

MicroCal 20T

High Accuracy 2 Channels
Documenting Thermometer



MULTIFUNCTION
CALIBRATORS

- ▶ $\pm 0.01\%$ rdg. Accuracy
- ▶ 0.01°C Resolution
- ▶ All Normalized IEC, DIN, JIS Thermocouples Pt, Ni, Cu Resistance Thermometers
- ▶ mV, & mA (Active and Passive Loop)
- ▶ Temperature Switch Test
- ▶ Rechargeable Batteries
- ▶ Built-in Environmental Condition Module for Ambient T, rH% and Barometric Pressure
- ▶ Real-time Clock with Memory for In-field Calibration Procedures ("As Found" + "As Left")
- ▶ RS232/USB Serial Interface
- ▶ Communication Module for MicroCal T Series
- ▶ CalPMan 2007 Calibration Procedure Manager Software Package



Introduction

MicroCal 20T is hand-held, high accuracy, two channel, multifunction thermometer. It is the optimal solution to calibrate all type of thermoelectric sensors, transmitters and temperature switches. Calibration certificate of your Working Standard can be uploaded from PC for automatic error adjustment in temperature calibrations.

Measure	Range	Resolution	Accuracy (% of reading)
Tc J	-210 to 1200°C	0.01 °C*	±(0.01% rdg. + 0.1°C)
	-350 to 2200°F	0.01 °F	±(0.01% rdg. + 0.2°F)
Tc K	-270 to 1370°C	0.01 °C*	±(0.01% rdg. + 0.1°C)
	-454 to 2500°F	0.01 °F	±(0.01% rdg. + 0.2°F)
Tc T	-270 to 400°C	0.01°C*	±(0.01% rdg. + 0.1°C)
	-454 to 760°F	0.01 °F	±(0.01% rdg. + 0.2°F)
Tc R	-50 to 1760°C	0.1°C	±(0.01% rdg. + 0.2°C)
	-60 to 3200°F	0.1°F	±(0.01% rdg. + 0.4°F)
Tc S	-50 to 1760°C	0.1°C	±(0.01% rdg. + 0.2°C)
	-60 to 3200°F	0.1°F	±(0.01% rdg. + 0.4°F)
Tc B	50 to 1820°C	0.1°C	±(0.01% rdg. + 0.3°C)
	140 to 3310°F	0.1°F	±(0.01% rdg. + 0.6°F)
Tc C	0 to 2300°C	0.1°C	±(0.01% rdg. + 0.2°C)
	32 to 4170°F	0.1°F	±(0.01% rdg. + 0.4°F)
Tc G	0 to 2300°C	0.1°C	±(0.01% rdg. + 0.3°C)
	32 to 4170°F	0.1°F	±(0.01% rdg. + 0.6°F)
Tc D	0 to 2300°C	0.1°C	±(0.01% rdg. + 0.3°C)
	32 to 4170°F	0.1°F	±(0.01% rdg. + 0.6°F)
Tc U	-200 to 400°C	0.01°C*	±(0.01% rdg. + 0.1°C)
	-330 to 760°F	0.01°F	±(0.01% rdg. + 0.2°F)
Tc L	-200 to 760°C	0.01°C*	±(0.01% rdg. + 0.1°C)
	-330 to 1400°F	0.01°F	±(0.01% rdg. + 0.2°F)
Tc N	-270 to 1300°C	0.01°C*	±(0.01% rdg. + 0.1°C)
	-450 to 2380°F	0.01°F	±(0.01% rdg. + 0.2°F)
Tc E	-270 to 1000°C	0.1°C	±(0.01% rdg. + 0.1°C)
	-450 to 1840°F	0.1°F	±(0.01% rdg. + 0.2°F)
Tc F	0 to 1400°C	0.1°C	±(0.01% rdg. + 0.1°C)
	32 to 2560°F	0.1°F	±(0.01% rdg. + 0.2°F)
Pt100 IEC OIML α= .3926	-200 to 850°C	0.01°C	±(0.01% rdg. + 0.05°C)
	-330 to 1570°F	0.01 °F	±(0.01% rdg. + 0.09°F)
Pt100 JIS SAMA α= .3902	-200 to 600°C	0.01°C	±(0.01% rdg. + 0.05°C)
	-330 to 1120°F	0.01 °F	±(0.01% rdg. + 0.09°F)
Pt200	-200 to 850°C	0.1°C	±(0.01% rdg. + 0.15°C)
	-330 to 1570°F	0.1°F	±(0.01% rdg. + 0.27°F)
Pt500	-200 to 850°C	0.1°C	±(0.01% rdg. + 0.1°C)
	-330 to 1570°F	0.1°F	±(0.01% rdg. + 0.2°F)
Pt1000 IEC OIML	-200 to 850°C	0.01°C	±(0.01% rdg. + 0.1°C)
	-330 to 1570°F	0.01°F	±(0.01% rdg. + 0.2°F)
Cu10	-70 to 150°C	0.1°C	±(0.01% rdg. + 0.4°C)
	-100 to 310°F	0.1°F	±(0.01% rdg. + 0.7°F)
Cu100	-180 to 150°C	0.1°C	±(0.01% rdg. + 0.05°C)
	-300 to 310°F	0.1°F	±(0.01% rdg. + 0.09°F)
Ni100	-60 to 180°C	0.1°C	±(0.01% rdg. + 0.05°C)
	-80 to 360°F	0.1°F	±(0.01% rdg. + 0.09°F)
Ni120	0 to 150°C	0.1°C	±(0.01% rdg. + 0.05°C)
	32 to 310°F	0.1°F	±(0.01% rdg. + 0.09°F)
mV	-20 to 200mV	1µV	±(0.01% rdg. + 3 µV)
V	-0.2 to 2V	10µV	±(0.01% rdg. + 10 µV)
	-2 to 20V	100µV	±(0.01% rdg. + 100 µV)
mA	-5 to 50mA	0.1µA	±(0.01% rdg. + 0.4 µA)
	Ω	0 to 500Ω	10mΩ
	0 to 5000Ω	100mΩ	±(0.01% rdg. + 120mΩ)

