

# M4000MD

## Digital HVAC Analyzer

### Owner's Manual



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## 1. INTRODUCTION

Congratulations! You now own one of the finest HVAC tools available today.

The unique M4000MD provides you with all the necessary information to measure HVAC performance – including Temperature, Humidity, Dew Point, Velocity, Volume and Capacity.

The M4000MD can be used for anything from simple Temperature readings to complex multi-outlet computations of BTU's, from Humidity measurement to system balancing or total outlet output. An advanced measurement instrument designed for in field use, the M4000MD is lightweight, completely portable and ergonomically designed. Three simple keypad buttons control the unit, providing quick and easy operation. An advanced microprocessor does all the computations needed – and the results are displayed on a large LCD screen.

For the best results with your new M4000MD, please read this manual carefully. It describes operation, care and additional information that will allow you to get the greatest benefit from your new instrument.

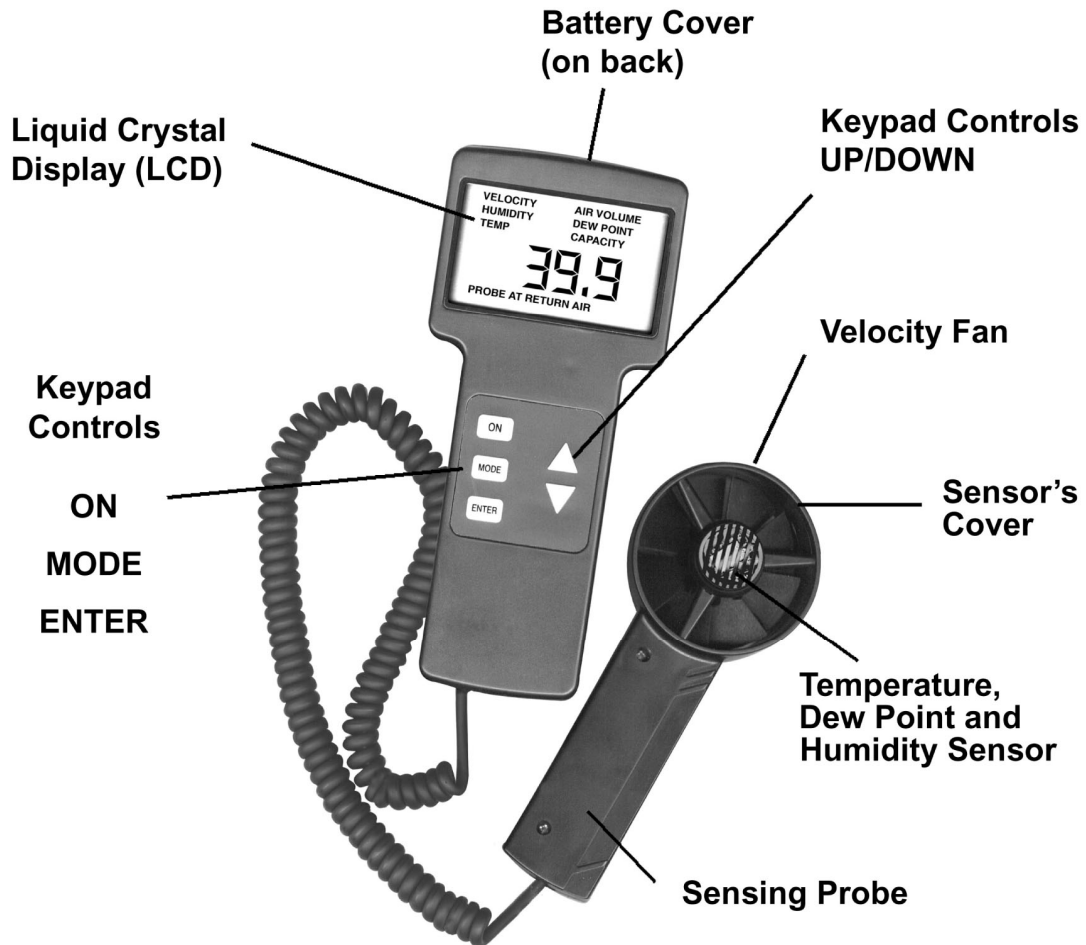
## 2. FEATURES

- Temperature in °C and °F
- Humidity in % Relative Humidity
- Air Velocity in m/sec
- Air Volume in m<sup>3</sup>/sec and CFM
- Capacity in kW and Btu/h
- Dew Point in °C and °F
- Allows the measuring of round grills
- Memory allows Cumulative Volume and BTU measurements
- Keypad Controls
- Portable and Lightweight
- Durable sensing mechanisms
- 1.8m (Six foot) coil cord
- Tough ABS housing
- 75 mm x 45 mm (3" x 1.75") Large Liquid Crystal Display
- Carrying Case Included

