MicroCal T30
Portable Temperature Calibrator
Instruction manual MM850495 ed.1
INTRODUCTORY NOTE

This manual has been with all the information you need to install, operate and maintain the Portable Temperature Calibrator MicroCal T30 and its accessories.

Eurotron has used the best care and efforts in preparing this book and believes the information in this publication are accurate. The Eurotron products are subjected to continuous improvement, in order to pursue the technological leadership; these improvements could require changes to the information of this book. Eurotron reserves the right to change such information without notice.

Any maintenance operation must be carried out by qualified personnel only. Eurotron supplies instructions and operative procedures for any operation on the instrument. We recommend contacting our technicians for any support requirements.

The instrument is fully tested in conformity with the directive n°89/336/CEE Electromagnetic Compatibility. Eurotron shall not be liable in any event, technical and publishing error or omissions, for any incidental and consequential damages, in connection with, or arising out of the use of this book.

The operator must not use this equipment for any other purpose than that stated. This document is the property of Eurotron and may not be copied or otherwise reproduced, communicated in anyway to third parties, not stored in any Data Processing System without the express written authority of Eurotron Instruments S.p.A.

All right reserved
Copyright © 2004

Eurotron Instruments S.p.A.
Viale Fratelli Casiraghi 409/413
20099 Sesto San Giovanni (MI) – Italy
Tel.: 02 248820.1 – Fax: 02 2440286
e-mail: info@eurotron.com
CONTENTS

1 INTRODUCTION ........................................................................................................................................... 4
   1.1 Specifications ............................................................................................................................................. 4
   1.2 Ordering code ............................................................................................................................................. 4

2 SAFETY .......................................................................................................................................................... 5

3 OPERATION .................................................................................................................................................. 6
   3.1 Parts and controls ..................................................................................................................................... 6
   3.1.1 Power lead ............................................................................................................................................. 6
   3.1.2 Power switch ....................................................................................................................................... 6
   3.1.3 Fan ....................................................................................................................................................... 6
   3.1.4 Stand .................................................................................................................................................. 6
   3.1.5 Dry-block .......................................................................................................................................... 6
   3.1.6 Temperature controller ...................................................................................................................... 7
   3.2 Operation ................................................................................................................................................. 7
   3.2.1 Dry-block set-up ................................................................................................................................. 7
   3.2.2 Temperature setting ............................................................................................................................ 7
   3.2.3 Probe testing ..................................................................................................................................... 7

4 MAINTENANCE .......................................................................................................................................... 8
   4.1 Care of the unit ....................................................................................................................................... 8
   4.2 Warranty terms ..................................................................................................................................... 8
1 INTRODUCTION

MicroCal T30 dry-block heat/cool sources allow users to check the accuracy of thermometers and sensors as a system, on site, without the need of heavy and expansive equipment. The dry-blocks are high accuracy, portable temperature sources that are extremely easy to use. Simply plug in, switch on and set the dry-block to the temperature that you wish to check, insert your probe into the correct size well and take the reading. Compare the temperature reading of your thermometer and probe to the displayed temperature of the dry block and the difference is the error of your instrument. For optimum accuracy and traceability, use a reference thermometer to make comparison measurements.

MicroCal T30 dry-blocks are controlled by a closed loop microprocessor based digital PID temperature controller system incorporating a combination heater/cooler and precision platinum RTD sensor housed in the aluminum block. Fan cooling allows rapid changes in block temperature upon demand. The required temperature may be adjusted in 0.1°C increments across the range of the instrument using the buttons on the front panel.

These units are ideal for use in a variety of industrial and process applications. Each unit is supplied with a traceable certificate of calibration showing actual test data, which can be used as part of quality assurance programs.

