CASELLA CEL

Microtherm

Heat Stress WBGT

Introduction

The Microtherm WBGT from Casella CEL is an ergonomically designed, compact, and rugged instrument designed to monitor heatstress potential of personnel in hot working environments in accordance with ISO 7243. It is the first heat stress meter that offers real-time graphical display of data and also features an audible/visual alarm which allows the operator to make rapid decisions if required. PC software for retrospective data analysis is included.

What is Heat Stress?

Workers exposed to hot working environments can be susceptible to heatstress, when the core body temperature rises to dangerous or hazardous levels. This can result in physiological symptoms like heatcramps, nausea, palpitations, stroke and possibly death. An overall estimation of heat stress levels on the body can be measured by utilising the Wet Bulb Globe Temperature Index (WBGT).This combines the measurement of three parameters; natural wet bulb temperature (tnw), globe temperature (tg) and air temperature (ta), applied to the following formulae for both indoor and outdoor environments:

WBGT (Indoor) = 0.7tnw + 0.3tg

WBGT (Outdoor) = 0.7tnw+ 0.2tg + 0.1ta.

The data collected for these values are compared to reference values (as defined by the standard and appropriate “work rest” regimes) can then be adopted in the workplace or more detailed medical analysis undertaken.

Key Features

- Large LCD graphics display
- Real-time display
- Full data-logging facilities as standard
- Low water level warning
- Audible / visual alarm for WBGT levels
- %RH and dewpoint calculation
- Ergonomic design
- Long battery life
- 10m extension cables available
- PC software included
- Meets requirements of ISO 7243
- Automatic calculation of work rest regimes via PC software
- Tripod mounting for meter and remote sensor array

Sensor array

Applications

- Power Stations
- Foundries
- Steel works
- Bakeries
- Glass manufacturing
- Routine monitoring
- Medical surveillance testing

Operation

The WBGT meter measures simultaneously from three PRTD sensors for Wet Bulb, Dry Bulb and Globe Temperatures. Sensors are manufactured to high accuracy standards: BS EN60751 and DIN 43760.

Processed data values include:

- WBGT (indoor and outdoor)
- 1 Hour (TWA) WBGT values
- Relative Humidity (%)
- Dewpoint

Sensors can be used either attached directly on the body of the unit (figure 1), or remotely via 10m extension cables (figure 2). Both the electronic unit and sensor array can be tripod mounted (tripod not included).

Figure 1

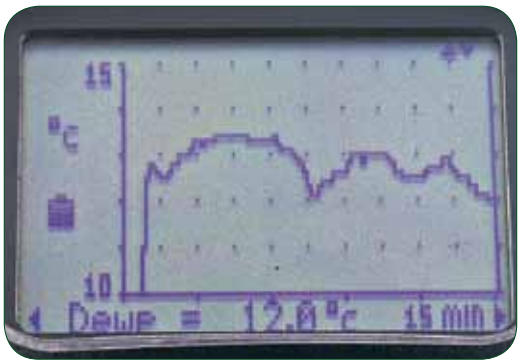
Figure 2

Display

The Microtherm WBGT incorporates a large 128 x 64 pixel graphics LCD with backlight, capable of displaying data in two modes;

Graphical Representation

The Microtherm WBGT is the first area heat stress instrument to offer a real-time scrolling graph of the temperature parameters being measured. This display can be shown over variable time bases of 15, 30, 60 & 120 minutes. This allows the user to assess how the environment is changing over time, without having to download to a PC.



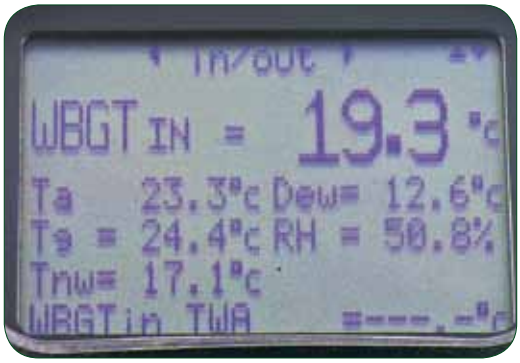
Graphical Display

Numerical Values

Instantaneous values for all parameters are displayed, combined with the hourly rolling average values.

Alarm

An adjustable alarm threshold may be defined for one selected data channel: WBGTtwa, WBGT, Ta or OFF. An audible alarm and flashing visual message on the display screen provides warning of excedence of the threshold.



Numerical Real-Time Display

Operation

Simple Keypad Operation

The Microtherm WBGT has been designed with a simple, easy to use menu structure for the displaying of information, instrument configuration and retrieval of data. The access of this menu via the touch keypad and screen prompts, ensures ease of use for the operator.

