

MODEL 609 & 610 ANGULAR RATE SENSORS

SPECIFICATIONS

- Silicon MEMS Gyro, DC Response
- ± 500 to $\pm 24,000^\circ/\text{sec}$ Range
- Insensitive to Shock Events
- SAE J211 & ISO 6487 Compliant
- NHTSA FMVSS 202a Compliant

The Model 609 and 610 Angular Rate Sensors are small analog MEMS gyroscope designed specifically for automotive safety testing and other system designs requiring accurate measurement of angular velocity. The Model 609 and 610 series utilizes silicon MEMS sensing elements with custom electronics and packaging to produce an angular rate sensor that is highly reliable even under excessive shock and vibration environments. A wide selection of ranges is available for your specific applications along with a triaxial mounting block designed for mounting of both the model 609/610 angular rate sensors and the model 64X accelerometers.

For a triaxial version, TE Connectivity also offers the model 603 angular rate sensor.

FEATURES

- 5Vdc Fixed Excitation Voltage, Model 609
- 5 to 16Vdc Excitation Voltage, Model 610
- Small, Lightweight Package
- -40°C to $+105^\circ\text{C}$ Temperature Range
- 10,000g Shock Resistant Design
- Low Cross-Axis Sensitivity

APPLICATIONS

- Auto Safety Crash Testing
- Dummy Instrumentation
- Pedestrian Impact
- Rollover Testing
- Motorsports
- Biomechanics Testing
- Aerospace Testing



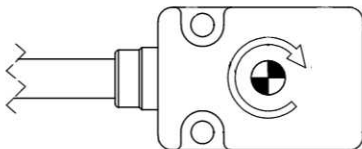
The Model 609 and 610 Angular Rate Sensors are identical in size, weight and form factor except for the location of the mounting holes.

The model 610 is designed with the two mounting holes located in opposite corners in order to best secure the sensor during testing. The opposite spacing of the mounting screws distributes the load evenly across the housing.

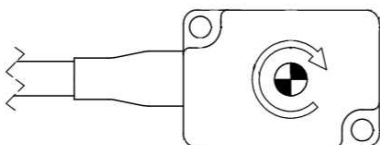
The model 609 has the traditional legacy mounting screw locations at the front of the sensor housing. This sensor is designed to be a drop-in for existing installations that utilize legacy sensors. We only recommend using model 609 if a change to mounting screw locations can not be accommodated.

The TE AC-A05700 mounting block is designed to accept both the model 609 and 610 screw hole locations.

Model 609 Footprint



Model 610 Footprint



PERFORMANCE SPECIFICATIONS

All values are typical at +24°C and 5Vdc excitation unless otherwise stated. TE Connectivity reserves the right to update and change these specifications without notice.

Parameters

DYNAMIC

	-0500	-1500	-6000	-8000	-12K	-18K	-24K	Notes
Dash Number								See Ordering Info
Range (deg/sec)	±500	±1500	±6000	±8000	±12K	±18K	±24K	
Sensitivity (mV/deg/sec)	4.00	1.33	0.333	0.250	0.167	0.111	0.083	±15%
Frequency Response (Hz)	0-1000	0-1000	0-1000	0-1000	0-2000	0-2000	0-2000	+1dB/-3dB
Non-Linearity (%FSO)	±0.5	±0.5	±0.5	±0.5	±0.5	±0.5	±0.5	BFSL
Cross-Axis Sensitivity (%)	<1	<1	<1	<1	<1	<1	<1	
Shock Limit (g)	10K	10K	10K	10K	10K	10K	10K	
Residual Noise (mV RMS)	3.66	1.20	3.30	2.40	1.22	1.50	1.80	Passband

ELECTRICAL

Zero Acceleration Output (mV)	±100							Differential
Excitation Voltage (Vdc)	5.0, Model 609							
Excitation Voltage (Vdc)	4.9 to 16.0, Model 610							
Excitation Current (mA)	<8							
Influence of Linear Acceleration (°/sec/g)	0.1							
Common Mode Voltage (Vdc)	2.5							±5%
Full Scale Output Voltage (Vpk)	±2							±15%
Output Resistance (Ω)	<100, Model 609							
Output Resistance (Ω)	<400, Model 610							
Insulation Resistance (MΩ)	>100							@100Vdc
Turn On Time (msec)	<100							
Ground Isolation	Isolated from Mounting Surface							

