Acceleration Sensor with constant current power

AS - 062

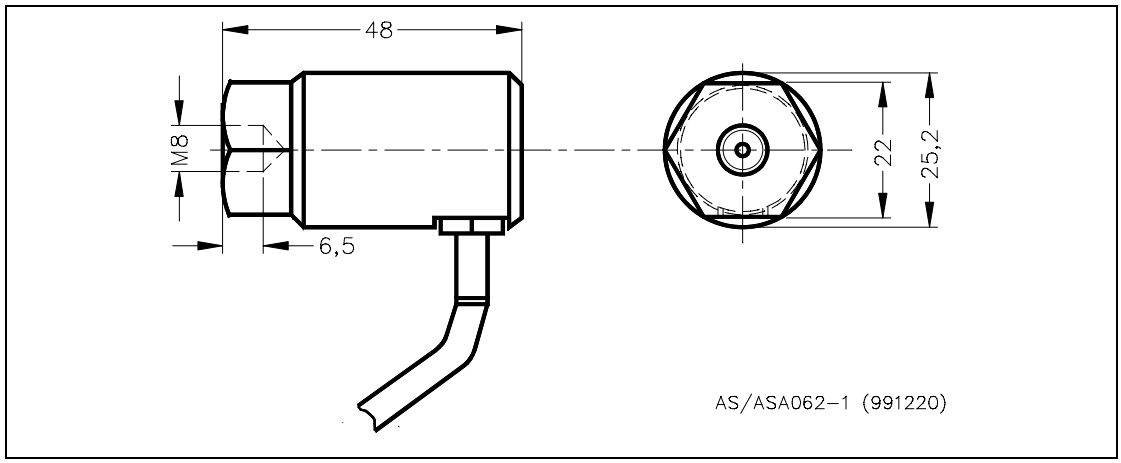


Fig. 1 Dimensions

1 Application

The AS-062 is mainly used for measurement of vibration acceleration at rotating machines such as turbines, pumps, compressors, etc.

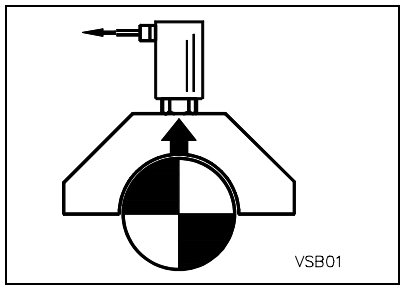
2 Measurement principle

The acceleration sensor operates according to the piezo-electric compression principle. A piezo-ceramic disc and an internal sensor mass form a spring-mass system in the sensor.

If this system is subjected to vibrations the mass produces an alternating force on the ceramic disc. As a result of the piezo effect this produces an electrical charge that is proportional to vibration acceleration.

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

2.1 Polarity



A movement of the bearing housing in the direction shown below produces a positive signal.

3 Technical Data

Transmission factor (referred to the measured value at 80 Hz and 25 °C)	100 mV/g 10,2 mV/m/s^2	± 5 % ± 5 %

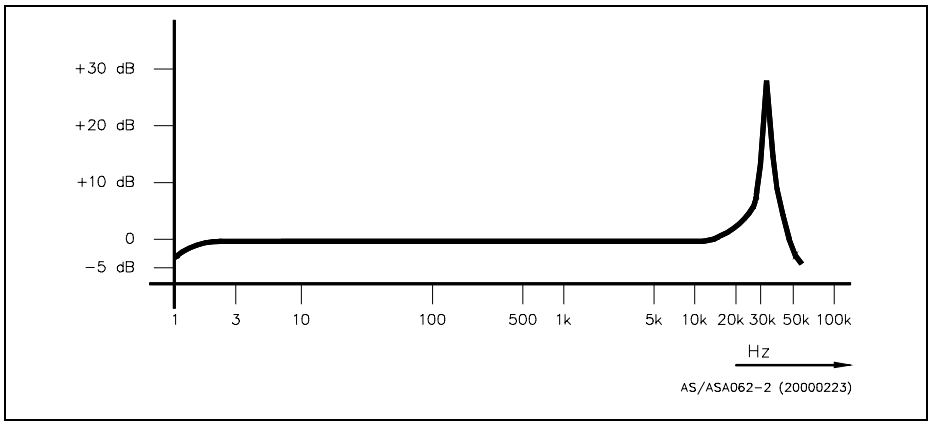


Fig. 2 Typical frequency response curve of the transmission factor

Overload capacity	continuous 500 g shock 5000 g (any direction)
Operating temperature range	-50 °C ... + 125 °C
Storage temperature range	-50 °C ... + 125 °C
Measuring range	± 80 g (U_{max} = + 24 V ... + 30 V) ± 40 g (U_{max} = + 20 V) ± 20 g (U_{max} = + 18 V)
Transverse sensitivity (80 Hz)	≤ 8 ... 10 %
Operating frequency range	4 Hz ... 10 kHz ± 5 % 1,5 Hz ... 13 kHz (± 3 dB)
Resonance frequency	> 20 kHz
Constant-current supply I_B	4 mA (2 mA ... max. 10 mA) polarised
Power U_{max}	+ 24 V (+ 18 V...+ 30 V) DC polarised
Dynamic internal resistance of output	≤ 300 Ω (Operating frequency range) approx. 2 kΩ (Resonance frequency) (Level control 1 V_{eff} I_B = 4 mA)
Passive potential (-50 °C ... + 100 °C)	+ 12,5 V ± 1,5 V
Sensitivity response to temperature	≤ 5 % of meas. value (ref. at 25 °C)
Distortion sensitivity	< 0,002 g/(μm/m)
Magnetic field sensitivity	< 80 Hz: 0,001 g/mT < 1 kHz: 0,014 g/mT

