



Electrostatic generator, 400 (kV), (Van De Graaff)

EQ047C

Function

Intended for physics laboratory and physics experiments on: Electricity. Discharge into air under atmospheric pressure. The cathode electrode and the anode electrode in the Van de Graaff generator. The dielectric strength of a material. The electrical conductivity of a material. The conductivity of a gas. Gases, conductors of the third kind. Configurations of the lines of force between electrodes, the lightning rod, the Faraday cage and the coaxial cable. The electric field. Analogy between the Earth's gravitational field and the electric field, conservative fields. Michael Faraday, lines of force and the electric field vector between two electrodes. What is a line of force for an electric field. Properties of electric field lines of force. The lines of force between different electrodes. The lines of force between a pair of straight, parallel electrodes with electrical charges of opposite signs. The lines of force between a pair of point electrodes with electrical charges of opposite signs. Lines of force between a ring electrode and a centered point electrode, with electrical charges of opposite signs. The lines of force between a straight electrode and a point electrode with electrical charges of opposite signs. Lines of force between two straight electrodes with charges of opposite signs and a ring between them, the Faraday cage, the electrostatic shield. The electrical potential and the amount of charge accumulated in the generator. Electric potential and the work to move an electric charge. The SI unit of electrical potential. The unit of natural electrical charge and the amount of electrical charge. The surface charge density. The measurement of the potential on the outer surface of the generator sphere. The measurement of the surface area of the generator sphere, etc.

Relevant attributes: This Van de Graaff belt generator was designed taking into account its use in different geographic locations, including coastal strips, its bearings are shielded and its shafts and devices with bearing houses are made of stainless steel, the motor It is embedded inside the base, so as not to contaminate the load conveyor belt, and the engine drive belt is protected by a grille to protect the operator.

Knowledge areas

Physics

Key Experiments

Discharge in gases under atmospheric pressure

Configurations of the power lines between submerged electrodes, lightning rods, Faraday cage and coaxial cables

The electric potential and the amount of accumulated charge in the generator

The extent of the spark in the Van de Graaff generator and dielectric strength

The principle of the operation of a leaves electroscope and the distribution of charges in a conductor

Playful experiment: Lighting a fluorescent lamp

Playful experiment: Lighting a neon lamp

Playful experiment: Making a "fountain" with Styrofoam balls (or confetti)

Playful experiment: Rearing paper strips

Playful experiment: Simulating a lightning rod

Playful experiment: Ruffling a person's hair

Playful experiment: One effect of "electric wind" - the tourniquet

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