Hall Effect Sensors

Al-Tek has taken its years of experience of designing and manufacturing Hall Effect sensors for engine timing applications and has developed a line of durable products for industrial use.

With multiple standard variations we offer the widest range of standard catalog sensors to meet your various design needs. The design is flexible to easily meet all of your application requirements.

The Hall Effect sensor can sense each change in target movement, regardless of speed, from near zero to 15 kHz frequency range, generating a steady pulse train of frequency proportional to target speed. Typically, each time a gear tooth (or any ferrous discontinuity) passes in front of the sensor the output changes state. This type of sensor is known as a “P” type because it uses N-P-N transistor logic (as opposed to “N” type, which uses P-N-P transistor logic).

Key features to note are:

- Reverse voltage protection, up to -30 Vdc, to prevent damage if miswired
- Higher temperature range of -40°C to +125°C
- Wide range of supply voltage in single design of 4.5 – 24 Vdc
- Two output options of Supply Tracking or TTL Compatible
- Rugged design meeting IEC 77 Standards (European Railroad Applications)

Suitable for 20 diametral pitch or coarser gear (target), the standard catalog sensors are easily applied to your varied sensing needs. If you have a unique, special requirement which cannot be met with any of the standard options, we will gladly review your specs and work with you on a special sensor design.

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

Zero Velocity – Magnetic Hall Effect Sensors – 5/8 and 3/4 Threads

Specifications

Power Supply

Power Supply Voltage:

4.5 – 24 Vdc

Power Supply Current:

50 mA maximum

Outputs

Ouput Voltage:

Essentially square wave fanout to 10 TTL inputs

TTL Compatible: (See Figure 1)

50% ±30% duty cycle

Logic 0: +.6 Vdc maximum

Logic 1: +4 to +4.6 Vdc @ 5mA

Supply Tracking: (See Figure 2)

50% ±30% duty cycle

Logic 0: +.6 Vdc maximum

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

Output Impedance:

2.2K Ohms ±5%

Output Current:

20 mA sink maximum

Output Current - Short Circuit:

5 mA maximum with 10V power supply

Reverse Battery Voltage:

-30 Vdc

Mechanical

Target Frequency:

0 to 15 kHz

Target Air Gap:

.005 to .020 with a 20 diametral pitch gear
.005 to .045 with a 12 diametral pitch gear
.005 to .060 with a 8 diametral pitch gear

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.

Materials

Housing:

300 series stainless steel

Leads:

AWG #24 Teflon, 200°C

Cable:

