

# Acceleration Sensor AS – 080/01

## 1 Application

The AS-080/01 acceleration sensor is mainly used to measure acceleration in high temperature applications (max. 150 °C).

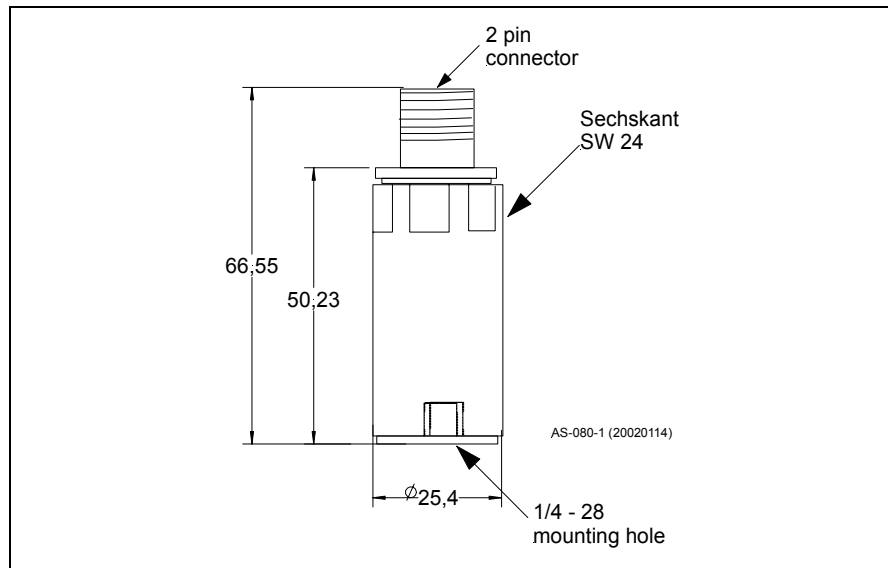


Fig. 1 Acceleration sensor

## 2 Measuring Principle

Acceleration sensors operate in accordance with the piezoelectric compression principle. Inside the sensor, a spring/mass damping system is formed by a piezoceramic element and an internal sensor mass.

When introducing vibrations to this system, the mass exerts an alternating force on the ceramic element and, due to the piezoelectric effect, induces an electric charge that is proportional to the vibration acceleration.

An integrated charge amplifier converts this charge signal to a usable voltage signal.

### 3 Technical Data

Type	Piezoelectric acceleration sensor with integrated charge amplifier	
Transmission factor	100 mV/g	± 5 %

