



Brüel & Kjær Vibro

A member of the NSK Group

BK vibro

Instructions

ASA-063 ATEX

Explosion-proof acceleration sensors with stabilized power supply

Yekan

تولید، تامین و کالیبراسیون
تجهیزات مانیتورینگ ارتعاش
www.Yekan-Vibro.ir



Keep accessible for future reference

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Instructions **Sensor ASA-063**, C103439.002 / V10, en, date of issue: 19.05.2021

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DE Achtung !

Vor Inbetriebnahme des Produktes muss die Betriebsanleitung gelesen und verstanden werden.

Bei Bedarf die Betriebsanleitung in fehlender EU-Sprache unter folgender Adresse anfordern:

www.bkvibro.com

EN Note!

Before operating the product the manual must be read and understood.

If necessary you may order the manual in the missing European Union language under the following address:

www.bkvibro.com

FR ATTENTION !

Avant utilisation de l'appareil, il faut impérativement avoir lu et compris le manuel d'emploi.

Si besoin, commander le manuel d'emploi dans la langue manquante à l'adresse suivante :

www.bkvibro.com

ES Nota importante!

Antes de utilizar este producto debe leer y comprender el manual.

Si necesita el manual en otro idioma de la Unión Europea, puede pedirlo en la siguiente dirección:

www.bkvibro.com

IT Nota !

Il manuale deve essere letto e compreso prima della messa in servizio del prodotto.

Se necessario, il manuale mancante nella lingua Europea desiderata, è ordinabile al seguente indirizzo:

www.bkvibro.com

PT Atenção !

Antes de usar o produto é necessário ler a documentação e entender-la.

Se for necessário é favor pedir a documentação na língua europeia que necessita dirigindo-se a está direção:

www.bkvibro.com

NL Attentie!

Voor ingebruikname van het produkt dient de gebruiksaanwijzing gelezen en begrepen te zijn.

Bij behoefte aan een gebruiksaanwijzing in een ontbrekende EU-taal is deze op onderstaand adres aan te vragen:

www.bkvibro.com

DK Henvisning:

Før produktets ibrugtagning skal brugsanvisningen læses og forstås!

Brugsanvisningen kan bestilles på et EU-sprog ved henvendelse til:

www.bkvibro.com

SE Observera !

Före idrifttagning av produkten måste bruksanvisningen läsas och förstås.

Om nödvändigt kan bruksanvisningen beställas i det saknade EU-språket under följande adress:

www.bkvibro.com

FI Huomio!

Ennen käyttöönottoa tulee lukea ja ymmärtää käyttöohjeet.

Kun tarvitset käyttöohjeita muilla EU-kielillä ota yhteys seuraavaan osoitteeseen:

www.bkvibro.com

GR Προσοχή !

Προτού λειτουργήσετε την συσκευή, πρέπει να διαβάσετε και να καταλάβετε το εγχειρίδιο.

Εάν χρειάζεσθε εγχειρίδιο σε κάποια άλλη Ευρωπαϊκή γλώσσα, αποτανθείται στην εξής διεύθυνση :

www.bkvibro.com

HU Figyelem!

A termék üzembe helyezése előtt az üzemeltetési utasítást el kell olvasni, és meg kell érteni.

Szükség esetén hiányzó EU-nyelven az üzemeltetési utasítást, az alábbi címen lehet igényelni:

www.bkvibro.com

PL Uwaga!

Przed rozpoczęciem użytkowania urządzenia uprzejmie prosimy o uważne zapoznanie się z instrukcją obsługi.

Instrukcje obsługi dla naszych urządzeń dostępne są we wszystkich oficjalnych językach Unii Europejskiej. Brakujące egzemplarze można zamawiać pod wskazanym poniżej adresem:

www.bkvibro.com

CZ Pozor!

Před uvedením výrobku do provozu je nutné přečíst si návod k provozu a porozumět mu.

V případě potřeby si návod k provozu v chybějící řeči EU vyžádejte na následující adrese:

www.bkvibro.com

SK Upozornenie !

Pred uvedením zariadenia do prevádzky si treba dôkladne prečítať prevádzkový návod a treba jeho obsah správne pochopiť.

V prípade potreby si prevádzkový návod vyžiadajte v príslušnom jazyku EÚ na nasledovnej adrese:

www.bkvibro.com

SI Pozor!

