

Acceleration Sensor AS - 065

1 Application

The AS-065 acceleration sensor is mainly used to measure acceleration when used in conjunction with the VIBROTEST 60 analyser and data collector.

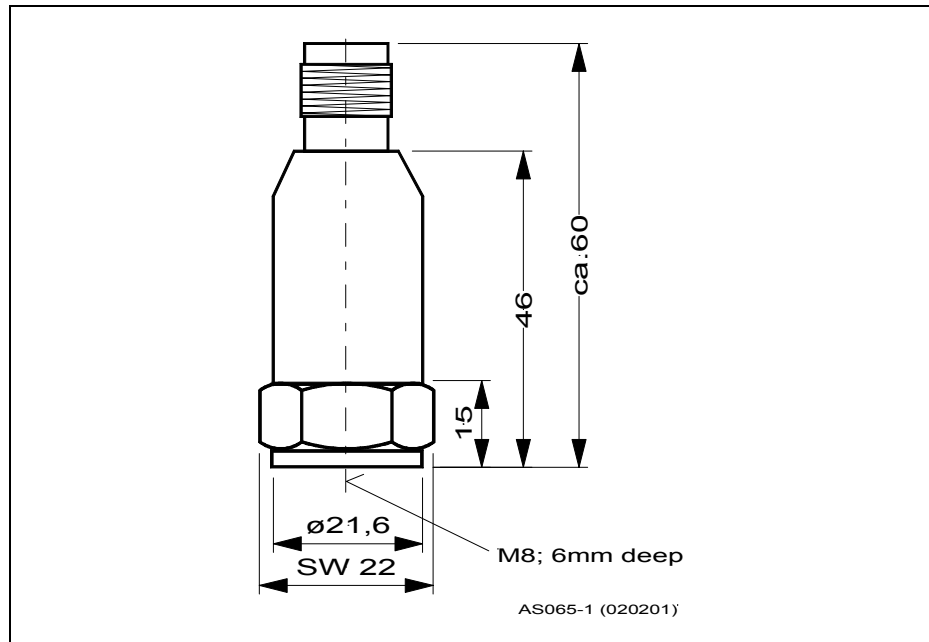


Fig. 1 Acceleration sensor

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 disk and an internal sensor mass.

When introducing vibrations to this system, the mass exerts an alternating force on the ceramic disk 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 %
	10,2 mV/m/s ²	± 5 %

