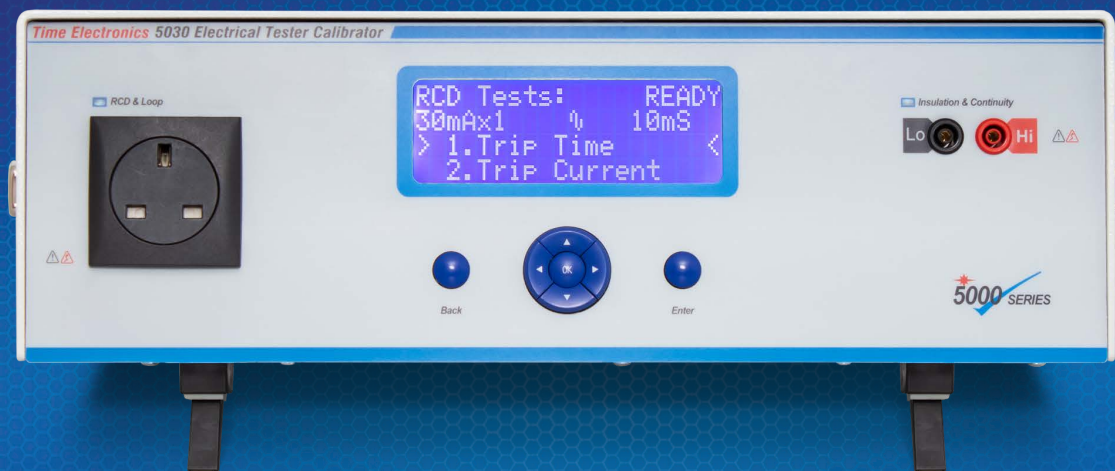




# Electrical Test Equipment Calibrators



For calibration of loop, RCD, insulation testers and PATs







## Electrical Test Equipment Calibrators

A range of instruments that provide users with calibration capabilities for electrical testers and meters. With these products you can test and verify the broad scope of electricians testing devices, accurately and efficiently.

There are various types of testers that check a wide range of electrical parameters. Models can be either single-function devices or comprehensive multifunction units. A combination of calibration equipment is often needed to test and verify different types and functions.

The 5068 and 5069 models are primarily resistance units for use in calibrating insulation testers. The 5070 is designed for 4-wire calibration of micro-ohmmeters and the 5080 for portable appliance testers.

The 5030 is a multifunction calibrator for RCD, loop, insulation, earth testers and multifunction installation testers. It is typically utilised in the calibration laboratory, with automated testing using EasyCal software.



## 5030 Electrical Tester Calibrator



### Description

A precision instrument designed to calibrate RCD, loop, insulation, earth testers and multifunction installation testers. The 5030 accurately simulates RCD trip times and measures currents produced by RCD testers. It replicates loop impedance and auto adjusts for local line impedance. It also provides insulation resistances and measures test voltages and currents. User control is via the central navigation keypad. Scrolling through menus and settings is intuitive and easy, with measurements and settings shown on the large clear LCD display.

**Regional test sockets and fault detection:** For loop and RCD tests the electrical tester (device under test) connects directly to the dedicated front panel mains socket. The 5030 can be fitted with a number of regional type sockets (specified on order). In these test conditions, if the device under test is faulty, the 5030 auto detects the fault, disconnects the output and warns the user. The 5030 is designed not to trip any RCDs on the local supply.

**Loop impedance with auto local loop measurement:** With 10 measurement points the 5030 covers a wide range of loop testers. The precision resistors that make up the loop calibration function are high power and capable of withstanding up to 30 A. An accurate automatic measurement of the local loop is made by the 5030 and added to the resistor value to give the loop impedance value, allowing for precise loop impedance calibration.

**Precise RCD trip times:** RCD trips can be simulated from 10 to 2000 ms in duration. The trip time can be set to predefined values for quick selection, or to a user time via the front panel.

**RCD current measurements:** Current measurement is made of the applied RCD test current. Current measurements are true RMS for AC, half wave rectified as well as being able to measure DC tests. The ranges covered are from 6 mA to 1000 mA, with multipliers of x0.5, x1, x2, and x5 up to a maximum of 2500 mA. To avoid false current measurements the 5030 incorporates a 'pre-test delay' setting. This feature is for use with RCD testers that produce a pre-test signal. A test current threshold setting (0 to 100 % of nominal current) is also user selectable.

