

# INSTRUCTION MANUAL

Wearable WBGT Meter

800126

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# INTRODUCTION

Thank you for purchasing this wearable WBGT meter. This compact meter measures air temperature, globe temperature, and humidity to give heat stress index for using in control of physical activity in hot environment to limit the danger of heat-related injuries.

WBGT (wet-bulb globe temperature) was developed as a monitoring basis at US military training camps and became widespread for the use in workplaces and sports situations.

It is suggested in an international standard ISO 7243 and many governments such as OSHA (US Occupational Safety & Health Administration), SMA (Sports Medicine Australia) and Japan Society for Occupational Health in establishing the permissible heat exposure limits in occupational health, sports or other physical activities.

The applications of the heat index can be in construction, iron and steel foundries, bricks-firing plants, glass facilities, boiler rooms, mining sites, army training, marathon, beach activities and so on.

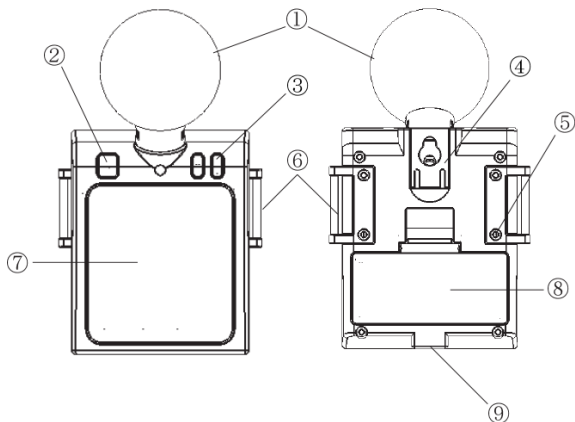
# FEATURES

- Simultaneously display WBGT, Temperature & RH
- For outdoor & indoor heat stress measuring
- Programmable buzzer & red LED danger zone warning
- Audible alarm volume adjustable (75dB / 60dB / mute)
- 4 level dangerous level indicator on LCD
- Wearable design with arm strap included
- Display updates every 20 seconds

## **Includes:**

- Meter x 1 pc
- AAA Size Batteries x 2 pcs
- Operation manual x 1 pc
- Arm Strap x 1 pc
- Buckles x 2 pcs

# DESCRIPTION



1. ABS Black Ball
2. Power Key [SET]
3. Up/Down Adjust (2 Keys)
4. Hanger
5. Screw to change the strap holder
6. Strap Holder
7. LCD Display
8. Battery Cover
9. Tripod Mount

# BATTERY INSTALLATION

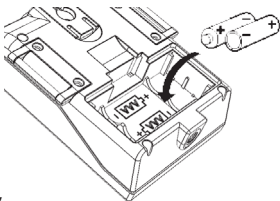
The meter is powered by 2 AAA batteries.

## Check the batteries when:


1. First time using the meter
2. The battery symbol appears on LCD
3. The meter will not power on

## To install the batteries

1. Turn off the meter.
2. Remove the battery cover.
3. Replace the old batteries with two new batteries.
4. Make sure the batteries are secure and the polarity is correct.
5. Install the battery cover.








## When to do battery replacement?

 appears on the LCD when battery voltage gets low. Please replace battery by opening the compartment on the rear of the meter.

# CONTROLS

## LCD Display

	WBGT	Wet Bulb Globe Temperature
	TEMP	Air Temperature
	RH%	Relative Humidity
	C/°F	Celsius/Fahrenheit
	IN	Indoor (no sun)
	OUT	Outdoor (full sun)
		Alarm indicator
		Battery Indicator
		Sound Level
		

## Function Keys

- Press [SET] key to turn on the meter.
- Press and hold [SET] key for 2 seconds to turn off the meter.
- In measurement mode, simultaneously press [SET], [▲] and [▼] keys for 3 seconds till entering setting mode.
- In power off status, simultaneously press [SET], [▲] and [▼] keys for 5 seconds till entering RESET mode.
- In normal mode, press [▲] or [▼] key to adjust the sound level.
- In setting mode, press [▲] or [▼] button to adjust the value of thresholds or ON / OFF the alarm.

