



Triaxial Angular Rate Sensor

ARS-E322-1A/80

Description:

The sensor is a solid-state, triaxial rate gyro configured from three single axis, matched gyros, driven by a microprocessor which provides bias removal and scale-factor compensation using rule-based logic, plus a Built-In-Test-Equipment (BITE) function. Power conditioning necessary to allow operation from a 24 volts DC supply is also implemented within the sensor enclosure. The microprocessor system supports serial data communication via an RS-232 bus. This allows the sensor to be adjusted using a PC running data communications software. The sensor provides complementary analog signals as the primary outputs. These outputs are also available as serial data on the RS-232 bus. The individual gyros are physically set along their axes and are then aligned to $<0.2^\circ$ accuracy using built-in software. Integrating the rate over time and subtracting the resulting average value from the original provides a bias-free rate signal. The integrator time-constant is held in non-volatile memory and is adjustable using commands sent via the RS-232 serial bus.



At switch-on, the integrator is held at zero for a preset time to allow the gyro to stabilize. After this interval, the integrator will accumulate the signal from the gyro unless the 'hold' command is set. This will freeze the action of the integrator. A 'set' command is available to initialize the bias removal integrator and allow an initial value to be established very rapidly. This initial value is computed as the average value of gyro bias over the period for which the 'set' command is held 'on'. This allows the system designer to have control over the accuracy of this initial value and to exchange accuracy for speed of operation. The sensor is intended for operation on a balanced gimbal and its mass is carefully controlled by adding ballast to ensure interchangeability without the need to re-balance the entire gimbal assembly.

- [Designed for Satellite Tracking Applications](#)
- [Solid State, Strap Down System](#)
- [High/Low Sensitivity Adjustment](#)
- [Low Cost, Low Power](#)
- [Rugged, High Reliability](#)
- [Analog and RS-232 Serial Outputs](#)
- [Two Year Limited Warranty](#)
- [Engineering Support](#)

Applications:

These sensors are used for instrumentation and control systems, and are ideally suited for the stabilization of satellite tracking antenna platforms.



Watson Industries, Inc.

3041 Melby Road Eau Claire, Wisconsin 54703 U.S.A
Phone: +1 (715) 839-0628 Fax: +1 (715) 839-8248
e-mail: support@watson-gyro.com Website: www.watson-gyro.com

ARS-E322-1A/80 Specifications

Angular Rate

Range: Roll, Pitch, Yaw	±50°/sec High	±5°/sec Low
Resolution:	0.002°/sec	
Analog Scale Factor:	2.5°/sec/V High	0.25°/s/V Low
Scale Factor Accuracy:	0.25%	At 20°C
Scale Factor Temp Coefficient:	0.6%	Over temperature range
Bias: Roll, Pitch, Yaw	< ±0.1°/sec	
Bandwidth:	> 70 Hz	90° phase shift, 1.25msec group delay
Noise:	< 0.03°/sec rms	
G-Sensitivity	Negligible	
G ² -Sensitivity	Negligible	
Hysteresis:	Negligible	

Environmental

Temperature: Operating	-40°C to +70°C	
Temperature: Storage	-50°C to +85°C	
Vibration: Survival	5g rms	20 Hz to 2 kHz
Shock: Survival	1000g	3ms ½ sine wave
Angular Velocity: Survival	> ±1000°/sec	

Electrical

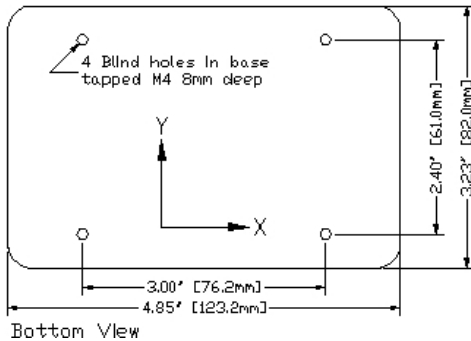
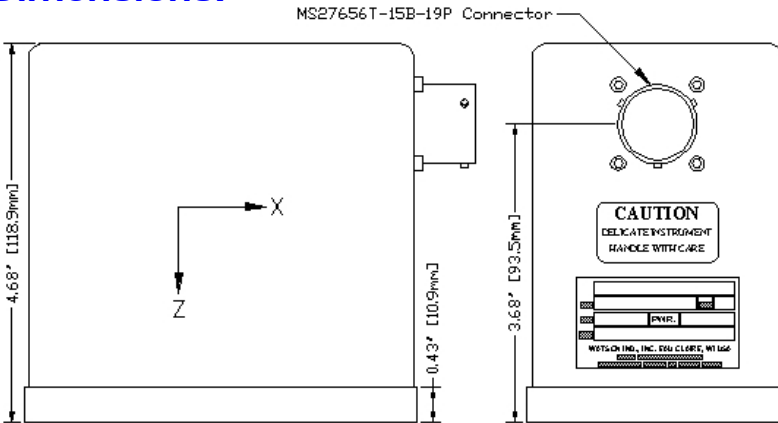
Input Power:	10 to 30VDC	6W
Input Current:	250mA @ 24VDC	
Digital Output:	RS-232	
Analog Output:	±10VDC	Differential, 20 V range
Output Impedance:	300 Ohm	Per line

Physical

Axis Alignment:	< 0.2°	
Size:	3.23"W x 4.85"L x 4.68"H	8.2 x 12.3 x 11.9 (cm)
Weight:	35.3 oz (2.2 lb)	1000 grams (1Kg)
Center of Gravity:	Near geometric center	
Connection:	MS27656T-15B-19P	
Life:	> 30,000 Hrs MTBF	

- Specifications are subject to change without notice.
- This product may be subject to export restrictions. Please consult the factory.

Dimensions:



Input Commands

Scale	Line A high - 50 °/sec, Line B high - 5 °/sec.
Hold	Line A high - Hold integration, Line B high - Normal
Set	Line A high - Rapid integration, Line B high - Normal



Watson Industries, Inc.

03/10 DAO

3041 Melby Road Eau Claire, Wisconsin 54703 U.S.A
 Phone: +1 (715) 839-0628 Fax: +1 (715) 839-8248
 e-mail: support@watson-gyro.com Website: www.watson-gyro.com



Watson Industries, Inc.

3041 Melby Road Eau Claire, Wisconsin 54703 U.S.A

Phone: +1 (715) 839-0628

Fax: +1 (715) 839-8248

e-mail: support@watson-gyro.com

Website: www.watson-gyro.com