**Insulation resistance and test voltage measurement:** The 5030 tests the functions of megohm meters using precision high value resistors up to 2 G $\Omega$ . Resistance value can be set via front panel or via remote control to allow many test points to be automated. Voltage measurement functions allow accurate test voltages up to 1 kV to be measured whilst under 0.5 mA or 1 mA test conditions.

**Continuity and earth resistance:** The 5030 precision low ohm resistors allow calibration of continuity functions found on most multifunction testers and insulation testers. Applied test voltages and currents are also measured.

**Mains voltage and frequency:** The local mains supply voltage and frequency is precisely measured by the 5030. This is used to cross reference the voltage reading on the unit under test and confirm the instruments accuracy.

### Features

- RCD 3 mA to 2500 mA, 10 ms to 2000 ms
- Loop 50 m $\Omega$  to 1.8 k $\Omega$
- Insulation up to 2 G $\Omega$  / 1 kV
- Continuity 0.1  $\Omega$  to 10 k $\Omega$
- Regional test sockets
- RS-232 / USB Control
- Fast and intuitive user interface
- PC/laptop control via EasyCal software

### EasyCal Calibration Software

The 5030 can be controlled via Time Electronics EasyCal software to automate the calibration process. This provides increased speed of calibration and consistency of results

Produce traceable calibration certificates and test reports for quality standards with additional uncertainty information for ISO 17025 conformance.







## Technical Specifications

### Loop

Function	Range / Values	Resolution	Accuracy
Loop Impedance Resistor Values	1800, 330.0, 180.0, 33.00, 18.00, 3.300, 1.800, 0.330, 0.150, 0.050 $\Omega$	4 digit	$\pm 0.5\%$ of displayed value $\pm 30\text{ m}\Omega$
Local Loop Compensation	0 to 9.999 $\Omega$	0.001 $\Omega$	$\pm 0.5\%$ of value $\pm 30\text{ m}\Omega$
Test Current	30 A max (200 ms) / 50 W max	–	–

### RCD

Function	Range / Values	Resolution	Accuracy
Trip Time	10 to 2000 ms	10 ms	$\pm 0.5\text{ ms}$
Current	6.000, 10.00, 30.00, 100.0, 300.0, 500.0, 1000 mA	4 digit	$\pm 0.5\%$ of reading $\pm 1\%$ with x5 multiplier
Current Multipliers	x0.5, x1, x2, x5	–	–
Maximum Current	2500 mA	–	–
Waveforms	AC, DC & half wave rectified	–	–
Phase Detection	0° or 180°	–	–
Pre Trigger Delay	0 to 2000 ms	10 ms	–
Pre Trigger Threshold	0 to 100 % of nominal current	1 %	–

### Insulation

Function	Range / Values	Resolution	Accuracy
Resistance	1 M $\Omega$ to 2000 M $\Omega$	1 M $\Omega$	1 % of value
	50 k $\Omega$ to 1990 k $\Omega$	50 k $\Omega$	1 % of value
Test Voltage Measurement @ 0.5 mA or 1.0 mA Load	50.0 to 99.9 V DC	0.1 V	1 % of reading
	100 to 1200 V DC	1 V	1 % of reading

### Continuity

Function	Range / Values	Resolution	Accuracy
Resistance	0.1 $\Omega$ to 100.0 $\Omega$	0.1 $\Omega$	1 % of value + 20 m $\Omega$
	250 $\Omega$ , 500 $\Omega$ , 1.00 k $\Omega$ , 2.50 k $\Omega$ , 5.00 k $\Omega$ & 10.0 k $\Omega$	3 digit	1 % of value
Test Voltage Measurement (input resistance 10 M $\Omega$ )	0.0 to 50.0 V DC	0.01 V	0.5 % of range
Test Current Measurement (between 1 $\Omega$ and 2 $\Omega$ )	0 to 400 mA DC	0.1 mA	0.5 % of range
Power Dissipation	1 watt maximum	–	–

### Voltage

Function	Range	Resolution	Accuracy
Line Voltage Measurement	200.0 to 260.0 V RMS	0.1 V	0.5 % of reading
Line Frequency Measurement	45.00 to 65.00 Hz	0.01 Hz	0.1 % of reading

## General Specifications

Warm up ..... 30 minutes to full accuracy.

Settling time ..... Less than 5 seconds.

Standard interfaces ..... RS-232 and USB.

Temperature performance ..... Operating: 10 to 35 °C,  
Full spec: 23 °C  $\pm$  5 °C, Storage: -10 °C to 50 °C.

Operating humidity/altitude ..... < 80 % non condensing / Altitude: 0 to 3 km.  
Non operating altitude: 3 to 12 km.

