

WHIMSHURST MACHINE



Principle:

The operating principle of the machine is based on two counter-rotating disks made of insulating material. Each disk has several metal segments attached to it, called sectors. As the sectors pass one another, they induce a charge imbalance on one another. This imbalance is drained off at the collecting electrodes.

Construction:

A number of metal foil sectors are pasted on an acrylic disc. Two set of brushes are mounted on the charge collectors - one on the front and another on rear disc. When the discs are rotated, the brushes collect the electrostatic charge of the metal foil which is transferred and stored in the Leyden jar capacitor. When a very high voltage is achieved, electrostatic breakdown occurs and spark between the electrodes is seen and heard.

Setup:

1. Set the gap between the two electrodes to about 1-2 inches
2. Rotate the handle slowly at first and increase the rotation.

3. Once the voltage of the capacitor is enough to overcome electrostatic breakdown at the electrodes, discharge will take place and spark is seen or heard.
4. After completing the experiment, discharge across the electrodes, and then across both capacitors using the metal "Y" handle.

Precautions:

1. As machine generates high voltage, do not touch the metal parts while operating the machine.
2. Remember to discharge across the electrodes with metal "Y" handle after completing the experiment.
3. Do not rotate the handle too vigorously as the pulley system may get damaged.
4. **If the spark is not seen or heard, check it up for moisture entrapping into brushes. The machine may be kept in the sun or near some heating device to remove the moisture.**