ENVIRONMENTAL

Thermal Zero Shift (%FSO)	±2.5							-40 to +105°C
Thermal Sensitivity Shift (%)	±2.0							-40 to +105°C
Operating Temperature (°C)	-40 to +105							
Humidity (Active Element & Electronics)	Hermetically Solder Seal							
Humidity (Housing)	Epoxy Sealed, IP65							

PHYSICAL

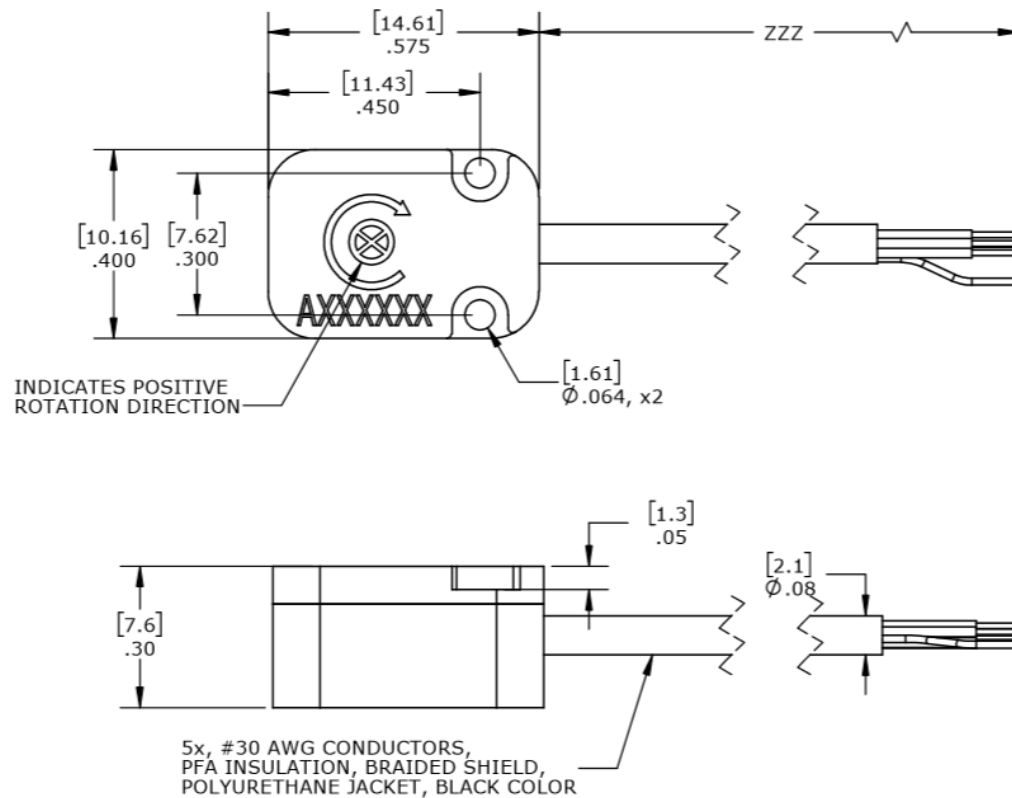
Case Material	Anodized Aluminum							
Cable	5x, #30 AWG Conductors, PFA Insulated, Braided Shield, PU Jacket							
Weight (cable not included)	3 grams							
Mounting	2x #0-80 or M1.4 Socket Head Cap Screws							
Mounting Torque	4 lb-in (0.45 N-m)							

Calibration supplied:	CS-ARLIN	NIST Traceable Linearity Calibration to FS Range
Supplied accessories:	AC-A04531	2x #0-80 (3/8 length) Socket Head Cap Screw and Washer
Optional accessories:	AC-A05700 121	Mounting Block (3x 610 Rate Sensors & 3x 64X Accelerometers) 3-Channel Precision Low Noise DC Amplifier

