+ Light 9 in 1

ENVIRONMENT METER

Model : SPR-101

Your purchase of this ENVIRONMENT METER 9 in 1 marks a step forward for you into the field of precision measurement. Although this Meter is a complex and delicate instrument, its durable structure will allow many years of use if proper operating techniques are developed. Please read the following instructions carefully and always keep this manual within easy reach.

OPERATION MANUAL

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1. FEATURES

* 9 in 1 professional environment instruments:
  1. Air velocty/Temp., 2. Humidity/Temp., 3. Light meter
  4. Air flow, 5. Dew point, 6. Wet bulb,
  7. Wind chill, 8. Heat index, 9. Type K Temp.(optional probe)
* Tiny bone shape with light weight and small size case design are suitable for handling with one hand.
* Wristlet design provides extra protection to the instrument especially for user one hand operation.
* Low-friction ball bearing mounted wheel design provides high accuracy at high and low air velocity.
* High precision humidity sensor with fast response time.
* Build in baro sensor for the atomsphere value and altitude measurement precisely.
* Built- in microprocessor circuit assures excellent performance and accuracy.
* Concise and compact buttons arrangement, easy operation.
* Memorize the maximum and minimum value with recall.
* ℃/℉ detection by pressing button on the front panel.
* Hold function to freeze the current reading value.

2. SPECIFICATIONS

2-1 General Specifications

Display	35 mm x 30 mm LCD display
Measurement	1. Air velocty/Temp. 2. Humidity/Temp. 3. Light meter 4. Air flow 5. Dew point 6. Wet bulb 7. Wind chill 8. Heat index 9. Type k Temp.(optional)
Operating Humidity	Max. 80% RH.
Operating Temperature	0 to 50 °C (32 to 122 °F)
Over Input Display	Indication of "- - - - "
Power Supply	UM4-AAA X 3 (DC 4.5 V battery)
Power Consumption	Approx. DC 5 mA
Weight	130g (w/o battery)
Dimension	HWD 120 x 45 x 20 mm (4.7 x 1.8 x 1.2 inch).
Standard Accessory	Instruction Manual

2-2 Electrical Specification (23 ±5℃)

Air velocity

Unit	*Range*	*Resolution*	*Accuracy*
ft/min	80 to 3937 ft/min	1 ft/min	≦ 20 m/s : ±3% F.S. Max. : 25 m/s
m/s	0.4 to 20.0 m/s	0.1 m/s	
km/h	1.4 to 72.0 km/h	0.1 km/h	
MPH	0.9 to 44.7 mile/h	0.1 MPH	
knots	0.8 to 38.8 knots	0.1 knots	
Temp.	0 to 50 ℃	0.1 ℃	
	32 to 122 ℉	0.1 ℉	

Remark :

ft/min : feet per minute
MPH : miles per hour
m/s : meters per second
knots : nautical miles per hour
km/h : kilometers per hour

Humidity/Temp.

Unit	*Range*	*Resolution*	*Accuracy*
% RH	10 to 95 %RH	0.1 %RH	*< 70% RH :* ±4 %RH *≧70% RH :* ±(4 % rearding +1.2 %RH)
Temp.	0 to 50 ℃	0.1 ℃	±1.2 ℃
	32 to 122 ℉	0.1 ℉	±2.5 ℉

Light ** auto range*

Unit	*Range*	*Resolution*	*Accuracy*
Lux	0 to 2,200 Lux	1 Lux	±5% readding ±8 dgt
	1,800 to 20,000 Lux	10 Lux	
Ft-cd	0 to 204.0 Fc	0.1 Ft-cd	
	170 to 1,860 Fc	1 Ft-cd	

Remark : Ft-cd : feet candle

Ar flow

Unit	*Range*	*Resolution*
CMM	0.024 to 36000	0.001/0.01/0.1/1
CFM	0.847 to 1271300	0.001/0.01/0.1/1/10 (x10)/100 (x100)

Dew point Temp.

Unit	*Range*	*Resolution*	*Remark*
℃	-25.3 to 49.0 ℃	0.1 ℃	* Calculate from the humidity/Temp. value
℉	-13.5 to 120.0 ℉	0.1 ℉	

Please refer to http://en.wikipedia.org/wiki/Dew_point

Wet bulb Temp.

