

# 907BH/907BV Digital Speed Sensor

## Bi-Directional - Quadrature Output Pulser Disc

### Description

The 907BH and 907BV Bi-Directional Digital Speed Sensors produce digital pulse signals for use with speed switches, tachometers, counters, signal conditioners, or as direct pulse input into programmable controllers. As a pulser disc or pulser wrap mounted on the monitored shaft rotates, the target magnets pass in front of the sensor. The sensor switches high and low as it is exposed to the alternating polarity of the magnets on the disc or wrap, which produces one pulse for every two magnets.

Model	Targets	Duty Cycle	Phase Angle
907BH 907BV	2 Magnets = 1 Pulse	50/50	Varied based on magnet geometry

The 907BH and 907BV sensors allow a gap distance up to 3/8 inch between the surface of the sensor and the target magnets. The gap flexibility makes the sensors tolerant of vibration, slight shaft run-out, and minor misalignment. The 907BH and 907BV Sensors are used in applications requiring hazardous location ratings, or in applications where the sensor may be subject to abuse.

Each sensor is powered by 5-24 VDC and provides 2 NPN Open Collector Quadrature outputs. The 907BH and 907BV Sensor is UL listed for use in Class I, Div 1, Group D; Class II, Div 1, Group E,F,G locations. The 907BH and 907BV Sensor have a XLB-3 cast aluminum enclosure which has a 1 inch NPT conduit opening and is provided with a steel mounting bracket.

### Quadrature

Quadrature signals provide speed and direction information. The 907BV and 907BH sensors are quadrature sensors and have two channels: channel A & channel B. The sensor will be marked for orientation with a direction label. For optimal performance, care should be taken when installing the sensor in regard to the direction of magnet travel. See figures 3 and 4 for determining whether a 907BV (vertical) or 907BH (horizontal) is needed for a given application. The 907BH or 907BV has two pulse trains. An ideal waveform is shown in Figure 1. Normally both the signals are nearly 50/50 duty cycle; however the phase angle between signals is dependent on magnet geometry. Typically, ideal phase angle is only critical for 4X decoding.

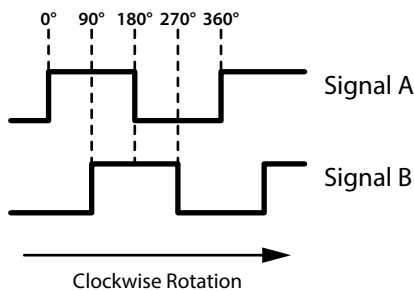


Figure 1: Output Waveform

### Pulser Disc

The end of the shaft to be monitored must be center drilled to a depth of 1/2 inch with a No. 21 drill and tapped for 10-32 UNF. After applying Loctite® or a similar adhesive on the threads to keep the pulser disc tight, the pulser disc should be attached decal side out with the supplied 10-32 UNF machine screw and lock washer.

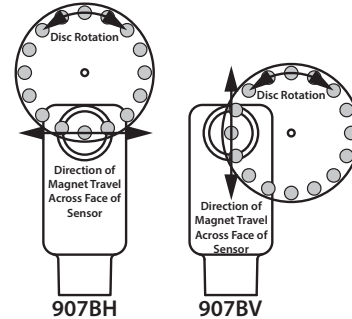


Figure 2: 907B with Pulser Disc

### Pulser Wrap

Pulser Wraps are custom manufactured to fit the shaft they will be mounted on. When the wrap is shipped, four Allen-head cap screws hold the two halves of the wrap together. These screws must be removed so that the wrap is in two halves. Place the halves around the shaft, reinsert the screws and torque them to 5 foot-pounds.

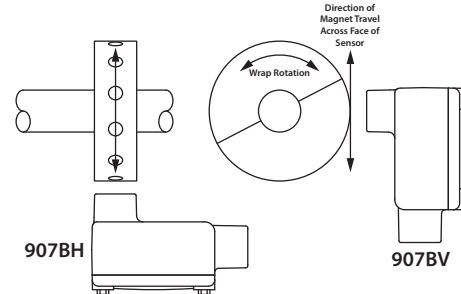


Figure 3: 907B with Pulser Wrap

### Sensor Installation

The 907BH and 907BV Sensors are supplied with a slotted mounting bracket. The sensor should be installed so the center line of the magnets pass in front of the center of the sensor as the disc or wrap rotates. When using the pulser disc, the center of the magnetized area of the disc, shown as Dimension B in figure 4, is 1-3/4 inches from the center hole of the disc.

The recommended gap distance between the sensor and the disc or wrap, Dimension A in figure 4 and 5, is 1/4 inch +/- 1/8 inch using 1/2" magnets. To achieve the proper gap distance adjust the position of the sensor using the slots on its mounting bracket.

**Important:** A direction label has been placed on the faces of the 907BH and 907BV sensors. The sensor must be positioned so that the magnets pass along that line (the center line of the magnets and the line on the sensor must be parallel with each other). See illustrations above and on the next page.

