

MAGNETIC FIELD SENSOR ( $\dot{B}$ )  
(FREE FIELD)

MODEL B-10

DESCRIPTION

The PROLYN Model B-10 sensor is a B-dot loop equivalent to the AFWL Model MGL-1. The sensor is a full cylinder loop that measures the time rate-of-change of a magnetic field. It is a portable device designed for making free field 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 design consists of a conducting cylinder which contains four equal-spaced longitudinal gap structures. The voltage developed across each gap is carried on pairs of 200-ohm transmission lines, which at opposite gaps are connected in parallel to 100-ohm cables. These cables in turn are connected to the 100-ohm twinax output cable. This design is effectively a half-turn loop driving the output connector. The gap and wiring configuration used causes any responses to electric fields to be cancelled and the sensors' output signal to result from only magnetic fields. The equation relating to the sensor is:

$$V_o = \vec{A}_{eq} \cdot \frac{d\vec{B}}{dt} = \text{sensor output (in volts)}$$

where

- $\vec{A}_{eq}$  = sensor equivalent area (m<sup>2</sup>)
- $\vec{B}$  = magnetic flux density vector (teslas)

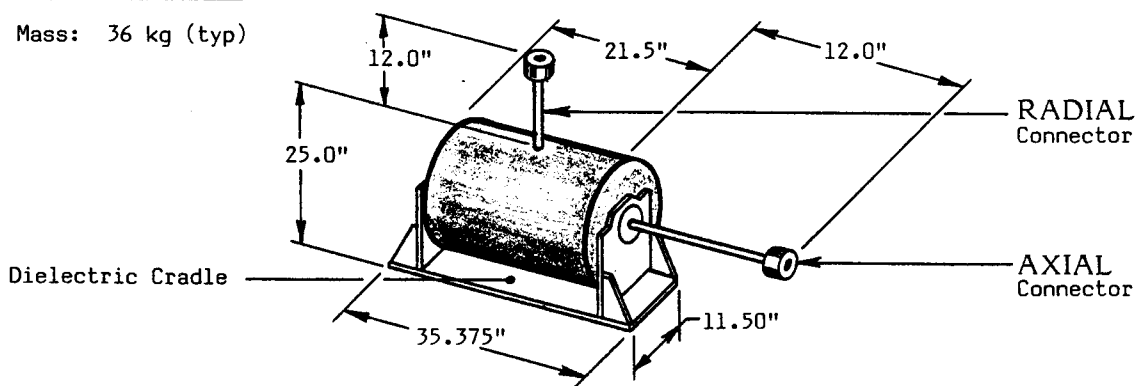
The sensor is a passive device, therefore, an external power source is not required. It is equipped for purging with a gas such as dry air, nitrogen, or SF<sub>6</sub>. It is available with an axial output, Model B-10(A), or a radial output, Model B-10(R).

ELECTRICAL SPECIFICATIONS

Equivalent Area (A <sub>eq</sub> ) .....	1 x 10 <sup>-1</sup> m <sup>2</sup>
Frequency Response (3 dB Point) .....	> 120 MHz
Risetime (t <sub>r</sub> 10-90) .....	< 3.0 ns
Maximum Output (peak) .....	± 5 kV
Output Connector .....	100 ohm Twinax (Modified GR-874)

PHYSICAL SPECIFICATIONS

Mass: 36 kg (typ)



ORDERING INFORMATION

\* Customer to specify axial (A) or radial (R) version.