

Compact Static Accelerometer: for acceleration or angle measurement in frequency ranges 0Hz to 550Hz.



Description

The B1, B2, and B3 sensors are capacitive spring mass accelerometers with integrated sensor electronics. Requiring very low power consumption these are characterized by a high degree of long-term stability. Resonant peaks are minimized by means of a special gas-dynamic damping in the primary transformer.

Manufactured with an Analog DC output, the integrated sensor electronics require only minimal power and are in conjunction with the capacitive primary transformer characterized by high accuracy, linearity, and long-term stability.

Applications

The B Series 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 (i.e. $\pm 90^\circ$)
- safety engineering
- dynamic measurement of position & velocity

Features

- Compact housing, less than 1" diameter
- Very high overload resistance
- Insensitive to interference by magnetic and electric fields
- 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 non-linearity
- 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 settling time
- Multiple housing options

MECHANICAL CHARACTERISTICS

Housing	Nickel Plated Brass	
Protection Degree	IP65	
Mounting	M4 Mounting Stud, M3 optional	
Mounting Plane	See "Figure 1"	
Outline Dimensions	$\varnothing 0.945"$ ($\varnothing 24\text{mm}$) X $.434"$ (11mm) h	
Electrical Connection	<i>Standard</i>	3 highly flexible, color-coded wires $\varnothing 0.04"$ ($\varnothing 1.0\text{mm}$) x 7.0" (18cm)
	<i>Optional</i>	A: Shielded cable $\varnothing 0.083"$ ($\varnothing 2.1\text{mm}$) x 1.65' (0.5m) B: 3 highly flexible, single color wires with Teflon isolation for extended temperature range
Weight	Approx. 0.89 ounces (25 grams) (not including cable)	
Operating Temperature	-40°F to +185°F (-40° to +85°C), optional +257°F (+125°C)	
Storage temperature	-49°F to +194°F (-45° to +90°C), optional +257°F (+125°C)	

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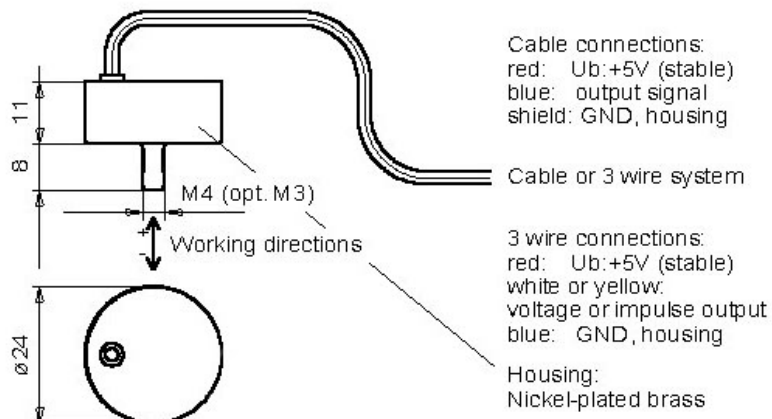
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TYPE	B1	B2	B3
Measuring Range	±3g (Approx. ±30m/s ²)	±10g (Approx. ±100m/s ²)	±50g (Approx. ±500m/s ²)
Resolution	<.001g	<.005g	<.020g
Frequency Range	0...160Hz	0...350Hz	0...550Hz
Max. Non-linearity	<0.5%		
Cross Axis Sensitivity	<1%		
Mechanical Overloading in Measuring Direction	10,000g (Approx. 100,000m/s ²)		
Power Supply U _{BN} (Regulated)	5 Volt		
Min ... Max. Supply U _{BZ}	3 ... 6 Volt		
Current Consumption U _B =5Volt	Approx. 1mA		
ANALOG VOLTAGE OUTPUT MODEL AT U _{BN} =5VOLT			
Sensitivity	Approx. 110mV/g	Approx. 23mV/g	Approx. 6.5mV/g
Temperature Drift of Sensitivity	< +0.06%/°C		
Temperature Drift of Zero	< 0.1mV/°C		
Zero Offset at U _B =5V	2.5 ±0.1 Volt - generally: 0.5U _B ±4%		
Output Impedance	10kΩ		
<i>Digital pulse-width modulated output signal - linear to the degree of angle - available upon request.</i>			
CABLE WIRING TABLE:			
3-WIRE (standard)		SHIELDED CABLE (optional)	
RED	+5VDC Stable	RED	+5VDC Stable
WHITE	Output Signal	BLUE	Output Signal
BLUE	GND (housing)	SHIELD	GND (housing)
ATTENTION! The supply voltage must not exceed 6 Volt and the polarity must not be reversed.			

