AT-HTS01

Manual

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Content

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.

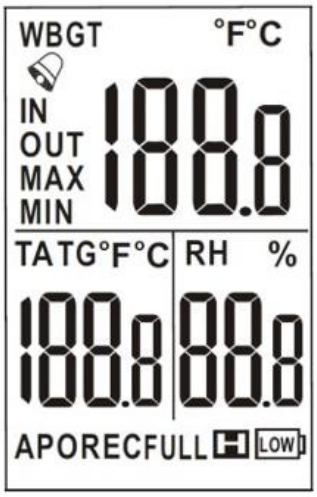
The applications of the heat index can be in construction, iron and steel foundries, bricks-firing plants, glass facilities, boiler rooms, mining sites, army training, marathon, beach activities and so on.

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
- Backlight indicator function (Green, yellow, red, flashing red)
- Easy self-calibration for humidity
- PC connect for auto logging
- Easy to obtain large screen sizes

Controls and Indicators

LCD display



Symbol indication

WBGT	Wet Bulb Globe Temperature
TG	Black Globe Temperature
TA	Air Temperature
RH/%	Relative Humidity
°C/°F	Celsius/Fahrenheit
IN	Indoor (no sun)
OUT	Outdoor (full sun)
APO	Auto Power Off
REC	Recording
MAX	Maximum
MIN	Minimum
FULL	Memory Full
	Low battery indicator
	Alarm indicator
	Hold Function

Function keys

Press power key to turn on/off the meter. When meter is powered on, APO displayed on LCD.

Press both keys to turn on the meter in non-APO mode. NO APO displayed on LCD. You will see the firmware version on the LCD for 1 second while power on.

In normal mode, press TA/TG key to switch the displayed temperature from TA to TG or TG to TA.

In normal mode, press MAX/MIN key to switch the displayed parameter to max/min and then return to normal. The value is counted from power on. If you want to reset the value, power off the meter. (Note: Max/Min value will be show on LCD for 60 seconds then return to normal mode automatically. In setup mode, press this key to exit from setup and return to normal mode.

In normal mode, long press this key to enter setting mode. In setup mode, this key is used for setting/save. In logging standby status, press this key to start or stop.

In normal mode, press IN/OUT key to switch the WBGT mode as Indoor or Outdoor. In setup mode, press this key to increase the value.

Press HOLD key to freeze current reading.  appears on LCD. Press again to release. In Setup Mode, press this key to decrease the value. While press HOLD to freeze the reading, it also activate the back light. The back light color was changed with WBGT value. See below. Press key again to release and turn off the back light.

Backlight

Above 32.2°C:	Flashing Red
31~32.2°C:	Red
29.4~31°C:	Yellow
26.7~29.4°C:	Green
Below 26.7°C:	No backlight

Long press till  icon flashing on display to indicate the logging function is in standby status.

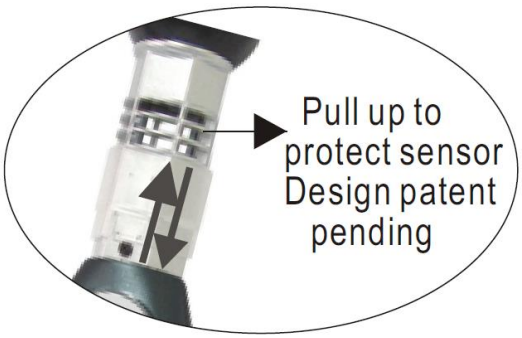
Operating instructions

Power on/off

Press  to turn on and turn off the meter. All indicators are shown on the LCD when power on, and then enter measuring mode. You will see the firmware version on the LCD for 1 second while power on.

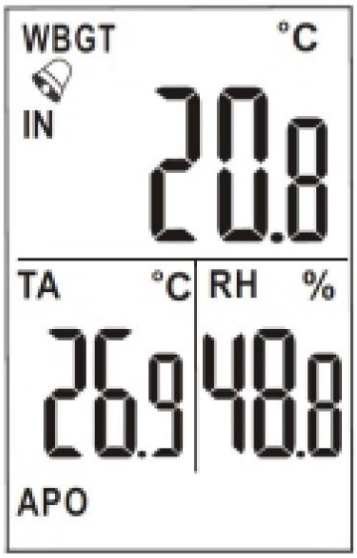
Measurement

Slide down the protecting sheath of sensor before measurements.



