



## GYRO STABILIZED STRAPDOWN HEADING REFERENCE

**SHR-S360**

### **Description:**

The SHR-S360 is the smallest version of our Strapdown Heading Reference line of sensors. This product uses MEMS gyros to make the SHR-S360 more economical and slightly smaller than the SHR-E360 heading reference that uses VSG gyros for enhanced accuracy and signal stability.

The SHR-S360 provides heading and sensor information. It includes a high accuracy triaxial fluxgate magnetometer, a triaxial accelerometer, and a rate gyro. This unit is a "strap-down" or "body-axis" sensor. The sensitive axes of the SHR are in a fixed position inside the sensor. This also means that they will stay at a constant relationship with the vehicle and move as the vehicle moves. Since the fluxgate sensors are not gimballed, the unit uses its angle sensors to calculate the rotation back to level. This is done in order to provide signals in earth-based coordinates. This function is similar to a mechanical gimbal except that no parts are physically moving – the rotations are done using software. The SHR-S360 has several advantages over using a traditional gimbal including: no bearings to wear out, no fluid to leak and high shock survivability.



The SHR-S360 is gyro-stabilized. This means that the SHR will provide better performance in dynamic applications. The internal gyro allows the SHR to respond to short-term movements while the fluxgate provides the long-term heading reference. This combination of sensors allows for accurate data in a wider range of applications than a SHR without gyro-stabilization.

The Watson Industries line of "strap-down" products provide a better magnetic heading than many other magnetic heading products on the market. A significant problem with mechanically gimballed compasses becomes apparent when trying to calibrate the heading sensor in the field. With a strap-down system, the magnetometers are fixed with respect to the vehicle in which it is mounted; Therefore, the constant soft and hard iron field distortions can be fully calibrated out.

- Solid State, Strapdown System
- Small Size
- Low Cost, Low Power
- Rugged, High Reliability
- Analog and RS-232 Serial Outputs
- PC Heading Calibration
- One Year Limited Warranty
- Engineering Support

### **Applications:**

The SHR-S360 provides superior heading reference performance in installations involving land vehicles.



### **Watson Industries, Inc.**

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# SHR-S360 Specifications

## Attitude

Range: Bank	±180°	
Range: Elevation	±90°	
Resolution:	0.02°	Binary mode (14 bit)
Analog Scale Factor:	18°/V	±10V Bank ±5V Elevation
Accuracy: Static	±0.5°	

## Magnetic Heading

Range:	0° - 360°	
Resolution:	0.02°	Binary mode (14 bit)
Analog Scale Factor:	18°/V	±10V Output
† Accuracy: Static	±1.5°	
* Accuracy: Dynamic	2%	

## Angular Rate

Range: Yaw	±100°/sec	
Resolution:	0.025°/sec	Binary mode (14 bit)
Scale Factor Accuracy:	2%	
Bias: Yaw	< 0.3°/sec	
Non-Linearity:	< 0.05%	Full scale range
Bandwidth:	20 Hz	

## Acceleration

Range: X, Y, Z	±10g	
Resolution:	4mg	
Scale Factor Accuracy:	1%	
Bias: X, Y, Z	< 10mg	
Non-Linearity:	0.1%	Full scale range
Bandwidth:	3 Hz	

## Magnetic

Range: X, Y, Z	±1000 mGauss	
Resolution:	0.1 mGauss	Binary mode (14 bit)
Scale Factor Accuracy:	1%	
Bias: X, Y, Z	< 5 mGauss	
Non-Linearity:	< 0.01%	Full scale range
Bandwidth:	10 Hz	

## Environmental

Temperature: Operating	-40°C to +85°C	
Temperature: Storage	-55°C to +85°C	
Vibration: Operating	2.5g rms	20 Hz to 2 KHz
Vibration: Survival	10g rms	20 Hz to 2 KHz
Shock: Survival	500g	10mS ½ sine wave

## Electrical

Frame Rate:	284.44 Hz	Maximum
Startup Time: Data	5 sec	
Startup Time: Fully operational	10 sec	
Input Power:	10 to 35VDC	2.3W
Input Current:	150mA @ 12VDC	85mA @ 24VDC
Digital Output:	RS-232	
Analog Output:	±10VDC	
Analog Output Impedance:	300 Ohm	Per line

## Physical

Axis Alignment:	< 0.25°	
Size: Including Mounting Flanges	3.24"W x 5.78"L x 2.38"H	8.2 x 14.7 x 6.0 (cm)
Weight:	19.4 oz (1.2lb)	550 grams (0.6Kg)
Connection: RS-232	9 pin female "D" subminiature	
Connection: Power / Analog Outputs	9 pin male "D" subminiature	

\* Actual accuracy can be calculated as the listed percentage multiplied by the change in value over the entire dynamic maneuver.

