Magnetic field sensors – free field, multi-gap type

The B10, B20, 90 and B100 are precision multi-gap design free-space magnetic field sensors. Each sensor consists of a conducting cylinder which contains four equally spaced longitudinal gap structures. The voltage developed across each gap is carried on pairs of 200Ω transmission lines, which at opposite gaps are connected in parallel to 100Ω cables. These cables in turn are connected to the 100ohm 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 sensor output signal to result from only magnetic fields.

These sensors should be supported by dielectric materials and placed not closed than two sensor diameters from conducting sensors.

SPECIFICATION

	B-10A/ B-10R	B-20A/ B-20R	B-60A/ B-60R	B-90R	B-100A/B-100R
Equivalent Area (Aeq)	1 x $10^{-1}m^2$	1 x $10^{-2}m^2$	1 x $10^{-3}m^2$	2 x $10^{-5}m^2$	3 x $10^{-4}m^2$
Freq. Resp.(3 db pt.)	>120MHz	>300MHz	>840MHz	>10GHz	>2.6GHz
Risetime (tr 10-90)	<3.0ns	<1.2ns	<0.42ns	<0.035ns	<0.13ns
Maximum output (peak)	+ 5kV	+ 5kV	+ 2kV	+ 150V	+ 1.5kV
Output connector(s)	100ohm Twinax (modified GR-874)	100ohm Twinax (modified GR-874)	2 SMA(Male)	2 SMA(Male)	2 SMA(Male)

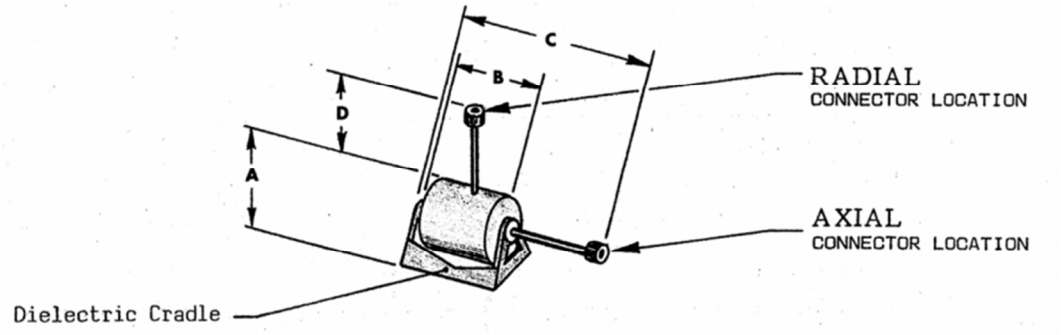
Other output connector types are available
Sensors are equipped with a dielectric holding cradle (except B-90R). Dimensions are available on request.

EQUATION

$$V_0 = A_{eq} \frac{dB}{dt}$$

Where V_o = sensor output (volts), A_{eq} = sensor equivalent area (m^2), B = magnetic flux density (Teslas)

DIMENSIONS



	B-10A/ B-10R	B-20A/ B-20R	B-60A/ B-60R	B-90R	B-100A/B-100R
Mass	36Kg	3.74Kg	550g	28g	32g
A (cm) - see outline	53.85	18.10	6.35	0.95	2.39
B (cm) - see outline	54.61	18.8	6.99	1.02	2.54
C (cm) - see outline	85.09	67.56	41.59	N/A	18.42
D (cm) - see outline	30.48	34.53	30.00	20.80	15.88

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