Display mode

The meter measures TA (Air Temp), TG (Globe Temp), RH (Relative Humidity), and calculates WBGT will be shows on the LCD.



IN/OUT switch

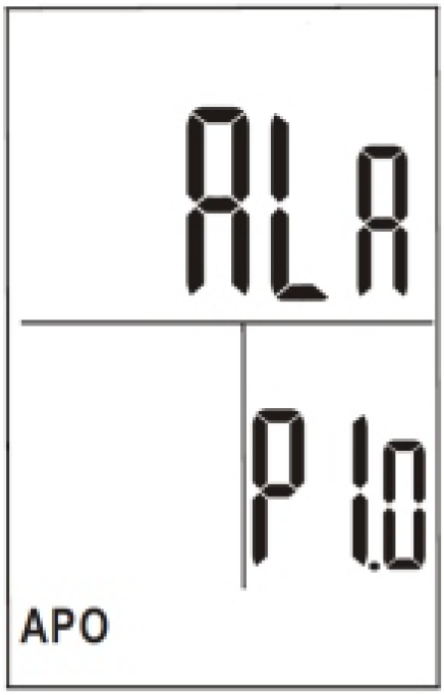
To measure WBGT without or with direct sun exposure under IN/OUT modes, hold down  for more than 1 second to switch.

ALARM/Unit setting

P1.0 WBGT alarm setting

P1.1 alarm buzzer ON/OFF

In normal mode, long press SET key to enter setup mode. (See below Fig.)When alarm is programmed as ON, appears on LCD. When the WBGT value reaches the alarm threshold, the icon and WBGT value will flash with continuous beeper sound per second. However, user can short press SET key to pause the buzzer, the buzzer then sound every 1 min afterward. But, LCD icon will flash until the WBGT value return to normal. Even if buzzer alarm is OFF, WBGT value flash while reaches the alarm threshold.



P1.2 alarm threshold

The default is setting as 31°C. The adjustment range is 20°C~50°C. Press IN▲ OUT or HOLD BKT▼ key to adjust and press SET key to confirm. Note : 0,5°C per step When in normal mode, press SET key can cease the buzzer but bell icon remain flashing until the measured WBGT is returned to normal.

P2.0 Unit setting

P2.1 temperature unit switch

Press up/down key to switch between °C and °F and then press SET key to confirm.

Datalogging

Before each recording, connect with computer to setup (see page xx). While ready, long press HOLD/BKT till flashing H on display. During flashing, press SET to start. To stop logging, long press HOLD/BKT till H flashing and then press SET to stop.

Battery replacement

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

Auto power off

The meter turns off automatically after 15 minutes non operation. To override the function, hold down ⏻ and HOLD/BKT for 2 seconds to turn on the meter. The LCD will display “n” and then enter measuring mode.

Tripod mounting

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

Datalogger setup

There is no need to install USB driver or software before operating logging function. *Setup logger every time before you want to start logging function.*

Connect to computer to setup

Step1:

Connect the logger with any windows computer. Computer will recognize logger as a CD-ROM and pop up new screen for configuration. If not, you may go to file management to click a recognized CR-ROM called “Logger“

Step2:

Double click “Logger configuration tool” to setup the logger. The logger configuration screen offers 8 languages to help you setup easily.
The programmable parameters are sampling rate, start delay time and Logger ID.
The programmable sampling rate is from 1 min to 2 hours
The start delay time is from 0 min to 12 hours

Note: *By choosing 5 mins, it means the first record will be taken into logger’s memory 5 mins after you pressing the start key of logger.*

Logger ID is a 4 digit number you can use to give each logger a unique property code, such as 0928.
After setting, click Save to synchronize the setting and your PC time zone to datalogger.
Close the setup screen

Step3:

Disconnect logger and leave it to the place where you want to monitor the WBGT.
Remember to push down the transparent protection shield.

Press keys to start logging

Step1:

Long press HOLD/BKT key for more than 1 second to activate the logger into standby status. You will see H icon flashing on display.

During H icon is flashing, pressing SET key to start the logging. You will see REC icon flashes on display. If the logger is programmed as start delay 5 mins, after pressing SET key, the REC icon will consistent display and then turn into flashing after 5 mins

Step2:

It will take 15 ~20 mins to make the WBGT logger to reach equilibrium with testing environment

Press keys to stop logging

To stop recording before memory is full, long press HOLD/BKT key till icon flash on display and then press SET key during the icon is still flashing to stop the recording. REC icon will disappear from display.
There are 12000 records memory space, while memory is full, FULL icon will appear on display.

