



MODEL 634 SIX-DEGREE OF FREEDOM SENSOR

SPECIFICATIONS

- Silicon MEMS Gyro, DC Response
- $\pm 100^\circ/\text{sec}$ to $\pm 18,000^\circ/\text{sec}$ Rate Ranges
- Silicon VC MEMS Accels, DC Response
- $\pm 2g$ to $\pm 100g$ Acceleration Ranges
- $< 2.0\%$ Total Error Band

The Model 634 6-DOF Sensor is an analog sensor that includes outputs of three gyroscope/rate sensors and three DC accelerometers in one small package. The rate sensors and accelerometers are aligned orthogonally to each other which allow the user to measure motions in all 6 degrees of freedom (6-DOF). The sensor features exceptional accuracy over full operating temperature range with a Total Error Band of $< 2\%$.

Designed specifically for product research and development in harsh environments, the Model 634 can maintain its precision under high shock conditions. The sensor utilizes silicon MEMS Gyro sensing elements with custom electronics and packaging to produce an angular rate sensor that is highly reliable even under excessive shock and vibration environments. The gas damped variable capacitance MEMS acceleration sensors also incorporate integral over-range stops for high-g shock protection and wide operating bandwidth.

For a similar sensor with higher acceleration and angular rate ranges, TE Connectivity also offers the model 633 6-DOF Sensor.

FEATURES

- Low Noise Jacketed Cables
- Rugged Integral Strain Relief
- 5 to 16V Excitation Voltage
- -40 to $+105^\circ\text{C}$ Temperature Range
- Shock Resistant Package
- Low Cross-Axis Sensitivity
- Exceptional Temperature Performance

APPLICATIONS

- Automotive Handling Testing
- Motorsports Applications
- Biomechanics Testing
- Shock & Impact Testing
- Motion Measurements
- Flight Testing

PERFORMANCE SPECIFICATIONS

All values are typical at +24°C and 10Vdc excitation unless otherwise stated. TE Connectivity reserves the right to update and change these specifications without notice.

Parameters

DYNAMIC (ACCELERATION SENSORS)

	-002	-005	-010	-030	-050	-100	Notes
Dash Number	-002	-005	-010	-030	-050	-100	See Ordering Info
Range (g)	±2	±5	±10	±30	±50	±100	
Sensitivity (mV/g)	1000	400	200	67	40	20	±10%
Frequency Response (Hz)	0-400	0-800	0-1200	0-1500	0-1500	0-1500	±1dB
Non-Linearity (%FSO)	±0.1	±0.1	±0.1	±0.1	±0.1	±0.1	BFSL
Transverse Sensitivity (%)	<3	<3	<3	<3	<3	<3	<1% Typical
Shock Limit (g)	2000	5000	5000	5000	5000	5000	
Damping Ratio	0.7	0.7	0.7	0.7	0.7	0.7	
Residual Noise (µV RMS)	360	380	400	440	480	500	Passband

DYNAMIC (RATE SENSORS)

	-100	-500	-1K5	-6K	-12K	-18K	Notes
Dash Number	-100	-500	-1K5	-6K	-12K	-18K	See Ordering Info
Range (deg/sec)	±100	±500	±1500	±6000	±12K	±18K	
Sensitivity (mV/deg/sec)	20.0	4.00	1.33	0.333	0.167	0.111	±15%
Frequency Response (Hz)	0-1000	0-1000	0-1000	0-1000	0-2000	0-2000	+1dB/-3dB
Non-Linearity (%FSO)	±0.5	±0.5	±0.5	±0.5	±0.5	±0.5	BFSL
Cross-Axis Sensitivity (%)	<1	<1	<1	<1	<1	<1	
Shock Limit (g)	3000	3000	3000	3000	5000	5000	
Residual Noise (mV RMS)	18.0	3.66	1.20	3.30	1.22	1.50	Passband

ELECTRICAL

Zero Acceleration Output (mV), Rate Sensors	±100						Differential
Zero Acceleration Output (mV), Accel Sensors	±50						Differential
Excitation Voltage (Vdc)	4.9 to 16.0						Per Channel
Excitation Current (mA)	<8						Per Channel
Influence of Linear Acceleration (deg/sec/g)	0.1						
Common Mode Voltage (Vdc), Rate Sensors	2.5						
Full Scale Output Voltage (Vpk), Rate Sensors	±2						
Common Mode Voltage (Vdc), Accel Sensors	1.22						
Full Scale Output Voltage (Vpk), Accel Sensors	±2						
Output Impedance (Ω)	<100						
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	2x Cables; 12x #30AWG Cond PFA Insulated, Braided Shield, PU Jacket
Weight (cable not included)	40 grams
Mounting	2x #4-40 or M3 Mounting Screw
Mounting Torque	6 lb-in (0.68 N-m)

