

# MODEL 53 & 53A ACCELEROMETER

## SPECIFICATIONS

- Triaxial DC Accelerometer
- Low Cost, High Performance
- $\pm 50g$  to  $\pm 2000g$  Range
- Low Profile, Adhesive Mount

The Model 53 Accelerometer is a small, compact triaxial device designed for vehicle impact and road testing. The accelerometer incorporates gas-damped MEMS sensing elements with mechanical stops for high overload protection. Featuring ranges from  $\pm 50g$  to  $\pm 2000g$  and frequency response to 5000Hz, this sensor is easily mounted in hard to reach places on vehicles under test.

## FEATURES

- -20 to +85°C Operating Range
- 2-10 Vdc Excitation
- $\pm 50$  mV Zero Measurand Output
- Gas Damping
- Mechanical Overload Stops
- Designed for Adhesive Mounting

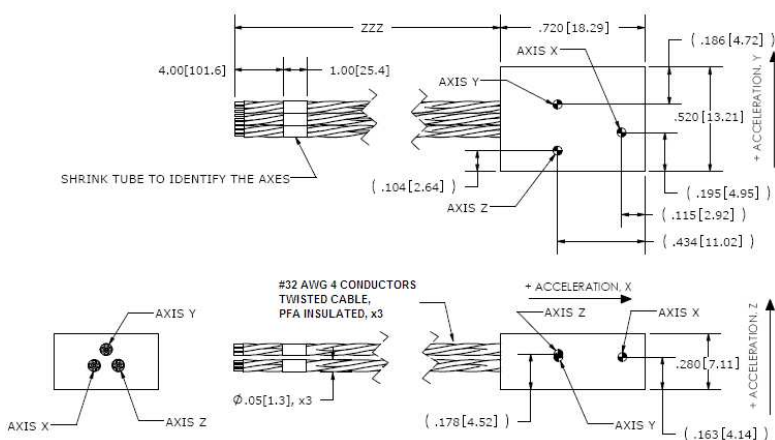
## APPLICATIONS

- Crash Testing
- Impact Testing
- Off Road Testing
- Vehicle Testing

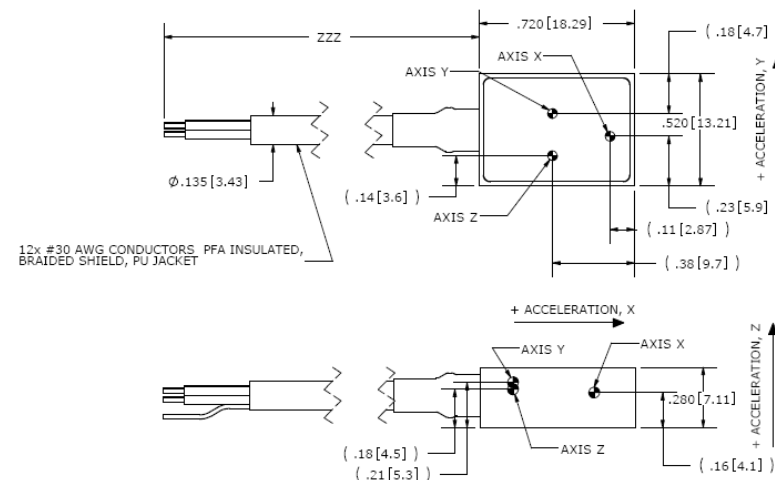


## DIMENSIONS

### 53 Dimensions



### 53A Dimensions



**PERFORMANCE SPECIFICATIONS**

All values are typical at  $\pm 24^{\circ}\text{C}$ , 80Hz and 10Vdc excitation unless otherwise stated. Measurement Specialties reserves the right to update and change these specifications without notice.

**Parameters**

**DYNAMIC**

	$\pm 50$	$\pm 200$	$\pm 500$	$\pm 2000$	<b>Notes</b>
Range(g)	$\pm 50$	$\pm 200$	$\pm 500$	$\pm 2000$	
Sensitivity (mV/g)	2	0.9	0.4	0.15	Ratiometric to Exc. Voltage
Frequency Response, Z Axis (Hz)	0-1000	0-2000	0-3000	0-4500	$\pm 1\text{dB}$
Frequency Response, X & Y Axis (Hz)	0-500	0-1000	0-1500	0-2500	$\pm 1\text{dB}$
Resonant Frequency (Hz)	4000	8000	15000	26000	
Damping Ratio	0.5	0.5	0.3	0.05	Typical
Shock Limit (g)	5000	5000	5000	5000	
Non-Linearity (% FSO)	$\pm 1$	$\pm 1$	$\pm 1$	$\pm 1$	Of Reading
Transverse Sensitivity (%)	<3	<3	<3	<3	

