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Operating manual

Stationary sensor box S-SB10

For continuous monitoring of processes

Original

Revision: 1.0 │ 2024-01-02

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Contents

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1 Notes on this document

1.1 General

Usage

This document constitutes an integral part of the product and contains important advice on safe operation as well as all information on intended and efficient use. Any person using the product needs to have read and understood this document.

Accessibility

The staff working with this product has to have constant access to this document to prevent handling errors and guarantee trouble-free operation.

Up-to-dateness

Every effort has been made to ensure that the information contained in this document is complete and correct at the time of release. This document describes all units and functions known of at the current point of time.

1.2 Representations in this document

Illustrations

Illustrations used in this document do not always contain all details or special cases. They only represent the relevant information.

Hints

Hints are marked as follows:

> ⓘ Hints describe specific information or particular features that might not be evident, even for experienced users. Neglecting a hint poses no direct safety risk. However, it can lead to workflow disruptions.

General icons

The following icons are used for visual emphasis:

Icon	Function
↗	Indicates a hyperlink.

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1.3 Identification of the warning notices

Classes of danger, signal words and colors

This document contains warnings regarding hazards of different classifications. These classes are characterized by signal words and colors. They include the following:

⚠ WARNING

Warns of possible immediate danger, which, if ignored, may lead to serious lasting damage to health and/or property.

⚠ CAUTION

Warns of dangers, which, if ignored, may lead to damage to property – including financial losses due to operational interruptions.

2 Safety instructions

This section contains safety information relating to the protection of persons as well as safe and fault-free operation. All user groups of the product need to know and comply with these safety instructions.

2.1 Introduction

Reliable and safe operation of the device depends on the careful handling and execution of operational and setting tasks.

Ignoring these safety instructions and warning information may lead to serious injury with lasting health consequences for personnel as well as damage or destruction of device components.

During handling of the device, please observe all safety instructions and warning information in all parts of this user documentation as well as the related codes of practice. Ensure that all those working with the device are also aware of these instructions.

2.2 Basic hazards

Definition

Basic hazards are residual risks that remain even with safety-conscious intended use of the product.

State of the art

The device meets the current state of the art and applicable safety rules. All components of the device are tested thoroughly before they leave the factory and are delivered in a condition for safe operation.

> **⚠ WARNING**
>
> **Danger of injury!**
>
> **Improper use of the device may lead to injuries.**
>
> →Do not open the device.
>
> →Protect the device against extreme heat (excessive sunlight, immediate vicinity of open fire or heating devices) during operation and when storing.
>
> →Avoid sharp impacts that could damage the device and/or its components.

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2.3 Personnel and qualifications

Basic requirements

The device must only be used by operators that have completely read and understood the safety instructions and all documents of the user documentation.

Responsibility of the operating company

Regarding the personnel authorized and/or trained by the operating company, the operating company carries the following responsibilities:

- The necessary training and instruction of personnel must be guaranteed.
- All personnel's competences and responsibilities must be clearly stated and documented.
- All user information on the device (operating manual, user documentation etc.) must be kept in the immediate vicinity of the product and must be accessible at all times.

Requirements for airborne and structure-borne sound testing

Operators of the device must have thorough expertise, skills and experience to avoid errors that may lead to unforeseeable consequences.

Airborne and structure-borne sound testing may only be carried out when the following (minimum) conditions are met:

- Selection of appropriate equipment,
- Complete and proper configuration of parameters via the digital configuration interface (RS485 interface)
- Selection of appropriate test method,
- Correct interpretation of mapped test values
- Consistent conclusion on the state of the system.

2.4 Use of the device

Measures for protection of personal safety

Improper use of the device may lead to injuries.

- If you have a pacemaker keep a minimal safety distance of 15 cm from the device at all times.
- Wear protective gloves during coupling to avoid skin irritations and crushing injuries.

Measures for protection of the device and/or equipment

Improper use of the device may lead to damage of the device. Damaged components may affect or distort the measurement result quality.

- During use and storage, protect the device against extreme, unusual heat (excessive sunlight, storage in heated cars or immediate vicinity of open fire or heating devices). It is critical to stay within the temperature ranges given in the technical specification.
- Do not use the device and its accessories if they display functional errors and/or visible damage.
- Only connect the device to approved equipment received from SONOTEC GmbH or its sales partners.
- The device adheres to the protection class given in the technical specification and is not protected against water. Do not submerge the device in liquids. Protect the device against moisture penetration.
- Do not use the device within strong electromagnetic fields.

