

PERFORMANCE SPECIFICATION
 VHF ISOTRON ACCELEROMETER
 7259B-XXX

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80165	NR	3/27/25	DAM	Initial Release of Performance Specification VHF Isotron Accelerometer, 7259B-XXX	DAM	55586

1.0 DESCRIPTION

The ENDEVCO® Model 7259B is a miniature, light weight piezoelectric accelerometer designed specifically for high frequency vibration measurement in structures and objects. Its unique sensor design allows for high seismic resonance and ruggedness. The unit is hermetically sealed against environmental contamination, and its light weight (4.4 gm) effectively minimizes mass loading effects.

The Model 7259B features ENDEVCO's PIEZITE® Type P8 crystal element, operating in annular shear mode, which exhibits low base strain sensitivity, wide bandwidth, and excellent output stability over time. This accelerometer incorporates an internal hybrid signal conditioner in a two-wire system, which transmits its low impedance voltage output through the same cable that supplies the required constant current power. Signal ground is connected to outer case of the unit, which acts as a shield for its low impedance output. When used with one of the supplied isolated mounting studs, the accelerometer is electrically isolated from ground. A specifically designed, low-noise coaxial cable is required for error-free operation. A model number suffix indicates acceleration sensitivity in mV/g; i.e., 7259B-10 features output sensitivity of 10 mV/g.

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), is supplied.

		Units	-10	-25	-100
2.0	<u>DYNAMIC CHARACTERISTICS</u>				
2.1	RANGE	g	500	200	50
2.2	VOLTAGE SENSITIVITY				
	Typical	mV/g	10.0	25.0	100
	Minimum	mV/g	8.5	20.0	90
2.3	FREQUENCY RESPONSE		See Typical Curve		
2.3.1	Resonance Frequency				
	Typical	kHz		90	
	Minimum	kHz		80	
2.3.2	Amplitude Response				
	± 1 dB	Hz		5 to 10 000	
	± 2 dB	kHz		30	
2.4	TEMPERATURE RESPONSE				
	-67°F (-55°C) max/min	%		See Typical Curve	-12 / 0

	+257°F (+125°C) max/min	%	-9 / 0		
		Units	-10	-25	-100
2.5	TRANSVERSE SENSITIVITY	%	≤ 5		
2.6	AMPLITUDE LINEARITY	%	1		
3.0	<u>OUTPUT CHARACTERISTICS</u>				
3.1	OUTPUT POLARITY		Acceleration directed into base of unit produces positive output.		
3.2	DC OUTPUT BIAS VOLTAGE	Vdc	+8.5 to +11.5	+8.5 to +11.5	+12.3 to +13.5
	-67°F to +257°F (-55°C to +125°C)	Vdc	+6.5 to +13.0	+6.5 to +13.0	+8.0 to +16.0
3.3	OUTPUT CONNECTION		See Connection Diagram		
3.4	OUTPUT IMPEDANCE	Ω	≤ 200		
3.5	FULL SCALE OUTPUT VOLTAGE	V	± 5		
3.6	RESIDUAL NOISE 1 Hz to 10 kHz	equiv. g rms	0.0015	0.0015	0.0002
3.7	OVERLOAD RECOVERY	μ sec	≤ 10		
3.8	LOAD		See Load Diagram		
3.9	GROUNDING		Signal ground connected to case		
3.10	ISOLATION		Case may be isolated from structure by adhesive or use of supplied isolation adapters.		
4.0	<u>POWER REQUIREMENT</u>				
4.1	SUPPLY VOLTAGE	Vdc	+23 to +30		
4.2	SUPPLY CURRENT	mA	+2 to +20		
4.3	WARM-UP TIME To within 10% of final bias	sec	≤ 5		
4.4	POLARITY PROTECTION		No damage with < 24 Vdc applied, with current limited to 20 mA maximum.		
5.0	<u>ENVIRONMENTAL CHARACTERISTICS</u>				
5.1	TEMPERATURE RANGE		-67°F to +257°F (-55°C to +125°C)		
5.2	HUMIDITY		Hermetically sealed		