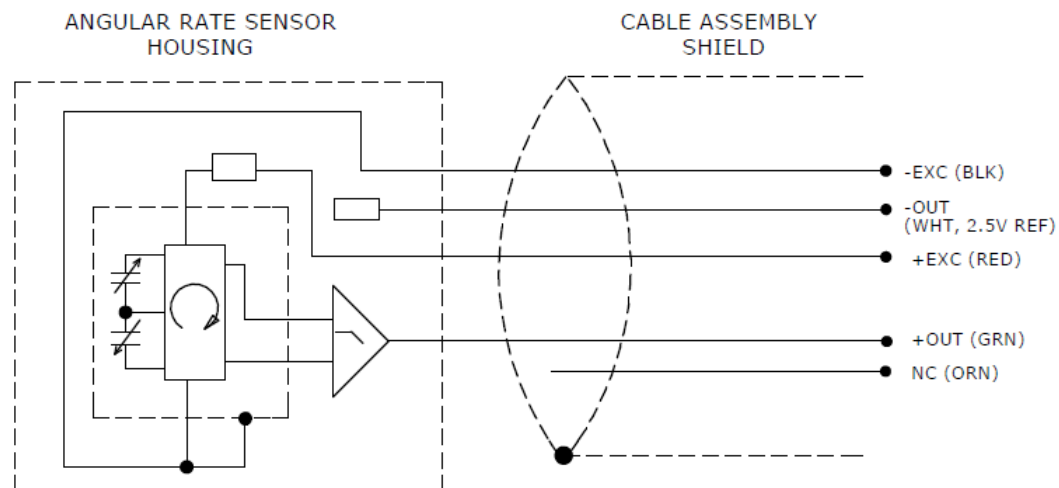
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MODEL 609 & 610 ANGULAR RATE SENSORS