# OPERATION

## POWER

Press [SET] key to turn on (press 1 second) and turn off (press 2 seconds) the meter. All indicators are shown on the LCD when power on (Fig.4), and then enter measuring mode. You will see the firmware version on the LCD for 1 second while power on. (Fig.5)

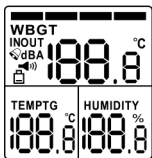


Fig.4

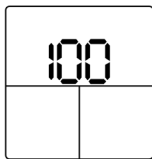


Fig.5

## MEASUREMENT

When in measurement mode, the WBGT value, temperature and humidity display on the screen.

## SOUND LEVEL


User can press the [▲] or [▼] key to adjust the volume of the alarm. In measuring mode, press [▲] or [▼] key to adjust the volume to OFF > 60dB > 75dB respectively.

**Note:** There is no buzzer icon displayed on the LCD while the sound is OFF.



## DANGER ZONE INDICATOR

There have 4 level heat stress danger zone indicator on the top of the LCD. This works based on WBGT The symbol will show as Fig 8.



	Hazardous	WBGT			
Caution	Extreme Caution	Danger	Extreme	Caution	26.7~29.4C (80~84.9F)
				Extreme caution	29.4~31C (85~87.9F)
				Danger	31~32.2 (88~89.9F)
				Extreme danger	>32.2C (>90F)

Fig.8

## ALARM

While the measured heat stress value is over alarm threshold, red LED, buzzer and measured value will all blink every second as reminder. After 30 seconds, it beeps 1 time per minute. User can terminate the beep sound at any time when pressing [ ▼ ] key. The alarm threshold value can be re-programmed.

## SETUP

This function allow users to customize their own checker. Press [SET] + [▲] + [▼] keys simultaneously for 3 seconds to enter setting mode. The meter will return to normal display while keys are inactive for 30 sec in setup mode.

## IN/OUT SWITCH

This function is to calculate WBGT without [IN] or with [OUT] direct sun exposure. Under IN/OUT modes, press [▲] or [▼] to switch [IN / OUT] then press [SET] key to confirm. (see Fig. 9 & 10)

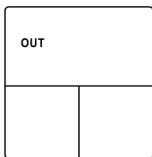


Fig.9

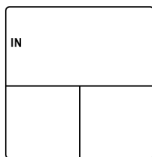


Fig.10

## ALARM THRESHOLD SETTING

This function allows users to customize alarm threshold or stay at factory default alarm threshold. While choosing to stay at factory default alarm threshold, please select [OFF].

[OFF] means to turn off customization function. The default alarm-threshold is defined in below and each range has different buzzer frequency to distinguish.

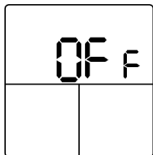


Fig.11

If user decide to customize their own alarm threshold, select [ON].

[ON] means the alarm threshold setting in turned ON by user. (See Fig 12 & 13)

The adjustment range is listed below.

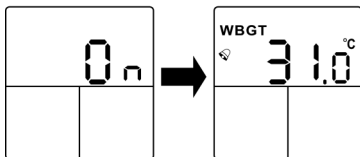


Fig 12

Fig 13

Hazardous	WBGT	Alarm Customize OFF	Alarm Customize ON
Caution	26.7~29.4C (80~84.9F)	Silent	Urgent beep upon the measured reading is over the threshold
Extreme caution	29.4~31C (85~87.9F)	Beep	
Danger	31~32.2 (88~89.9F)	Urgent Beep	
Extreme danger	>32.2C (>90F)	Urgent Beep	

Press [▲] or [▼] key to adjust alarm value. Press SET key to save the value. The adjustment is 0.1 per step. The adjustment range is 20~50C for WBGT.

**Note:** If you prefer to disable the alarm notifications completely, follow these procedures. While adjusting alarm threshold value, simultaneously press [▲] and [▼] keys. The alarm threshold will show [--.] on the LCD. Press [▲] and [▼] again to revert the status.

