

Psychrometer/Anemometer

840034

Instruction Manual

SPER
SCIENTIFIC

Environmental Measurement Instruments

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FIRST TIME USE

When operating the meter, press the buttons firmly for one full second to ensure proper operation.

Before measurement, rotate probe cover clockwise to open.

The probe and anemometer are calibrated as a system. Do not connect the probe to another psychrometer/ anemometer as measurements will be inaccurate.

INTRODUCTION

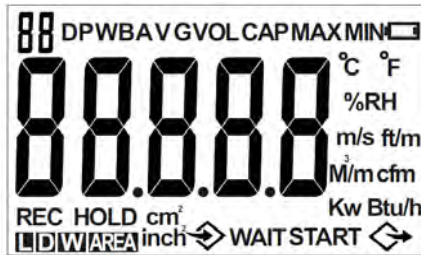
Thank you for purchasing this psychrometer/anemometer. The unique meter design contains seven HVAC & RH parameters in one: Humidity, Air Temperature, Dew Point, Wet Bulb, Air Velocity, Air Volume, and BTU.

The temperature/humidity sensor is built in to the probe and is protected by a turnable cap. Please turn the cap open to get accurate temperature and humidity readings when in operation.

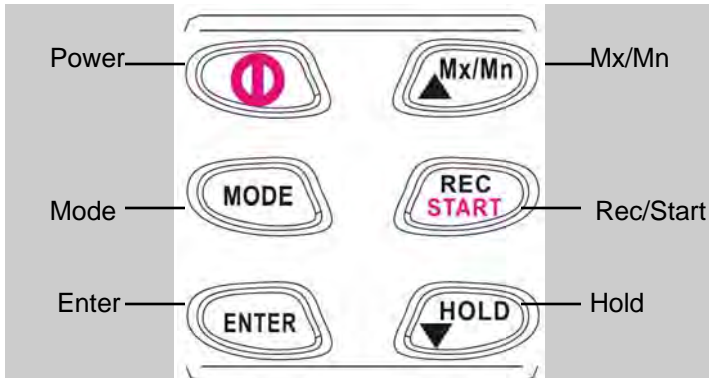
The microprocessor-based psychrometer is a must-have device for HVAC engineers. It is easy to get wet bulb, dew point and BTU readings.

FRONT PANEL DESCRIPTION

LCD Display



Key Pad



Power

1. Press and release the **Power** button to turn on the meter.

Mode

2. With the meter on, press the **Mode** button to select the different units of measure: Temp (Temperature), DP (Dew Point), WB (Wet Bulb), RH (Relative Humidity), Velocity. Press the **Mode** button longer than two seconds to select VOL and CAP.

FRONT PANEL DESCRIPTION

Enter

3. Press **Enter** to confirm the scale settings and calibration.

Mx/Mn/Up ▲

4. Press the **Mx/Mn** button to view average, maximum, and minimum values.

Rec/Start

5. In velocity mode, press **Rec/Start** to start measuring volume or capacity.

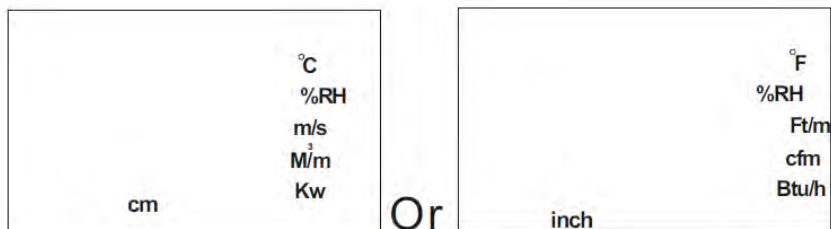
Hold/Down ▼

6. Press the **Hold button** to retain the current reading in the display, and then press **Hold** again to return to live measurement.
7. Press the **Power** button and the **Hold** button simultaneously for more than 3 seconds to enter the RH calibration mode.
8. Press **Enter** and **Hold** simultaneously to turn backlighting on or off.