Calibration Supplied:	CS-FREQ-0100	NIST Traceable Amplitude Calibration to FR Limit
	CS-ARLIN	NIST Traceable Linearity Calibration to FS Range

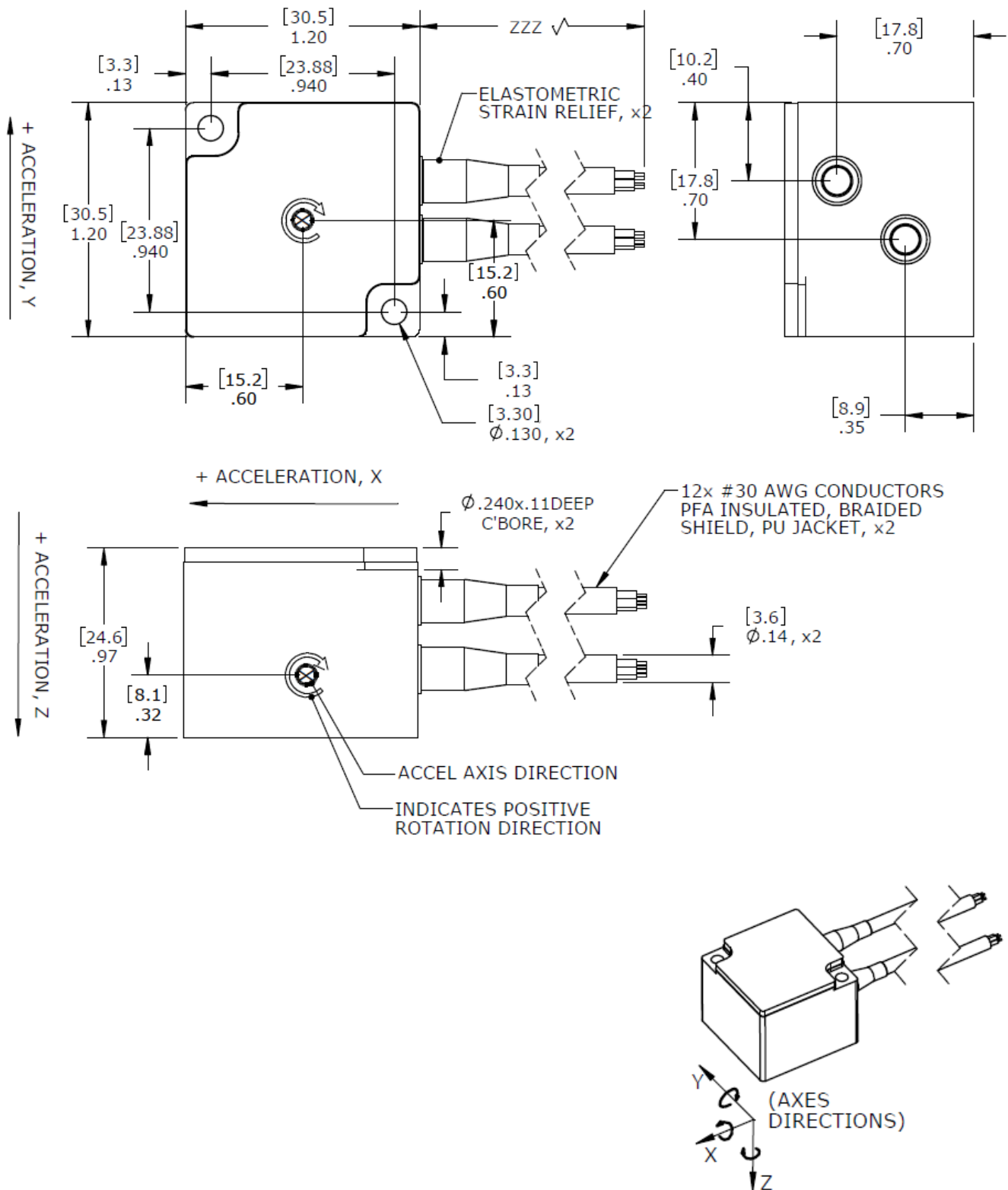
Supplied Accessories:	2x #4-40 (1.0" length) Socket Head Cap Screw
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Optional Accessories:	121	3-Channel Precision Low Noise DC Amplifier
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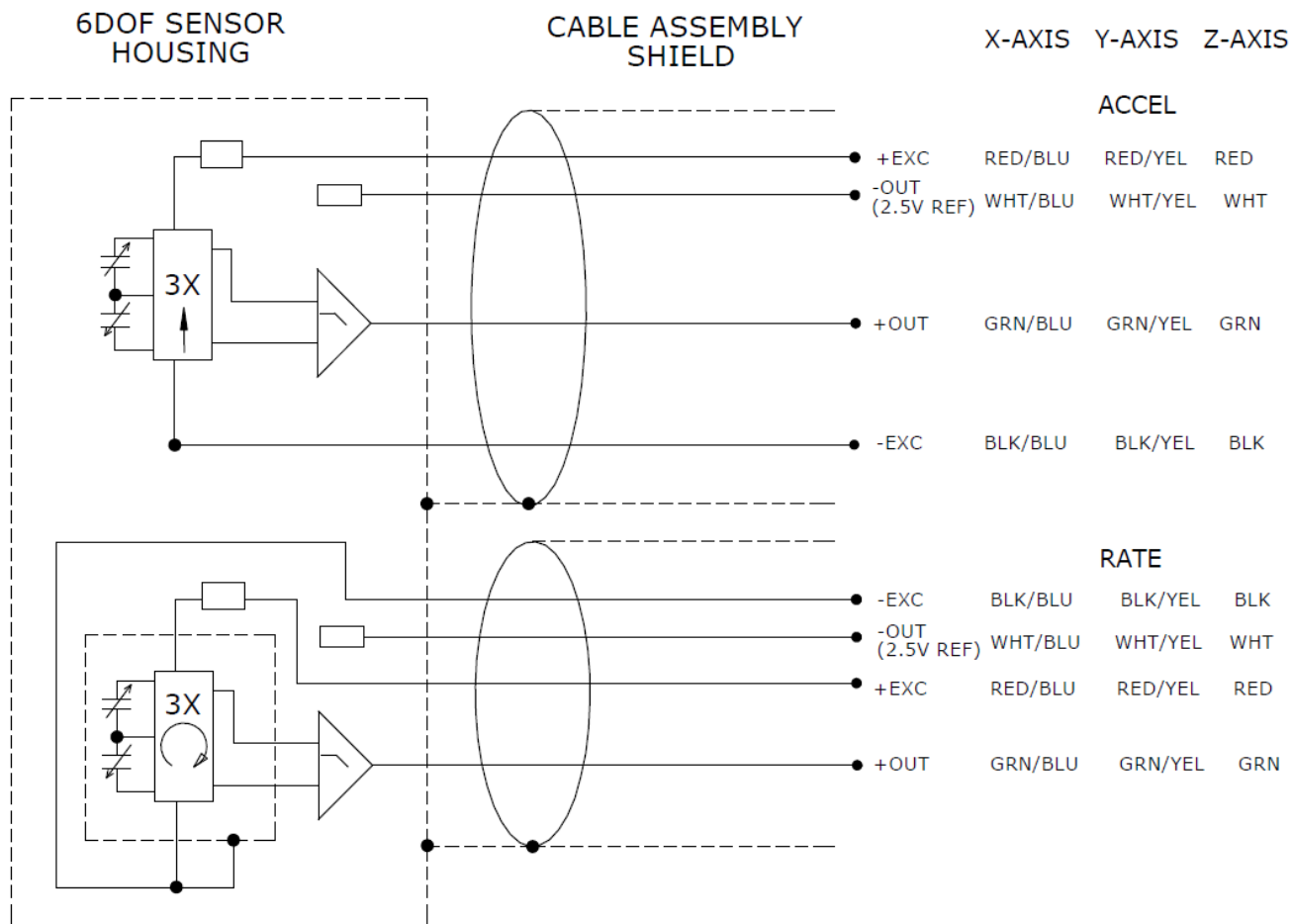
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MODEL 634 SIX-DEGREE OF FREEDOM SENSOR

DIMENSIONS



SCHEMATIC



ORDERING INFORMATION

634	GGG	RRR	ZZZ	XX
Range (Accelerometer)				
002 = 2g				
005 = 5g				
010 = 10g				
030 = 30g				
050 = 50g				
100 = 100g				
Range (Rate Sensor)				
100 = 100deg/sec				
500 = 500deg/sec				
1K5 = 1500deg/sec				
6K = 6000deg/sec				
12K = 12,000deg/sec				
18K = 18,000deg/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				
Reserved for custom designs. Leave blank for standard options listed above.				

Example; 634-010-1K5-120
Model 634, 10g accel range, 1500deg/sec rate range, 120inch (10ft) cable length

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