Pred zagonom proizvoda morate najprej prebrati in razumeti navodilo za uporabo.

Po potrebi zahtevajte navodilo za uporabo v jeziku EU, ki vam manjka, na naslednjem naslovu:

www.bkvibro.com

LV Uzmanību!

Pirms produkta ekspluatācijas uzsākšanas, rūpīgi izlasiet lietošanas instrukciju.

Vajadzības gadījumā pieprasiet lietošanas instrukciju izstūkstošajā ES valodā pa šādu adresi:

www.bkvibro.com

LT Dėmesio!

Prieš pradedant naudoti produktą, atidžiai perskaitykite instrukciją.

Esant reikalui, reikalaukite instrukcijos trūkstama ES kalba tokiu adresu:

www.bkvibro.com

ET Tähelepanu!

Enne toote kasutuselevõttu tuleb kasutusjuhend läbi lugeda ja sellest aru saada.

Kui vajate kasutusjuhendit mõnes muus EL keeles, küsige seda järgmiselt aadressilt:

www.bkvibro.com

BG Внимание!

Преди въвеждане в експлоатация на продукта ръководството му трябва да бъде прочетено и разбрано.

При нужда от ръководство на липсващ EU език, Вие можете да го поръчате на следния адрес:

www.bkvibro.com

RO ATENȚIE!

Înainte de utilizarea produsului trebuie să citiți și să înțelegeți prezentul manual de operare.

La nevoie puteți comanda manualul de operare într-una din limbile recunoscute oficial în U.E. la următoarea adresă:

www.bkvibro.com

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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

The ASA-063 is mainly used indoor or outdoor for measurement of vibrations at rotating machines such as turbines, pumps, compressors, etc.

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 General

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 Delivery extend

- Sensor ASA-063
- Threaded stud M8 x 14
- Threaded stud M8 x 1/4" 28 UNF
- Snap ring
- Documentation



5 Dimensional drawing

5.1 ASA-063

ASA-063 one model of the ASA-06x series.

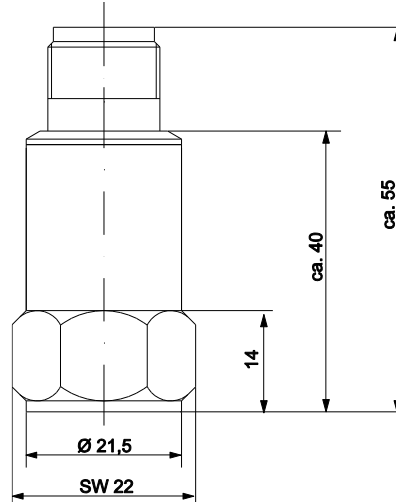


Figure 5-1) Dimensions

6 Range of application

All sensors of the ASA-06x series are certified for use in “potentially explosive surroundings” acc. to ATEX.

These sensors are also suitable for use in category 1 and/or 2 equipment for gases or category 2 equipment of types of dust (ATEX).

Sensor ASA-063 is mostly used for measuring the vibrating acceleration occurring in rotating machines, such as turbines, pumps, compressors etc.

The sensors may only be used acc. to the specifications made in the respective data sheet and only for the measurement of mechanical vibrations.

7 Connection

Connector (MIL C-5015) assignment: 5/8" – 24 UNEF 2A

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

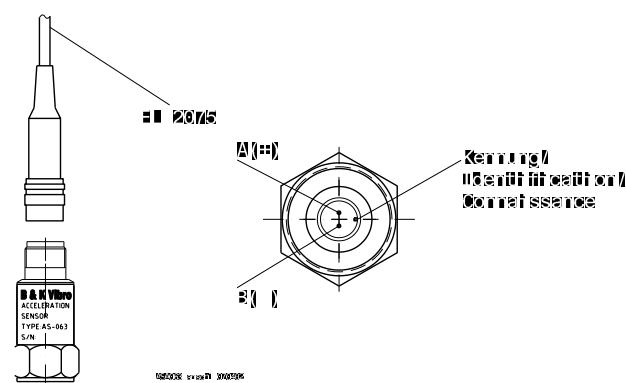


Figure7-1) Connector assignment ASA-063

Constant Power supply I _B	4 mA Min. 2 mA / Max. 10 mA, protected against reverse polarity
Maximum output voltage	+30 V

8 Connecting cable



The connection cable must be heat resistant with at least 130 °C!

