Brüel & Kjær Vibro
A member of the NSK Group

Instruction

AS-030

Acceleration Sensor

CE

Keep accessible for future reference

Instruction **Sensor AS-030**, C102 787.002 / V06, en, date of issue: 19.01.2022

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Table of Contents

1 Hints

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 misuse of the product.

1.2 User Qualification

Ensure that all work in conjunction with our systems is performed by skilled, expert and authorized workers. 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 of system specification has its effects on monitoring process with stationary systems and on the measuring sequence with portable measuring systems.

1.3 Intended Use

If sensors and the 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 sensor as specified in data sheet. 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. For originally intended use, see system documentation.
- Mounted sensors must not be used as steps.
- Ensure that system is exposed only to admissible environmental influences specified in technical system data sheet.
- Handle the systems with care in order to prevent damage to the systems or personal damage due to falling.
- Maintain electrical equipment in regular intervals. Remedy defects, e.g. loose wires, defective connectors, immediately.
- Check cable and connectors in regular intervals.
- Never use cable to pull plug out of socket.

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 personnel concerned has received and understood same.

If 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 in conforms to the EC directives.

1.3.2 Prohibition of Unauthorized Modifications

System and accessories must not be changed neither in construction nor safety technology without the express consent of Brüel & Kjær Vibro. Any unauthorized modification excludes Brüel & Kjær Vibro's liability for resulting damages.

2 Application

AS-030 is to be mounted with the stud supplied. If the sensor will be used in a manner which is not specified in the instructions function and protection provided by the sensor may be impaired.

3 Measuring Principle

The acceleration sensors are working according to the piezoelectric compression principle. Inside the sensor, a piezo ceramic disk and an internal seismic mass form an oscillatory spring-mass damping system. As soon as vibrations are lead into the system, the mass exerts a changing force onto the ceramic disc. Due to the piezo effect, electric charges occur, which are proportional to the acceleration.
An integrated amplifier will then convert the charge signal into a utilizable voltage signal.

4 Extent of delivery

- Acceleration pick-up type AS-030
- AC-305/01 EPDM protective cap (-50°C ... + 150°C)
- Faston cable ferrules 6.3 mm for cable cross-section 0.5 mm² ... 1.5 mm²
- Faston cable ferrules 6.3 mm, isolated version for cable cross-section 0.5 mm² ... 1.5 mm²
- Threaded stud M8 x 1,25 x 14 (AC-350)
- Threaded stud M8 x 1,25 / 1/4" 28 UNF (AC-351)
- Hose clamp SGL 7-11/5 ZYW2
- Hose clamp SGL 11-19/5 ZYW2

5 Dimensional drawing

5.1 AS-030

.

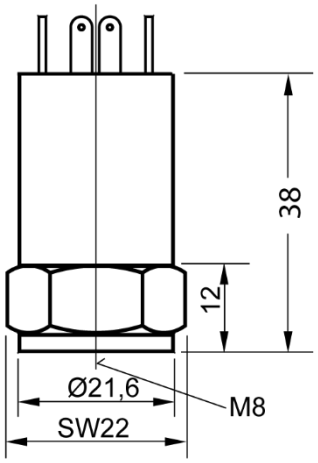


Figure 5-1) Dimensional drawing - all values in mm

6 Mounting

6.1.1 Coupling

As a general rule, the following applies:

The mass of the acceleration sensor should be at least ten times smaller than the vibrationally relevant mass of the measuring object, onto which it is mounted. The acceleration sensor is an additional weight for the measuring object which may influence its vibration behaviour.
The acceleration sensor needs a non-positive, contact resonance-free and rigid fastening to the measuring object, especially for measurements with high frequencies.

