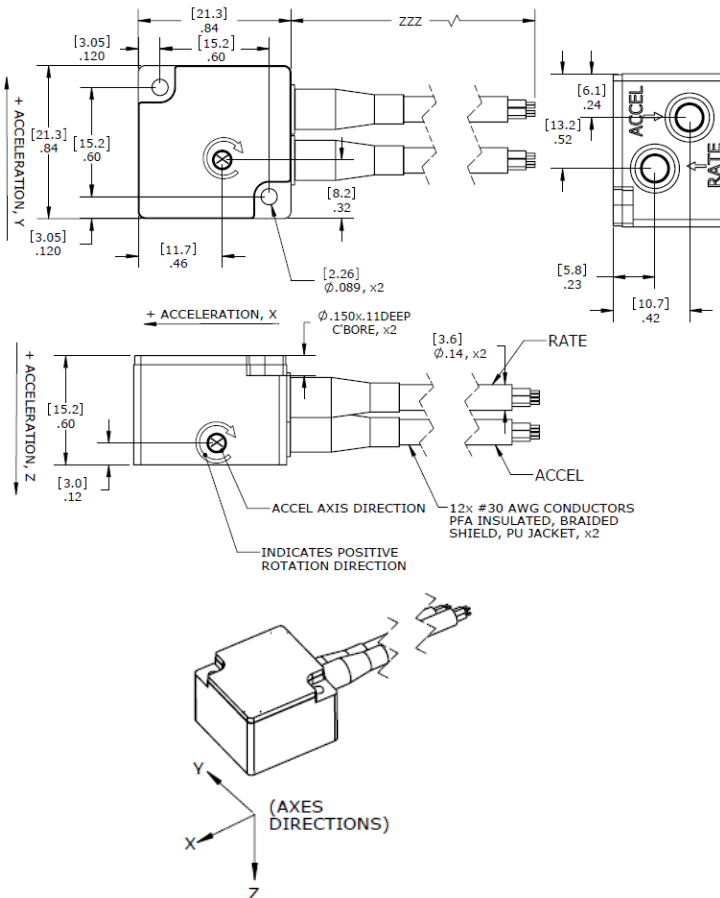


DIMENSIONS



MODEL 633

Six-Degree of Freedom Sensor

SPECIFICATIONS

- Silicon MEMS 6DOF Sensor
- ± 50 to $\pm 6000g$ Acceleration Range
- ± 500 to $\pm 24,000^\circ/\text{sec}$ Rate Range
- Miniature Compact Package
- Rugged Shock Resistant Housing

The Model 633 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). Designed specifically for product research and development in harsh environments, the Model 633 can maintain its precision under high shock condition.

FEATURES

- Low Noise Jacketed Cables
- Rugged Integral Strain Relief
- Reliable Silicon MEMS Sensors
- -40 to $+105^\circ\text{C}$ Temperature Range
- Shock Resistant Package
- Low Cross-Axis Sensitivity
- SAE J211 Compliant Performance

APPLICATIONS

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

PERFORMANCE SPECIFICATIONS

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

Parameters

DYNAMIC (RATE SENSORS)

	-500	-1K5	-6K	-12K	-18K	-24K	Notes
Dash Number	-500	-1K5	-6K	-12K	-18K	-24K	See Ordering Info
Range (deg/sec)	±500	±1500	±6000	±12K	±18K	±24K	
Sensitivity (mV/deg/sec)	4.00	1.33	0.333	0.167	0.111	0.083	Not ratiometric
Frequency Response (Hz)	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	BFSL
Cross-Axis Sensitivity (%)	<1	<1	<1	<1	<1	<1	
Shock Limit (g)	3000	3000	3000	5000	5000	5000	
Residual Noise (mV RMS)	3.66	1.20	3.30	1.22	1.50	1.20	Passband

DYNAMIC (ACCELERATION SENSORS)

	-050	-100	-200	-500	-2K	-6K	Notes
Dash Number	-050	-100	-200	-500	-2K	-6K	See Ordering Info
Range (g)	±50	±100	±200	±500	±2000	±6000	
Sensitivity (mV/g)	2.0	1.1	0.8	0.4	0.15	0.10	Ratiometric ¹
Frequency Response (Hz)	0-1000	0-1200	0-1500	0-2000	0-3500	0-3500	±1/2dB
Natural Frequency (Hz)	4000	6000	8000	10000	23000	26000	
Non-Linearity (%FSO)	±1.0	±1.0	±1.0	±1.0	±1.0	±1.0	
Transverse Sensitivity (%)	<3	<3	<3	<3	<3	<3	
Shock Limit (g)	5000	5000	5000	5000	10000	10000	
Damping Ratio	0.5	0.5	0.5	0.3	0.05	0.05	Typical

ELECTRICAL

Zero Acceleration Output (mV), Rate Sensors	±100						Differential
Zero Acceleration Output (mV), Accel Sensors	±25						
Excitation Voltage (Vdc), Rate Sensors	5 to 16						
Excitation Voltage (Vdc), Accel Sensors	2 to 10						
Excitation Current (mA), Rate Sensors	<8						
Influence of Linear Acceleration (deg/sec/g)	0.1						
Common Mode Voltage (Vdc), Rate Sensors	2.5						±5%
Full Scale Output Voltage (Vpk), Rate Sensors	±2						±15%
Output Resistance (Ω), Rate Sensors	400						
Input Resistance (Ω), Accel Sensors	2400 to 6000						
Output Resistance (Ω), Accel Sensors	2400 to 6000						
Insulation Resistance (MΩ)	>100						@100Vdc
Turn On Time (msec), Rate Sensors	<100						
Ground Isolation	Isolated from Mounting Surface						

