

# 3M Occupational Health & Environmental Safety Division QUESTemp<sup>OTM</sup> Series Heat Stress Monitors



## Durable, Easy and Accurate Heat Stress Analysis

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### Industry-Leading Technology and Design

Heat Stress prevention begins with the accurate measurement and analysis of heat stress in the workplace. The QUESTemp<sup>o</sup> series of heat stress monitors provides safety professionals with the durable, easy-to-use instrumentation needed to measure and analyze heat stress related exposure levels.

The QUESTemp<sup>o</sup> series includes both area and personal monitors, making it easy to select an instrument that meets the needs of different users and environments. From manufacturing to military applications, there is a QUESTemp<sup>o</sup> monitor for your application.





## Innovative Advancements in Heat Stress Assessment

The QUESTemp<sup>®</sup> Series area heat stress monitors are designed to quickly and accurately evaluate potential heat stress environments. These rugged instruments deliver high performance monitoring through WBGT (Wet Bulb Globe Temperature) sensing technology and the calculation of a WBGT Index value. An optional air probe enables the calculation of PMV/PPD thermal comfort indices. These innovative instruments are designed for the rigors of the workplace, with easy-to-use features, intrinsic safety certification\* and advanced reporting capabilities.

*\*QUESTemp<sup>®</sup> 44/46/48N excluded.*



# Market-Leading Easy-to-Use Heat Stress



## QUESTemp<sup>o</sup> Area Monitors

### Key Features

- Models with intrinsic safety certification
- Long battery life and robust construction
- Data logging capabilities for enhanced reporting and measurement
- Multilingual display (English, French, German, Italian, Spanish)
- Real-time clock provides accurate reporting with time stamping
- Convenient stay time display per multiple standards
- Optional remote sensor bar allows for simultaneous monitoring of up to three areas
- Optional air probe accessory for calculation of PMV/PPD thermal comfort indices
- Download data to QuestSuite™ Professional II for analysis and data management

*For a full listing of features specific to each model, please refer to the chart on the back panel*

### Environments and Applications

- Military training facilities
- Athletic training & events facilities
- Warehousing & distribution centers
- Manufacturing plants
- Nuclear and fossil fuel power generation plants
- Shipbuilding operations
- Occupational heat stress management
- Indoor air quality investigations
- Thermal comfort monitoring
- Risk analysis of job function or activity



### Reduced Maintenance with Innovative Waterless Wet Bulb Sensing Technology

The QUESTemp<sup>o</sup> 44/46/48N utilizes a Waterless Wet Bulb sensor designed for working environments where daily instrument upkeep is difficult. A high-quality humidity sensor and a proprietary algorithm perform the calculation of the WBGT values eliminating the hassle of daily wet bulb maintenance.

Specially engineered for Department of Defense Ashore and Afloat Operations – the QUESTemp<sup>o</sup> 48N features d-ring attachments and a heavy-duty lanyard, along with an event logging mode for quick evaluation.

*The QUESTemp<sup>o</sup> may be export controlled, so please check before exporting outside of the U.S.*

# Analysis

## QUESTemp<sup>o</sup> Personal Monitors



### Personal monitoring for added peace of mind

The QUESTemp<sup>o</sup> II personal heat stress monitor provides an additional level of data by directly detecting the individual's physiological heat response. User-selected alarm trip points provide an audio alert to workers experiencing elevated core temperatures. This instrument is ideal for applications where individuals face a wide range of heat exposure. It allows safety directors to monitor personal heat stress levels and create heat stress measures that can minimize risk.

### Key Features

- Compact size combined with belt or pocket attachment allows for convenient personal monitoring
- E.A.R. "Earlink" earplug covers ear canal sensor providing a comfortable vehicle for measurement and warning if dangerous deep body core temperatures are reached
- Minute-by-minute data logging allows for documentation of personal heat exposure
- Intrinsic safety certification for monitoring in potentially hazardous locations where heat is often extreme



### SPECIFICATIONS FOR QUESTEMP<sup>o</sup> II PERSONAL HEAT STRESS MONITORS

#### SENSOR:

##### Thermistor Temperature Sensor

Accuracy and ranges: +/-0.1° C (0.2° F)  
from 32° C to 40° C (89.6° F to 104° F)

#### MEASUREMENT PARAMETERS:

Temperature reading: Celsius or Fahrenheit

Time stamping with clock

10 second data logging intervals

Overall summary data

Detailed time history data

#### MECHANICAL DESIGN:

IP54 water & dust ingress protection rating

Case (Aluminum): 13 x 6.4 x 2.5 cm (5.1" x 2.5" x 1")

##### Weight

Housing: 283 g (10 oz)

Ear sensor assembly: 4.2 g (0.15 oz)

#### OPERATING TEMPERATURE RANGE:

Unit: 0° C to 70° C (32° F to 158° F)

#### OPERATING HUMIDITY:

0% to 95% (non-condensing)

#### DATA MANAGEMENT:

QuestSuite™ Professional

#### OUTPUT:

RS-232 serial printer / computer interface

Audio Alert

#### POWER SOURCE:

9V disposable batteries (60 hrs)

#### STANDARDS / APPROVALS:

##### Intrinsic Safety

UL/CSA standards for Class I groups C & D;  
Class II groups E, F & G;  
Class III temperature code T3C