DIMENSIONS, MODEL 609



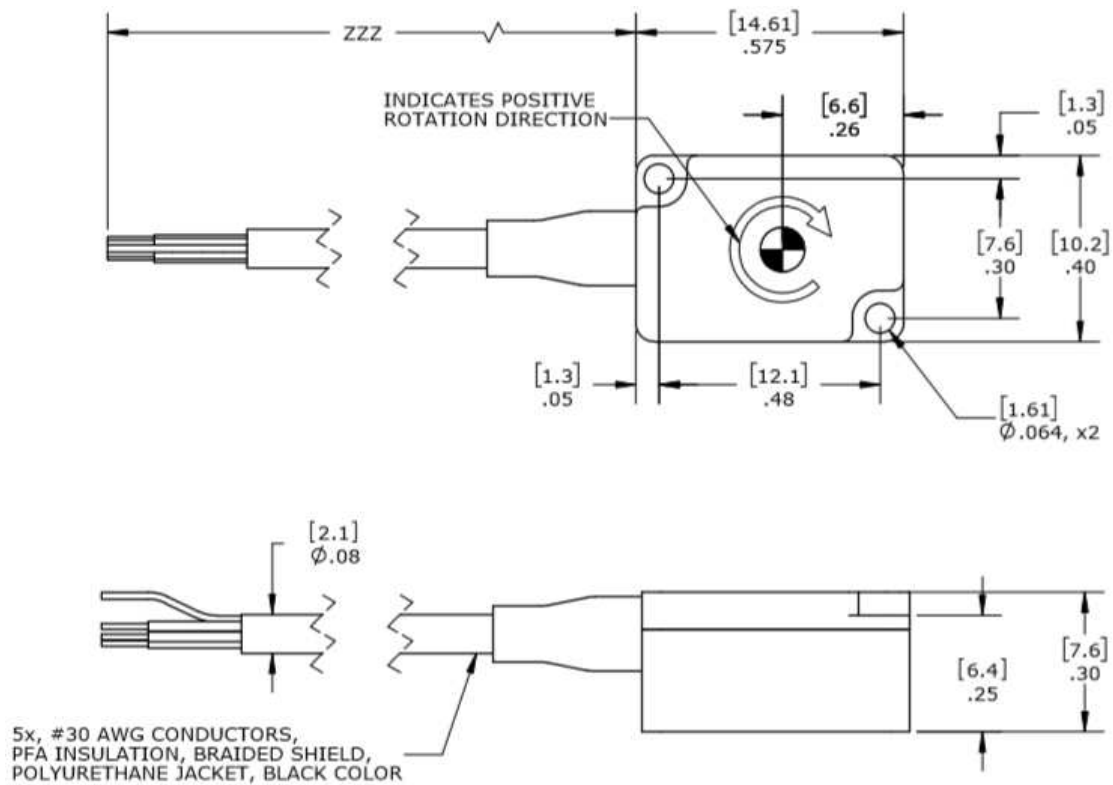
SCHEMATIC, MODEL 609



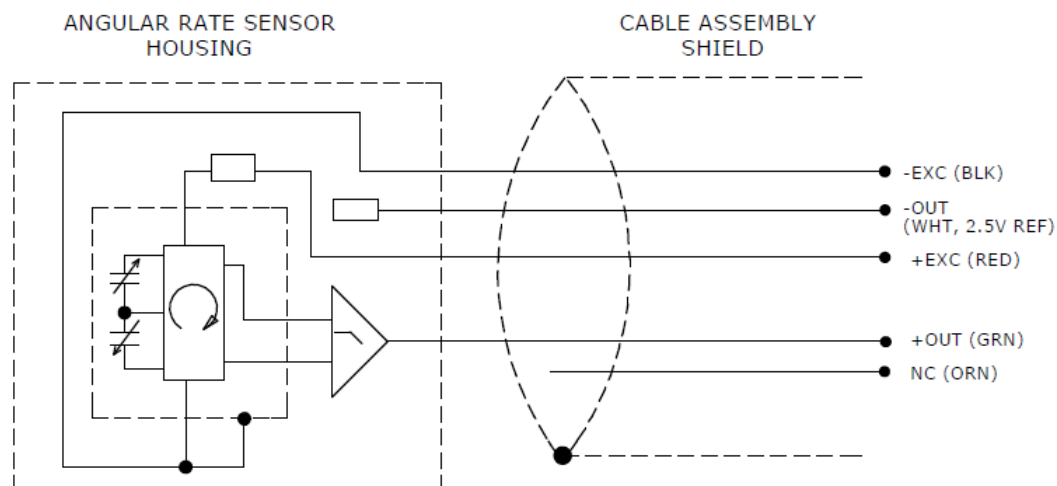
SHUNT CALIBRATION SUPPORTED FOR EITHER OUTPUT LEAD TO BLACK LEAD. UNIT BEHAVES LIKE 400 Ω BRIDGE POWERED BY 5V EXCITATION.