ENVIRONMENTAL

Thermal Zero Shift, Rate Sensors (%FSO)	±2.5						-40 to +105°C
Thermal Sensitivity Shift, Rate Sensors (%)	±2.0						-40 to +105°C
Thermal Zero Shift, Accel Sensors (mV/°C)	-0.11 ±0.11						-40 to +105°C
Thermal Sensitivity Shift, Accel Sensors (%/°C)	-0.25 ±0.25						-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	Stainless Steel
Cable	2x Cables; 12x #30AWG Cond PFA Insulated, Braided Shield, PU Jacket
Weight (cable not included)	35 grams
Mounting	2x #2.56 or M2 Mounting Screw
Mounting Torque	4 lb-in (0.45 N-m)

¹ Output is ratiometric to excitation voltage

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

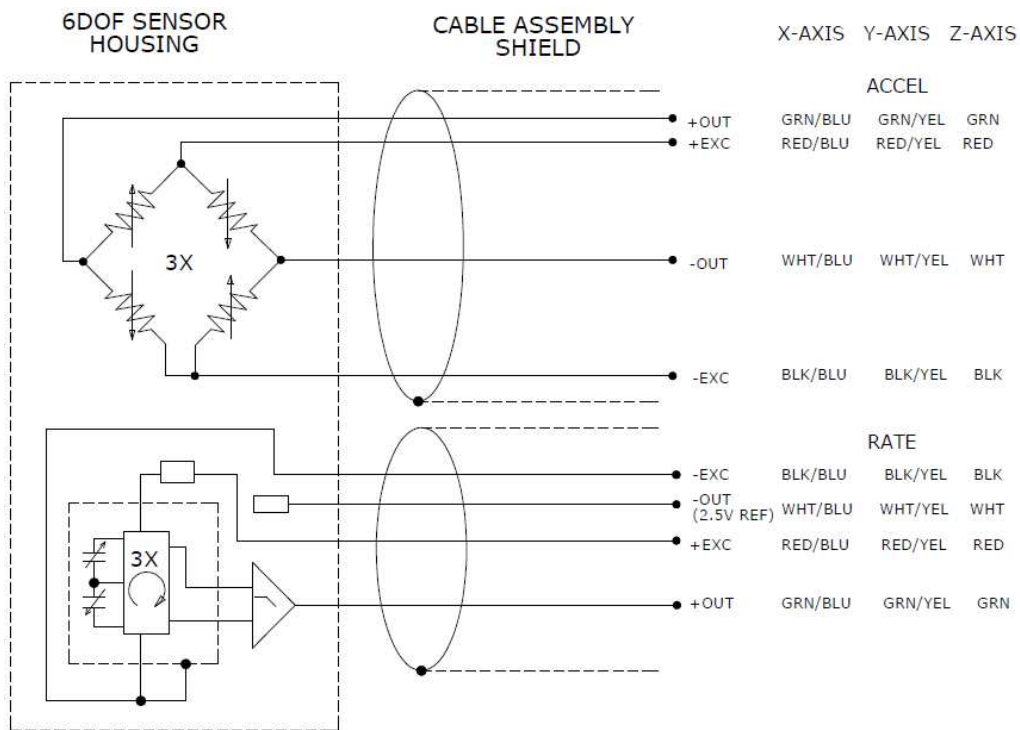
Supplied accessories: AC-D03548 2x #2-56 (3/4" length) Socket Head Cap Screw

Optional accessories: 121 3-Channel Precision Low Noise DC Amplifier
 140 Auto-zero Inline Amplifier

MODEL 633

Six-Degree of Freedom Sensor

SCHEMATIC



The information in this sheet has been carefully reviewed and is believed to be accurate; however, no responsibility is assumed for inaccuracies. Furthermore, this information does not convey to the purchaser of such devices any license under the patent rights to the manufacturer. Measurement Specialties, Inc. reserves the right to make changes without further notice to any product herein. Measurement Specialties, Inc. makes no warranty, representation or guarantee regarding the suitability of its product for any particular purpose, nor does Measurement Specialties, Inc. assume any liability arising out of the application or use of any product or circuit and specifically disclaims any and all liability, including without limitation consequential or incidental damages. Typical parameters can and do vary in different applications. All operating parameters must be validated for each customer application by customer's technical experts. Measurement Specialties, Inc. does not convey any license under its patent rights nor the rights of others.

MODEL 633

Six-Degree of Freedom Sensor

ORDERING INFORMATION

PART NUMBERING Model Number+Accel Range+Rate Range+Cable Length

633-GGG-RRR-ZZZ-XX

| | | | _____ Special requirements, otherwise leave blank
| | | _____ Cable (120 is 120 inches)
| | _____ Rate Range (-500 for 500deg/sec, -12K for 12000deg/sec)
| _____ Accel Range (-050 for 50g, -2K for 2000g)

Example: 633-500-6K-120

Model 633, 500g, 6000deg/sec, 120" Cable

Measurement Specialties, Inc., a TE Connectivity company.

Measurement Specialties, TE Connectivity, TE Connectivity (logo) and EVERY CONNECTION COUNTS are trademarks. All other logos, products and/or company names referred to herein might be trademarks of their respective owners.

The information given herein, including drawings, illustrations and schematics which are intended for illustration purposes only, is believed to be reliable. However, TE Connectivity makes no warranties as to its accuracy or completeness and disclaims any liability in connection with its use. TE Connectivity's obligations shall only be as set forth in TE Connectivity's Standard Terms and Conditions of Sale for this product and in no case will TE Connectivity be liable for any incidental, indirect or consequential damages arising out of the sale, resale, use or misuse of the product. Users of TE Connectivity products should make their own evaluation to determine the suitability of each such product for the specific application.

© 2015 TE Connectivity Ltd. family of companies All Rights Reserved.