- Cable EL2075-S-xxxx down to -40 °C (Accessory)
- Cable EL2157-S-xxxx down to -55 °C (Accessory)

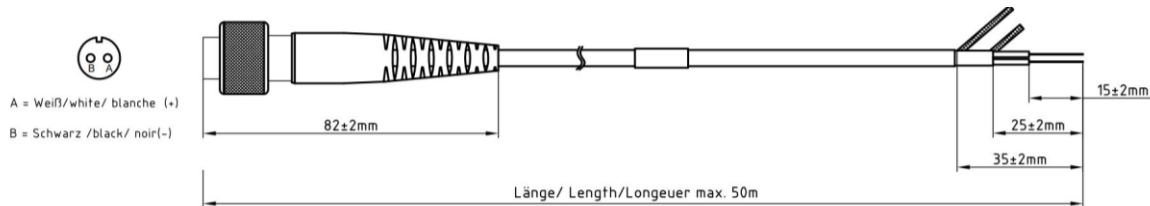


Figure 8-1) Connecting cable

Length	5 m, 10 m, 15 m, 20 m
Structure	2-wire, stranded + sheath + armoured
Sheath insulation	ETFE
Colour	outer sheath: blue
Outside diameter	4,5 mm (±0,3 mm)
Number of leads	2
Conductor cross-section	0,325 mm ² (22AWG)
Wire insulation	ETFE



9 How to mount the acceleration sensor

Prior to mounting, please check

1 Sensor

- with regard to completeness
 - complete number of components
 - no visible damages

2 Mounting accessories

- complete number available (if necessary)
 - set screw
 - screw fittings, clamps,
- all components are compatible
 - same thread at sensor and mounting bore at the measuring point

3 Line distance

- Line distance from sensor to terminal box
 - No damages at the line?

4 Tools

- Mounting
 - torque wrench
 - fork wrench
 - Screwdriver

9.1 Installation

9.1.1 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.

- Please mount the sensor with the enclosed set screw.

By using either:

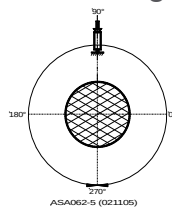
- set screw M8 x 14 or
- set screw M8 / 1/4" 28 UNF

Any fitting position is possible.

Operational hints

The connecting line is protected by a stainless steel tube, make sure that it is safely connected to the equipoten-tial bonding conductor. (volume resistance $\leq 1 \text{ M}\Omega$).

Measuring direction / fitting position



There are no limits to the measuring direction. The sensor can be used in all directions (360°).