FRONT PANEL DESCRIPTION

Auto Off

The 840034 defaults to auto-off mode when turned on. To override the auto-off function, with the meter off, hold the **Power** button and **Mx/Mn** buttons simultaneously for more than two seconds. The meter will turn on with the auto-off function inactive.



Select Unit

1. With the meter off, press the **Power** button for more than two seconds to select metric or imperial measurement.
2. Press **Mx/Mn** or **Hold** to select the scale.
3. Press **Enter** to save; the meter will turn on automatically.

MEASUREMENT PROCEDURES

Air Flow

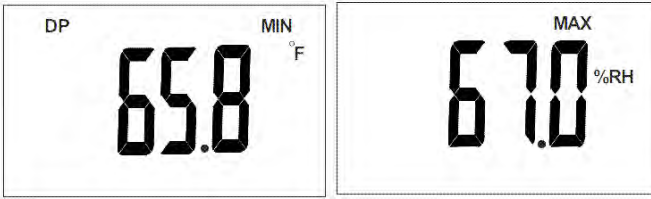
Your model 840034 meter measures both basic measurements, including air temperature, humidity, dew point, wet bulb, and air velocity as well as extended measurements, including air volume, sum of volume, capacity, and sum of capacity.

1. When the meter is turned on, air temperature is shown on the LCD.
2. To view the other measurement parameters, press the **Mode** button (continually) to display them in turn.
3. Press **Mode** for over two seconds to switch between volume and capacity.

Max, Min and Avg

1. When the meter is turned on, min/max and average readings will automatically be saved for all basic measurements: air temperature, dew point, wet bulb, humidity, and velocity.
2. Press the **Mx/Mn** button to view the average value, maximum value, and minimum value in turn.
3. Press **Mx/Mn** again to return to normal mode. The data will be erased once the meter is turned off.
4. When in Mx/Mn/Avg mode, press the **Mode** button to cycle through the different parameters (see following).

MEASUREMENT PROCEDURES



Air Volume: Outlet Size

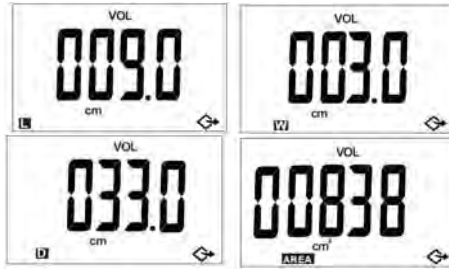
1. While in standard mode, hold the **Mode** button to enter air volume mode.
2. To measure the volume, you must first enter the air outlet size. There are 3 choices:

Length and Width. Press the **Hold** button to select the numeric setting first. Then press **Mx/Mn** to select the appropriate value (0-9). Values are displayed from 0 to 9 in a cycle. After entering the length, press **Enter** to save the setting. Repeat this process for width setting. Press **Enter** again to save these settings.

Diameter. While in the default setting mode (length), press **Enter** for over two seconds to choose a diameter setting. Press the **Hold** button to select a numeric setting first, and then press **Mx/Mn** to select the appropriate value. After selecting, press **Enter** to finish.

Area. While in diameter setting mode, press **Enter** for over two seconds to enter the area setting. Press the **Hold** button to select a numeric setting first, then press the **Mx/Mn** button to select the appropriate value (0-9). After selecting, press **Enter** again to finish. (See following examples.)

MEASUREMENT PROCEDURES



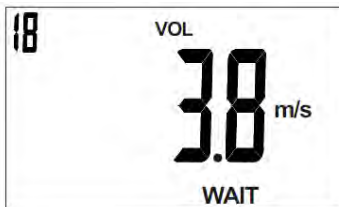
Air Volume

After you set the outlet size settings, there is a 20 second wait before you can begin measurement.

During the 20 second waiting period, the count -down number is displayed on the top left-hand corner. The meter will beep when the wait time is over.

