ENDEVCO
AN AMPHENOL COMPANY

PERFORMANCE SPECIFICATION
TRIAXIAL ACCELEROMETER
65M1-XXX

Document Number	Rev	Date	Entered by	Description of Change	Change Accountable Engineer	ECO
76313	NR	10/6/22	NAD	Initial Release of Triaxial Accelerometer 65M1-XXX Performance Specification	DAM	53601

1.0 DESCRIPTION

The ENDEVCO Model 65M1 is a miniature triaxial accelerometer designed for laboratory testing and modal analysis data acquisition. The ENDEVCO Model 65M1 is packaged in a 11.2 mm cube of welded titanium construction. This is a rugged sensor that can withstand shock levels greater than comparable cantilever beam accelerometers. An isolation jacket encapsulates the accelerometer to provide electrical isolation against the mounting surface.

Interface to the ENDEVCO Model 65M1 triaxial accelerometer is made via side connector Microtech style 4-pin receptacle. Power to the ENDEVCO Model 65M1, in the form of a constant current, travels through the same pins as the low impedance output signals. The ENDEVCO Model 65M1 is designed for adhesive mount.

The following performance specifications conform to ISA-RP-37.2 (1964) and are typical values, referenced at +75°F (+24°C), 4 mA, and 100 Hz, unless otherwise noted. Calibration data, traceable to National Institute of Standards and Technology (NIST), are supplied.

		Units	-10	-100
2.0	DYNAMIC CHARACTERISTICS			
2.1	RANGE	g	±500	±50
2.2	VOLTAGE SENSITIVITY			
2.2.1	Typical	mV/g	10	100
2.2.2	Tolerance	%	±20	±20
2.3	FREQUENCY RESPONSE			
2.3.1	±1dB Amplitude Response	Hz	.4 to 4000	1.5 to 4000
2.3.2	±3dB Amplitude Response	Hz	.2 to 8000	.7 to 8000
2.3.3	Resonance	Hz	50000	42000
2.3.4	Phase Response, ±5°	Hz	3 to 1500	10 to 1500

	UNITS	-10	-100

2.4	TEMPERATURE RESPONSE			
2.4.1	Sensitivity Deviation, ±5%			+32°F to +104°F (0°C to +40°C)
2.4.2	Sensitivity Deviation, ±10%			-4°F to +185°F (-20°C to +85°C)
2.4.3	Bias Voltage	Vdc		+6 to +16
2.5	TRANSVERSE SENSITIVITY [1]	%		<5
2.6	AMPLITUDE LINEARITY	%		<1

3.0 <u>OUTPUT CHARACTERISTICS</u>

3.1	OUTPUT POLIARITY			see arrows on outline drawing
3.2	DC OUTPUT BIAS VOLTAGE [2]	Vdc		+12.3 to +13.5
3.3	OUTPUT CONNECTION			see connection diagram
3.4	OUTPUT IMPEDANCE			
3.4.1	2mA to 3mA	Ω		<300
3.4.2	3mA to 20mA	Ω		<100
3.5	FULL SCALE OUTPUT	Vpk		±5
3.6	NOISE (Floor)			
	Broadband (2Hz to 10kHz)	µG rms	800	400
	Spectral:	µG/√Hz		
	1 Hz		500	300
	10 Hz		80	50
	100 Hz		15	10
	1 kHz		6	4
3.7	GROUNDING			signal ground is connected to the case and Isolated from the mounting surface

	Units	-10	-100

4.0 <u>POWER REQUIREMENT</u>

4.1	CURRENT REQUIREMENT	mA		+2 to +20	
4.2	VOLTAGE SUPPLY	Vdc		+23 to +30	
4.3	WARM-UP TIME (time to reach 10% of final bias)	sec		<20	
5.0	ENVIRONMENTAL CHARACTERISTICS				
5.1	TEMPERATURE RANGE				
5.1.1	Operating			-65°F to +257°F (-55°C to +125°C)	
5.1.2	Storage			-65°F to +257°F (-55°C to +125°C)	
5.2	HUMIDITY			welded construction	
5.3	SINUSOIDAL VIBRATION LIMIT	g pk	±500		±200
5.4	SHOCK LIMIT [3]	g pk	10000		10000
5.5	BASE STRAIN SENSITIVITY At 250µ strain	eq. g/µstrain	<0.0007		<0.0006
5.6	THERMAL TRANSIENT SENSITIVITY	eq. g/°F	0.006		0.004
5.7	Electromagnetic Sensitivity	eq. g/Gauss	.0003		.0002
6.0	PHYSICAL CHARACTERISTICS				
6.1	DIMENSIONS			0.39 inch (10mm) cube	
6.2	WEIGHT	oz (gram)		0.17 (5)	
6.3	CASE MATERIAL				
6.3.1	Inner Case			Titanium, commercially pure	
6.3.2	Outer Case			Aluminum, anodized	
		Units	-10		-100
6.4	CONNECTOR [4]			4-pin Microtech-style side mounted	

