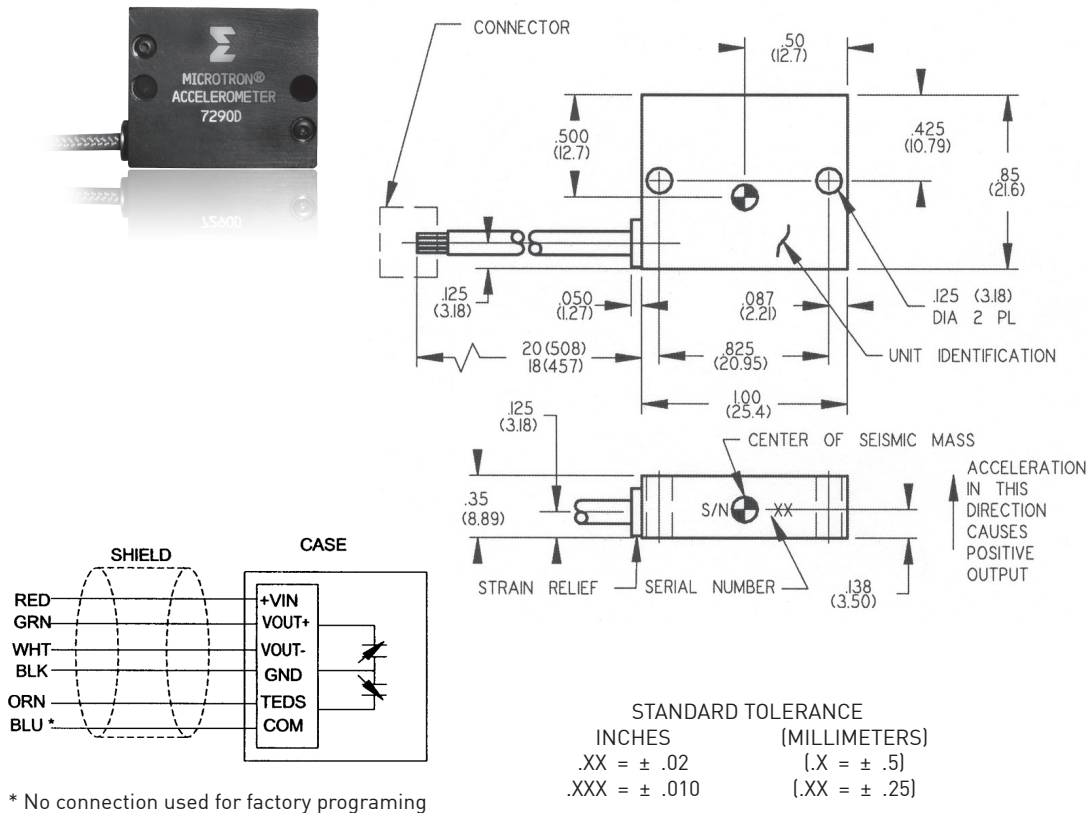


Variable capacitance accelerometer

Model 7290D



* No connection used for factory programming

The Endevco model 7290D accelerometer is designed to provide very high thermal stability and global accuracy as is typically required for flight test and similarly challenging test environments.

The accelerometer utilizes a patented variable capacitance sensing element (patents 4,574,327; 4,609,968; and 4,999,735). Gas damping and internal overrange stops enable the anisotropically etched silicon-sensing element to withstand high shock and acceleration loads.

Included in each accelerometer is a custom signal conditioner enabling the device to operate with a nominal excitation of 8.0 Vdc to 30.0 Vdc and provides a high level, low impedance output. The ±2.25 volt differential output (single-ended output optional) is DC coupled at a DC bias of approximately 2.5 V. In order to maintain stringent thermal characteristics and high accuracy, a custom ASIC provides factory programmable temperature compensation. All compensation and adjustments are incorporated within the accelerometer and no post-processing is required. The compensation is accomplished via a five point linear fit algorithm for both Thermal Sensitivity Shift and Thermal Zero Shift. Each 7290D includes a Transducer Electronic Data Sheet (TEDS) conforming to IEEE 1451.4. The TEDS stores the serial number and calibration information.

Key features

- DC response
- 2 to 100 g full scale
- 2.5% total dynamic accuracy
- Electronic compensation
- Gas damping
- Up to 10 000 g shock survivability
- TEDS

Variable capacitance accelerometer

Model 7290D

Specifications

The following performance specifications conform to ISA-RP-37.2 (1964) and are typical values, referenced at +75°F (+24°C) and 10 Vdc excitation unless otherwise noted. Calibration data, traceable to National Institute of Standards and Technology (NIST), is supplied.

