

Taking the heat

Sensors for high temperature dynamic measurements

When selecting sensing instruments for measuring dynamic events in high temperature (>550°F, 288°C) applications, it involves much more than just matching the temperature rating of the accelerometer or pressure transducer to the test environment. At very high temperatures, every component has to work together in a synergistic fashion. The cable that transmits the signals has to be able to withstand the environment and without adding triboelectric noise. The charge converter that receives and conditions the signal should match the output impedance of the sensor over its entire temperature range.

As a leading provider of pressure and vibration sensors for the most demanding aerospace, nuclear, turbine and industrial control measurement applications, Endevco advanced sensors are proven to withstand the challenges of high temperature environments.

- › Able to withstand high temperatures (+550°F, +288°C)
- › Long term, stable performance
- › Small size & lightweight

A close-up, low-angle view of the interior of a gas turbine engine, showing the complex arrangement of compressor and turbine blades. The lighting is a deep red, highlighting the metallic surfaces and the radial symmetry of the components.

Applications

- › Gas turbine vibration measurements
- › HALT/HASS testing
- › Automotive engine testing

Endevco vibration sensors

Model number	2220E	2230E	2230EM1	6222S	2271A/2271AM20	2272
Description	Thru-hole mount 360° cable orientation Lightweight	Triaxial Adhesive mount	Triaxial Flange mount	ARINC mount Differential output	High sensitivity side or top exit connector	Wide frequency response
Sensitivity pC/g, typical	3.0	3	3	20 / 50 / 100	11.5	13
Sinusoidal limit g	1,000	1,000	1,000	2,000 / 1,000 / 500	1,000	1,000
Shock limit g	5,000	2,000	2,000	4,000 / 2,000 / 1,000	10,000	2,000
Frequency response ±1 dB Hz	1 to 12,000	1–10,000	1–10,000	1–12,000 / 1–9,000 / 1–9,000	1 to 8,000	1–9,000
Temperature range °C (°F)	-55 to +260 [-67 to +500]	-55 to +260 [-67 to +500]	-55 to +260 [-67 to +500]	-54 to +260 [-65 to +500]	-269 to +260 [-452 to +500]	-269 to +269 [-452 to +500]
Signal/ground isolation	Yes	No	No	Yes	Yes	No
Hermetic seal	Yes	Yes	Yes	Yes	Yes	Yes
Weight gram (without cable)	3.1	17	22.5	91	27	27
Dimensions mm [in]	Ø 9.53 x 5.8 [Ø 0.375 x 0.23]	17.15 x 11.68 x 15.24 [0.675 x 0.46 x 0.60]	17.15 x 11.68 x 15.24 [0.675 x 0.46 x 0.60]	41.4 x 30.2 x 20.3 [1.63 x 1.19 x 0.80]	15.9 hex x 19.8 [5/8 hex x 0.78]	15.9 hex x 19.8 [5/8 hex x 0.78]
Mounting method	Screw	Adhesive	Screw	Screw	Stud	Stud
Cable included	3053V-120	3053V-120 [3]	3053V-120 [3]	No	3090C-120	3090C-120

Model number	2221F	7240C	7201	7703A	7704A
Description	Thru-hole mount 360° cable orientation	Very high frequency	General purpose	General purpose Radiation tested	General purpose Radiation tested
Sensitivity pC/g, typical	10	3.0	10 / 50 / 100	50 / 100 / 200 / 300 / 1,000	50 / 100
Sinusoidal limit g	1,000	1,000	2,000	2,000 / 1,000 / 850 / 675 / 500	2,000 / 1,000
Shock limit g	3,000	5,000	20,000 / 10,000 / 5,000	10,000 / 5,000 / 2,000 / 1,600 / 1,000	10,000 / 5,000
Frequency response ±1 dB Hz	0.1–12,000	1–20,000	1–15,000 / 1–10,000 / 1–8,000	1–9,000 / 1–8,000 / 1–6,000 / 1–5,000 / 1–3,000	1–9,000 / 1–8,000
Temperature range °C (°F)	-55 to +260 [-67 to +500]	-55 to +260 [-67 to +500]	-73 to +260 [-100 to +500]	-55 to +288 [-67 to +550]	-55 to +288 [-67 to +550]
Signal/ground isolation	Yes	No	No	Yes	Yes
Hermetic seal	Yes	Yes	Yes	Yes	Yes
Weight gram (without cable)	11	4.8	18 / 20 / 25	25 / 29 / 62 / 70 / 120	25 / 29
Dimensions mm [in]	Ø 15.24 x 8.9 [Ø 0.60 x 0.35]	9.53 hex x 11.68 [3/8 hex x 0.46]	15.88 hex x 19.8 [5/8 hex x 0.78]	for -50 / -100: 16.0 hex x 19.8 [5/8 hex x 0.78] for -200 / -300 / -1000: 25.4 hex x 23.1 [1.0 hex x 0.91]	16.0 hex x 21.1 [5/8 hex x 0.83]
Mounting method	Screw	Stud	Stud	Stud	Stud
Cable included	3090C-120	3053V-120	3090C-120	3090C-120	3090C-120

Cable assemblies

Model number	6917B	3090C	3053V
Connector 1	7/16-27 female plug (2 socket)	10-32 male plug	M3 male plug, hex end
Connector 2	Pigtail	10-32 male plug	10-32 male plug, hex end
Cable type	Twisted pair, shielded	Coaxial, shielded	Coaxial, shielded
Capacitance pF/ft, max	80	40	32
Conductor size AWG	Stranded, 20	Stranded, 30	Solid, 33
Jacket material	Wrapped Teflon®	Wrapped Teflon®	Extruded Teflon®, VersaFlex
Overall diameter in, max	0.21	0.08	0.054
Bend radius in, min	0.6	0.85	0.5
Temperature range °C (°F)	-54 to +260 [-65 to +500]	-269 to +260 [-452 to +500]	-254 to +260 [-432 to +500]
Low noise treated	Yes	Yes	Yes

Supportive instrumentation

Model number	2771CM2	2771C
Features	Designed for use with extreme high temp sensors, 1200°F [650°C]	4 gain options Supports TEDS
Input	PE	PE
Channels	1	1
Gain	1 mV/pC	0.1 / 1 / 5 / 10 mV/pC
Broadband noise rms	10 µV	5 / 30 / 50 / 50 µV
Lower cutoff freq Hz [-3 dB]	2	0.4 / 0.4 / 2 / 2
Upper cutoff freq Hz [-3 dB]	30	8 / 30,000 / 50,000 / 50,000 (±5%)
Power requirements VDC	24-30	24-30
Operating temperature °C (°F)	-40 to +257 [-40 to +125]	-40 to +257 [-40 to 125]
Weight grams	57	57