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K-Beam®

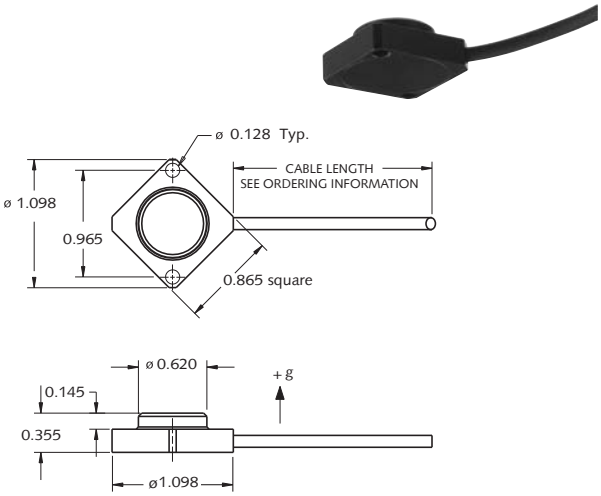
Type 8305A...

Light Weight, Low Profile Capacitive Accelerometers

The 8305A... capacitive accelerometer series measures single axis acceleration in a steady state or low-level, low-frequency environment.

Featuring high sensitivity and low thermal response characteristics, the accelerometer series is available in two measuring ranges, single ended or differential output and connector options.

- Small, lightweight variable capacitance sensing element
- Frequency response 0 ... 250Hz
- Operates from a 9 volt battery
- Ground Isolated
- Conforming to CE



Description

The 8305A... K-Beam accelerometer series utilizes a three layer silicon micro-machined variable capacitance sensing element which enables it to have true static response. Unlike a piezoelectric accelerometer which is an active sensor requiring no external excitation, the K-Beam accelerometer requires DC Excitation to operate. They are fully calibrated sensors with all excitation and signal conditioning electronics integrated into a single package.

K-Beam accelerometers provide a high level output signal with excellent long-term stability. The 8305A... standard configuration, provides the convenience of a single polarity power supply and a single-ended output. A 2.5 volt offset is present at 0 g. The 8305A…M4 and 8305A…M7 versions add a 4-pin (pos. and neg. respectively) connector to the cable end of the standard 8305A. The 8305A…M2 versions, operate from a single polarity supply and provides a differential output. When connected to a differential amplifier, the offset at 0 g is nominally 0 volts. Power can be furnished from a regulated DC power supply or from a 9-Volt alkaline battery. The K-Beam accelerometers are available either in a standard 0.5 meter length or in a user specified cable length.

Application

The 8305A series of units are low cost and considered general purpose types but like all K-Beam types, they measure low-level, low-frequency vibration and static acceleration.

Applications include: vehicle stability control and ride analysis, structure analysis, robotics and/or platform motion control, inclination and tilt.

Mounting

Reliable and accurate measurements require that the mounting surface be clean and flat. The sensor can be attached to the test structure with the supplied screws. The Operating Instruction Manual for the 8305 provides detailed information regarding mounting surface preparation.

000-217a-04.04 (K8.8305)