- OR -

If you prefer not to wait, press **Rec/Start** to begin measuring volume right away.



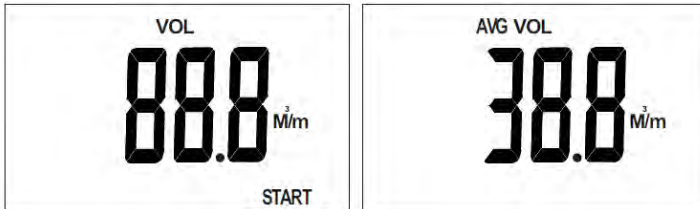
After you begin measuring volume, the meter will automatically count the volume for 60 seconds to calculate an average value. During this 60 seconds, move the probe along the entire outlet to cover each part so the measured data will be more accurate.

The count-down time is displayed on the top left corner and the meter beeps when 60 seconds is up.

MEASUREMENT PROCEDURES

After 60 seconds the LCD displays the average volume.

To measure additional outlets, press **Enter** and you will be returned to the air volume dimensions setup screen (see below).



If measuring more than one outlet, press **Enter** again to repeat the procedure from outlet size input.

After measuring multiple outlet volume, press Mx/Mn key to review the sum of all outlets. Press **Hold** key to review the last outlet volume.

Capacity Size Set Up

Hold the **Mode** button while in normal mode to enter air volume, then press again for approximately one second to enter capacity mode.

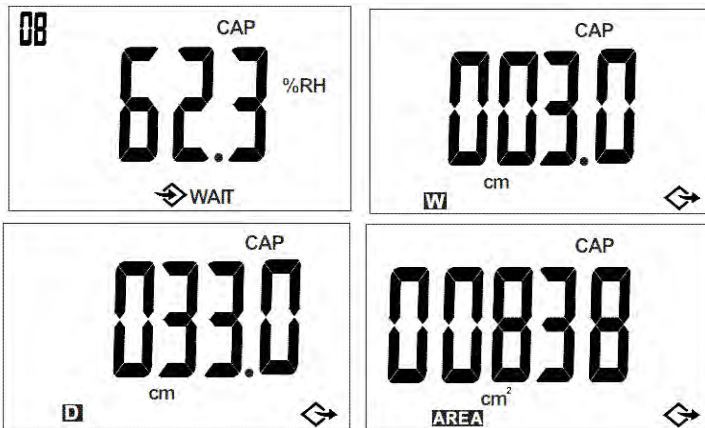
MEASUREMENT PROCEDURES

There are 3 choices for entering size:

Length and Width. Press **Hold** to select the numeric setting. Then press **Mx/Mn** to select the appropriate value (0-9). These values will cycle between 0 to 9. After entering the length, press **Enter** to save the setting. Repeat the procedure for width setting. Press **Enter** again to finish size setting.

Diameter. With mode set to length, press **Enter** for over two seconds to choose diameter settings. Press **Hold** to select the numeric setting first, then press **Mx/Mn** to select the appropriate values (0-9). After selection, press **Enter** again to finish size setting and move to the next step.

Area. While in diameter setting mode, press **Enter** for over two seconds to enter area settings. Press the **Hold** button to select the numeric first, then press **Mx/Mn** to select the appropriate values (0-9). Press **Enter** again to finish the size setting and advance to the next step.



MEASUREMENT PROCEDURES

Available Size Range

Please refer to the chart below for input size ranges.

	L/W/D	AREA
cm	000.0~999.0	00000~99999
inch	000.0~999.9	00000~00000

MEASUREMENT PROCEDURES

Capacity Measurement

To measure capacity, put the probe in the outlet, and press **Enter**. The meter will count for 60 seconds to measure the average temperature and RH%. The count-down will display in the top left corner of the LCD, and the meter will beep when 60 seconds is up. The meter will display the outlet size setting automatically.

