Hybrid–Powered Environmental Quality Meter

850068

Instruction Manual

SPER SCIENTIFIC *Environmental Measurement Instruments*

Hybrid-Powered Environmental Quality Meter 850068

Printed in the USA

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MATERIALS SUPPLIED

- Meter
- Anemometer Vane Probe
- Water-Resistant Plastic Case
- One DC 9V Battery
- Instruction Manual

INTRODUCTION

The Sper Scientific Hybrid-Powered Environmental Quality Meter 850068 is a 4 -in-1 instrument that functions as a:

- **Light Meter**—measures light using an exclusive photodiode and color-correction-filter, light sensor. Meets the Commission Internationale de l'Eclairage (CIE) photopic standards.

- **Anemometer**—measures wind-speed using a low-friction, ball bearing wheel design to provide exceptional accuracy.

- **Hygrometer**—measures relative humidity using a high-precision humidity sensor with fast response time.

- **Thermometer**—measures temperature using standard Type-K (NiCr-NiAl) thermocouple input jack for all Type-K probes (optionally available).

INTRODUCTION

The rugged, light-weight and portable design of the Environmental Quality Meter allows you to use it almost anywhere to monitor elements and maintain a healthy and safe environment.

The Hybrid-Powered Environment Quality meter also offers a Green power source through a built in hand-crank generator, enabling battery-free operation.

Recommended exposure limits for the various elements have been set through government organizations such as the US Occupational Safety and Health Administration (OSHA) and the National Institute for Occupational Safety and Health (NIOSH).

Current recommendations and guidelines are available through these organizations, as well as many others. (Refer to Environment References page 27.)

FEATURES

- Multi-Purpose 4-in-1 Meter
- Hybrid-Power (Hand-Crank Generator)
- Rugged, Light-Weight, and Portable
- Accurate and Easy-to-Use
- One-Button Control
- Hold
- Minimum and Maximum Recall
- Multi-Channel Display
- Tripod Mountable
- Data Analysis through PC Connection
- Zero Offset Adjustment
- Easy Calibration

UNIT DESCRIPTION

LCD DISPLAY

Light–Level Measurement Units	
Lux **Ft-cd** **x10**	Both Lux and Ft-cd (Foot Candle) measure luminance. Lux = lumens per square meter. Ft-cd = lumens per square foot . X10 = Value displayed is 1/10 the value.
Air Velocity Measurement Units	
ft/min	Feet per minute
m/s	Meters per second
km/h	Kilometers per hour
MPH	Miles per hour
knots	Nautical miles per hour
Relative Humidity Measurement Units	
%	Relative humidity (RH) is a term used to describe the amount of water vapor that exists in the air and displays as a percentage.
Temperature Measurement Units	
°C/°F	Represents the temperature in either Celsius or Fahrenheit degrees.
Record Mode and Hold Indicators	
REC	Meter is operating in Record Mode.
MAX	Maximum value recorded.
MIN	Minimum value recorded.
HOLD	Meter display is in Hold Mode.

KEY PAD

Turns the unit **on/off**

Freezes current measurement value Clears recorded min/max values

Enters Record Mode
Displays recorded min/max values

Changes unit of measure for anemometer
Calibrates the light sensor

Changes unit of measure for light meter and temperature scale

Selects measurement mode

POWER TYPE SELECTION

Hybrid Power (Green) Selection

1. Slide the Power Type Switch up to the **G** position to use the meter's Green power source instead of battery power.

   The low battery indicator will display in the upper left corner of the LCD display.

2. Lift and extend the generator's hand-crank located at the bottom of the unit.

3. Rotate the handle clockwise to windup or crank the generator to create power for the meter.

Cranking the meter's generator for 20 seconds will offer several minutes of energy. Use as needed for efficient Green-power operation.

POWER TYPE SELECTION

Battery Power Selection

1. Ensure that you have correctly installed the 9V battery in the battery compartment. (Refer to Battery Replacement page 22).
2. Slide the Power Type Switch down to the **B** position to use the meter's battery power source instead of Green power.

