# 1017 D.C. Multi Function Calibrator

- ◆ D.C. Volts 10 nV 100 V
- D.C. Current 100 nA 100 mA
- Resistance 10 mR 10 kR
- 0.005% (50ppm) accuracy
- 1 ppm setting resolution
- Stability <5ppm/day <25ppm/yr
- ♦ Noise < 2ppm (0.1 1 Hz)
- Mains/Battery operation
- Portable 29 x 11 x 25 cm

The **1017** is a high performance portable D.C. calibrator for use in the field or laboratory, and 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 R to 10 kR is available 0.01 R 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** is either mains or re-chargeable battery. Fully isolated battery operation enables good performance where earth loops and other noise pick-up occurs.



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- ♦ OPTIONAL NULL MEASURE
- Null indicator 1uV/div max sens.
- ♦ Null readout 0 to +/- 1V f.s.d.
- Zero and Gain controls

**Temperature coefficient and stability** are outstanding due to the use of special computer selected reference diodes and the latest in resistor technology. Special low-thermal emf terminals ensure good performance when working with micro-volt signal levels.

### **Digital deviation control**

This allows the output to be either increased or decreased directly in percentage terms from +/-0.001% to +/-0.999%. This is particularly useful when recording results for calibration certificates when errors are generally specified in percentages - it enables the user to immediately see if the unit being calibrated is within specification.

#### Null measure option

The 1017 is available with an optional internal null amplifier/indicator. This enables high accuracy differential measurements to be made with ease. A rear panel isolated output of the amplified null voltage is available for driving chart recorders or data loggers.

### **Specifications**

Voltage ranges/accuracy	$0 - 9.99999 \text{mV}$ in 10nV steps, $0 - 99.9999 \text{mV}$ in 100nV steps, $0 - 999.999 \text{mV}$ in 100nV steps, $0 - 999.999 \text{mV}$ in 1 $\mu$ V steps, $0 - 9.99999 \text{V}$ in 10 $\mu$ V steps, $0 - 99.9999 \text{V}$ in 10 $\mu$ V steps, $0 - 99.9999 \text{V}$ in 100 $\mu$ V steps, $\pm 0.02\%$ of setting $\pm 0.002\%$ of range $\pm 0.01\%$ of setting $\pm 0.004\%$ of range
	0.1uV and 2uV depending on the type of leads and connections used.
	Output resistance: 10mV & 100mV: 10R. 1V & 10V: <150mR. 100V: <1R Output current: 10 & 100mV: 10R o/p res. 1V & 10V: 150mA; 100V: 10mA.
Current range/accuracy	0 - 99.9999mA in 0.1uA steps, $\pm$ 0.02% of setting $$ + $\pm$ 0.004% of range Max drive voltage: 10V
Resistance range/accuracy	0 - 9.99999kR in 0.01R steps, ± 0.05% of full scale Power rating : 0.25W per resistor End resistance : less than 200 mR
Deviation Control	0% to 0.999% in 0.001% steps; 0.5% accuracy (Voltage and Current.)
Voltage/Current Stability	TC: <10 ppm per °C. Stab (ppm @ constant temp): <5 /day, <15/90day, <25/yr
Noise (pk-pk)	10mV range: <0.2uV/sec, <0.3uV/10sec, <0.4uV/min   100mV range: <0.2uV/sec, <0.4uV/10sec, <0.6uV/min   1V range: <0.2uV/sec, <0.5uV/10sec, <1.5uV/min   10V range: <1.0uV/sec, <2.0uV/10sec, <8.0uV/min   100V range: <40uV/sec, <100uV/10sec, <500uV/min   100mA range: <0.2uA/sec, <0.4uA/10sec, <1.0uA/min
Warm-up and Settling time	Warm-up: < 5 minutes to full accuracy. Settling: < 0.5 sec
Output Connections	The output is via two low thermal emf terminals (0.2uV/degC). A mains earth terminal is provided for screening purposes. Output polarity can be selected by a switch on the front panel. A rear panel connector is provided for the null amplifier output, fully isolated 0 to +/- 1V representing the indicator F.S.
Null amplifier option	Sensitivity: max +/- 1uV/div, min +/- 200mV fsd. Input resistance: >1Mohm
Power Supply	The 1017 can be powered continuously from a 230V 50/60 Hz (110 V to order) mains supply, or from the internal rechargeable Ni-Cad battery pack. A front panel indicator shows the state of charge at all times.
Operating temperature:	0 to 50 degC (32 to 120 degF). 15 to 25 degC for optimum performance.
Operating Humility:	10 to 90% non-condensing 25 degC (77 degF)
Dimensions	290 x 250 x 110 mm (11.5 x 10 x 4.3 ins) Weight 2.4 kg (5.4 lb)
Optional Extras	Null measure option and calibration certificates traceable to NPL or UKAS.

## **Ordering Information**

Description	Order Code
D.C. Multi Function Calibrator Null measure option N.P.L. Traceable Calibration Certificate	1017 9716 9152
UKAS Calibration Certificate	9109