SAFETY PRECAUTIONS

1. All hand held high voltage test equipment must be operated by responsible and authorised personnel and yellow warning labels should be prominently displayed. When the equipment is in use and should the operator accidentally make contact with the test electrode, he may experience a mild shock or zapp and in order to avoid this possibility, the wearing of rubber or plastic gloves and conductive footwear is recommended. Furthermore the operator should enjoy good health and not suffer from a cardiac condition. Usage of the equipment is confined to the following specification – CHECKING THE POROSITY OR ELECTRICAL BREAKDOWN OF DIELECTRIC OR INSULATING MATERIALS.
2. It is recommended that testing should be conducted well clear of personnel not involved in the testing procedure or in such a position where surprise of receiving an electric shock or zapp could cause a related accident, if for example, tests being conducted close to moving or rotating machinery or in such an unstable position that the operator should fall and injure himself. It is recommended that the operator should have an assistant to ensure that unauthorised personnel are kept clear of the testing area and generally assist when necessary with the testing procedure.
3. DANGER – do not test equipment of this type in any combustible or flammable atmosphere as a test voltage will cause an arc or spark, and an explosion could result. Therefore, the Plant or Safety Officer should be consulted before proceeding with a test.
4. Any exposed metal used in conjunction with the tester should, if possible, be securely connected to earth or ground to avoid others receiving an electric shock should they come into contact with the exposed metal.

OPERATION

Connect the two core mains cable to a three pin plug – Brown to the Live terminal (L) and Blue to Neutral (N).

To set voltage – 1mm of spark is approx. 1.700 i-e. 10mm =17.000V.
Adjust output control depending on application.

Bring the probe tip near to an earthed metal surface and adjust to the required length of spark by control knob at rear of tester. It is important to limit the high frequency voltage applied in accordance with the breakdown strength and thickness of material to be tested, as a sufficiently high voltage will cause break-through of any material (the thinner the coating the lower the voltage to be applied).

The surface of the object to be tested is systematically checked by going over it with the correct probe of the spark tester. Voids or defects will be recognised by the passage of a bright spark. At the same time a hissing noise is observed. It is thus possible to find the exact location of the defect and to mark its position. After repair a further check is made to ascertain whether the repair has been successful.

APPLICATIONS

INSULATION TESTING

Any insulating material such as rubber, ebonite, all plastics, bitumastic coatings and nylon, can be checked for freedom from pin-holes by exploring the surface with the probe and backing the insulant with an earthed plate. Avoid puncturing the work by using excessive voltage.

LEAK DETECTION

The spark tester will readily locate leaks in evacuated glass systems. Pass the probe over the glass surface and, providing the system pressure is in the range 0.01 torr to about 10 torr, any small cracks or pin-holes will cause the spark to concentrate and pass through at that point creating a glow discharge within. When leak searching thin glass the minimum spark is advised and the probe should be kept moving to avoid the risk of rupturing the glass. Great care should be exercised at sharp bends or where the glass may be under stress.

LEAK PATH REMOVAL

These films of contaminating materials deposited on insulators camn produce undesirable electrical leakage. Such deposits can be removed by applying the high frequency discharge to the conduct near the point of leakage, disconnecting associated equipment before doing so.

OZONE PRODUCTION

The spark tester may be used as a convenient source of small electrodes of ozone, useful for chemistry lecture demonstrations. A variety of probes, insulated extension rods and special electrodes are available in kit form or as single items.

PRECAUTION – Accidental touching of the probe will cause a shock whilst it is painful and unpleasant it is not dangerous.