After pressing **Enter** to finish and leave size settings, there is a waiting period before putting the probe to the air source. During this time, the count -down time is displayed in the top left corner and the meter beeps when time is up.

- OR -

Press **Rec/Start** to begin measuring right away.



Note: *It takes 90 seconds to first stabilize the sensor. When taking several measurements, the waiting period automatically adjusts from 90 to 20 seconds on the second measurement. Move the probe along the air source to get an accurate value.*

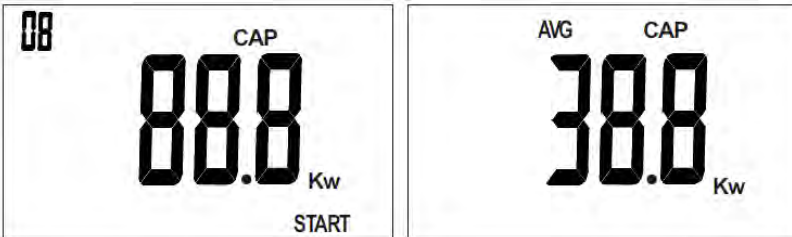
If you would like to measure more than one outlet, wait for 10 minutes between measurements to allow the humidity sensor to stabilize to ambient humidity.

After measuring capacity, the meter will automatically calculate capacity for 60 seconds and give an average value.

MEASUREMENT PROCEDURES

During the 60 second measurement time, move the probe to cover the entire area so the measured data is more accurate. The count-down time displayed on the top left is a reminder, and the unit beeps when 60 seconds is up.

After the 60 seconds is up, average volume will display on the LCD.



If there is more than one outlet size, press **Enter** to repeat the procedure for outlet size input. You can measure as many times as necessary.

After measuring more than one outlet volume, you can press **Mx/Mn** to review the sum of all outlets. Press the **Hold** button to review the last outlet capacity.

LOW BATTERY

Your unit contains a two-level battery indicator. Level 1 will flash. In this situation, the meter will work normally; however users should install new batteries soon.

The level 2 indicator will show on the LCD screen without flashing. In this situation the batteries should be changed immediately as follows:

1. Open the battery cover on the back of the meter.
2. Remove the old batteries.
3. Insert four (4) new AAA batteries and make sure they are inserted for correct polarity.
4. Replace cover.

USB SOFTWARE

Output USB

- A. 9600 bps, 8 data bits, no parity
- B. Format: Tx. ASCII code by every second while meter is on.

VXXX.XMPS (FTM): TXXX.XC (F):HXX.X%

dxxx.xc (F):wXXX.XC(F):

vXXXXX.XCMM(CFM):

UXXXXX.XKW(BTU)

Values for this unit are as follows:

1 = velocity

2 = air temperature

3 = humidity

4 = dew point

5 = wet bulb

6 = air volume

7 = capacity

The x means one of the {0|1|2| |9|-}

C. format for air value:

E01 = probe isn't connected

E02 = under flow

E03 = over flow

The unit for error code is Nul.

FOR EXAMPLE:

V010.5MPS:TE02Nul:H66.7%:dE04Nu;wE04Nul:v000
20.5CMM

TROUBLESHOOTING

Meter is on, but there is no display

1. Make sure that the **Power** button has been pressed long enough to turn on the unit.
2. Check and/or replace the batteries. Be sure there is good contact and that the polarity is correct.
3. Remove batteries for one minute. Replace them, and try again.

Display disappears

1. Check to see whether low battery indicator appeared before display disappeared. If yes, replace batteries.
2. Turn on the meter by holding the **Power** button and the **Mx/Mn** button simultaneously for more than two seconds. This will turn on the meter and disable the auto power off function of the meter.

ERROR CODES

- E1** The probe is disconnected or damaged
- E2** Below measuring range; calibrate the meter.
- E3** Above measuring range; calibrate the meter.
- E4** The original data is in error—Value error.
- E5** Out of meter display range.
- E6** The value is not calculated completely.
- E11** Humidity calibration error.