Line power ..... 220 to 240 V AC 50 Hz.  
Power consumption 200 W maximum.

Dimensions / Weight ..... W 430 x H 155 x D 255 mm / Weight: 8 kg.

Supplied with ..... User manual, RS-232 cable, USB adaptor/cable.

## Ordering Information

5030 .....	Electrical Tester Calibrator
C201 .....	Traceable calibration certificate (Factory)
C137 .....	Accredited calibration certificate (ISO 17025)
ECFLA .....	EasyCal Software (see separate datasheet for options)



## 5068 Insulation Tester Calibrator



### Description

A precision instrument suitable for calibrating and testing general purpose insulation testers and megohmmeters with test voltages up to 2.5 kV. It is constructed in a high strength co-polymer plastic case and is powered by a rechargeable battery. This ensures full isolation from the mains and prevents stray leakage.

The insulation tester being calibrated can be tested for open circuit voltage and short circuit current. These are displayed on the digital meter mounted on the front panel. Nine selectable precision resistors provide the insulation resistance test. Also fitted are 4 fixed low resistance values for verification of the low ohm ranges and continuity. Rugged, compact and portable, the 5068 is easy to transport and ideal for site calibration work. Also available is the 5069, 10 kV version.

### Specifications

Resistance (Insulation)	10 G $\Omega$ , 1 G $\Omega$ , 400 M $\Omega$ , 250 M $\Omega$ , 100 M $\Omega$ , 10 M $\Omega$ , 1 M $\Omega$ , 500 k $\Omega$ , 100 k $\Omega$ .
Resistance (Low ohm)	1 $\Omega$ , 10 $\Omega$ , 100 $\Omega$ , 1 k $\Omega$ .
Resistance accuracy	Low ohm resistance: 1 % Insulation resistance: 100 k $\Omega$ to 1 G $\Omega$ : 1 % Insulation resistance: 10 G $\Omega$ : 5 %
Resistance temperature coefficient	Insulation resistance: < 250 ppm/ $^{\circ}$ C. Low ohm resistance: < 50 ppm/ $^{\circ}$ C.
Continuity	Selectable 5 $\Omega$ .
Open circuit voltage measure	0 to 2 kV range & 0 to 2.5 kV range: 1 % FS accuracy.
Voltage display	1.999 kV full scale and 2.50 kV full scale.
Voltage temperature coefficient	< 300 ppm/ $^{\circ}$ C.
Short circuit current measure	0 to 2 mA and 0 to 20 mA ranges: 1 % FS accuracy.
Current display	1.999 mA full scale, and 19.99 mA full scale.
Current temperature coefficient	< 450 ppm/ $^{\circ}$ C.
Power	Internal battery, 6 V re-chargeable NiCad, > 150 hrs between charges.
Dimensions / Weight	W 270 x H 175 x D 250 mm / 2.1 kg.
Supplied with	High voltage safety connection leads (2.5 kV). Low resistance leads. Mains battery re-charger (230 V 50 Hz).

### Features

- Insulation resistance from 100 k $\Omega$  to 10 G $\Omega$
- Low ohm verification at 1  $\Omega$ , 10  $\Omega$ , 100  $\Omega$ , 1 k $\Omega$
- Basic accuracy 1 %
- Up to 2.5 kV operation
- Battery operation (> 150 hrs between charges)
- Continuous connection – no arcing
- Fully shrouded safety connectors
- Display of open circuit voltage
- Display of short circuit current



### Ordering Information

5068	Insulation Tester Calibrator (InsCal)
C189	Traceable calibration certificate (Factory)
C112	Accredited calibration certificate (ISO 17025)



## Description

A precision instrument suitable for calibrating and testing general purpose insulation testers and megohmmeters with test voltages up to 10 kV.

It is constructed in a high strength co-polymer plastic case and is powered by a rechargeable battery. This ensures full isolation from the mains and prevents stray leakage. The insulation tester being calibrated can be tested for open circuit voltage and short circuit current. These are displayed on the digital meter mounted on the front panel.

The insulation resistance is provided by a precision 4 dial decade resistance bank which can be set to a maximum of 99.99 GΩ with additional resistance values of 100 kΩ, 200 kΩ, 500 kΩ, 1 MΩ, 2 MΩ and 5 MΩ which can be switched in as required. Rugged and portable, the 5069 is ideal for site calibration work. Also available is the 5068 InsCal, 2.5 kV version.

