OPERATION MANUAL

HEAT INDEX WBGT METER

CE

Model: ☐ 8758
☐ 8778

INTRODUCTION

Thank you for purchasing the Heat Index WBGT meter. The handy 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. (See appendix)

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:

- Direct measurement of the radiation effect with a brass black ball.
- Adjustable WBGT alarm threshold
- Audible beeper for heat stress monitoring
- Sensor protecting mechanism
- Easy self calibration for humidity
- PC connect for data analysis

CONTROLS AND INDICATORS

LCD display

Symbol indication

WBGT	Wet Bulb Globe Temperature
TG	Black Globe Temperature
TA	Air Temperature
%	Relative Humidity
C/F	Celsius/Fahrenheit
IN	Indoor (no sun)
OUT	Outdoor (full sun)
	Low battery indicator
DP/REC	Vain icons in these models.

Function Keys

Turn on and off the meter
Enter alarm setting mode
Select digit in setting mode
Exit from setting mode
Select display mode
Shift IN/OUT mode
Increase value in setting
+ Set as non-sleep
+ Select °C or °F
+ + Enter RH calibration

OPERATING INSTRUCTIONS

1. POWER ON/OFF

Press (ON/OFF) to turn on and turn off the meter. All indicators are shown on the LCD when power on, and then enter measuring mode.

2. MEASUREMENT

Slide down the protecting sheath of sensor before measurements.

Select display mode

The meter measures TA(Air Temp), TG (Globe Temp.), RH (Relative Humidity), and calculates WBGT. Press (MODE/▲) to select modes. An icon shows on the top to indicate the current operation mode. (Fig. A)

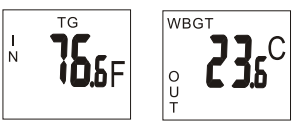


Fig. A

IN/OUT switch

To measure WBGT without or with direct sun exposure under IN/OUT modes, hold down (MODE/▲) for more than 1 second to switch.

Select Unit

Press (MODE/▲) and (NEXT) simultaneously in measuring mode to select °C or °F.

3. ALARM SETTING

The meter features audible alarm to give warning for possible heat stress in the environment. When WBGT value reaches the alarm threshold, the value starts to blink with continuous beep(about 70 dB). The alarm stops when measured value falls below the threshold or the meter is turned off.

The alarm threshold is adjustable for different applications. Hold down ⏻ for 2 seconds to turn on the meter and enter alarm setting. The current setting displays with a blinking digit. Press MODE to increment the value and ALARM to select digit. After new alarm threshold is set, press ALARM for 2 seconds to return to measuring mode.

The setting range is 20.0~37.2°C (68.0~99.0°F). "OUT" will show if setting is out of range. (Fig. B)

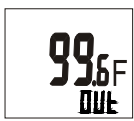


Fig. B

4. BATTERY REPLACEMENT

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

5. AUTO POWER OFF

The meter turns off automatically after 20 minutes non-operation. To override the function, hold down and for 2 seconds to turn on the meter. The LCD will display “n” and then enter measuring mode. (Fig. C)

Fig. C

6. TRIPOD MOUNTING

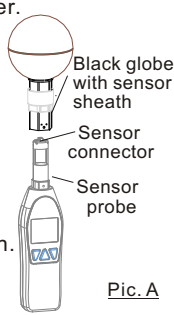
The meter can fit on a tripod for long time monitoring. A built-in thread is on the rear side of the meter.

RH CALIBRATION

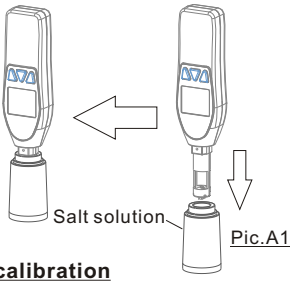
The meter can be calibrated on the humidity by end users with 33% and 75% salt solution. The ambient condition is recommended to be at 23+/-2ºC and stable humidity. Users can terminate the calibration anytime by turning off the meter.

Unscrew the black globe with sensor sheath (see pic. A) before calibration.

Follow the illustration on page 7 to recap sensor sheath after completing calibration.



Pic. A



Pic.A1

33% calibration

Plug the sensor probe into 33% salt bottle（Pic A1）, hold down SET, NEXT, and MODE buttons for 2 seconds to power on the meter until blinking “3X.X%” appears. Meter is now calibrating, and will finish in about 60 mins. when the value stops blinking.

Note:

Strongly recommend to use one hand to press one button, and use two fingers of the other hand to press two buttons simultaneously . This is easier for you to operate 3 keys.

75% calibration

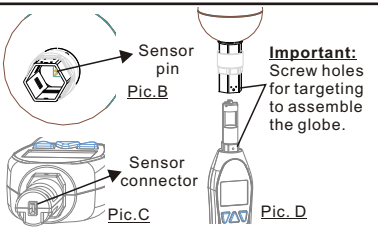
After 33% calibration, plug the sensor probe into 75% salt bottle , then press MODE for 2 seconds to start.