PROBE REPLACEMENT

If you change to a new probe, you should input the RH% calibration data enclosed in each probe. The data will be recorded on a slip of paper shipped with each probe. Please keep the paper for future use.

There are two calibrations that need to be input. The first value is "Slope, S"; the second value is "Intercept, Z."

For Slope (value S):

1. While the meter is off, press the **Power** button plus **Mx/Mn** plus **Rec/Start** at the same time for two seconds. This takes you to the humidity slope calibration mode. The LCD will display the current saved S value and the last digit (flashing) is ready to edit.
2. If the saved S value is different from your slip of paper, press Hold to move to the value you want to edit and then use **Mx/Mn** to change the value.
3. Press **Enter** to save the new S value. The meter will advance to the intercept (value Z) screen automatically.

Note: While setting the slope, only input five digits after the decimal point. You will need to round off the sixth digit. You should also input two digits before the decimal.

Examples:

- a. If the S value is 8.239678, you should enter 08 23968.
- a. If the S value is 11.23968, you should enter 11 23968.

PROBE REPLACEMENT

c. If the S value is 0.2396838, you should enter

00 23968.



For Intercept (value Z)

1. After pressing **Enter** to save the S setting, the meter will advance to the intercept (Z) input setting automatically. The last digit will flash to indicate the Z value is now ready for editing.
2. If the last saved Z value is different from the slip of paper, press **Hold** to move to the value you want to edit and then use **Mx/Mn** to change the value.
3. Press **Enter** to save the new Z value. The meter will return to the normal RH value mode.

Note: While setting the Z value, only input three digits after the decimal point. You will need to round off the fourth digit.

Examples:

- a. If the Z value is -928.8683, you should enter 09 28 868.
- b. If the Z value is -1928.868, you should enter 19 28 868.
- c. If the Z value is -89.68482, you should enter

00 89 685.



SPECIFICATIONS

SCALE	RANGE	RES.	ACCURACY
Temperature	-20°C to 60°C (-4 to 140°F)	0.1°C (0.1°F)	±0.6°C (±1°F)
Relative Humidity	0 to 100% RH	0.1%	±3% at 10 to 90% RH (cal. Temp.) ±5% at other ranges
Dew Point	-68 to 70°C (-7.6 to 158°F)	0.1°	
Wet Bulb Temperature	-22 to 70°C (-90 to 158°F)	0.1°	
Air Velocity	0.3 to 35 m/s (1 to 114 ft/s)	0.1	±5%
Air Volume	0 to 99999 m ³ /s (0 to 99999 cfm)	0.1(0-99999.9) or 1 (1000-99999)	±5%
Capacity	0-99999 BTU/H (KW)	0.1 (0-999.9) or 1 (1000-99999)	

SPECIFICATIONS

Power:

4 x 1.5V AAA battery or 9V > 200A adapter

Dimension: (H x W x D)

Probe: 170 x 77 x 40mm³

Meter: 175x70x33mm³

OPTIONAL ACCESSORIES

840027 AC Adapter

840052 Data Acquisition Software

840054 USB Cable

840089 Rubber Holster

840090 Water Resistant Instrument Pouch

Sper Scientific warrants this product against defects in materials and workmanship for a period of **five (5) years** from the date of purchase, and agrees to repair or replace any defective unit without charge. If your model has since been discontinued, an equivalent Sper Scientific product will be substituted if available. This warranty does not cover probes, batteries, battery leakage, or damage resulting from accident, tampering, misuse, or abuse of the product. Opening the meter to expose its electronics will void the warranty. To obtain warranty service, ship the unit postage prepaid to:

SPER SCIENTIFIC LTD
7720 E Redfield Rd, Suite 7
Scottsdale, AZ 85260
WWW.SPERSCIENTIFIC.COM
INFO@SPERSCIENTIFIC.COM

The defective unit must be accompanied by a description of the problem and your return address. Register your product online or return your warranty card within 10 days of purchase.