2.5 Modifications and alterations

No modifications on the device and/or accessories

The device and/or its accessories must not be opened or disassembled. The device does not contain any components to be cleaned, maintained or repaired by operators.

Unauthorized modifications of the device and/or its accessories are prohibited and lead to exclusion of liability by the manufacturer for resulting damage and consequences.

Spare parts and accessories

Spare parts and accessories must comply with the technical requirements specified by SONOTEC GmbH and its suppliers. Whenever original parts are used, compliance is given.

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3 Description of the device

This section describes use, connectors and operating elements of the device.

3.1 Intended use

The 'Stationary sensor box S-SB10' and its associated probes can be used for permanent monitoring of machine and plant processes, as long as these generate a detectable ultrasonic level. Variance of the sound signals indicates a change in the condition and/or process of the test object.

- Broadband signal acquisition from 150 Hz to 100 kHz
- Automatic or manual input amplification, bandpass filter, alarm threshold, averaging

Permanent installation at a test site allows trend monitoring over time. Based on changes of the sound level, statements regarding the system condition may be made. Different probes are available for differing airborne and structure-borne applications. The described variant offers one current output and one RS485 interface.

The associated 'S-SB10 software' allows for configuring multiple parameters for signal acquisition, processing and output. All parameter settings may be stored either temporarily or permanently in the 'Stationary sensor box S-SB10'.

> ⓘ Please mind the additional information in the 'S-SB10 software' user documentation.

Prohibited use

Any use not approved by the manufacturer is prohibited and may lead to personal injury and/or damage to property.

SONOTEC GmbH accepts no liability for damage caused by unauthorized use of the device.

In particular, unauthorized use includes:

- Use of equipment and/or accessories with visible damage
- Use in wet rooms
- Use in potentially explosive environments
- Use in environmental conditions that do not adhere to the stipulated requirements
- Unauthorized modifications of the equipment, the software and/or accessories
- Use of unauthorized spare parts and/or unauthorized accessories

3.2 Process description of the device

The device is used for acquisition and processing of ultrasonic signals. A sound level (RMS) equivalent to the sound signal is calculated and will be provided via either the current interface or the digital RS485 interface for subsequent evaluation or control processes.

S-SB10 supports trending analyses for detection of long-term changes within the system to be tested.

By using the alarm module, appropriate threshold values may be defined. These will be used for triggering an action (in terms of control tasks).
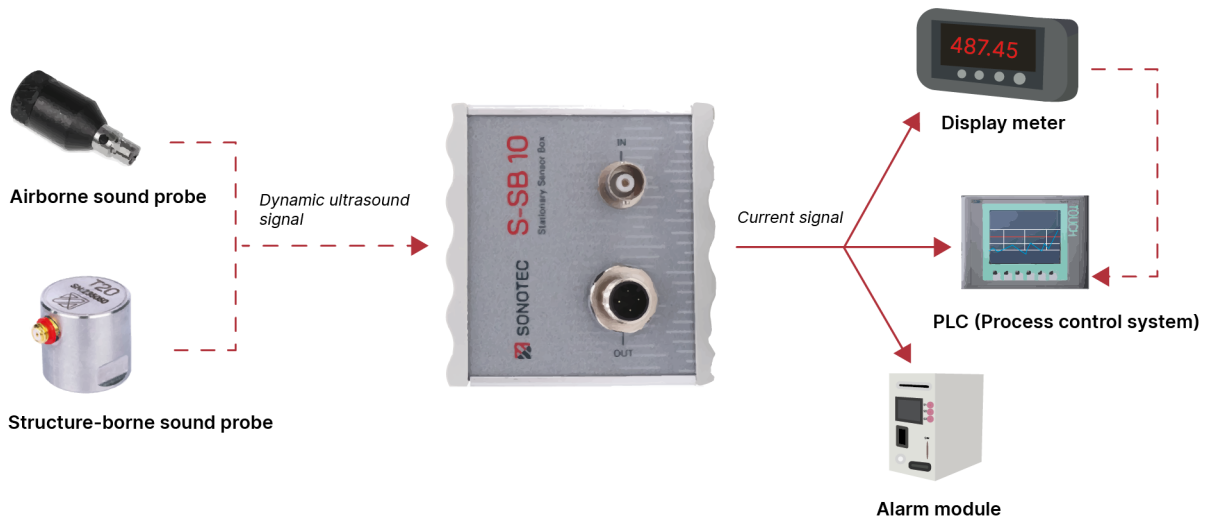