Figure 1: Dimensions and Mounting Position ([mm])



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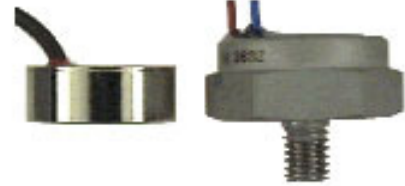
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Compact Accelerometer: for Dynamic Measurement of Acceleration or Vibration in Frequency Ranges 1Hz to 1.5kHz.



Description

BDK sensors are dynamic accelerometers that are capacitive spring-mass based, with incorporated sensor electronics. Resonance peaks are minimised by means of a special gas-dynamic damping in the primary transformer. With very low power consumption, these sensors are characterised by very low drift (or error) and long-term stability.

Applications

These accelerometers are used for applications requiring high overload tolerance, high long-term stability, small lower cut-off frequency, light weight and low power consumption.

Typical applications include:

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

Features

- Compact housing, less than 1" diameter
- Light weight
- Very high overload resistance
- Insensitive to interference by magnetic and electric fields
- Low cut-off frequency
- Linear frequency response with little or no resonant peak at upper cut-off frequency
- Low non-linearity
- High signal-to-noise ratio
- Very low cross-axis sensitivity
- Hermetically sealed
- High long-term stability
- Small temperature drift
- Integrated sensor electronics
- Long connection leads available
- Multiple housing options

MECHANICAL CHARACTERISTICS		
Housing	Type 1	Stainless Steel, M6 Mounting Stud
	Type 2	Nickel Plated Brass
Dimensions	Type 1	Ø 0.87" (Ø 22mm) X 0.39" (10mm) h
	Type 2	Ø 0.80" (Ø 20mm) X 0.30" (7,5mm) h
Weight	Type 1	Approx. 0.60 ounces (17 gr ams)
	Type 2	Approx. 0.25 ounces (7 grams)
Protection on Degree		IP65
Mounting		See "Figure 1"
Mounting Plane		See "Figure 1"
Electrical Connection	Standard	3 highly flexible, color-coded wires Ø 0.04" (Ø 1.0mm) x 7.0" (18cm)
	Optional	Type 1 Housing: Shielded cable Ø 0.083" (Ø 2.1mm) x 1.65' (0.5m)
Operating Temperature		-40°F to +185°F (-40° to +85°C)
Storage temperature		-49°F to +194°F (-45° to +90°C)