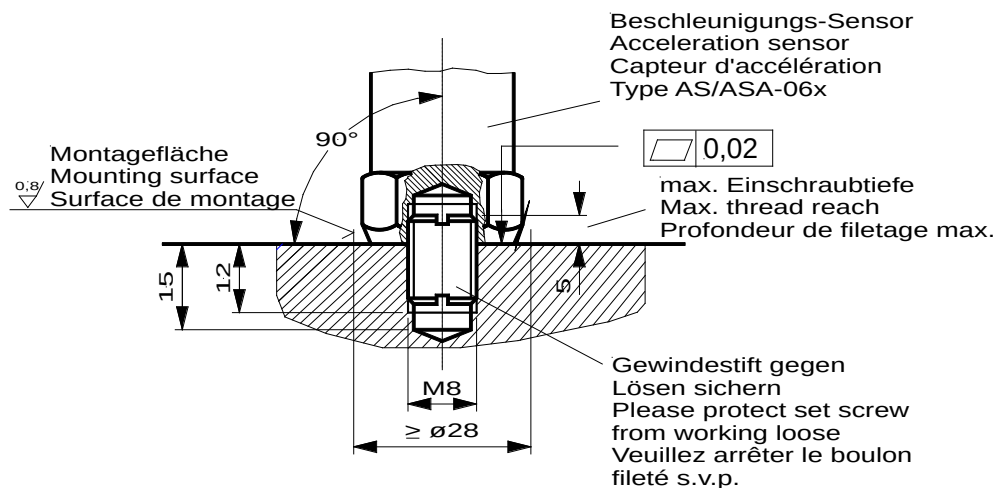


Figure9-1) Installation ASA-063

- Make sure that the mounting surface is flat and smooth
- Drill a 15 mm deep, M8 resp. 1/4" screw thread into the mounting surface
- Apply a thin layer of silicone grease onto the mounting surface, in order to reduce the contact resonance
- Screw in the set screw as shown in **Figure9-1** and secure it with e.g. LOCTITE 243 medium strength or LOCTITE 270 high-strength
- Screw the sensor onto the set screw. Please observe the maximum fastening torque of the set screw
- Make sure that the maximum thread reach for acceleration sensors is $\leq 5 \text{ mm}$
- The recommended fastening torque for the enclosed set screw is:
 - M8-1/4"-28UNF: 3.5 Nm
 - M8 x 14 6.5 Nm
- After attachment of the connecting cable at the sensor, the enclosed snap ring has to be pressed between union nut and plug housing of the cable (**Figure7-1**)



9.2 Hints for mounting and installation

A precondition for operational safety is "**correct**" installation. It protects the sensor against:

- mechanical damages (e.g. caused by pinching of the line)
- damages at the line caused by vibration (e.g. abrasion of insulation))
- electric interference (EMV)
- environmental influences (e.g. humidity, temperature).

When putting up electric systems in potentially explosive surroundings, not only the general installation instructions for electric systems have to be observed, but also standard IEC 60079-14 resp. the relevant country-specific regulations for explosion-protected systems.

The sensor is suitable for use in potentially explosive surroundings of categories 1 and 2. When a cable transition is made from explosion protection zone 0 to explosion protection zone 1 a lead-through element with protection class IP 67 must be inserted according EN 60529.

9.2.1 Lines and protective tubes

The sensor line as well as possible extension lines have to be protected both electrically and mechanically. Please take the local conditions into account when doing so.

The connecting line is protected by a stainless steel tube, make sure that it is safely connected to the equipoten-tial bonding conductor. (volume resistance $\leq 1 \text{ M}\Omega$).

Marking of lines

It is very important to mark the line from the point of measurement to the connection of the electronic super-vision system. It is indispensable for documentation, initiation and for the service departments and has to be done by the customer.

Customer's responsibility

The customer is solely responsible for the correct layout of the electric system under consideration of explosion protection regulations as well as for the correct initiation. The explosion protection- and safety regulations currently valid have to be observed resp. checked by an expert, if necessary. In case that the system is put up by a sub-contractor on behalf of the customer, it must not be put into service until the sub-contractor has proven that it has been installed correctly and in conformity with the valid regulations by means of an installation certificate.

10 Explosion protection

EC-design test certificate (www.bkvibro.com)

EC-design test certificate	PTB 07 ATEX 2008 Issue 3
Protection class acc. to EN 60529	IP 66/67
List of standards	EN IEC 60079-0: 2018, EN 60079-11: 2012
ATEX-Marking	 II 1 G Ex ia IIC T6...T1 Ga  II 2 G Ex ia IIC T6...T1 Gb  II 2 D Ex ia IIIC T85 °C ... T145 °C D
IECEx- Marking (IECEx PTB 12.0033)	Ex ia IIC T6...T1 Ga Ex ia IIC T6...T1 Gb Ex ia IIIC T85 °C ... T145 °C Db
Standards	IEC 60079-0 : 2017 IEC 60079-11:2011
EAC Ex	In compliance with TR-TS 012/2011 (TP-TS 012/2011) EAC Ex Certificate: RU-C-DE.AA87.B.00334



Category 1G	
Temperature class:	Maximum ambient temperatures:
T6	-55 °C... 50 °C
T5	-55 °C... 60 °C
T4	-55 °C... 90 °C
T3, T2, T1	-55 °C... 125 °C
Category 2G	
Temperature class:	Maximum ambient temperatures:
T6	-55 °C... 65 °C
T5	-55 °C... 80 °C
T4	-55 °C... 115 °C
T3, T2, T1	-55 °C... 125 °C
Category 2D	
Temperature class:	Maximum ambient temperatures:
T6	85 °C
T5	100 °C
T4	135 °C
T3, T2, T1	145 °C

Table 10-1) Temperature classes

10.1 Supply network

Acc. to type of protection, inherent safety Ex ia IIC or Ex ia IIIC to be connected to a certified, intrinsically safe circuit only

Maximum values:

U_i	=	28 V	I_i	=	95 mA	P_i	=	665 mW
C_i	=	ASA-063 + EL2..., see Table 10-2	L_i	=			=	negligibly small



HINT!

