

MAGNETIC FIELD SENSOR (\dot{B})
(GROUND PLANE)

MODEL B-40

DESCRIPTION

The PRODYN Model B-40 sensor is a B-dot loop equivalent to the AFWL Model MGL-4. The sensor consists of a half-cylinder loop on a base plate, that when mounted to a conducting surface produces a voltage output in response to a time variant B field. This B-dot sensor can also be used to measure surface current density since the magnetic field over a conductive sheet is related to surface current density (see Model B-540 Data Sheet for equations).

This sensor is essentially one-half of a cylindrical loop with a gap structure located in the middle of each of its two quadrants. The voltage developed at the gaps are combined by a parallel-series wiring configuration that averages the signal over the loop structure. By this arrangement, signals induced by electric fields normal to the ground plane are cancelled out and a quarter-turn loop driving the output cable results. The pertinent equation for this device is:

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

where

\vec{A}_{eq} = sensor equivalent area (m²)

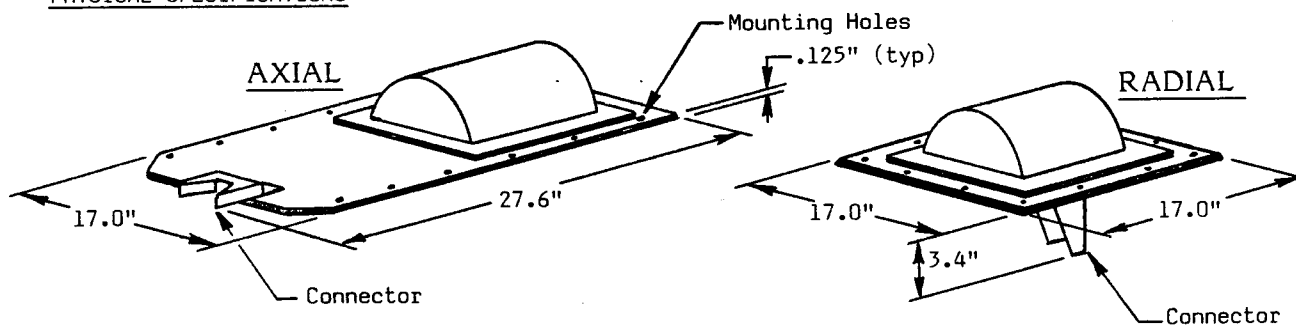
\vec{B} = magnetic flux density vector (teslas)

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 SF₆. The sensor is available with a axial output, Model B-40(A), or a radial output, Model B-40(R).

ELECTRICAL SPECIFICATIONS

Equivalent Area (A _{eq})	1 x 10 ⁻² m ²
Frequency Response (3 dB Point)	> 230 MHz
Risetime (t _r 10-90)	< 1.5 ns
Maximum Output (peak)	± 5 kV
Output Connector	50 ohm GR-874**

PHYSICAL SPECIFICATIONS



Mass: 4.5 kg (typ)

ORDERING INFORMATION

- * Customer to specify axial (A) or radial (R) version.
- ** This can be changed to a Type N, SMA, etc. (Max output voltage will be affected)