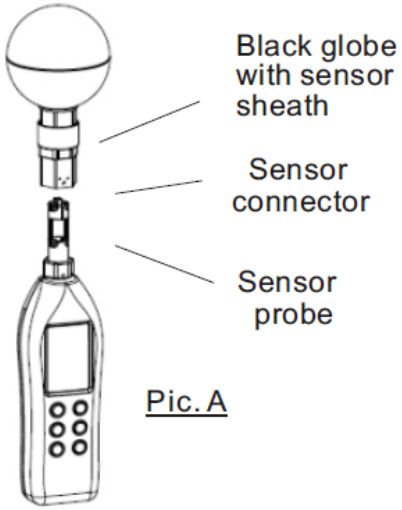
Connect to computer to read out

The procedure is same like connecting to setup. Pressing download button on setup screen and choose where to save the logged file to. The read out csv report can be opened by windows excel. The saved report contains Configuration Time, Start Time, Start delay, Sampling rate, ID no. and Total records number.

Each record contains Date and time, IN or OUT, TA, RH(%), TG and WBGT.

Humidity 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°C ±2°C and stable humidity. Users can terminate the calibration anytime by turning off the meter.

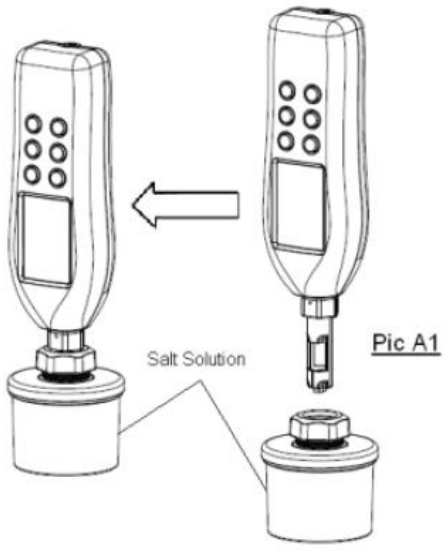


Pic. A

Unscrew the black globe with sensor sheath (see Pic. A) before calibration. Reverse way to install the globe set after calibration. There is a dust free membrane to protect the humidity sensor, please remove it as well before calibration and re-install it by following the guiding line after calibration.

33% calibration

Plug the sensor probe into 33% salt bottle(Pic. A1),hold down + and buttons for 3 seconds to power on the meter until blinking A3X.X%@ appears. Meter is now calibrating, and will finish in about 60 minutes.



Pic A1

75% calibration

After 33% calibration, plug the sensor probe into 75% salt bottle, then press “HOLD” for 2 seconds to start. The blinking A7X.X%@ shows on the screen and meter is now calibrating. Wait about 60 minutes 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.

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.

Error message on the display

Code	Problem	Solution
E2	1. The value is under range. 2. Improper sensor installation.	Check whether the sensor is installation correct. Put the meter in room temp. for 30 minutes. If the error messages still appear, send back for repair.
E3	The Value is over range.	Put the meter in room temp. for 30 minutes. If the error messages still appear, send back for repair.
E4	1. The value is in error because of the original data. 2. Improper sensor installation.	Put the meter in regular room temp. for 30 minutes. If the error messages still appear, send back for repair.
E11	RH Calibration error.	• Do the calibration again.- • Check the battery voltage or replace with new batteries. • Check whether the sensor is well plugged into the salt bottle and no air comes in. • Check ambient condition.
E31 / E33	Circuit error. Power on but no display.	• Check whether the batteries are in good contact and correct polarity, or take out the batteries for one minutes and reinstall and retry. • Return to the vendor for repair or replacement.
dL 1St	Means“ download first”, the logged data is not yet transferred to PC	Connect with PC to config before logging. Even you want to keep the setting same as previous run, you still need to go to config screen to Save.

Specification

Black Ball Size		75(D) x 75(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	±1℃(15~40℃)
		±1.5℃(Others)
	Outdoor	±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 Minutes typical
Operating condition		0~50℃ , 0~95% RH
Storage condition		-20~65℃ , 0~95% RH
memory size		12000 records