The relative accuracies shown above are stated for 360 days and the operative conditions are from 18 to 28°C

All input ranges: additional error ±1 digit.

Eurotron traceability chart and uncertainty can be supplied on request.

* Resolution is 0.1°C with temperature below -200°C.

Dual input channels

Both channels (CH1 and CH2) are used for simultaneous input. You can use the calibrator as a two channel, high accuracy thermometer to verify and certify temperature sensors and transmitters. Use the MicroCal 20T calibrator with MicroCal T series dry block and Eurotron Working Standards for a complete and professional temperature calibration system.

4-wire resistance thermometer

Resistance and temperature with resistance thermometer may be measured on a 2, 3 and 4 wire connections for best accuracy and resolution (0.01°C).

Specifications

Voltage

Input impedance:
>10 MΩ for ranges up to 2000 mV f.s.
>500 kΩ for ranges up to 20 V f.s.

Input impedance (Tc ranges): >10 MΩ
General

Calibration: self learning technique with automatic procedure
Channel 1-Channel 2 insulation: 250 Vdc
Common mode rejection: 140 dB at ac operation

Normal mode rejection: 60 dB at 50/60 Hz
Display: graphic LCD display with automatic and manual backlight device

Measurement sampling time: 250 ms
Digital inter face: full bidirectional RS232

Power supply: external charger and rechargeable Ni-MH battery

Battery life (typical):
10 h on Tc and mV input/output (backlight Off)

4 h with 20 mA simulation (backlight Off)
Recharging time (typical): 5 h at 90% and 6 h at 99% with instrument switched off.