## Specifications

Resistance.....	10 GΩ, 1 GΩ, 100 MΩ, 10 MΩ decade ranges.
Fixed values .....	5 MΩ, 2 MΩ, 1 MΩ, 500 kΩ, 200 kΩ, 100 kΩ.
Resistance accuracy .....	100 kΩ to 5 MΩ = 1 %. 10 MΩ to 10 GΩ = 1 %. 10 GΩ to 100 GΩ = 5 %.
Resistance temperature coefficient.....	Less than 250 ppm/°C
Open circuit voltage measure .....	0 to 2 kV range, accuracy 1 % FS. 0 to 10 kV range, accuracy 2 % FS.
Voltage display .....	1.999 kV full scale, and 10 kV full scale.
Short circuit current measure .....	0 to 2 mA and 0 to 20 mA ranges, accuracy 1 % FS.
Current display .....	1.999 mA FS, and 19.99 mA FS.
Power.....	Internal battery, 6 V re-chargeable NiCad, >150 hrs between charges.
Dimensions / Weight .....	W 406 x H 175 x D 330mm / 4.4 kg.
<b>Unit supplied with:</b>	
Safety connection leads with bare ends to allow custom probes (10 kV rated), 4mm 5 kV test lead set, wallet to carry test leads, and mains charger.	

## Features

- Insulation resistance from 100 kΩ to 100 GΩ
- Basic accuracy 1 %
- Up to 10 kV operation
- Battery operation (>150 hrs between charges)
- Continuous connection – no arcing
- Fully shrouded safety connectors
- Display of open circuit voltage
- Display of short circuit current



## Ordering Information

5069 .....	Insulation Tester Calibrator (InsCal)
C189 .....	Traceable calibration certificate (Factory)
C112 .....	Accredited calibration certificate (ISO 17025)





## 5070 Micro-Ohmmeter Calibrator



### Description

The 5070 DuctorCal is a portable instrument suitable for calibrating high current ductor testers and micro-ohm meters. It incorporates 5 sets of high current standard resistors that are used to enable precision calibration.

It has full 4 terminal capabilities with extra large terminals for the current connection. Gold plated terminals are used throughout to reduce contact resistance and thermal EMFs. It has a substantial maximum continuous current rating, but can also be used with much higher transient/pulse test currents. The internal resistance standards are all high quality manganin types with good long term stability and temperature coefficients.

Rugged and portable, the 5070 is ideal for site calibration work, housed in a safety yellow field case with carry handle.

### Specifications

Range	Resistance values	Accuracy	Max current
200 $\mu\Omega$	50, 100, 150, 200 $\mu\Omega$	0.8 %	200 A
2 m $\Omega$	0.5, 1, 1.5, 2 m $\Omega$	0.5 %	100 A
20 m $\Omega$	5, 10, 15, 20 m $\Omega$	0.2 %	30 A
200 m $\Omega$	50, 100, 150, 200 m $\Omega$	0.1 %	10 A
2 $\Omega$	0.5, 1, 1.5, 2 $\Omega$	0.1 %	3 A

The currents shown above are the continuous rated for both AC and DC. Higher currents (as generated by pulse driven instruments) can be used with an ON to OFF time ratio of 1:10 or less. The allowed peak currents are 10 times those specified above, with an upper limit of 1000 A and a maximum applied time of 4 seconds. At least 1 minute should be allowed between applications for cooling.

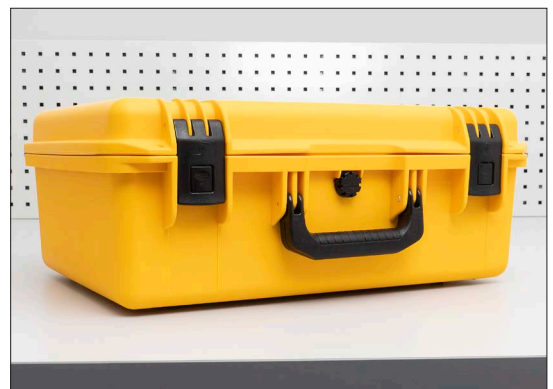
It is important to ensure there are adequate low resistance connections to the 5070 current terminals.

**Dimensions** ..... W 540 x H 210 x D 410 mm

**Weight** ..... 11 kg

### Features

- Calibrate ductor testers and micro-ohmmeters
- 0.2, 2, 20, 200, 2000 m $\Omega$  ranges
- 5 point calibration: 0, 25, 50, 75, 100 %
- 0.1 % best accuracy
- Gold plated terminals
- Low thermal emf connection
- Portable and robust carrying case



### Ordering Information

5070 ..... Ductor Tester and Micro-Ohmmeter Calibrator

C146 ..... Traceable calibration certificate (Factory)

C107 ..... Accredited calibration certificate (ISO 17025)





## Description

A precision calibrator designed to provide rapid high accuracy calibration of portable appliance testers and insulation/continuity testers. The 5080 has calibration functions for earth bond, insulation, leakage, touch leakage, and load test. It is a practical and simple operation instrument that can be utilised in the lab as a calibration standard or as a mobile testing unit for site calibration work.