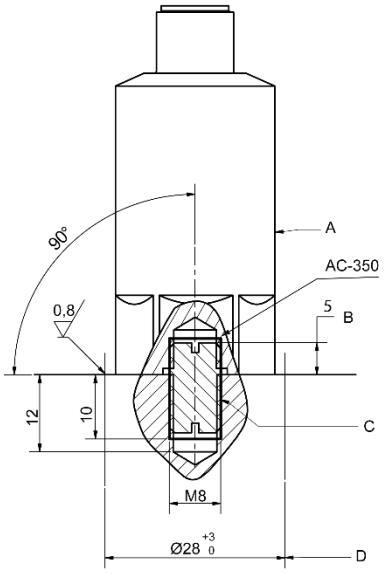


Figure 6-1) Mounting AS-030 - all values in mm

A = Sensor B = max. reach of screw C = Threaded stud D = Mounting surface

AS-030 is to be mounted with the stud supplied. Selectable:

- Stud 8 x 1,25 x 14
- Stud M8 x 1,25 / 1/4" 28 UNF

The sensor can be mounted in any position.

1. The mounting surface (D) in the area of AS-030 must be plane and machined.
2. Provide mounting surface with threaded hole M8 or 1/4“, 12 mm deep
3. Apply a thin film of silicone grease on the mounting surface to prevent contact resonance.
4. Screw stud into the mounting surface in accordance with **Figure 6-1** (C) and secure same (e.g. with LOCTITE).
5. Max. reach of screw ≤ 5 mm (B) for acceleration sensors to be adhered to.
6. Screw AS-030 (A) onto the stud.
7. Observe max. tightening torque in accordance with stud.

7 Connection

7.1 Electrical Connection

Note the following hints before you connect the accelerometer:

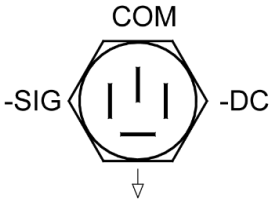
- If the cable is not supplied by Brüel & Kjær Vibro, we recommend a shielded signal cable (foil shield with 100 % cover) with a cable capacitance of approx. 70 nF/km measured wire/wire, with the rest of the wires and shield open.
- In addition we recommend that the pick-up be protected against dust and moisture if you intend using it without the supplied silicon protective cap.

7.2 Connecting the cable to the AS-030

To connect the cable to the accelerometer with the protective cap, proceed as follows:

- Shorten the protective cap so that the opening for the cable is somewhat smaller than the cable diameter.
- Pull the cable through the protective cap
- Strip the cable ends back approx. 20 mm
- The ferrule contacts on the accelero-meter are made for the 6.3 mm Fast-on cable ferrules supplied.
- Crimp the Fast-on ferrules to the cable ends
- Connect the ferrules to the accelerometer ferrule contacts
- Ensure that the connections are correct. The contacts are marked -DC, COM, SIG, and „⏚ “ on the accelerometer. (⏚ = 0 V)

7.3 Connection



4 x Fast-on ferrule contacts 6.3 mm according to DIN 46244

- A = + (SIG / 4mA)
- B = - (0V / GND)

Figure 7-1) Connection diagram (viewed from contact end)

NOTE

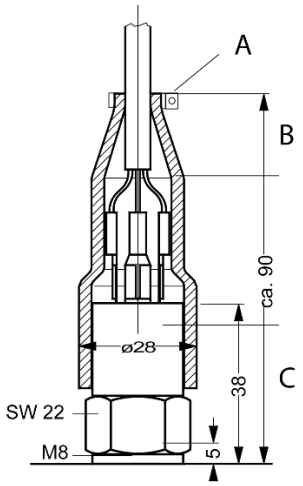
For the contacts SIG and –DC insu-lated Fast-on ferrules should be used ! For the contacts COM and ⏚ non-insulated Fast-on ferrules should be used !

CAUTION!

In case the ambient temperature is higher than 80 °C, the sensor cable must be soldered directly to the plug contacts of the sensor instead of using the supplied Fast-on ferrules.

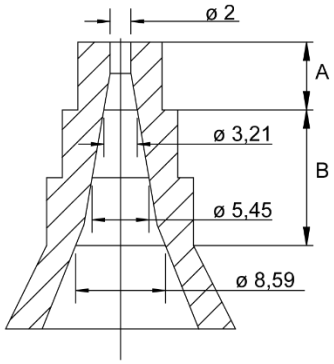
7.4 Soldering the sensor cable to the plug contacts of the sensor

- A soldering iron temperature of 300 deg. C must not be in contact with the ferrule contacts for longer than 10 seconds, otherwise the soldered contacts inside the accelerometer will be loosened.
- After the soldering is complete, slide the protective cap over the accelerometer.
- Cut the upper part of the protective cap back to correspond with the cable diameter and use the supplied AC-305 hose clamp. This hose clamp must be used at the point of exit of the cable from the protective cap!!



