PERFORMANCE SPECIFICATION
SENSOR 6, DEGREES OF FREEDOM
(7360AM1-XXX-YYY-ZZZ)

Document Number	Rev	Date	Entered by	Description of Change	Change Accountable Engineer	ECO
77536	NR	2/10/23	NAD	Initial Release of Model 7360AM1-XXX-YYY-ZZZ Performance Specification	HX	53562

1.0 DESCRIPTION

The ENDEVCO® Model 7360AM1 is a six-degree of freedom (6DOF) sensor that features three DC accelerometers and three angular rate sensors packaged in a compact enclosure. This 6DOF sensor is designed specifically for automotive safety testing and other system designs in harsh shock and vibration environments requiring accurate measurement of accelerations and angular velocity,. The 7360A 6DOF sensor features various accelerating ranges including ±2, ±10, ±50, ±200, ±500g and angular rate ranges including ±100, ±500, ±1500, ±8000, ±12000 and ±18000 deg/sec, and provides full scale voltage output of ±2Vpk.

2.0 CHARACTERISTICS

2.1 ACCELEROMETER

All specifications assume +75°F (+24°C) and 5±0.02 Vdc excitation unless otherwise stated.
The following parameters are 100% tested.

		Units	Range Dash Number				
	RANGE	g	-2	-10	-50	-200	-500
2.1.1	SENSITIVITY	mV/g	1000 ±50	200 ±10	40 ±2	10 ±1.0	4 ±0.3
2.1.2	FREQUENCY RESPONSE						
	(±1dB, ref 100 Hz) Max	Hz	0-300	0-1500	0-1800	0-1800	0-1800
	(±3dB, ref 100 Hz) Typical	Hz	0-550	0-2500	0-2800	0-5000	0-5000
2.1.3	ZERO MEASURAND OUTPUT	mV	±50	±50	±50	±50	±50

2.2 RATE SENSOR

2.2.1 All specifications assume +75°F (+24°C) and +7 Vdc excitation unless otherwise stated.
The following parameters are 100% tested.

			Range Dash Number					
	DASH No.	Units	-100	-500	-1K5	-8K	-12K	-18K
	RANGE	deg/sec	±100	±500	±1500	±8000	±12000	±18000
2.2.2	SENSITIVITY (±15%)	mV/deg/sec	20	4	1.333	0.25	0.167	0.111
2.2.3	ZERO MEASURAND OUTPUT	mV	±100	±100	±100	±100	±100	±100
2.2.4	NON-LINEARITY (Maximum)	%FSO [1]	±0.5	±0.5	±0.5	±0.5	±0.5	±0.5

3.0 PERFORMANCE

3.1 ACCELEROMETER
The following parameters are established from testing of sample units.

		Units	Range Dash Number				
			-2	-10	-50	-200	-500
3.1.1	TRANSVERSE SENSITIVITY (Typical)	%	3.0	3.0	3.0	3.0	3.0
3.1.2	THERMAL ZERO SHIFT (MAX) -40°C to +100°C, ref. 24°C (-40°F to 212°F, ref. 75°F)	%FSO	±2.0	±2.0	±2.0	±2.0	±2.0
3.1.3	THERMAL SENS SHIFT (MAX) -40°C to +100°C, ref. 24°C (-40°F to +212°F, ref. 75°F)	%	±2.0	±2.0	±2.0	±2.0	±2.0
3.1.4	COMBINED NON-LINEARITY (BFSL) AND HYSTERESIS (Typical)	%FSO	±0.5	±0.5	±0.5	±0.5	±1
3.1.5	NATURAL FREQUENCY, TYP	Hz	1300	2700	5500	9800	18000
3.1.6	THRESHOLD (RESOLUTION) [2]	equiv. g's.	.0002	.001	.005	.02	.05

3.2 RATE SENSOR
The following parameters are established from testing of sample units.

			Range Dash Number					
	DASH No.	Units	-100	-500	-1K5	-8K	-12K	-18K
3.2.1	FREQUENCY RESPONSE (+1dB/-3dB, ref 100 Hz)	Hz	0-1000	0-1000	0-1000	0-1000	0-2000	0-2000
3.2.2	CROSS AXIS SENSITIVITY	%	<1	<1	<1	<1	<1	<1
3.2.3	THERMAL ZERO SHIFT (MAX) -40°C to +105°C, ref. 24°C (-40°F to 221°F, ref. 75°F)	%FSO	±2.5	±2.5	±2.5	±2.5	±2.5	±2.5
3.2.4	THERMAL SENS SHIFT (MAX) -40°C to +105°C, ref. 24°C (-40°Fto +221°F, ref. 75°F)	%	±2.0	±2.0	±2.0	±2.0	±2.0	±2.0

