

Accelerometers of high overload resistance with integrated electronics for measurement of acceleration in the frequency range 0 to several 100 Hz

Features

- very high overload resistance
- lower cut-off frequency is zero, hence suitable for measuring static acceleration, such as gravity (inclinations) or radial acceleration (centrifugal force)
- linear frequency response with little or no resonant peak at upper cut-off frequency
- low total harmonic distortion
- high signal-to-noise ratio
- no measurable hysteresis of signal
- hermetically sealed
- high long-term stability
- small temperature drift
- integrated sensor electronics
- analog DC or pulse width modulated or frequency modulated output
- low power consumption
- very short on-transition delay
- optional galvanic isolation of sensor circuit from measuring location
- multiple housing options – M4 thread (default), M3 thread, magnetic housing, special requests

Description

The sensors B1, B2 and B3 are capacitive spring-mass accelerometers with integrated electronics. Resonant peaks are minimized by special gas-dynamic damping in the primary transformer.

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

The accelerometers B1, B2 and B3 are used for applications requiring high overload tolerance, high long-term stability, small lower cut-off frequency down to measurement of static acceleration, very short on-transition delay and low power consumption. Typical applications include:

- measurements on vehicles, machinery, buildings and plants for process control and error diagnosis
- seismic measurements
- inclination measurements
- safety engineering
- dynamic measurement of position and velocity

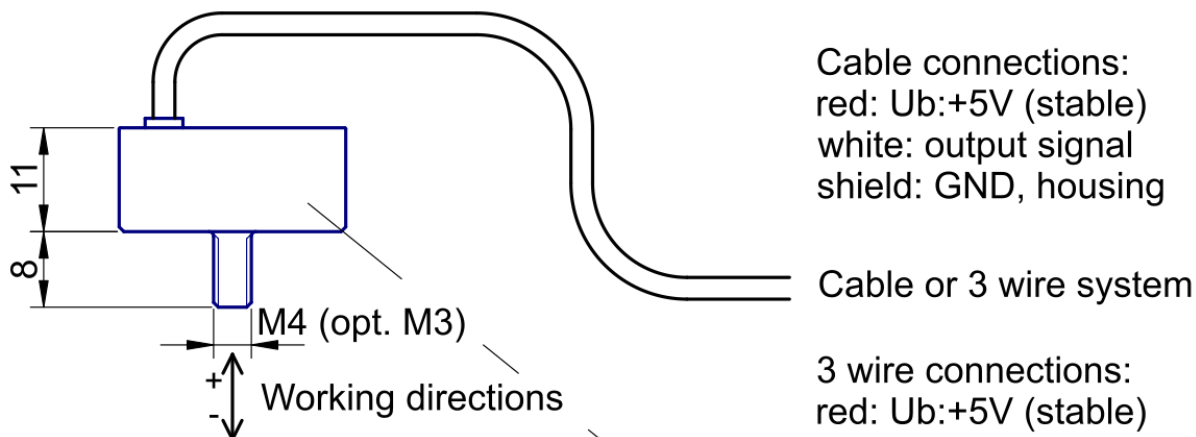
Specifications

Type	B1	B2	B3
Measuring range	$\pm 3\text{g}$ (ca. $\pm 30\text{m/s}^2$)	$\pm 10\text{g}$ (ca. $\pm 100\text{m/s}^2$)	$\pm 50\text{g}$ (ca. $\pm 500\text{m/s}^2$)
Resolution	$< 10^{-3}\text{g}$	$< 5 \cdot 10^{-3}\text{g}$	$< 2 \cdot 10^{-2}\text{g}$
Frequency range	0...160Hz	0...350Hz	0...550Hz
Values for analog DC output at $U_{bN} = 5$ Volt			
Sensitivity	approx. 130mV/g	approx. 30mV/g	approx. 7.5mV/g
Temperature drift of sensitivity	approx. +0.051%/K	approx. +0.035%/K	approx. +0.026%/K
Temperature drift of zero point	approx. $\pm 0.1\text{mV/K}$	approx. $\pm 0.1\text{mV/K}$	approx. $\pm 0.1\text{mV/K}$