**ELECTRICAL**

Zero Acceleration Output (mV)	< $\pm 50$				
Excitation (Vdc)	2 to 10				
Input Resistance ( $\Omega$ )	2400-6000				
Output Resistance ( $\Omega$ )	2400-6000				
Insulation Resistance (M $\Omega$ )	>100				@100Vdc
Residual Noise ( $\mu\text{V RMS}$ )	<10				
Ground Isolation	Isolated from Mounting Surface				

**ENVIRONMENTAL**

Thermal Zero Shift (%FSO/ $^{\circ}\text{C}$ (%FSO/ $^{\circ}\text{F}$ ))	$\pm 0.05 (\pm 0.03)$				From 0 to $+50^{\circ}\text{C}$
Thermal Sensitivity Shift (%/ $^{\circ}\text{C}$ (%/ $^{\circ}\text{F}$ ))	$-0.20 \pm 0.05 (-0.11 \pm 0.03)$				From 0 to $+50^{\circ}\text{C}$
Operating Temperature ( $^{\circ}\text{C}$ ( $^{\circ}\text{F}$ ))	-20 to $+85$ (-4 to $+185$ )				
Storage Temperature ( $^{\circ}\text{C}$ ( $^{\circ}\text{F}$ ))	-40 to $+90$ (-40 to $+194$ )				
Humidity	Epoxy Sealed, IP65				

**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				Without cable
Mounting	Adhesive				

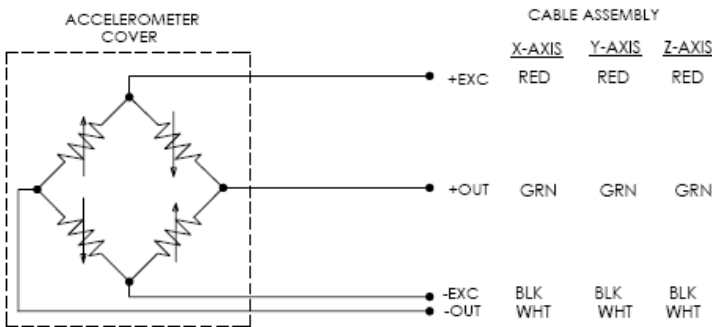
**Calibration supplied:** CS-FREQ-0100 NIST Traceable Amplitude Calibration from 20Hz to  $\pm 1\text{dB}$  Frequency Response Limit

**Optional accessories:** 121 Three Channel DC Signal Conditioner Amplifier  
140A Auto-zero Inline Amplifier

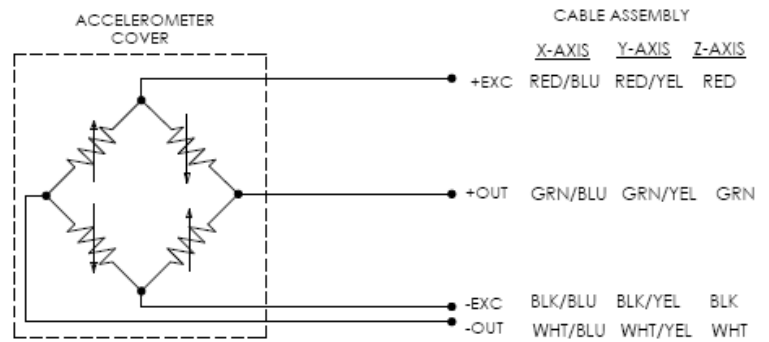
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SCHEMATIC

53 Schematic



53A Schematic



ORDERING INFORMATION

PART NUMBERING Model Number+Range+Cable Length

53-GGGG-CCC-XXX  
 | | | Options (leave blank otherwise)  
 | | | Cable (360 is 360 inches)  
 | | | Range (0500 is 500g)

Example: 53-0500-360  
 Model 53, 500g, 360" (30ft) Cable

Optional Dash Number  
 -003 5Vdc Calibration

53A-GGGG-CCC-XXX  
 | | | Options (leave blank otherwise)  
 | | | Cable (360 is 360 inches)  
 | | | Range (0500 is 500g)

Example: 53A-0500-360  
 Model 53A, 500g, 360" (30ft) Cable

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