



## bkvibro AS-477 Acceleration sensor Instructions

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**Brüel & Kjær Vibro**

A member of the NSK Group

**AS-477 Acceleration sensor  
Instructions**

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Figure 1-1) Acceleration sensor AS-477



**NOTE!**

This manual is a part of the product. Read the manual carefully before using the product and keep it accessible for future use.

**1.1 Pictograms and their Meanings**



This symbol warns of dangerous situations which can result from the misuse of the product.

**1.2 User Qualification**

Ensure that all work in conjunction with our systems is performed by a skilled, expert, and authorized workers (for ATEX systems according to EN 60079-14). Among these works are:

**Installation and Commissioning**

Installation and commissioning primarily concern work on electrical equipment. These works may be performed exclusively by electricians or workers instructed and supervised by an electrician in accordance with electrotechnical regulations/directives.

**Change of System Specification**

Any change in system specification has its effects on the monitoring process with stationary systems and on the measuring sequence with portable measuring systems.

**1.3 Intended Use**

If sensors and cables are used in a way not described in the relevant user manuals, function and protection may be impaired and serious personal damage, death, or serious, irreversible injuries may result.

- Exclusively use the sensor as specified in the datasheet. Any use other than specified is considered inappropriate. Brüel & Kjær Vibro does not assume any liability for damages resulting from inappropriate use. The user is solely responsible.
- Mounted sensors must not be used as steps.
- Ensure that system is exposed only to admissible environmental influences specified in the technical system datasheet.
- Maintain electrical equipment at regular intervals. Remedy defects, e.g. loose wires, defective connectors, immediately.

## Hot surfaces

- In line with the user manuals, sensors and cables can be operated in extensive ambient temperature ranges, whereby they can become hot through self-heating on housing walls and can produce burning.
- When mounted at external heat or cold sources (e.g. machine parts), systems, sensors and cables can adopt dangerous temperatures, whereby burning, among other things, can occur in the event of contact.

### 1.3.1 Recommendations to User

If the use of the system in conjunction with machines or plant sections can produce risks outside of Brüel & Kjær Vibro's responsibility, the user is expected to prepare and distribute safety technical instructions or warnings and to ensure that the person concerned has received and understood it.



If the system is integrated into a machine or designed to be assembled, commissioning must not take place until the machine the system is to be integrated into conforms to the EC directives.

### 1.3.2 Prohibition of Unauthorized Modifications

System and accessories must not be changed either in construction or safety technology without the express consent of Brüel & Kjær Vibro. Any unauthorized modification includes Brüel & Kjær Vibro's liability for resulting damages.

## Application

The AS-477 is mainly used for the measurement of vibrations at rotating machines such as turbines, pumps, compressors, etc.

## Measuring Principle

The acceleration sensor operates according to the piezo-electric principle. A piezo element 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 piezo element. As a result of the piezo effect, an electrical charge is produced that is proportional to the vibration acceleration.

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

## Mounting

### 4.1 Coupling General rule:

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

The acceleration sensor is an additional mass, which loads the object on which it is mounted, and this changes the vibration behavior if it is too large. The sensor requires a friction-locked, contact resonance-free, rigid mounting to the object, particularly for measurements at high frequencies. The cable must be attached on a non-tension basis and load-free in connection.

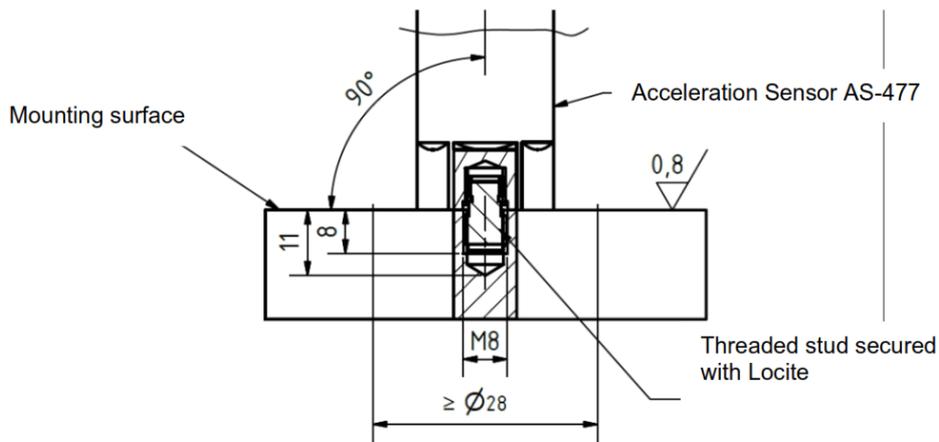


Figure 4-1) Mounting (all length in [mm])

The sensor is to be installed with the threaded stud (1/4"– 28 UNF on M8X1,25) included. It can be installed in any orientation on the machine.

1. The mounting surface must be machined flat in the area of the sensor (roughness depth 0.8 μm) and have a minimum diameter of 28 mm.
2. Supply installation surface with threaded bore M8X1,25 according to drawing (fig.4-1).
3. The bore must be countersunk and cleaned.
4. Screw-threaded stud into installation surface according to drawing (fig. 4-1) and secure (LOCTITE 243 intermediate strength or LOCTITE 270 high strength).
5. Apply a thin layer of silicone grease to the installation surface to reduce contact resonance.
6. Screw the sensor onto the threaded stud with a mounting torque of 3.5 Nm (key width 7/8" / 22.2 mm) and secure (LOCTITE 243 medium strength or LOCTITE 270 high strength).

