Description

The SB1I is a pressure die cast aluminium sensor housing (IP65) with an integrated sensor for measuring uniaxial acceleration or inclination. In addition to the sensor, the box contains a signal conditioner with 4...20mA, 2-wire output and a separate, highly stable supply voltage 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, a noise voltage filter and a diode bridge for unipolar coupling to the current loop. Interference signals caused by unwanted ground currents are avoided by electrically isolating sensor and signal conditioner from the housing. Unlike the SB2..., the SB1I 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.

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

Application

The SB1I is suitable for applications requiring precise inclination or acceleration measurements under harsh circumstances and returning of a 4...20mA output signal. Areas of successful implementation include construction, mining, agricultural machinery, transportation and conveyor systems, ships, operation & automation technology as well as general mechanical engineering.
Technical Data

<table>
<thead>
<tr>
<th>Specification</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Termination max.</td>
<td>3 x 1.5 mm²</td>
</tr>
<tr>
<td>Cable gland</td>
<td>PG M12 Size in metric mode/or M12 conne.</td>
</tr>
<tr>
<td>Measuring ranges</td>
<td>In accordance with the actual SEIKA-Sensor</td>
</tr>
<tr>
<td>Protection degree</td>
<td>IP65</td>
</tr>
<tr>
<td>Mounting</td>
<td>Any direction</td>
</tr>
<tr>
<td>Working planes sensor (NGx - Sensor)</td>
<td>1 directions of mounting X Wall mount</td>
</tr>
<tr>
<td>Measuring directions (N-NB2 or NB3 Sensor)</td>
<td>in X,Y co-ordinate to the housing</td>
</tr>
<tr>
<td>Supply voltage to the box</td>
<td>+10 ... +30 Volt</td>
</tr>
<tr>
<td>Minimum loop current</td>
<td>2.5mA to 3.5mA</td>
</tr>
<tr>
<td>Maximum loop current</td>
<td>Approx.24mA</td>
</tr>
<tr>
<td>Output current loop signal</td>
<td>4...20mA (12mA as zero point)</td>
</tr>
<tr>
<td>Adjustable area’s via pot.-meters</td>
<td>Signal-zero (12mA), Span</td>
</tr>
<tr>
<td>Max. Load impedance</td>
<td>500 Ohm (at 24 Volt loop supply)</td>
</tr>
<tr>
<td>Working temperature</td>
<td>-40 ... +85°C</td>
</tr>
</tbody>
</table>

Options: Special ranges, calibration, silicon filling, custom within

Dimensions & Measuring Directions of SB1i with NGx sensor (Only wall mount!)

- Excitation pot. meter
- Zero pot.
- 4...20mA current loop
- No fixed polarity
- Cable fixing
- Box-connection
- Measuring channel galvanic separated from housing
- Housing height: 36mm
- Solder terminal for time constant
- 2 Mounting screws M4
- 86mm
- 36mm
- 64mm
The above diagrams demonstrate the feasibility of measuring most angles of inclination and directions of acceleration with SEIKA cased sensors. The resulting multitude of different possibilities do make choices difficult. We’d be glad to give you advice on putting together the components best suited for your measurement task and are happy to receive your information on what planes and directions the inclinations and/or accelerations are to be measured. A sketch of your situation is often very handy.
SEIKA SB1i-Inclination

Dimensions in mm

High accurate power-supply regulator with current limitation (5V, 500mW)
Active low-pass filter 3rd order hardware programmable
Nominal amplifier with zero-regulator gain-regulator and temperature-compensation

Unipolar 4...20mA current loop with max 24mA limit polarity protected

Box housing

SBBW1 Mounting Bracket (option)

Nordic Transducer * Als Odde * DK-9560 Hadsund Denmark * Tel: +45 98581444 * Fax: +45 98581866
Internet: www.ntt.dk * e-Mail: ntt@ntt.dk

Minimum loop current: 2.5mA...3.5mA  Maximum loop current: 22mA...26mA

$U_{b \text{min}} = 10V + \text{voltage drop along cable} + \text{voltage drop across load at 26mA}$

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

e.g.: (100m transmission wire $2 \times 0.14 \, \text{mm}^2$): $0.6V + (100 \, \text{Ohm load}) \cdot 2V + 10V = U_{b \text{min}} = 12.6V$

e.g.: (2km transmission cable $2 \times 0.5 \, \text{mm}^2$): $3.2V + (500 \, \text{Ohm load}) \cdot 10V + 10V = U_{b \text{min}} = 23.2V$

$SB1i$ can also be completely potted inside for IP67 protection
SEIKA SB1i-Inclination

NGx sensor Wall mount

Nx sensor X or Y direction wall mount

NBx sensor y direction desk mount

NBx sensor X direction desk mount

Side Up PG Right = SUR

Side Up PG Left = SUL-X or SUL-Y

Lid Up Right = LUR

Lid Up Right = LUL

All Seika Sensor boxes can be delivered with PG12 cable out at left or right side!
We can also deliver with M12 connectors instead of PG
SEIKA SB1i-Inclination

Stainless Steel brackets for mounting in different situations.

 Nx or NBx sensors  X or Y direction wall mount PG down

End Up = EUD-X or EUD-Y
SEIKA SB1i-Inclination

All sensor boxes will be supplied with a linearity diagram for the working range.

The SB1i-Bx sensor boxes can be supplied with accurate test data as shown here up to +/-10°.

As option a special XB1 very strong stainless steel housing can also be supplied for the SB1i for down to 100 meter water.
TZ Option.
As option we can make a handmade a Laser trimmed temperatur compensation on a specific range so a high stability can be used for years usage.

Option ATEK Ex can be supplied also, only via SB2i box.