Figure 1: Signal flow

3.3 Device labeling
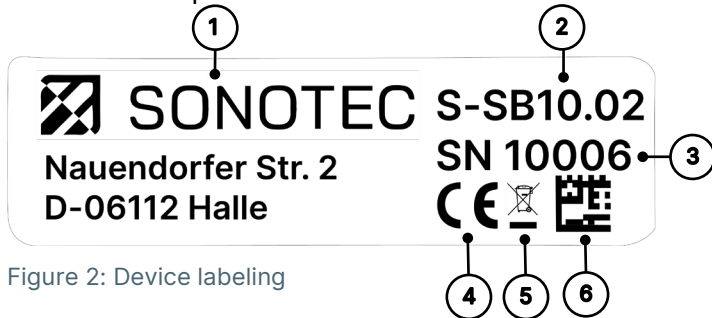
All labels are placed on the device's backside.

Figure 2: Device labeling

No.	Label
1	Manufacturer's address
2	Model ID
3	Serial number
4	CE marking
5	Disposal information
6	QR code (serial number)

3.4 Connectors, interfaces, device elements

Device structure
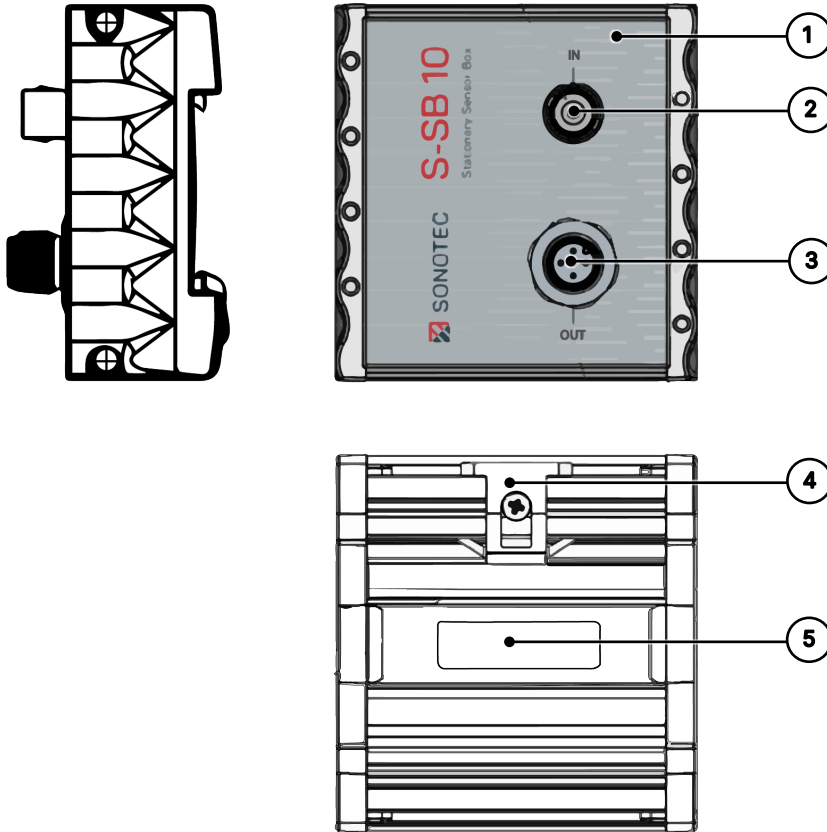
Figure 3: Structure of the S-SB10 sensor box

Description

No.	Connector/interface/device element
1	Stationary sensor box S-SB10 with housing
2	Probe connector
3	Sensor cable plug connector
4	Mounting bracket for support rail
5	Identification label