Shared specifications	
Linearity deviation	<0,5%
Transverse sensitivity	<1%
Mechanical overload resistance in direction of measurement	10 000 g (approx. 100 000 m/s ²)
Nominal supply voltage (regulated externally)	U _{bN} = 5 Volt
Permissible range of supply voltage	U _{bz} = 3V ... 6V
Current drawn at U _b = 5V	approx. 1mA
Degree of protection	IP65
Operating temperature	-40°C ... +85°C (125°C optional)
Storage temperature	-45°C ... +90°C (125°C optional)
Weight (standard housing with approx. 18cm wires)	approx. 26g
Electrical connection	standard: • 3 highly flexible, color-coded wires ø ~1mm, length approx. 18 cm <hr/> optional: • 0.5m strong, flexible, shielded cable, 2 wires + shield, ø2,1mm or • 3 flexible, color-coded wires with Teflon insulation for extended temperature range • special lengths on request
Values for analog DC output at U _{bN} = 5 Volt	
Zero offset at U _b =5V	2.5±0.1 Volt - generally: 0.5U _b ±4%
Output impedance	10 kOhm

- Each sensor is calibrated after production. It is delivered with an individual calibration record that includes the precise offset and sensitivity values, the static characteristic curve and the linearity deviation curve.
- On request: PWM-output

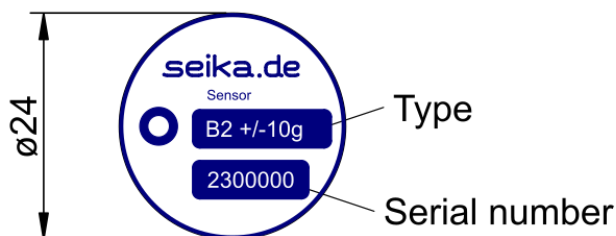
Dimensions (in mm) and Connections



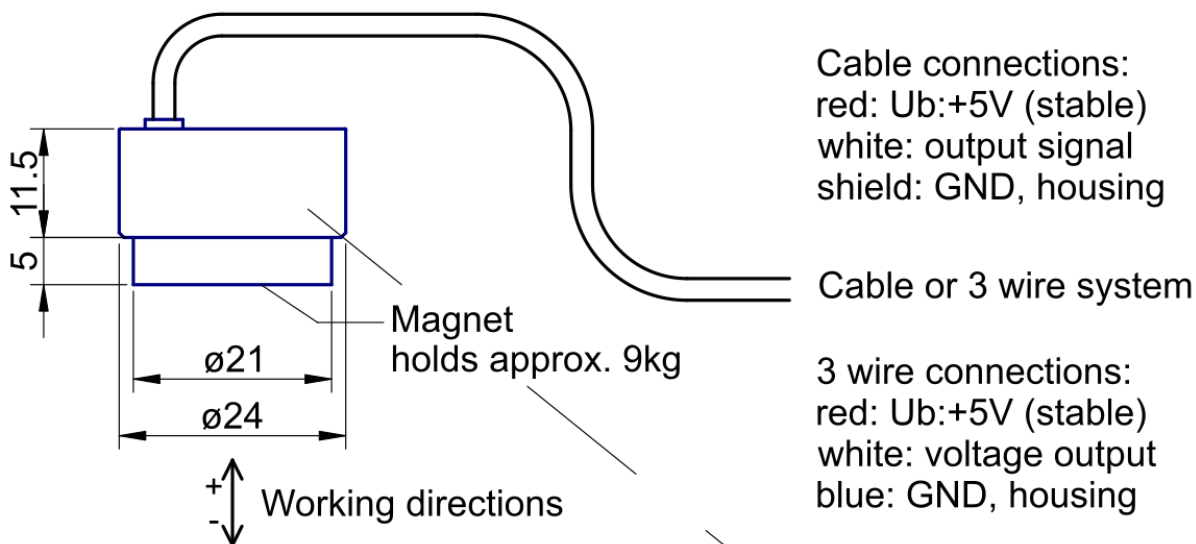
Cable connections:
red: Ub:+5V (stable)
white: output signal
shield: GND, housing

Cable or 3 wire system

3 wire connections:
red: Ub:+5V (stable)
white: voltage output
blue: GND, housing



Housing:
stainless steel



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Housing type MAG

Attention! The supply voltage must not exceed 6 Volt and the polarity must not be reversed.

Accessory MAGZ1 — lever to detach the magnetic housing



Frequency response

Typical amplitude-frequency characteristics of the SEIKA sensors B1, B2, B3

