

Miniature IEPE Accelerometer

PiezoStar Triaxial 100 ... 1,000g

Type Z22198D

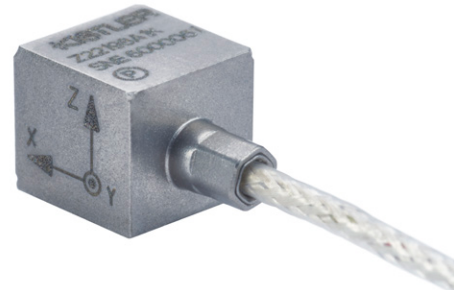
The product family Type Z22198D consists of accelerometers which measure vibration in the three orthogonal axes.

- Triaxial accelerometers IEPE – 1,000 g, 500 g, 250 g and 100 g range
- Low mass of 0.9 grams and miniature size of a 6 mm cube
- Extreme wide frequency
- Case isolated
- PiezoStar sensing element with very low thermal sensitivity shift

Description

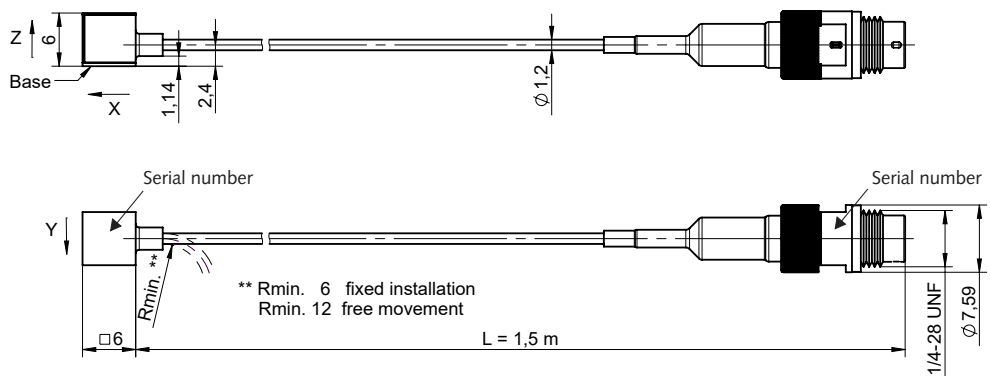
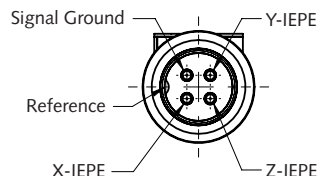
The integrated PiezoStar sensing element delivers a very low thermal sensitivity shift. This unique sensing element is combined with low noise electronics to provide a wide frequency bandwidth. The accelerometer is case isolated to guarantee low noise performance even with high electromagnetic interference, for example in electric motors.

In addition, the welded titanium housing combines ruggedness and light weight. The integral cable is attached to the sensor using a patented technology, combining robustness and easy handling for demanding installations. The cable is equipped with a four-pin industry standard connector (1/4-28 UNF pos.).



Application

These triaxial miniature accelerometers are designed for structural testing for example on satellites, printed circuit boards, and components with limited mounting space. Ideally suited for structural analysis of very small components or subsystems, full vehicle testing for aviation, space, and automotive, as well as a wide range of general test structures. The PiezoStar accelerometer technology excels in operational testing over dynamic test conditions.



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Technical data

Type	Unit	Z22198D1K0A	Z22198D500A	Z22198D250A	Z22198D100A
Acceleration class (range)	g	±1,000	±500	±250	±100
Acceleration limit	g _{pk}	±2,000			
Threshold (1 Hz ... 10 kHz)	g _{rms}	<0.006			
Sensitivity at 159.15 Hz, 10 g _{rms} *	mV/g	3.6 (±35%)	7.7 (±35%)	16.6 (±35%)	49.9 (±35%)
Resonant frequency mounted	kHz	>35			