† Static heading accuracy is dependent on the magnetic environment.

This sensor will meet or exceed this spec within the 48 contiguous United States.

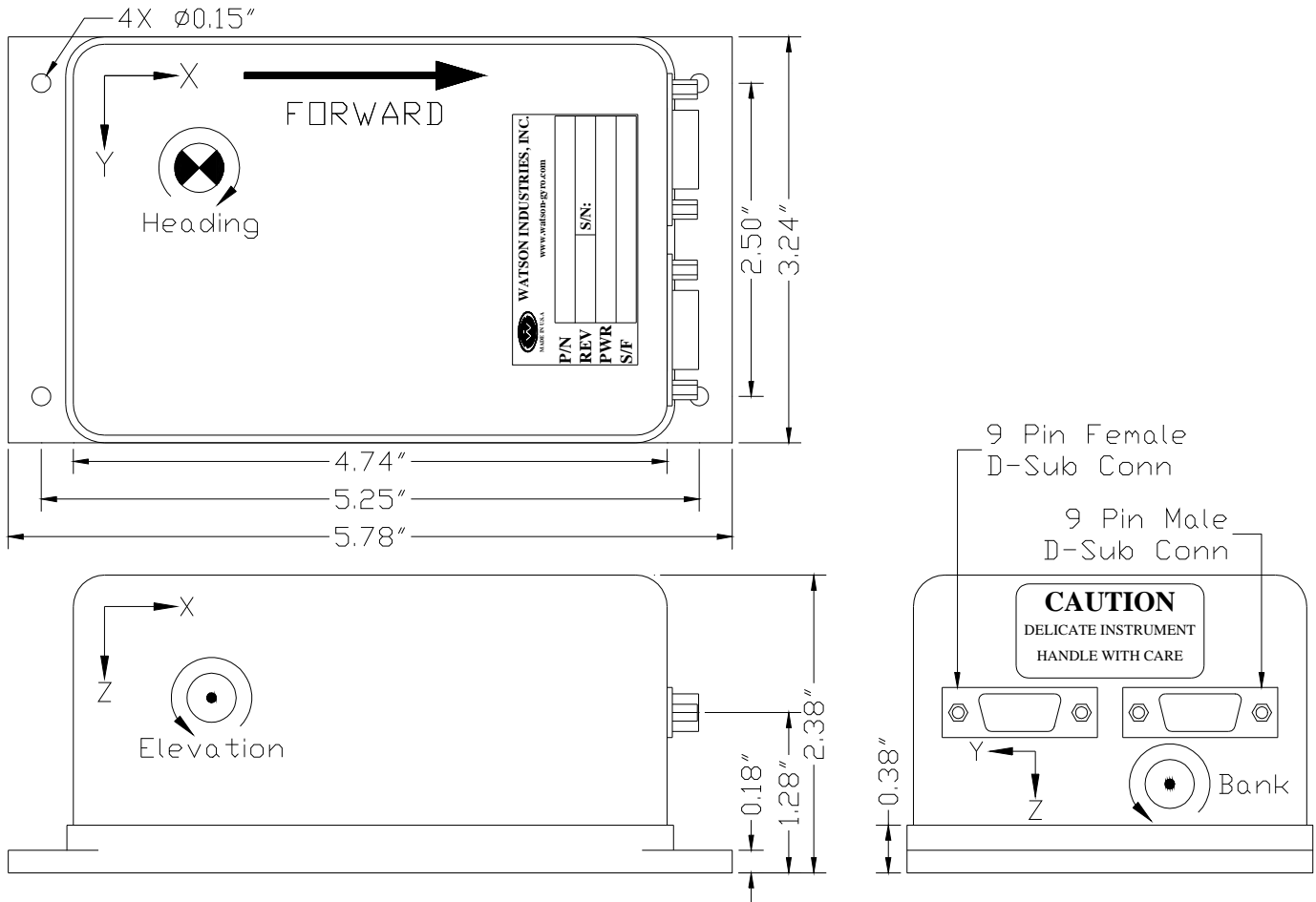
- Specifications are subject to change without notice.
- This product may be subject to export restrictions. Export Classification ECCN 7A994.



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**Dimensions:**



03/18 DAO



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