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Accessories structure
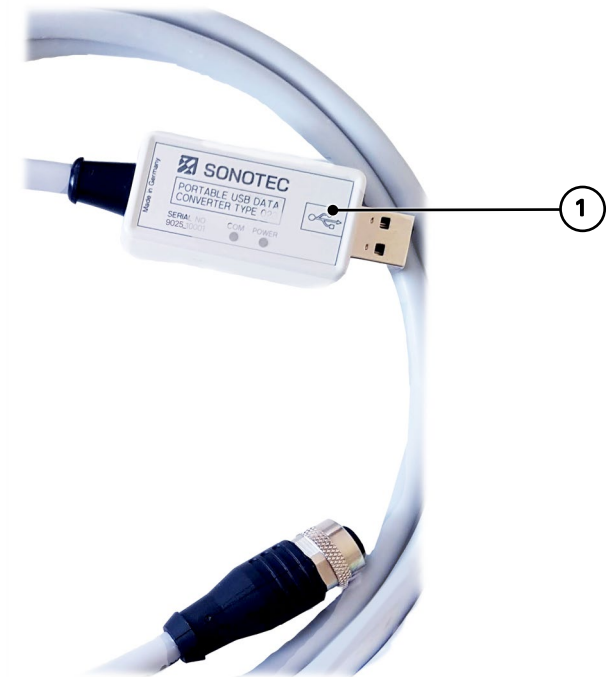
Figure 4: USB data converter
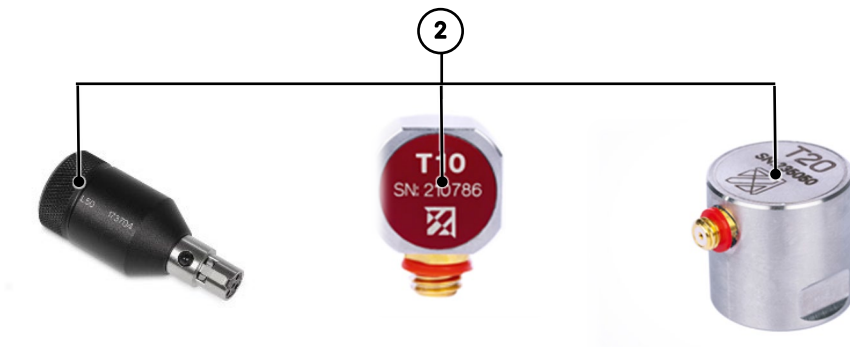
Figure 5: Different kinds of probes

Description

No.	Accessory
1	Portable USB data converter type 025
2	Probes (optional)

�घ Please mind the additional information in the device's technical data sheet.

4 Transport and mounting

4.1 Transporting the device

To protect the Stationary sensor box S-SB10 against transport damage, it will be delivered in protective packaging.

4.2 Mounting the device

The 'Stationary sensor box S-SB10' is intended for mounting on support rails.

> ⊙ Please mind the additional information in the device's technical data sheet.

For mounting/fastening the device, please proceed as follows:

1. Position the upper part of the base profile (1) on the support rail.
2. Push the lower part of the device towards the support rail until the mounting bracket (2) audibly snaps in.
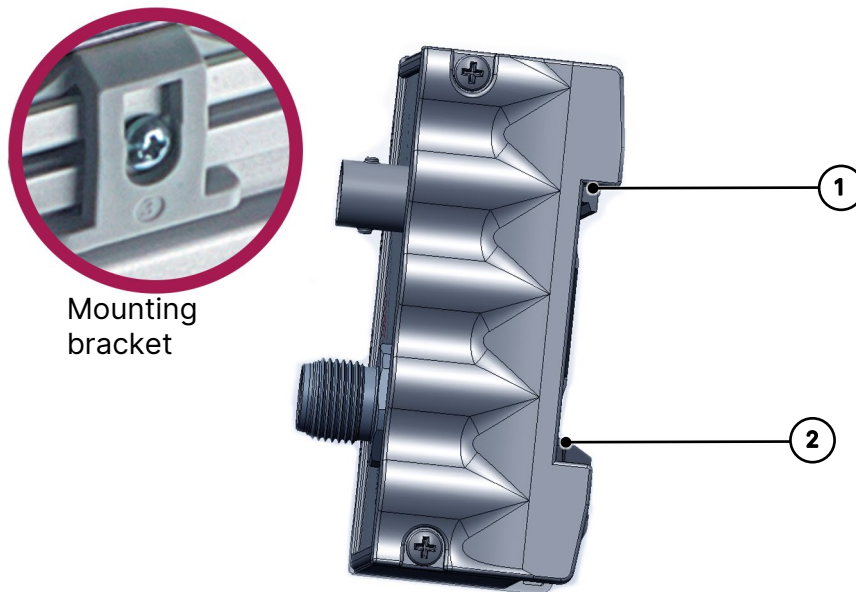
Mounting bracket

Figure 6: Device mounting

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5 Device start-up

5.1 Installing the connections

⚠ WARNING

Contact with live parts!

