

ELECTRIC FIELD SENSOR (D)

(FREE FIELD)

MODEL SD-20

DESCRIPTION

The PROLYN Model SD-20 sensor is equivalent to the AFWL Model HSD-2. This sensor produces a voltage output in response to a time variant E-field. It is a lightweight device designed for use in making free space measurements. For this type of measurement, the sensor should be supported by dielectric materials and placed not closer than two sensor diameters from conducting surfaces.

The sensor consists of two conductive hemispherical shells mounted on opposite sides of a conductive base plate by means of dielectric spacers. In an E-field, current is generated on each shell and picked off each shell at four equally spaced points with four 200-ohms strip lines. These are connected to the 100-ohm twinaxial output cable at the center of the sensor. The equation pertinent to this device is:

$$V_o = R A_{eq} \frac{dD}{dt}$$

where

V_o = sensor output (volts)

R = sensor characteristic load impedance (100 ohms)

A_{eq} = sensor equivalent area (m^2)

D = magnitude of electric displacement vector ($\vec{D} = \epsilon_o \vec{E}$, in Coul/ m^2)

The sensor is a passive device, therefore, an external power source is not required. The sensor is equipped for purging with a gas such as dry air, nitrogen, or SF_6 .

ELECTRICAL SPECIFICATIONS

Equivalent Area (A_{eq})	$1 \times 10^{-1} m^2$
Frequency Response (3 dB Point)	> 130 MHz
Risetime (t_r 10-90)	≤ 2.7 ns
Maximum Output (peak)	± 4 kV
Output Connector	100 ohm Twinax (Modified GR-874)

PHYSICAL SPECIFICATIONS

Mass: 2.15 kg