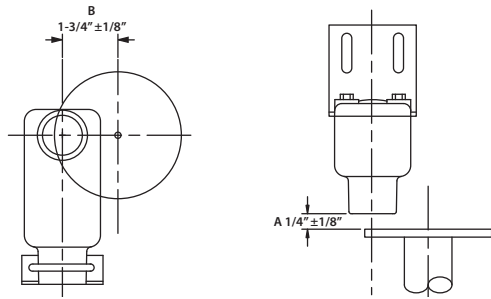


Figure 4: 907B and Pulser Disc

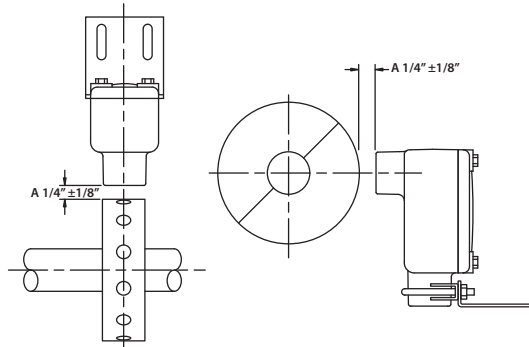


Figure 5: 907B and Pulser Wrap

## Wiring Chart

New Color	Old Color	Connect To	Description
Brown	Red	Supply	Sensor Supply
Black	Black	Sensor A	Signal A
Blue	White/Clear	Circuit Ground	Sensor Ground
White	Green	Sensor B	Signal B
Shield	Shield	Circuit Ground	Shield

## 907B Specifications

Supply	5-24 Vdc @ 20 mA
Output Type	NPN Open Collector (Current Sinking)
Current sink	25 mA Max per channel
Max Frequency	20 kHz
Temp Range	-40° C to +60° C standard -40° C to +125° C optional
Gap Distance	1/4 inch +/- 1/8 inch w 1/2" Magnets
Max Cable Length	1500 feet
Body Material	Cast Aluminum
Cable	4-Conductor, Shielded, PVC jacket 10' standard, other lengths optional
Mounting Bracket	Zinc Plated Steel, Included

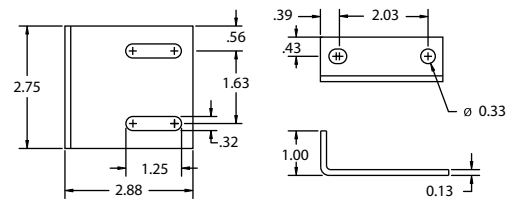


Class I, Div 1, Group D  
Class II, Div 1, Groups E, F, G  
UL File: E249019

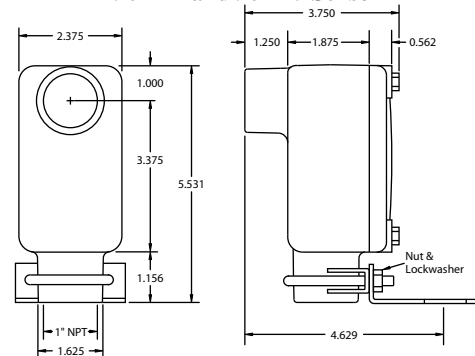


## Part Dimensions

### 907BH and 907BV Mounting Bracket



### 907BH and 907BV Sensor



## Electrical Connections

The 907BH and 907BV sensors are designed for use with devices that have an internal pull-up resistor. If the device receiving the signal from the sensor does not have a pull-up resistor, a resistor must be placed between the sensor supply voltage and the sensor signal output. Two pull-ups are required for the 907BH and 907BV sensors, one for Signal A and one for Signal B

**Note:** If your device reads in the wrong direction, reverse the sensor A and sensor B leads.

Supply Voltage	Resistor Value 1/4 Watt	Resistor Max. Value
5V - 11V	1K	10K
12V - 15V	2.2K	10K
16V - 24V	4.7K	10K

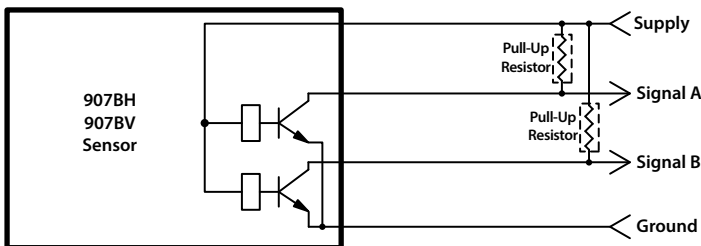


Figure 6: 907B Bi-directional Output Circuit

**Note:** Turn sensor supply OFF when wiring. Damage will occur if the SIGNAL and SUPPLY wires are shorted with power applied. Exercise caution when wiring the sensor.

Spare Parts List	Stock No.
907BH Sensor w/10' PVC Cable	775-006101
907BV Sensor w/10' PVC Cable	775-006100
907BH Sensor w/50' PVC Cable	775-006107
907BV Sensor w/50' PVC Cable	775-006105
907BH Sensor w/100' PVC Cable	775-006109
907BV Sensor w/100' PVC Cable	775-006110