Note…
The battery life is greater than 1000 hours when using alkaline batteries (250 hours when using general purpose batteries).

MEASUREMENT PROCEDURES

Light-Level Measurement

1. Press **POWER** to turn the meter **on**.
2. Press **FUNCTION** until the meter displays the Lux or Ft-cd light-level measuring unit.
3. Press **LUX/FT-CD** to select between Lux and Ft-cd.
4. To ensure measurement accuracy, calibrate the light meter using the Zero-Offset adjustment feature. To calibrate:

MEASUREMENT PROCEDURES

5. Cover the light sensor to block any light from registering on the meter. Press **ZERO** to calibrate the meter to zero.

   The meter displays the light-level value as 0 and is ready to measure light, even in low-lit and dark areas.

6. Uncover the light sensor and ensure that the light sensor on the front of the meter is pointing toward the lumination subject and is free from obstruction.

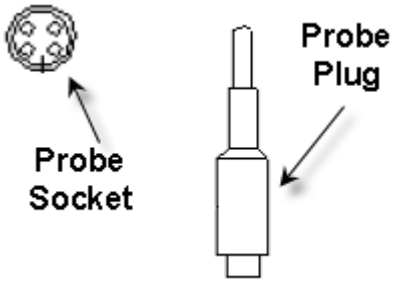
7. The meter measures the light level of the surrounding environment and displays the reading.

   When measuring intense light, the meter displays x10 to indicate that the value displayed is 1/10 the actual value.

MEASUREMENT PROCEDURES

Air-Velocity Measurement

1. Ensuring correct pin alignment, insert the Anemometer plug into the **PROBE IN** Anemometer socket located at the top of the unit.



2. Press **POWER** to turn the meter **on**.

3. Continuously press **FUNCTION** until the meter displays the wind-speed and ambient temperature measuring units (ft/min, m/S, km/h, MPH, knots, °C, °F).

3. Continuously press **UNIT** to select the desired wind-speed measuring unit.

4. Press °**C/**°**F** to select between a Celsius (°C) and Fahrenheit (°F) temperature reading.

5. Hold the Anemometer Vane Probe and ensure that the Anemometer Vane Probe Head and air flow sensor is free from obstruction.

MEASUREMENT PROCEDURES

6. Face the air-flow sensor (marked with a yellow dot) in the direction of the wind.

7. The meter measures the wind-speed and ambient temperature of the surrounding environment and displays the value.

MEASUREMENT PROCEDURES

Relative Humidity Measurement

1. Press **POWER** to turn the meter **on**.

2. Continuously press **FUNCTION** until the meter displays the relative humidity and ambient temperature measuring units (%RH, °C, °F).

3. Press °**C/**°**F** to select between a Celsius (°C) and Fahrenheit (°F) temperature reading.

4. Ensure that the humidity sensor is free from obstruction.

5. The meter measures the relative humidity and ambient temperature of the surrounding environment and displays the value.

Note…
When moving the meter to a new environment, it may take a few minutes for the humidity readings to stabilize.

MEASUREMENT PROCEDURES

Thermocouple Temperature Measurement

This procedure requires an optional Type-K thermocouple probe.

1. Press **POWER** to turn the meter **on**.
2. Ensuring correct polarity (**+ –**), carefully plug any Type-K thermocouple probe into the Temperature Thermocouple Input Port at the top of the meter.

   Temperature differences between the probe and the meter may cause inaccurate results. Allow a few minutes for the probe and meter to adjust to ambient temperature.

3. Continuously press **FUNCTION** until the meter displays the temperature measuring unit (°C, °F).

4. Press °**C**/°**F** to select between a Celsius (°C) and Fahrenheit (°F) temperature reading.

5. Make contact between the thermocouple sensor probe and the object you want to measure.

6. The meter measures the temperature of the object and displays the value.

MEASUREMENT PROCEDURES

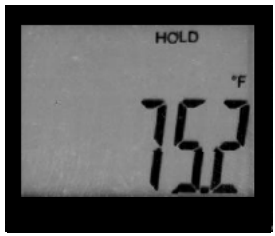
Hold Mode Selection

1. Press **POWER** to turn the meter **on**.

2. Using the **FUNCTION** button, select your desired measurement function (Light, Air-Velocity, Relative Humidity, or Temperature).

