INNOVATIVE HANDHELD HEAT STRESS MONITOR

TWL-1S

133.0

DESIGNED FOR EASY HEAT RISK ASSESMENT

- 4 essential sensors for thermal comfort measurement
- Built-in WBGT and TWL algorithm
- Intuitive user interface wireless remote notification

- Shipped with tool box and tripod for easy carriage and use
- Scarlet software TWLIT for quick setup and data download

Feature

Sensor Protection
- Humidity sensor is well protected by a replaceable polypropylene filter in a solid shield.
- A silicone pad keeps the anemometer from dust.

Wind Cup
- Cup anemometer captures winds from any direction. You do not have to manually decide the wind direction before measuring wind speed.
- Compared to impeller, wind cup is not restricted to wind direction.

Risk Indication
- Backlights color indicates the risk level based on TWL.
- Recommended schedule for work, rest and rehydration is integrated.
- Configurable timers to schedule the work time.

Remote Warning
When work timer expires or thermal risk is high, pager carriers will be notified with wireless technology.
The coverage is 200 meters in an open space.

	TWL-1S Monitor	
Low risk **Unrestricted zone** **TWL : >140**	**Medium risk** **Cautionary zone** **TWL : 115 - 140**	**High risk** **TWL : < 115**

Applications

It is essential to assess thermal risk and manage thermal hazards associated with the work environment and protect the health of the workforce in order to reduce time lost due to thermal illnesses and increase the efficiency of working in the heat. TWL-1S can be applied to outdoor and indoor work sites for assessing the thermal risk level. Once the TWL has been identified, there is a recommended schedule for work, rest and rehydration in order to maximize workers' safety and reduce the heat related risk in the workplace. Remote paging function enables the site managers to stay alert with high thermal risk within 200 meters.

Open-cut
mining

Aluminum,
metal cable

Glass

Construction,
cement

Software

TWLIT (TWL Information Technology) is an user-friendly software specifically designed for quick setup of logger paramet (date, time and sampling rate) and data download from TWL-1S. Downloaded data can be exported and saved as CSV fo allowing further analysis in Excel or other compatible software. TWLIT is available at www.scarlet.com.tw
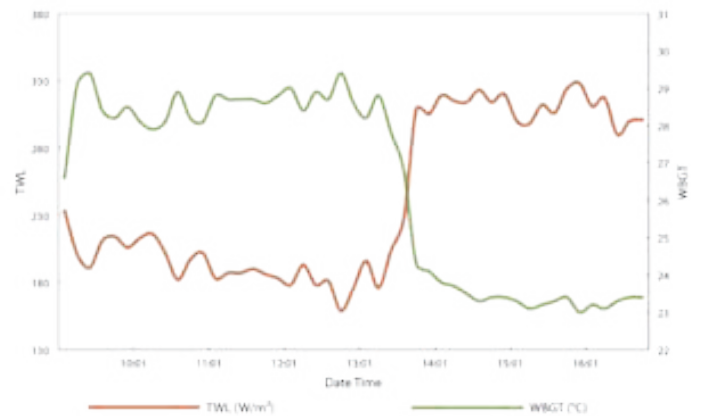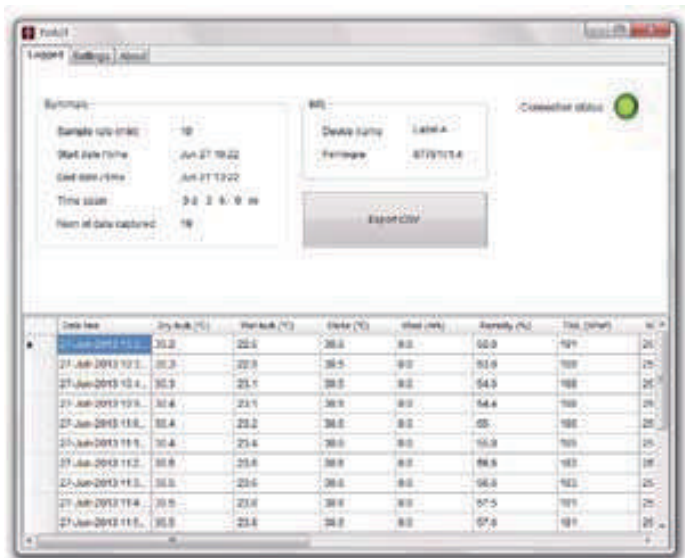
Technical Specification

Sensors

TWL-1S Hest Stress Monitor measures air temperature (T_a), relative humidity (%RH), globe bulb temperature (T_g) and wind speed (WS), whereas wet bulb temperature (T_w) is derived from T_a, %RH at sea level atmosphere pressure.

