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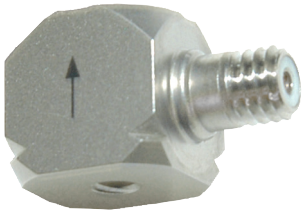
Miniature IEPE Accelerometer

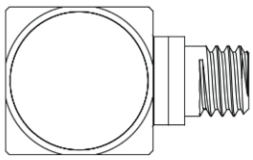
Type 8740A…

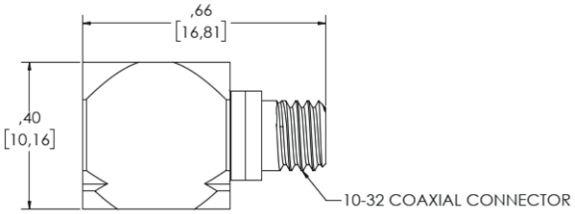
Light weight, ceramic shear, high sensitivity

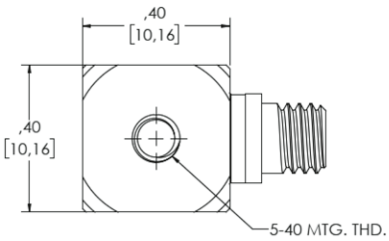
The Type 8740A… is a high sensitivity single axis accelerometer. The sensor is designed primarily for modal analysis applications and has selective use as a general purpose vibration sensor.

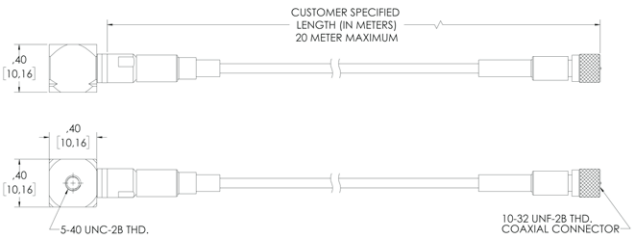
- IEPE, ±5 g, ±10 g, and ±50 g ranges
- High sensitivity, low noise and high dynamic range
- Choice of ranges and sensitivities
- Ground isolated mounts
- TEDS option
- IP68 waterproof cable option
- Conforming to CE











Note: Requires a thermally stable environment. Slight temperature fluctuations may cause high thermal transient output or error.

Description

Type 8740A… is a miniature and lightweight single axis accelerometer which reduces mass loading on thin-walled structures important to multichannel modal applications or general vibration measurements.

Internal of the Type 8740A… accelerometer is a ceramic shear sensing element, assuring high immunity to base strain. The charge signal is converted by the internal low noise charge amplifier to a proportional high level voltage signal at an output impedance of less than 200 ohms.

Type 8740A… single axis accelerometer, has an integral 10-32 connector and is designed for easy installation in confined areas. Type 8740A… has a welded titanium housing and is ground isolated when mounted with the mounting clip or adhesive mounting adapter. Type 8740A… is IP68 waterproof with its Integral Cable option and is tested for 48 hours at a pressure of 16 bar. The sensing element design provides outstanding amplitude and phase response over a wide frequency range.

The accelerometer operates directly from the internal power source found in most FFT analyzers, from several Kistler Piezotron power supply couplers or from any industry standard IEPE (Integrated Electronic Piezo Electric) compatible power source.

Application

This miniature and light weight, single axis accelerometer series is ideally suited for multiple channel modal analysis on small components or subsystems and well as full vehicle testing for aviation, space, automotive as well as a wide range of general test structures.

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Technical data

Specification	Unit	Type 8740A5D0…	Type 8740A010…	Type 8740A050…
Acceleration range	g	±5	±10	±50
Sensitivity (±15%)	mV/g	1 000	500	100
Resonant frequency mounted	kHz	34		
Frequency response (±5%)	Hz	0.3 … 7 000		
Frequency response (±10%)	Hz	0.2 … 9 000		
Phase shift <5°	Hz	1.5 … 7 000		
Amplitude non-linearity	%FSO	±1		
Time constant	s	1.2 … 3.0		
Threshold	g_{rms}	0.000042	0.000045	0.00006
Spectral Noise (1Hz), typ.	$\mu g_{rms}/\sqrt{Hz}$	14	16	30
Spectral Noise (10Hz), typ.	$\mu g_{rms}/\sqrt{Hz}$	3.8	4.0	5.0
Spectral Noise (100Hz), typ.	$\mu g_{rms}/\sqrt{Hz}$	1.3	1.3	1.4
Spectral Noise (1kHz), typ.	$\mu g_{rms}/\sqrt{Hz}$	0.42	0.45	0.54
Spectral Noise (10kHz), typ.	$\mu g_{rms}/\sqrt{Hz}$	0.2	0.2	0.34
Transverse sensitivity	%	3.3		
Environmental				
Base strain sensitivity @ 250 με	g/με	0.001		
Shock limit (150 μs (micro) pulse width, max.)	g_{pk}	5 000		
Operating temperature	°C	–54 … 75		
Output				
Bias nom.	VDC	14*		
Impedance	Ω	<200		
Voltage, F.S., nom.	V	±5		
Power supply				
Voltage	VDC	22 … 30		
Constant current	mA	2 … 18		
Power supply				
Sensing element	Type	Ceramic		
Case material		Titanium		
Sealing		Hermetic (8740A…BSP option: IP68 (waterproof) tested at 16 bar for 48 hours)		
Connector	Type	10 – 32 coaxial		
Ground isolation		With Accessory		
Mass	gr	4.5		
Mounting	Type	Wax, adhesive, Clip, Magnet, stud (5-40 UNF-2B)		
Mounting torque, stud	N·m	0.7 ± 0.07		