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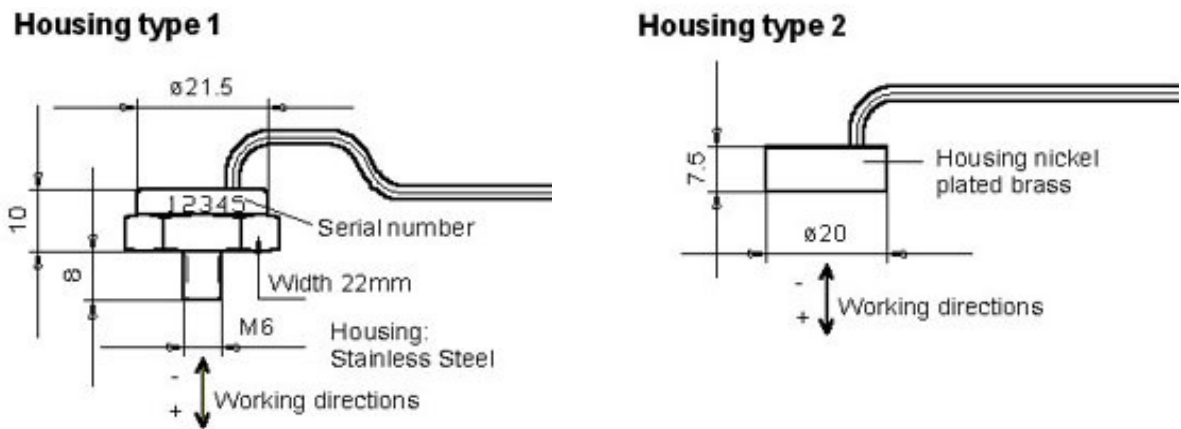
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MODEL	BDK3	BDK10	BDK100
Measuring Range	±3g (Approx. ±30m/s ²)	±10g (Approx. ±100m/s ²)	±100g (Approx. ±1000m/s ²)
Resolution	<10 ⁻³ g	<5*10 ⁻³ g	<5*10 ⁻² g
Frequency Range	1...300Hz	1...800Hz	1...1500Hz
Max. Non-linearity	<0.5%		
Cross Axis Sensitivity	<1%		
Mechanical Overloading in Measuring Direction	10,000g (Approx. 100,000m/s ²)		
Power Supply U _{BN} (Regulated)	5 Volt		
Min ... Max. Supply U _{BZ}	2 ... 16 Volt		
Current Consumption U _B =5Volt	BD: Approx. 250uA (optional 30uA), BDK: Approx. 2mA		
ANALOG VOLTAGE OUTPUT MODEL AT U _{BN} =5VOLT			
Sensitivity	Approx. 150mV/g	Approx. 60mV/g	Approx. 10mV/g
Temperature Drift of Sensitivity	< +0.06%/°C		
Temperature Drift of Zero	< 0.1mV/°C		
Zero Offset at U _B =5V	2.5 ±0.1 Volt - generally: 0.5U _B ± 4%		
Output Impedance	100 Ohm		
<i>Digital pulse-width modulated output signal - linear to the degree of angle - available upon request.</i>			
CABLE WIRING TABLE:			
3-WIRE (standard)		SHIELDED CABLE (optional for Housing Type 1)	
RED	+5VDC Stable	RED	+5VDC Stable
WHITE	Output Signal	BLUE	Output Signal
BLUE	GND (housing)	SHIELD	GND (housing)
ATTENTION! Do not reverse voltage operating polarity!			

Figure 1: Dimensions and Mounting Position ([mm])





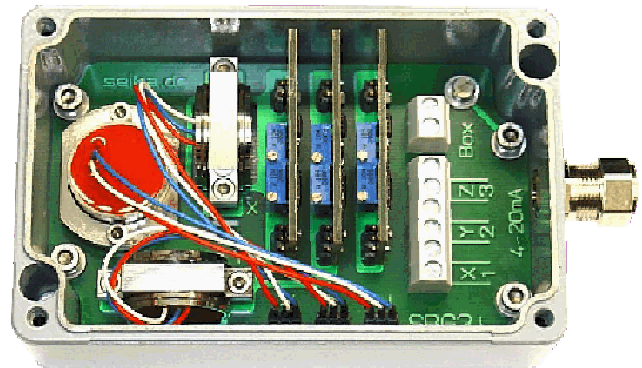
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SBG3i (4-20mA)

Tri-Axis Inclinometer Sensor Package

Page 1 of 2

Rugged, environmentally sealed sensor package with (3) integrated sensors & signal amplifiers for (3) 4...20mA 2-wire outputs.



