

K-Beam® Accelerometer

Type 8310B...

Hermetically Sealed, Ground Isolated Capacitive Accelerometers

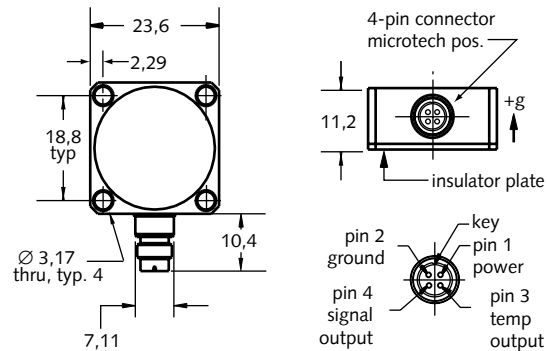
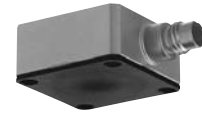
The single axis capacitive accelerometer measure static acceleration or low-level, low-frequency vibration. Featuring excellent frequency response, an insensitivity to thermal transients and transverse acceleration, the 8310B... includes an internal temperature sensor and output that can be used to externally compensate the operation of the accelerometer.

- Available in 2g, 10g, 25g and 50g ranges
- Frequency response 0 ... 250 Hz (± 5%), 2g version
- Wide supply voltage range up to +32VDC
- Noise 380 µg (2g version)
- Bipolar output: ± 2 VFS, single supply
- High shock resistance
- Conforming to CE

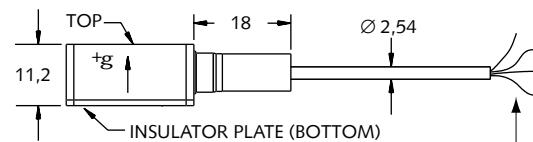
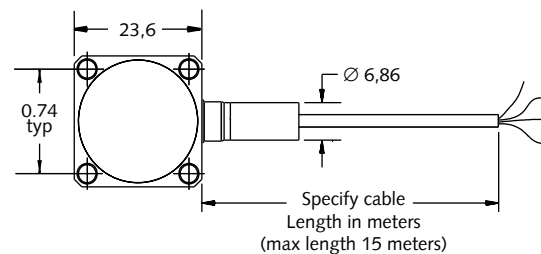
Description

The 8310B... K-Beam accelerometer series utilizes a micro-machined variable capacitance sensing element. The sensing element consists of a very small inertial mass and a flexure element cantilever positioned between two plates. As the mass deflects under acceleration, the capacitance between these plates changes. AC excitation and synchronous amplitude demodulation circuitry contained in the accelerometer's signal conditioner provides an analog output signal proportional to the applied acceleration. The output signal format is bipolar at 0 ±2V. and the unit is powered by a single ended power supply

The sensing element and electronics are integrated into a single lightweight, hermetically sealed titanium housing. Ground isolation is provided by an insulator plate permanently bonded to the housing . The 4-pin receptacle installed on the basic model provides the convenience of a detachable cable. The 8310B...M11sp variation contains an integral four conductor cable terminated in pigtailed; length user specified. The 8310B... has an internal temperature sensor with output transfer function. $Temp (^{\circ}C) = (Vt - 0,424) / 0,00625$ where Vt is the measured voltage from the unit's temperature output. The temperature output can be used to externally compensate operation of the accelerometer. Accuracy of temperature sensor output is ±4°C.



8310B... standard version with a 4-pin pos. connector



8310B...M11 Wiring information				
Color	Red	Black	White	Yellow
Use	Power	Ground	Output	Temperature

