

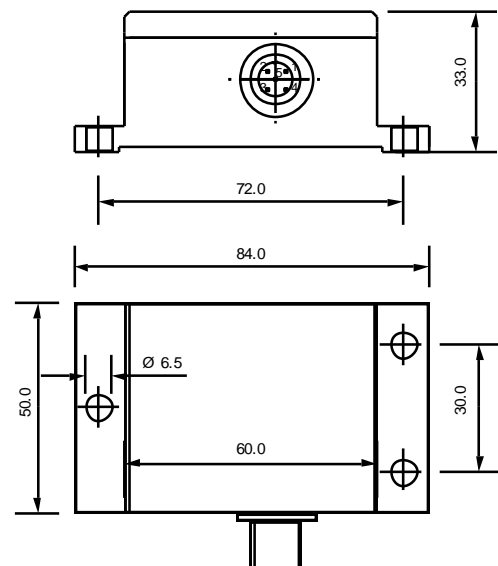
Dual axis Inclinomater / Accelerometer Sensor KAS203-Serie

The sensing elements work based on the capacitive principle. They feature high precision and high shock resistance, resulting among others from the improved **bulk** micro electro mechanical system, made of high purity silicon. Due to the especially appropriate structure, no drifts caused by deformation of the sensing mass are expected even after severe hits. The gas damping inside the sensing element prevents **resonance oscillations** or overshooting of the sensing mass.

The sensor is mounted in a water proof housing (IP67/68) which provides three holes for fixation and a commonly used M12 connector (IP67/68). The 4 ... 20mA output allows for long connecting lines. Using an appropriate resistor, the current output can be converted to a 1 ... 5V or 2 ... 10V voltage signal.

This sensors are available in dual axis versions with +/-30°...+/-90° (KAS201-Serie), +/-1,5...8° (KAS211-Serie), +/- 2...4g (KAS202-Serie) and +/- 6...18g (KAS203-Serie) measuring ranges.

All sensors are calibrated at 1g/0°. Thus a further zero alignment (other than mechanical adjustment to the application) is not necessary.



- 4 ... 20mA (3-wire) current output
- high repeatability up to $4\text{mg}/0,01\%$ over range
- high resolution up to $1\text{mg}/0,005\%$
- Dual axis versions for acceleration measuring
- Inclination sensors are temperature compensated
- Sensor is calibrated at 0° / 1g
- Sensor element shock proof $\geq 20.000\text{g}$
- Operation temperature range -40 ... +85°C
- Rugged water proof metal housing
- Rugged M12 connector (IP67/68 with closed cap)
- Three wire interface, reverse polarity protected

Options/other versions:

- High resolution measuring ranges:
0,005mA = 0,001°
- +/- 30...90° dual axis versions
- +/- 2...4g dual axis versions
- Two wire (current loop) versions
- IP68/69 Cable-Version available
- Digital output with +/- 15...180° range
- Customized adaptations in small quantities

Specifications

Parameter	Condition	KAS203 -11A	KAS203 -12A	KAS203 -01A	KAS203 -02A	KAS203 -21A	KA2903 -22A	Unit
Measuring range ⁴⁾		+/- 6	+/- 6	+/- 12	+/- 12	+/- 18	+/- 18	g
Repeatability at 0° (horizontal position) ¹⁾	20°C	<4				<6		mg
Typ Resolution at 0° / 1g Noise sensig element	DC ... 400Hz	2				3		mg
typ. Offset temperature dependency	13...37°C	100				150		µg√Hz
long term stability ⁵⁾⁶⁾	10 Jahre	1,25				1,9		mg / °C
Cross axis sensitivity ²⁾	max. / typ	7				11		mg
Measuring direction		4/1						%
Damping	-3 dB	X / Y						
Operating temperature range ⁸⁾	not condensing	400	1000	400	1000	400	1000	Hz
Shock resistance Chip ⁷⁾	Min.	-40..+85						°C
Output signal I _{out}		20'000						g
Output signal I _{out} 0°-position		4..20						
Sensitivity	Nominal	1.333 ⁷⁾		0.666 ⁷⁾		0.444 ⁷⁾		mA/g
Power supply ³⁾	stabilized	20... 30						VDC
Connection		M12						
Water resistance		IP67/68/69 ⁸⁾						IP-class

- 1) **Repeatability:** maximum offset occurring with position change after return to initial position (corresponds to achievable precision, including temperature hysteresis after temperature compensation and linearization).
- 2) **Cross axis sensitivity:** maximum error occurring with (additional) inclination or acceleration from another direction than the measuring plane
- 3) **Supply** stabilized
- 4) Static angle (inclinometer) measuring possible: 1g = 90° → Trigonometric function

$$\text{angle} = \arcsin \left(\frac{I_{out} - 12(\text{Off set})}{\text{Sensitivity}} \right)$$

(values without units)

- 5) Typical values
- 6) **Long term stability:** calculated values from HTB tests. Test results available at request.
- 7) Related to sensing element
- 8) IP69 : cable with cable clamp instead of connector

More detailed connection instruction please sees in the files “applications basics” and “user guide”