

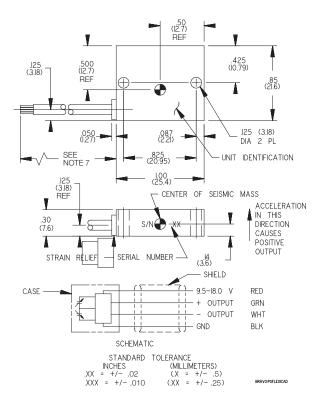


Model 7290A Variable capacitance accelerometer

Features

- DC response
- 2 to 150 g full scale
- Motion, low frequency, tilt
- 10K g shock survivability





Description

The Endevco® model 7290A Microtron® accelerometer family utilizes unique variable capacitance microsensors. The accelerometers are designed for measurement of relatively low level accelerations in aerospace and automotive environments. Typical applications require measurement of whole body motion immediately after the accelerometer is subjected to a shock motion, and in the presence of severe vibrational inputs.

Gas damping and internal overrange stops enable the anisotropically-etched silicon microsensors to withstand high shock and acceleration loads.

The model 7290A can operate from 9.5 V to 18.0 V and provide a high level, low impedance output. The ±2 volt differential output is dc coupled at a dc bias of approximately 3.6 V. Frequency response is controlled by the near-critically damped sensors. The use of gas damping results in very small thermally-induced changes of frequency response.

Endevco three-channel systems, model 136 or 436 are recommended as signal conditioner and power supply.

U.S. Patents 4,574,327, 4,609,968 and 4,999,735

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Model 7290A Variable capacitance accelerometer



Specifications

All values are typical at +75°F (+24°C) and 15 Vdc excitation unless otherwise stated. Calibration data, traceable to the National Institute of Standards, (NIST), is supplied.

Dynamic characteristics	Units	7290A-2	-10	-30	-50	-100	-150
Range [1]	g	±2	±10	±30	±50	±100	±150
Sensitivity	mV/g	1000 ±50	200 ±10	66 ±4	40 ±2	20 ±1	13.2 ±0.66
Frequency response (± 5%) [2]	Hz	0 to 15	0 to 500	0 to 800	0 to 1000	0 to 1000	0 to 1000
Mounted resonance frequency	Hz	1300	3000	5500	6000	6000	6000
Non-linearity and hysteresis	% FSO typ (max)	±0.20 (±0.50)	±0.20 (±0.50)	±0.20 (±0.50)	±0.20 (±0.50)	±1 (±2)	±1 (±2)
Transverse sensitivity [3]	% (max)	2	2	2	2	2	2
Zero measurand output	mV	±50	±50	±50	±50	±50	±50
Damping ratio		4.0	0.7	0.7	0.6	0.6	0.6
Damping ratio change							
From -65°F to +250°F (-55°C to +121°C)	%/°C	+0.08	+0.08	+0.08	+0.08	+0.08	+0.08
Thermal zero shift (max)							
From 32°F to 122°F (0°C to 50°C)	% FSO [4]	±1.0	±1.0	±1.0	±1.0	±1.0	±1.0
From -13°F to +167°F (-25°C to +75°C)	% FS0	±2.0	±2.0	±2.0	±2.0	±2.0	±2.0
Thermal sensitivity shift (max)							
From 32°F to 122°F (0°C to +50°C)	%	±2.0	±2.0	±2.0	±2.0	±2.0	±2.0
From -13°F to +167°F (-25°C to +75°C)	%	±3.0	±3.0	±3.0	±3.0	±3.0	±3.0
Thermal transient error per ISA RP 37.2	Equiv. g/°C	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Overrange (determined by electrical clipping or	- mechanical stops	, whichever is smal	ller.)				
Electrical clipping	g	-3.5/+3.8	-18/+19	-53/+57	-87/+95	-175/+190	-265/+288
Mechanical stops, typical	g	±4	±30	±90	±90	±150	±300
Recovery time	μs	< 10	< 10	< 10	< 10	< 10	< 10
Threshold (resolution) [5]	Equiv. g's	0.0005	0.0025	0.0075	0.013	0.013	0.013
Base strain sensitivity, max	Equiv. g's	0.01	0.01	0.01	0.01	0.01	0.01
Magnetic susceptibility (@ 100 gauss, 60 Hz)	Equiv. g's	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Warm-up time (to within 1%)	ms	1	1	1	1	1	1

Electrical characteristics

 Excitation voltage
 9.5 to 18.0 Vdc

 Current drain
 8.5 mA typ, 10 mA max

 Output impedance/load
 500 ohms max/10K ohms resistance minimum, 0.1 μF capacitance maximum

 Residual noise
 100 μV rms typ, 0.5 to 100 Hz

 500 μV rms typ, 0.5 Hz to 10 kHz
 500 μV rms typ, 0.5 Hz to 10 kHz

Physical characteristics

Case material Electrical connections Mounting/torque Weight

Environmental characteristics

Acceleration limits (in any direction)
Static
Vibration

Shock Zero shift Temperature Operating Storage Humidity/altitude ESD sensitivity Anodized aluminum alloy Integral cable, four conductor No. 28 AWG, Teflon® insulated leads, braided shield, Hyperflex™ jacket Two holes for 4-40 or M3 mounting screws / 6 lbf-in (0.68 Nm) 12 grams without cable (cable weighs 9 grams/meter)

20 000 g 100 g sinusoidal 20 - 2000 Hz / 40 g rms random 20 - 2000 Hz 5000 g (150 μS haversine pulse) for -2 and -10; 10 000 g (80 μS haversine pulse) for -30, -50, -100 and -150 0.1% FSO typical at 5000 g

-65°F to +250°F (-55°C to +121°C) -100°F to +300°F (-73°C to +150°C) Unaffected. Unit is epoxy sealed. Unit meets Class 2 requirements of MIL-STD-883, Method 3015



Model 7290A Variable capacitance accelerometer

1 g and 5 Hz for -2

measured at 1 g

1 g, 1 to 100 Hz for -2,

measured at room temp

10 g and 100 Hz for all other ranges

10 g, 20 to 10 000 Hz for all other ranges



Specifications

All values are typical at +75°F (+24°C) and 15 Vdc excitation unless otherwise stated. Calibration data, traceable to the National Institute of Standards, (NIST), is supplied.

Calibration

Sensitivity (measured with 15 Vdc excitation)

Frequency response

Zero measurand output Transverse sensitivity

Accessories

EHW265	(2) size 4, flat washers
EH702	(2) 4-40 x 7/16 inch cap screws
EHM464	(1) hex wrench

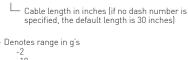
Optional accessories

7990	triaxial mounting block
7990M5A	triaxial mounting block

Notes:

- 1. Customized range, 7290A-XXXM30, available on special order. FSO is nominally 4 volts.
- 2. Extended frequency response available on special order to extend up to 0-900 Hz for 7290A-10-ZZZ,
- 0-1500 Hz for 7290A-30-ZZZ and 0-2000 Hz for 7290A-50-ZZZ, 7290A-100-ZZZ and 7290A-150-ZZZ. 3 1% maximum available on special request
- I% maximum available on special request
 Full scale output (FSO) is nominally 4 volts.
- 5. Threshold = (max. residual noise; 0.5 to 100 Hz) / sensitivity
- A 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. 7. Model number definition:

7290A-XXX-ZZZ





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Continued product improvement necessitates that Meggitt reserve the right to modify these specifications without notice. Meggitt 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.

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