PERFORMANCESPECIFICATION
ISOTRON TRIAXIAL ACCELEROMETER
7253D-XXX

Document Number	Rev	Date	Entered by	Description of Change	Change Accountable Engineer	ECO
76689	NR	7/14/22	NAD	Initial Release of Performance Specification of 7253D-XXX	DAM	52965

1.0 DESCRIPTION

The ENDEVCO Model 7253D is an integral electronics triaxial accelerometer designed for applications requiring the measurement of shock or vibration simultaneously in three mutually perpendicular axes. The ENDEVCO Model 7253D is small, lightweight and has broad frequency response. The accelerometer is available in two configurations: 7253D-10 (10mV/g) and 7253D-100 (100 mV/g).

Each axis utilizes the Endevco Type P-8 shear piezoelectric sensing element in conjunction with a hybrid charge amplifier to provide a low impedance output of 5 V full scale in a two wire system. 2 to 20 mA constant current excitation is required for each axis. Electrical connection is made to each axis through a 4 pin Micro tech standard male connector.

Signal grounds are common to each other and isolated from the mounting surface by a hard anodized insulator.

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

		Units	Range Dash Number -10	-100
2.0	**DYNAMIC CHARACTERISTICS**			
2.1	RANGE	g pk	± 500	± 50
2.2	VOLTAGE SENSITIVITY			
	Typical	mV/g	10	100
	Minimum	mV/g	9	90
	Maximum	mV/g	11	110
2.3	FREQUENCY RESPONSE			
2.3.1	Resonance Frequency			
	Typical	kHz	50	
	Minimum	kHz	45	
2.3.2	Amplitude vs Frequency			
	± 5%	Hz	10 to 6000	
	± 10%	Hz	2 to 10000	3 to 10000
	± 3 dB	Hz	1.0 to 15000	1.5 to 15000

		Units	Range Dash Number -10	-100
2.4	SENSITIVITY DEVIATION vs TEMPERATURE Curve		See Typical	
	At -67°F (-55°C) max/min	%	0 / -15	
	At +257°F (+125°C) max/min	%	+10 / -5	
2.5	TRANSVERSE SENSITIVITY	%	5 max	
2.6	AMPLITUDE LINEARITY	%	< 2	
3.0	**OUTPUT CHARACTERISTICS**			
3.1	OUTPUT POLARITY		Acceleration directed into base produces positive output	
3.2	DC OUTPUT BIAS VOLTAGE			
	Room Temperature, +75°F (+24°C)	Vdc	+11 to +14	
	-67°F TO +257°F (-55°C TO +125°C)	Vdc	+ 8 to + 16	
3.3	OUTPUT CONNECTION Diagram		See Connection	
3.4	OUTPUT IMPEDANCE	Ω	<200	
3.5	MAXIMIUM FULL SCALE OUTPUT VOLTAGE	V	± 5	
3.6	RESIDUAL NOISE			
	Broadband (1 Hz - 10 kHz)	equiv. μg rms	2000	400
	Spectral	equiv. μg/√Hz		
	1 Hz		1500	300
	10 Hz		200	50
	100 Hz		30	10
	1000 Hz		10	4
3.7	OVERLOAD RECOVERY 2 x full scale	μs	<10	
3.8	GROUNDING		Signal ground connected to case but isolated from mounting surface.	
3.9	SENSITIVITY DEVIATION VS. CURRENT 2 - 10 mA	%	± 1	
4.0	**POWER REQUIREMENT**			
4.1	SUPPLY VOLTAGE	Vdc	+ 23 to + 30	
4.2	SUPPLY CURRENT	mA	+ 2 to +10	
4.3	SUPPLY NOISE	μA pk	<10	

	Units	Range Dash Number

			-10	-100
4.4	WARM-UP TIME ±10% of stabilized bias Time Constant	 sec sec	 2 0.5	
5.0	**ENVIRONMENTAL CHARACTERISTICS**			
5.1	TEMPERATURE RANGE Operating +125°C)		-67°F to + 257°F (-55°C to	
5.2	HUMIDITY sealed		Hermetically	
5.3	SINUSOIDAL VIBRATION LIMIT	g pk	1000	1000
5.4	SHOCK LIMIT [2]	g pk	5000	5000
5.5	BASE STRAIN SENSITIVITY at 250 μstrain	equiv. g pk/μ strain	0.13	0.05
5.6	THERMAL TRANSIENT SENSITIVITY	equiv. g pk/°F equiv. g pk/°C	0.16 0.29	0.07 .12
5.7	ELECTROMAGNETIC NOISE at 100 Gauss	equiv. g/Gauss	.0001	.00006
6.0	**PHYSICAL CHARACTERISTICS**			
6.1	DIMENSIONS Drawing		See Outline	
6.2	WEIGHT	gm (oz)	<10	(.352)
6.3	CASE MATERIAL		Titanium alloy 6Al-4V	
6.4	CONNECTOR		4 pin Micro-Tech standard male connector with each axis as identified per outline drawing.	
6.5	MOUNTING	inch	Clearance hole for 10-32 x 5/8 long mounting screw and washer Recommended torque: 18 in-lbs	
7.0	**ACCESSORIES**			
7.1	SUPPLIED			

	42883	Mtg Screw Assy, 1X
	EHM488 [3]	Hex Wrench, 1X
	3027AM3-120 [3]	Cable
7.2	OPTIONAL	
	32622	Removal Tool, 1X
	32279	Mounting Wax
	31849	Adhesive Kit, 1X

8.0 CALIBRATION

8.1 SUPPLIED

Sensitivity	mV/g	
Maximum Transverse Sensitivity	%	
Frequency Response	%	±5% 20 Hz to 6 kHz ±10% 6 kHz to 10 kHz all three axes

9.0 NOTES

[1] +23Vdc must be available to the accelerometer to ensure full scale operation at temperature extremes.

[2] Shock pulses of short duration may excite transducer resonance. Shock level above the sinusoidal vibration limit may produce temporary zero shift that will result in erroneous velocity or displacement data after integration.

[3] For -R units the noted accessories are optional.

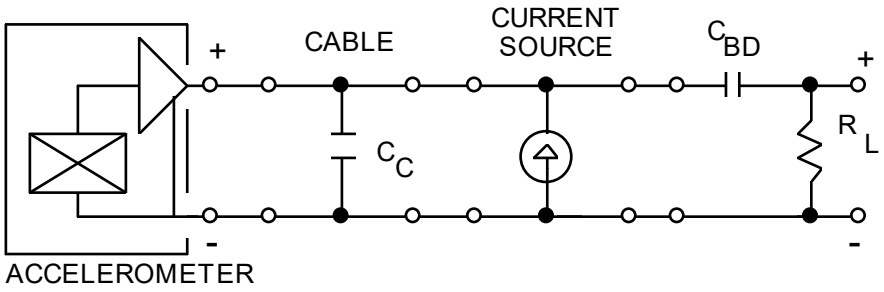
[4] Model Number Definition

7253D - XXX - R

- R — Indicates replacement part (omit if unit is not a replacement)
- XXX — Denotes acceleration range in mV/g
  - -10 = 10
  - -100 = 100
- 7253D — Basic Model Number

5 CE Certification: This product is fully compliant to European Union's Low Voltage Directive, 2006/95EC and EMC Directive 2004/108/EC and is eligible to bear the CE mark

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.

$$f_{-3\,dB} = \frac{1}{2\ \pi\ R_L\ C_{BD}}$$