



## MODEL 53 & 53A TRIAXIAL CRASH TEST ACCELEROMETER

### Specifications

- Triaxial MEMS Crash Test Accelerometer
- Best in Class Piezoresistive MEMS Sensor
- $\pm 50g$  to  $\pm 2000g$  Dynamic Ranges
- Compliant to SAE J211/J2570
- Compliant to ISO-6487
- Ideal for Crush Zone and Side Impact Installations
- Low Profile, Adhesive Mount

### Features

- Minimal Warm-Up Drift
- 0-4500Hz Bandwidth, All Axes
- Linearity  $< 1\%$
- 10,000g Shock Protection
- 2-10Vdc Excitation
- IP66 Environmentally Sealed
- Optimum Gas Damping
- Multiple Cable Options

### Applications

- Crush Zone Testing
- Auto Safety Testing Applications
- Shock and Impact Testing
- Transient Drop Testing
- Helmet Impact Testing
- Biomechanical Studies

The TE Connectivity model 53 and 53A triaxial crash test accelerometers are some of the most popular sensor to be used in crush zone and side impact testing when a triaxial solution is preferred. The accelerometers feature the next generation of the reliable TE Connectivity piezoresistive MEMS chip with superior stability and measurement accuracy.

The model 53 and 53A accelerometers are both available in ranges from  $\pm 50g$  to  $\pm 2000g$  and features a full-bridge configuration with a nominal  $4000\Omega$  impedance that offers quick warm-up time and minimal drift, unlike lower impedance designs on the market.

Both of the model 53 series accelerometers are fully compliant to the performance requirements of SAE-J211 & SAE-J2570. The accelerometers are packaged in an anodized Aluminum housing and fully encapsulated in Stycast potting for reliable protection in harsh crash test applications.

The model 53 accelerometer has three sets of twisted leads for the electrical interface while the model 53A has an integral 12 wire cable assembly with braided shield and Polyurethane jacket. For a flange mount version of the model 53A, TE Connectivity also offers the model 53AF with identical performance.

TE Connectivity also supplies the calibration data in a user friendly excel format which enables high volume users to quickly upload the calibration information for each sensor installed.

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## MODEL 53 & 53A ACCELEROMETER

### Performance Specifications

All values are typical at +24°C, 80Hz and 10Vdc excitation unless otherwise stated. TE Connectivity reserves the right to update and change these specifications without notice.

#### PARAMETERS

DYNAMIC						NOTES
Range (g)	±50	±100	±200	±500	±2000	
Sensitivity (mV/g) <sup>1</sup>	1.2-3.0	0.6-1.2	0.6-1.2	0.3-0.6	0.12-0.3	@10Vdc Excitation
Frequency Response (Hz)	0-1000	0-1200	0-2000	0-3000	0-4500	±1dB, All Axes
Natural Frequency (Hz)	4000	6000	8000	15000	28000	
Transverse Sensitivity (%)	<3	<3	<3	<3	<3	
Non-Linearity (%FSO)	±1	±1	±1	±1	±1	
Damping Ratio	0.5	0.5	0.5	0.3	0.15	
Shock Limit (g)	10000	10000	10000	10000	10000	

#### ELECTRICAL

Zero Acceleration Output (mV)	<±50					Differential
Excitation Voltage (Vdc)	2 to 10					
Input Resistance (Ω)	3500-4500					
Output Resistance (Ω)	3500-4500					
Insulation Resistance (MΩ)	>100					@100Vdc
Residual Noise (μV RMS)	<10					
Ground Isolation	Isolated from mounting surface					
Warm-up Time	<10 seconds					@10Vdc Excitation

#### ENVIRONMENTAL

Thermal Zero Shift (%FSO/°C)	±0.04					From 0 to +50°C
Thermal Sensitivity Shift (%/°C)	-0.20 ±0.05					From 0 to +50°C
Operating Temperature (°C)	-20 to +85					
Storage Temperature (°C)	-20 to +85					
Humidity	Epoxy Sealed, IP66					

