Time Electronics
1090 Portable Process Calibrator

Description

The 1090 is a high performance portable process calibrator that combines source and measurement functions for thermocouples, Pt100s, µV, mV, and mA. As a multifunction instrument the 1090 combines accuracy and durability with simple operation, making it ideal for process plant applications.

Thermocouple Measurement and Simulation

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 (µV, mV, and mA)

Measurement ranges are 0 to ± 30 mV and 0 to ± 60 mA.
Source ranges are 0 to ± 80 mV and 0 to 80 mA.

Temperature Units Selection

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

24 V Process Loop Drive Mode

A process loop can be driven at 24 V and up to 60 mA by selecting the 'Milliamp Source' mode and setting it at 60 mA (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 µV / µA 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.

Features

- Measure and simulate 8 thermocouples
- Measure and simulate Pt100-RTD
- Measure and source µV / mV / mA
- Displays units in °C, °F, µV / mV, or mA
- Automatic or manual cold junction compensation
- 10 point memory recall
- Process loops 4 to 20 mA and 0 to 50 mA
- 24 V loop drive voltage
- Mains or battery operation
- 60 hours typical use between charges

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 rechargeable metal hydride battery that can be recharged from an external mains charger (supplied as standard). An auto power-down feature helps conserve battery lifeby switching off the instrument if inactive for over 5 minutes. This can be disabled if not required. The unit is supplied in a robust case with a carrying strap. A pocket for the instruction manual is provided.

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Technical Specifications

Temperature

Measure accuracy			Simulate accuracy		
Thermocouple type	Temp range °C	Accuracy °C	Thermocouple type	Temp range °C	Accuracy °C
J	–200 to 580	0.7	J	–210 to 150	0.15
				150 to 1200	0.3
K	–200 to -150	2.5	K	–270 to 190	0.5
	–150 to 750	0.5		190 to 1250	0.4
T	–200 to 0	1.5	T	–200 to 150	0.4
	0 to 400	0.4		150 to 400	0.5
R	50 to 400	3.0	R	–50 to 800	0.8
	400 to 1750	1.5		800 to 1750	2.0
S	–50 to 100	3.0	S	–50 to 850	0.9
	100 to 1750	1.5		850 to 1750	2.0
B	110 to 1000	3.5	B	100 to 1200	2.0
	1000 to 1800	1.5		1200 to 1800	3.0
N	–100 to 890	0.6	N	–270 to 260	0.5
				260 to 1300	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 1 µV should be allowed for stray thermal emf effects.					

PT100

Pt100 measure			Pt100 simulation	
Range	Accuracy	Resolution	Set temperature points (°C)	Accuracy
–200 to 700 °C, 2 wire.	0.2 % of resistance value (typically 0.7 °C)	0.2 °C or °F	–100, –50, –20, 0, 20, 50, 100, 200, 300, 400, 500, 600, 700, 800	0.1 % of resistance value (typically 0.5 °C)

Voltage

Millivolt measure				Millivolt source			
Range	Resolution	Accuracy	Input resistance	Range	Resolution	Accuracy	Output resistance
0 to 30 mV	10 µV	0.05 % FS ± 1 digit	100 kΩ	0 to 8 mV	0.5 µV	± 4 µV	10 Ω
				8 to 80 mV	5 µV	0.02 % FS	10 Ω

Current

Milliamp measure				Milliamp source			
Range	Resolution	Accuracy	Input resistance	Range	Resolution	Accuracy	Max load (24 V drive)
0 to 60 mA	20 µA	0.05 % FS ± 1 digit	0.5 Ω	0 to 8 mA	0.5 µA	± 10 µA	300 Ω / 80 mA 480 Ω / 50 mA 1.2 kΩ / 20 mA
				8 to 80 mA	5 µA	0.02 % FS	

Inching..... Three levels of increment, 0.1, 1 or 10 for °C / °F, and 1, 10, or 100 µV / µA for voltage/current. The lowest of these represents the highest setting resolution and provides the most precise control of the output.

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

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

General Specifications

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 Ni-MH rechargeable battery pack gives approx. 60 hours continuous use. The mains recharger supplied gives full recharge in 11 hours. To conserve battery life a user inactivity power-down feature is included.

Dimensions / weight..... H 235 x W 150 x D 75mm, weight 1.2 kg.

Optional extras..... Calibration Certificates - traceable to NPL and UKAS.

Ordering Information

1090..... **Portable Process Calibrator**

C177..... Traceable calibration certificate (Factory)

C139..... Accredited calibration certificate (ISO 17025)

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

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