- A = Hose clamp (AC-305)
- B = Protection cap (AC-305)
- C = Acceleration sensor AS-030

Sensor protective cap:



- A = Hose clamp SGL 7-11/5 ZYW2 (M/N 4374 336)
- B = Hose clamp SGL 7 – 19/5 ZYW2 (M/N 4374 337)

8 Technical Data

Electrical	
Transmission factor	100 mV/g ±5 % 10,2 mV/m/s^2 ±5 %

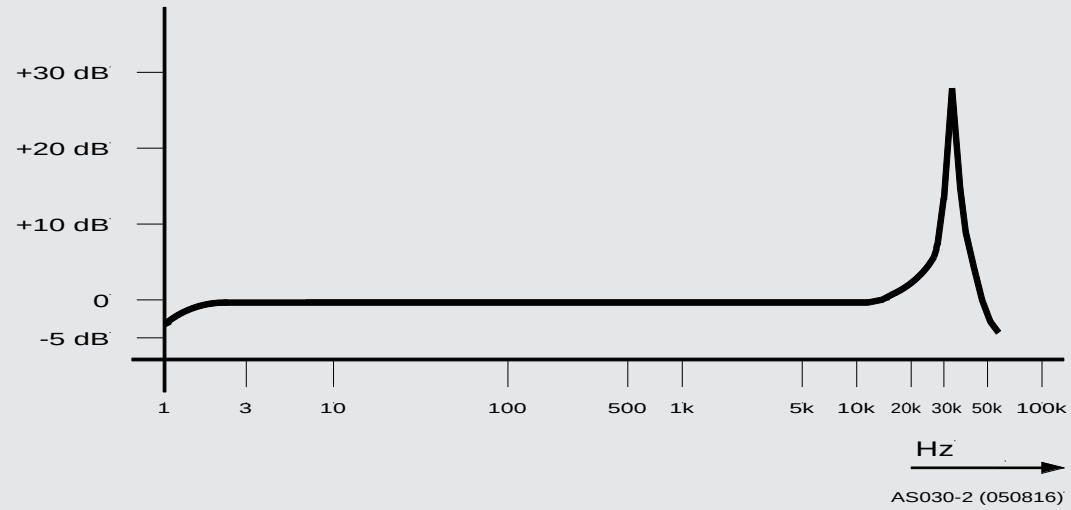


Figure 8-1) Typical frequency response of sensitivity

Frequency range	3 Hz ... 10 kHz (± 0,5 dB) 1 Hz ... 15 kHz (± 3 dB)
Transverse sensitivity (80 Hz)	≤ 7 %
Resonance frequency	20 kHz
Noise	0,1 Hz-100 kHz ≤ 0,6 mV_{ss} 0,1 Hz- 1 kHz ≤ 0,2 mV_{ss}
Measuring range	±80 g (U_B = -24 V...-30 V) ±40 g (U_B = -20 V) ±20 g (U_B = -18 V)
Linearity error	≤ 0,1 % (0,1 g ... 10 g)
Output impedance	≤ 5 Ω
Open-circuit potential (-50 °C ... +125 °C)	-12 V ± 2 V
Temperature sensitivity	< 0,01 g/K
Strain sensitivity	< 0,0003 g/ (μm/m)
Magnetic field sensitivity	< 0,003 g/mT
Insulation resistance (Housing supply voltage 0 V))	≥ 20 MΩ
Dielectric strength of insulation	500 V_{RMS} (> 3 min)
Voltage supply	U_B = -24 V (-18 V...-30 V)
Supply voltage feed through	≤ 36 kHz < -30 dB
Stability with capacitive load	0 ≤ C_L ≤ 470 nF
Weight	60 g
Housing	Stainless steel, sealed with Epoxy-resin rugged industrial design

Protective system	Careful installation of the protective cap provides protection against contact with the exposed sensor contacts. The protective cap does not provide adequate protection from moisture.
Operating temperature range	-55 °C ... +125 °C
Storage temperature range (in original packaging)	-20 °C ... +70 °C
Overload capacity	continuous 500 g shock 5000 g (all directions) Fall from 1.5 m on concrete without damage (plug contacts excluded)
Dependence of sensitivity on operating voltage	< 1 %
Sensitivity deviation due to temperature	- 22 °C - 3 % 22 °C 0 % 65 °C - 4,5 % 120 °C - 10 %

8.1 EMV

- EN 61326-1

Through electro-magnetic 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.

