

Variable Capacitance Accelerometer

Model 7292-XM1

- Shunt Calibration Simulation
- 2 to 100 g Full Scale*
- Overrange Stops
- Gas Damping
- Rugged, Hermetically Sealed

ENDEVCO
MODEL
7292-XM1



Actual size

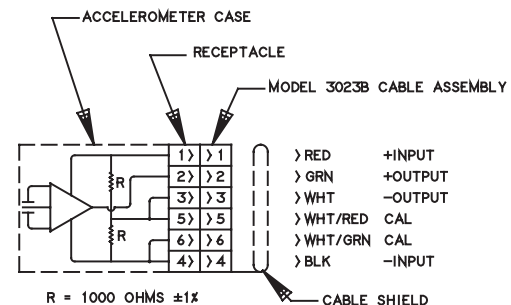
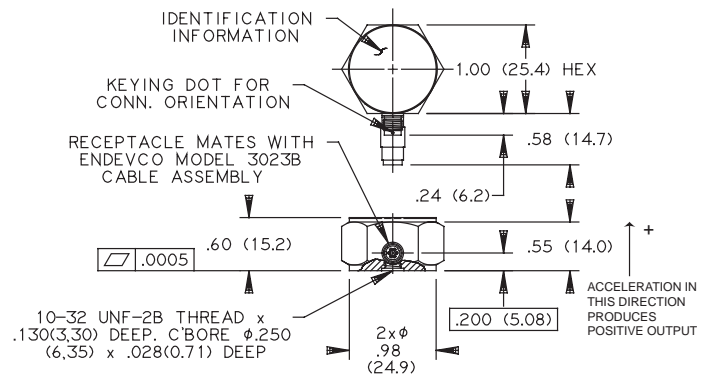
DESCRIPTION

The ENDEVCO® Model 7292-XM1 MICROTRON® accelerometer utilizes unique variable capacitance microsensors. This series is designed for the measurement of relatively low-level accelerations in rugged aerospace and automotive environments. Since it can respond to DC accelerations (steady-state events), it is ideal for measuring whole-body motion immediately after being subjected to shock motion.

The 7292-XM1 is an excellent replacement for several of the popular 2262 series of piezoresistive accelerometers which are used in many flight-test and automotive applications. A rugged hermetic, stainless-steel package provides years of reliable service. The 10-32 mounting stud and electrical interface are similar to that of the 2262 series of accelerometers. Shunt calibration simulation provides a functional check of the electrical performance of the accelerometer and the measurement system.

The 7292-XM1 operates from a 10 Vdc source and provides a high level differential, DC-coupled output. The use of gas damping provides the near-critically damped characteristics found in the 2262 series of accelerometers without thermally induced changes in frequency response. The 7292-XM1 is insensitive to magnetic fields and requires a warm-up time of only one millisecond!

ENDEVCO Model 136 Three-Channel System, Model 4430A or the OASIS 2000 Computer-Controlled System are recommended as signal conditioners and power supplies.



WIRING DIAGRAM

SPECIFICATIONS

PERFORMANCE CHARACTERISTICS: All values are typical at +75°F (+24°C) and 10 Vdc excitation unless otherwise stated. Calibration data, traceable to the National Institute of Standards (NIST), is supplied.

	Units	7292-2M1	-10M1	-30M1	-100M1*
RANGE	g pk	±2	±10	±30	±100
SENSITIVITY (at 100 Hz) [1] [2]	mV/g	1000 ±100	200 ±20	66 ±8	20 ±2
FREQUENCY RESPONSE (± 5%)	Hz	0 to 15	0 to 500	0 to 800	0 to 1000
MOUNTED RESONANCE FREQUENCY	Hz	1300	3000	5500	6000
NON-LINEARITY AND HYSTERESIS [3]	% FSO Typ	±0.20	±0.20	±0.20	±1
	% FSO (Max)	±0.50	±0.50	±0.50	±2
TRANSVERSE SENSITIVITY [4]	% Typ	1	1	1	1
ZERO MEASURAND OUTPUT [2]	mV Max	±250	±250	±250	±250
DAMPING RATIO		4.0	0.7	0.7	0.6
DAMPING RATIO CHANGE	%/°F	+0.04	+0.04	+0.04	+0.04
From -65°F to +250°F (-55°C to +121°C)	%/°C	+0.08	+0.08	+0.08	+0.08