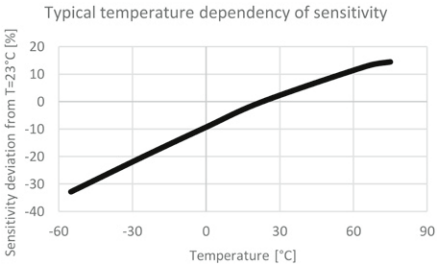
1 g = 9.80665 m/s², 1 in = 25.4 mm, 1 gram = 0.03527 oz, 1 lbf-in = 0.113 N·m

* TEDS Txx will increase Bias by 0.5 VDC nominally

** All values listed are Typical, unless otherwise specified

Temperature Coefficient of Sensitivity

Type 8740A…



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Accessing TEDS Data

Accelerometers with a "T" suffix are variant options which incorporate the TEDS 'Smart Sensor' design. Viewing an accelerometer's data sheet requires a TEDS compatible data acquisition system. The TEDS Interface provides a negative current excitation (reverse polarity) altering the operating mode of the PiezoSmart sensor, allowing the program editor software to read or add information contained in the memory chip.

Mounting

Reliable and accurate measurements require that the mounting surface be clean and flat. The sensor can be attached to the structure with wax or adhesive or using the supplied adaptor stud. The instruction manual for Type 8740A… provides detailed information regarding mounting surface preparation.

Included accessories	**Type**
• Ground isolated mounting clip	800M156
• Mounting wax	8432
• ISO 17025 Calibration Certificate	
• IP68 Waterproof Certificate of Conformity (only for Type 8740A...BSP option)	

Optional accessories	**Type**
• Magnetic mounting base	800M160
• Ground isolated adhesive mounting base	800M158

Optional cables	**Type**
• Fluropolymer jacketed cable, 10-32 (pos.) to BNC (pos.)	1761B…
• Fluropolymer jacketed cable, 10-32 (pos.) to 10-32 (pos.)	1762B…
• Flexible PVC jacketed cable, 10-32 pos to BNC (pos.)	1768A…K01
• Flexible PVC jacketed cable 10-32 (pos.) to 10-32 (pos.)	1768A…K02

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Ordering key

Type 8740A... □ □ □

Measuring range

±5 g	**5D0**
±10 g	**010**
±50 g	**050**

TEDS templates / variants

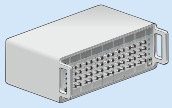
Standard	**B**
Default, IEEE 1451.4 V0.9, Template 0 (UTID 1)	**T00**
IEEE 1451.4 V0.9 Template 24 (UTID 116225)	**T01**
LMS Template 117, Free format Point ID	**T02**
LMS Template 118, Automotive Format (Field 14 Geometry = 0)	**T03**
LMS Template 118, Aerospace Format (Field 14 Geometry =1)	**T04**
P1451.4 V1.0 template 25 – Transfer Function Disabled	**T05**
P1451.4 V1.0 template 25 – Transfer Function Enabled	**T06**

Cable length

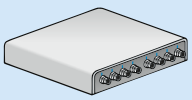
Customer specified (for waterproof IP68 integral cable Type 8740A... B only – maximum 20 meter length)	**SP**
No integral cable	**–**

Measuring chains

IEPE sensor and customer IEPE compatible DAQ

Measuring	Connecting	Amplifying	Acquiring	Analyzing
Type 8740A... 	Types 1761B… Type 1768A...K01 (10-32 (Pos.) to BNC (Pos.)) 		IEPE Compatible Data Acquisition Unit (customer supplied) 	Laptop (customer supplied) 

IEPE sensor and Kistler LabAmp

Measuring	Connecting	Amplifying	Acquiring	Analyzing
Type 8740A... 	Types 1761B… Type 1768A...K01 (10-32 (Pos.) to BNC (Pos.)) 	Kistler LabAmp Type 5165A... Signal Conditioning & Data Acquisition (Analog & Digital Output) 	Ethernet Cable	Notebook with LabAmp GUI