Introduction

2100

2102

Breakdown / hipot testers come in various configurations, from a simple AC high voltage source (which is generated by a step up transformer) to more complex units which generate both AC and DC voltages with leakage current measurement capabilities. Leakage current is the output current being drawn at the set voltage from uA levels up to around 20mA. Most include some kind of trip which turns the unit off when a preset current is exceeded.

From the calibration viewpoint, breakdown/hipot testers can be considered as power supplies, with the exception of the *safety issues* caused by the higher voltages being generated.

The calibration of breakdown testers involves :

1. Measuring the high voltage output at several points on each range (both AC and DC).

2. Calibrate the leakage current meter if fitted - this is calibrated by comparing the current displayed on the tester against the current indicated by a calibrated meter. An appropriate load resistor is used to draw the current at an output voltage of between 500V and 1kV.

3. Confirming correct operation of the current trip.

The 2100 calibrator with breakdown tester adaptor provides the capability to perform all of the above testing in one simple solution with AC/DC voltage measurement up to 12kV and current measurement up to 20mA.

Typical Calibration Procedure

Using the 2100 with breakdown tester adaptor :

1. Voltage Measurement

Select **kV Test** function on the 2100 followed by the appropriate voltage range (3kV/12kV, AC or DC.)
Connect the 'Hot' output from the Hipot to either the 3KV/12KV input as required, and 'Low' output to the ground terminal.
Adjust the hipot tester output to the required calibration point and record the actual output voltage displayed on the 2100.

Note In the absence of manufacturers calibration points it is normal practice to chose several points across the scale on each range.

2: Current measurement

Select **KVI** from the 2100 soft menu, then select the current range/function (200uA,2mA,20mA,AC/DC) to match the calibration point on the hipot's meter.

Each current measurement range on the 2102 offers a choice of 3 input/load resistors. Use the input impedance which will draw the nominal current at the required test voltage without exceeding 1kV.
e.g. for the 20mA range use
200Kohms for current up to 5mA,
100kohms for current up to 10mA and
50kohm for currents up to 20mA.
(Note the input/load impedance values are nominal and do not effect the current measurement accuracy.)

Adjust the Hipot's output voltage to set the required calibration current on the hipots meter. Read & record the current displayed on the 2100.

Note the 2100 should be considered as a current meter in series with a choice of load resistors. This allows the hipot current meter to be calibrated at higher voltages, for example, 400uA could be measured on the 2mA range into 500kohms requiring only a 200volts output, it may however it is better to use the 2MOhm with the output set to 800Volts as this would be closer to working conditions.

3: Trip Current Level Measurement

Select **KVI** from the 2100 soft menu, then select the current range/function (200uA,2mA,20mA,AC/DC) which will draw enough current to meet the trip current level to be checked (as detailed in section 2).
e.g. For a 4mA current trip level, select the 5mA range.

NOTE : The *maximum* voltage that should be applied is 1kV.

Slowly wind up the voltage output adjust from zero, and monitor the current measured and displayed on the 2100 until the current drawn triggers the current trip indicator / buzzer on the hipot tester.

>> The current displayed on the 2100 is only displayed until a trip has been triggered and will then reset to zero -there is no 'peak hold' of the reading.