9 Maintenance and repair

All sensors of the AS-03x series are maintenance-free.

IMPORTANT REPAIR INSTRUCTION:

Measurements should only be carried out by authorized experts and outside the explosion-proof sector.
If the sensor is used in potentially explosive surroundings, please observe the standards and legal regulations valid at the time of inspection.

10 Disposal

After use, dispose of the systems, cables and sensors in an environmentally friendly manner, in accordance with the applicable national provisions.
WEEE-Reg.-Nr. DE 69572330

11 CE-Declaration

Brüel & Kjær Vibro
A member of the NSK Group

EU-Konformitätserklärung / *EU- Declaration of conformity*

Hiermit bescheinigt das Unternehmen / *The company*

Brüel & Kjær Vibro GmbH
Leydheckerstraße 10
D-64293 Darmstadt

CE

die Konformität des Produkts / *herewith declares conformity of the product*

Beschleunigungs-Sensor / *Acceleration Sensor*

Typ / *Type*

AS-030

mit folgenden einschlägigen Bestimmungen / *with applicable regulations below*
EU-Richtlinie / *EU-directive*

2014/30/EU EMV-Richtlinie / *EMC-Directive*

2011/65/EU + (EU) 2015/863 Richtlinie zur Beschränkung der Verwendung bestimmter gefährlicher Stoffe in Elektro- und Elektronikgeräten/ *EU Directive for the restriction of the use of certain hazardous substances in electrical and electronic equipment*

Angewendete harmonisierte Normen / *Harmonized standards applied*

EN 61326-1: 2013
EN IEC 63000:2018

Bereich / Division
Brüel & Kjær Vibro GmbH

Unterschrift / Signature
CE-Beauftragter / *CE-Coordinator*

Ort/*Place* **Darmstadt**
Datum / *Date* **16.12.2021**

(Niels Karg)

UNRESTRICTED DOCUMENT

12 China RoHS

Brüel & Kjær Vibro

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MANAGEMENT SYSTEM

DQS-zertifiziert nach
certified by DQS according to
ISO 9001:2015 Reg.-No. 067156 QM15

Statement of Conformity

ROHS declaration according SJ/T 11364

产品名称：AS-030
发布：**Brüel & Kjær Vibro GmbH**
产品中有害物质的名称及含量

部件名称	有毒有害物质或元素					
	铅（Pb）	汞（Hg）	镉（Cd）	六价铬（Cr(VI)）	多溴联苯（PBB）	多溴二苯醚（PBDE）
压电	X	o	o	o	o	o

本表格依据SJ/T11364的规定编制
O：表示该有毒有害物质在该部件所有均质材料中的含量均在GB/T 26572 规定的限量要求以下。
×：表示该有毒有害物质至少在该部件的某一均质材料中的含量超出GB/T 26572标准规定的限量要求。

Product name: AS-030

Issued by: Brüel & Kjær Vibro GmbH

Name and content of harmful substances in the product

Name of parts	Toxic and hazardous substances or elements					
	Lead (Pb)	Mercury (Hg)	Cadmium (Cd)	Hexavalent chromium (Cr(VI))	Polybrominated biphenyls (PBB)	Polybrominated diphenylethers (PBDE)
Piezo	X	o	o	o	o	o

This table is based on SJ/T11364 The provisions
0: indicates that said harmful substances contained in all of the homogeneous materials for this part is below the limit requirements of GB/T 26572.
X: indicates that said harmful substances contained in at least one of the homogeneous materials used for this part is above the limit requirements of GB/T 26572 Standard limits.

Datum/*Date*
16.12.2021

Seite/*Page 1/1*

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