SONOTEC

SONAPHONE

Ultrasonic Testing Device for Preventive Maintenance

User Documentation:
Airborne Sound Sensor BS10

Revision: 1.0; Date: 2017-11-06
Subject to technical modifications

Content

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1 Information on this document

1.1 General

This document forms part of the airborne sound sensor BS10 and should therefore be stored in its immediate vicinity where it can be accessed by all operators at any time. It contains all the instructions to ensure safe operation of the airborne sound sensor with the SONAPHONE, as well as all the information needed to ensure proper and efficient use. It must therefore be read prior to first use and before carrying out any further steps.

⚠ WARNING The airborne sound sensor BS10 must only be operated by users who have read (in full) and understood the safety information in the corresponding document and the provided user documentation.

This document has been created with all due care. SONOTEC does not assume any guarantee of the completeness, correctness and current validity of the provided data, and is not liable for errors or omissions.

Please note that the user documentation for the SONAPHONE is made up of different sections due to the device's modular construction. The scope of supply will vary depending on the device and accessory options that have been ordered.

1.2 Symbols used

Hazards or special information are indicated in the following ways:

⚠ WARNING	Warns of possible **imminent dangers** which, if ignored, may lead to **lasting adverse health effects and/or serious material damage**.
⚠ CAUTION	Warns of dangers which, if ignored, may lead to **injury and/or material damage** - including financial losses due to operational interruptions.
ATTENTION	Warns of dangers which, if ignored, may lead to **material damage** - including financial losses due to operational interruptions.

Note

This section provides information or draws attention to specific features.

2 Description of the airborne sound sensor BS10

2.1 Applications and designated use

The airborne sound sensor with accessories for different testing work has been specially designed for the following tasks:

- Detection and evaluation of leaks in compressed air, gas and vacuum systems (depending on the app)
- Tightness Testing of windows, doors, vehicles or containers (in combination with the SONAPHONE T ultrasonic transmitter)
- Detection of electrical partial discharges and insulation damage

2.2 Functioning

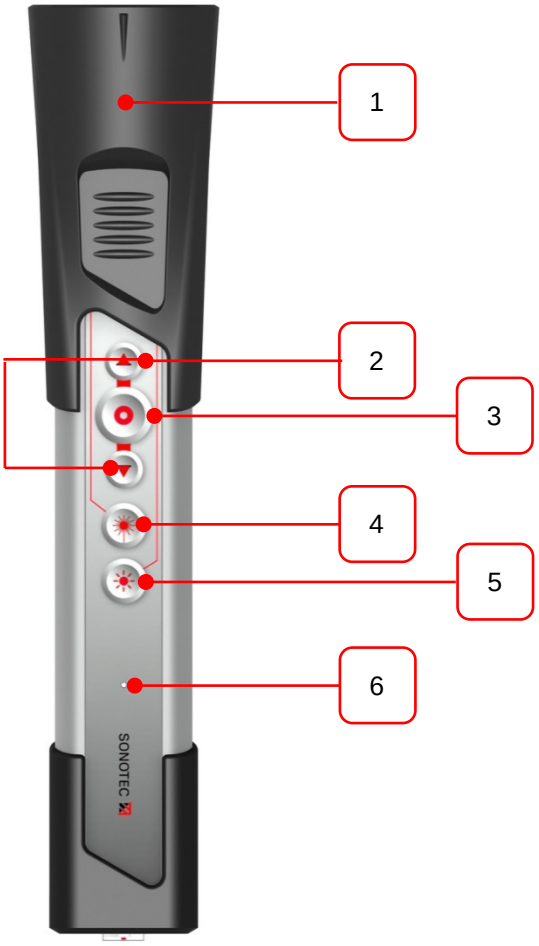
The sensor attachments guide the ultrasound to the ultrasonic microphone.

The ultrasonic microphone inside the sensor converts sound pressure fluctuations in the air to an electrical signal over a wide frequency range. This electrical signal is amplified and digitalized within the sensor. Further data processing and output takes place in the testing device.

