User Manual

TRIPLETT

HSDL300

Heat Stress/ WBGT Datalogger

CE

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Introduction

Thank you for purchasing the Triplett HSDL300 Heat Index WBGT Datalogger. The HSDL300 meter measures air temperature, globe temperature, and humidity to give heat stress 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.

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)
- PC connect for auto logging

Controls and Indicators

LCD display

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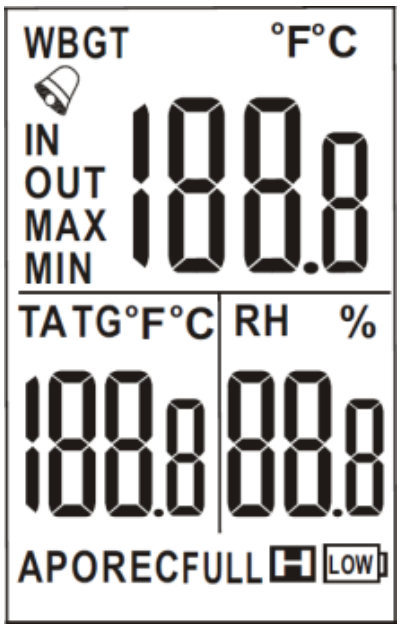

Icons and Symbols

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	Low battery indicator
	Alarm indicator
H	Hold Function

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Function Buttons

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

-Press + key to turn on the meter in non-APO mode. NO APO 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.

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-In normal mode, long press SET key to enter setting mode.
-In setup mode, 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 change with WBGT value. See below.
Press key again to release and turn off the back light.
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.

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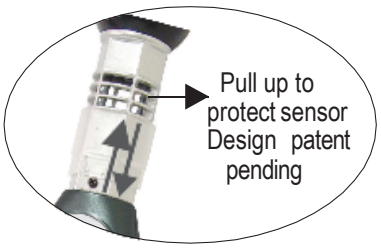
Operation

1. 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.

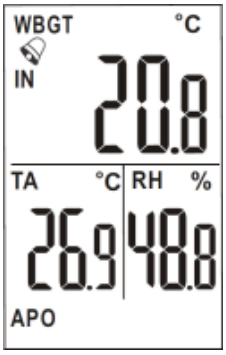
2. MEASUREMENT

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. (Fig. A)



IN/OUT switch

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

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3. ALARM / UNIT SETTING

P1.0 WBGT alarm setting

P1.1 alarm buzzar 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/EXIT 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.

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P2.0 Unit setting

P2.1 temperature unit °C /°F switch

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

4. DATALOGGING

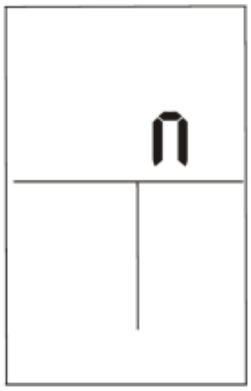
Before each recording, connect with computer to setup (see page 8). While ready, long press HOLD till H flashing on display. During flashing, press SET to start.
To stop logging, long press HOLD till H flashing and then press SET to stop.

5. 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.

6. AUTO POWER OFF

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



7. 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.

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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.

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■ Press keys to start logging

Step1:

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

During 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 key till H on 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

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Error Messages

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 wether 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.	- Checkwhether the batteries are in good contact and correct polarity, or take mout the batteries for one minutes and restall and retry. - Return to the vendor for repair or replacement.
dL 1St (Appear while long pressing Hold key to activate logging mode)	Means“ download first”, the logged data is not yet transfered to PC	-Connect meter 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.

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Specifications

Temperature Range	32 to 122°F (0 to 50°C)
Temperature Resolution	0.1°F/0.1°C
Temperature Accuracy	+/-1.8°F (0.6°C)
Humidity Range	0.1 to 99.9%RH
Humidity Resolution	0.1%RH
Humidity Accuracy	+/-3%RH (@ 25°C, 10~90%RH) Other +/-5%RH)
Globe Temperature Range (Inside Black Ball)	32 to 176°F (0 to 80°C)
Globe Temperature Accuracy In/Out	Inside: +/-1.0°C (15 to 40°C) Others 5°C Outside: +/-1.5°C (15 to 40°C) Others 2°C
WBGT Range	32 to 122°F (0 to 50°C)
WBGT Alarm Range	68 to 122°F (20 to 50°C)

Sampling Rate Intervals (Minutes)	1, 5, 10, 30, 60, 90, 120 mins
Start Delay Time (Minutes)	0, 5, 30, 45, 60, 90, 120 mins
Memory Points	12000 readings, each contains WBGT, TA, TG and RH
Black Ball Size	Diameter:3.0”(75mm) Height: 3.0” (75mm)
Stabilization Time	15 to 25 Minutes Typical
Battery Life	>200 Hours

LCD Size	2.0” (H) x 1.25” (W) (50mm (H) x 32mm (W)
Operating Temperature	32 to 122°F (0 to 50°C)
Operating RH%	Humidity < 80%
Storage Temperature	-4 to 122°F (-20 to 50°C)
Storage Humidity RH%	Humidity < 90%
Dimensions	12.0” x 3.0” x 1.5” (302mm(H)x75mm(W) x37mm(D)

Weight	0.66lb(300g)
Batteries	(4) 1.5V AAA
Included	(4) 1.5V AAA Batteries, User Manual, Mini USB Cable

APPENDIX

PERMIS SIB LE HEAT EXPOSURE THRESHOLD LIM IT

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

WBGT INDEX AND PHYSICAL EXERCISE

Value: WBGT
Recommendations to heat exposure level for working and physical

Activity WBGT	Flag	Activity Intensity
< 26.7°C (< 80°F)	White	Normal activity. Caution should be taken.
26.7-29.4°C (80-84.9°F)	Green	Discretion is required in planning intense physical activity.
29.4-31°C		Intense activity for new

(85-87.9ºF)	Yellow	and unacclimatized persons should be curtailed.
31-32.2ºC (88-89.9ºF)	Red	Intense exercise must be curtailed for those with less than 12 weeks training in hot weather. Be on high alert
> 32.2ºC (> 90ºF)	Black	Cancel all outdoor exercise.

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

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

Warranty

Triplett / Jewell Instruments extends the following warranty to the original purchaser of these goods for use. Triplett warrants to the original purchaser for use that the products sold by it will be free from defects in workmanship and material for a period of (1) one year from the date of purchase. This warranty does not apply to any of our products which have been repaired or altered by unauthorized persons in any way or purchased from unauthorized distributors so as, in our sole judgment, to injure their stability or reliability, or which have been subject to misuse, abuse, misapplication, negligence, accident or which have had the serial numbers altered, defaced, or removed. Accessories, including batteries are not covered by this warranty.

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