Unit	*Range*	*Resolution*	*Remark*
℃	-5.4 to 49.0 ℃	0.1 ℃	* Calculate from the humidity/Temp. value
℉	22.2 to 120 ℉	0.1 ℉	

Please refer to http://en.wikipedia.org/wiki/Wet-bulb_temperature

Heat index

Unit	*Range*	*Resolution*	*Accuracy*
℃	0 to 100.0 ℃	0.1 ℃	±2.0 ℃
℉	32 to 212 ℉	0.1 ℉	±3.6 ℉

Pleas refer to http://en.wikipedia.org/wiki/Heat_index

Type K thermometer

Sensor Type	*Resolution*	*Range*	*Accuracy*
Type K	0.1 ℃	-50.0 to 1300.0 ℃	± (0.4 % reading + 0.5 °C)
		-50.1 to -100.0 ℃	± (0.4 % reading+ 1 °C)
	0.1 ℉	-58.0 to 2372.0 ℉	± (0.4 % reading+ 1 °F)
		-58.1 to -148.0 ℉	± (0.4 % reading+ 1.8 °F)

Effects of the heat index (shade values)

Celsius	Fahrenheit	Notes
27–32 °C	80–90 °F	Caution : Fatigue is possible with prolonged exposure and activity. Continuing activity could result in heat cramps
32–41 °C	90–105 °F	Extreme caution : Heat cramps, and heat exhaustion are possible. Continuing activity could result in heat stroke
41–54 °C	105–130 °F	Danger : Heat cramps, and heat exhaustion are likely ; heat stroke is probable with continued activity
over 54 °C	over 130 °F	Extreme danger : Heat stroke is imminent

Note :

Exposure to full sunshine can increase heat index values by up to 8 °C (14°F).

Wind chill

Unit	*Range*	*Resolution*	*Accuracy*
°C	-9.4 to 44.2 °C	0.1 °C	±2.0 °C
°F	15.0 to 112.0 °F	0.1 °F	±3.6 °F

** Wind chill value is effect only when the Temp. value < 15 °C and*

Air velocity value > 1.4 m/s.

* Please refer to http://en.wikipedia.org/wiki/Wind_chill

3. FRONT PANEL DESCRIPTION

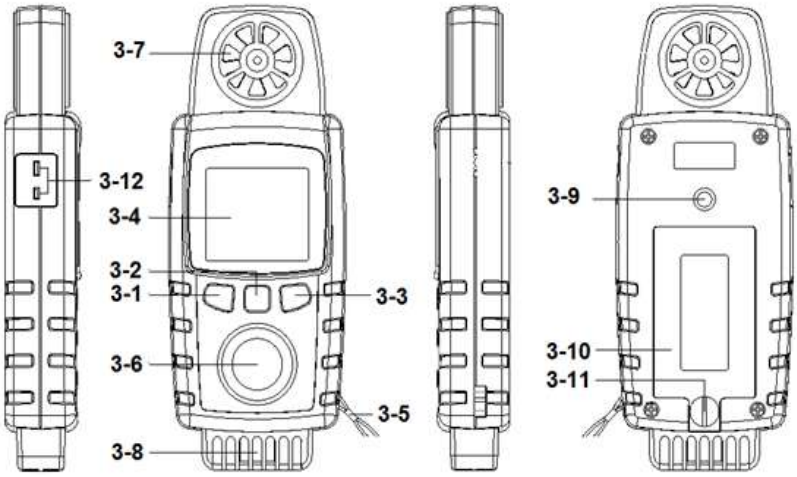


Fig. 1

3-1 Hold button
3-2 ⏻ Button (Power button)
3-3 REC batton
3-4 LCD display
3-5 Wristlet
3-6 Light Sensor
3-7 Anemometer Vane
3-8 Humdity/Temp. sensor
3-9 Tripod Fix Nut
3-10 Battery Compartment / Cover
3-11 Battery Cover Screws
3-12 Type K probe socket

4. MEASURING PROCEDURE

4-1 Power on/off

⏻ Button = Power Button

1) *Power on :*
Press " Power Button " once.

2) *Power off :*
During power on, press " Power Button " > 3 seconds. will power off.

4-2 LCD backlight on/off

During power on, press " Power Button " once, then the LCD backlight will be on 5 seconds then off automatically,

4-3 Function selection

The meter can select 9 kind function as :

a. **Anemometer (Air velocity/Temp.)**
b. **Air flow (CMM, CFM)**
c. **Wind chill**
d. **Humidity/Temp.**
e. **Dew point Temp.**
f. **Wet bulb Temp.**
g. **Heat index**
h. **Light meter**
i. **Type K Temp.(optional)**

During power on, press the " Hold button " continuously (not release the button), the Display will show the following text in sequence :

Display text	***Function***
An	Anemometer (Air velocity/Temp.)
AirFL	Air flow (CMM, CFM)
CHiLL	Wind chill
rH	Humidity/Temp.
dP	Dew point
_Et	Wet bulb Temp.
HEAt	Heat index
LigHt	Light meter
tYPE	tYpE K Temp.(optional)

Until the Display show the desired function, just release the " Hold button " , the meter will execute this function with default.