## EMV

EN 61326-1

Through electromagnetic stray fields, influences on the measured values may arise. In case of disturbing influences of this type, a grounded protective conduit is recommended for the signal cable.

## Calibration

**In the event of a calibration request, we offer the following services:**

- Factory calibration by Brüel & Kjær Vibro
- Calibration traceable to national standards by our DAkkS accredited calibration laboratory

## Disposal



After use, dispose of the systems, cables, and sensors in an environmentally friendly manner, in accordance with the applicable national provisions. WEEE-Reg.-No DE 69572330

## Technical Data

### Features

High sensitivity Suitable for slowly rotating machinery Robust design M12 plug Constant current supplied 



### Applications

The sensor is suitable for the recording of high and low-frequency signals. Typical applications are, for example, the monitoring of transmissions or cooling fans in wind turbines, heavy-duty and planetary gears, or large fans.

### Product Description

#### Scope of delivery:

- Sensor AS-477
- 1 x Threaded bolt 1/4" – 28 UNF to M8X1,25
- Documentation

### Connection

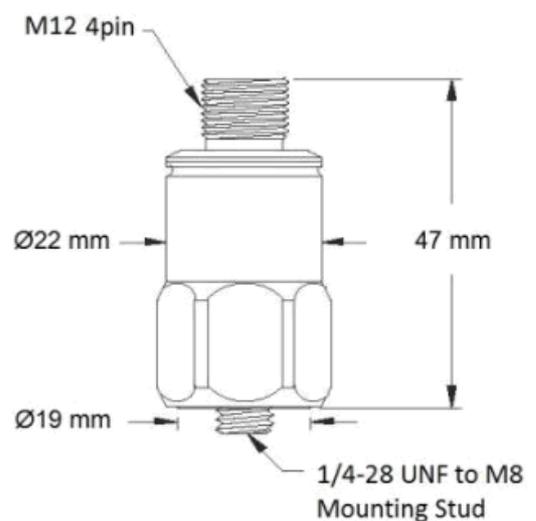
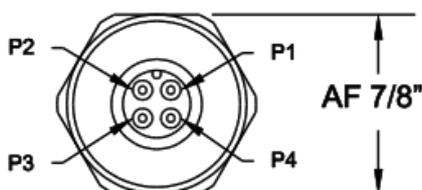
Plug Connection (M12 male)

**Pin 1:** + (SIG)

**Pin 2:** – (0V / GND)

**Pin 3:** not connected

**Pin 4:** not connected



Length in [mm]

The following performance data apply, to the extent that nothing else is indicated, under standard conditions (Ambient temperature = 25 °C, Constant current = 4 mA).

<b>Dynamic</b>	
Sensitivity, nom. (at 100 Hz):	500 mV/g $\pm$ 5 % 0,2 Hz .. 14 kHz: $\pm$ 3 dB
Frequency response:	0,7 Hz .. 5 kHz: $\pm$ 5 %
Measurement range:	10 g Peak
Resonance frequency:	min. 25 kHz, typically 30 kHz
Amplitude linearity:	< 1 %
Cross sensitivity:	< 5 %
<b>Electric</b>	
Maximum output voltage:	30 V
Constant current supply (secure against reverse polarity):	2 mA .. 10 mA (24 V nom.)
Broadband noise (2.5 Hz .. 25 kHz):	250 $\mu$ g
Spectral noise:	10 HZ: 2,5 $\mu$ g $\sqrt$ HZ 100 HZ: 1,5 $\mu$ g $\sqrt$ HZ 1000 HZ: 1,5 $\mu$ g $\sqrt$ HZ
Output resistance:	<300 $\Omega$
The bias voltage, typically:	12,5 VDC
Across the entire temperature range:	10 V – 14 V
Grounding:	Housing isolated against sensor electronic
<b>Surroundings</b>	
Operating temperature range: Operating temperature with connection cable AC-140...:	-50 °C ... +120 °C -30 °C ... +90 °C
The storage temperature range in original packaging:	-20 °C ... +70 °C
Overload capacity:	Constant, sinusoidal: 500 g
Housing design:	Schock: 5.000 g
Degree of protection acc. EN 60529:	Hermetically sealed stainless steel housing
Measurement principle:	IP67 / IP68 (incl. Nema 6) (only with connection cable AC-1403 or AC-1404)
<b>Physical values</b>	
Weight:	Piezoelectric principle, shear-type 90 g
Housing material:	316 L stainless steel
Thread:	1/4" – 28 UNF



Brüel & Kjaer Vibro GmbH

**Signature**

CE-Coordinator



(Niels Karg)

**Place**

Date 08.10.2021

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**11/2021**  
**C106002.002 / V07**  
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**Documents / Resources**

	<a href="#">bkvibro AS-477 Acceleration sensor</a> [pdf] Instructions AS-477 Acceleration sensor, AS-477, Acceleration sensor, AS-477 sensor
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**References**

- [Condition Monitoring Solutions - Brüel & Kjær Vibro](#)