1090 Temperature and Process Calibrator

Time Electronics
Calibration, Test & Measurement

- **Measure/Simulate 8 thermocouples**
- **Measure/Simulate PT100**
- **ITS 90 standard**
- **Measure/Source (uV/mV/mA)**
- **Display in °C and °F**
- **Automatic CJC - selectable**
- **10 point memory recall**
- **Inching and Step functions**
- **Mains/Battery + auto power down**
- **Process loops 4-20mA and 0-50mA**
- **24V loop drive voltage**

The **1090** is a portable high performance process calibrator that combines source and measurement functions for thermocouples, PT100s, uV, mV, and mA.

Thermocouple measurement and simulation
The unit can measure and simulate the temperature and mV characteristics of J, K, T, R, S, B, N and E thermocouples.

Cold junction compensation
The unit can be operated with or without internal cold junction compensation.

PT100 measurement and simulation
Based on 0.3850 alpha probe standard.
Range is –200 °C to 700 °C.

Measurement and Source (uV, mV, and mA)
Measurement ranges are 0 to +/-30mV and 0 to +/-60mA.
Source ranges are 0 to +/-80mV and 0 to +80mA.

Temperature units selection
The display can be easily changed from °C to °F. The equivalent uV (thermocouples) and ohms (PT100) can also be shown.

24V Process Loop drive mode
A process loop can be driven at 24V and up to 60mA by selecting the 'Milliamp Source' mode and setting it at 60mA (or a lower level if required).

Inching (Incrementing/Decrementing)
The unit has a general-purpose inching function. This adjusts the output in fixed increments of temperature (thermocouples only) or voltage or current. The set-up menu gives a the user a choice of three levels of increment i.e. 0.1, 1 or 10 for °C/°F, or 1, 10, or 100 uV/uA for voltage/current. The lowest of these represents the highest setting resolution and provides the most precise control of the output. This is especially useful for calibrating thermostat controllers that have tight specification on hysteresis.

Memory recall and step/auto-step functions
Up to 10 values can be stored in the unit's non- volatile memory and they can be recalled at any time. The user can also manually step through them in sequence using the step key. Continuous stepping (auto-step) is also available at any user selectable rate between 1 and 10 seconds/step.

Power is via an internal high capacity re-chargeable metal hydride battery that can be re-charged from an external mains charger (supplied as standard). The unit is supplied in a robust case with a carrying strap. A pocket for the instruction manual is provided.

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1090 Technical Specifications

MEASURE ACCURACY			SIMULATE ACCURACY		
THERMOCOUPLE TYPE	TEMPERATURE RANGE °C	ACCURACY °C	THERMOCOUPLE TYPE	TEMPERATURE RANGE °C	ACCURACY °C
J	-200 to 580	0.7	J	-210 to 150 150 to 1200	0.15 0.3
K	-200 to –150 -150 to 750	2.5 0.5	K	-270 to 190 190 to 1250	0.5 0.4
T	-200 to 0 0 to 400	1.5 0.4	T	-200 to 150 150 to 400	0.4 0.5
R	-50 to 400 400 to 1750	3.0 1.5	R	-50 to 800 800 to 1750	0.8 2.0
S	-50 to 100 100 to 1750	3.0 1.5	S	-50 to 850 850 to 1750	0.9 2.0
B	110 to 1000 1000 to 1800	3.5 1.5	B	100 to 1200 1200 to 1800	2.0 3.0
N	-100 to 890	0.6	N	-270 to 260 260 to 1300	0.5 1.0
E	-50 to 400	0.4	E	-50 to 1000	0.3
Resolution: 0.1 °C or °F			Resolution: 0.1 °C or °F		

An additional correction representing the equivalent 1µV should be allowed for stray thermal emf effects.

Cold Junction Compensation: Accuracy 0.2 °C. Resolution 0.1 °C.
Operating Temperature: -10 to 40 °C (15 to 105 °F)
Connections: Industry standard 4mm screw terminals.
Power: A metal hydride rechargeable battery pack gives approximately 60 hours continuous operation. The mains re-charger supplied allows full recharge in 11 hours. To conserve battery life, a user inactivity power-down feature is included.

Millivolt Measure 0 to +/- 30mV
Resolution: 10µV
Accuracy: 0.05% of f.s. ±1 digit
Input resistance: 100K Ohms
Milliamp Measure 0 to +/- 60mA
Resolution: 20µA
Accuracy: 0.05% of f.s. ±1 digit
Input resistance: 0.5 ohms

PT100 Simulation
14 set temp. points: -100, -50, -20, 0, 20, 50, 100, 200, 300, 400, 500, 600, 700, 800 °C
Accuracy: 0.1% of resistance value (typically 0.5 °C)

PT100 Measure (0.2 °C or °F resolution)
Range: -200 to 700 °C, 2 wire.
Accuracy: 0.2% of resistance value (typically 0.7 °C)

Memory recall and step functions
10 memory locations for non-volatile storage of values.
Manual and Auto-Step, rate adjustable from 1 to 10 sec/step

Millivolt Source 0 to +/- 80mV
Accuracy (8 to 80mV): 0.02% of f.s.
Resolution (8 to 80mV): 5uV
Accuracy (0 to 8mV): +/-4uV
Resolution (0 to 8mV): 0.5uV
Output resistance : 10 ohm
Milliamp Source 0 to +80mA
Accuracy (8 to 80mA): 0.02% of f.s.
Resolution: 5uA
Accuracy (0 to 8mA): +/-10uA
Resolution: 0.5uA
Max load (24V drive): 300R/80mA ,480R/50mA ,1.2K/20mA
Inching
Three levels of increment, 0.1, 1 or 10 for °C/°F, and 1, 10, or 100 uV/ uA for voltage/current. The lowest of these represents the highest setting resolution and provides the most precise control of the output.
24V Process Loop drive mode
A process loop can be driven at 24V and up to 60mA by selecting the 'Milliamp Source' mode and setting it at 60mA (or a lower level if required).

General Specification

Dimensions: 235 x 150 x 75 mm (9.25 x 6 x 3")
Weight: 1.25 Kg (2.8lb)
Optional Extras: Calibration Certificates – traceable to NPL and UKAS

Ordering Information

Code	Description
1090	Temperature and Process Calibrator (including batteries, charger and carrying case)
9177	Factory (NPL Traceable) Calibration Certificate
9139	UKAS Calibration Certificate (ISO 17025)

Due to continuous development Time Electronics reserves the right to change specifications without prior notice.

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