# TENMARS
# HEAT STRESS WBGT Meter

## TM-288
### User's Manual


CE

HB2TM2880002

# Contents

## 1 Introduction:

Thanks for purchasing the **Compact Heatstroke Index Meter**.

The chance of heatstroke increases dramatically in the moist heat environment. This product, measuring in WBGT, provides real-time alarm immediately so as to prevent heatstroke in such the environment.

## 2 Accessories:

| | | | |
|---|---|---|---|
| 1 | Meter | 1 | Carabiner |
| 1 | User's Manual | 1 | Key ring |
| 1 | CR2032 3V battery | 1 | Silicone elbow for anti-skid |
| 1 | Fastener for armband with screws | 1 | Screw for silicone elbow |
| 1 | Flexible armband | | |

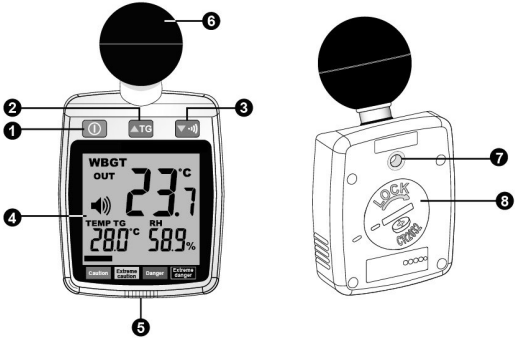
## 3 Safety Precaution:

| | |
|---|---|
|  | Caution! Please refer to this manual. Improper use may damage the meter and its components. |
| CE | Complies with European Directive. |

- Operating altitude: up to 2000M.
- Operating environment: Indoor use; Pollution degree 2.
- Clean with soft cloth when dirty, such as glasses cloth. Do not clean with chemicals and other solvents.
- EMC: EN61326-1:CISPR 11:Group 1, Class B
  - ✧ Class B – Equipment for use in all establishments other than domestic.
  - ✧ Group 1 – RF energy generated is needed for internal functioning.

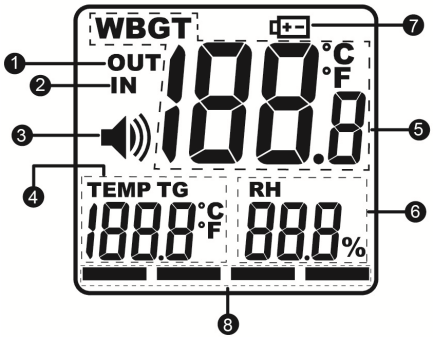
# 4 Instrument Description:

## 4.1 Feature and function




1. Power/setting button
2. TG switch/Up button
3. Alarm switch/Down button
4. LCD display
5. Temperature/humidity sensor
6. TG probe
7. Tripod nut
8. Battery cover

### 4.2 LCD display indication




1. Outdoor Index
2. Indoor Index
3. Alarm
4. Air temp. (TEMP)/ black-globe temp (TG)
5. Heat Index
6. Humidity indicator
7. Low battery indicator
8. Heat hazard level

### 4.3 Instructions

Three ways to use: 1. wearable, 2. hanging, 3. tripod.

#### 4.3.1. Application for the wearable type

Apply the kit as shown in Fig. 1, for the outdoor sportors to wear them on their arms as shown in Fig. 2.

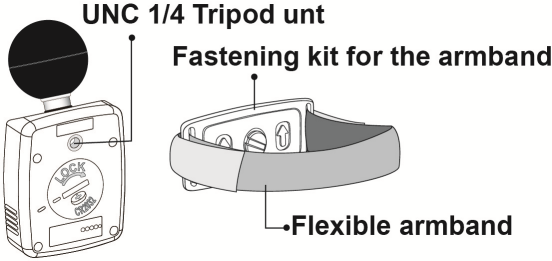



**Fig. 1 Application for Wearable kits**

**Fig. 2 Wearing on an arm**

**4.3.2. Application for the hanging type**

- Attach a silicone elbow on the meter with fastening a screw into the nut on the back, as shown in (Fig. 3).
- As walking, you may hang it on your waist (Fig. 4)
- Alternatively, hang it on the backpack (Fig. 5), or hang it on the baby stroller's handle (Fig. 6)

