



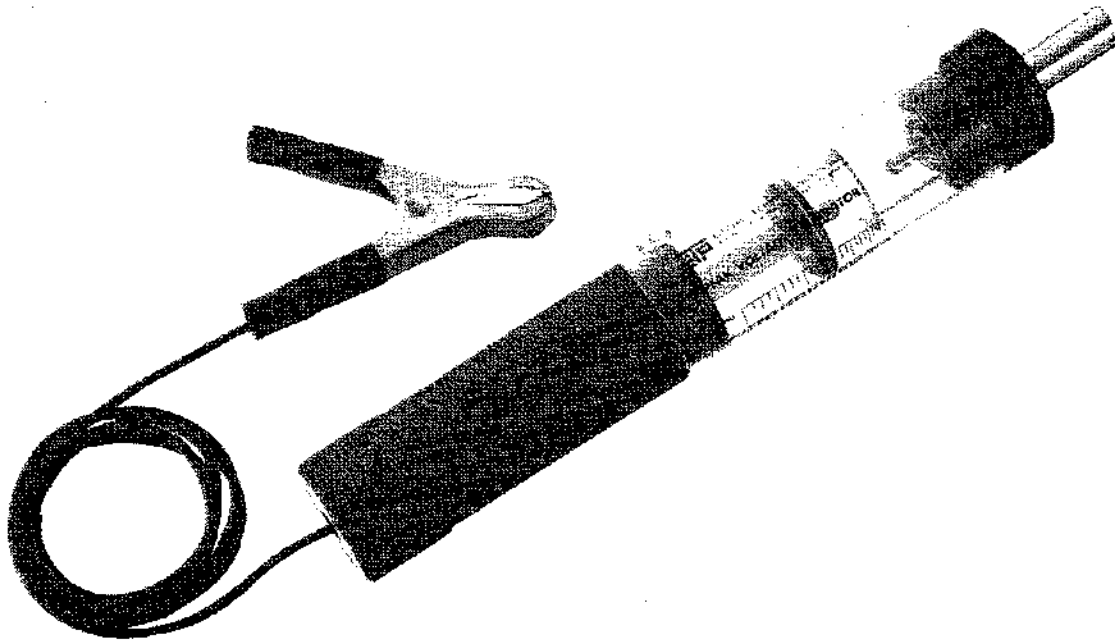
ELECTRO-TECHNIC PRODUCTS INC.

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OPERATING MANUAL

Model 1270

Peak Voltage Calibrator



Part Number 085-0030-1

Printed in USA

Leak Testers, Corona Treaters, Science Education Products

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SECTION 1 - GENERAL INFORMATION

- 1.1.1 The Model 1270 Peak Voltage Calibrator is intended for use with the Electro-Technic Products High Frequency Generators to set the output voltage accurately. In use, it replaces the electrode normally used with the Generator.
- 1.1.2 It consists of a plastic barrel, 8.375 in. (21.5 cm) long and 1.25 in. (3.2 cm) in diameter, with two electrodes inside. One is stationary and the other is movable. A built-in safety stop prevents the electrodes from making contact. An alligator clip with insulated handles is attached to the movable electrode via a 2.5 ft (75 cm) long wire. The fixed electrode is inserted into the Generator electrode socket. A graduated scale on the barrel permits accurate measurement of the gap between electrodes. The scale is calibrated in volts and distance.
- 1.1.3 Applications include laboratory work requiring an exact voltage setting, production work where a consistent, repeatable, and verifiable voltage setting must be established and maintained, or for surface treating over delicate or sensitive surfaces where a certain maximum voltage must not be exceeded.

1.2 Packing List

Quantity	Product No.	Description
1		Peak Voltage Calibrator
1	085-0030-3	Instruction Manual

1.3 Warranty Repair/Replacement Information

- 1.3.1 Forward the instrument freight prepaid to the factory or distributor address, along with a copy of the invoice for warranty verification.
- 1.3.2 The manufacturer reserves the right to repair or replace any instrument for warranty repair.
- 1.3.3 Instruments found to be out of warranty will be repaired for a minimal labor and parts charge, unless directed to do otherwise. If it is determined that repair costs will exceed the cost of a new instrument, the customer will be advised.
- 1.3.4 Parts for discontinued models will be made available wherever possible for a minimum period of five years after the model has been discontinued.

