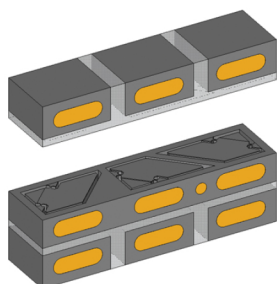
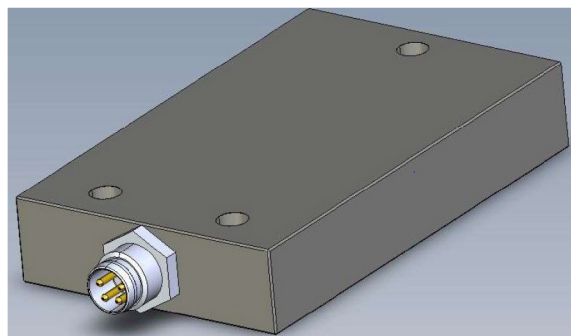


Precision Dual-Axis Inclination- and Acceleration-Sensors

KAS4000-Serie with voltage output

- Measuring of static (Inclination) and dynamic (acceleration) values
- Inclination output sinus compensated
- high repeatability up to 0.01%
- high longterm stability up to 0.03% / year
- Very robust against harsh environment



The sensors are based on an advanced “bulk micro machined” technology:

The three dimensional structure of these sensors comprise a pendulum made of mono crystalline silicon. The pendulum is hermetically enclosed between two silicon discs. A gas damping prevents overshooting and interfering resonance oscillation. An ASIC measures the capacitive change caused by the movement of the pendulum.

From this construction results a **long term stable**, high **resolution** und **shock resistant** sensor.

Specifications:

Parameter	Conditions	Inclination ⁴⁾	Acceleration
Measuring range		=> Table variation of sensors below	
Repeatability ¹⁾	at 0° angle	±0.01° or ±0.01%	±0.01%
Noise density	± 10° version other ranges	0.002°/√Hz T.B.A.	32μg/√Hz T.B.A.
Offset temperature dependency ⁷⁾ X-axis	0...60°C -40...+85°C	±0.002°/°C ±0.003°/°C	±0.04mg/°C ±0.05mg/°C
Long term stability, typical ⁶⁾	1 Jahr ⁶⁾ X-axis	0.03°	0,5mg
Measuring direction / axes		=> Table variation...	
Cross axis sensitivity ²⁾	average/Typ Max	±0,2% ±1.5%	
damping ⁵⁾	typical / 3 dB	10 Hz ⁵⁾	70 Hz ⁵⁾
Internal averaging	roll	=> table variation...	
Internal data rate ⁸⁾	from ASIC ⁸⁾	2000 Hz	
Data rate on output ⁸⁾	averaged ⁸⁾	100 Hz	
operating temperature range		-40...+85°C	
proofness M8 connector	closed	67-68 IP	
proofness housing	potted	65-67 IP	
output signal ¹⁰⁾	V _{out}	0.5 ... 4.5V ¹⁰⁾	
Offset in 0° / Position	0° Position	2.5V nominal ⁹⁾¹⁰⁾	
Supply ³⁾		9 ... 30VDC	

- 1) Repeatability: maximum offset occurring with position change after return to initial position (corresponds to achievable precision, including temperature hysteresis on same temperature)
- 2) Cross axis sensitivity: maximum error occurring with (additional) inclination or acceleration from another direction than the measuring plane
- 3) Supply (can be) unstabilized
- 4) Data calculated in angles, output in g optional possible
- 5) Combination of internal gas-damping and low-pass filtering
- 6) Calculated values from HTOL, AEC-Q100 tests, representing 10 years: X-axis ~5mg / 0,3°; Y-axis ~7mg / 0,4°; Z-axis ~9mg / 0,5°; including power-on drift
- 7) Core sensor element system: High repeatable, extreme low hysteresis effects. Y&Z-axis values has factor 2 higher
- 8) Internal data rate: Is requested by the sensor element. Depending on the damping, the measured values are buffered and averaged according to the averaged according to the "rolling" method
- 9) adjustment of 0point and linearization available as an option
- 10) No protection against missconnection, if needed, please contact factory

