

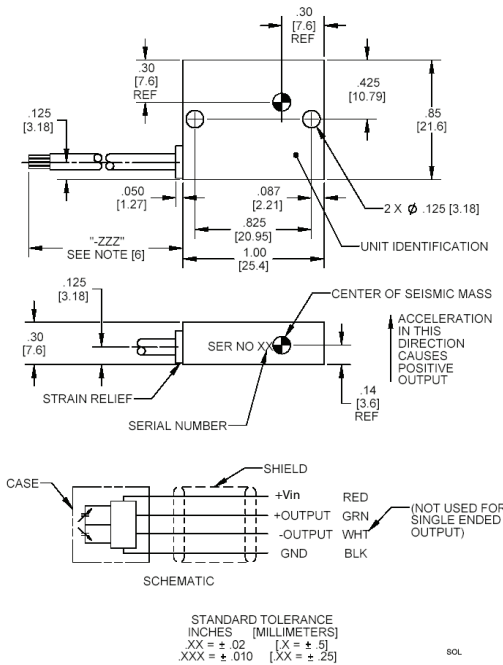
Endevco®

Variable capacitance accelerometer

Model 7290E and 7290EM5



M5 option



Key features

- 2, 5, 10, 30, 50 and 100 g full scale ranges
- Motion, low frequency, tilt
- 10K g shock survivability
- Precision digital temperature compensation
- M5 option for water tight performance

Model 7290E 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. State-of-the-art digital temperature compensation electronics provide for precise compensation over a wide temperature range. The use of gas damping results in very small thermally induced changes in frequency response.

Gas damping and internal over-range stops enable the anisotropically-etched silicon microsensors to withstand high shock and acceleration loads. For outdoor use specify the M5 option, which has a PFA cable and a reinforced cable to case connection. The M5 is watertight for outdoor applications such as vehicle road testing and flight test. It was tested to IP67 during development, but is not intended for underwater use, which would void the product warranty.

The accelerometer is available with a choice of two power options. One option [R] allows for operation from 9.5 V to 18.0 V. The second option [U] allows for operation over a range of 12.5 V to 36 V. 7290E provides both a differential and single ended output. The differential output has a range of ±2 V and is DC coupled. The single ended output is 0.5 V to 4.5 V with 2.5 V of bias voltage.

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

Meggitt Sensing Systems

Our measurement product competencies:

Piezoelectric accelerometers | Piezoresistive accelerometers | Isotron accelerometers | Variable capacitance accelerometers | Pressure transducers | Acoustic sensors | Electronic instruments | Calibration systems | Shakers | Modal hammers | Cable assemblies

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smart engineering for
extreme environments

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Specifications

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

Dynamic characteristics	Units	-2	-5	-10	-30	-50	-100
Range	g	±2	±5	±10	±30	±50	±100
Sensitivity	mV/g	1000 ±50	400 ±20	200 ±10	66 ±4	40 ±2	20 ±1
Frequency response (± 5%)	Hz	0 to 15	0 to 30	0 to 500	0 to 1000	0 to 2000	0 to 2000
Mounted resonance frequency	Hz	1300	1600	3000	5500	6000	6000
Non-linearity and hysteresis [1]	% FSO typ (max)	±0.20 (±0.50)	±0.20 (±0.50)	±0.20 (±0.50)	±0.20 (±0.50)	±0.20 (±0.50)	±1 (±2)
Transverse sensitivity	% (max)	2	2	2	2	2	2
Zero measurand output	mV	±50	±50	±50	±50	±50	±50
Damping ratio		4.0	2.5	0.7	0.7	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 -40°F to 212°F [-40°C to 100°C]	% FSO	±1.0	±1.0	±1.0	±1.0	±1.0	±1.0
Thermal sensitivity shift (max)							
From -40°F to 212°F [-40°C to +100°C]	%	±1.0	±1.0	±1.0	±1.0	±1.0	±1.0
Overrange [determined by electrical clipping or mechanical stops, whichever is smaller.]							
Electrical clipping	volts	±2.4	±2.4	±2.4	±2.4	±2.4	±2.4
Mechanical stops, typical	g	±4	±12	±30	±90	±90	±200
Recovery time	µs	< 10	< 10	< 10	< 10	< 10	< 10
Resolution [2]	Equiv. g's	0.0002	0.0005	0.0010	0.0030	0.0050	0.0100
Base strain sensitivity, max	Equiv. g's	0.01	0.01	0.01	0.01	0.01	0.01
Magnetic susceptibility (Ø 100 gauss, 60 Hz)	Equiv. g's	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Warm-up time (to within 1%)	ms	15	15	15	15	15	15

Electrical characteristics

Excitation voltage	9.5 to 18.0 Vdc 12.5 to 36.0 Vdc
Current drain	8.5 mA typ, 10 mA max
Output impedance/load	100 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 28 AWG, Teflon® insulated leads, braided shield, Hyperflex™ jacket for 7290E; Four 30 AWG PFA 340 insulated leads, braided shield, gray PFA 340 jacket for 7290EM5
Mounting/torque	Two holes for 4-40 or M3 mounting screws / 6 lbf-in (0.68 Nm)
Weight	10 grams without cable (cable weighs 9 grams/meter for 7290E and 13 grams/meter for 7290EM5)

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, -5 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

Calibration

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

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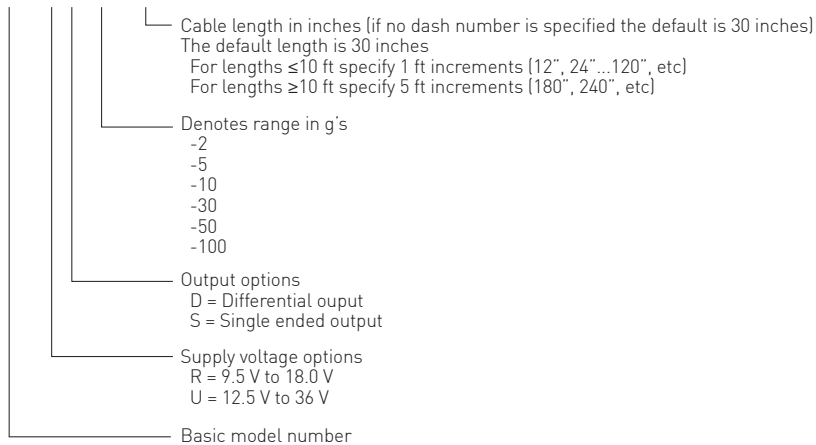
Accessories

Product	Description	7290E	7290EM5
EHW265	Size 4, flat washers (2)	Included	Optional
EH702	4-40 x 7/16 inch cap screws (2)	Included	Optional
EHM464	Hex key wrench	Included	Optional
7990	Triaxial mounting block	Optional	Optional

Notes

1. Full scale output (FSO) is nominally 4 volts.
2. Resolutin = (2x residual noise; 0.5 to 100 Hz) / sensitivity
3. Maintain high levels of precision and accuracy using Meggitt's factory calibration services. Call Meggitt'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.
4. Model number definition:

7290E-X-X-XXX-ZZZ



Note: Add M5 after 7290E for 7290EM5

Contact

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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. 080816

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