



# **Environmental Quality Meter**

850071

Instruction Manual

SPER  
SCIENTIFIC LTD.

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## TABLE OF CONTENTS

1. INTRODUCTION .....	2
2. PANEL DESCRIPTION .....	3
3. OPERATING INSTRUCTIONS .....	4
3-A. Measurement Procedures .....	4
• Type K, J Thermometer Measurement	
• Hold	
• Record Maximum/Minimum	
3-B. Thermocouple Calibration .....	4-5
3-C. Anemometer, Light, IR Thermometer and Humidity.....	5
3-D. Automatic Shut Off .....	5
3-E. Overload Indicator .....	5
3-F. Battery Replacement .....	5
3-G. RS 232 PC Serial Interface.....	5-6
4. SPECIFICATIONS .....	6-7
5. OPTIONAL ACCESSORIES .....	7-8
6. WARRANTY .....	8

### 1. INTRODUCTION

Using interchangeable probes this versatile meter reads airspeed, temperature, RH, and light. You can order probes for only the parameters currently required and add additional probes in the future.

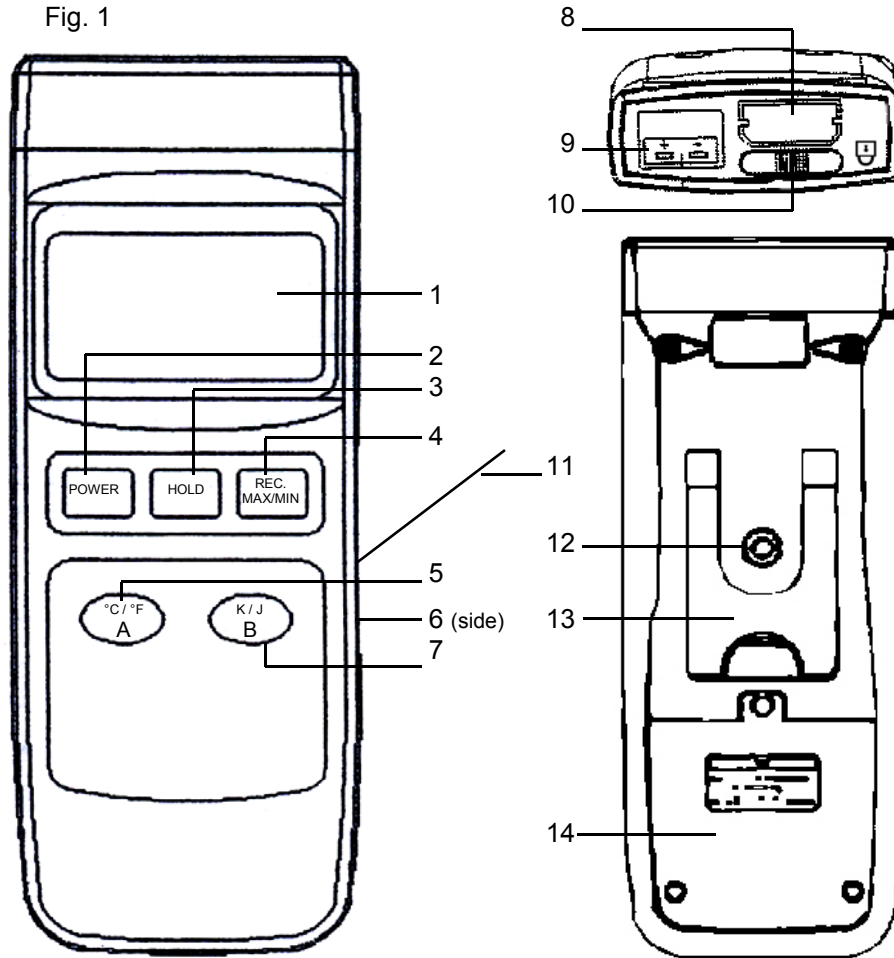
Intelligent probes electronically retain calibration information. No recalibration is required when changing probes. The display simultaneously reads temperature in user selectable °C & °F and all measurements are automatically temperature compensated.

The RS-232 port enables communication with a computer. The unit also features automatic shut off, hold and min-max, has a fold out easel back and a tripod screw. Comes with a 9V battery and a hard-shell foam-lined carrying case with room for one or two probes.