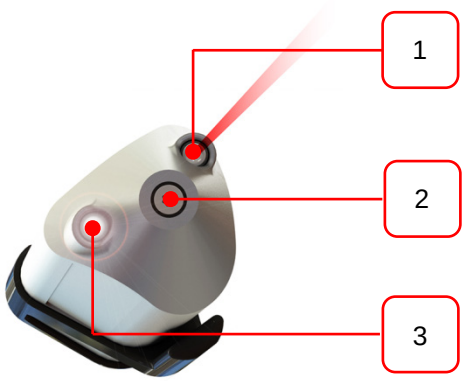
The target laser helps with the precise location of damaged areas:
If the sensor points towards the damaged area during the search, the precise location can be detected by means of acoustic signals, by pivoting the sensor and searching for a local maximum sound level. The target laser marks the approximate position of the damaged area.

The LED light serves as a torch, making it easier to search for damaged areas in poorly lit environments.

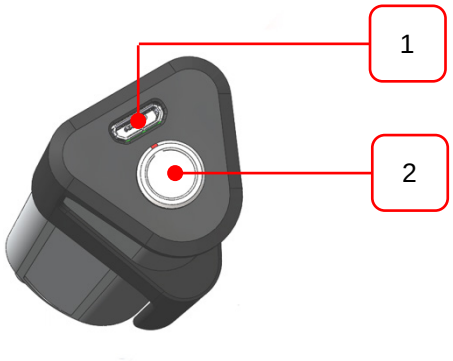
2.3 Connections, operating and display elements



No.	Operating and display elements
1	Sensor accessory: Small acoustic horn (standard)
2	Adjusting the volume
3	Starting/stopping the measurement recording
4	Target laser on (press and hold)
5	LED light (torch) on/off
6	Status LED



No.	Sensor elements
1	Target laser (do not look into the beam! Laser class 2)
2	Ultrasonic microphone
3	LED light (torch)



No.	Connections
1	USB connection (for service work only)
2	Socket for sensor cable with marked plug-in position

2.4 Airborne sound sensor BS10 accessories

The intensity and behavior of ultrasonic signals depend on factors such as the process during which they are generated. Options for verifying and recording the signals and for providing these to the user in high-quality format so that sensible statements can be made with regard to system conditions are also dependent upon a number of different factors.

In order to guide signals to the ultrasonic microphone on the airborne sound sensor BS10 in a high-quality format, a number of different attachments are available for different testing tasks. In order to ensure optimal results, please observe the fields of application for the accessories as well as the corresponding instructions.

Small acoustic horn BS10-2

Attachment for airborne sound sensor BS10 (standard)

The channeling and directing of the ultrasonic signals via the small, funnel-shaped horn BS10-2 improves the signal strength at the ultrasonic microphone. This allows for the verification of damaged areas at medium distances. Using the target laser allows the area to be narrowed down for subsequent precise location.

Note: Use the precise locator BS10-1 for extremely accurate verification.

Large acoustic horn BS10-3 (optional)

Attachment for airborne sound sensor BS10

Application:

Location of damaged areas at large distances

If the systems and system components being tested are large distances apart, the large acoustic horn should be used to narrow down the search area. The funnel pools the ultrasonic signals over large distances, allowing for verification with the SONAPHONE. Areas where ultrasonic signals can be verified in this way can then undergo precise location using the precise locator BS10-1.

Note: Continue with precise location using the small acoustic horn BS10-2 or use the precise locator BS10-1 to accurately locate damaged areas.

Precise locator BS10-1 (optional)

Attachment for airborne sound sensor BS10

Application:

Precise location of damaged areas
at close range

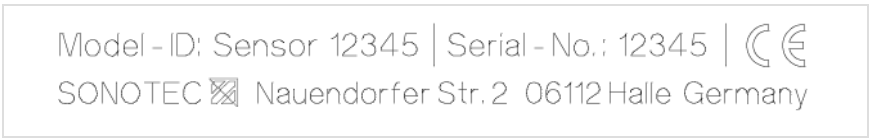
The precise locator BS10-1 is used in close range applications for the accurate verification of ultrasonic signals. The attachment consists of two parts that are connected and can be rotated, meaning that the tip can be rotated towards the damaged area being located.