Live parts of the device may lead to property damage and personal injury (e. g. muscle cramps and secondary accidents) even at low currents.

→ Always check the insulation for damage before starting up the device.

→ Only use cables that adhere to the stipulated installation instructions regarding voltage, current, insulation material, load capacity etc.

⚠ CAUTION

Damage to property!

Possible damage of sensor cable and USB port!

→ Always check cables and lines for damage before installation.

→ When connecting the probes, please mind the proper plugging positions. (see Figure 7: Sensor cable engagement)

Installation at probe input (IN)

The socket for the probe's sensor cable has a notch that indicates the proper plugging position.

1. Always install the sensor cable in the prescribed position.
    → The plug has to perceptibly engage (see red marking in Figure 7: Sensor cable engagement)

Figure 7: Sensor cable engagement

For disconnecting the probe plug, please proceed as follows:
1. Press and turn the plug until the pin disengages.
2. Carefully pull the sensor cable in a straight direction to remove it from the socket.

Installation at current output (OUT)

1. Connect the USB data converter (type 025) to a personal computer and the device.

> ⊙ Please mind the additional information in the 'USB data converters type 025' user documentation.

Software installation

⬀ The link for downloading the 'S-SB10 software' will be sent by email for download from the Sonotec Cloud server https://cloud.sonotec.de/login. To enable the personal computer's interaction with the device, the SONOTEC driver will be provided directly with the device.

1. Install the SONOTEC driver.
2. Start the 'S-SB10 software' on the computer.

> ⊙ For configuration, please refer to the 'S-SB10 software' manual.

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5.2 Coupling the probes

The probes may be used for condition monitoring of machines, plants and processes which generate detectable structure-borne / airborne sound in the ultrasonic range. Depending on the purpose, connect the respective probe to the device.
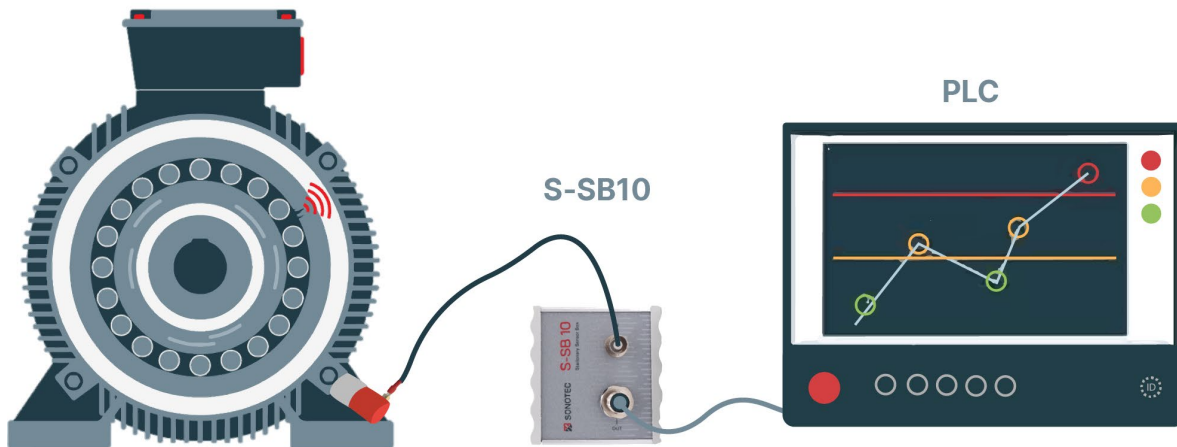
Coupling a probe with a machine

Figure 8: Coupling a structure-borne sound probe with a machine

> ⓘ Please mind the different coupling methods of the probes.

⎘ Our website https://www.sonotec.eu/en/products/preventive-maintenance/ provides information on the different devices. Contact our Service staff.