#### PHYSICAL

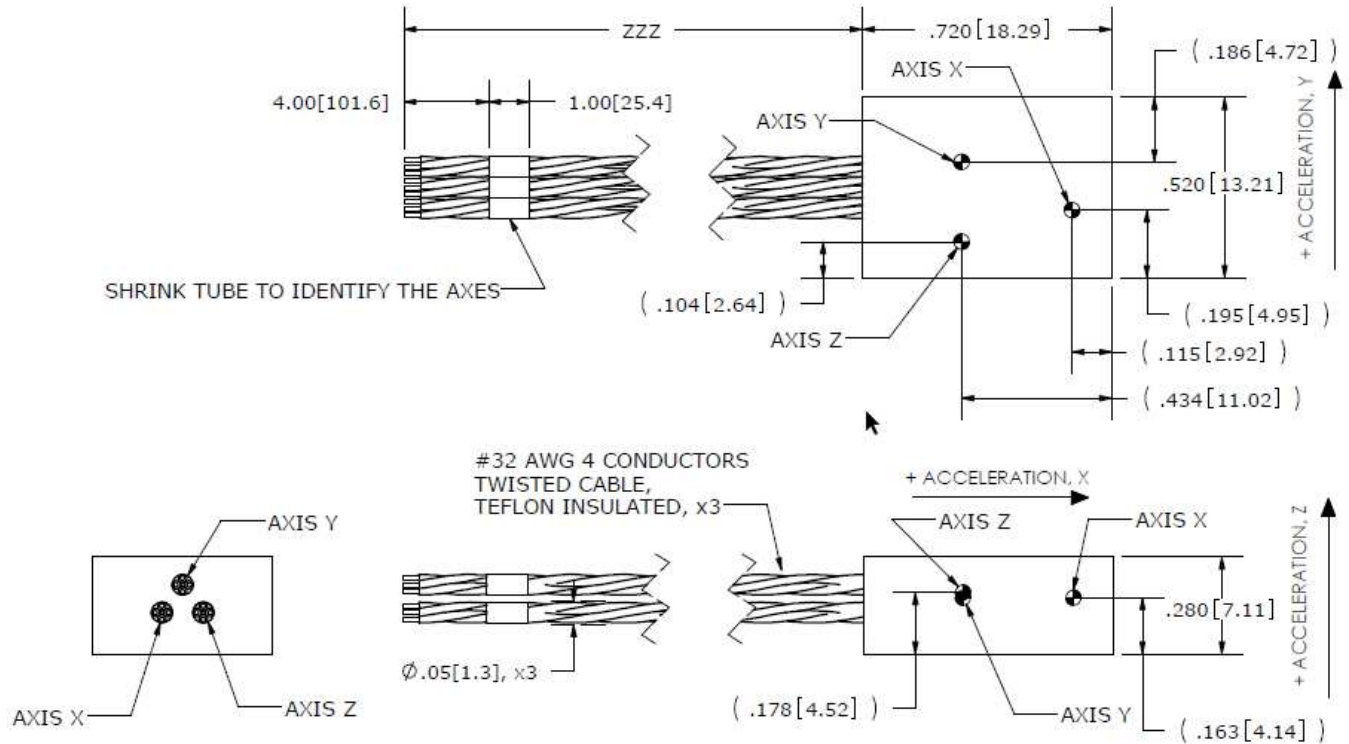
Case Material	Anodized Aluminum					
Cable, Model 53	#32 AWG Twisted Conductors, PFA Insulated					
Cable, Model 53A	#30 AWG Conductors PFA Insulated, Braided Shield, PU Jacket					
Weight (grams)	3.5					Cable not included
Mounting	Adhesive					