Note: Mark the damaged area with a leak tag.

2.5 Device identification/type label

Laser class identification:

The type label is located on the back of the device, and should be to hand in the event of a service call. As well as the sensor designation, the following information can also be found on the housing:



3 Operation of the airborne sound sensor

⚠ WARNING

Risk of injury to eyes

The target laser (laser class 2) can cause serious eye damage. Never look into the laser beam. Never direct the laser at other people or vehicles. Please note that reflected laser light can cause eye injuries in the event of prolonged use.

3.1 Connecting the sensor and attaching accessory parts

ATTENTION

Risk of damage to the connectors

Take note of the red dots indicating the plug-in position on the plug and socket.

⇨ Connect the sensor to the SONAPHONE in accordance with the red dots, making sure to use the designated cable.

↳ The sensor is powered via the cable, and the test data is transferred to the SONAPHONE automatically.

↳ The sensor is ready for operation when the operating display LED lights up green.

The sensor accessory parts are simply attached onto the sensor shaft for assembly, and removed for disassembly.

Note

Make sure that the accessory parts are securely positioned on the sensor shaft. The ultrasound is guided to the microphone by the attachments. Misaligned sensor attachments may have an impact on the signals.

The directional characteristics of the target laser may also be affected.

3.2 Operation via the buttons on the sensor

Measurements can be controlled via the touchscreen on the device or via the buttons on the sensor itself.

The acoustic playback volume can be adjusted using the function buttons. Testing can also be started and stopped. The integrated target laser and the LED light (torch) also help with the precise location of damaged areas.

3.3 Cleaning and maintenance

The sensor is maintenance-free. It can be cleaned externally using a damp cloth and a mild, non-abrasive cleaning agent.

4 Disposal

Electrical and electronic equipment can pose serious health and environmental risks if it is not properly disposed of. For this reason it must not be disposed of in domestic waste according to WEEE directive 2012/19/EU (Waste Electrical and Electronic Equipment Directive) but separately at designated collection points or has to be sent back to the manufacturer.

The following symbol on the device refers to the legal obligation in Germany to arrange a separate disposal for electronic equipment.

It has to be handled according to specific processes (e.g. concerning the batteries or circuit boards) to ensure a safe, environmentally-friendly recycling or the separate disposal of different device components.

The taking back of used equipment is regulated differently in the various countries and regions. Consult the local authorities and other competent public authorities to inform yourself about the taking back conditions of commercially used electrical equipment. The device and also the battery do not contain harmful substances that have to be labelled separately regarding the disposal as mercury (Hg), cadmium (Cd), lead (Pb) or hexavalent chromium (e.g. in galvanized parts or circuit boards).

5 Warranty

The SONAPHONE ultrasonic testing device and its corresponding sensors comply with the current state of the art and the safety regulations. All devices and accessory parts are factory tested and are delivered in a safe condition for operation. We reserve the right to make modifications to the device as part of ongoing product development, and to make changes to the shape and color.

Within the warranty period, SONOTEC Ultraschallsensorik Halle GmbH will rectify, free of charge, all defects caused by material or manufacturing errors. At its own discretion, SONOTEC Ultraschallsensorik Halle GmbH will provide a guarantee in the form of either a repair or the replacement of the defective device or component. The warranty does not cover the internal batteries or damage caused by improper use, wear or interventions in the device or sensors. The warranty also does not cover any defects that have only a negligible impact on the value or usability of the device.

The recording of valid test results, the interpretation of these results and any measures that are derived as a result are exclusively the responsibility of the user. SONOTEC does not assume any guarantee for the correctness of the recorded test values or test results. SONOTEC accepts no liability for any errors or damages that arise as a result of the further use of the recorded test and measurement values.

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