## 2. PANEL DESCRIPTION

Fig. 1



- |                           |  |
|---------------------------|--|
| 1. Display                | 8. Probe Input (probes are optional)                 |
| 2. Power Button           | 9. K/J Temperature Input                             |
| 3. Hold Button            | 10. Probe Lock                                       |
| 4. REC. MAX/MIN Button    | 11. RS232 Cover<br>(lifts up to reveal RS232 Output) |
| 5. °C / °F and A Button   | 12. Tripod Screw                                     |
| 6. RS-232 Output (see 11) | 13. Stand  |
| 7. K / J and B Button     | 14. Battery Compartment & Cover                      |

### 3. OPERATING INSTRUCTIONS

#### 3-A. MEASUREMENT PROCEDURES

##### Type K, J Thermometer Measurement

- Plug the thermocouple probe in the **K/J TEMPERATURE INPUT** (9).
- Make sure the **PROBE LOCK** (10) is in the locked position.
- Turn on the instrument by pressing the **POWER** (2) button.
- Press the **K/J** (7) button to select the type K (factory default) or J mode ("J" is displayed).
- Press the **°C/°F** (5) button to select the temperature unit. "°C" or "°F" is displayed on the bottom-right of the LCD.

##### Hold

- During measurement, press **HOLD** (3) to freeze the measured value.
- "HOLD" is displayed.
- Press the **HOLD** (3) button again to exit.

##### Record Maximum / Minimum

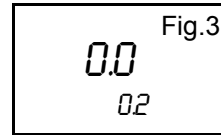
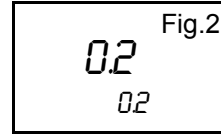
- Press the **REC MAX/MIN** (4) button once to enter the recording mode. "REC" is displayed.
- Press the **REC MAX/MIN** (4) button as needed to view the recorded Max and Min values. "REC Max" and the maximum recorded value or "REC Min" and the minimum recorded value are displayed.
- Note: Max/Min values are frozen and are not updated until the meter returns to recording mode.
- To return to recording mode, press the **HOLD** (3) button. "REC" is displayed without "Max" or "Min".
- To erase the recorded Max/Min values and exit the recording mode, press the **REC MAX/MIN** (4) button for at least 2 seconds.

#### 3-B. THERMOCOUPLE CALIBRATION

The unit is fully calibrated to assure high quality measuring performance. However, accuracy can be affected by environmental changes or when changing thermocouple probes. Use a reliable calibrator to perform this procedure.

- Make sure the **PROBE LOCK** (10) is in the lock position.
- Turn on the instrument by pressing the **POWER** (2) button.
- Connect the unit to a calibrator and adjust the calibrator to 0.0 output.
- Press and hold both the **REC MAX/MIN** (4) and **HOLD** (3) buttons for at least one second.

- The upper and lower display will show the same value (Fig. 2).
- Press the °C/°F (5) button to add 0.1 to the upper display value or press the K/J (7) button to decrease the value by 0.1 (Fig. 3) shows a 0.2 decrease. In the example, the K/J (7) button was pressed twice.
- When the desired value is displayed, release the buttons to complete the procedure.
- Note: A calibration point of 0.0 - to - normal ambient temperature is recommended. Do not adjust the offset temperature above this range.



**3-C. ANEMOMETER, LIGHT, IR THERMOMETER, and HUMIDITY MEASUREMENT.** Refer to the instruction manual for each probe.

**3-D. AUTOMATIC SHUT OFF**

After approximately 10 minutes without activity (no buttons pushed), the meter will automatically shut off to prolong battery life. To disable this feature, press the **REC MAX/MIN (4)** button.

**3-E. OVERLOAD INDICATOR**

When the measurement is out of range, "- - -" appears on the display. Additional information may be contained in probe instruction manuals.

**3-F. BATTERY REPLACEMENT**

- Replace the battery when the low battery icon is displayed in the left corner of LCD. In-spec measurements may be made for several hours after the low battery indicator appears.
- Slide the battery cover away from the instrument, remove the battery and replace with a 9V battery (alkaline or heavy duty type).
- Close the battery cover.



**3-G. RS232 PC SERIAL INTERFACE**

The instrument features RS232 output via a 3.5 mm terminal. The signal output is a 16-digit data stream that can be adapted to user-defined applications. A RS232 lead with the following connection is required to link the instrument with the PC serial interface.

