



Inclinometer with integrated 0...5V signal conditioner for inclination measurement in the range between ± 1 to ± 10 degrees

Features

- linear output characteristics
- high measurement accuracy
- high long-term stability
- integrated sensor electronics including signal conditioner and low-pass filter
- temperature compensated, conditioned 0...5V output signal
- unconditioned operating voltage between 9V and 30V
- optional 5 Volt reference voltage output
- hysteresis free output signal
- minimal zero point drift
- low power consumption
- small housing, light weight
- EMC protective circuit
- different output signal options
- no interference by ambient electromagnetic fields
- minimal transverse sensitivity over whole measuring range!
- hermetically sealed

Description

The high precision inclinometer NBA based on a spring-mass-system and is equipped with an integrated sensor electric special made and developed by SEIKA Mikrosystemtechnik GmbH. It includes a laser trimmed signal conditioner with electronic temperature drift compensation, a very stable voltage circuit and a low-pass-filtering for elimination of unwanted transients.

The capacitive principle of measuring ensures an extra long-term stable and linear correlation between the measuring inclination and normalized output signal.

The integrated sensor electronics require only minimal power and are in conjunction with the capacitive primary transformer characterized by high accuracy and long-term stability.

Application

The NBA is suitable for applications requiring a small, light sensor for measurement of relatively small inclination angles with output signal 0...5V.

Typical areas of application include measuring instruments and inspection systems, vehicles, automation and safety engineering, scientific devices, medical and communications equipment as well as levelling systems.

Technical Specifications

Type	NBA2	NBA3
Dimensions	see dimension drawing	see dimension drawing
Measuring range, other measurement ranges on request	$\pm 2^\circ$	$\pm 10^\circ$
Display range	$\pm 4^\circ$	$\pm 20^\circ$
Resolution	$<0.001^\circ$	$<0.001^\circ$
Linearity deviation	$<+/-0.004^\circ$	$<0.02^\circ$
Settling time	0.3 sec. (shorter times optional)	0.3 sec. (shorter times optional)
Supply voltage	9...30V	9...30V
Current drawn at $U_b=5V$	approx. 2mA	approx. 2mA
Degree of protection	IP65	IP65
Operating temperature	-40 to +85°C (125°C optional)	-40 to +85°C (125°C optional)
Storage temperature	-45 to +90°C (125°C optional)	-45 to +90°C (125°C optional)
Weight without cable	25 gram	25 gram
Electrical connection	3 (4) highly flexible wires, \varnothing approx. 1mm, length 18cm optional: 0,5m shielded cable $\varnothing 2,1$ mm 3 flexible Teflon-coated wires (125°C)	3 (4) highly flexible wires, \varnothing approx. 1mm, length 18cm optional: 0,5m shielded cable $\varnothing 2,1$ mm 3 flexible Teflon-coated wires (125°C)
Sensitivity	1000mV/°	200mV/°
Temperature drift of sensitivity in temp. range -25 and +85°C	$<2\%$	$<2\%$
Temperature drift of zero point	$\pm 0.002^\circ/K$	$\pm 0.002^\circ/K$
Zero offset at $U_b=5V$	2,5 \pm 0,1 Volt	2,5 \pm 0,1 Volt

On request: special housing types

On request: PWM-output

All measuring ranges between $+/-1^\circ$ and $+/-10^\circ$ are possible.

Each individual sensor will be tested and measured up after finishing production. All deliveries with individual printed calibration data sheet (offset and sensitivity).

Dimensions (in mm) and Connections

The diagram illustrates the dimensions and connections for the NBA2 and NBA3 accelerometers. It includes a side view of the cylindrical sensor with a mounting thread, a top view of the circular face, and a list of connection specifications.

Dimensions (in mm):

- Total height: 11
- Height of the main body: 8
- Thread: M4 (opt. M3)
- Face diameter: $\varnothing 24$

Top View Labels:

- seika.de Accelerometer
- Typ (Type)
- Serial number

Cable connections:

- red: U_b : +9V...30V
- blue: output signal
- shield: GND, housing

Cable or 3 (4) wire system

wire connections:

- red: U_b : +9V...30V DC
- white: voltage output
- black: GND, housing
- brown: optionally referenz-output voltage 5.00V (1mA)

Housing:
Nickel-plated brass

Attention! These sensors are not suited for applications subject to high mechanical shocks! Due to the sensor type the NB is sensitive to shock!