Table variation of sensors

Measuring ranges	averages (3db Hz)	axis	Product-number
± 10°	0...10Hz	X & Y	KAS4331-111
± 30° (0.5g sinuscompensated)	0...20Hz	X & Y	KAS4331-411
± 90° (1g sinuscompensated)	0...20Hz	X & Y	KAS4331-911
± 2g	0...50Hz	X & Y	KAS4331-D11
± 4g	0...70Hz	X & Y	KAS4331-G11
As option available measuring ranges between ±5° and ±90° or up to 7g	As option available 3db frequency response between 0 and 70 Hz (300 Hz)	As option every combination from X, Y, und Z (max. 2 axis) available	T.B.D.

Connection

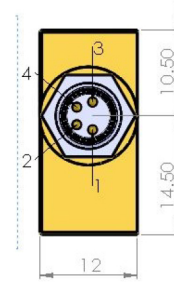
Pinout from M8 connector (m):

1	(brown ¹⁾)	9 ... 30 VDC
2	(white ¹⁾)	GND
3	(blue ¹⁾)	output A (x-axis ²⁾)
4	(black ¹⁾)	output B (y-axis ²⁾)

¹⁾ In using cable with Binder connector (f)

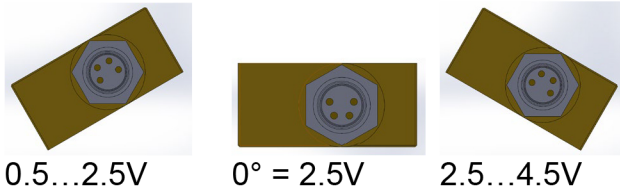
²⁾ Variances possible, please consider Specifications

No protection against miss-connection

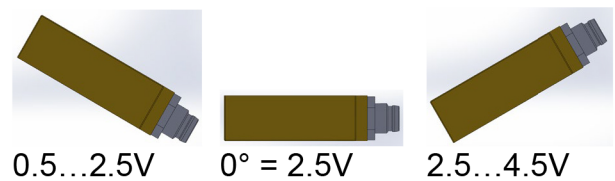


Mechanical integration:

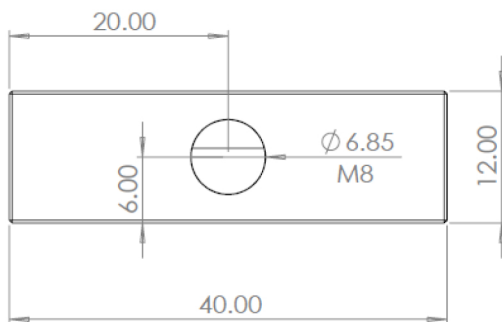
X-axis



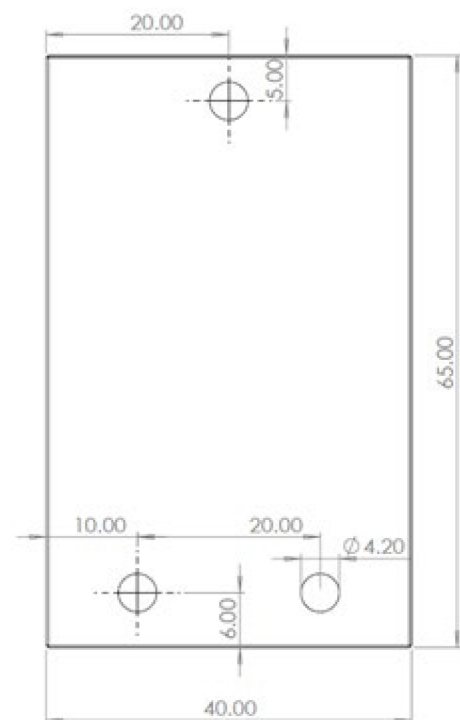
Y-axis



Housing:



Housing is made from very rugged POM material



Other Versions available

- Version in rugged IP67-68-69 housing
- 4...20mA outputs
- digital outputs
- measurement ranges from $\pm 10... \pm 180^\circ$ or 0.2...6g (10g)
- different cables and connectors

Please let us know your wishes and application: We create for you the best solution!

Distributor