AWG #20 Irradiated cross-linked polyolefin, 125°C

TTL Compatible

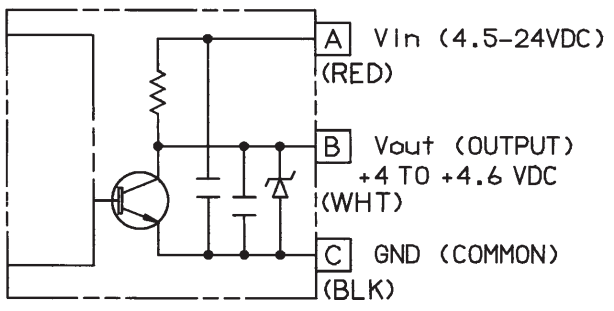


Figure 1

Supply Tracking

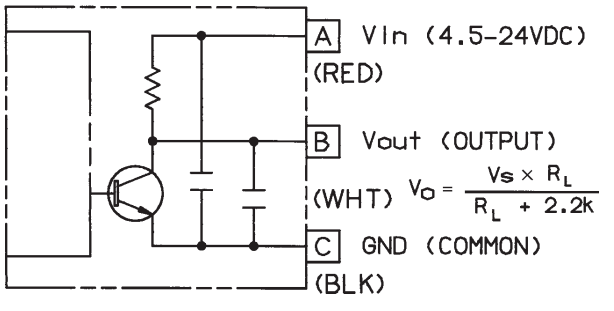


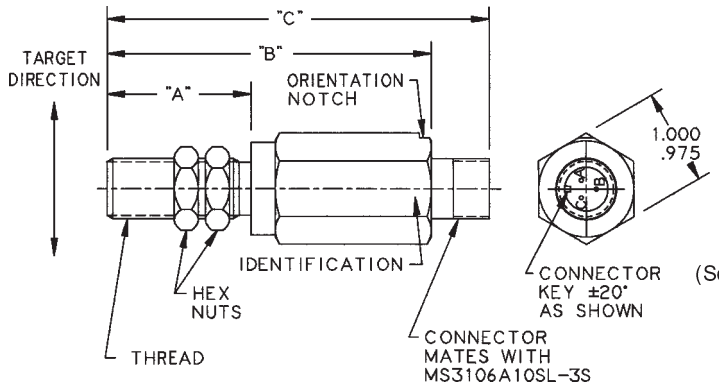
Figure 2

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

Al-Tek Instruments, Cheshire, CT USA

Zero Velocity – Magnetic Hall Effect Sensors – 5/8 and 3/4 Threads

Hex Body with Connector

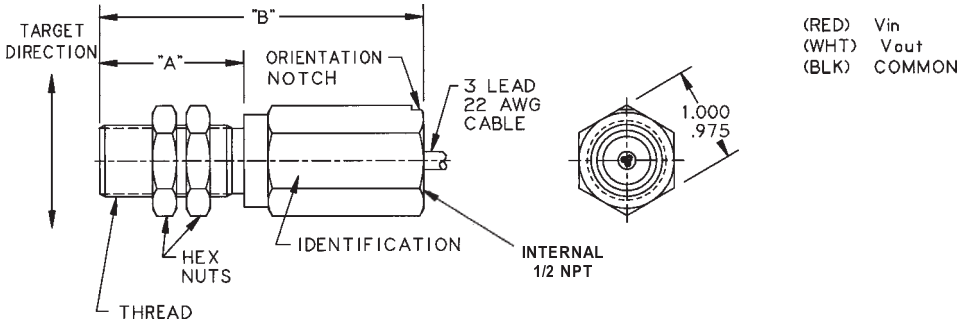


(Select cable from group "B" see index)

Part Num.	Thread	"A" Dimension	"B" Dimension	"C" Dimension	Output
H1512-001	.625-18 UNF-2A	1.500 (38.100)	3.375 (85.725)	4.012 (101.905)	TTL Compatible
H1522-001	.625-18 UNF-2A	1.500 (38.100)	3.375 (85.725)	4.012 (101.905)	Supply Tracking
H1512-002	.625-18 UNF-2A	2.750 (69.850)	4.625 (117.475)	5.262 (133.655)	TTL Compatible
H1522-002	.625-18 UNF-2A	2.750 (69.850)	4.625 (117.475)	5.262 (133.655)	Supply Tracking
H1612-001	.750-20 UNEF-2A	1.500 (38.100)	3.375 (85.725)	4.012 (101.905)	TTL Compatible
H1622-001	.750-20 UNEF-2A	1.500 (38.100)	3.375 (85.725)	4.012 (101.905)	Supply Tracking
H1612-002	.750-20 UNEF-2A	2.750 (69.850)	4.625 (117.475)	5.262 (133.655)	TTL Compatible
H1622-002	.750-20 UNEF-2A	2.750 (69.850)	4.625 (117.475)	5.262 (133.655)	Supply Tracking

Net Weight: 9 oz. max.

Hex Body with Cable



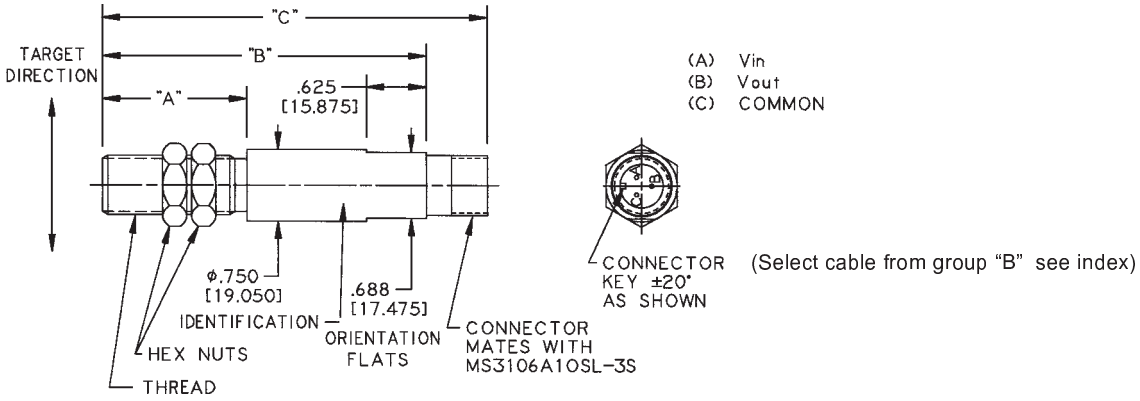
Part Num.	Thread	"A" Dimension	"B" Dimension	Cable Length	Output
H1512-013	.625-18 UNF-2A	1.500 (38.100)	3.375 (85.725)	10 ft (3.05m)	TTL Compatible
H1522-013	.625-18 UNF-2A	1.500 (38.100)	3.375 (85.725)	10 ft (3.05m)	Supply Tracking
H1512-014	.625-18 UNF-2A	2.750 (69.850)	4.625 (117.475)	10 ft (3.05m)	TTL Compatible
H1522-014	.625-18 UNF-2A	2.750 (69.850)	4.625 (117.475)	10 ft (3.05m)	Supply Tracking
H1612-013	.750-20 UNEF-2A	1.500 (38.100)	3.375 (85.725)	10 ft (3.05m)	TTL Compatible
H1622-013	.750-20 UNEF-2A	1.500 (38.100)	3.375 (85.725)	10 ft (3.05m)	Supply Tracking
H1612-014	.750-20 UNEF-2A	2.750 (69.850)	4.625 (117.475)	10 ft (3.05m)	TTL Compatible
H1622-014	.750-20 UNEF-2A	2.750 (69.850)	4.625 (117.475)	10 ft (3.05m)	Supply Tracking