Features

- *Rugged pressure die-cast Aluminium housing with saltwater resistant coating*
- *IP65 to IP67 Environmental Protection*
- *Twist free 4-point fastening of rigid, 3.2mm thick base PCB*
- *Three integrated signal conditioners with 4...20mA, 2-wire outputs*
- *No separate supply voltage necessary*
- *All B-, BD- and N- series fit the housing and can be installed in different directions of operation*
- *Output signals calibrated to customer's specifications*
- *Sensors and signal conditioners electrically isolated from housing*
- *Both output channels are electrically isolated from and independent of each other*
- *EMC certified*
- *Internal, highly stable sensor supply voltages*
- *10...30 Volt terminal voltage*
- *Programmable dynamic response*
- *High mechanical overload resistance*
- *Either connection polarity - possibility of 4-wire connection for both measuring loops*
- *Low pass filter with optional choice of cut-off frequency for suppression of interference frequencies*

Description

The SBG3i is a pressure die-cast Aluminum sensor housing (IP65) with up to three integrated sensors for measuring acceleration (along three axis for acceleration) and/or inclination (and/or two axis for tilt).

This package also contains three independent signal conditioners, each with a 4...20mA, 2-wire output, and three separate highly stable voltage supply feeding off the corresponding current loop - one for each sensor. Each signal conditioner includes an active low pass filter, which the upper cut-off frequency / settling time can be adjusted to suit the measurement task, an output stage with current limitation, a noise voltage filter and a diode bridge for unipolar connection to the current loop. Interference signals caused by unwanted ground currents are eliminated by electrically isolating each sensor and signal conditioner from each other and the housing.

A special electronic temperature compensation system can significantly reduce the temperature sensitivity of the implemented sensors. The compact PG cable gland and compact housing size in combination with the 3-wire connection enable the use of this high quality measuring system in harsh operating conditions.

Applications

The SBG3i is suitable for applications requiring precise acceleration or inclination measurements along three axis under harsh circumstances and returning of a 4...20mA output signal each.

Areas of successful implementation include construction, mining, agricultural machinery, transportation and conveyor systems, ships, operation and automation technology as well as general mechanical engineering.

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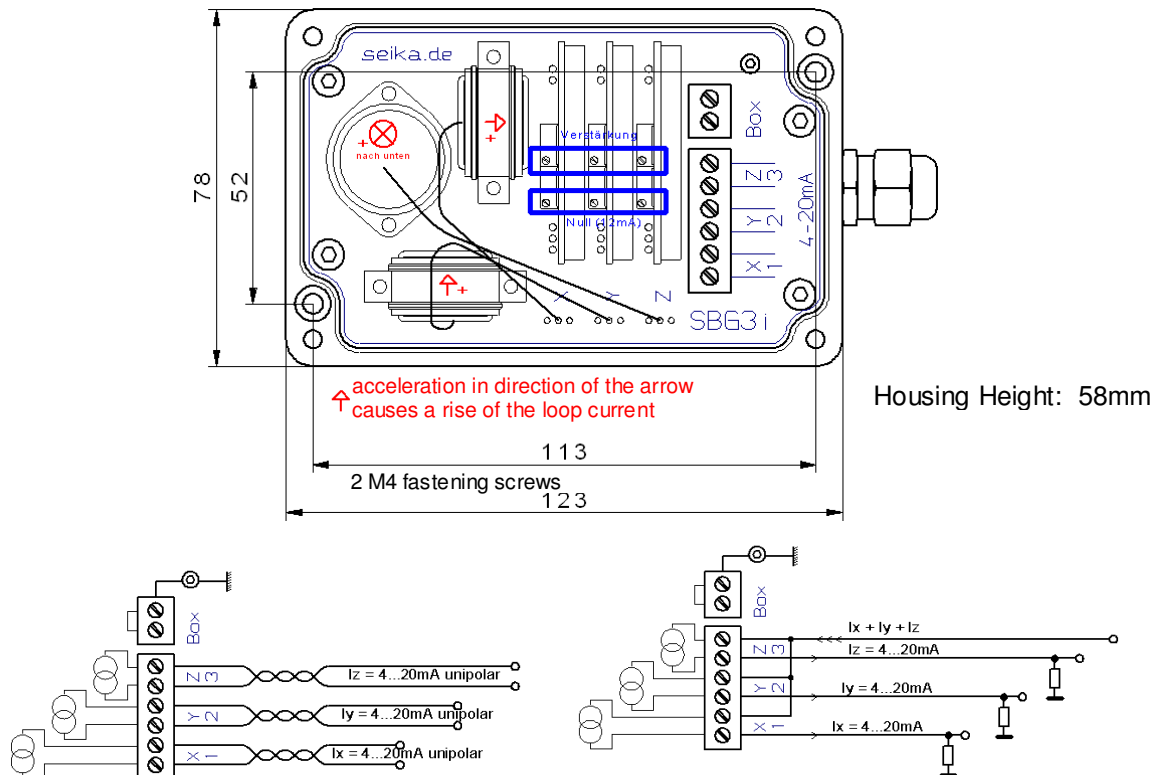
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SBG3i (4-20mA)