8310B...M11sp version with an integrated pigtail terminated cable

8310B_000-566e-10.05

Technical Data

Type	Units	8310B2	8310B10	8310B25	8310B50
Acceleration Range	g	± 2	± 10	± 25	± 50
Sensitivity ±5 %	mV/g	1000	200	80	40
Zero g Output	mV	±30	±30	±40	±40
Resolution (Threshold) (Ref 5% bandwidth)	µg	540	2830	2940	5700
Amplitude Non-linearity	%FS	± 0,8	± 0,8	± 1	± 1
Resonant Frequency nom.	Hz	1400	2700	8700	10000
Frequency Response ±5%	Hz	0 ... 250	0 ... 180	0 ... 300	0 ... 500
Noise typ. (0 ... 100Hz)	µgrms	380	2000	2400	4000
Noise Density (0...100 Hz) typ.	µgrms /√ Hz	38	200	240	400
Phase Shift max.	@ 0 Hz	degree	0	0	0
	@ 10 Hz	degree	2	2	2
	@ 100 Hz	degree	20	20	20
Sensitive Axis Misalignment typ. (max. ≤ 30)	mrad	≤10	≤10	≤10	≤10
Transverse Sensitivity typ. (max. 3%)	%	1	1	2	2
Environmental:					
Random Vibration 20... 2000 Hz	grms	20	20	20	20
Shock half sine, 700µs	gpk	6000	6000	3000	3000
Temperature Coefficient Sensitivity typ.	%/°C	0,02	0,02	0,02	0,02
Temperature Coefficient of Bias, typ. (max)	mg/°C	0,2 (1)	1 (5)	3 (15)	5 (20)
Temperature Range Operating	°C	-40 ... 85	-40 ... 85	-40 ... 85	-40 ... 85
Temperature Range Storage	°C	-55 ... 125	-55 ... 125	-55 ... 125	-55 ... 125
Output:					
Impedance max.	Ω	350	350	350	350
Load Resistance min.	kΩ	30	30	30	30
Capacitive Load max.	µF	0,5	0,5	0,5	0,5
Supply:					
Voltage	VDC	3,8 ... 32	3,8 ... 32	6 ... 32	6 ... 32
Current nom.	mA	1,3	1,3	13	13
Construction:					
Sensing Element	type	capacitive	capacitive	capacitive	capacitive
Housing/Base	material	titanium/ Al. hard anodize	titanium/ Al. hard anodize	titanium/ Al. hard anodize	titanium/ Al. hard anodize
Sealing - housing/connector	type	hermetic	hermetic	hermetic	hermetic
Connector	type	4-pin pos.	4-pin pos.	4-pin pos.	4-pin pos.
Ground Isolation	MΩ	10	10	10	10
M11 (integral cable)	type	pigtail	pigtail	pigtail	pigtail
Weight	grams	17	17	17	17
Mounting Torque	Nm	0,5	0,5	0,5	0,5

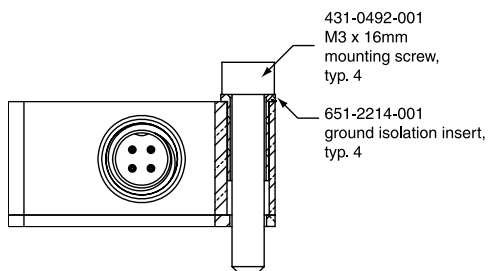
1 g = 9,80665 m/s², 1 inch = 25,4 mm, 1 gram = 0,03527 oz, 1 lbf-in = 0,1129 Nm

Application

These high performance, solid state sensors are ideally suited for applications requiring the measurement of low level acceleration in a steady-state or low frequency environment. Vehicle stability control and ride analysis; automotive vibration, structural analysis; robotics and/or platform motion control systems, building and bridge vibration measurements are but a few areas of application.

Mounting

Reliable and accurate measurements require that the mounting surface be clean and flat. The accelerometers can be attached to the test structure with adhesive or by the supplied screws. The operating instruction manual for the 8310B... provides detailed information regarding mounting surface preparation.



Accessories Included

- (4) mounting screws, 4-40 UNC-2A x 5/8" long 431-0491-001
- (4) mounting screws, M3 x 16mm long 431-0492-001
- mounting wax 8432
- (4) screwhole inserts 651-2214-001

Optional Accessories

- triaxial mounting cube 8518A
- cable, 4-pin neg. (microtech) to pigtails 2m long 1592M1
- cable, 4-pin neg. (microtech) to pigtails specify length in meters 1592M1sp
- cable, 4-pin neg. (microtech) to (2) banana jacks (power) and BNC pos. to signal output available in lengths of 2, 5, 10, 20m 1786C
- K-Beam power supply with 115 VAC to DC power supply 5210S1
- K-Beam power supply with 230 VAC to DC power supply 5210S1E

Ordering Key

Measuring Range

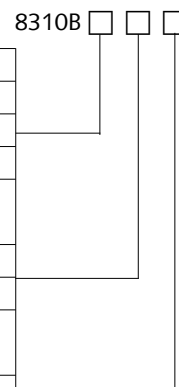
±2g	2
±10g	10
±25g	25
±50g	50

Cable

standard detached	-
integrated	M11

Cable length (meters)

user specified (M11 only)	sp
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