Housed in a robust safety case the 5080 is easily portable, rugged and ideal for field use. It is battery powered, which ensures isolation and prevents inaccuracies due to stray leakage. Features include safety interlock that prevents contact with earth bond studs during insulation and leakage tests, and an LCD display for voltage and current.

## Specifications

### Earth Bond – Calibrated low value resistive loads

20 m $\Omega$ , accuracy 5 %. 190 m $\Omega$ , 210 m $\Omega$ , 950 m $\Omega$ , 1.050 m $\Omega$ , 1.08  $\Omega$ , 2  $\Omega$ , 10  $\Omega$ , 18  $\Omega$ , accuracy 1 %.

Open circuit voltage measurement .....Range: 0 to 20 V. Accuracy: 0.25 % of full scale.

High current AC measurement .....Range: 0 to 50 A AC. Accuracy: 0.5 % of reading  $\pm$  0.2 A.

Low current AC measurement .....Range: 0 to 2 A AC. Accuracy: 0.5 % of reading  $\pm$  2 mA.

Low current DC measurement .....Range: 0 to 2 A DC. Accuracy: 1 % of reading  $\pm$  2 mA.

### Insulation – Calibrated high value resistive loads

95 k $\Omega$ , 105 k $\Omega$ , 500 k $\Omega$ , 950 k $\Omega$ , 1.05 M $\Omega$ , 5 M $\Omega$ , 10 M $\Omega$ , accuracy 0.1 %.

20 M $\Omega$ , 50 M $\Omega$ , 100 M $\Omega$ , accuracy 1.0 %.

Open circuit voltage measurement .....Range: 0 to 1 kV DC. Accuracy: 0.25 % of full scale.

Current measurement .....Range: 0 to 20 mA DC. Accuracy: 0.25 % of full scale.

### Leakage – Resistive loads for leakage current

Nominal leakage currents at 230 V AC of 0.5, 1, 2, 5, 10, 15 mA.

Mains voltage measurement .....Range: 0 to 500 V AC. Accuracy 0.25 % of full scale.

Leakage current measurement .....Range: 0 to 20 mA AC. Accuracy 0.25 % of full scale.

### Touch Leakage – Constant current source for touch leakage meters

Current .....1.9 mA AC 50  $\pm$  5 Hz, into 2 K $\Omega$  maximum load resistance.

Current measurement .....Range: 0 to 2 mA AC. Accuracy: 0.25 % of full scale.

### Load Test – Connection of external load via a IEC connector

Mains voltage measurement .....Range: 0 to 500 V AC. Accuracy: 0.25 % of full scale.

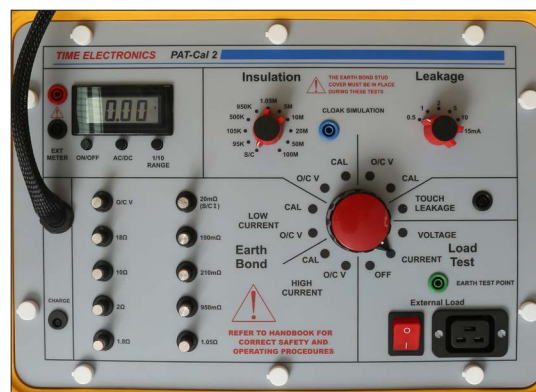
Load current measurement .....Range: 0 to 13 A AC. Accuracy: 0.5 % of full scale.

Dimensions / Weight .....W 406 x H 175 x D 330 mm, weight 5.5 kg.

Power.....Internal battery 6 V re-chargeable NiCad, >200 hrs between charges.

## Features

- For calibration of PATs and VDE 0701 testers
- Earth bond range 18  $\Omega$  to 20 m $\Omega$
- Earth bond currents up to 50 A AC
- Load test currents up to 13 A AC
- V & I displayed on integral LCD digital meter
- Safety interlock feature
- Battery operation (>200 hrs between charges)
- Portable and robust carrying case



## Ordering information

5080	.....Portable Appliance Tester Calibrator (PATCAL)
C188	.....Traceable calibration certificate (Factory)
C135	.....Accredited calibration certificate (ISO 17025)



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Y E A R S



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