Tri-Axis Inclinometer Sensor Package

TECHNICAL DATA	
Termination/Cable Diameter	max.: 6 x 1 mm ² / Ø 5 ... Ø7 mm
Cable Fixing	M12 x 1.5 cable gland, clamping range 6mm ... 7.5mm
Measuring Ranges	In accordance with selected sensor
Environmental Protection Rating	IP65 (with RTV fill IP67)
Mounting	Any direction
Inclinometer Measuring Plane	N Series: 3 directions of mounting
Accelerometer Measuring Directions	B, BD Series: Place in X, Y, Z co-ordinates to the housing
Supply Voltage	+8 ... +30 VDC non-regulated
Minimum Loop Current	3mA
Maximum Loop Current	Approx.24mA
Output Current Loop Signal	4...20mA (12mA as zero point)
Adjustable Parameters via Potentiometers	Signal-zero (12mA), Span
Max. Load Impedance	500 Ohm (at 24 Volt loop supply)
Operating Temperature	-40 to +85 °C (-40° to +185°F)
OPTIONS	
Scaled Angle Measuring Ranges, Calibration Certificate, Silicone RTV Filled Housing (IP67)	

FIGURE 1: Dimensions ([mm]), Mounting Position and Wiring
(Shown with N- or NB-type inclinometer sensor or B- or BDK-type Accelerometer)



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Allows mounting up to five (5) sensors for multi-axis acceleration and/or inclination measurements.

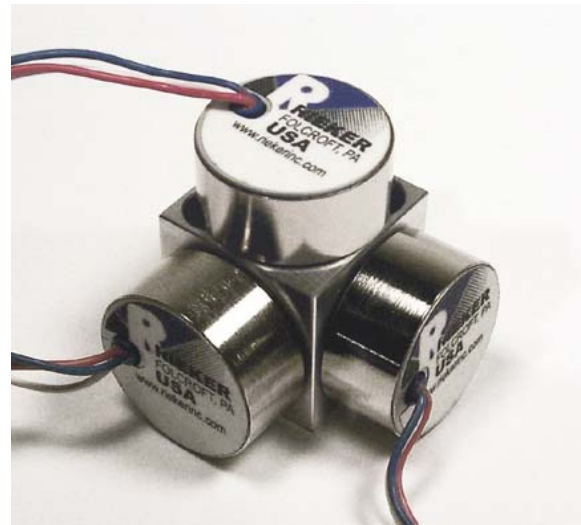
Available in Delrin (POM) plastic or Aluminum.

