

The Casella CEL Microtherm Indoor Air Quality instrument is designed to monitor and record the indoor environment of storage facilities, factories, office or general workplace environments.

The overall instrument is compact and portable, allowing it to be transported and operated by a single person. Power is supplied from the mains, re-chargeable battery pack (option) or a combination of both. The fully integrated comprehensive software enables the user to archive data and generate reports automatically.

We spend over 90% of our time indoors, therefore indoor air quality is important if we are to maintain a healthy, safe and efficient working environment. The adverse publicity, absenteeism and reduced productivity associated with Sick Building Syndrome (SBS) have focused attention on improving air quality. The current annual cost of SBS in the UK is estimated at £500 million.

By carrying out simple, regular monitoring of the thermal and gaseous environments in their workplaces using the Microtherm Indoor Air Quality unit, employers can help identify problem areas, reduce their employees' symptoms, increase productivity and morale and help comply with the relevant legislation. Other users can ensure that perishable or valuable stock is kept in optimum conditions.

#### Principles Of Operation

The Microtherm Indoor Air Quality unit consists of a central control and logging unit, to which a selection of probes can be attached via DIN type connectors. Up to 11 parameters may be monitored simultaneously. Standard Sensor capabilities are:

- Temperature and % Relative Humidity (%RH)
- Air velocity
- Globe temperature (40 or 150mm)

A range of other sensors can be supplied for special monitoring applications that require the measurement of particulate and gaseous pollutants, which may be introduced into the building from internal or external sources such as vehicle emissions and tobacco smoke.

- Wet bulb temperature
- Carbon dioxide (ppm)
- Carbon monoxide (ppm)



- Ozone (ppm)
- Particulate/Aerosols (these very important pollutants can be monitored by connection to a Casella CEL Microdust Pro unit)
- Light Intensity
- Noise

The instrument may be configured as an integrated desk-top/local monitoring unit with the sensors and control unit combined as one assembly, or for general area monitoring with the sensors remote from the control unit and are linked together via an extension cable. The remote sensor arrangement includes a tripod to support the sensor assembly. The central unit is pre-programmed to log the inputs and store data to the internal memory (13,000 readings). A PCMCIA card option allows memory expansion to 81,000 readings. Results can also be viewed directly, via the LCD display.

In addition to recording basic sensor readings, certain calculated parameters can also be selected for recording. These parameters are calculated using the average

reading for each sensor based on one-second intervals taken during the logging period. These values are calculated in accordance with the equations defined in the appropriate ISO standards.

Parameters calculated (to appropriate ISO standards)

- Predicted Mean Vote (PMV)
- Predicted Percent Dissatisfied (PPD)
- Mean Radiant Temperature (MRT)
- Wet Bulb Globe Temperature Index - WBGT (indoor and outdoor)
- Velocity Turbulence Intensity
- Draught Risk
- Relative Air Velocity

Data is then kept on board until analysed using the WinIAQ based software package.

The programme operates under a Windows™ environment (3.1 or later). All aspects and functions are easily accessed from drop-down menus and comprehensive help files are provided within the package to offer a full glossary of terms and details of the relevant legislation/standards.

Basic operating parameters of the unit are maintained in profiles that are user-defined. These include:

- **Sensor Allocation:**  
Which channels are activated/selected
- **Parameter Selection:**  
Which calculations you require
- **Constant Selection:**  
In order to calculate certain parameters, constants often have to be entered. These typically include what clothes are being worn (CLO values) and values of Metabolic Rate to give indication of level of manual labour involved
- **Logging Interval:**  
Variable between 5 - 3,600 seconds

Profiles can be recalled at any time to allow repetition of previous monitoring regimes.

Once a survey has been completed, data can be retrieved, either directly via serial port, or via modem and is then stored in data files for analysis. The application makes data collection as simple and automated as possible. Full colour graphs are automatically generated and a zoom facility allows individual time events within the sample time frame to be analysed in more detail. Tables of file data are also generated and a summary screen option displays maximum, minimum and average information. All graphs and summary reports can be readily transferred to other word processor and spreadsheet applications as bitmaps or text, via the clipboard. Data files created by the application are saved as comma delimited ASCII text. This allows files to be imported into many commercial spreadsheet applications. Reports can then be generated quickly and easily.

The removable PCMCIA memory card, not only increases the storage capacity of the Microtherm Indoor Air Quality unit, but also

provides a convenient and reliable medium to transport the data. All information saved onto the card may be extracted either via the designated slot in the control unit or separate card reader. PCMCIA cards are therefore ideally suited to applications that require greater memory capacity for longer term monitoring. This option allows data to be viewed 'real-time' from the controller onto a PC monitor screen; an ideal feature for the commissioning of new buildings.

#### Features

- Robust, small, lightweight unit
- User-configured to suit application
- Integral (desk-top) or remote sensing
- Calculates to appropriate ISO standard parameters
- Comprehensive sensor range
- Direct reading of parameters
- Versatile analysis software
- Battery back-up for data storage
- Modem operation feature
- PCMCIA memory expansion option

#### Applications

- Indoor air quality studies
- Thermal comfort analyses
- New building commissioning
- Storage of goods/produce monitoring
- Assessment of HVAC efficiency
- COSHH surveys in the workplace
- Building energy management
- Theatre/exhibitions and conference venues
- Life sciences research
- Schools, colleges and Universities

#### Applicable Standards

BS 1339	Definitions, formulae and constants relating to humidity of the air
BS EN60751	Platinum Resistance Thermometer (PRT) sensors
BS EN8207	Energy efficiency in buildings
ISO 7243	Hot environment WBGT index
BS EN7730	Moderate thermal environments
ISO 7726	Hot thermal environments
ISO/DIN 9920	Ergonomics of the thermal environment 1974
Health and Safety at Work Regulations (UK)1992	
Workplace (HSW) Regulations (UK) 1994	
Control of Substances Hazardous to Health Regulations (UK)	



## Specification

## MICROTHERM INDOOR AIR QUALITY

Control and display panel	32 character, backlit LCD with 5 key operation
Data storage	Maximum 13000 readings on internal memory Expandable to 81000 readings with 256k PCMCIA card
Recording interval	1 second increments from 5 to 3600 seconds
Outputs	a) 9-way D type socket for RS232 communication b) 25-way D type socket for parallel data link to sensor hub c) 6-way DIN socket for external alarm d) Two jack sockets for external power
Power supply	Mains or external battery pack
Weight	2.1kg- control unit 3.2kg- control unit and sensor array 5.7kg- control unit and sensor array mounted on tripod
Size	275 x 250 x 75mm-control unit 380 x 400 x 430mm-control unit and sensor array

## Ordering Information

Microtherm Indoor Air Quality kit including:	141110D
Control unit, control software, power supply, air velocity, 40mm black globe, temperature and relative humidity sensors, tripod, interconnections, instruction manual and attaché style carrying case	

## Accessories and Spares

Natural wet sensor	141004C
150mm black globe attachment	100940A
MICRODUST attachments/interconnections	141182A
Carbon monoxide sensor	141150C
Ozone sensor	141152C
Interconnections box (used if both CO and O <sub>3</sub> required)	141168B
Carbon dioxide sensor	141026D
Battery pack and charger	141154C
Card reader	-MCI1

## Contact Details

Sales	Tel: +44 (0) 1234 841468	Fax: +44 (0) 1234 841490	
Service	Tel: +44 (0) 1234 847799	Fax: +44 (0) 1234 841490	e-mail: <a href="mailto:info@casellameasurement.com">info@casellameasurement.com</a>