Insulation resistance (Housing to power 0 V)	≥ 20 MΩ
Interference voltage suppression between housing and 0 V (frequency-dependent)	< 0,5 kHz ≥ 100 dB < 1 kHz ≥ 95 dB 10 kHz ≥ 75 dB
Protection class acc. to DIN 40 050	IP 67
Mass	approx. 130 g (without cable)
Housing material	Stainless steel 1.4301

EMC

Interference resistance	acc. to DIN EN 50082-2 / 96-02
Interference emission	acc. to DIN EN 55011 / 98-12

Connecting cable

Length	5 m
Construction	2-conductor stranded + shield
Outer material insulation	ETFE
Outer insulation colour	black
Outside diameter	3,3 mm (± 0,15 mm)
No. of conductors	2
Conductor cross-section area	0,14 mm^2 (7 x 0,16 mm)
Conductor insulation	ETFE

Conductor layout

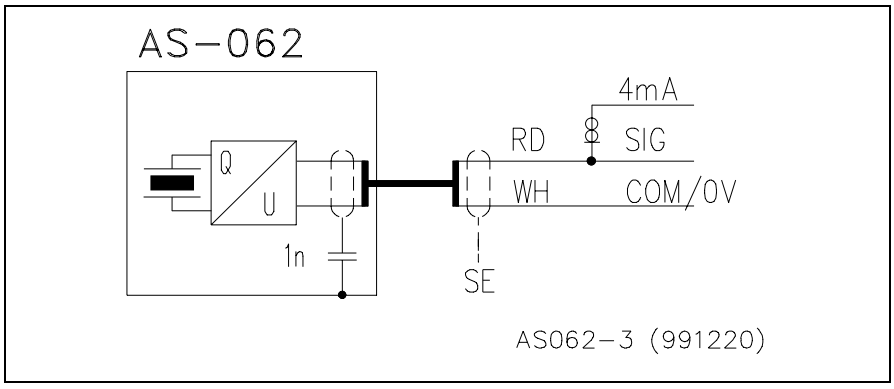


Fig. 3 wiring diagram

4 Mounting

4.1 Coupling

General rule.

The weight of the acceleration sensor should always be lower at least by a factor ten than the weight of the object onto which it is mounted.

The acceleration sensor is an additional parasitic mass which loads the object on which it is mounted and this changes the vibration behaviour if it is too large.

4.2 Mounting the acceleration sensor

The acceleration sensor requires a friction-locked, contact resonance-free, rigid mounting to the object, particularly for measurements at high frequencies.

- The sensor is to be attached using the supplied threaded stud, either:
- Threaded stud M8 x 14 or
- Threaded stud M8 / 1/4“ 28 UNF.

The sensor may be mounted in any direction.

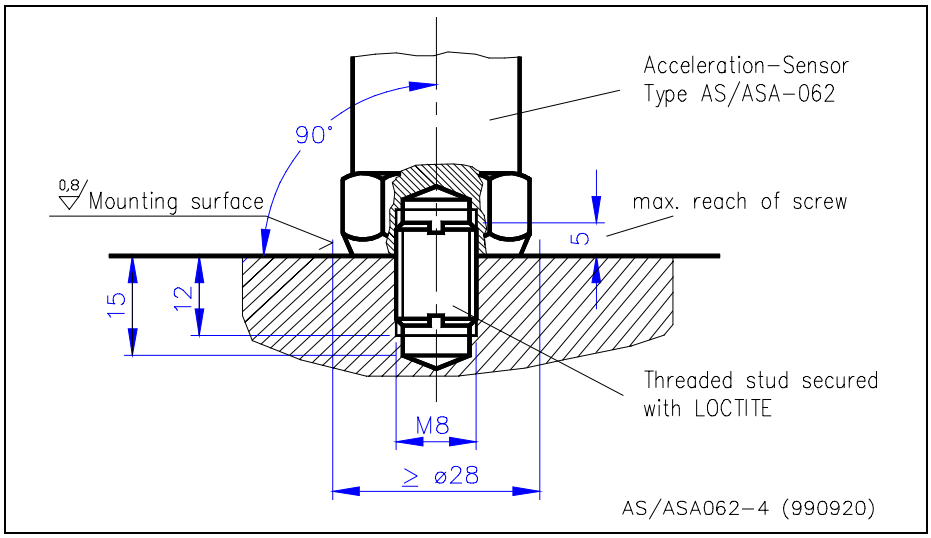


Fig. 4 Mounting

- The mounting surface in the area of the sensor must be flat and machined
- Provide a size M8, resp. 1/4“ threaded hole 12 mm deep in the surface of the machine
- Apply a thin film of silicone grease on the mounting surface to prevent contact resonance
- Screw the M8, resp. 1/4“, stud into the mounting surface in accordance with Fig. 4 and secure it with adhesive, e.g. LOCTITE 243 medium strength, or LOCTITE 270 high strength
- Maintain a max. length of the threaded stud ≤ 5 mm for acceleration sensors
- Screw the sensor onto the threaded stud, observing the corresponding maximum torque for the threaded stud
- Recommended maximum torque for the supplied threaded stud is 3,5 Nm