Software

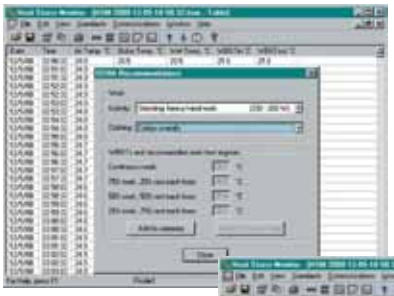
The software (WinHSM) provides an interface for data collection to PC for retrospective analysis. It produces graphical and tabular reports which can easily be imported into other applications. Summary and WBGT Heat Stress Index reports can also be generated.

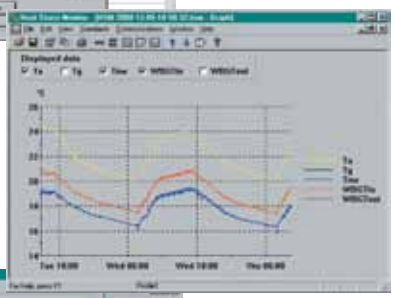
Work rest regimes are calculated, Clothing (Clo) correction factors, and metabolic rates can be entered in accordance with OSHA and ISO 7243.

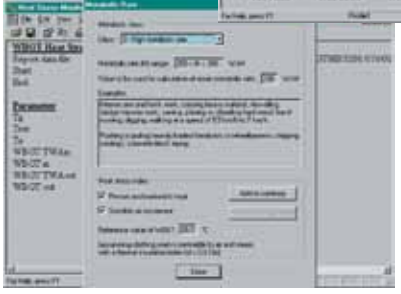
Data can also be viewed “live” by selection of the real-time option whilst connected to the PC.

Calibration

Calibration of the Microtherm WBGT is performed against an internal reference prior to every single measurement. This ensures a high accuracy for each of the temperature sensors and eliminates the need for annual recalibration. Sensor arrays are also interchangeable without need for recalibration.


Tabular data format/ OSHA calculations


Graphical report format


ISO calculations

Technical Specification

Specification	MICROTHERM HEAT STRESS WBGT		
Identity	Sensor specifications		
	Parameter	RANGE	ACCURACY
Ta	Air temperature	10-60˚C	+/- 1˚C
Tg	Globe temperature	20-120˚C	+/- 0.5˚C (20-50) +/-1.0˚C (50-120)
Tnw	Natural wet temperature	5 to 40˚C	+/- 0.5˚C
Transducers	PRTD 100 elements 0.1% using 4 wire extension cables available in 10m, lengths up to 30m		
Displayed Data Values			
Ta	Air temperature		
Tg	Globe temperature		
Tnw	Natural wet temperature		
WBGT	Inside and Outside		
Time Weighted WBGT values	Based on a 1 hr rolling average updated every 30 seconds. (During the first hour '— -' is displayed.)		
%RH	Based on"Ta" and non aspirated "Tnw" sensor		
Dewpoint	Based on "Ta" and non aspirated "Tnw" sensor		
Data Logger			
Total record capacity	512k memory providing up to 49,100 data records		
Number of runs stored	32		
Logging interval	30 seconds to 1 hour		
Software			
Operating System	MS Windows 95/98 NT, XP, Vista compatible. RS232 serial port, 8MB RAM, FDD & HDD, VGA Graphics.		
Power			
Battery Power supply	4 x AA cells Dry cells or NiMH		
Battery life	40hrs NiMH / 85hrs alkaline. Battery monitoring warning and auto power down. Consumption; 30mA typical		
External power supply	3.5 to 14VDC (12v nominal) 90-240VAC Universal input mains power adaptor. Internal fast charge circuitry		
Communications			
RS232			
Applicable Standards			
ISO 7243/7726, OSHA			
Operating Temperature Range			
Sensors	-5˚C to +120˚C		
Electronics	-5˚to +60˚C		
Dimensions	Instrument: 245 x 95 x 50mm. Array: 90 x 225 x 65mm. Sensor/carry case (H x W xD): 135 x 490 x 370mm		
Weight	Sensor/carry case 0.97kg. Instrument only 0.75kg		

ORDERING INFORMATION

Microtherm Heat Stress WBGT meter with kit case	180000A
Microtherm Heat Stress WBGT meter with kit case with calibration certificate	180042A
10m Extension Lead for sensor array	180043B
Small Tripod (max height 215mm)	CEL-90330
Standard Tripod (max height 1,160mm)	CEL-6713

Microtherm Heat Stress WBGT kit includes:

Microtherm Heat Stress WBGT meter
Sensor Array
Pack of spare wicks and screwdriver
Rechargeable batteries (x4)
Universal mains PSU (110/240VAC) with UK, Europe and USA plug adaptors
Distilled water countainer
RS232 communication cable (USB adaptor available)
Windows Win HSM software
Hard carrying case

Distributed By:

Thank you for reading this data sheet.

For pricing or for further information, please contact us at our UK Office, using the details below.

UK Office
Keison Products,
P.O. Box 2124, Chelmsford, Essex, CM1 3UP, England.
Tel: +44 (0)330 088 0560
Fax: +44 (0)1245 808399
Email: sales@keison.co.uk