It is to be noted that the overall capacity increases by attaching the cable EL2.... The appropriate value is to be inferred from the following table.

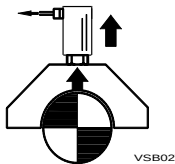
10.1.1 Supply

The sensor must be connected to SELV-supply with limited energy (max. current see intrinsic safety values).

ASA-063	Typ	Length [m]	C _{iges} [nF] (Sensor + Cable)
15 nF	EL2075-S-0050	5	17
	EL2157-S-0050		
	EL2075-S-0100	10	19
	EL2157-S-0100		
	EL2075-S-0150	15	21
	EL2157-S-0150		
	EL2075-S-0200	20	23
	EL2157-S-0200		
	EL2075-S-0250	25	25
	EL2157-S-0250		
	EL2075-S-0300	30	27
	EL2157-S-0300		
	EL2075-S-0350	35	29
	EL2157-S-0350		
	EL2075-S-0400	40	31
	EL2157-S-0400		
	EL2075-S-0450	45	33
	EL2157-S-0450		
	EL2075-S-0500	50	35
	EL2157-S-0500		

Table 10-2) Total capacities ASA-063 + EL2...

10.1.2 Polarity



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



11 Technical Data

Electrical

Sensitivity (at 80 Hz / 23±3 °C)

