

PERFORMANCE SPECIFICATION
 PIEZOELECTRIC ACCELEROMETER
 7724

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77760	NR	7/11/23	NAD	Initial Release of Performance Specification for Piezoelectric Accelerometer 7724	DAM	53938

1.0 DESCRIPTION

The ENDEVCO® Model 7724 ISOSHEAR piezoelectric accelerometer is designed for vibration measurement in structures and objects at cryogenic temperatures. This ISOSHEAR design is extremely stable and virtually insensitive to such environmental inputs as base bending and thermal transients, especially large amplitude, quick duration temperature gradients. The device is virtually immune to spurious high frequency discharge after exposure to temperature transients of greater than +100°F (+38°C) per minute. This accelerometer is hermetically sealed against external contamination.

The Model 7724 features ENDEVCO's PIEZITE® Type P-23 crystal element, operating in the shear mode, which exhibits low base strain sensitivity, high resonance frequency, and excellent output stability over time. This piezoelectric accelerometer self-generates its high impedance output and requires no external power for operation. Signal ground is isolated from the outer case of the unit. The accelerometer features a 10-32 top-connector. A low-noise coaxial cable is required for error-free operation.

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	3.7
2.1.2	Minimum	pC/g	3.0
2.2	FREQUENCY RESPONSE		See Typical Curve, Page 4
2.2.1	Resonance Frequency		
2.2.1.1	Typical	kHz	20
2.2.1.2	Minimum	kHz	18
2.2.2	Amplitude Response [1]		
	± 5%	Hz	1 to 4000
	±1dB (ref.)	Hz	1 to 6000

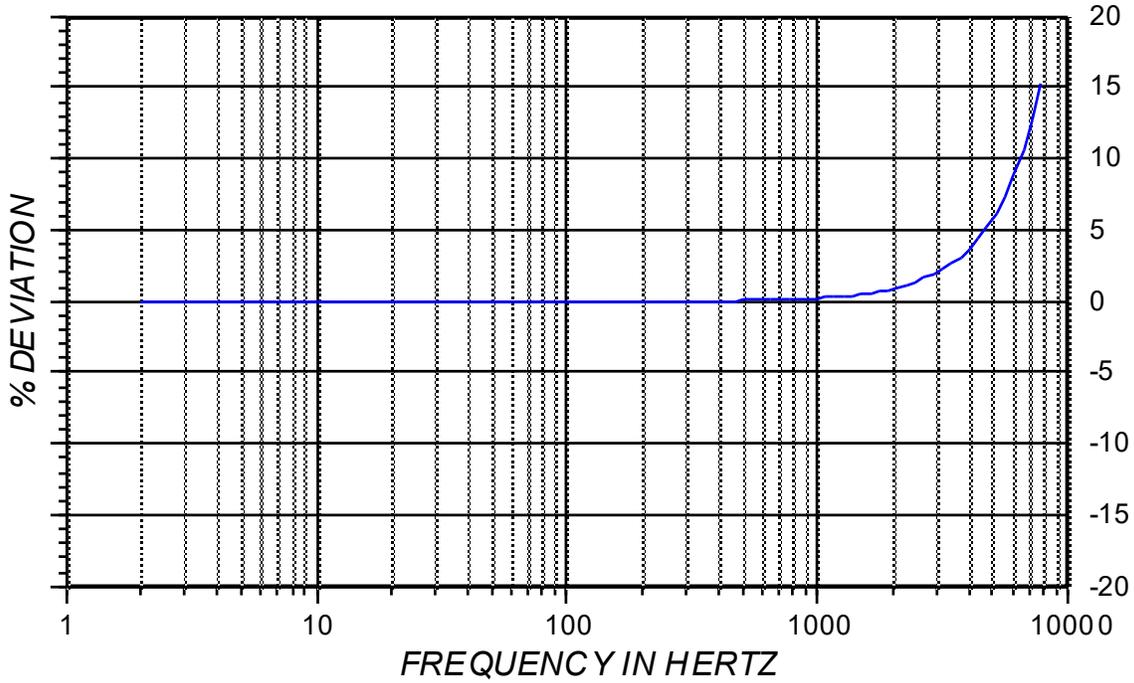
		<u>UNITS</u>	
2.3	TEMPERATURE RESPONSE		See Typical Curve, Page 4
2.3.1	-300°F (-184°C) max/min	%	+10 / -2
2.3.2	+350°F (+177°C) max/min	%	+2 / -10
2.4	TRANSVERSE SENSITIVITY	%	≤ 3
2.5	AMPLITUDE LINEARITY Up to vibration limit	%	1/500 g
3.0	<u>ELECTRICAL CHARACTERISTICS</u>		
3.1	OUTPUT POLARITY		Acceleration directed into base of unit produces positive output at center socket of receptacle.
3.2	RESISTANCE [2]	GΩ	≥ 10
3.2.1	At +350°F (+177°C)	MΩ	≥ 250
3.3	ISOLATION [2]	GΩ	≥ 1
3.3.1	At +350°F (+177°C)	MΩ	≥ 100
3.4	CAPACITANCE	pF	120
3.5	GROUNDING		Signal return isolated from case
4.0	<u>ENVIRONMENTAL CHARACTERISTICS</u>		
4.1	TEMPERATURE RANGE [3]		-300°F to +350°F (-184°C to +177°C)
4.2	HUMIDITY		Hermetically sealed
4.3	SINUSOIDAL VIBRATION LIMIT	g pk	500
4.4	SHOCK LIMIT [4]	g pk	2500
4.5	BASE STRAIN SENSITIVITY	equiv. g pk/μ strain	0.0008
4.6	ELECTROMAGNETIC SENSITIVITY	equiv. g rms/gauss	0.0003
4.7	TRANSIENT TEMPERATURE ERROR [5]	equiv. g pk/°F	0.001

