



***Time Electronics***

**5069 Ins-Cal**

**Insulation Tester Calibration System**

**Technical Manual**



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All Time Electronics' instruments are subject to continuous development and improvement and in consequence may incorporate minor detail changes from the information contained herein.

# 1. Supplied Items

## 5069 Ins-Cal Insulation Tester Calibration System



Accessories in the box:

Wallet



10KV lead



5KV Lead Set



Battery charger



## 2. General Description



This instrument provides all the equipment necessary to test and calibrate insulation test sets and megohm meters.

It consists of a high precision resistance box, a volt meter and a milliamp meter.

It is constructed from very high insulation materials, including its case, and is fully isolated from any external circuits including the mains supply.

The switches in the resistance circuit are constructed special high voltage low leakage wafers and are self cleaning, so should require no maintenance.

All parts of the instrument, including the bared leads provided have been tested for safety up to ten kilovolts.

The sections of the instrument may be used separately but the user must be aware that they have a common earth which will prohibit two of the sections being used in the same circuit.

Maximum voltage is dependent upon humidity levels. Below 50% relative humidity is recommended.

## 3. Specifications

### 3.1. Technical Specification

#### Insulation Resistance

3 x Spot values, 100K $\Omega$ , 200K $\Omega$ , 500K $\Omega$ , 1%, Max. Volts 500V

3 x Spot values, 1M $\Omega$ , 2M $\Omega$ , 5M $\Omega$ , 1%, Max. Volts 2KV

9 x 10M ohm 1% Max. Volts 1KV

9 x 100M ohm 1% Max. Volts 6KV

9 x 1G ohm 1% Max. Volts 6KV

10 x 10G ohm 5% Max. Volts 10KV

All resistors have a temperature coefficient of 250ppm.

*Break before make self cleaning switch contacts.*

**NOTE: The maximum voltage applied must be limited to the rating of the lowest decade being used.**

**For example if 100M ohm and 10M ohm decades are used, the maximum applied voltage will be limited to 1kV.**

#### Volt Meter

Low Range: 0 to 1.999KV, resolution 1V; 1% of full scale reading

High Range: 0 to 10.0KV, resolution 10V; 1% of full scale reading

At 10KV limit the humidity should be below 50%.

Terminal impedance: 1G ohm

#### Milli Amp Meter

Low Range: 0 to 2 mA; 1% of full scale reading

High Range: 0 to 20 mA; 1% of full scale reading

Terminal impedance: 447 ohm (this includes the discharge resistor for short circuit test).

### 3.2. General Specification

Environmental: Operating temperature 20 to 26°C. Humidity below 50%

Power: Internal battery, 6V re-chargeable NiMH, >150hrs between charges

Dimensions: 406W x 330D x 175H mm

Weight: 4.41Kg

Supplied with: Safety connection leads with bare end to allow custom probes (10KV rated), 4mm 5KV test lead set, wallet to carry test leads and mains battery charger (230V 50Hz).

### 3.3. Order Codes and Optional Extras

5069: INSCAL Insulation Tester Calibration System

9189: Factory (NPL Traceable) Calibration Certificate

9112: UKAS Calibration Certificate (ISO 17025)

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## 4. Typical Operation Instructions

### **5069 Ins-Cal Typical Operation Procedure**

- 1) Fully charge the battery in the 5069.
- 2) Fully charge the battery in the insulation tester (or fit fresh batteries).
- 3) Complete the set up procedure for the insulation tester (UUT = Unit Under Test).
- 4) Connect the selected test leads to the 5069 (these are 4mm recessed sockets).
- 5) Adjust the pointer at zero on the UUT (meter display, if required).
- 6) Select O/C VOLTAGE setting on 5069 panel.
- 7) Plug the 4mm connectors into the UUT observing their polarities.
- 8) Switch on 5069 and select range of voltage measurement (X1/X10).
- 9) Select voltage range on UUT, and press the test button.
- 10) When the reading has stabilized record the o/c voltage reading on the 5069 display.
- 11) Select S/C CURRENT setting on 5069 panel.
- 12) On the 5069; select the current range (X1/X10).
- 13) Press the test button on the UUT, and record the current reading on the 5069 display.
- 14) Return to o/c Voltage setting (8) and repeat the test; (this is to check the voltage has recovered). Switch off the output from the UUT.
- 15) Select resistance on the 5069 panel.
- 16) Set the resistance decade switches on the 5069 to the value required.
- 17) Note the lowest allowed voltage of the decades set on the 5069, and ensure that the voltage set on the UUT does not exceed this rating.  
  