1.1 Specifications

<table>
<thead>
<tr>
<th>Specification</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Temperature range</td>
<td>+33 to +300°C (at 20°C ambient)</td>
</tr>
<tr>
<td>Resolution</td>
<td>0.1°C</td>
</tr>
<tr>
<td>Accuracy</td>
<td>±0.5°C (±33 to 199.9°C)</td>
</tr>
<tr>
<td></td>
<td>±1°C (±200 to 300°C)</td>
</tr>
<tr>
<td>Stability</td>
<td>±0.5°C</td>
</tr>
<tr>
<td>Heating time</td>
<td>Ambient to 300°C in 10 min</td>
</tr>
<tr>
<td>Stabilization</td>
<td>5 min</td>
</tr>
<tr>
<td>Cooling time</td>
<td>300°C to 100°C in 15 min</td>
</tr>
<tr>
<td>Hole dimensions</td>
<td>2 x ø3.3mm - 1 x ø4.8mm - 1 x ø6.4mm - 1 x ø9.6mm</td>
</tr>
<tr>
<td>Well depth</td>
<td>100mm</td>
</tr>
<tr>
<td>Power</td>
<td>230 Vac 50-60Hz (110-115Vac 50-60Hz) 200W</td>
</tr>
<tr>
<td>Display</td>
<td>10mm LED</td>
</tr>
<tr>
<td>Dimensions</td>
<td>57 x 125 x 158 (HxWxD) mm</td>
</tr>
<tr>
<td>Weight</td>
<td>900g</td>
</tr>
</tbody>
</table>

Note: hole dimensions given are nominal

Certificate: This instruments has been checked or calibrated against laboratory standards which are traceable via certification to national and international standards at 50°C, 100°C and 150°C.

1.2 Ordering code

MicroCal T30 cat.8158
2 SAFETY

Operate dry-blocks in an ambient temperature between +10 and +30°C (+15 to +25°C for optimum accuracy) and a humidity between 5 to 95% (non condensing). The fan runs continuously to moderate the internal unit temperature. Always ensure the air vents and fan aperture are clear and have at least 150mm of space between them and any obstructions. NEVER cover the unit while in operation or operate if the fan stops. If the equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

The calibrator can operate at high temperatures. Precautions MUST be taken to prevent personal injury or damage to surrounding objects. Probes may be hot when removed from the unit and should be placed on a heat resistant surface. The unit may remain hot for several minutes after switching off. DO NOT switch off at temperatures above +100°C. Allow to cool before storage.

Care must be taken when removing probes and inserts from the unit. If the unit is set at a high temperature, the probes and inserts will be very hot and could cause burns to the hands. Please, use the insert removal tool supplied. After removal, place hot probes and inserts only on a suitable heatproof surface.

Only place inserts and temperature probes in dry-block holes. These units are designed to operate in dry conditions. DO NOT introduce any liquid into any of the dry-block holes.

These dry-blocks are designed to be rugged and durable but do contain electronics. DO NOT operate in dirty, dusty or very damp environments or near liquids that could present a hazard from electric shock.

Connect the input power lead to only a 230V, 50-60Hz (or 110-115V, 50-60Hz depending on the model) grounded a.c. power supply. The unit requires up to 200W of power. Mains plug fuse is 3A.

MicroCal T30 heat sources are programmed and calibrated at the factory for optimum performance and should not need adjusting. If the unit is out of calibration or needs repair, please return to the supplier. The dry-block unit is equipped with an internal electrical fuse. If a fuse blows, return to the supplier for inspection and repair. There are no user serviceable parts inside.
3  OPERATION

3.1  Parts and controls

3.1.1  Power lead
The power lead is clamped through the rear panel of the unit and is not removable. Plug into a standard 230V (or 110-115V depending on the model).

3.1.2  Power switch
The power switch is located on the rear panel of the unit and operation is indicated with a 1 and a 0.

3.1.3  Fan
The internal fan runs continuously when the unit is operating to provide cooling for the internal electronic components and the heat sink. It is a 2-speed fan and at lower set point temperature the fan speed will increase (shown by indicator O2 on the controller).

Allow at least 150mm of space all around the unit and DO NOT obstruct any of the ventilation holes.

3.1.4  Stand
The stand can be folded flat against the under side of the unit when not in use or if the unit has to operate in horizontal position. It can be swung down and forward until it hits the stops so that the unit can be used in an inclined position. The stand was not designed to be a carrying handle and should not be forced past the stops for this purpose.

3.1.5  Dry-block
The aluminum dry-block is located on the front panel. Dry-well models have blocks with holes in to accept temperature probes. The dry-well model MicroCal T30 is designed to accept 4 different probe sizes: 2 x ø3.3mm - 1 x ø4.8mm - 1 x ø6.4mm - 1 x ø9.6mm. Other inserts are available to suit standard probe diameters.
Use the nearest, larger size insert to the probe diameter being checked. The inserts are a close fit in the dry-block to give good thermal conduction. Keep the inserts clean and avoid damage by storing carefully. The inserts must be regularly removed and cleaned to ensure they do not seize in the dry-block. DO NOT introduce any liquids or substance into the dry-block or inserts as this may result in the inserts sticking in the dry-block.

