



Accelerometers of high overload resistance with integrated electronics and normalized voltage output for measuring static and dynamic acceleration in the frequency range zero to several 100 Hz

Features

- very high overload resistance
- insensitive to interference by magnetic and electric fields
- lower limiting frequency is zero; hence suitable for measuring static acceleration such as gravity (inclination) or radial acceleration (centrifugal force)
- integrated sensor electronics including normalizing amplifier and low pass filter
- hermetically sealed
- high long-term stability
- linear frequency response without (BA1) or with only small (BA2, BA3) resonance peak at the high end of the frequency range
- excellent signal to noise ratio
- small temperature drift
- low distortion
- no measurable hysteresis
- small transverse sensitivity
- unstabilized 9...30V operating voltage, short turn on delay, low current consumption
- normalized 0...5V voltage output

Options

- different housings
- cable types and lengths
- sensor reference voltage output
- isolation of sensor ground from housing
- normalizing according to customer defined measuring ranges and signal output voltages
- extended operating temperature range
- externally stabilized operating voltage (3...5V)

Description

BA1, BA2 und BA3 are capacitive spring-mass based accelerometers with integrated electronics. The resonant peaks are minimized by gas-dynamic dampening in the primary transformer.

An integrated circuit, developed by SEIKA Mikrosystemtechnik GmbH, performs signal transformation, amplification and low pass filtering. The operating voltage is precisely stabilized inside the sensor.

Application

BA1, BA2 and BA3 are used for applications requiring high overload tolerance, high long-term stability, low limiting frequency of zero Hz enabling static acceleration measurements, very short turn on delay, low power consumption and normalized output signal.

Typical applications include:

- measurements on vehicles, machinery, buildings and constructions for process control and surveillance
- seismic measurements
- inclination and acceleration measurements on moving objects like vehicles, ships and aircraft
- seismic measurements
- dynamic determination of location and velocity

Technical Specification

Type	BA1	BA2	BA3
Measuring range	$\pm 3g \approx \pm 30m/s^2$	$\pm 10g \approx \pm 100m/s^2$	$\pm 50g \approx \pm 500m/s^2$
Resolution	max 10e-3g	max 5e-3g	max 0.2e-3g
Frequency range	0...160Hz	0...350Hz	0...550Hz
Deviation from linearity	max 0.5%FS		
Mechanical overload resistance in direction of measurement	10000g \approx 100000m/s ²		
Operating voltage	unstabilized 9...30V		
Optional externally stabilised operating voltage	stabilized 3...5V		
Current consumption	circa 2mA		
Ingress protection	IP65		
Operating temperature	-40...+85°C, optional -40...+125°C		
Storage temperature	-45...+90°C, optional -45...+125°C		
Weight (in metal housing, without cable)	circa 23g		
Standard connection with coloured litz wires	3 (4 with optional reference voltage output) flexible and coloured single litz wires, d=1mm, l=18cm (teflon isolation with optional extended temperature range)		
Optional connection with cable	durable, flexible and shielded round cable, d=2.1mm, l=0.5m		
Nominal sensitivity *	667mV/g	200mV/g	40mV/g
Temperature drift of sensitivity	max 0.06%/K		
Temperature drift of zero voltage	max 0.5mV/K		
Nominal voltage at zero angle *	2.5V		
Optional reference voltage output	highly stabilized 5V, max 1mA (if the optional externally regulated operating voltage is used, the reference output equals that operating voltage)		
Output impedance	circa 100Ohm		

* Each sensor will be delivered with its individual calibration dataset (offset and sensitivity)

Dimensions (in mm) and connections