Electromagnetic conformance: CE Mark

Patent number: 5062432

# Specifications for QUESTemp<sup>o</sup> Area Heat Stress Monitors

Key: • Feature or Parameter of Unit ○ Option	QUESTemp <sup>o</sup> Natural Wet Bulb Models			QUESTemp <sup>o</sup> Waterless Wet Bulb Models		
	QT <sup>o</sup> 32	QT <sup>o</sup> 34	QT <sup>o</sup> 36	QT <sup>o</sup> 44	QT <sup>o</sup> 46	QT <sup>o</sup> 48N
<b>MEASUREMENT PARAMETERS:</b>						
Dry bulb temperature	•	•	•	•	•	•
Wet bulb temperature	•	•	•	•	•	•
Globe temperature	•	•	•	•	•	•
Relative humidity	•	•	•	•	•	•
Air velocity			○		○	
WBGT (indoor) index	•	•	•	•	•	
WBGT (outdoor) index	•	•	•	•	•	•
Heat index / HUMIDEX	•	•	•	•	•	
Temperature reading: Celsius or Fahrenheit	•	•	•	•	•	•
Data logging intervals: 1,2,5,10,15,30 or 60 minutes		•	•	•	•	•
Event logging mode						•
Display languages: Choose from English, French, German, Italian, Spanish	•	•	•	•	•	•
Time & date stamping with clock and calendar		•	•	•	•	•
Displayed stay times: ACGIH TLV, U.S. Navy PHEL charts, U.S Navy/Marine Corp. Ashore Flag Conditions, EPRI action limits (QT <sup>o</sup> 48N excludes EPRI)			•		•	•
Head-Torso-Ankle Weighted Average WBGT (optional with tri-sensors)	○	○	○	○	○	
<b>SENSORS:</b>						
Dry bulb sensor - 1000 Ohm platinum RTD Accuracy and ranges: +/-0.5 from 0° C to 120° C (+/-0.9° F from 32° F to 248° F)	•	•	•	•	•	•
Wet bulb sensor - 1000 Ohm platinum RTD Accuracy and ranges: +/-0.5 from 0° C to 120° C (+/-0.9° F from 32° F to 248° F)	•	•	•			
Waterless Wet Bulb (Humidity) sensor Accuracy and ranges: +/-1.1° C (k=2) between 0° C and 80° C (32° F and 176° F)				•	•	•
Globe sensor - 1000 Ohm platinum RTD Accuracy and ranges: +/-0.5 from 0° C to 120° C (+/-0.9° F from 32° F to 248° F)	•	•	•	•	•	•
Relative humidity sensor Accuracy and ranges: +/-5% from 20 to 95% (non-condensing)	•	•	•	•	•	•
Air Velocity Probe - Omni-directional heated thermistor Accuracy and ranges: +/- (0.1 m/s + 4%) from 0 to 20 m/s			○		○	
<b>OPERATING TEMPERATURE RANGE:</b>						
Sensor assembly: -5° C to 100° C (23° F to 212° F)	•	•	•	•	•	•
Electronics: -5° C to 60° C (23° F to 140° F)	•	•	•	•	•	•
<b>DATA MANAGEMENT:</b>						
QuestSuite™ Professional II		•	•	•	•	•
Thermal comfort indices in accordance with ISO 7730 Predicted Mean Vote (PMV) and Predicted Percent Dissatisfied (PPD)			○		○	
<b>OUTPUT:</b>						
RS-232 serial printer / computer interface		•	•	•	•	•
Parallel printer interface		•	•	•	•	•

\*All Specifications Subject to Change



## Specifications (Continued)

Key: • Feature or Parameter of Unit ○ Option	QUESTemp° Natural Wet Bulb Models			QUESTemp° Waterless Wet Bulb Models		
	QT°32	QT°34	QT°36	QT°44	QT°46	QT°48N
<b>POWER SOURCE:</b>						
9V disposable batteries: battery life 140 hours	•	•	•			
9V disposable batteries: battery life 80 hours				•	•	•
NiMH rechargeable battery: battery life 300 hours	•	•	•			
NiMH rechargeable battery: battery life 160 hours				•	•	•
AC power adapter wall power cube	•	•	•	•	•	•
<b>MECHANICAL:</b>						
D-ring with lanyard attachment Allows for hands-free monitoring						•
Tripod mount / remote sensor bar Allows for up to 61 m (~200 ft) long distance measurement	•	•	•	•	•	•
IP54 water & dust ingress protection rating	•	•	•	•	•	•
Case size (including mounted sensor assembly) 23.4 x 18.3 x 7.6 cm (9.2" x 7.2" x 3")	•	•	•	•	•	•
Weight: 1.2 kg (2.6 lb) with mounted sensor assembly	•	•	•	•	•	•
<b>STANDARDS / APPROVALS:</b>						
<b>Intrinsic Safety</b> UL/CSA standards for Class I groups A, B, C & D Class II groups E,F, & G Class III temperature code T3 & ATEX	•	•	•			
Electromagnetic conformance: CE Mark	•	•	•	•	•	•

*\*All Specifications Subject to Change*

## QuestSuite™ Professional II Software

It's an extremely effective "System Solution" for recording, reporting, charting and analyzing exposures to a variety of occupational and environmental hazards. With QuestSuite, there are no more headaches from learning different programs or switching among multiple software applications. It's the one simple, yet robust system solution for all Quest Technologies data logging instruments.



**3M**

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098-595 Rev. C 07/10