3.1.6 Temperature controller

In normal operating mode, the numeric LED display shows the actual block temperature. A control output indicator light (O1) is located in the top left corner of the display. This indicates when the unit is in heat mode or when the unit is controlling within the proportional control band.

To show the set point temperature in the display, press and release either (▼▲). Press and hold either the up or down arrow button to change the shift value. A factory set value will be entered at the time of certification. The shift value should only be adjusted if the unit is being monitored by a precision reference thermometer.

All other functions of the controller have been factory set and locked to maintain accuracy and repeatability.

3.2 Operation

3.2.1 Dry-block set-up

Place the dry-block unit on a flat level surface with at least 150mm of space all around. The stand may be swung out to lift the front of the unit. Plug the power lead into a suitable grounded AC power outlet socket. Check for and remove any foreign objects prior to switch on. Turn the instrument on using the switch located on the rear panel, below the power lead. The fan will start immediately and the controller display will illuminate after approximately 3 sec.

3.2.2 Temperature setting

The dry-block may be set to any temperature between +33 and +300°C in 0.1°C increments (see 3.1.6 temperature controller for details). The control will cause the unit to heat or cool to the set point temperature. The dry-block temperature is displayed in operation. A small overshoot and undershoot will occur when the block reaches the set point temperature. Once the set point temperature is reached a further 5min should be allowed for stability to be achieved. For optimum accuracy and stability allow the unit to warm up to 30min after power up. The displayed block temperature should stay within ±0.5°C of the set point temperature.

3.2.3 Probe testing

Insert the probe to be tested into one of the holes in the dry-block. The probe should be a snug fit for good heat transfer but should not be so tight that it cannot be easily removed. Best results will be obtained when the probe is inserted to the full depth of the dry-block hole of closest size to the probe diameter. Allow the reading from the probe to stabilize and then compare the reading with either the temperature controller display or an external reference thermometer. For optimum accuracy, use a high precision reference thermometer and probe. If probes with a large mass are inserted into the dry-block holes, the unit requires up to 10-15 min. to re-stabilize.
4 MAINTENANCE

4.1 Care of the unit
These dry-block units require very little maintenance. Avoid operation in dusty, dirty, oily or wet environments. If the case becomes dirty, it may be cleaned using a damp cloth and mild detergent. Do not allow moisture to enter the case. It is important to check for and remove any foreign objects in the dry-block holes.

WARNING: never introduce any fluids or other foreign material into the dry-block. This will damage the dry-block and could cause inserts or probes to become stuck. It could also cause a potential electric shock. In the event that the heat/cool source should require service or repair, please contact the manufacturer for assistance. There are no user serviceable parts inside and any attempted repair will void any warranty.

4.2 Warranty terms
Each instrument is shipped with a Warranty Certificate that indicates the validity conditions of the warranty itself. Eurotron Instruments warrants its products against defects in materials and workmanship. If the unit should malfunction, it must be returned during the warranty period, transportation prepaid, to Eurotron for evaluation. Upon examination, if the unit is found to be defective it will be repaired or replaced at no charge. Eurotron's WARRANTY does not apply to defects resulting from any action of the purchaser, including but not limited to mishandling, improper interfacing, operation outside of design limits, improper repair, or unauthorized modification. This WARRANTY is VOID if the unit shows evidence of having been tampered with or shows evidence of being damaged as a result of excessive corrosion; or current, heat, moisture or vibration; improper specification; misapplication; misuse or other operating conditions outside of Eurotron's control.
This warranty applies to the original purchaser only. Please include a copy of the original invoice or a small service charge may be applied.

Direct all warranty and repair requests/inquiries to the Eurotron Customer Service Department. BEFORE RETURNING ANY PRODUCT(S) TO EUROTRON, PURCHASER MUST OBTAIN AN AUTHORIZED RETURN (AR) NUMBER FROM EUROTRON'S CUSTOMER SERVICE DEPARTMENT (IN ORDER TO AVOID PROCESSING DELAYS).
The purchaser is responsible for shipping charges, freight, insurance and proper packaging to prevent breakage in transit.