6.5	MOUNTING [5]		adhesive
7.0	CALIBRATION		
7.1	SUPPLIED, each axis		
7.1.1	Sensitivity	mV/g	
7.1.2	Transverse Sensitivity	%	
7.1.3	Frequency Response	Hz	20 to 6000
8.0	ACCESSORIES		
8.1	SUPPLIED		
	CABLE ASSEMBLY		3027AM3-120, 1X [6] [7] [9]
	MOUNTING WAX		32279, 1X [9]
8.2	OPTIONAL		
	CABLE ASSEMBLY		3027A-120 [6]
	CABLE ASSSEMBLY		3027AVM13-XXX [7]

NOTES:

[1] 3% maximum transverse sensitivity is available on request

[2] 22 Vdc minimum must be available to the accelerometer to ensure full scale operation at the temperature extremes.

[3] Shock pulses of short duration may excite transducer resonance. Shock level above the sinusoidal vibration limit may produce temporary zeroshift, which will result in erroneous velocity or displacement data after integration.

[4] Microtech DR-4S-4 receptacle mates with Endevco Model 3027AM3.

[5] Be careful not to apply abusive forces when removing the accelerometer from a structure. Hammer taps and wrench 'snaps' often impart permanent damage to the case and internal sensors.

[6] The 3027A cable assembly should be used in applications where the accelerometer is used near its upper temperature extreme, 257°F (125°C). The supplied cable assembly, the 3027AM3-120, is rated for use up to only 185°F (85°C).

[7] The 3027ABM13-XXX cable assembly should be used as a 257°F (125°C) extension cable for model 3027AM3-120. Cable length, in inches, is specified by a model number suffix. A 120-inch cable, model 3027AVM13-120, is standard. Varied lengths are also available on special order.

8 Due to mounting limitation, a reverse polarity will be printed on the Calibration Certificate on the "X" axis.

[9] For -R units, the indicated accessories are optional.

10 Model Number Definition

65M1-XXX-R

Indicates replacement unit

Demotes acceleration range in mV/g

Basic Model Number

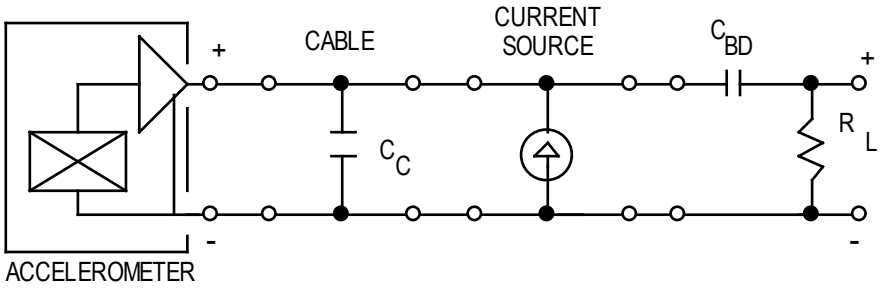

FIGURE 1
Connection Diagram
Each Axis

Range is dependent on the sensitivity of the unit and bias, and the compliance voltage of the constant current power source. The positive range is limited to the difference between the compliance voltage and the unit's bias, divided by the unit's sensitivity. The negative range is limited to approximately 2 volts less than the bias voltage divided by the unit's sensitivity. Cable capacitance C_C will load the accelerometer output, affecting frequency response, and is dependent on the magnitude of constant current. R_L should not be less than 100kΩ.

Bias decoupling capacitor (C_{BD}) and load resistor (R_L) can be determined from:

$$f_{-3dB} = \frac{1}{2 \pi R_L C_{BD}}$$ where f_{-3dB} is the lowest frequency of interest.