The test generator used for the hardware damage test and the memory loss test is given in Figure 2.7-4.

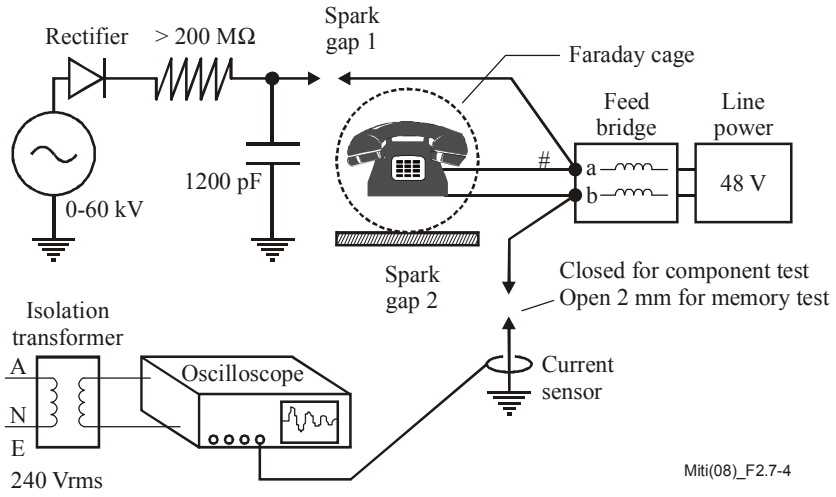

Figure 2.7-4 – Test generator for hardware damage and memory loss test

Lead lengths

The lead resistances and inductances are critical factors in determining the maximum current amplitude obtainable for a given generator source voltage and hence, the shorter the lengths (phone & earth) involved, the less source voltage required.

Test method

– *Hardware component test*: Spark gap 2 shall be closed. Spark gap 1 shall be opened to 1 mm. The voltage source for the generator shall be slowly increased until breakdown just occurs across Spark gap 1. The breakdown across the spark gap will be repeated as the capacitor recharges and discharges. The peak-to-peak current, of the first cycle, flowing to ground shall be measured and noted. The waveform shall be the same as the ringwave. The phone shall be subjected to 10 ringwave impulses before the telephone is tested for correct operation. Spark gap 1 shall then be opened in 1-mm steps and the process repeated until a peak current of 800 A is achieved. This is the current that the telephone is expected to resist without damage or misoperation. A new phone sample may be tested at this point to remove any deleterious combined effects of previous testing.

– *Memory retention test:* The opening of Spark gap 1 shall be adjusted to achieve a peak current of 400 A. It will be necessary to reduce the source voltage until a controlled discharge repetition rate is achieved. Once this current has been achieved, Spark gap 2 shall be opened to 2 mm. A minimum of 10 ring-wave impulses shall be performed on the telephone after which correct operation and memory retention shall be confirmed.

NOTE – The first half cycle of this ringwave will have a very high frequency ring wave superimposed on it. No attempt should be made to characterize this very high frequency ring wave as it would be exceeding the oscilloscope and current transformers operational performance parameters. Furthermore, it would require specialist measurement techniques, which are beyond the scope of this handbook.