5.3	SINUSOIDAL VIBRATION LIMIT	g Units	1000 -10	800 -25	500 -100
5.4	SHOCK LIMIT [1]	g	10000	5000	2000
5.5	BASE STRAIN SENSITIVITY				
	With 2980M12 & 2980M13	equiv. g pk/μ strain		0.001	
	With 2981-11 Mounting Stud	equiv. g pk/μ strain		0.01	
5.6	THERMAL TRANSIENT SENSITIVITY	equiv. g pk/°F		0.2	
5.7	ELECTROMAGNETIC SENSITIVITY	equiv. g rms/gauss	0.003	0.0015	0.0001
6.0	<u>PHYSICAL CHARACTERISTICS</u>				
6.1	DIMENSIONS		See Outline Drawing		
6.2	WEIGHT				
	Without Insulator	gm (oz)		4.4 (.15)	
	With Insulator	gm (oz)		4.6 (.16)	
6.3	CASE MATERIAL		Stainless steel		
6.4	CONNECTOR		M3 X 0.5 6g thread, glass		
6.5	MOUNTING TORQUE	lbf-in (Nm)		18 (2)	
	With Model 2981-11				
7.0	<u>ACCESSORIES</u>				
7.1	SUPPLIED				
	CABLE ASSEMBLY		3053VM1-120, 1X [2]		
	MOUNTING STUD, ADHESIVE TYPE		2980M13, 1X [2]		
	MOUNTING STUD		2980M12, 1X [2]		
	MOUNTING STUD		2981-11, 1X [2]		
7.2	OPTIONAL ACCESSORIES				
	CABLE ASSEMBLY		3053V-120, 1X		
	CABLE ASSEMBLY		3901-118, 1X		
8.0	<u>CALIBRATION</u>				
8.1	SUPPLIED				
	Voltage Sensitivity	mV/g			

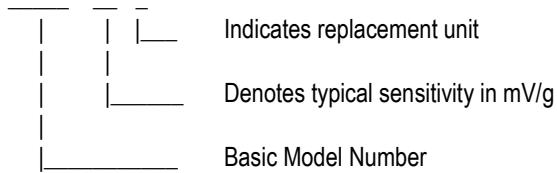
Frequency Response	dB	20 Hz to 50 kHz
Maximum Transverse Sensitivity	%	

9.0

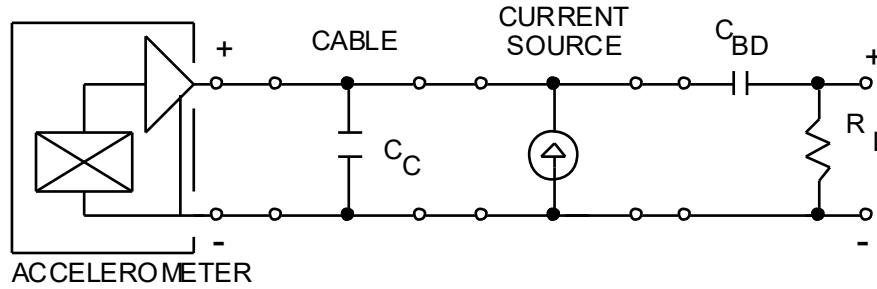
NOTES

- [1] Shock pulses of short duration may excite transducer resonance. Shock level above the sinusoidal vibration limit may produce temporary zero shift, which will result in erroneous velocity or displacement data after integration.
- [2] For -R units, the indicated accessories are optional.
- 3 Model Number Definition.