3. When a value displays that you want to retain, press **HOLD**.

   The meter freezes the current measurement value and discontinues measurement while in Hold Mode.



4. Press **HOLD** again to exit Hold Mode and resume measurement.

MEASUREMENT PROCEDURES

Record Mode & Auto-Off Selection

To save battery life, the Environmental Quality Meter turns **off** automatically after 10 minutes of inactivity. To override this feature:

1. With the meter turned **on**, press **MAX/ MIN**. The meter displays REC, disables the Auto-Off feature, enters Record Mode and begins recording maximum and minimum values.

2. While the meter displays REC and when you are ready to view the maximum and/or minimum measured values, press the **MAX/MIN** button.

   (The **MAX/MIN** button toggles between the maximum and minimum measured values.)

3. To clear the max/min values and continue recording, press **HOLD**. The meter clears the previously recorded max/min values and enters Record Mode.
4. To exit the Record Mode, press and hold **MAX/MIN** for 2 seconds.

   The meter exits Record Mode, displays the current reading value, and resets to automatically turn **off** after 10 minutes of inactivity.

MEASUREMENT PROCEDURES

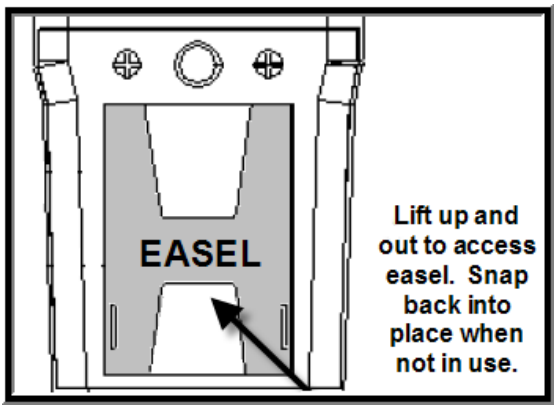
Hands-Free Operation

The Environmental Quality Meter includes both a built-in mini-easel and a tripod screw-mount for easy hands-free monitoring.

Field (840093) Tripod is available as optional accessories and attach simply via the screw-mount located on the back of the meter.

To use the easel:

1. Lift up the easel's bottom edge and extend out using the easel's hinge.
2. Using the mini-easel, you can stand the meter on any stable surface for hands-free, long-term monitoring.
3. When finished monitoring, lightly collapse the easel back into place.



BATTERY REPLACEMENT

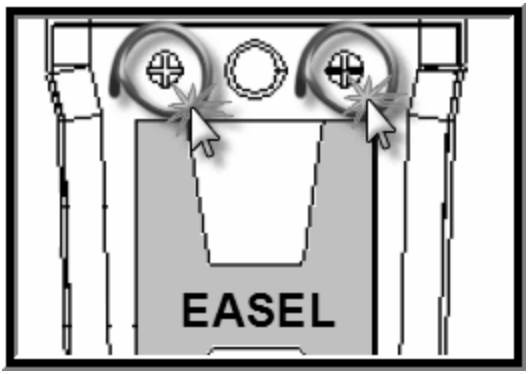
1. If the meter displays the low battery icon , press **POWER** to turn the meter **off**.

2. Use a small Philips screwdriver to unscrew the two screws that secure the battery compartment and remove the cover.

3. Remove the old batteries and replace with one DC 9V battery, ensuring correct polarity.

4. Replace the compartment cover and re -secure using the two Philips-head screws.

Note…
The battery life is greater than 1000 hours when using alkaline batteries (250 hours when using general purpose batteries).



TROUBLESHOOTING

No Display:

- Ensure that you have pressed **POWER** for longer than 100mS.
- Ensure that the batteries are in good condition, have proper contact, and are in correct polarity. When in doubt, replace the batteries.

