

BH SERIES

Bi-Directional, Dual Channel, Magnetic Hall Effect Speed Sensors - 5/8 and 3/4 Threads

AI-Tek Bi-directional, zero velocity sensors are self-calibrating to the specific customer application and provide two independent frequency outputs and a direction signal output to indicate change in direction of the sensed, ferrous target.

The Bi-directional sensor can also be referred to as a dual channel sensor since it utilizes two Hall effect sensing elements, physically offset from each other. Each element generates a single channel of target information, identical in frequency and polarity, but offset in the time domain (phase shifted). Special circuits inside the sensor are designed to calibrate each channel to its application target, then analyze these two channels of information for a phase lead / lag condition. The direction output will then provide a logic 1 level for clockwise or a logic 0 for counterclockwise rotation, assuming proper sensor orientation.

For applications that exceed 500 Ft (150 meters) go to page 42 for the DSDA, (Digital Signal Distance Amplifier).

It is the customer's responsibility to determine whether the product is proper for customer's use and application.

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Specifications

Power Supply

Power Supply Voltage: 10 - 28 Vdc

Power Supply Current:

100 mA maximum

Outputs

Output Voltage:

Essentially square wave fanout to 10 TTL inputs

TTL Compatible: (See Figure 1)

40% to 60% duty cycle

Logic 0: +.6 Vdc maximum

Logic 1: +4 to +5.0 Vdc @ 5mA

Supply Tracking: (See Figure 2)

40% to 60% duty cycle

Logic 0: +.6 Vdc maximum

Logic 1: $V_O = \frac{V_S \times R_L}{R_L + 2.2k}$

Direction Logic:

Output high (Logic 1) with rotation toward notch

Output Impedance: 2.2K Ohms ±5%

Output Current:

20 mA sink max., 1.0 mA source max.

Reverse Battery Voltage: -30 Vdc

Rise/Fall Time: 5 μs / 3 μs typical

Mechanical

Target Frequency: 0 to 15 kHz

Target Performance:

DIAMETRICAL PITCH	AIRGAP RANGE (Inches)
8	.051 - .160
10	.020 - .140
12	.010 - .120
20	.010 - .100
24	.005 - .050
32	.005 - .040

Environmental

Operating Temperature:

-40°C to +125°C

Thermal Shock:

100 cycles air to air (-40° to +130°C)

1 min. ramp time with 30 min. soak

Salt Spray:

Per MIL-STD-202, method 201, test cond. B, 5% NaCl for 48 hrs. No visible corrosion

Humidity:

92% RH@ 40°C for 90 hrs. No visible corrosion.

Dielectric Strength:

Per MIL-STD-202, method 301, 1000 Vrms (60Hz) for 5 sec. leads to case. 1.0 mA max. leakage.

Insulation Resistance:

Per MIL-STD-202, method 302, 500 Vdc for 30 sec. leads to case. 100 mega-ohm min.

Vibration:

Per MIL-STD-202, resonant frequency search, sine method 204, test cond. C&D (20g); random method 214a, test cond. A&B (7.56g) for 15 min.

Shock:

Per MIL-STD-202, method 213b (sawtooth), test cond. H&I (100g, 6 ms), 3 shocks, mutually perpendicular planes

EMC:

Design principles consistent with BS/EN and MIL-STD's for EMC hardness

Materials

Housing:

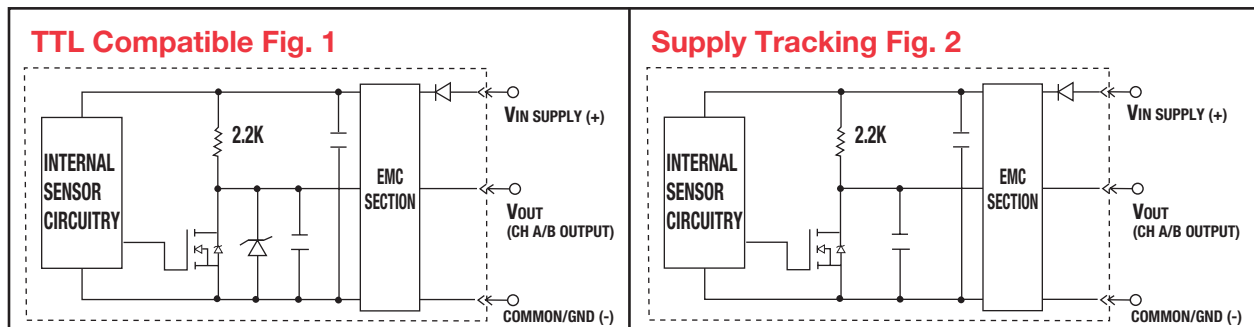
300 series stainless steel

Cable:

AWG #22 Irradiated cross-linked polyolefin, 125°C, 5 lead wires

Channel phasing: 45° to 135°

Sensor must be aligned. Target rotation toward notch/flat results in Logic 1 direction output.



Note: Either output will work with any AI-Tek Tachometer.