			Range Dash Number					
		Units	-100	-500	-1K5	-8K	-12K	-18K
3.2.5	RESIDUE NOISE (PASSBAND, TYPICAL)	mV RMS	12	3.2	2.5	2.1	1.8	1.8
4.0	**ELECTRICAL**							
4.1	ACCELEROMETER							
4.1.1	EXCITATION VOLTAGE			5±0.02Vdc				
4.1.2	CURRENT DRAIN			8mA max each accelerometer axis, 24 mA max total				
4.1.3	OUTPUT IMPEDANCE			100 ohms max				
4.1.4	LOAD			10K ohms resistance minimum 50 pF capacitance maximum				
4.1.5	RESIDUAL NOISE			50 μVrms typ; 0.5 to 100 Hz 500 μVrms typ; 0.5Hz to 10 kHz				
4.1.6	MAXIMUM EXCITATION VOLTAGE WITHOUT DAMAGE			20 Vdc				
4.1.6	INPUT VOLTAGE PROTECTION			REVERSE POLARITY PROTECTED				
4.1.8	INSULATION RESISTANCE Case to leads shorted together Shield to leads shorted together			100 Meg Ohms minimum at 50 Vdc				
4.1.9	WARM-UP TIME (to within 1% of final output value)			<100 ms				
4.2	RATE SENSOR							
4.2.1	EXCITATION VOLTAGE			5 to 16 Vdc				
4.2.2	CURRENT DRAIN			6 mA max each rate sensor axis, 18mA max total.				
4.2.3	OUTPUT IMPEDANCE			200 ohms max				
4.2.4	MAXIMUM EXCITATION VOLTAGE WITHOUT DAMAGE			20 Vdc				
4.2.5	COMMON MODE VOLTAGE (±5%)			2.5 Vdc				
4.2.6	FULL SCALE OUTPUT VOLTAGE (±15%)			±2 Vpk				
4.2.7	INSULATION RESISTANCE (@100Vdc)			>100 MΩ				
4.2.8	WARM-UP TIME (to within 1% of final output value)			<100 ms				

5.0	**PHYSICAL**	
5.1	WEIGHT (typical)	35 grams (without cable), cable 0.1 oz/ft (9 gm/m)
5.2	CASE MATERIAL	Anodized aluminum alloy.
5.2.1	CABLE TYPE	2 cables, 12x #30AWG Cond PFA Insulated, Braided Shield, PU Jacket
5.3	MOUNTING/TORQUE	2x #4-40 or M3 Mounting Screw/ 6 lb-in (0.68 N-m)
6.0	**ENVIRONMENTAL**	
6.1	ACCELERATION LIMITS (in any direction)	
6.1.1	SHOCK LIMIT 5000g	
6.2	TEMPERATURE	
6.2.1	OPERATING RANGE	-40°F to +212°F (-40°C to +100°C)
6.2.2	STORAGE RANGE	-40°F to +212°F (-40°C to +100°C)
6.3	HUMIDITY	IP67
7.0	**CALIBRATION DATA**	
7.1	ACCELEROMETER	
7.1.1	SENSITIVITY (Measured with 5±0.02Vdc excitation)	Measured at 1g and 100 Hz for the -2 Measured at 10 g and 100Hz for the -10, -50, -200 and -500
7.1.2	ZERO MEASURAND OUTLUT Note: X and Z axis are “Reverse Polarity” when testing ZMO.	Measured at room temperature
7.1.3	FREQUENCY RESPONSE (Measured with 5±0.02 excitation)	Measured at 1g, 20 to 1000 Hz for the -2 Measured at 10 g, 20 to 10000 Hz for the -10, -50,-200 and -500
7.2	RATE SENSOR	
7.2.1	SENSITIVITY (Measured with +7 Vdc excitation)	Measured at 100 deg/s for -100, 500deg/s for -500, 1500 deg/s for -1K5, and 3000 deg/s for -8K, -12K and -18K.
7.2.2	ZERO MEASURAND OUTPUT	Measured at +7 Vdc excitation and room temperature
7.2.3	NON-LINEARITY (Measured with +7 Vdc excitation)	Measured within range -100 ~ +100 deg/s for -100, -500 ~ +500 deg/s for -500, -1500 ~ +1500 deg/s for -1K5, and -3000 ~ +3000 deg/s for -8K, -12K and -18K.

8.0 ACCESSORIES

8.1 SUPPLIED

EH866	4-40 X 1 1.4 Socked Head Cap Screw, 2X
EHW289	#4 Flat Washer, 2X

8.2 OPTIONAL

9.0 NOTES

[1] Full scale output (FSO) is nominally 4 volts

[2] THRESHOLD = 2X MAX. RESIDUAL NOISE; .5 TO 100Hz/SENSITIVITY

[3] Model Number Definition:

7360AM1 - XXX - YYY - ZZZ

- ZZZ: Cable length in inches, i.e. 7360AM1-XXX-YYY-120 has 2 cables, each with a length of 120 inches [3.5M]. Tolerance between the two may vary, as long as both cables are inside the tolerance range. See Fig 1 for length tolerance.
- YYY: Denotes range of angular rate
  -100 = ±100deg/sec, -500 = ±500deg/sec, -1K5 = ±1500deg/sec,
  -8K = ±8000deg/sec, -12K = ±12000deg/sec,
  -18K = ±18000deg/sec
- XXX: Denotes range of acceleration
  -2 = 2g, -10 = 10g, -50 = 50g, -200 = 200g, -500 = 500g
- 7360AM1: Basic Model Number

CABLE LENGTH TOLERANCE

CABLE TOLERANCES IN ENGLISH			CABLE TOLERANCES IN METRIC		
1"≤ LENGTH < 1'	=	+1"/ - 0	2.54cm ≤ LENGTH < 30.5cm	=	+2.54cm/ - 0
1'≤ LENGTH < 5'	=	+2"/ - 0	30.5cm ≤ LENGTH < 1.5m	=	+5.1cm/ - 0
5'≤ LENGTH < 100'	=	+6"/ - 0	1.5m ≤ LENGTH < 30.5m	=	+15.2cm/ - 0
100'≤ LENGTH	=	+1'/ - 0	30.5m ≤ LENGTH	=	+30.5cm/ - 0

Figure 1