Compatible with the following Seika sensors:

- NB3 Incliniometer
- B1, B2, and B3 Accelerometers

Note:

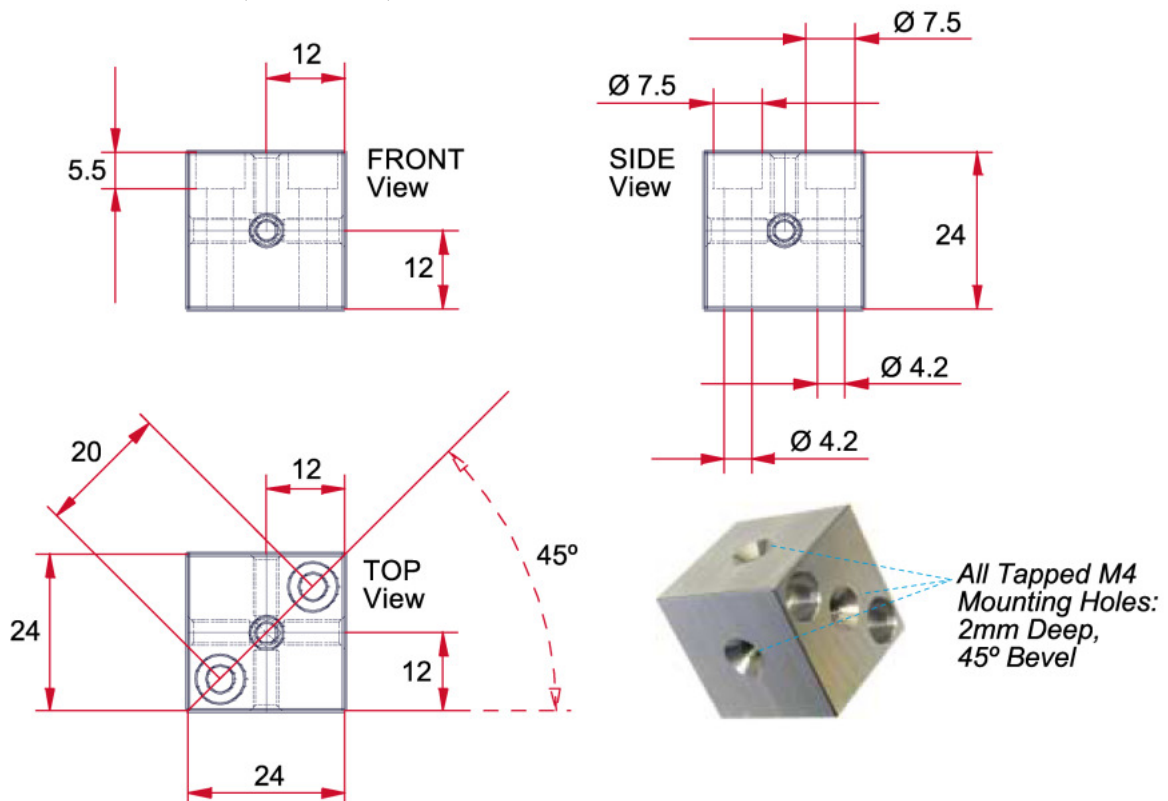
- Sensors sold separately
- *Sensor must be ordered with the M4 mounting stud option.*



TECHNICAL DATA

PART NUMBER	MATERIAL	WEIGHT
BS24	Plastic (Poly oxymethylene)	.65 Ounces (18.5 Grams)
BS24-A	Aluminum	1.13 Ounces (32 Grams)

Figure 1: BS24 Dimensions (in millimeters)



This “Cube” allows for mounting multiple sensors for Tri-axial measurements.

Compatible with the following Seika sensors:

- N or NB3 Inclinometers
- B or BDK Accelerometers

Customer specified combinations. Package comes factory assembled, sensors permanently mounted to cube as specified at time of order.



ATTENTION: When ordering an SW3 with an NV6A (4-20mA) Signal Conditioner, please indicate ISOLATED ASSEMBLY; or NON-ISOLATED SENSOR ASSEMBLY with NV4A (±4VDC) or NV8A (0-5VDC).

MATERIAL	Aluminum or POM
WEIGHT	2.75 Ounces (78 Gram)
WEIGHT + (3) SENSORS	App. 5.12 Ounces (145 Gram)

Figure 1: Dimensions (inches [mm])