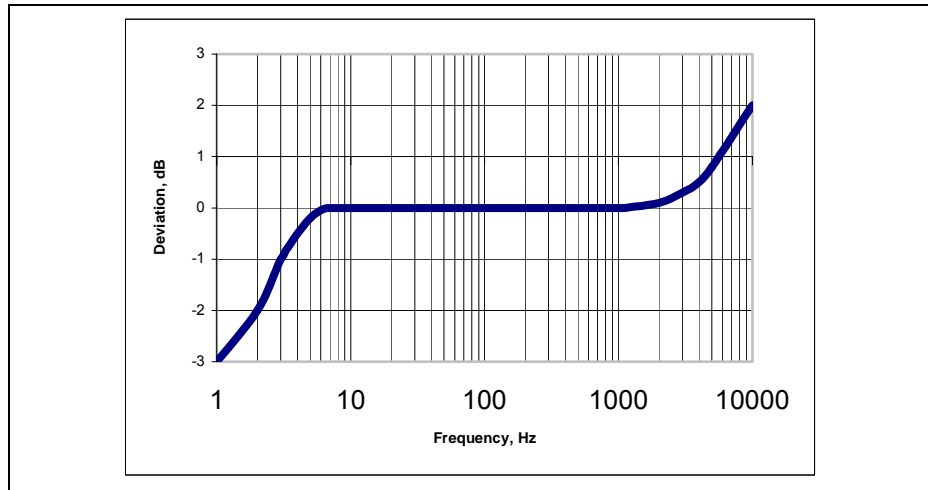


Fig. 2 Typical frequency response of the transmission factor

Vibration limit	500 g peak	
Shock limit	5000 g peak	
Temperature range	- 50 °C ... + 150 °C	
Storage temperature range	- 50 °C ... + 150 °C	
Acceleration range	50 g peak	
Amplitude non-linearity	1 %	
Frequency response		
+ / - 5 %	4 ... 5 000 Hz	
+ / - 10 %	3 ... 6 000 Hz	
+ / - 3 dB	1 ... 10 000 Hz	
Resonance frequency	20 kHz	
Transverse sensitivity, max.	5 % of axial	
<b>Electrical noise</b>		
Broadband 2.5 Hz to 25 kHz	0.3 mg	
Spectral at	25 °C	150 °C
10 Hz	10 µg/√Hz	30 µg/√Hz
100 Hz	3 µg/√Hz	10 µg/√Hz
1000 Hz	2 µg/√Hz	6 µg/√Hz
Constant current supply $I_B$	4 mA (2 mA ... 4 mA)	
max. supply voltage $U_{max}$	+ 24 V (+ 18 V ... + 30 V)	
Output impedance, max.	100 Ω	

Bias output voltage	
at 25 °C	12 VDC
at 150 °C	11 VDC
Electromagnetic sensitivity	15 µg/gauss
Base strain sensitivity	0,0005 g/(µm/m)
Sealing	Hermetic
Temperature response	see Figure 3

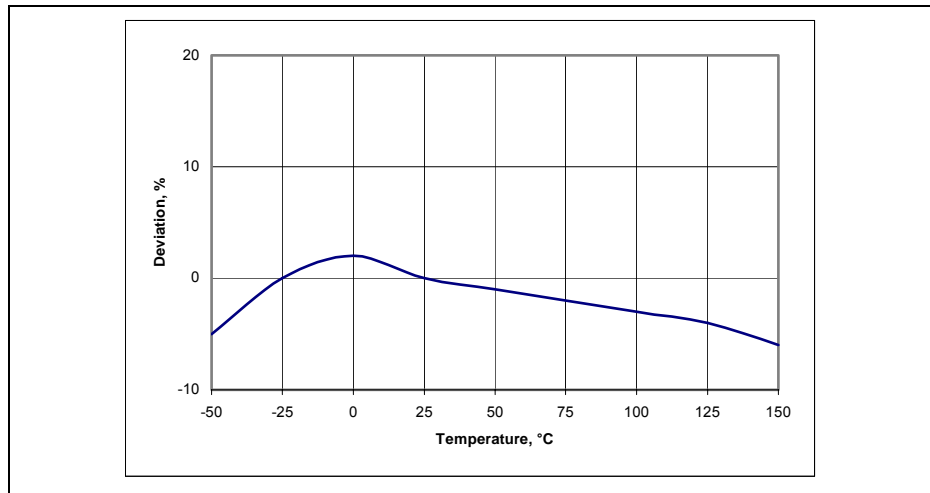
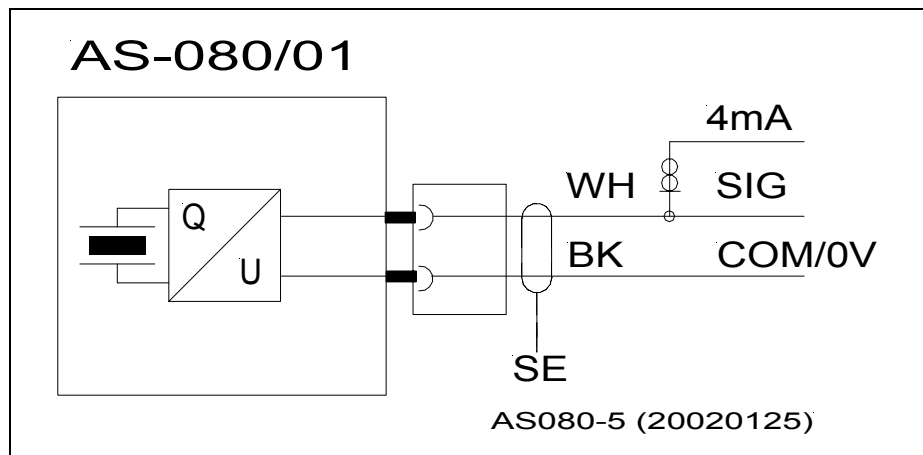


