Single Axis Vertical Reference System

VRS-S132-1AD

Description:

The Watson Industries Single Axis Vertical Reference System is a solid-state gyro package used to measure angular displacement and rate, especially where dynamic motion may interfere. Under these conditions, the effects of lateral accelerations severely limit the performance of an ordinary accelerometer or pendulous device.

The Watson Single Axis Vertical Reference achieves improved performance by integrating the output of an angular rate gyro to get an estimate of the attitude, which is then compared to the output of conventional accelerometers to find the error. This error is then filtered over a long time constant and subtracted from the rate gyro output to correct biases as a closed loop error correction system. This system lets the gyro dominate the attitude accuracy above the correction loop frequency while the accelerometer reference dominates the lower frequencies.

This sensor package uses smaller MEMS gyros. This allowed us to reduce the height of the VRS-S132 compared to the VRS-E132.

The VRS can be a functional replacement for mechanical gyros, which are often more expensive and less reliable than this solid-state sensor. The VRS is especially suited for applications where there is limited bank and elevation such as ships, underwater vehicles, some land vehicles, and certain camera applications. This is because the VRS uses a linear coordinate system.

- Solid State, Strap Down System
- High Accuracy
- Low Cost, Low Power
- Rugged, High Reliability
- Analog and RS-232 Digital Outputs
- One Year Limited Warranty
- Engineering Support

Applications:

The VRS is used to stabilize and control ships and submersibles, to stabilize antenna platforms, to instrument automobiles, and for many other applications.

Watson Industries, Inc.
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VRS-S132-1AD Specifications

Attitude			
	Range: Elevation	±90° (±50°)	Digital (Analog)
	Resolution:	0.02°	Binary mode (14 bit)
	Analog Scale Factor:	5°/V	±10V Output
	Accuracy: Static	±0.5°	(up to 75°)
*	Accuracy: Dynamic	2%	
Angular Rate			
	Range: Pitch	±100°/sec	
	Resolution:	0.025°/sec	Binary mode (14 bit)
	Analog Scale Factor:	10°/sec/V	±10V Output
	Scale Factor Accuracy:	2%	
	Bias: Pitch	< 0.3°/sec	
	Non-Linearity:	< 0.05%	Full scale range
	Bandwidth:	20 Hz	
Acceleration			
	Range: X, Z	±10g	
	Resolution:	4mg	
	Scale Factor Accuracy:	1%	
	Bias:	< 10mg	
	Non-Linearity:	0.1%	Full scale range
	Bandwidth:	3 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	1.7W
	Input Current:	125mA @ 12VDC	70mA @ 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:	19.4oz (1.2lb)	550 grams (0.6Kg)
	Connection: RS-232 / Analog Outputs	9 pin female "D" subminiature	
	Connection: Power	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.

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

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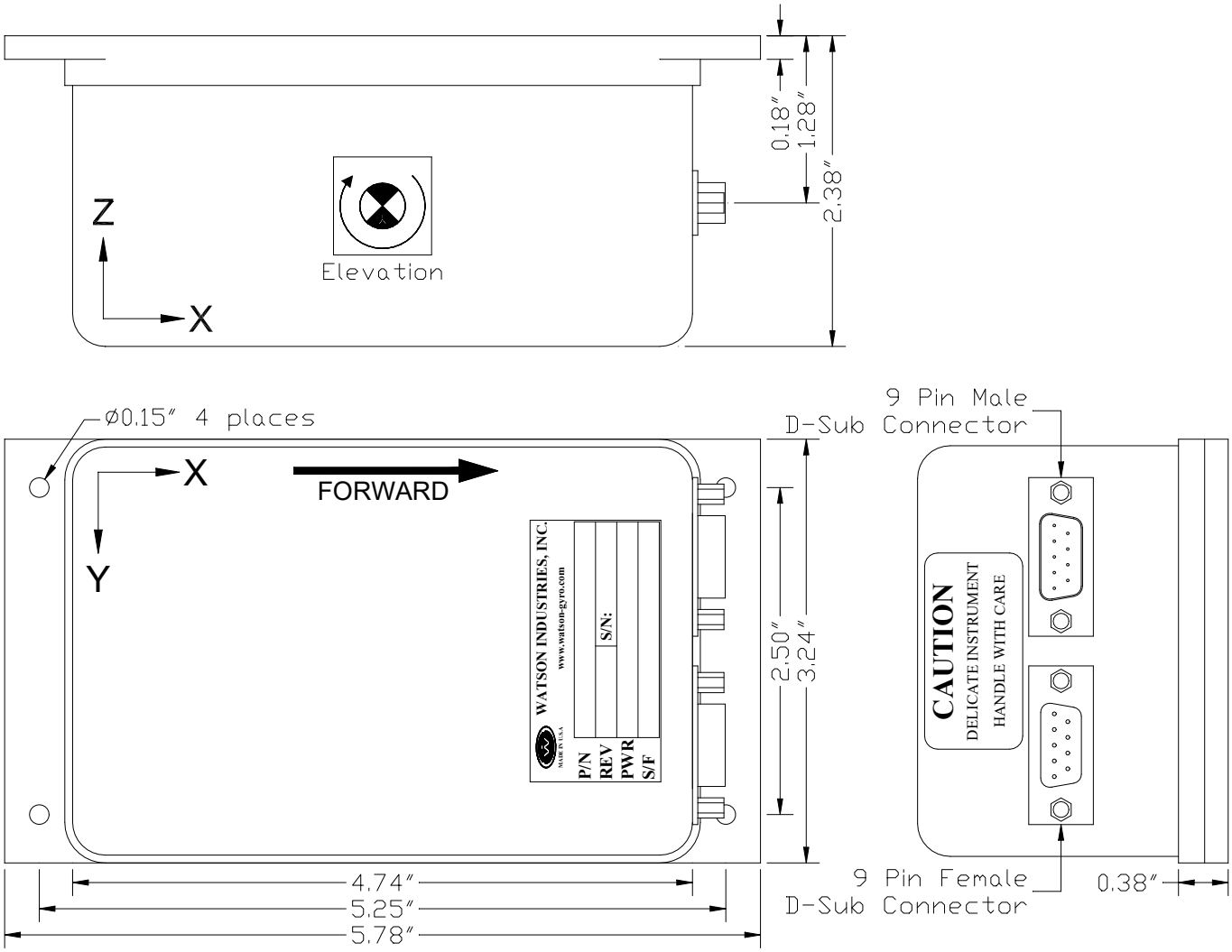
Dimensions:



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