Coupling the structure-borne sound probes 'T10' and 'T20'

> ⓘ For further information, please refer to the user documentation of the 'T10' and 'T20' structure-borne sound probes.

Coupling the airborne sound probe 'L50'

When measuring ultrasound in air, the ambient air is used as couplant medium between test body and transmitter resp. reciever. This means, there is no direct contact with the test site.

> ⓘ Please mind that using the 'L50' airborne sound probe additionally requires the adapter cable for connection with the device.

6 Cleaning and maintenance

Guidelines

Do not open the device! The device does not contain any parts that may be serviced or repaired by the user.

Initial operation and recurring inspections

Each device will be thoroughly tested before leaving the manufacturer's site and will be delivered in safe operating condition. However, device damage caused by transport or longer running times can never be completely ruled out.

Always decommission the device immediately if:

- the housing shows visible damage,
- the plug connector is lose or defective,
- other malfunctions occur that indicate that the device might not be fully functional.

Check the following items regularly to guarantee device safety:

- Visual inspection of the device (labeling, scratches, defective cables etc.)
- Inspection of lose components within the device (burr, screws, nuts etc.)
- Inspection of sound coupling and serial interface

> ⚠ For maintaining the devices high-quality condition, SONOTEC GmbH recommends to send the device to the manufacturer for calibration at least once every 2 years.

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7 Troubleshooting

> ⊙ Please mind the section 'Error messages' in the user documentation of the 'S-SB10 software'.

If you encounter errors not included in the software user documentation, please contact our Service staff.

In case of inquiries, please keep the following information at hand:

- Model ID and serial number of the device and the sensor system (see device labeling)
- Version of the 'S-SB10 software'
- Email received with Cloud login information

The following information might also be helpful:

- Date of purchase and name of dealer
- Applications in use when the error occurred

8 Disposal

8.1 Recycling and taking back of used equipment

Waste electrical and electronic equipment may pose health and safety risks if disposed of incorrectly. This is why according to the Directive 2012/19/EU (Waste Electrical and Electronic Equipment Directive, WEEE), they must not be disposed of as general domestic waste but have to be submitted at designated collection points or sent back to the manufacturer.

The following symbol indicates the legally prescribed duty to dispose of electronic waste as separate disposal.

The device and its accessories must undergo the prescribed recycling processes (e. g. of the circuit boards) to ensure safe and environmentally friendly reuse or separate disposal of individual device components.

The return of waste devices is regulated differently in different places. Find out from your local council about the return conditions for commercially used electronic devices.

The device does not contain any substances hazardous to health that have to be indicated separately for disposal like mercury (Hg), cadmium (Cd), lead (Pb) or hexavalent chromium (e. g. in galvanized parts or circuit boards).

Specific guidelines may apply to accessories like probes. Always mind the instructions in the relevant user documentation.

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9 Warranty

Condition at delivery

All products and accessories have been tested thoroughly before they leave the factory, are state-of-the-art products at the time of delivery and adhere to all applicable safety regulations.

Warranty

During the warranty period, SONOTEC GmbH will eliminate all deficiencies caused by material or manufacturing faults free of charge. SONOTEC GmbH will at its own discretion offer warranty by reparation or replacement of faulty products.

Exceptions

Defects resulting from improper use, wear or manipulation of the product are exempt from warranty. The warranty also does not cover those faults that affect value or usability of the product to a negligible amount.

Responsibility of the user/operator

Users/operators must ensure that the product is properly installed and set up and used safely.

Operating errors

Operating errors may never be completely ruled out by the manufacturer. SONOTEC GmbH is in no way liable for any direct or indirect damage caused by operating errors (e.g. damage on software and/or hardware, damage by downtime, damage by malfunction as well as damage or loss of measurement and test data).

Quality of captured data

The determination of valid test results, their interpretation and the actions derived therefrom are exclusively subject to the personal responsibility of the users. SONOTEC GmbH does not guarantee the correctness of determined test values and/or test results. SONOTEC GmbH does not assume liability for any faults or damages that might occur due to further use of determined test and measurement values.

10 Manufacturer information

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Certification and registration

- Quality management according to ISO 9001:2015
  (license registration number: 091006014)
- Registration according to Electrical and Electronic Equipment Act (ElektroG) at "stiftung ear":
  WEEE Reg. No. DE 22125904

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