

PERFORMANCE SPECIFICATION  
 PIEZOELECTRIC ACCELEROMETER  
 2221F-X

Document Number	Rev	Date	Entered by	Description of Change	Change Accountable Engineer	ECO
77412	NR	2/27/23	NAD	Initial Release of 2221F-X Performance Specification	DAM	53548

1.0 DESCRIPTION

The ENDEVCO® Model 2221F piezoelectric accelerometer is designed specifically for high temperature vibration measurement on small structures and objects. The unit is hermetically sealed for use in extreme environment and ensure long term stability. Its light weight (11 gm) effectively minimizes mass loading effects.

The Model 2221F features ENDEVCO's PIEZITE® Type P-8 crystal element, operating in annular shear mode, which exhibits excellent output sensitivity stability over time. This piezoelectric accelerometer self-generates its high impedance output and requires no external power for operation. Signal ground is connected to the outer case of the unit, and when used with an isolated mounting screw, the accelerometer is electrically isolated from ground. A low-noise coaxial cable is required for error-free operation. The transducer has a centrally located thru bolt, allowing for 360° cable orientation. The unit may also be adhesively mounted if the application permits.

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

		<u>UNITS</u>	
2.0	<u>DYNAMIC CHARACTERISTICS</u>		
2.1	CHARGE SENSITIVITY		
2.1.1	Typical	pC/g	10.0
2.1.2	Minimum	pC/g	7.5
2.2	FREQUENCY RESPONSE		See Typical Curve
2.2.1	Resonance Frequency		
2.2.1.1	Typical	kHz	45
2.2.1.2	Minimum	kHz	40
2.2.2	Amplitude Response [1]		
	± 5%	Hz	1 to 10 000
	±1 dB (ref.)	Hz	.1 to 12000

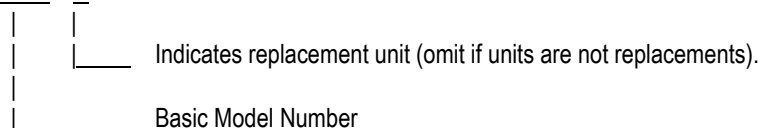
		<u>UNITS</u>	
2.3	TEMPERATURE RESPONSE		See Typical Curve
2.3.1	-67°F (-55°C) max/min	%	-25 / 0
2.3.2	+500°F (+260°C) max/min	%	+40 / 0
2.4	TRANSVERSE SENSITIVITY	%	≤ 3
2.5	AMPLITUDE LINEARITY Per 400 g, 0 to 2000 g	%	1
3.0	<u>ELECTRICAL CHARACTERISTICS</u>		
3.1	OUTPUT POLARITY		Acceleration directed into the base of the unit produces positive output.
3.2	RESISTANCE	GΩ	≥ 10
3.2.1	At 350°F (177°C)	GΩ	≥ 1
3.3	ISOLATION	MΩ	10
3.3	CAPACITANCE	pF	900
3.4	GROUNDING		Signal return is connected to case. Case is isolated from mounting surface by insulated screw assembly.
4.0	<u>ENVIRONMENTAL CHARACTERISTICS</u>		
4.1	TEMPERATURE RANGE		-67°F to +500°F (-55°C to +260°C)
4.2	HUMIDITY		Hermetically Sealed
4.3	SINUSOIDAL VIBRATION LIMIT	g pk	1000
4.4	SHOCK LIMIT [2]	g pk	3000
4.5	BASE STRAIN SENSITIVITY	equiv. g pk/μ strain	0.02
4.6	THERMAL TRANSIENT SENSITIVITY	equiv. g pk/°F (°C)	0.004 (0.007)
5.0	<u>PHYSICAL CHARACTERISTICS</u>		
5.1	DIMENSIONS		See Outline Drawing
5.2	WEIGHT	gm (oz)	11 (0.39)
5.3	CASE MATERIAL		Stainless Steel

