



## 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  $\pm 2$  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

北京汇润科贸有限公司

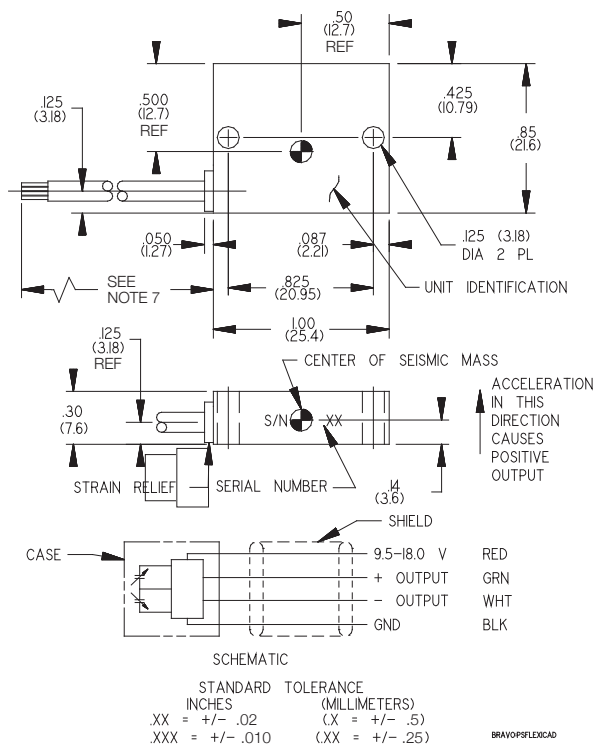
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# Model 7290A

## Variable capacitance accelerometer

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extreme environments

### 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)	% FSO	±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 smaller.)							
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

### Physical characteristics

Case material	Anodized aluminum alloy
Electrical connections	Integral cable, four conductor No. 28 AWG, Teflon® insulated leads, braided shield, Hyperflex™ jacket
Mounting/torque	Two holes for 4-40 or M3 mounting screws / 6 lbf-in (0.68 Nm)
Weight	12 grams without cable (cable weighs 9 grams/meter)

### Environmental characteristics

Acceleration limits (in any direction)	
Static	20 000 g
Vibration	100 g sinusoidal 20 - 2000 Hz / 40 g rms random 20 - 2000 Hz
Shock	5000 g (150 µS haversine pulse) for -2 and -10; 10 000 g (80 µS haversine pulse) for -30, -50, -100 and -150
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 epoxy sealed.
ESD sensitivity	Unit meets Class 2 requirements of MIL-STD-883, Method 3015



# Model 7290A

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### Specifications

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#### Calibration

<b>Sensitivity</b> (measured with 15 Vdc excitation)	1 g and 5 Hz for -2 10 g and 100 Hz for all other ranges
<b>Frequency response</b>	1 g, 1 to 100 Hz for -2, 10 g, 20 to 10 000 Hz for all other ranges
<b>Zero measurand output</b>	measured at room temp
<b>Transverse sensitivity</b>	measured at 1 g

#### Accessories

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

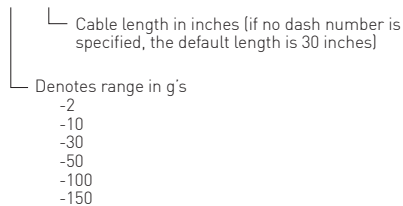
#### Optional accessories

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
4. Full scale output (FSO) is nominally 4 volts.
5. Threshold = [max. residual noise; 0.5 to 100 Hz] / sensitivity
6. 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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