Display Disappears:

- If the low battery indicator appeared on the LCD before the display disappeared, replace the batteries.
- Disable the Auto-Off function and place the unit in Record Mode. (Refer to Record Mode and Auto-Off Selection page 19).

ERROR CODES

- - - - Measurement is out-of range.

 Indicates low battery, replace batteries.

SPECIFICATIONS

General Specifications	
Size	6.7” (H) x 2.8” (W) x 1.5” (D) 170mm (H) x 70mm (W) x 39mm (D)
Weight	15.2 oz. (432g) Excluding Battery
Power Supply	DC 9V battery or Green-Power (Crank Generator)
Power Consumption	Anemometer: Approx. DC 11 mA. Other functions : Approx. DC 7.5 mA.
Operating Temp	0 to 50 °C (32 to 122 °F)
Operating Humidity	Maximum 80% RH
Display Size	1.57” (H) x 1.26” (W) 40 mm (H) x 32 mm (W)
Response Time	Typically 15 seconds

Light Meter Specifications			
Unit	**Range**	**Resolution**	**Accuracy**
Lux	0 to 2,000 Lux 1800 to 20,000 Lux	1 Lux 10 Lux	±5% rdg ±8 dgt
Ft-cd	0 to 204.0 Ft-cd 170 to 1860 Ft-cd	0.1 Ft-cd 1 Ft-cd	
**rdg (reading), dgt (digital)*			

SPECIFICATIONS

Anemometer Specifications			
Unit	**Range**	**Resolution**	**Accuracy**
ft/min	80 to 4930 ft/min	1 ft/min	≤20 m/s ±3% F.S. >20 m/s ±4% F.S.
m/s	0.4 to 25.0 m/s	0.1 m/s	
km/h	1.4 to 90.0 km/h	0.1 km/h	
MPH	0.9 to 55.9 MPH	0.1 MPH	
knots	0.8 to 48.6 knots	0.1 knots	
** F.S. =Full Scale*			

Thermometer & Hygrometer Specifications			
Unit	**Range**	**Resolution**	**Accuracy**
°C (Ambient)	0 to 50°C	0.1 °C	±1.2 °C
°F (Ambient)	32 to 122°F	0.1 °F	±2.5 °F
°C (Type-K)	-100 to 1300°C	0.1 °C	±(1% rdg + 1 °C)
°F (Type-K)	-148 to 2372°F	0.1 °F	±1% rdg + 2 °F
%RH	10 to 95% RH	0.1% RH	<70% RH ±4% RH ≥70 RH ±(4% rdg + 1.2% RH)
** rdg (reading)*			

OPTIONAL ACCESSORIES

- 800060 to 77 Type-K Thermocouple Probes
- 840090 Water-Resistant Case
- 840093 Field Tripod

ENVIRONMENT REFERENCES

Refer to any of the following organizations for current and reliable data regarding recommended exposure limits for the various elements.

- American Conference of Governmental Industrial Hygienists (www-acgih.org).
- American Industrial Hygiene Association (www.aiha.org).
- Canadian Centre for Occupational Health & Safety (www.ccohs.ca).
- Commission Internationale de l'Eclairage (www.cie.co.at).
- Environmental Protection Agency (www.epa.gov).
- International Electrotechnical Commission (www.iec.ch).
- International Organization for Standardization (www.iso.org).
- National Climatic Data Center (www.ncdc.noaa.gov).
- National Institute for Occupational Safety and Health (www.cdc.gov/niosh).
- US Occupational Safety and Health Administration (www.osha.gov).

WARRANTY

Sper Scientific warrants this product against defects in materials and workmanship for 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 damage resulting from accident, misuse, or abuse of the product. To obtain warranty service, ship the unit postage prepaid to:

SPER SCIENTIFIC LTD.
8281 E. Evans Rd., Suite #103
Scottsdale, AZ 85260
(480) 948-4448

The defective unit must be accompanied by a description of the problem and your return address. Register your product online at www.sperwarranty.com within 10 days of purchase.

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