		<u>UNITS</u>	
5.4	CONNECTOR		Coaxial, 10-32 male thread
5.5	MOUNTING TORQUE	lbf-in (Nm)	8 (1)
6.0	<b><u>ACCESSORIES</u></b>		
6.1	SUPPLIED		
6.1.1	Cable Assembly	1 x [3]	Model 3090C-120 (10 ft)
6.1.2	Insulated Mounting Screw	1 x	P/N 10207
6.1.3	Allen Wrench]	1 x [3]	P/N EHM49
6.1.4	Adhesive Mounting Adaptor	1 x [3]	Model 2987
6.2	OPTIONAL		
6.2.1	Mounting Screw Assy	1 x	P/N 34802
7.0	<b><u>CALIBRATION</u></b>		
7.1	SUPPLIED		
7.1.1	Frequency Response	% dB	20 Hz to 10 000 Hz 10 kHz to 50 kHz
7.1.2	Charge Sensitivity	pC/g	
7.1.3	Maximum Transverse Sensitivity	%	
7.1.4	Capacitance	pF	

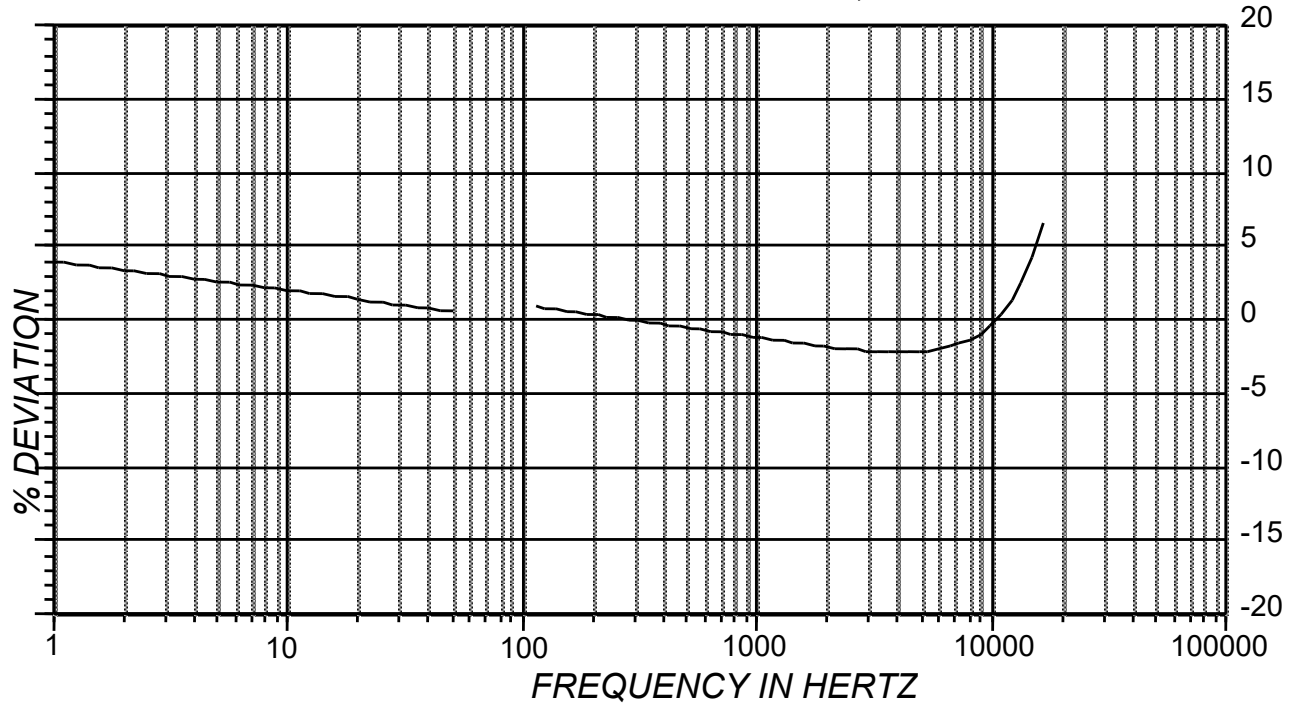
## 8.0 **NOTES**

- [1] Low-end response of the transducer is a function of its associated electronics.
- [2] Shock pulses of short duration may excite transducer resonance. Shock level above the sinusoidal vibration limit may produce temporary zershift which will result in erroneous velocity or displacement data after integration.
- [3] For “-R” assemblies the noted accessories are optional.
- 4 Model Number Definition:

2221F – R



**TYPICAL AMPLITUDE RESPONSE, MODEL 2221F**



**TYPICAL TEMPERATURE RESPONSE, MODEL 2221F**

