

**MAGNETIC FIELD SENSORS (B)
MULTI-GAP TYPE GROUND PLANE
MODELS B-30, -40, -50, -70, -80**

Description

PRODYN's precision high frequency multi-gap ground plane type sensors are designed to produce a voltage output in response to a time variant B field when mounted to a conducting surface. The sensor consists of a half-cylinder loop on a base plate that has a parallel-series wiring configuration that cancels the electric field induced signals and makes the sensor's output signal the result of only the magnetic field. They can also be used to measure surface current density since the magnetic field over a conductive surface is related to surface current density.

The equation relating to B-Dot measurements is:

$$V_o = Aeq \cdot \frac{db}{dt} = \text{sensor output (in volts)}$$

Where Aeq = sensor equivalent area (m²)
 B = magnetic flux density vector (Teslas)

The equation relating to surface current density is:

$$V_o = Aeq \mu_o \frac{dJ_s}{dt} \sin \theta = \text{sensor output (in volts)}$$

Where Aeq = sensor equivalent area (m²)
 μ_o = permeability of free space ($4\pi \times 10^{-7}$ H/m)
 J_s = surface current density (Amps/m)
 $\sin\theta$ = angle between sensor axis and J_s vector

Specifications

Electrical

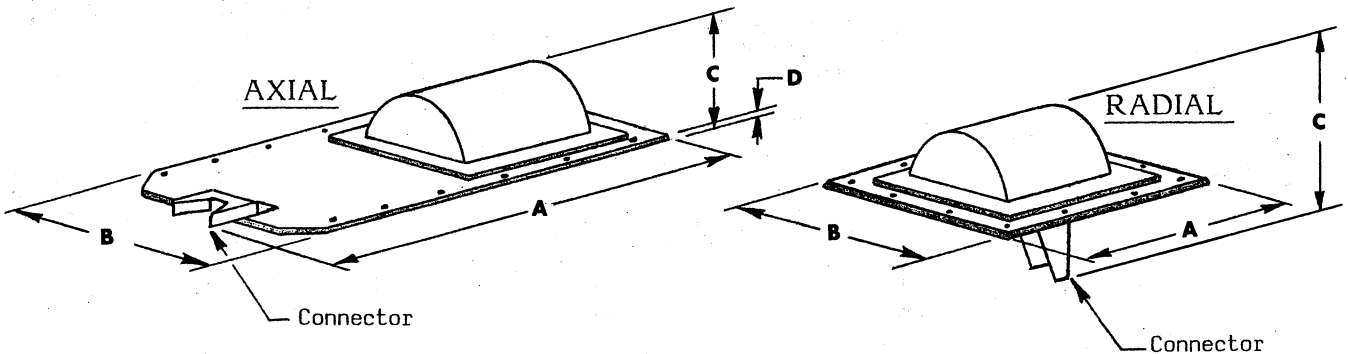
Equiv. Area (Aeq)
 Freq Resp(3dB Point)
 Risetime (tr10-90)
 MaxOutput (peak)
 Output Connector

B-30 (**)	B-40 (***)	B-50 (***)	B-70 (R)	B-80 (R)
$1 \times 10^{-1} \text{ m}^2$	$1 \times 10^{-2} \text{ m}^2$	$1 \times 10^{-3} \text{ m}^2$	$1 \times 10^{-4} \text{ m}^2$	$1 \times 10^{-5} \text{ m}^2$
>78 MHz	>230 MHz	>700 MHz	>1.8 GHz	>7.5 GHz
<4.5 ns	<1.5 ns	<0.5 ns	<0.2 ns	≤.045 ns
± 5 kV	± 5 kV	± 5 kV	±1 kV	± 250 v
50 ohm GR-874*	Type N Female*	Type N Female*	SMA Female	SMA Female

Physical

Mass
 B (cm)
 A (cm)
 C (cm)
 D (cm)

	B-30 (**)	B-40 (***)	B-50 (***)	B-70 (R)	B-80 (R)
Mass	26kg	4.5 kg	2.7 kg	80 g	15gr
B (cm)	93.98	43.18 (Axial) 43.18 (Radial)	25.40 (Axial) 25.40 (Radial)	5.59	2.54
A (cm)	97.54	70.10 (axial) 43.18 (Radial)	54.10 (Axial) 28.70 (Radial)	5.59	2.54
C (cm)	39.21	13.03 (Axial) 21.34 (Radial)	5.72 (Axial) 15.25 (Radial)	4.12	1.32
D (cm)	0.48	0.32	0.32	0.24	0.13



Note: Typical configuration. Please see outline drawings for more detail.

* Can be changed to a Type N, SMA, etc. (Max output voltage will be affected)
 ** Available in axial output only.
 *** Customer to specify axial (A) or radial (R) version.