Dynamic characteristics	Units	7290D-2	-10	-30	-50	-100
Range	g	±2	±10	±30	±50	±100
Sensitivity	mV/g	1125 ±50	225 ±10	75 ±4	45 ±2	22.5 ±1
Frequency response [1]						
±5% amplitude	Hz	0 to 15	0 to 500	0 to 800	0 to 1000	0 to 1000
±3 dB amplitude	Hz	0 to 35	0 to 1500	0 to 2800	0 to 4500	0 to 5000
Resonance frequency	Hz	1300	3000	5500	5500	6000
Non-linearity and hysteresis	% FSO (typ)	±0.2	±0.2	±0.2	±0.2	±1.0
% FSO (max)	±0.5	±0.5	±0.5	±0.5	±2.0	
Transverse sensitivity	% max	2.0	2.0	2.0	2.0	2.0
Zero measurand output	mV	±100	±50	±50	±50	±50
(single-ended output device)	mV	2500 ±100	2500 ±50	2500 ±50	2500 ±50	2500 ±50
Damping ratio		4.5	0.7	0.7	0.6	0.6
Damping ratio change	% / °F	+0.04	+0.04	+0.04	+0.04	+0.04
From -67°F to +257°F (-55°C to +125°C)	% / °C	+0.08	+0.08	+0.08	+0.08	+0.08
Thermal zero shift						
From -67°F to +257°F (-55°C to +125°C)	% FSO (typ)	±1.5	±1.5	±1.5	±1.5 [2]	±1.5 [2]
% FSO (max)	±3.0	±3.0	±3.0	±3.0 [2]	±3.0 [2]	
Thermal sensitivity shift						
From -67°F to +257°F (-55°C to +125°C)	% (typ)	±1.5	±1.5	±1.5	±1.5 [2]	±1.5 [2]
% (max)	±3.0	±3.0	±3.0	±3.0 [2]	±3.0 [2]	
Total dynamic accuracy [3]	% FSO	< 2.5	< 2.5	< 2.5	< 2.5	< 2.5
(across specified temperature range)						
Magnetic susceptibility [4]	Equiv. g	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Warm-up time [to within 1%]	ms	10	10	10	10	10
Output characteristics						
Excitation		8.0 to 30.0 Vdc				
Current drain		8.5 mA typ, 10 mA max				
Output impedance/load		50 ohms max / 10 K ohms resistance minimum, 0.1 µF capacitance maximum				
Residual noise (0.1 to 100 Hz), typ.		0.5 mVrms typ, 0.8 mVrms max; 0.1 to 100 Hz 1.0 mVrms typ, 2.0 mVrms max; 0.1 to 1 kHz 30 µVrms / √Hz typ; 0.1 to 10 kHz				
Environmental characteristics						
Acceleration limits (in any direction)		20 000 g				
Static		20 000 g				
Vibration		100 g sinusoidal 20–2000 Hz 40 g rms random 20–2000 Hz				
Shock		5000 g (150 µsec haversine pulse) for the -2 and -10; 10 000 g (80 µsec haversine pulse) for the -30, -50 and -100				
Zero shift		0.1% FSO typical at 5000 g				
Temperature						
Operating		-67°F to +257°F (-55°C to +125°C)				
Storage		-67°F to +257°F (-55°C to +125°C)				
Humidity/altitude		Unaffected. Unit is epoxy sealed. Hybrid and sensor are hermetically sealed.				
ESD Sensitivity		Unit meets Class 1 requirements of MIL-STD-883, Method 3015				
Physical characteristics						
Case material		Anodized aluminum alloy				
Electrical connections		Integral cable, six conductor No. 30 AWG, Teflon® insulated leads, braided shield, hyperFLEX jacket				
Identification		Manufacturer's logo, model number and serial number				
Mounting/torque		Two holes for 4-40 or M3 mounting screws / 6 lbf-in				
Weight		1	5 grams, excluding cable (8 grams) and connector (6 grams)			

Variable capacitance accelerometer

Model 7290D

Specifications cont

Calibration

Sensitivity	Measured at 1g and 5 Hz for -2 Measured at 10g and 100 Hz for -10, -30, -50, and -100
Frequency response	Measured at 1g, 1 to 100 Hz for -2 Measured at 10g, 20 to 10 kHz for -10, -30, -50, and -100
Zero measurand output	Measured at room temperature
Transverse sensitivity	Measured at 1 g

Accessories

Product	Description	7290D
EHW265	(2) flat washers, size 4	Included
EH517	(2) 4-40 x 1/2 inch cap screws	Included
EHM464	(1) wrench, hex key	Included
7990	Triax mounting block	Optional

Notes

1. See calibration data supplied for details.
2. Additional compensation process required for higher g ranges.
3. Total dynamic accuracy is the root sum squared of thermal sensitivity shift, non-linearity and hysteresis, and transverse sensitivity.
4. At 100 Gauss, 60 Hz.
5. Maintain high levels of precision and accuracy using Endeveco's factory calibration services. Call Endeveco'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.

Contact

ENDEVCO

www.endevco.com

Tel: +1 (866) ENDEVCO

[+1 (866) 363-3826]