Variable Capacitance Accelerometer

SPECIFICATIONS

PERFORMANCE CHARACTERISTICS—continued

	Units	7292-2M1	-10M1	-30M1	-100M1
THERMAL ZERO SHIFT					
From 32°F to 122°F (0°C to 50°C)	% FSO Max	±2.0	±2.0	±2.0	±2.0
From -13°F to +167°F (-25°C to +75°C)	% FSO Max	±4.0	±4.0	±4.0	±4.0
THERMAL SENSITIVITY SHIFT					
From 32°F to 122°F (0°C to +50°C)	% Max	±4.0	±4.0	±4.0	±4.0
From -13°F to +167°F (-25°C to +75°C)	% Max	±6.0	±6.0	±6.0	±6.0
THERMAL TRANSIENT ERROR	Equiv. g/°F	< 0.0006	< 0.0006	< 0.0006	< 0.0006
PER ISA RP 37.2	Equiv. g/°C	< 0.001	< 0.001	< 0.001	< 0.001
OVERRANGE (Determined by Electrical clipping or Mechanical stops, whichever is smaller.)					
Electrical clipping	g	-5/2.3	-5/2.3	-5/2.3	-5/2.3
Mechanical stops, typical	g	±4	±30	±90	±200
Recovery Time	µs	< 10	< 10	< 10	< 10
THRESHOLD (RESOLUTION) [5]	Equiv. g's	0.0005	0.0025	0.0075	0.013
BASE STRAIN SENSITIVITY, MAX [6]	Equiv. g's	0.01	0.01	0.01	0.01
MAGNETIC SUSCEPTIBILITY [7]	Equiv. g's	< 0.1	< 0.1	< 0.1	< 0.1
WARM-UP TIME (to within 1%)	ms	1	1	1	1

ELECTRICAL

EXCITATION [2]	10 ± 0.05 Vdc, Calibration
CURRENT DRAIN [8]	9.5 mA Typ, 18.5 mA (max)
OUTPUT IMPEDANCE/LOAD	1KΩ
INPUT IMPEDANCE	2KΩ
CASE ISOLATION	100 MΩ

PHYSICAL

CASE MATERIAL	Stainless, type 304
ELECTRICAL, CONNECTIONS	Endevco model 3023B-30 (supplied)
MOUNTING/TORQUE	Provision for 10-32 unf x 1/8" stud. Mounting torque 18lbf-in (2nm)
MASS	40 grams (cable weighs 18 grams/meter)

ENVIRONMENTAL

ACCELERATION LIMITS (in any direction)	
Static	20 000 g
Sinusoidal/Random Vibration	100 g pk, 20 - 2000 Hz/40 g rms, 20 - 2000 Hz
Shock (half-sine pulse)	5000 g, 150 µsec or longer for the -2 and -10; 10 000 g, 80 µsec or longer for the -30 and -100
Zero Shift	0.1% FSO typical at 5000 g
TEMPERATURE	
Operating	-65°F to +250°F (-55°C to +121°C)
Storage	-100°F to +300°F (-73°C to +150°C)
HUMIDITY/ALTITUDE	Unaffected. Unit is hermetically sealed.
ESD SENSITIVITY	Unit meets Class 2 requirements of MIL-STD-883, Method 3015

CALIBRATION DATA SUPPLIED (noted on shipping box)

SENSITIVITY	
(at 1g and 5 Hz for -2; 10g and 100 Hz, all other ranges)	
FREQUENCY RESPONSE	1-100 Hz for the -2; all other ranges, 20 - 10,000 Hz, % deviation reference 100Hz
ZERO MEASURAND OUTPUT	mV
MAXIMUM TRANSVERSE SENSITIVITY	% of sensitivity

*Contact factory for higher/special ranges

ACCESSORIES (included)

3023B-30	30" CABLE ASSEMBLY
92981-12	10-32 MOUNTING STUD, HEX SOCKET

OPTIONAL ACCESSORIES

2981-3	10-32 ADAPTOR STUD, SLOT
2981-4	M5 X 0.8 ADAPTOR STUD

NOTES

- Reference frequency is 5 Hz on the 2 g range, 100 Hz for -10,-30,-100
- Over the excitation range 10 ± 0.05 Vdc
- Full scale output (FSO) is nominally 4 volts
- 1% is typical. 1% maximum available on special order
- THRESHOLD = MAX. RESIDUAL NOISE: 0.5 TO 100 Hz
SENSITIVITY

- Per ISA 37.2 at 250 Microstrain
- At 100 Gauss, 60 Hz
- Current drain increases slightly with increasing excitation; typical change is +.06 mA per volt from 9.5 to 18.0 Vdc.
- Maintain high levels of precision and accuracy using Endevco's factory calibration services. Call Endevco's inside sales force at 800-982-6732 for recommended intervals, pricing and turn-around time for these services as well as for quotations on our standard products.

Continued product improvement necessitates that Endevco reserve the right to modify these specifications without notice. Endevco maintains a program of constant surveillance over all products to ensure a high level of reliability. This program includes attention to reliability factors during product design, the support of stringent Quality Control requirements, and compulsory corrective action procedures. These measures, together with conservative specifications have made the name Endevco synonymous with reliability.