		<u>UNITS</u>	
5.0	<u>PHYSICAL CHARACTERISTICS</u>		
5.1	DIMENSIONS		See Outline Drawing
5.2	WEIGHT	gm (oz)	29 (1.0)
5.3	CASE MATERIAL		Stainless Steel
		<u>UNITS</u>	
5.4	CONNECTOR		Coaxial receptacle with 10-32 UNF threads designed to mate with ENDEVCO Model 3000 series cable assembly.
5.5	MOUNTING TORQUE	lbf-in (N-m)	18 (2)
6.0	<u>ACCESSORIES</u>		
6.1	SUPPLIED		
6.1.1	Cable Assembly	1 x	Model 3090C-120 (10 ft)
6.1.2	Mounting Stud, 10-32, Hex I.D.	1 x	Model 92981-12
6.1.3	Hex Key Wrench	1 x	EHM464
6.2	OPTIONAL		
6.2.1	Mounting Stud	1 x	Model 2981-4
6.2.2	Adapter Stud, 10-32	1 x	Model 2981-3
7.0	<u>CALIBRATION</u>		
7.1	SUPPLIED		
7.1.1	Charge Frequency Response	% dB	20 to 4 kHz 4 kHz thru resonance
7.1.2	Charge Sensitivity	pC/g	
7.1.3	Maximum Transverse Sensitivity	%	
7.1.4	Capacitance	pF	

NOTES

- [1] Low-end response of the transducer is a function of its associated electronics.
- [2] Prolonged exposure at maximum temperature may decrease the return to room temperature resistance to as low as 100 M Ω but will not degrade the overall performance of unit. All units are processed to initially meet 10 G Ω at room temperature.
- [3] The device is sampled tested at -300°F (-184°C) during assembly, but is capable of withstanding exposure at -452°F (-269°C).
- [4] 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.
- [5] With 1 Hz high pass filter.

TYPICAL AMPLITUDE RESPONSE



TYPICAL TEMPERATURE RESPONSE