<sup>1</sup> Output is ratiometric to excitation voltage

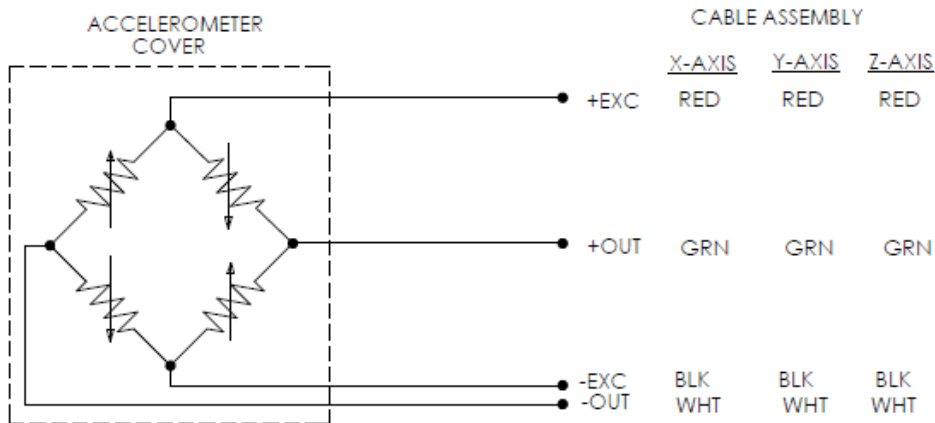
<b>Calibration supplied:</b>	CS-FREQ-0100	NIST Traceable Amplitude Calibration from 20Hz to 4000Hz
<b>Optional accessories:</b>	121	3-Channel Precision Low Noise DC Amplifier
	140A	Auto-Zero Inline Amplifier