### 3. WARNINGS & PRECAUTIONS

- When the instrument is first introduced into a new environment, i.e. from a service vehicle into a building, allow 10 minutes for the instrument's humidity sensor to stabilize.
- Remember to allow unit readings to stabilize in order to avoid false readings.
- Do not place Sensor Cover in direct contact with any surface, especially extremely hot or moist ones.
- Do not expose Sensor to temperatures outside its range.
- Do not expose Fan to velocities above its range.
- Avoid contact with solvents and liquids.
- Avoid extreme mechanical shock or vibrations.
- Always take care to keep the coil cord free of rotating objects such as fan blades or cages.

#### 4. INSTRUMENT DESCRIPTION



## 5. OPERATING INSTRUCTIONS

### 5.1. Units of Measure

PARAMETER	METRIC	English - Press [▼]
Temperature	°C	°F
Humidity	%RH	
Velocity	meters/sec	
Width / Length	Centimeter	
Air Volume	M <sup>3</sup> /sec	CFM
Capacity	kW	BTU/H
Dew Point	°C	°F

## 5.2. Turn the unit ON or OFF

5.2.1. Press the [ON] button - the unit will beep and the LCD lights.

5.2.2. Press [ON] button again to switch the unit off.

## 5.3. Measuring Temperature and Dew Point

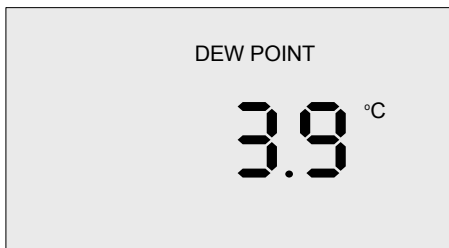
5.3.1. The M4000MD will switch on in the TEMP mode. If already in another mode, press the [MODE] button until TEMP is displayed on LCD.



5.3.2. Place the probe in front of the outlet (or the area to be measured) so that the SENSOR'S COVER IS FACING THE OUTLET.

5.3.3. The temperature in °C is displayed. Press [▼] for °F.

5.3.4. To display Dew Point - Press [▲]. Dew Point is displayed in °C.  
Press [▼] for °F





## 5.4. Measuring Humidity Level

5.4.1. Press the [MODE] button – “HUMIDITY%” will be displayed on LCD.

5.4.2. Place the probe in front of the outlet (or area to be measured) so that the sensor’s cover is facing the outlet.

5.4.3. Relative Humidity level in %RH is displayed.



## 5.5. Measuring Air Velocity

5.5.1. Press the [MODE] button – “VELOCITY” will be displayed on LCD.

5.5.2. Place the probe in front of the outlet (or area to be measured) so that the sensor’s cover is facing the outlet.

5.5.3. Air velocity in meters per second (m/s) is displayed.



## 5.6. Measuring Air Volume

5.6.1. Press the [MODE] button – “AIR VOLUME” and “ENTER WIDTH” (flashing) will be displayed on LCD.

The M4000MD is requesting the A/C outlet’s width.

5.6.2. Using the [▲] and [▼] buttons, enter the appropriate measurement in centimeters.



5.6.3. Press [ENTER] to store the width in memory. – "AIR VOLUME" and "ENTER LENGTH" (flashing) will be displayed on LCD.

The M4000MD is requesting the A/C outlet’s length.

5.6.4. Using the [▲] and [▼] buttons, enter the appropriate measurement in centimeters. DO NOT PRESS ENTER UNTIL STEP 5.5.7



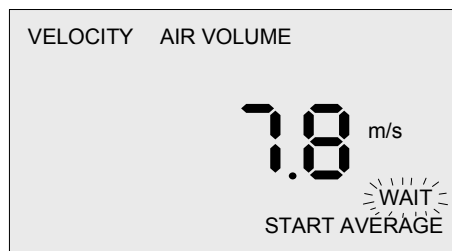
5.6.5. **To measure round grills** – after step 5.5.1 press and hold the [ENTER] button for more than 2 seconds, until "ENTER" and "DIAMETER" are flashing on LCD.

The M4000MD is requesting the A/C outlet’s diameter.