Meter (3.5 mm jack plug)	PC (9W 'D' Connector)	
Center Pin.....	Pin 4	Pin 2 } 2.2 K
Ground/shield .....	Pin 2	Pin 5 } resistor

The 16 digits data stream will be displayed in the following format:	
<b>D15 D14 D13 D12 D11 D10 D9 D8 D7 D6 D5 D4 D3 D2 D1 D0</b>	
Each digit indicates the following status:	
D0	End Word
D1 & D8	Display reading, D1 = LSD, D8 = MSD. For example: If the display reading is 1234, then 08 to 0hs: 00001234
D9	Decimal Point (DP), position from right to the left
D10	Polarity: 0 = Positive, 1 = Negative
D11 & D12	Annunciator for Display °C=01, °F=02, % RH=4, m/s=8, Knot=9 Km/h=10, ft/min=11, mile/h=12, Lux=15, Ft-cd=16,
D13	The upper display data = 1, The lower display data = 2
D14	4
D15	Start Word
RS232 FORMAT: 9600, N, 8, 1	

#### 4. SPECIFICATIONS

Circuit	Custom one-chip of microprocessor LSI circuit.
Display	Dual function LCD display: 2" x 1.3" (51mm x 32mm) Digit size: 0.6" (15mm).
Sampling Time	Approximately 0.8 seconds.
Operating Environment	0°C to 50°C (32°F to 122°F)., max. 80% RH.
Power Supply	006P DC 9V battery (Alkaline or heavy duty).
Power Current	Approximately DC 7 mA.
Weight (meter)	8.8 oz (250 g).
Size (meter)	7 ¾" x 2 ½" x 1" (195 x 68 x 30 mm).

## 5. OPTIONAL ACCESSORIES

Probes	UOM	Range	Res.	Accuracy
Anemometer Probe 850072	M/s	0.4 ~ 25.0	0.1	±2% +0.2d fs
	Km/h	1.4 ~ 90.0		
	Mile/h	0.9 ~ 55.9		
	Knots	0.8 ~ 48.6		
	Ft/min	80 ~ 4930	1	±2% +20 ft/min)
	°C	0 ~ 50	0.1	±0.8°
	°F	32 ~ 122		±1.5°
Mini Extension Anemometer Probe 850073	M/s	0.4 ~ 12.0	0.1	±2% +0.2d fs
	Km/h	1.4 ~ 43.2		
	Mile/h	0.9 ~ 26.8		
	Knots	0.8 ~ 23.3		
	Ft/min	80 ~ 2358	1	±2% +20 ft/min
	°C	0 ~ 50	0.1	±0.8°
	°F	32 ~ 122		±1.5°
Humidity Probe 850074	RH	10% ~ 95%	0.1%	> 70%RH ±5% rdg + 1%RH) <70%RH ±5%RH
	°C	0 ~ 50	0.1	±0.8°
	°F	32 ~ 122		±1.5°
Light Probe 850075	Lux	2,000	1	±(5% + 2d)
	Lux	20,000	10	
	Lux	50,000	100	
	Ft-Candle	200	0.1	
	Ft-Candle	2,000	1	
	Ft-Candle	5,000	10	
Metal Anemometer Probe 850077	°C	0 ~ 60	0.1	0.8
	°F	32 ~ 140	0.1	1.5
	M/s	0.5 ~ 40.0	0.1	± ( 2 % + 2 d ) F.S.
	Km/h	1.8 ~ 144.0		
	Mile/h	1.1 ~ 89.4		
	Knots	1.0 ~ 78.1		
	Ft/min	100 ~ 7880	1	± ( 2 % + 20 ft/min ) F.S.

## 5. OPTIONAL ACCESSORIES (continued)

Probes	UOM	Range	Res.	Accuracy
Thermocouple Probes	Type K	-58 ~ 2372°F -50 ~ 1300°C	0.1	±0.2% +1°C, 1.8°F fs
	Type J	-58 ~ 2102°F -50 ~ 1150°C		
IR Temperature 850076 D/S 7:1 Emissivity 0.95	°C	-10 ~ 300	1	±3% rdg or ±3°C which ever is greater
	°F	14 ~ 572		

840090	Water Resistant Instrument Pouch
840092	Bench-Top Tripod
840093	Field Tripod
850080	Software.
840057	RS232 Cable

## 6. WARRANTY

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

Sper Scientific  
7720 E Redfield Rd, Suite 7  
Scottsdale, AZ 85260

Include a description of the problem and your return address along with the returned item. Return your warranty card within 10 days of purchase or register online at <http://www.sperscientific.com>.