4-4 Unit selecttion

1) During power on, press the " REC button " continuously > 3 seconds, the Display will show the text " Unit " release the " REC button ", then pr ⏻ button " is sleeted, press the " REC button " to save the unit with default.

REC button = Enter button

2) If the Display with two units, such as anemometer with two Display, upper Display show the air velocity value, lower Display show the Temp. value. After finish the upper Display unit selection (already press the " REC buton " to enter) then can select the lower Display unit (℃,℉) following by pressing the " ⏻ button " once. After finish the lower Display unit selection, then press the " REC button " to save the lower Display unit with default.

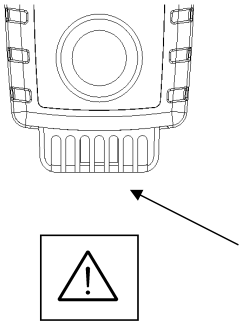
The selection unit for all function are :

Measurement	Unit
Air velocity	M/S, Km/h, mph, knot, FPM
Temp. (Air velocity)	°C, °F
Air flow	CMM, CFM
Wind chill	°C, °F
Temp. (Humidity)	°C, °F
Dew point	°C, °F
Wet bulb Temp.	°C, °F
Heat index	°C, °F
Light meter	Lux, Ft-cd * auto range
Type K Temp.	°C, °F

4-5 Reverse the Display direction automatically

As intend to match the sensor convenient position, Light sensor should put on the top case side to prevent when hand hold the case may interrupt the sensor, the Display direction for Light measurement will reverse automatically.

4-6 Special attention for the Humidity measurement



Attention :
Intend to get the precision reading, for the Humidity / Temp. , Dew point Temp., Wet bulb Temp., Heat index measurement, the hand or fingers do not touch (or stay away) the Humidity sensor (3-8, Fig. 1).

4-7 Air flow measurement

1) Power on, select the function to " Air flow measurement " (refer to chapter 4-3), now the meter is ready for Air flow measurement.

2) Set the measurement area dimension :

Press the " Hold button " once, the Display will show the indicator " HOLD " then press the " REC button " continuously until the left down bottom of Display show " m-2 " or " F-2 "

m-2 = meter square
F-2 = ft square

3) Use the " Hold button " and the ⏻ button " to adjust the air flow dimension value. Until the desired dimension value is set, press " REC button " to save the setting value with default.

⏻ button = ▲ button
Hold button = ▼ button
REC button = Enter button

4- 8 Hold Function

Whenever press the " Hold Button " will freeze the current reading value with a "HOLD" symbol on the display.To release the Hold function, just press the" Hold button "once again, the " HOLD " indicator will be disappeared.

** During execute the " REC function ", the Hold function is disable.*

4-9 REC (Record) function

1) The REC (Record) function can record and display the maximum and minimum reading values. Start the Record function by pressing the " REC Button " once. There will be a " REC " symbol on the display.

2) With the REC symbol on the display :
   (a) Press the " REC button " once and the " Max " symbol along with the maximum value will appear on the display.
   (b) Press the " REC button " again, the " MIN " symbol along with the minimum value will appear on the display.
   (c) To exit the memory record function, press the " REC button " continuously for at least 2 seconds. The display will revert to the current reading.
   (d) Clear the recorded MAX or MIN value by pressing the " Hold button " on Previous recorded MAX/MIN value will be given up and then revert to the REC. function keep on recording.

4- 10 Auto power off disable

In order to prolong the battery life, the instrument has "Auto Power Off " function. The meter will switch off automatically if no buttons are pressed for around 10 minutes.
However if intend disable the " Auto power off " function, just execute the " REC " function (above chapter 4-9), then the Auto power off function will be canceled.

4-11 Type k Temp. measurement

1) Insert the plug of the optional Type K Temp. probe, TP-01 into the " Type K probe socket " (3-12, Fig. 1).

2) Power on the meter, select the function to " Type K Temp. " (refer to chapter 4-3), now the meter is ready for Type K Temp. measurement.

5. BATTERY REPLACEMENT

1) When the LCD display shows " symbol, it is necessary to replace the battery. However measurement may still be made for several hours a the low battery indicator appears.
2) Open the " Battery Compartment / Cover " (3-10, Fig. 1) and remove the battery.
3) Install the battery (UM4-AAA DC1.5 V x 3) and then reinstate the cover.

SPARTNA

Spartna General Trading L.L.C
+971547796588
info@spartna.com