MODEL 609 & 610 ANGULAR RATE SENSORS

DIMENSIONS, MODEL 610

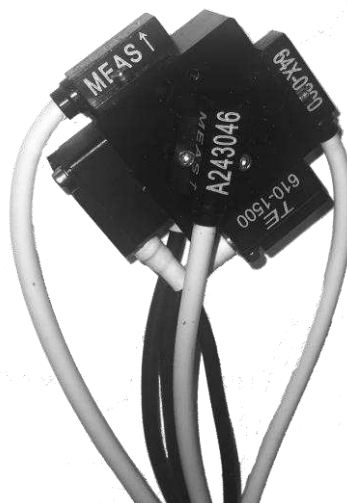
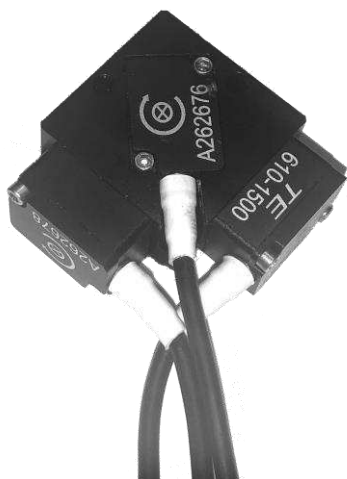
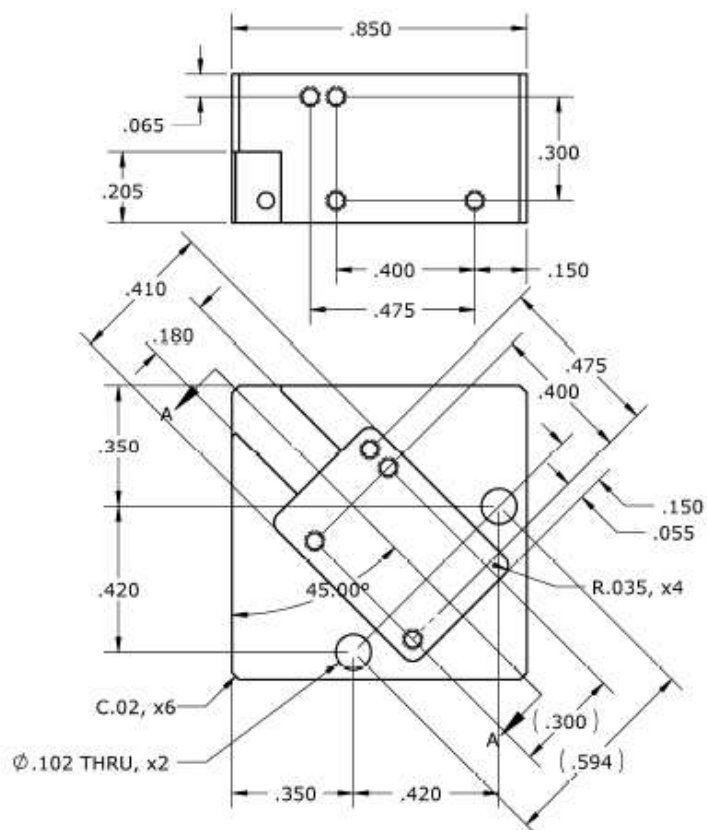
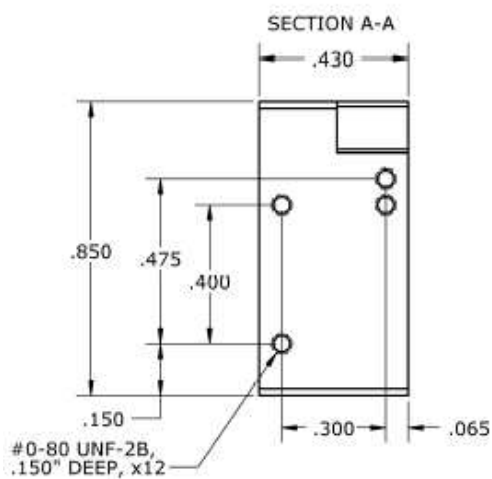
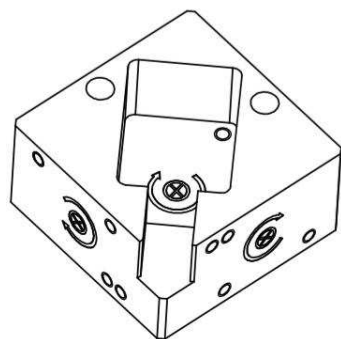


SCHEMATIC, MODEL 610



SHUNT CALIBRATION SUPPORTED FOR EITHER OUTPUT LEAD TO BLACK LEAD. UNIT BEHAVES LIKE 400Ω BRIDGE POWERED BY 5V EXCITATION.

TRIAXIAL MOUNTING BLOCK (PN AC-A05700)



ORDERING INFORMATION

609 or 610	GGGG	ZZZ	XX
Range			
500=500deg/sec			
1500=1500deg/sec			
6000=6000deg/sec			
8000=8000deg/sec			
12K=12,000deg/sec			
18K=18,000deg/sec			
24K=24,000deg/sec			
Cable length			
120=120 inches, 10 feet			
240=240 inches, 20 feet			
360=360 inches, 30 feet			
600=600 inches, 50 feet			
197=197 inches, 5 meters			
276=276 inches, 7 meters			
394=394 inches, 10 meters			

Example; 609-1500-360
Model 609, 1500deg/sec range, 360inch (30ft) cable length

Example; 610-12K-276
Model 610, 12,000deg/sec range, 276inch (7meter) cable length

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