Bulk Indium Arsenide BH-703 / 706 **Hall** Sensors

Three Axis

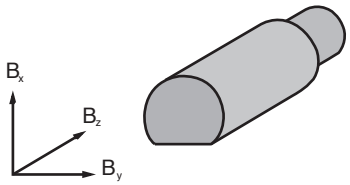
Description

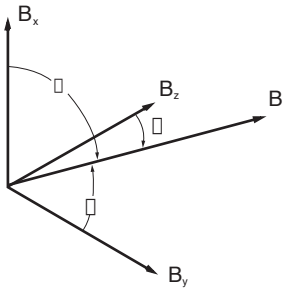
The BH-703 multi-axis Hall sensor consists of three individual Hall elements oriented in mutually perpendicular planes and encapsulated in a small epoxy package. This enables the BH-703 to produce voltages proportional to the three orthogonal components (B_x, B_y, B_z) of a magnetic flux in any direction. Thus the BH-703 may be permanently mounted or arbitrarily oriented to sense fields in any direction.

The magnitude of the flux vector, B, can be found using the following relation:

$$B = \sqrt{B_x^2 + B_y^2 + B_z^2}$$

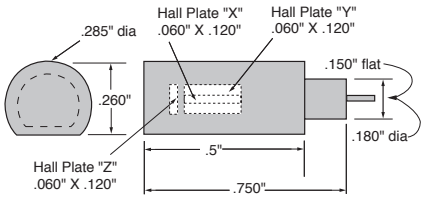
The flux direction may be found using the following relations:
$\alpha = \cos^{-1} B_x/B$, $\beta = \cos^{-1} B_y/B$, $\gamma = \cos^{-1} B_z/B$ where α, β, γ are the angles between B and B_x, B_y, B_z respectively.





Features

- Three Axis, simultaneous measurement
- Instrumentation Quality



Mechancal Specifications

a. Notes: All tolerances unless specified are ±0.010".
Unless otherwise noted: B=1kG, $I_C = I_{CN}$, T=25°C, Static air.

b. Leads: #34 AWG copper with polyurethane insulation, approximately 20" long. The BH-703 has 12 leads.

c. Polarity: When the magnetic field vectors are oriented as shown, and I_C enters the red lead, the positive Hall voltage appears at the blue leads.

Electrical Specifications

SPECIFICATIONS	UNITS	BH-703	BH-706
Input resistance, R_{in}	ohms	3.5 max.	3 max.
Output resistance, R_{out}	ohms	3.5 max.	3 max.
Magnetic sensitivity, V_H (loaded)	mV/kG	5.5 to 10	6 to 9
Max. resistive residual voltage, V_M @ B=0	±μV	100	200
Max. control current @25°C, static air	mA	300	300
Nominal control current	mA	100	100
Angularity	degrees	Hall plates 3 within ±2	Hall plates 2 within ±2
Sensitivity matching	±% of RDG	1	1
Max. linearity error, (-10 kG to +10 kG) with R_{lin}	±% of RDG	1	1
Mean temperature coefficient of V_H (-20°C to +80°C)	%/°C	-0.04 max.	-0.04 max.
Mean temperature coefficient of resistance (-20°C to +80°C)	%/°C	+0.15 max.	+0.15 max.
Temperature dependence of resistive residual voltage (-20°C to +80°C)	μV/°C	0.5 max.	0.5 max.
Operating temperature range	°C	-40 to +100	-40 to +100
Storage temperature range	°C	-40 to +120	-40 to +120

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F.W. BELL®

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Bulk Indium BH-703 / 706 **Hall** Sensors

Two Axis

Description

The BH-706 multi-axis Hall sensor consists of two Hall elements mounted in mutually perpendicular planes and encapsulated in a small epoxy package. This enables the BH-706 to produce voltages proportional to two perpendicular components (B_x, B_y) of a magnetic field. Thus the BH-706 may be permanently mounted to sense field components in its X, Y planes.

The magnitude of the flux vector, B within the X, Y plane can be found using the following equation:

$$B = \sqrt{B_x^2 + B_y^2}$$

The direction of B can be computed using the following equation:

$$\emptyset = \tan^{-1} B_y / B_x$$

where Ø is the angle between B and B_x.

Mechancal Specifications

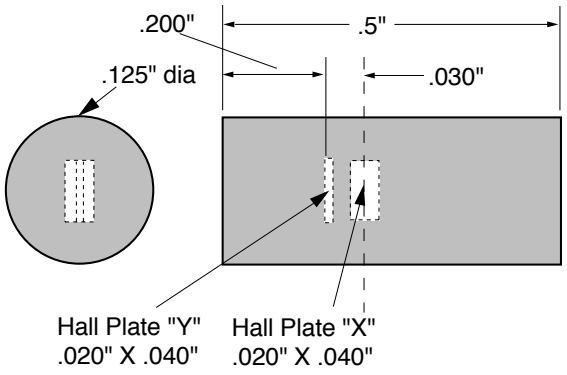
Leads: #34 AWG copper with polyurethane insulation, approximately 20" long. The BH-706 has 8 leads.

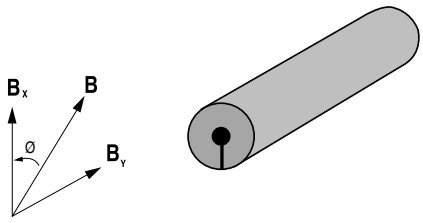
Polarity: When the magnetic field vectors are oriented as shown, and I_c enters the red leads, the positive Hall voltage appears at the blue leads.

Note: All tolerances unless specified are ± 0.010".

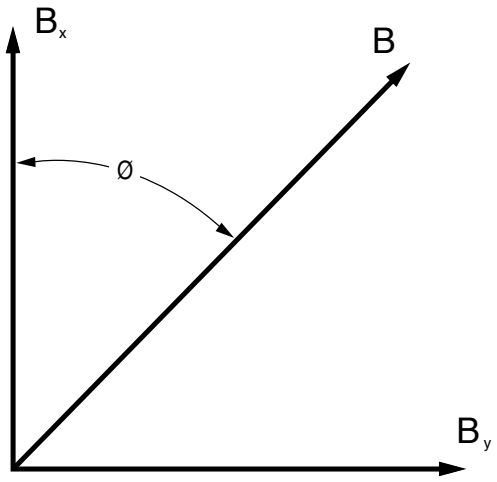
Features

- Two Axis, simultaneous measurement
- Instrumentation Quality





Unless otherwise noted:
B=1 kG, $I_c = I_{cn}$, T=25 C, Static air.



Note: Due to continuous process improvement, specifications subject to change without notice.

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