 2 – 9 x 3.5 = 31.5 square inches
- Step 3 – 31.5 ÷ 144 = .219 square feet

Note: *This method may result in a slightly elevated result as it does not fully remove the louvers that are in the air path.*

MAINTENANCE

LOW BATTERY

When the low battery "B" icon appears on the display, all readings will change to "- - -" to prevent inaccurate results. Change the 9V battery located in the inner compartment on the rear of the instrument.

CLEANING

Periodically clean your meters case using a damp cloth (not wet) only. DO NOT use abrasive, flammable liquids, cleaning solvents, or strong detergents as they may damage the finish, impair safety, or affect the reliability of the structural components.

BATTERY REPLACEMENT:

Remove screw from the battery compartment cover on the back of your meter and remove cover. Replace battery with a fresh 9 Volt battery paying attention to polarity. Replace cover and secure with screw.

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SPECIFICATIONS:

	English	Metric
Air Velocity Range	99 ~ 3937 ft/min	0.5 ~ 20 m/s
Air Velocity Resolution	0.1 ft/min	0.1 m/s
Air Velocity Accuracy	±(3% or reading + 39 ft/min)	±(3% or reading + 0.2m/s)
Temperature Range	-4 ~ 140°F	-20 ~ 60°C
Temperature Resolution	0.1°F	0.1°C
Temperature Accuracy	±1.1°F(-4 ~ 122°F); ±2.2°F at others	±0.6°C(-20 ~ 50°C); ±1.2°C at others
RH% Range	0.1 ~ 99.9% RH	
RH% Resolution	0.1% RH	
RH% Accuracy	±3% RH at 77°F(25°C) and 10 ~ 90%RH; ±5% at others	
Wet bulb range	-4 ~ 158°F	-20 ~ 70°C
Wet bulb resolution	0.1°F (°C)	
Air volume display	0 ~ 99999 CFM (m^3/s)	
Air volume resolution	0.1 (0 ~ 9999.9), 1 (10000 ~ 99999)	
LCD Size (HxW)	1.38 x 2.13 inches	35.2 x 54 mm
Operating temperature range	32 ~ 122°F	0 ~ 50°C
Operating RH%	Less than 80% (handset)	
Storage temperature range	-4 ~ 122°F	-20 ~ 50°C
Storage RH%	Less than 90%	
Dimension	7.1 x 2.9 x .5 inches	180 x 73 x 38 mm
Weight	.37 lbs	170g
Battery	9V battery (1)	

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DAFM4

Digital Air Flow Meter

Limited Warranty

The DAFM4 is warranted to be free from defects in materials and workmanship for a period of one year from the date of purchase. If within the warranty period your instrument should become inoperative from such defects, the unit will be repaired or replaced at UEi's option. This warranty covers normal use and does not cover damage which occurs in shipment or failure which results from alteration, tampering, accident, misuse, abuse, neglect or improper maintenance. Batteries and consequential damage resulting from failed batteries are not covered by warranty.

Any implied warranties, including but not limited to implied warranties of merchantability and fitness for a particular purpose, are limited to the express warranty. UEi shall not be liable for loss of use of the instrument or other incidental or consequential damages, expenses, or economic loss, or for any claim or claims for such damage, expenses or economic loss.

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A purchase receipt or other proof of original purchase date will be required before warranty repairs will be rendered. Instruments out of warranty will be repaired (when repairable) for a service charge. Return the unit postage paid and insured to:

1-800-547-5740 • FAX: (503) 643-6322
www.ueitest.com • Email: info@ueitest.com

This warranty gives you specific legal rights. You may also have other rights which vary from state to state.

PLEASE
RECYCLE

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