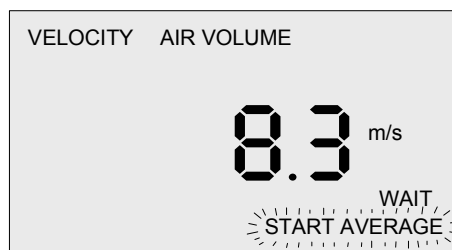
5.6.6. Using the [▲] and [▼] buttons, enter the appropriate measurement in centimeters. DO NOT PRESS ENTER UNTIL STEP 5.5.7



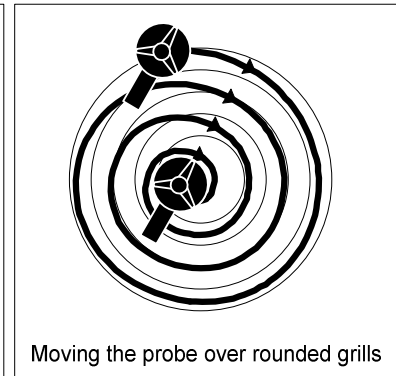
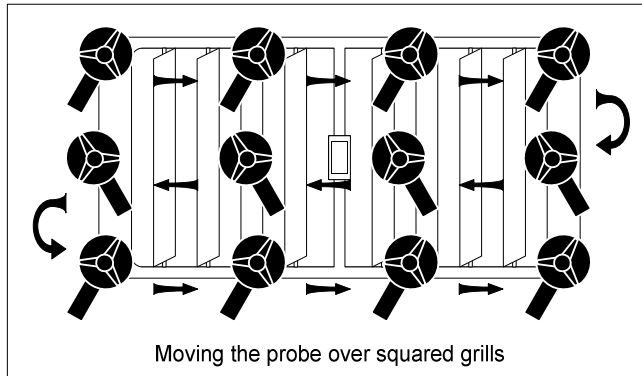
5.6.7. Place the probe in front of the unit's outlet so that the sensor's cover is facing the outlet. Press [ENTER]. The M4000MD will flash "WAIT" for about 20 seconds.



Keep the probe in front of the outlet's grill and when "START AVERAGE" begins to flash, move the probe back and forth across the unit's outlet.



Make sure to cover the complete area of the grill, moving the probe at a rate of speed to cover the entire grill in less than 10 seconds. Go back and repeat moving the probe across the outlet for one minute.



At the end of one minute the M4000MD will beep, signaling that the measurement time has ended and the LCD will display the measured Air Volume in M<sup>3</sup>/sec.



To display Air Volume in CFM (cubic feet per minute) press and hold the [▼] button.



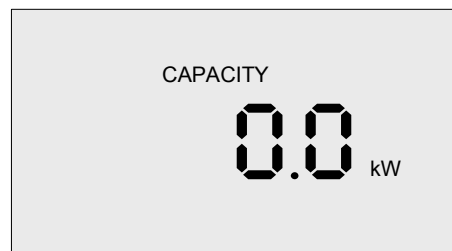
**Note:** Aim at getting readings from all available openings.

- 5.6.8. To repeat this measurement or IF YOU WISH TO MEASURE ADDITIONAL OPENINGS, press [ENTER] and repeat steps 5.5.2 - 5.5.7. Measure each opening as previously described in order to obtain an overall average reading. At the completion of each test, the sum of ALL measurements can be displayed by pressing the [▲] button.

## 5.7. Measuring Capacity

**IMPORTANT NOTE:** Before you begin to measure capacity, press the [MODE] button until you reach the "HUMIDITY" mode. Place the probe in front of the inlet grill, so that the sensor's cover is facing AWAY FROM THE INLET GRILL and wait until the humidity measurement stabilizes (this also allows the "TEMP" measurement to stabilize). DO NOT place the probe at the output grill because it will take a long time (10 minutes) to return to normal room humidity and temperature conditions!

5.7.1. Press [MODE] button – until "CAPACITY" appears on LCD.



**Note:** When measuring return air it is recommended that the FAN SPEED IS SET ON HIGH and the probe is placed at the center of the inlet grill. (No movement is necessary during this measurement).

5.7.2. Align the probe in front, at the center of unit's inlet, so that the sensor's cover is facing AWAY FROM THE INLET grill and press ENTER. The LCD will display HUMIDITY %, CAPACITY, Probe at RETURN AIR and "WAIT" will be flashing.



The M4000MD will start measuring the unit's inlet air parameters while displaying a flashing "WAIT". After measuring for one minute, the unit will beep and the "WAIT" will stop flashing, signaling that the measurement has ended, and a flashing "ENTER WIDTH" will be displayed on LCD.



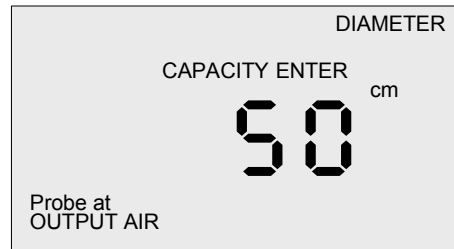
5.7.3. Using the [▲] and [▼] buttons enter the outlet's width in cm and press [ENTER]. A Flashing "ENTER LENGTH" will be displayed on LCD.