Frequency response

X axis (typical, ±5%)	Hz	0.3 ... 5,800	0.5 ... 5,800	1.0 ... 5,800	2.5 ... 5,800
Y axis (typical, ±5%)	Hz	0.3 ... 5,600	0.5 ... 5,600	1.0 ... 5,600	2.5 ... 5,600
Z axis (typical, ±5%)	Hz	0.3 ... 10,900	0.5 ... 10,900	1.0 ... 10,900	2.5 ... 10,900
X axis (typical, ±10%)	Hz	0.15 ... 8,800	0.3 ... 8,800	0.6 ... 8,800	1.5 ... 8,800
Y axis (typical, ±10%)	Hz	0.15 ... 7,700	0.3 ... 7,700	0.6 ... 7,700	1.5 ... 7,700
Z axis (typical, ±10%)	Hz	0.15 ... 15,000	0.3 ... 15,000	0.6 ... 15,000	1.5 ... 15,000
Amplitude non-linearity	%FSO	±1			
Time constant nom.	s	3.2	1.5	0.7	0.2
Transverse sensitivity	%	<10			
Transverse sensitivity typ.	%	4			
Magnetic field sensitivity	mg/Gauss	0.05			

Environmental

Base strain sensitivity @ 250 µε**	g/µε	0.035			
Shock limit (1 ms pulse), max.	g _{pk}	2,000			
Thermal sensitivity shift (typical) (–55 ... +125°C) [–67 ... +257°F]	%	±5.0			
Operating temperature range					
Sensor permanent	°C [°F]	–55 ... +125 [–67 ... +257]			

Output

Bias nom.	VDC	11			
Output impedance	Ω	<80			
Voltage full-scale	V	±5			

Power supply

Voltage	VDC	20 ... 30			
Constant current	mA	2 ... 10			

Construction

Electrical isolation		Case isolated			
Mass – sensor only excl. cable	grams	0.9			
Sensing element	type	PiezoStar			
Housing/base	material	Titanium			
Protection class; sensor housing and cable attachment; (EN 60529)	type	IP64			

Technical data (continuation)

Type	Unit	Z22198D1K0A	Z22198D500A	Z22198D250A	Z22198D100A
Cable					
Operating temperature range	°C [°F]	-55 ... +170 [-67 ... +338]			
Cable diameter	mm	1.2			
Mass	grams/meter	3.2			
Cable mantel		Special fluorothermoplastics, transparent			
Connector					
Operating temperature rang	°C [°F]	-15 ... +80 [+5 ... +176]			
Connector	type	4-pin 1/4-28 UNF connector male			

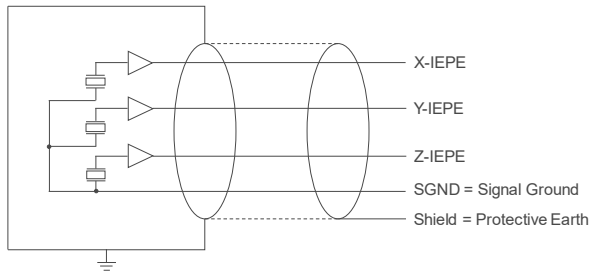
* The stated sensitivity is the mean (nominal) value. For example for Z22198D1K0A sensor the mean sensitivity is 3.6 mV/g with a spread between 4.86 mV/g and 2.34 mV/g. This results in a mean acceleration range of 1,388g with a spread between 1,028g and 2,137g.

** Base strain sensitivity depends on the mounting condition.

If not specified all values at room temperature and with 4 mA excitation current and with the sensor mounted on base.

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

Electrical/grounding concept



Mounting

The accelerometer must be mounted on its base plate (see drawing on page 1) on the component to be tested in order to achieve an optimum frequency response. Mounting the accelerometer on other sides reduces the frequency bandwidth. It is essential that it is mounted on a smooth (<Ra1.6), flat and clean surface.

When conducting tests at room temperature, it's recommended to utilize the included wax for sensor mounting. However, for tests conducted below or above room temperature, consider using adhesive bonds such as cyanoacrylate (e.g. Loctite 454) or speed bonder.

CAUTION: The accelerometer contains a high output PiezoStar element combined with a sensitive electronic. Handle the sensor with care during mounting and removal, especially when using a magnetic base or removing the sensor from adhesive mount.