The blinking “7X.X%” shows on the screen and meter is now calibrating. Wait about 60 mins.until blinking stops ,it means the calibration is completed and meter returns to measuring mode.

Note:

The RH value difference between the meter display and calibration standard should be within +/-0.3%, otherwise it is a failed calibration.

CAUTION:
Reassemble the globe with caution by fitting the pin (Pic. B) into the connector (Pic.C). It helps to position by targeting the screw holes on the sheath and the meter. Incorrect installation may damage the sensor.



TROUBLESHOOTING

? Power on but no display

Check whether the batteries are in good contact and correct polarity, or take out the batteries for one minute and reinstall and retry.

? Calibration failure

a. Check the battery voltage or replace with new batteries.

b. Check whether the sensor is well plugged into the salt bottle and no air comes in. Check ambient condition.

? Error message on the display

E2: The value is under range. Improper sensor installation.

E3: The value is over range.

E4: The value is in error because of the original data. Improper sensor installation.

E11: RH calibration error. Do the calibration again.

E32/E33: Circuit error. Return to the vendor for repair or replacement.

RS232 INTERFACE

The meter can do PC link for on-line logging and data analysis via RS232 interface and software.
The protocol is as follows.

A.9600 bps, 8 data bits, no parity.

B.Format
(Transmitting ASCII code by every second while meter is on.)
Wxxx.xC(F):Txxx.xC(F):Txxx.xC(F)
:Hxx.x%LRCCRLF
Note: The 1st value is WBGT, the 2nd is TA, the 3rd is TG, and the 4th is RH.

SPECIFICATION

		8758	8778
Black ball size		40(D)x35(H)mm	75(D)x75(H)mm
Air Temp. range		0~50℃ (32~122℉)	
Air Temp. accuracy		±0.6℃	
Globe Temp. range		0~80℃ (32~176℉)	
Globe Temp. accuracy	Indoor	±2℃ (15~40℃) ±2.5℃ (Others)	±1℃ (15~40℃) ±1.5℃ (Others)
	Outdoor	±3℃ (15~40℃) ±3.5℃ (Others)	±1.5℃ (15~40℃) ±2℃ (Others)
WBGT Temp. range		0~50℃ (32~122℉)	
WBGT Formula		**Indoor/Outdoor and no sun:** WBGT=0.7WB + 0.3TG **Outdoor and full sun:** WBGT=0.7WB + 0.2TG + 0.1TA	
RH range		0~100%	
RH accuracy		±3% (10~90%RH) ±5% (other range)	
Resolution		0.1℃/℉, 0.1%RH	
Response time		15 seconds typical	
Operating condition		0~50℃, 0~95% RH	
Storage condition		-20~65℃, 0~95% RH	
Meter size		40(H)x48.7(W)x254(L)mm – 8758 75(H)x75(W)x278.2(L)mm – 8778	
Battery life (without beep)		1000 hours (Alkaline) 250 hours (General purpose)	

MATERIALS SUPPLIED

This package contains:

- ✓ Meter
- ✓ 2pcs AAA batteries
- ✓ Operation manual
- ✓ Plain box packaging

Optional accessory:

- ✓ 33% calibration salt (VZHR33AZ)
- ✓ 75% calibration salt (VZHR75AZ)
- ✓ RS232 cable and software

WARRANTY

The meter is warranted to be free from defects in material and workmanship for a period of one year from the date of purchase. This warranty covers normal operation and does not cover misuse, abuse, alteration, neglect, improper maintenance, or damage resulting from leaking batteries. Proof of purchase is required for warranty repairs. Warranty is void if the meter has been opened.

RETURN AUTHORIZATION

Authorization must be obtained from the supplier before returning items for any reason. When requiring a RA (Return Authorization), please include data regarding the defective reason, the meters are to be returned along with good packing to prevent any damage in delivery and insured against possible damage or loss.

APPENDIX

Recommendations to heat exposure level for working and physical activity!

PERMISSIBLE HEAT EXPOSURE THRESHOLD LIMIT

Value:WBGT

Work/rest regimen (Each hour)	Light	Moderate	Heavy
Continuous work	30°C /86°F	26.7°C /80°F	25°C /77°F
75% work, 25% rest	30.6°C /87°F	28°C /82°F	25.9°C /78°F
50% work, 50% rest	31.4°C /89°F	29.4°C /85°F	27.9°C /82°F
25% work, 75% rest	32.2°C /90°F	31.1°C /88°F	30°C /86°F

Source: ACGIH 1992(The American Conference of Governmental Industrial Hygienists)

WBGT INDEX AND PHYSICAL EXERCISE

WBGT	Flag	Activity Intensity
< 80°F < 26.7°C	White	Normal activity. Caution should be taken.
80-84.9°F 26.7-29.4°C	Green	Discretion is required in planning intense physical activity.
85-87.9°F 29.4-31°C	Yellow	Intense activity for new and unacclimatized persons should be curtailed.
88-89.9°F 31-32.2°C	Red	Intense exercise must be curtailed for those with less than 12 weeks training in hot weather. Be on high alert
> 90°F > 32.2°C	Black	Cancel all outdoor exercise.

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

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