Using the [▲] and [▼] buttons enter the outlet's length in cm.

**DO NOT PRESS [ENTER] UNTIL STEP 5.6.5**

5.7.4. **To measure round grills** - At step 5.6.3, press [ENTER] button for more than 2 sec until a flashing DIAMETER is displayed on LCD.

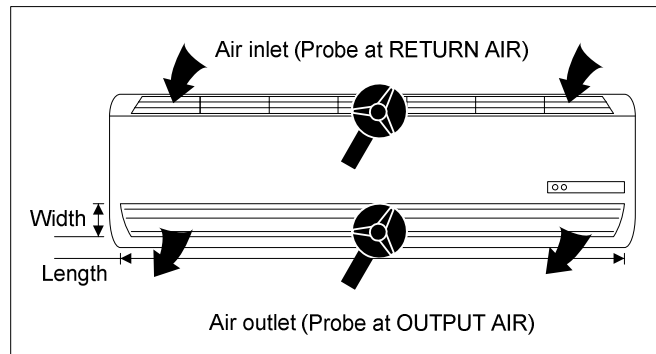


Using [▲] and [▼] buttons enter the outlet's diameter in cm. and then follow next steps.

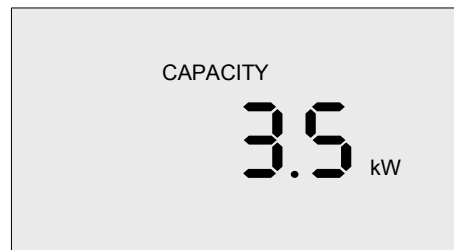
5.7.5. Place the probe in front of the outlet so that the sensor's cover is facing the outlet and then press [ENTER], the following display will show:



"WAIT" will flash. No need to move probe at this time, the M4000MD is waiting until the sensors stabilize with the new TEMPERATURE and HUMIDITY readings (about 90 seconds) then "START AVERAGE" will flash Measure for one minute making sure to move the probe over the complete area of the grill (Refer to Step 5.5.7). Aim at getting average readings from all available openings.



At the end of one minute the unit will beep and the LCD screen will display the results in kW.



To repeat this measurement, the return air and grill size are already in memory, simply press [ENTER] and repeat sections 5.6.3 -5.6.5 above.

- 5.7.6. When there are several outlet openings but the same return air, press [ENTER] and repeat steps 5.6.3 - 5.6.5 for each one (make sure you enter the correct width and length for each opening). In Step 5.6.5 "WAIT" will flash for 20 seconds. Each time a measurement ends the LCD will display the kW for that specific outlet. At the completion of each test, the sum of ALL measurements can be displayed by pressing the [▲] button.

**Note:** If you wish to go through the complete process of measuring capacity again, which includes the return air measurement, you should wait 10 minutes to allow the humidity sensor to return to ambient conditions.



## **6. MAINTENANCE**

Your M4000MD requires no maintenance apart from battery replacement. From time to time wipe the unit clean with a damp cloth. Do not use solvents or abrasives. Occasionally inspect the coil cord for nicks and/or cuts and return for replacement if any are found.

### **6.1. Low Battery Indication**

The battery requires replacement when the LCD characters begin to flash on and off.

### **6.2. Battery Replacement**

To replace the battery, slide the battery compartment cover, located on the back of the top portion of the unit, upward to access the battery. Remove and replace with a new and/or a tested 9V alkaline battery. Replace cover before operation.

## 7. SPECIFICATIONS

Ranges:	Temperature	-5°C to 65°C (23°F to 149°F)
	Humidity	10-95% RH
	Velocity	0.5 to 15 m/sec. (1.8 to 49 fps)
Accuracy:	Temperature	± 2°C
	Humidity	± 3% RH
	Velocity	± 3%
	Dew Point	± 3%
Response Time:	Temperature	< 5 sec.
	Humidity	< 10 sec.
	Velocity	Instantaneous
	Dew Point	< 10 sec.
Operating Temp.:	0°C to 50°C (32°F to 122°F)	
Power Supply:	One 9V alkaline battery	
Battery Life:	Approx. 8 hours continuous	
Weight:	430g (15 ounces)	
Dimensions:	Controls	20.3 x 8.9 x 5 cm (8" x 3.5" x 2")
	Probe	17.1 x 7.6 x 5 cm (6.75" x 3" x 2")
	Display	5 digits 75 x 45 mm (3" x 1.75") LCD
	Coil Cord Length	1.8m (72")



## M4000MD