Battery charge indication: bar graph on the LCD display (flashing on charge)
Line operation: 100V - 120 V - 230V - 240

Vac with the external battery charger
Operating environment temperature range: from -10 °C to +55 °C

Storage temperature range: from 0 °C to +60 °C (excluding batteries)

Humidity: max 95%RH non condensing
Case: Injection moulded polycarbonate case

Sealing: IP54
Weights: nett 1.4 Kg gross 2.5 Kg

Dimensions: 290x98x57 mm.

Current

Input impedance: <20 Ω at 1 mA
Loop supply: 24 Vdc ±5%

Resistance and RTDs

Connections: 2, 3 and 4 wires
Source resistance effects: ±1 µV error for 1000Ω source resistance

Rtd and Ω measurement excitation current: 0.2 mA

Rtd cable compensation: up to 100 mΩ (for each wire)

Rtd cable compensation error (Pt100): ±0.005°C/Ω of total wire

Maximum load resistance: 1000 Ω at 20 mA

Thermocouples

Engineering unit: °C/°F/K selectable best
Resolution: 0.01°C / 0.01°F

Temperature scale: ITS90 and IPTS68 selectable

Reference junction compensation:

internal automatic from -10 °C to +55 °C
external adjustable from -50 °C to +100 °C

remote with external Pt100 from -10°C to +100 °C

Rj compensation drift: ± 0.002°C/C (from -10 °C to +45 °C) - Class A Pt100

ACCESSORIES

BB530203 RS232 cable

BB530212 USB cable

BB260198 LogMan-Data Logging software

BB260199 LinMan-Linearization software

BB260215 CalpMan 2007 - Calibration Procedure Manager

BB530204 MicroCal T series communication module

Ordering Codes

Code	Model												
3120	MicroCal 20T, Instruction manual and Eurotron report of Calibration												
	<table border="1"> <thead> <tr> <th>Table A</th> <th>Line Charger</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>120V 50/60 Hz with USA plug</td> </tr> <tr> <td>2</td> <td>230V 50/60 Hz with Schuko plug</td> </tr> <tr> <td>3</td> <td>230V 50/60 Hz with UK plug</td> </tr> <tr> <td>4</td> <td>230V 50/60 Hz with European plug</td> </tr> <tr> <td>5</td> <td>100V 50/60 Hz with USA/Japan plug</td> </tr> </tbody> </table>	Table A	Line Charger	1	120V 50/60 Hz with USA plug	2	230V 50/60 Hz with Schuko plug	3	230V 50/60 Hz with UK plug	4	230V 50/60 Hz with European plug	5	100V 50/60 Hz with USA/Japan plug
Table A	Line Charger												
1	120V 50/60 Hz with USA plug												
2	230V 50/60 Hz with Schuko plug												
3	230V 50/60 Hz with UK plug												
4	230V 50/60 Hz with European plug												
5	100V 50/60 Hz with USA/Japan plug												
	<table border="1"> <thead> <tr> <th>Table B</th> <th>Options</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>None</td> </tr> <tr> <td>1</td> <td>HART protocol</td> </tr> <tr> <td>2</td> <td>EC module (T + RH% + barometric measurements)</td> </tr> <tr> <td>3</td> <td>Internal memory expansion card</td> </tr> <tr> <td>4</td> <td>Dry block communication module for MicroCalT</td> </tr> </tbody> </table>	Table B	Options	0	None	1	HART protocol	2	EC module (T + RH% + barometric measurements)	3	Internal memory expansion card	4	Dry block communication module for MicroCalT
Table B	Options												
0	None												
1	HART protocol												
2	EC module (T + RH% + barometric measurements)												
3	Internal memory expansion card												
4	Dry block communication module for MicroCalT												
	<table border="1"> <thead> <tr> <th>Table C</th> <th>Report of Calibration</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Eurotron Report</td> </tr> </tbody> </table>	Table C	Report of Calibration	1	Eurotron Report								
Table C	Report of Calibration												
1	Eurotron Report												

3120 - 4 - 1 2 - 1 Typical Ordering Code