Fig. 3 Typical temperature response

Housing	316 L stainless steel,
Weight	135 g
Mounting	Central hole mounting by means of 1/4 - 28 stud;
Output connector	2 pin, MIL-C-5016 style
Pin A	power signal
Pin B	common



## EMC

Immunity to interference	as per DIN EN 50082-2 / 96-02
Suppression of radio interference	as per DIN EN 55011 / 92-07

## Accessories

AC-439 connecting cable	10 m, adjustable by customer one side with connector MIL-C-5015 one side open
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## 4 Mounting

### 4.1 Coupling

#### General rule:

The weight of the acceleration sensor should be at least ten times lower than the technically vibrating weight of the object being measured and to which the sensor is attached.

#### Basis:

The acceleration sensor is an additional parasitic mass which loads the object being measured and changes the vibration behaviour.

### 4.2 Mounting of plug connector

#### Note

When connecting the plug of the AC-439 note the following:  
Before screwing the plug on to the sensor connection socket, add a little grease to the thread and the sealing surface otherwise there is the danger that the plug and sensor will adhere to one another.

## 4.3 Mounting of acceleration sensor

### Note:

The acceleration sensor requires a friction-locked, contact resonance-free and rigid mounting to the measuring object, especially for measurement of high frequencies.

- ◆ AS-080/01 is to be mounted with the threaded stud supplied.  
Selectable:

- Stud 1/4" – 28 UNF

The sensor can be mounted in any position.

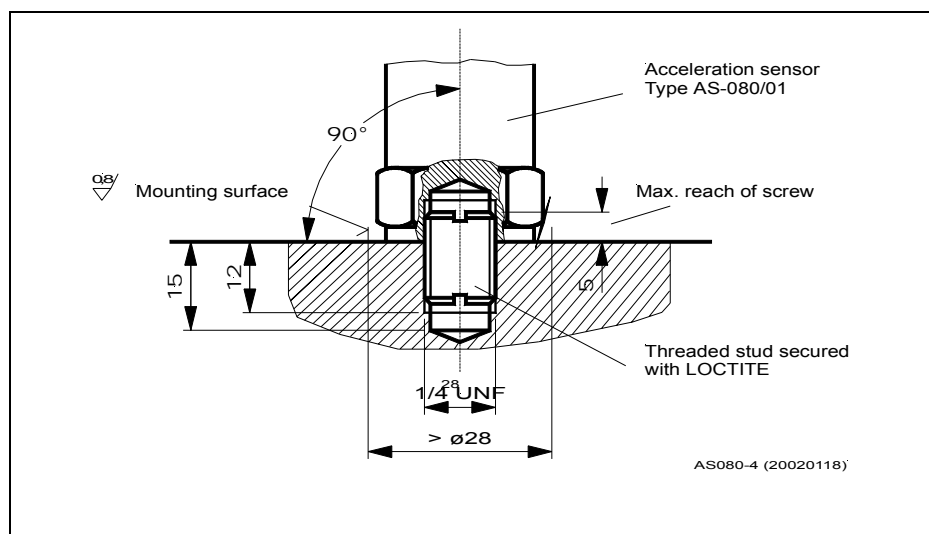


Fig. 4 Mounting

- ◆ The mounting surface in the area of AS-080/01 must be flat and machined.
- ◆ Prepare the mounting surface with an 1/4"-28 threaded hole 12 mm deep.
- ◆ Apply a thin film of silicone grease to the mounting surface to prevent contact resonance.
- ◆ Screw the stud into the mounting surface in accordance with fig. 4 and secure it (e.g. with LOCTITE 243 medium-bond, LOCTITE 270 heavy-duty bond).
- ◆ Max. protrudance of the stud  $\leq 5$  mm for acceleration sensors must be observed.
- ◆ Screw AS-080/01 onto the stud.  
Observe max. tightening torque in accordance with the stud.