Net Weight: 9 oz. max.

Dimensions in inches and (mm).

Zero Velocity – Magnetic Hall Effect Sensors – 5/8 and 3/4 Threads

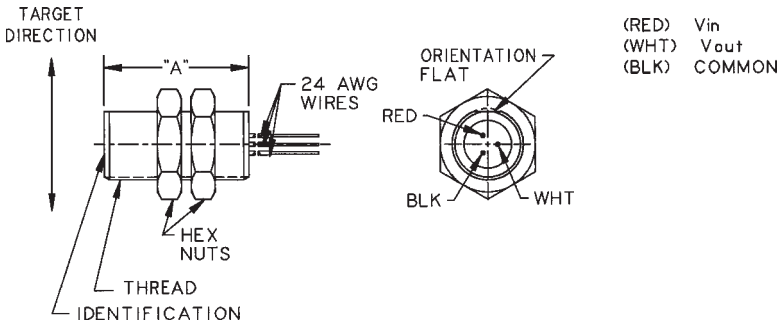
Round Body with Connector



Part Num.	Thread	"A" Dimension	"B" Dimension	"C" Dimension	Output
H1512-005	.625-18 UNF-2A	1.500 (38.100)	3.375 (85.725)	4.012 (101.905)	TTL Compatible
H1522-005	.625-18 UNF-2A	1.500 (38.100)	3.375 (85.725)	4.012 (101.905)	Supply Tracking
H1512-006	.625-18 UNF-2A	2.750 (69.850)	4.625 (117.475)	5.262 (133.655)	TTL Compatible
H1522-006	.625-18 UNF-2A	2.750 (69.850)	4.625 (117.475)	5.262 (133.655)	Supply Tracking
H1512-007	.625-18 UNF-2A	4.000 (101.600)	5.875 (149.225)	6.512 (165.405)	TTL Compatible
H1522-007	.625-18 UNF-2A	4.000 (101.600)	5.875 (149.225)	6.512 (165.405)	Supply Tracking
H1612-005	.750-20 UNEF-2A	1.500 (38.100)	3.375 (85.725)	4.012 (101.905)	TTL Compatible
H1622-005	.750-20 UNEF-2A	1.500 (38.100)	3.375 (85.725)	4.012 (101.905)	Supply Tracking
H1612-006	.750-20 UNEF-2A	2.750 (69.850)	4.625 (117.475)	5.262 (133.655)	TTL Compatible
H1622-006	.750-20 UNEF-2A	2.750 (69.850)	4.625 (117.475)	5.262 (133.655)	Supply Tracking
H1612-007	.750-20 UNEF-2A	4.000 (101.600)	5.875 (149.225)	6.512 (165.405)	TTL Compatible
H1622-007	.750-20 UNEF-2A	4.000 (101.600)	5.875 (149.225)	6.512 (165.405)	Supply Tracking

Net Weight: 7 oz. max.

Fully Threaded with Leads



Part Num.	Thread	"A" Dimension	Lead Length	Output
H1512-009	.625-18 UNF-2A	1.500 (38.100)	12 (304)	TTL Compatible
H1522-009	.625-18 UNF-2A	1.500 (38.100)	12 (304)	Supply Tracking
H1512-010	.625-18 UNF-2A	2.750 (69.850)	12 (304)	TTL Compatible
H1522-010	.625-18 UNF-2A	2.750 (69.850)	12 (304)	Supply Tracking
H1612-009	.750-20 UNEF-2A	1.500 (38.100)	12 (304)	TTL Compatible
H1622-009	.750-20 UNEF-2A	1.500 (38.100)	12 (304)	Supply Tracking
H1612-010	.750-20 UNEF-2A	2.750 (69.850)	12 (304)	TTL Compatible
H1622-010	.750-20 UNEF-2A	2.750 (69.850)	12 (304)	Supply Tracking

Net Weight: 3 oz. max.

Dimensions in inches and (mm).

AI-Tek Instruments, Cheshire, CT USA