SECTION 2 - INSTALLATION

- 2.1.1 Turn off power to the High Frequency Generator.
- 2.1.2 The tip of the Calibrator can be inserted into the electrode socket of the High Frequency Generator. But for the most accurate results, especially for electrodes with a large surface area, or brush-type electrodes, when the Generator is turned on, simply touch the tip of whatever electrode is being used to the shaft of the Calibrator. This ensures that the voltage is set to the exact electrode being used.

Note: For voltage settings less than 20 kV, use the Model 1246 Shorting Block on the electrode, except for Model BD-10 Series Generators.

- 2.1.3 Attach the alligator clip lead from the Calibrator to a large metal object, or earth ground.

SECTION 3 - OPERATION

3.1 Operation Controls

- 3.1.1 Gap Adjustor Dial. Located opposite the plastic barrel. This knurled dial adjusts the gap between the two electrodes of the Calibrator.

3.2 Operation

- 3.2.1 The ring attached to the movable electrode indicates the position on the graduated scale corresponding to the gap distance and voltage. See Figure 1 which is the scale on the Calibrator enlarged to twice actual size. Turn the Gap Adjustor Dial to the gap distance/voltage desired. About 30 complete turns of the dial adjusts the gap distance by about 1 in. (25 mm); therefore, a fine, precise setting is possible.
- 3.2.2 Adjust the output of the Generator so that no spark would be generated at the electrode tip if power were applied. For models with a High Voltage Adjust Knob located on the Generator Housing, turn the knob completely counterclockwise.
- 3.2.3 Turn on power to the Generator and slowly increase the voltage control until a spark is seen to jump the gap between the electrodes of the Calibrator. The Generator voltage output is now equal to the value indicated on the Peak Voltage Calibrator scale.
- 3.2.4 To be able to interpret the voltage reading from the scale, the difference between the starting voltage and the breaking voltage must be understood.

Starting Voltage is the potential required to cause a spark initially to jump between an electrode and a metal object. This voltage is usually higher than the voltage required to sustain the spark once it has started.

Breaking Voltage is the potential below which a spark between an electrode and a metal object can no longer be sustained. Many factors contribute to the spark ceasing to jump across the gap.

When the Peak Voltage Calibrator is used, the gap between electrodes can be increased by as much as 0.25 in. (6 mm) between the starting voltage and the breaking voltage of the spark.

- 3.2.5 Because the uncertainty in establishing the breaking voltage, the Calibrator is designed to read the starting voltage. When this Calibrator is not used, the only other way to establish the spark voltage is to measure the spark length from the High Frequency Generator electrode tip to a metal object. Normally it is difficult to accurately measure this distance, and generally it is the breaking - not starting - voltage which is used. This is why the spark length indicated by the peak Voltage Calibrator is shorter than that which would be delivered when a spark develops, for example, when a pin hole leak is detected in a tank lining. When a pin hole is encountered, the corona discharge will deliver a spark from the electrode tip through the pin hole to the metal surface below.
- 3.2.6 After the peak voltage desired has been established, turn off power to the High Frequency Generator, remove the Peak Voltage Calibrator and reinstall the electrode normally used. Spark generated from this electrode tip will correspond to the same voltage as that indicated on the scale of the Calibrator provided:
- The same Generator voltage adjustment is maintained.
 - The geometry of the electrode is similar to that of the electrodes of the Calibrator. Electrodes with a large surface area, or brush-type electrodes, may, because of their size, deliver a peak spark voltage somewhat lower than that indicated by the Calibrator.

3.3 Hazards

- 3.3.1 The same precautions should be taken while operating this device as those taken when using a High Frequency Generator. Consult the instructions for the Generator for specific operating precautions.
- 3.3.2 The fixed position of the electrodes are set at the factory. A safety stop prevents accidental shorting. Do not attempt to alter this setting in any way, doing so may create a potential shock hazard.

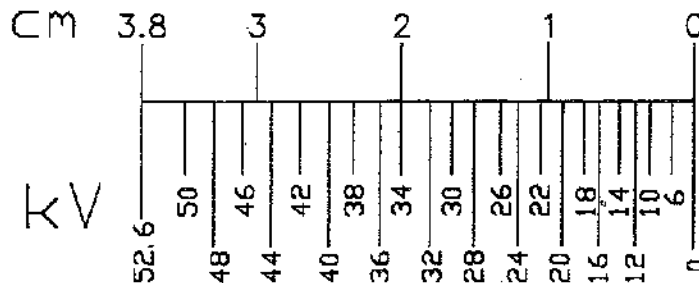


Figure 1. Spark Gap Scale (Enlarged to Twice Actual Size)