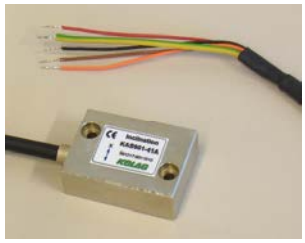
Single Axis Precision Inclination (Acceleration) Sensor
KAS901 and KAS931

- **senses in positive and negative direction**
- **static and dynamic acceleration measured**
- **high repeatability <0.01% over range**
- **high resolution <0.001% over range**
- **shock resistance of the pendulum min. 20'000g**
- **Temperature range -30 ... +85°C**
- **active and passive temperature compensation**
- **small, solid brass housing with fixing holes**
- **M8 sensor plug connector or rugged PVC cable**
- **large output span: -4…+4V output over measuring range**
- **Power supply requirement: 7... 30 VDC, stabilized**

Plug Variant KAS93x-xx



Wire Variant KAS90x-xx

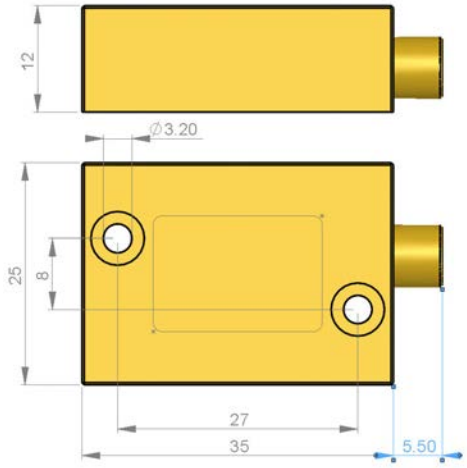
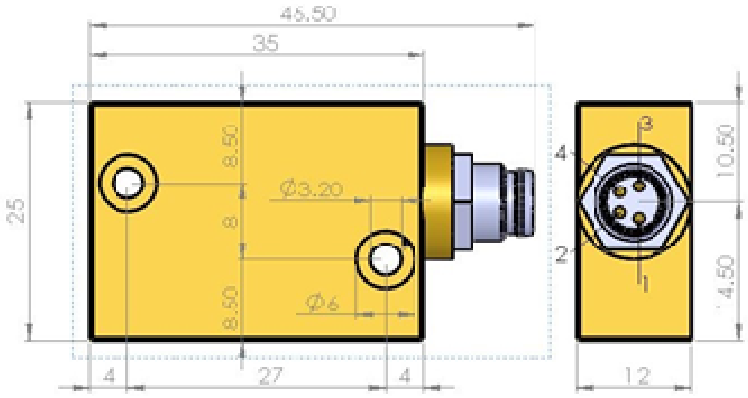
The sensors are based one an advanced "bulk micro machined" technology. The three dimensional structure of these sensors comprise a pendulum made of mono crystalline silicon. The pendulum is hermetically enclosed between two silicon discs. From this construction results a long term stable, high resolution und shock resistant sensor. A gas damping prevents overshooting and interfering resonance oscillation. An ASIC measures the capacitive change caused by the movement of the pendulum. The sensor gives two values in the same direction **which can be measured in a differentially. This avoids** lot of interferences from outside and increase the resolution and accuracy by factor 2 in comparison with KAS901-01, -02 and KAS931-01, -02 [8]**.**

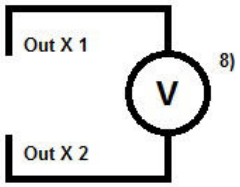
Specifications

Parameter	Conditions	KAS901-41 KAS931-41	KAS901-42 KAS931-42	Units
Measuring range [4]		+/- 15 (0,259)	+/- 30 (0,5)	° (g)
Repeatability at 0° [1]	at 20°C, typ.	<0.01 (<0.11)	0.01 (0.11)	° (mg)
Resolution Noise	At 0°, 20°C At 0°, 20°C	<0.001 0.0004 7	<0.001 0.0004 7	° °/√Hz µg/√Hz
Measuring direction	horizontal	x	x	Axis
Temperature dependency typ. [9]	+23…+70 -22…+23	0.0015 0.0023	TBA TBA	°/°C °/°C
Cross axis sensitivity [2]	worst case	4	4	%
Damping	-3 dB, typ.	18	18	Hz
Operating temperature range		-30 [7] ... +85	-30 [7] ... +85	°C
Shock resistance		20'000	20'000	G
Output signal V_{out} [7] Offset = V_{out} in 0° [7] Sensitivity on 0° [4] Sensitivity	Nominal Nominal Nominal Nominal	+/-4 V [8] 0 279.2 [4] 15.444	+/- 4 V [8] 0 139.6 [4] 8.0	V [8] V mV/° V/g
Power supply [3]		7... 30	7... 30	VDC
PVC-cable shielded	nominal	1.0	1.0	m
Analog resistive output load	Vout to Vdd or GND	Min. 10	Min. 10	kOhm
Analog capacitive output load		Max. 20	Max. 20	nF

1) Repeatability: maximum offset on horizontal position 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) Measuring range: Trigonometric function: (angle = $\arcsin\left(\frac{\text{Vout} - 0\,(\text{Offset})}{\text{Sensitivity}}\right)$ (past values without units)
5) Typical values;
6) Long term stability: calculated values from HTB tests. Test results available at request.
7) Cable is specified for -15°C for dynamic and -30°C for static applications
8) Differential Voltage between Out X1 and Out X2. Also possible is the measuring on X1 or/and X2 separately: Offset 2.5V, +/- 2V Span
9) Related to sensing element

Connection

Wire Variant KAS90x-xx	Plug Variant KAS93x-xx
	
Red: +7 …30 VDC Black: 0 VDC Braun: Out X1 Orange: Out X2 Shield: Casing	1 +7 …30 VDC 2 0 VDC 3 Out X1 4 Out X2
The outputs are not protected!	**The outputs are not protected!**



For Wire and Plug Variant

Mechanical installation

X-Axis:

0.5…2.5V 0° = 2.5V 2.5…4.5V

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