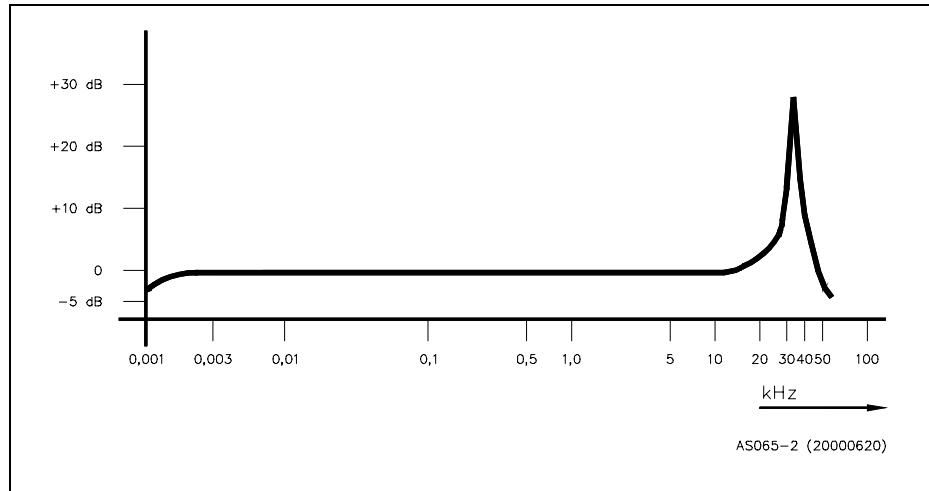


Fig. 2 Typical frequency response of the transmission factor

Overload capacity	Continuous 500 g Shock 5000 g (all directions) Fall from 1.5 m on concrete without damage	
Operating temperature range	- 50 °C ... + 120 °C	
Storage temperature range	- 50 °C ... + 120 °C	
Measuring range	± 80 g ($U_{\max} = + 24 \text{ V} \dots + 30 \text{ V}$) ± 40 g ($U_{\max} = + 20 \text{ V}$) ± 20 g ($U_{\max} = + 18 \text{ V}$)	
Linearity error	≤ 0,1 % (0,1 g ... 10 g)	
Transverse sensitivity (80 Hz)	≤ 7 %	
Frequency range	3 ... 10 000 Hz (± 0,5 dB) 1 ... 15 000 Hz (± 3 dB)	
Resonance frequency	35 kHz ± 3 kHz	
Noise	Frequency range	Noise density
	at 1 Hz	280 $\mu\text{g}/\sqrt{\text{Hz}}$
	> 100 Hz	6 $\mu\text{g}/\sqrt{\text{Hz}}$
Constant current supply I_B	4 mA (2 mA ... 10 mA)	
max. supply voltage U_{\max}	+ 24 V (+ 18 V ... + 30 V)	
Dynamic impedance at the output	≤ 300 Ω (1 Hz ... 10 kHz) ca. 2 k Ω (38 kHz) (Modulation 1 V_{eff} $I_B = 4 \text{ mA}$)	

Open-circuit potential (-50 °C ... + 100 °C)	+ 13 V ± 1,5 V
Temperature sensitivity	< 0,01 g/K
Expansion sensitivity	< 0,0003 g/(µm/m)
Magnetic field sensitivity	< 0,003 g/mT
Insulation resistance (Housing-supply voltage 0V)	≥ 20 MΩ
Dielectric strength of insulation	500 V _{RMS} (> 3 min)
Interference voltage suppression between housing and 0 V (frequency-dependent)	< 0,5 kHz ≥ 110 dB < 1 kHz ≥ 100 dB 10 kHz ≥ 60 dB
Protection system	IP 40 when mounted

EMC

Immunity to interference	as per DIN EN 50082-2 / 96-02
Suppression of radio interference	as per DIN EN 55011 / 92-07
Housing	Stainless steel, with a rugged industrial design
Weight	85 g
Mounting	Central hole mounting by means of M8 x 14 stud; Max. tightening torque 4,5 Nm or M8 / 1/4,, 28 UNF; Max. tightening torque 3,5 Nm

Connection

TNC plug connector

Accessories

AC-436 connecting cable	AS-065 with VIBROTEST 60
AC-437 connecting cable	AS-065 with VIBROTEST 60

4 Mounting

4.1 Ankopplung

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 vibrational behaviour.

4.2 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-065 is to be mounted with the threaded stud supplied.
Selectable:

- Stud M8 x 14
- Stud M8 / 1/4,, 28 UNF

The sensor can be mounted in any position.

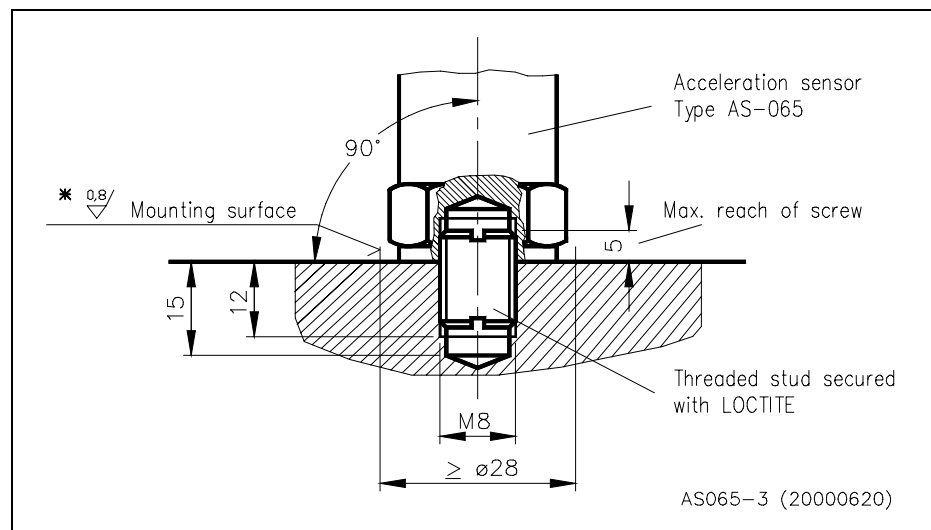


Fig. 3 Mounting

- ◆ The mounting surface in the area of AS-065 must be flat and machined.
- ◆ Prepare the mounting surface with an M8 or 1/4,, 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. 3 and secure it (e.g. with LOCTITE 243 medium-bond, LOCTITE 270 heavy-duty bond).
- ◆ Max. protrudance of the stud ≤ 5 mm for acceleration sensors must be observed.
- ◆ Screw AS-065 onto the stud.
Observe max. tightening torque in accordance with the stud.