



Accelerometers of high overload resistance with integrated 0...5V signal conditioner for measurement of acceleration in the frequency range 0 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
- 9...30V operating voltage, short turn on delay, low current consumption
- normalized 0...5V voltage output

Description

BA1, BA2 and BA3 are capacitive spring-mass 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.

The sensors are manufactured with an analog DC output. The sensor electronics require only small amounts of power and are in conjunction with the capacitive primary transformer characterized by low error and high long-term stability.

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:

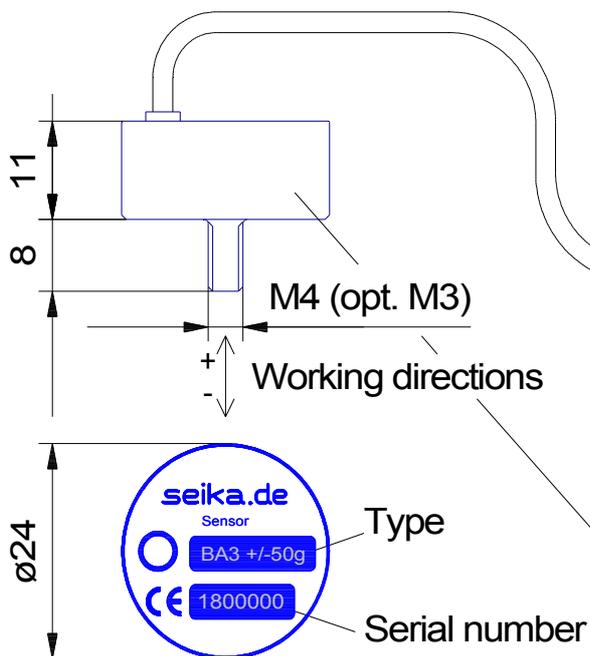
- measurements on vehicles, machinery, buildings and constructions for process control and surveillance
- seismic measurements
- inclination and acceleration measurements on moving objects like vehicles, ships and aircraft
- dynamic determination of location and velocity

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 | 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 (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



Cable connections:
 red: Ub: 9...30V DC
 white: output signal
 shield: GND, housing

Cable or 3 (4) wire system

Wire connections:
 red: Ub: 9...30V DC
 white: voltage output
 black: GND, housing
 brown: optional reference-
 output voltage 5.00V (max. 5mA)

Housing:
 Stainless steel