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Technical Data

Type		Units	8305A2...	8305A10...
Acceleration Range		g	±2	±10
Sensitivity ±5%.		mV/g	500	100
M2 version only		mV/g	1000	200
Zero g Output ±5%		V	2.5	2.5
M2 version only, ±0.2 5V		V	0	0
Resolution (Threshold) typ.		µg	280	1410
Noise Density typ. (0 ... 10 0Hz)		$\mu g_{rms}/\sqrt{Hz}$	20	100
Noise (0 ... 100Hz) typ.		μg_{rms}	200	1000
Resonant Frequency nom.		kHz	1.4	2.7
Phase Shift @	10 Hz max.	degree	2	2
	100 Hz max.	degree	20	20
Frequency Response ±5% (100 Hz Ref.)		Hz	≥200	≥180
Amplitude Non-linearity typ. (max.)		%FSO	0.4 (0.8)	0.4 (0.9)
Sensitive Axis Misalignment typ. (max.)		mrad	<10 (30)	<10 (30)
Transverse Sensitivity typ. (max.)		%	1 (3)	1 (3)
Environmental:				
Random Vibration 20 ... 2000 Hz		g_{rms}	20	20
Shock 0.5 ms, half sine		g_{pk}	6000	6000
Temperature Coefficient of:	Sensitivity typ. (max.)	%/°F	0.01 (0.018)	0.01 (0.018)
	Bias typ. (max).	mg/°F	0.11 (0.56)	0.56 (2.8)
Temperature Range:	Operating	°F	–40 ... 185	–40 ... 185
	Storage	°F	–65 ... 255	–65 ... 255
Integral Cable Length		m	0.5	0.5
Capacitive Load max.		pF	5000	5000
Operating Load Resistance min.		kΩ	40	40
Supply Voltage		VDC	7 ... 16	7 ... 16
Current typ.		mA	0.7	0.7
Output Impedance		Ω	40	40
Construction:				
Sensing Element		type	capacitive	capacitive
Housing/ Base		material	Al./ hard anodize	Al./ hard anodize
Sealing - Housing/Cable		type	Epoxy	Epoxy
Connector		type	pigtail, or 4-pin	pigtail, or 4-pin
Cable		type	shielded	shielded
Weight		grams	6.5	6.5
Ground Isolation min.		MΩ	10	10
Mounting		type	cap screw	cap screw

1 *g* = 9.80665 m/s², 1 inch = 25.4 mm, 1 gram = 0.03527 oz, 1 lbf-in = 0.1129 Nm

000-217a-04.04 (K8.8305)

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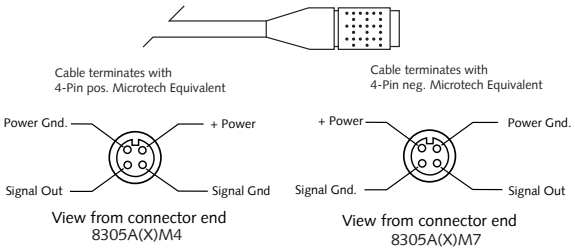
Pigtail Interface Connections

Wire Color	Signal 8305A...	Signal 8305A...M2
red	power (+7...+16 VDC)	power (+7...+16 VDC)
white	(+) signal output	(+) signal output
black	power/ signal ground	power/ signal ground
orange	not used	(-) signal output
blue	not used	not used
green	not used	not used
shield	connected to case	connected to case



Ordering Key

8305A □ □ □

Measuring Range (g)	
2	2
10	10
Output	
single ended, pigtail terminated	-
differential, pigtail terminated	M2
single ended, 4-pin pos. terminated	M4
single ended, 4-pin neg. terminated	M7
Cable length (meters)	
standard (0.5)	-
user specified	sp

Related Products

8310A... K-Beam; two ranges; titanium, hermetically sealed housing; ground isolated; with internal temperature sensor; 17 grams

8312A... K-Beam; two ranges; anodized aluminum, epoxy sealed housing; ground isolated; 12 grams

8324A... K-Beam; two high g ranges; titanium, hermetically sealed housing, ground isolated; optional integral cable; 15 grams

8330A... ServoK-Beam™; 1500mV/g sensitivity; 0.8 µg resolution; anodized aluminum, epoxy sealed housing; ground isolated; 28.5 grams

8393A... Triaxial K-Beam; two ranges; anodized aluminum, epoxy sealed housing; ground isolated; 60 grams

Supplied Accessories

431-0475-001	(2) M2.5 x 10mm Socket HD Cap Screw
431-0475-002	(2) 4-40 x 3/8" Socket HD Cap Screw
434-0318-001	(4) Washer, 2.7mm I.D., Thk. Fiber
8432	(1) Mounting Wax

Optional Accessories

8516	triaxial mounting cube
1578Asp	extension cable, 4 pin neg. to 4 pin pos. Microtech equivalent connectors; specify length in meters
1592Asp	extension cable, 4 pin neg. to 4 pin neg. Microtech equivalent connectors; (cross connects pins) 1572 output/power supply interface (use with 8305A...M4)
5210	K-Beam power supply

000-217a-04.04 (K8.8305)