100 mV/g

±5 %

10,2 mV/m/s²

±5 %

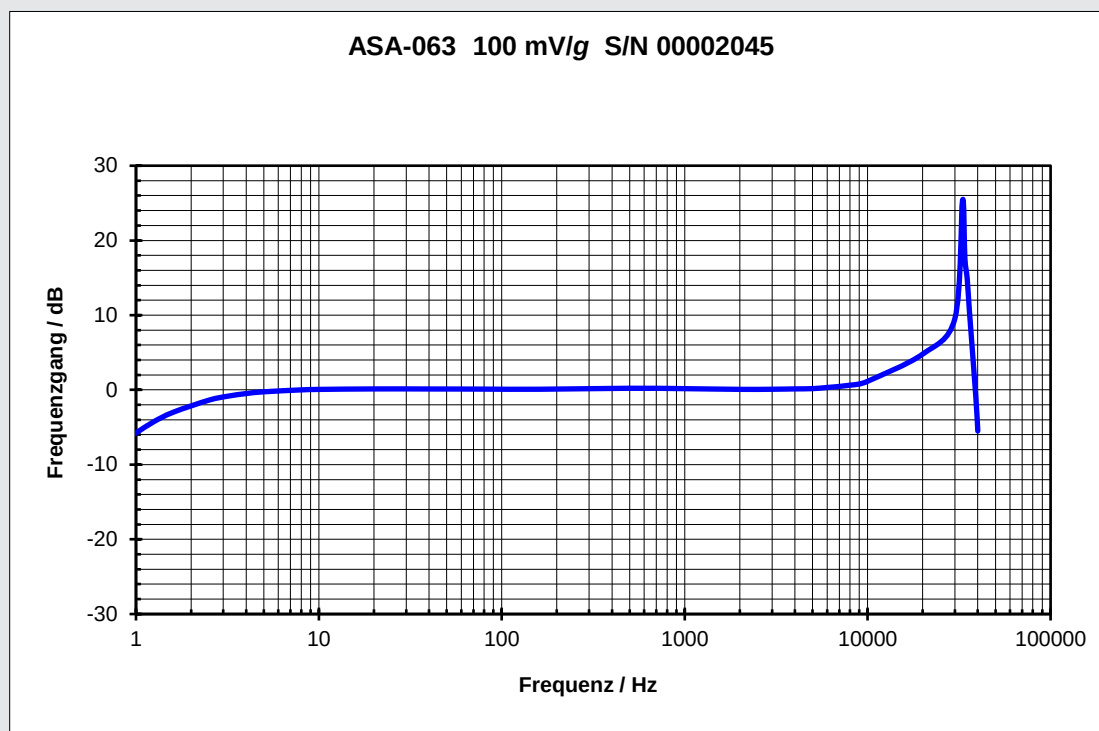


Figure 11-1) Typical frequency response of sensitivity

Accuracy of Sensitivity	4 Hz ... 10 kHz : ±5 %
	1,5 Hz / 13 kHz : ±3 dB
Temperature response	-50°C ... +120 °C : ±5 %
Transverse sensitivity (80 Hz)	≤ 8 ... 10 %
Resonance frequency	35 kHz ± 3 kHz
Measuring range	± 80 g (U _{max} = +24 V...+30 V): ±7%
	± 40 g (U _{max} = +20 V): ±7%
	± 20 g (U _{max} = +18 V): ±7%
Dynamic internal resistance of output	≤ 300 Ω ((Operating frequency range) approx. 2 kΩ (Resonance frequency) (Level control 1 V _{eff} I _B = 4 mA)
Open-circ. pot. (-50 °C ... +125 °C)	+12,5 V ±1,5 V
Strain sensitivity	< 0,002 g/ (μm/m)
Insulation resistance (Housing - Pin A/B)	≥ 20 MΩ
Weight	approx. 130 g (without cable)
Housing material	Stainless steel 1.4301
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)
Humidity	99,99 %
Pollution degree	3
Max. altitude	2000 m

11.1 EMC

- 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.

12 Maintenance and repair

All sensors of the ASA-06x series are maintenance-free.



IMPORTANT REPAIR INSTRUCTION:

Never open a defective sensor! It has to be replaced in case of damage. Should a defect occur at the power supply lead, the sensor has to be replaced immediately.

12.1 Error detection / rapid test

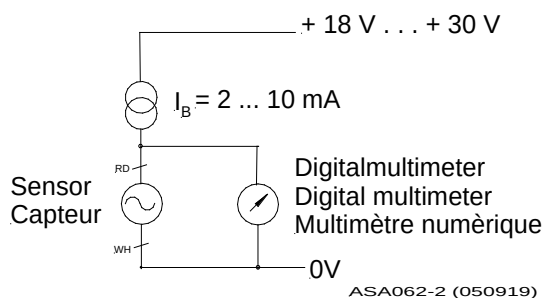
In order to detect errors, please check the rest potential. The rest potential can be checked outside the ex-sector with the help of a standard digital multimeter. The measuring function can only be checked with the help of a suitable vibration testing machine.

12.1.1 Error chart

Type of malfunction	Possible cause	Verification in both cases
No measuring signal	Defective sensor	Rest potential $\neq -12,5 \text{ V} \pm 1,5 \text{ V}$
	Cable defectively	conductance of the cable cores $R_{\text{conductor}} = 0 \text{ Ohm}$

Table 12-1) Error chart

12.1.2 Set-up of measuring instruments





NOTE!



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.

13 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

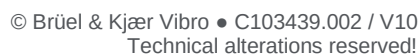
14 CE-Declaration

**Brüel & Kjær Vibro****EU-Konformitätserklärung / EU- Declaration of conformity**Hiermit bescheinigt das Unternehmen / *The company*

Brüel & Kjær Vibro GmbH
Leydheckerstraße 10
D-64293 Darmstadt

die Konformität des Produkts / *herewith declares conformity of the product***Beschleunigungs-Sensor / Acceleration Sensor**Typ / *Type***ASA-062, ASA-063, ASA-064, ASA-068, ASA-069, ASA-066**mit folgenden einschlägigen Bestimmungen / *with applicable regulations below*
EU-Richtlinie / *EU-directive***2014/30/EU EMV-Richtlinie / EMC-Directive****2014/34/EU ATEX-Richtlinie / ATEX-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 60079-0:2018; EN 60079-11:2012****EN IEC 63000:2018**EG-Baumusterprüfung / *EC-Type-Examination Certificate***PTB 07 ATEX 2008 Ausgabe 3 / Issue 3**Bereich / *Division***Brüel & Kjær Vibro GmbH**Unterschrift / *Signature***CE-Beauftragter / CE-Coordinator**Ort/Place **Darmstadt**
Datum / *Date* **30.04.2021**
(Niels Karg)

UNRESTRICTED DOCUMENT



Contact

Brüel und Kjær Vibro GmbH

Leydheckerstrasse 10
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