7259B - XX - R

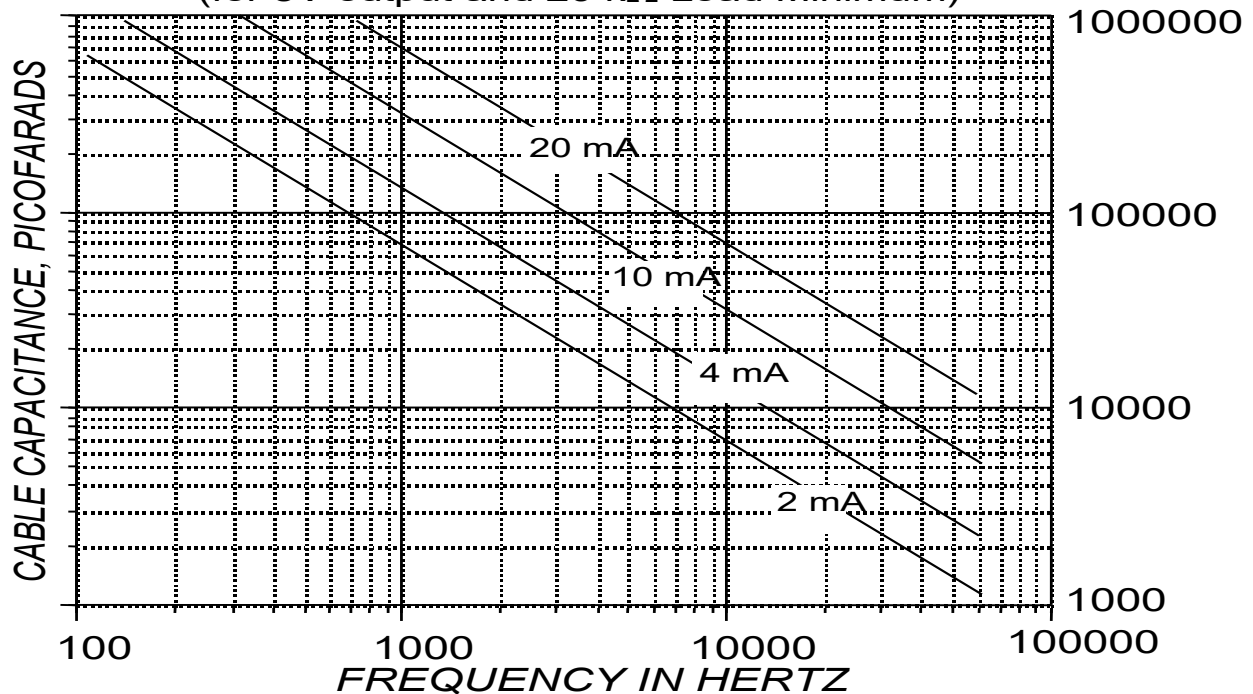


CONNECTION DIAGRAM, EACH CHANNEL

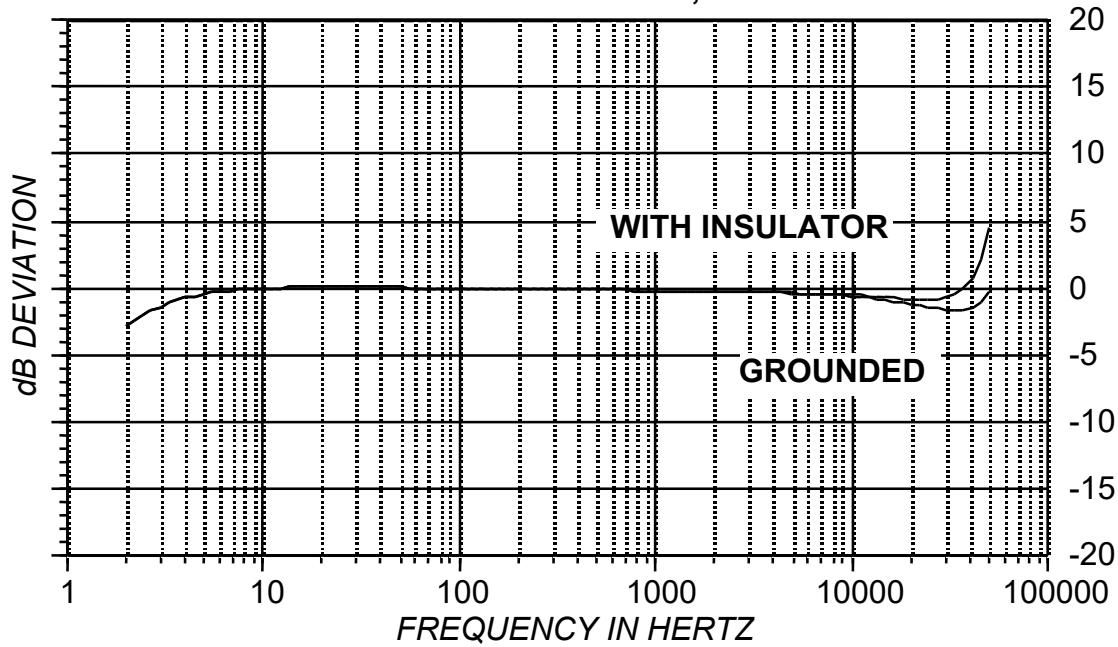


- Range is dependent on the sensitivity of the unit and bias, and the compliance voltage of the constant current power source. The positive range is limited to the difference between the compliance voltage and the unit's bias, divided by the unit's sensitivity. The negative range is limited to approximately 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, as shown in Load Capacitance vs. Frequency Plot.
- Bias decoupling capacitor C_{BD} and load resistor R_L can be determined from:
where f is the lowest frequency of interest.
$$f_{-3\text{ dB}} = \frac{1}{2\pi R_L C_{BD}}$$

THEORETICAL LOAD DIAGRAM (for 5V output and 20 k Ω Load Minimum)



TYPICAL AMPLITUDE RESPONSE, MODEL 7259B



TYPICAL TEMPERATURE RESPONSE, MODEL 7259B