# MODEL 53 & 53A ACCELEROMETER

## Dimensions, Model 53

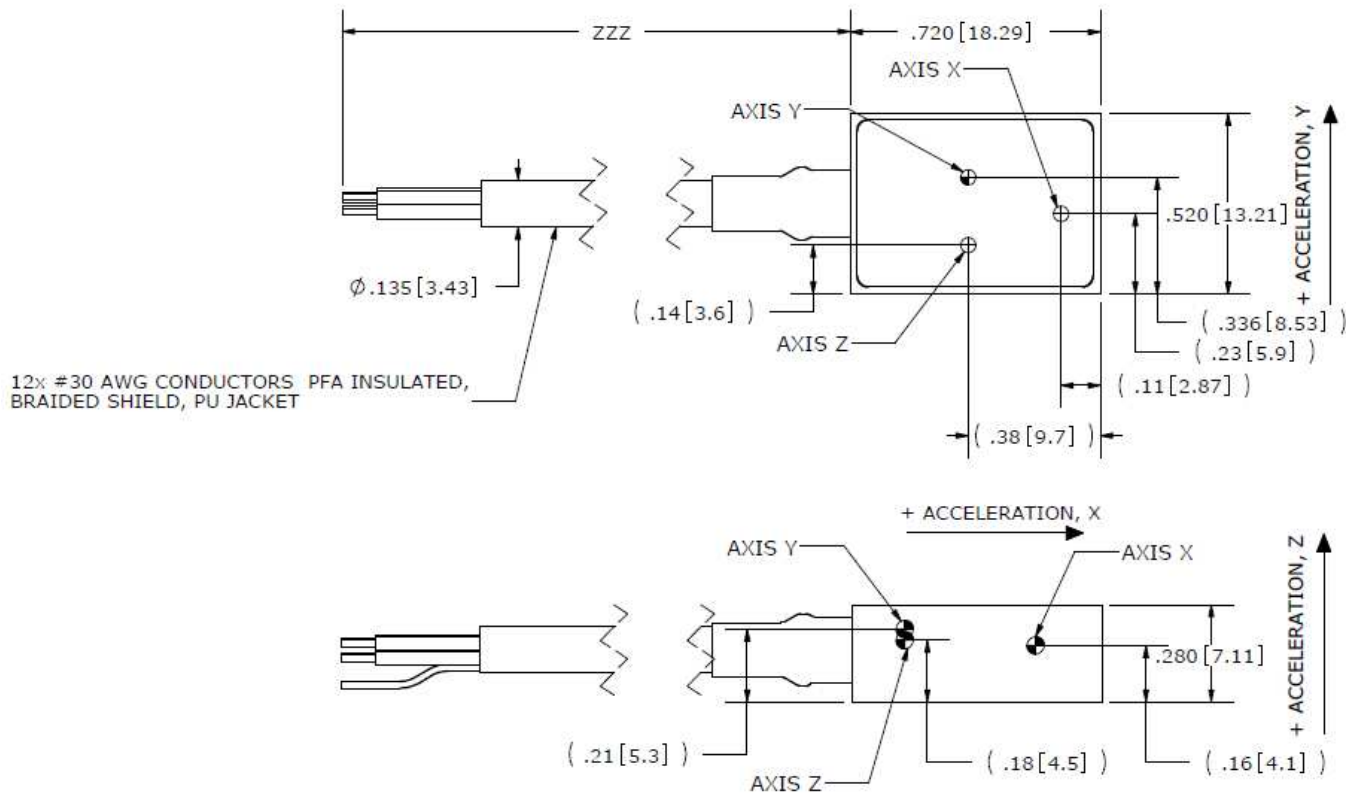


## Schematic, Model 53

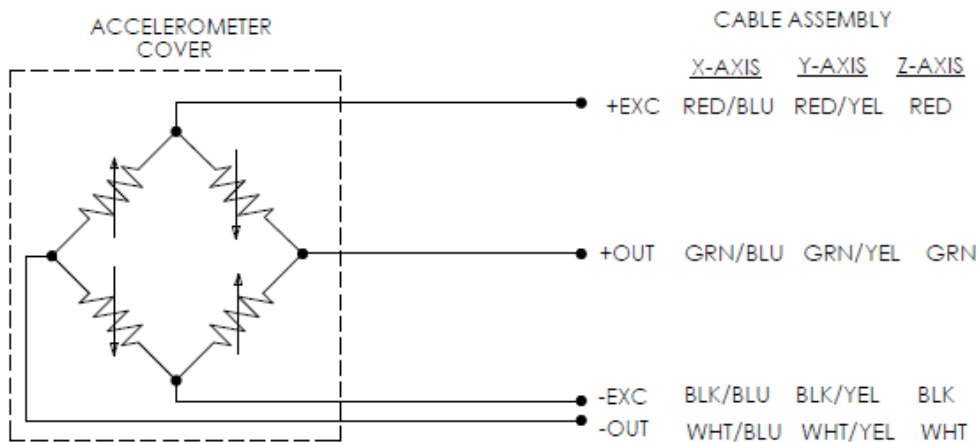


# MODEL 53 & 53A ACCELEROMETER

## Dimensions, Model 53A



## Schematic, Model 53A



## MODEL 53 & 53A ACCELEROMETER

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### Ordering Information

**53 (twisted conductor leads)**  
**53A (shielded jacketed cable)**

**GGGG**

**ZZZ**

**XXX**

**Range**

0050 = 50g  
0100 = 100g  
0200 = 200g  
0500 = 500g  
2000 = 2000g

**Cable length**

120 = 120 inches, 10ft  
240 = 240 inches, 20ft  
360 = 360 inches, 30ft  
  
197 = 197 inches, 5 meters  
276 = 276 inches, 7 meters  
394 = 394 inches, 10 meters

**Excitation Voltage Option**

Blank = 10Vdc  
003 = 5Vdc

Example;53-2000-360

Model 53 (twisted conductor leads), 2000g range, 360inch (30ft) cable length

Example;53A-0500-276-003

Model 53A (shielded jacketed cable), 500g range, 276inch (7m) cable length, 5V calibration

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