Eg, if the 100M $\Omega$  and 10M $\Omega$  decades are set, the highest allowed applied voltage must not exceed 1KV.
- 18) Press the test button on the UUT. Please note on the higher resistance ranges, due to the very low currents present, the display on the UUT may fluctuate and take time to settle, please follow any precautions given by the tester manufacturer. Proceed and record all test results, noting the allowed errors of the 5069 and also for that of the UUT.

Insulation Testers will vary from make to make so the controls may be different, however the principles should still apply.

Observe Safety at all times and if possible, carry out the tests in a low humidity environment.

## 5. 5069 Ins-Cal Procedural Notes

1. Always remove the battery charger leads from both instruments before starting set up.
2. Use only the measuring leads supplied with the **Unit Under Test** or those supplied with the 5069. When checking high resistance values the leads may pick up electrical interference, which can cause a disturbance to the readings obtained. Some manufactures fit a guard connection for use with dedicated leads, this will stabilize the readings.
3. It is not recommended to operate the resistance decade switches while a test is made. This will not automatically do any damage but may cause arcing and create transients which could give false readings on the UUT display due to the fact that the switch is break before make between each resistor. This will ensure that contact arc is suppressed with high relative humidity.
4. Avoid opening the 5069 case lid in the rain or in steamy conditions for the moisture will impair the readings.



## 6. Guarantee & Servicing

### Guarantee Period

This unit is guaranteed against defects in materials and workmanship for a period of **one year** from its delivery to the customer.

We maintain comprehensive after sales facilities and the unit can, if necessary be returned to us for servicing. During this period, Time Electronics Ltd will, at its discretion, repair or replace the defective items. For servicing under guarantee, the instrument type and serial number must always be quoted, together with details of any fault and the service required. The purchaser of the instrument must prepay all shipping charges. Time Electronics Ltd will pay return shipping charges.

This guarantee is void if servicing has been attempted by an unauthorised person or agent. If, during the guarantee period, failure is due to misuse or abuse of the unit, the repair will be put in hand without delay and charged unless other instructions are received.

Please note that if you require a new UKAS Certificate during the warranty period, this will be charged at the current rate on our price list.

### Service After Guarantee Period

Even after the guarantee period has expired, Time Electronics Ltd., can still service your instrument. As the manufacturer, we have the specialised knowledge needed to keep your instrument in peak condition and we also maintain a comprehensive spare parts service.

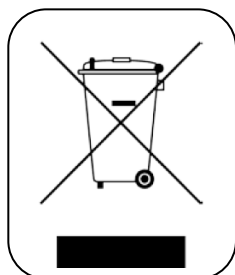
Please enclose details of the service required and your full company details including a contact name when returning for servicing.

### Returning Instruments

When returning instruments, please ensure that they have been adequately packed, preferably in the original packing supplied. **Time Electronics Ltd will not accept responsibility for units returned damaged.** Please ensure that all units have details of the service required and all relevant paperwork.

Send the instrument, shipping charges paid to:-

**Time Electronics Ltd**  
 Botany Industrial Estate, Tonbridge, Kent, TN9 1RH  
 Tel: +44(0)1732 355993 Fax: +44(0)1732 770312  
 Email: mail@TimeElectronics.co.uk  
 Web Site: www.TimeElectronics.com



#### **Disposal of your old equipment**

1. When this crossed-out wheeled bin symbol is attached to a product it means the product is covered by the European Directive 2002/96/EC.
2. All electrical and electronic products should be disposed of separately from the municipal waste stream via designated collection facilities appointed by the government or the local authorities.
3. The correct disposal of your old appliance will help prevent potential negative consequences for the environment and human health.
4. For more detailed information about disposal of your old appliance, please contact your city office, waste disposal service or return to Time Electronics.