## TEMPERATURE UNIT (°C / °F)

Press [▲] and [▼] key to switch °C (degrees Celsius) or °F (degrees Fahrenheit). Press [SET] key to save the selection. (See Fig 15 & Fig 16)

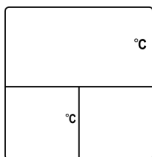


Fig 15

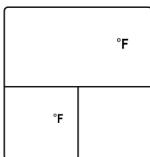


Fig 16

## RESET FUNCTION

This allows user to RESET the meter to default setting. In POWER OFF status, press [SET], [▲] and [▼] keys simultaneously for 5 second still [rSt] symbol show on the LCD in 5 seconds. Then full display will be turned on and go to measurement mode automatically. (See Fig 17)

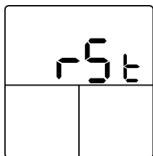


Fig 17

The default status of each setup parameter is:

Description	Default Value
IN/OUT	OUT
ALARM THRESHOLD SETTING	OFF
°C / ° F	°C
SOUND LEVEL	🔊

# SPECIFICATIONS

Temperature Range	0 - 50 °C
Temperature Resolution	0.1 °C/°F
Temperature Accuracy	+/- 0.6 °C
Humidity Range	0.1 - 99.9 %RH
Humidity Resolution	0.1 %RH
Humidity Accuracy	±5 @ 10.0 - 90.0 %RH ±7 @ others
Globe Temperature (Inside Ball)	0 - 70 °C
WBGT Temperature Range	0 - 50 °C
WBGT Alarm Range	20 - 50 °C
WBGT Ball Size	40 mm Diameter
Stabilization Time	15-25 minutes typically
Battery Life	About 300 hours
Battery Type	AAA x 2 pcs
LCD Size	40(h) x 39 (w) mm
Operation Temperature	0 - 50 °C
Operation RH%	<80 %RH
Storage Temperature	-20 - 50 °C
Storage RH%	<90 %RH
Dimensions (mm)	70(h) x 60(w) x 22(t)
Weight	90g
Standard Packaging	Meter/Battery/Manual

# TROUBLESHOOTING

Problem	Cause	Solution
Power on but no display.	Pressing of the power key was too short.	Make sure to press the power key for more than 2 seconds.
	Batteries are not making good connection.	Verify the batteries are making good contact and are the correct polarity.
	Batteries are depleted.	Replace with new batteries.
Display Disappears	Low Battery	Replace batteries.

Error Code	Cause	Solution
TATG		
E02	The Value is under the range.	Move the meter to room temperature for at least 30 minutes. If error still appears, contact Sper.
E03	The Value is over the range.	Refer to E02 Solution.
RH / WBGT		
E04	The Value is in error due to the original data.	Refer to E02 Solution.
Other		
	Can't adjust value from the meter.	Replace batteries. If error still appears, contact Sper.
	Unexpected error on Meter	Please [RESET] the meter. If error still appears, contact Sper.

# APPENDIX

## WBGT & Physical Exercise

WBGT Reading	FLAG	Activity Intensity
< 26.7 °C (< 80.0 °F)	WHITE	Normal activity. Caution should be taken.
26.7 - 29.4 °C (80.0 - 84.9 °F)	GREEN	Discretion is required in planning intense physical activity.
29.4 - 31.0 °C (85.0 - 87.9 °F)	YELLOW	Intense activity for new and acclimatized persons should be curtailed.
31.0 - 32.2 °C (88.0 - 89.9 °F)	RED	Intense exercise must be curtailed for those with less than 12 weeks training in hot weather. Be on high alert.
> 32.2 °C (> 90 °F)	BLACK	Cancel all outdoor exercise.

Source: Manual of Naval Preventive Medicine (NAVMED P-5010)

## **WARRANTY**

Sper Scientific warrants this product against defects in materials and workmanship for a period of **one (1) year** 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.**  
8281 E. Evans Rd., Suite 103  
Scottsdale, AZ 85260

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