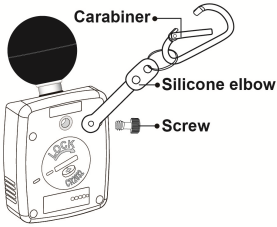



**Fig. 3 Hanging kit**

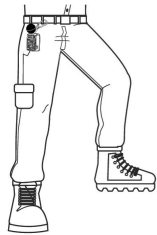


**Fig. 4 Hanging on the waist**

**Fig. 5 Hanging on the backpack**

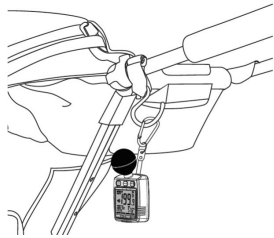


**Fig. 6 Hanging on the baby stroller**

#### 4.3.3. Application for the tripod

The tripod mount on the back of the meter is available to any type of tripod (Fig. 6). A bike can also be mounted by a clamp (Fig. 7) for the outdoor measurement of the heat index.

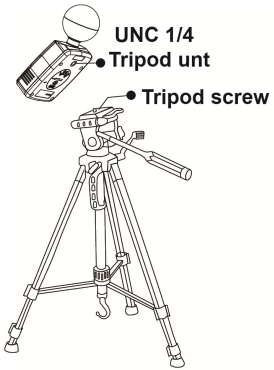



**Fig. 7 Tripod application**

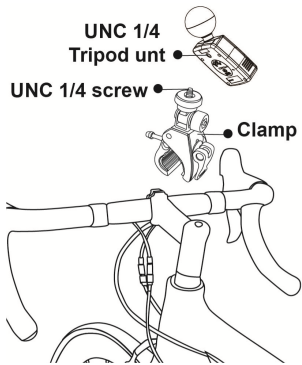



**Fig. 8 Bike application**

## 5 Operation:

### 5.1 Power on/off

Press ⏻ to turn the power on or off

### 5.2 Setting OUT/IN and alarm ON/OFF mode

Press and hold ▲TG + ▼·)) for 2 seconds and enter the SET1.

**SET1:** Press ▲TG or ▼·)) to set OUT/IN (default is OUT). Press ⏻ to enter set2

**SET2:** The user sets the alarm to turn on or off, and the user sets it at any value to issue an alarm. Press ▲TG or ▼·)) to turn Alarm on/off. The ON indicates **Alarm User(Refer to 5.3)** while 🔊 flashing ,Press ⏻ to enter SET3.( SET3 setting is skipped if selecting Alarm OFF).

**SET3**: Press ▲TG + ▼·)) to set the Alarm value.

Press ⏻ again to exit the setting.

**※PS: If the setting period exceeds 15 seconds, it will return to measurement mode**

### 5.3 Thermal hazard prevention standards

| Heatstroke caution level | Temperature baseline | Alarm Default | Alarm User 🔊 Flashing |
|---|---|---|---|
| Caution: | >21~25°C | mute | As exceeding the setting value, beep for 15 seconds |
| Extreme caution | >25~28°C | Beep for 4 seconds | |
| Danger | >28°C~31°C | Beep for 15 seconds | |
| Extreme Danger | >31°C | Beep for 3 second and pause for 2 seconds, repeat until 15 seconds | |

**After alarm finishes, the alarm will repeatedly work per 1 minute if the temperature continuously exceeds the baseline.**

### 5.4 Calibration mode

In the shutdown state, press and hold ▲TG and then press ⏻ to enter calibration mode: Press ▲TG or ▼·)) to select item TA/TG/RH, click ⏻ to confirm, and press ▲TG or ▼·)) to increase or decrease temperature and humidity data.

### 5.5 Reset to factory settings

In the shutdown state, press and hold ▲TG + ▼·)) and then press ⏻ for 5 seconds, going to the power-on state while all the icons on the display appears. Enter the test mode while the hardware version appears. (At the moment, all calibration and settings are wipeout and restored to the factory settings).

### 5.6 Switching℃/℉

In the shutdown status, press and hold ▼·)) and then press ⏻ for more than 3 seconds to power on. In the power-on state, you can switch between °F and °C.

### 5.7 Alarm mode: loudness/quiet/Off

▼·)): Click for loudness → quiet → mute (buzzer without display); switch the modes cyclically.

### 5.8 Switching TEMP/TG

▲TG: Click to switch the mode to TG (black-globe temp.) from TEMP (Air temp.), and it will automatically return to TEMP on 5 seconds later.

