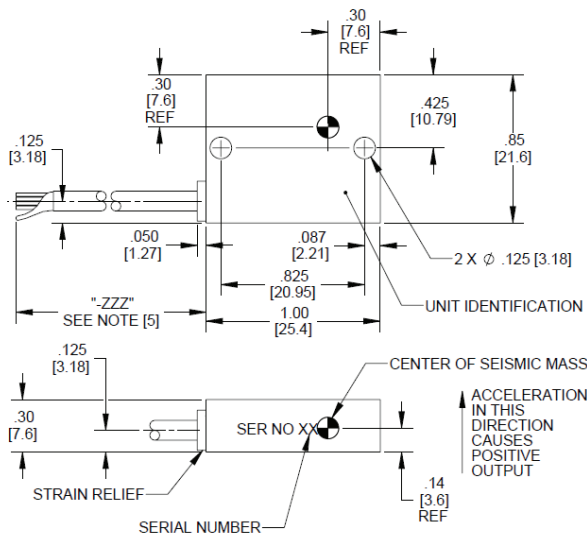


# Variable capacitance accelerometer

## Model 7290G and 7290GM5



M5 option

STANDARD TOLERANCE  
 INCHES [MILLIMETERS]  
 .XX = ± .02 [X = ± .5]  
 .XXX = ± .010 [XX = ± .25]

### Key features

- 2, 5, 10, 30, 50, 100 and 200 g full scale ranges
- Motion, low frequency, tilt
- 10K g shock survivability
- Precision digital temperature compensation
- M5 option for water tight performance

### Description

Model 7290G 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 specified for operation over the wide excitation voltage range of 8V to 40V. Model 7290G can be configured for either 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.

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

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The following performance specifications are 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.

Specifications								
Dynamic characteristics	Units	-2	-5	-10	-30	-50	-100	-200
Range	g	±2	±5	±10	±30	±50	±100	±200
Sensitivity	mV/g	1000 ±50	400 ±20	200 ±10	66 ±4	40 ±2	20 ±1	10 ±0.5
Frequency response (± 5% max)	Hz	0 to 15	0 to 30	0 to 500	0 to 1000	0 to 2000	0 to 2000	0 to 2000
(± 10% typ)	Hz	0 to 30	0 to 80	0 to 1300	0 to 1800	0 to 3000	0 to 3000	0 to 4000
(± 3dB typ)	Hz	0 to 60	0 to 150	0 to 2800	0 to 3000	0 to 4500	0 to 4500	0 to 6000
Mounted resonance frequency	Hz	1300	1600	3000	5500	6000	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)	±1 (±2)
Transverse sensitivity	% (max)	2	2	2	2	2	2	2
Zero measurand output	mV	±50	±50	±50	±50	±50	±50	±50
Damping ratio	% of critical	4	2.5	0.7	0.7	0.6	0.6	0.6
Damping ratio change								
From -65°F to +257°F (-55°C to +125°C)	%/°C	0.08	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	±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	±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	±2.4
Mechanical stops, typical	g	±4	±12	±30	±90	±200	±200	±300
Recovery time	µs	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Resolution [2]	Equiv. g's	0.0002	0.0005	0.001	0.003	0.005	0.01	0.02
Base strain sensitivity, max	Equiv. g's	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Warm-up time (to within 1%)	ms	15	15	15	15	15	15	15
<b>Electrical characteristics</b>								
Excitation voltage		8 to 40Vdc						
Current drain		4.5 mA typ, 6 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						
<b>Physical characteristics</b>								
Case material		Anodized aluminum alloy						
Electrical connections		Integral cable, four conductor 28 AWG, Teflon® insulated leads, spiral shield, Hyperflex™ jacket for 7290G; Four 30 AWG PFA 340 insulated leads, braided shield, gray PFA 340 jacket for 7290GM5						
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 7290G and 13 grams/meter for 7290GM5)						
<b>Environmental characteristics</b>								
Acceleration limits (in any direction)								
Static		20,000 g						
Shock		5000 g (150 µs haversine pulse) for -2, -5 and -10 10 000 g (80 µs haversine pulse) for -30, -50, and -100						
Zero shift		0.1% FSO typical at 5000 g						
Temperature								
Operating		-65°F to +257°F (-55°C to +125°C)						
Storage		-40°F to +212°F (-40°C to +100°C)						
Humidity/altitude		Unaffected. Unit is epoxy sealed. IP67 for 7290GM5 only.						
ESD sensitivity		Unit meets Class 2 requirements of MIL-STD-883, Method 3015						
<b>Calibration</b>								
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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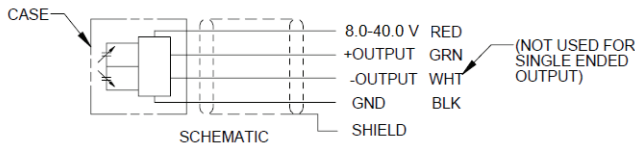
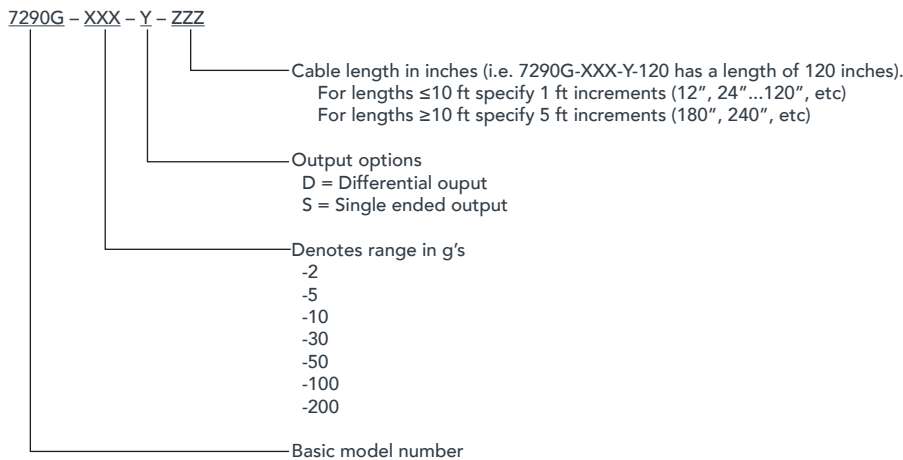
Accessories			
Options	Description	7290G	7290GM5
EHW265	Size 4, flat washers (2)	Included	Included
EH702	4-40 x 7/16 inch cap screws (2)	Included	Included
EHM464	Hex key wrench	Included	Included
7990	Triaxial mounting block	Optional	Optional
136	3-channel DC differential voltage amplifier	Optional	Optional

Options	
Options	Description
M1	Made with leaded solder for colder storage temp, recommended for space applications
M5	With more robust cable and strain relief, IP67, recommended for outdoor installation

## Notes

- Full scale output (FSO) is nominally 4 volts.
- Resolution = (2x residual noise; 0.5 to 100 Hz) / sensitivity
- Maintain high levels of precision and accuracy using Endevco's factory calibration services. Call Endevco's inside sales force at 866-ENDEVCO for recommended intervals, pricing and turn-around time for these services as well as for quotations on our standard products.
- Model number definition:



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