



1017 Multifunction DC V/I/R Calibrator

Time Electronics

Calibration, Test & Measurement

- DC Volts 10nV to 100V
- DC Current 100nA to 100mA
- Resistance 10m Ω to 10k Ω
- 0.005% (50ppm) accuracy
- 1 ppm setting resolution
- Noise < 2ppm (0.1 to 1Hz)
- Stability <5ppm/day <25ppm/yr



The **1017** is a high performance portable DC calibrator for use in the field or laboratory. It is constructed in a durable, compact plastic case with a tilt stand/carry handle.

Five DC voltage ranges from 10mV to 100V full scale are available, each with a 6-digit (1ppm) resolution. The DC current range is 100mA full scale with a 100nA (1ppm) resolution. Resistance from 0.01 Ω to 10k Ω is available 0.01 Ω steps.

The voltage, current and resistance ranges make it suitable for calibrating a wide range of transducers, from thermocouples, 4-20mA and 0-10V transmitters, to Platinum Resistance Thermometers, all in the same instrument.

Power

Mains or rechargeable battery. Battery operation enables good performance where earth loop and noise pick-up occurs.

Stability v Temperature and Time

Outstanding performance is due to the use of special computer selected reference diodes and the latest in resistor technology. The special low-thermal emf terminals reduce errors when working with microvolt signals.

Digital Deviation Control

Allows the output to be increased/decreased in % terms from 0 to +/-0.999%. This provides a direct read-out of error and simplifies the recording results for calibration certificates. It enables the user to immediately see if the unit under test is within specification.

1017 Technical Specifications

Voltage Ranges/Accuracy:	0 - 9.99999mV in 10nV steps, $\pm 0.02\%$ of setting $\pm 0.005\%$ of range 0 - 99.9999mV in 100nV steps, $\pm 0.01\%$ of setting $\pm 0.004\%$ of range 0 - 999.999mV in 1 μ V steps, $\pm 0.005\%$ of setting $\pm 0.002\%$ of range 0 - 9.99999V in 10 μ V steps, $\pm 0.005\%$ of setting $\pm 0.002\%$ of range 0 - 99.9999V in 100 μ V steps, $\pm 0.01\%$ of setting $\pm 0.004\%$ of range <i>The above accuracies are independent of thermal emfs which can be 2μV or more depending on the type of leads and connections used.</i>
Output resistance:	10mV & 100mV: 10 Ω . 1V & 10V: <150m Ω . 100V: <1 Ω
Drive current max:	10&100mV: as 10 Ω o/p resistance. 1V&10V: 150mA; 100V: 10mA.
Current Range/Accuracy:	0 - 99.9999mA in 0.1 μ A steps, $\pm 0.02\%$ of setting + $\pm 0.004\%$ of range. Drive voltage max: 10V
Resistance Range/Accuracy:	0 - 9.99999k Ω in 0.01 Ω steps, $\pm 0.05\%$ of setting +/- 0.003% of range. Power rating: 0.25W per resistor End resistance: less than 200m Ω
Deviation Control:	0% to 0.999% in 0.001% steps. Deviation accuracy: V&I output, 0.5%.
Temperature Coefficient:	<5 ppm per $^{\circ}$ C
Long Term Stability:	<5ppm/day, <15ppm/90day, <25ppm/year
Short Term Stability – Noise:	10mV range: <0.2 μ V/sec, <0.3 μ V/10sec, <0.4 μ V/min 100mV range: <0.2 μ V/sec, <0.4 μ V/10sec, <0.6 μ V/min 1V range: <0.2 μ V/sec, <0.5 μ V/10sec, <1.5 μ V/min 10V range: <1.0 μ V/sec, <2.0 μ V/10sec, < 8.0 μ V/min 100V range: <40 μ V/sec, <100 μ V/10sec, <500 μ V/min 100mA range: <0.2 μ A/sec, <0.4 μ A/10sec, <1.0 μ A/min
Warm-up and Settling time:	Warm-up: <10 mins to full accuracy. Settling: < 0.5 secs, 100V range 5 secs.
Output Connections:	The output is via low thermal emf terminals (0.2 μ V/ $^{\circ}$ C). A mains earth terminal is provided for screening purposes. Output polarity can be selected by a switch on the front panel.
Power Supply:	The 1017 can be powered continuously from a 230V 50/60 Hz (110V to order) mains supply, or from the internal rechargeable NiCad battery pack. A front panel indicator shows the state of charge at all times.
Operating temperature:	0 to 50 $^{\circ}$ C (32 to 120 $^{\circ}$ F). 15 to 25 $^{\circ}$ C for optimum performance.
Operating Humidity:	10 to 90% non-condensing 25 $^{\circ}$ C (77 $^{\circ}$ F)

General Specification

Dimensions:	290 x 250 x 110mm
Weight:	2.4 kg (5.4 lb)
Optional Extras:	Calibration Certificate traceable to NPL UKAS Calibration Certificate

Ordering Information

Code	Description
1017	Multifunction DC V/I/R Calibrator
9152	Factory (NPL Traceable) Calibration Certificate
9109	UKAS Calibration Certificate (ISO 17025)

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

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