## 6 General Specifications:

- In compliance with JIS B 7922 Level 2
- Three applications: arm band, tripod, and hanging.
- High-sensitive capacitive humidity sensor and bandgap temperature sensor.
- Measure the WBGT, black-globe temp. (TG), Air temp. (TA), humidity (%RH).
- Low voltage indicator
- °C or °F selectable.
- With the plastic black-globe of the diameter Ø40mm.
- Three-stage WBGT alarm selectable: → → mute (buzzer not displayed), cyclic setting.
- Outdoor or indoor (default is OUT) measurement mode selectable.
- Sampling interval: per 20 seconds
- Dimension: 116 x 60 x 50mm(L x W x H) ◦
- Weight: 80 g (excluding battery weight)
- Power: 3V CR2032 x 1.
- Battery life up to about 500 hours (alarm not provided).
- Operating wind speed: 0.3 m/s or above.
- Operation temperature and humidity: 0°C to +50°C,<80%RH (No condensation)
- Storage temperature and humidity: 0°C to +60°C,<70%RH (No condensation)
- Display dimension: 41mm(W) x 38mm(L)

# 7 Electrical Specification

**Wet Bulb Globe Temperature (WBGT)**

| Unit | Measuring range | Resolution | tolerance range 15~40°C |
|---|---|---|---|
| °C | 0~50.0 | 0.1 | ±2.0 |
| °F | 32.0~122.0 | 0.1 | ±3.6 |
| ※Indoor & outdoor without sunshine "IN" :WBGT = (0.7×WET)+(0.3×TG)<br>Outdoor in sunshine "OUT" :WBGT=(0.7×WET)+(0.2×TG)+(0.1×TA) | | | |

**Air temperature (TA)**

| Unit | Measuring range | Resolution | Tolerance @15~40°C |
|---|---|---|---|
| °C | 0~50.0 | 0.1 | ±0.6 |
| °F | 32.0~122.0 | 0.1 | ±1.1 |

**Black-globe temperature (TG)**

| Unit | Measuring range | Resolution | Tolerance @15~40°C |
|---|---|---|---|
| °C | 0~80.0 | 0.1 | ±0.6 |
| °F | 32.0~176.0 | 0.1 | ±1.1 |

**Humidity (%RH)**

| Unit | Measuring range | Resolution | Tolerance @25°C |
|---|---|---|---|
| %RH | 30.0~90.0 | 0.1 | ±5.0%RH |
| %RH | <30.0 , >90.0 | 0.1 | ±7.0%RH |

**Caution**

While working in a high humidity environment, please keep the meter in a low humidity environment for 24 hours after use.

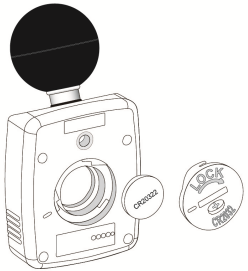
## 8 Maintenance or Repair

1.  appearing on the LCD display indicates the battery low. Please replace the battery immediately to ensure the accuracy.
2. Please use a soft cloth, such as glasses cloth, to wipe the meter for the dirt and not use chemical solvents.
3. If not using for a long time, please remove the battery to prevent the leakage of battery fluid which may corrode the internal components.
4. In case of malfunction, the meter can only be sent to the authorized service suppliers or back to the original factory for maintenance.

## 9 Battery Replacement

1. Turn off the power.
2. Uninstall the bracket and open the battery cover on the back of the meter, and remove the battery.
3. Install a CR2032 battery and ensure the polarity positions of positive and negative.

Place back the battery cover and the bracket back.




| | Caution |
|---|---|
| | **As battery low icon appears on the LCD display, please replace the battery immediately by the correct steps.** |

## 10 Product Disposal:

Note: This symbol indicates that the meter and its accessories must be separated and processed properly.

TENMARS


**Professional Electrical and Environment Test & Measurement Instruments:**

LED light meter, Temperature & Humidity meter,Infrared Thermometer, Sound level meter, Light meter, EMF meter, UV Light meter, RF meter, Hot wire Anemometer, Co meter,Anemometer, Lan cable tester, Co2 meter, Solar power meter, Radiation meter, Clamp meter, Multimeter, Phase Rotation test, Digital Insulation tester

**Our products of high quality are selling well all over the world**

**TENMARS ELECTRONICS CO., LTD.**
**6F, NO.586 Ruiguang Rd, Neihu Dist.**
**Taipei City, Taiwan**
**E-mail: service@tenmars.com**
**http://www.tenmars.com**