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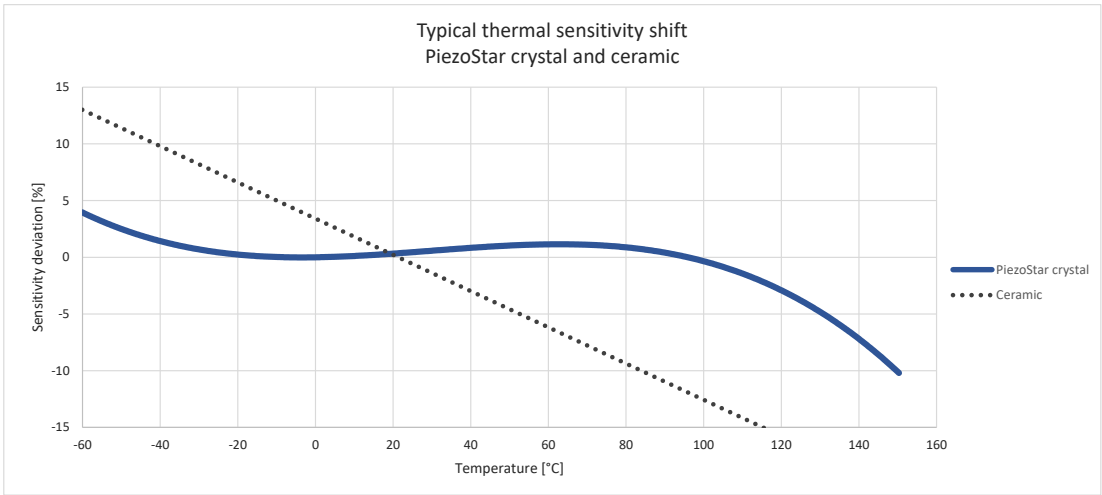
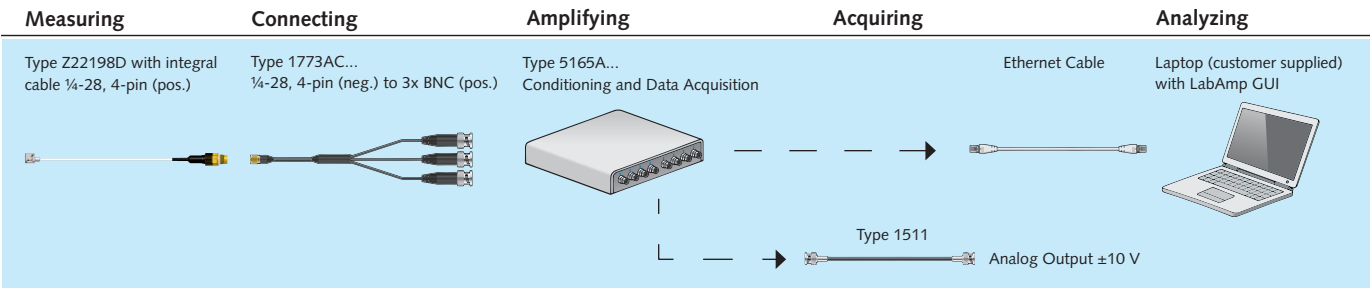


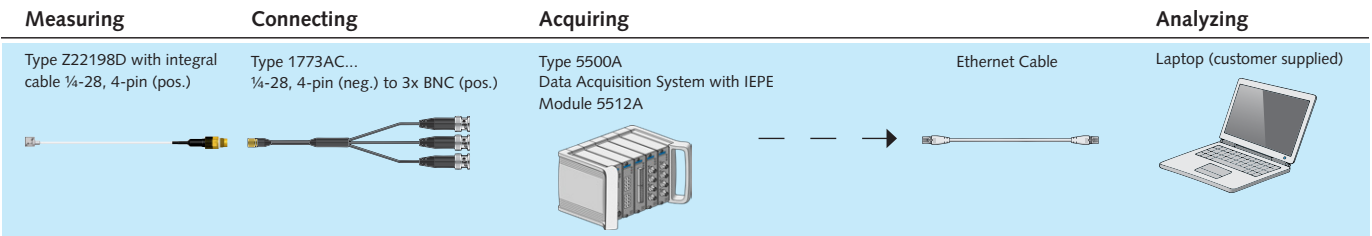
Fig. 1: Thermal sensitivity shift (typical)

Measuring chains

IEPE sensor and Kistler LabAmp



IEPE sensor and KIDAQ



Accessories with Type Z22198D

Accessories included

- Petro Wax 5grams

Type/Mat. No.
8432

Optional cables

- Breakout cabel 4-pin ¼-28 UNF neg. to 3x BNC pos., length 5 meter
- Breakout cable 4-pin ¼-28 UNF neg. to 3x BNC pos., length 10 meter

Type/Mat. No.
1773AC5

1773AC10

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