Heat Indecies

WBGT (Wet Bulb Globe Temperature) and TWL (Thermal Work Limit) can be calculated on the device. WBGT is derived from T_w, T_g or/and T_a wheather indoor or outdoor. TWL is derived from T_w, T_g, T_a, WS with the assumption of safe maximum core temperature for human < 38.2 °C.

Remote Warning (TWL-1SR Only)

Integrated with radio frequency transmitter, TWL-1S is able to remotely warn pager carriers when the thermal risk is high. The transmission coverage is 200 meters in open space.

Calibration

Annual recalibration is recommended for the humidity sensor with built-in calibration program and optional calibration kit.
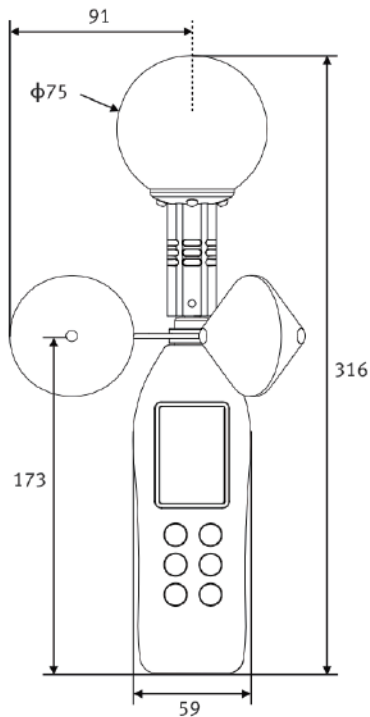
Temperature sensor	Range 0...60 °C Accuracy ±0.6 °C
Humidity sensor	Range 5...95 %RH Accuracy ±3% (at 25 °C;10...90 %RH); ±5% (others)
Globe bulb indoor	Range 0...80 °C Accuracy ±1.0 °C (15...40 °C); ±1.5 °C (others)
Globe bulb outdoor	Range 0...80 °C Accuracy ±1.5 °C (15...40 °C); ±2.0 °C (others)
Wind speed	Range 0.5...10 m/s Accuracy ±(2% of reading + 0.2) m/s
WBGT formula	Indoor $WBGT = 0.7 \times T_w + 0.3 \times T_g$ Outdoor $WBGT = 0.7 \times T_w + 0.2 \times T_g + 0.1 \times T_a$
WBGT indoor	Range 0..66 °C
WBGT outdoor	Range 0..64 °C
TWL calculation	Dynamic calculation based on T_w, T_g, T_a and WS. Safe max. T_{core} < 38.2 °C
Display	32(W) x 50(H) mm LCD screen
Backlight	Yes. Color depends on TWL measurement
Power supply	4x AAA batteries supply 6V
Power consumption	6 mA with backlight off
Battery indicator	Yes
Battery life	120 hr with alkaline batteries
Dimension	59(W) x 37(D) x 316(H) mm Globe bulb 75 mm diameter Wind cup 91 mm rotation radius
Weight	330g
Enslosure	ABS
Standard	CE-compliant
Sensor protection	Polypropylene filter
Operating range	-10...60 °C
Pager frequency	433 MHz
Pager dimension	51(L) x 74(W) x 28(H) mm
Pager weight	76g
Alarm loudness	85db @ 10 cm
Logger memory	2,000 readings
Standard accessory	Tripod x 1, pager x 1, AA battery x 1, AAA battery x 4 USB cable x 1, toolbox x 1, comformity certificate, user manual (Noted: Pager only in TWL-1SR version)
Calibration kit	Optional. $MgCl_2$ and NaCl O-ring sealed bolttles
Storage condition	25 °C indoor

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