

Sensor box for use in particularly harsh operating conditions containing one sensor and one signal conditioner with 4...20mA, 2-wire output

Features

- large, robust pressure die cast aluminium housing (IP65)
- angular adjustable, vibration damped 3-point fastening of rigid, 3.2mm thick base PCB
- integrated signal conditioner with 4...20mA, 2-wire output
- temperature drift compensation
- no separate supply voltage necessary
- all SEIKA sensors fit the housing and can be installed in different directions of operation
- output signal calibrated to customer's specifications
- sensor and signal conditioner electrically isolated from housing
- extensive EMC protection
- highly stable sensor supply voltage
- 10V ... 30V terminal voltage
- loop current limitation
- high mechanical overload resistance
- either connection polarity
- low pass filter with optional choice of cut-off frequency for suppression of interference frequencies

Description

The SBL1 is a large, pressure die cast aluminium housing (IP65) with an integrated sensor for uniaxial inclination measurements.

In addition to the sensor, the box contains a signal conditioner with a 4...20mA, 2-wire output and a separate, highly stable supply voltage for the actual sensor feeding off the current loop. Furthermore, the signal conditioner includes an active low pass filter, whose upper cut-off frequency / settling time can be adjusted to suit the measurement task, an output stage with current limitation, noise voltage filters and a diode bridge for unipolar connection to the current loop. Interference signals caused by unwanted ground currents are eliminated by electrically isolating sensor and signal conditioner from the housing.

Unlike the SB2..., the SBL1 can accommodate larger inclinometers, such as the NG.. series, that have a higher measuring accuracy. A special electronic temperature compensation system can significantly reduce the temperature sensitivity of the implemented sensor.

SEIKA Mikrosystemtechnik GmbH - Ellharter Str.10 - D-87435 Kempten - Tel: 0831-25532 Fax: 0831-25534

Internet: <http://www.seika.de> - <http://www.seika.net> - Email: seika@seika.de

The compact PG cable gland and compact housing size in combination with the 2-wire connection enable the use of this high quality measuring system in harsh operating conditions.

Application

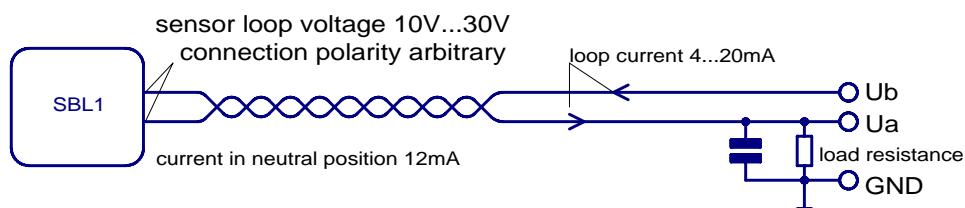
The SBL1 is suited for taking precise inclination or acceleration measurements under harsh circumstances and returning a 4...20mA output signal. Areas of successful implementation include construction, mining (especially large open pit mining machinery), agricultural machinery, transportation and conveyor systems, ships, operation and automation technology as well as general mechanical engineering.

Technical Specifications

Terminals	3 x 1.5mm ² (2 signal+1 earth)
Cable fixing	PG21 (metal with integrated strain relief clamp)
Measuring range, Resolution, etc.	dependent on implemented SEIKA sensor
Degree of protection	IP65
Mounting orientation	Any
Measuring planes (N.., NB.. sensor)	3 main housing planes
Measuring plane (NG.. sensor)	parallel to housing bottom
Terminal voltage	10V ... 30V
Minimum loop current	2.5mA ... 3.5mA
Maximum loop current	22mA ... 26mA
Output loop current	4...20mA (12mA in sensor zero position)
Adjustable variables	zero (12mA), amplification
Maximum load resistance	500 Ohm (at 24 Volt supply voltage)
Operating temperature	-40°C ... +85°C

Options: special measuring ranges, calibration protocol

Connection



minimum loop current: 2,5mA ... 3,5mA maximum loop current: 22mA ... 26mA

$U_{bmin} = 10V + \text{voltage drop along cable} + \text{voltage drop across load at } 20mA$

$U_{bmin} = 10V + (20mA \cdot R(\text{cable})) + (20mA \cdot R(\text{load}))$

e.g.: (100m transmission wire 2x0,14mm² :)0,6V + (100 Ohm load:)2V + 10V = $U_{bmin} = 12,6V$

e.g.: (2km transmission cable 2x0,5mm² :)3,2V + (500 Ohm load:)10V + 10V = $U_{bmin} = 23,2V$

Since the supply voltage of the SBL1 feeds off the loop current (the SBL1 requires 3mA at the most), a voltage of 9V across the SBL1 terminals must be guaranteed to ensure correct functionality even for the maximum loop current of 24mA (maximum voltage drop across transmission line and load resistor).

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Dimensions in mm

