AQUAPHON®
A 200 Receiver

Operating instructions
**A 200 receiver**

Fig. 1: Front

- Connectors
- LED
- Light sensor
- Touch screen

Fig. 2: View from above

- Charging socket
- USB port
- Microphone socket
- ON/OFF key
- Activation keys
**TS 200 carrying rod**

![Diagram of TS 200 carrying rod]

- Charging socket
- Handle
- Pipe
- Adapter
- Sensor area
- Light key
- LED
- ON/OFF key

**Fig. 3:** Full view

**Fig. 4:** Handle (view from above)

**Fig. 5:** Adapter with fastening screw
left: star-knob screw, right: screw with Allen head
Information about this document

The warnings and notes in the document mean the following:

---

⚠️ WARNING!
Risk of personal injury. Can result in serious injury or death.

---

⚠️ CAUTION!
Risk of damage to property.

---

Note:
Tips and important information.

---

Enumerated lists (numbers, letters) are used for:
- Instructions that must be followed in a specific sequence

Bullet lists (bullet points, dashes) are used for:
- Lists
- Instructions comprising only one action

Numbers enclosed by forward slashes /.../ refer to referenced documents.
<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1 Introduction</strong></td>
<td>1</td>
</tr>
<tr>
<td>1.1 Warranty</td>
<td>1</td>
</tr>
<tr>
<td>1.2 Purpose</td>
<td>2</td>
</tr>
<tr>
<td>1.3 Intended use</td>
<td>2</td>
</tr>
<tr>
<td>1.4 General safety information</td>
<td>3</td>
</tr>
<tr>
<td><strong>2 AQUAPHON system</strong></td>
<td>4</td>
</tr>
<tr>
<td>2.1 General information about the system</td>
<td>4</td>
</tr>
<tr>
<td>2.1.1 Communication</td>
<td>4</td>
</tr>
<tr>
<td>2.1.2 Hearing protection</td>
<td>4</td>
</tr>
<tr>
<td>2.1.3 Operating concept</td>
<td>4</td>
</tr>
<tr>
<td>2.1.3.1 Switch-on mode</td>
<td>5</td>
</tr>
<tr>
<td>2.1.3.2 Applications</td>
<td>6</td>
</tr>
<tr>
<td>2.1.3.3 Contact points</td>
<td>6</td>
</tr>
<tr>
<td>2.2 System components</td>
<td>7</td>
</tr>
<tr>
<td>2.2.1 Overview</td>
<td>7</td>
</tr>
<tr>
<td>2.2.2 A 200 receiver</td>
<td>8</td>
</tr>
<tr>
<td>2.2.2.1 Setup</td>
<td>8</td>
</tr>
<tr>
<td>2.2.2.2 Carrying the system</td>
<td>10</td>
</tr>
<tr>
<td>2.2.2.3 Playing back noises</td>
<td>10</td>
</tr>
<tr>
<td>2.2.2.4 Displaying the measurement values</td>
<td>10</td>
</tr>
<tr>
<td>2.2.2.5 Automatic power off</td>
<td>11</td>
</tr>
<tr>
<td>2.2.2.6 Main view</td>
<td>11</td>
</tr>
<tr>
<td>2.2.3 TS 200 carrying rod</td>
<td>15</td>
</tr>
<tr>
<td>2.2.4 Microphones</td>
<td>16</td>
</tr>
<tr>
<td>2.3 Switching on and off</td>
<td>18</td>
</tr>
<tr>
<td>2.3.1 Components</td>
<td>18</td>
</tr>
<tr>
<td>2.3.2 System</td>
<td>18</td>
</tr>
<tr>
<td>2.4 Power supply to the components</td>
<td>19</td>
</tr>
<tr>
<td><strong>3 System in use</strong></td>
<td>20</td>
</tr>
<tr>
<td>3.1 Attaching the microphone to the carrying rod</td>
<td>20</td>
</tr>
<tr>
<td>3.2 Switching on the system</td>
<td>21</td>
</tr>
<tr>
<td>3.2.1 Startup with user guide</td>
<td>21</td>
</tr>
<tr>
<td>3.2.2 Direct startup</td>
<td>23</td>
</tr>
<tr>
<td>3.3 Starting a measurement</td>
<td>24</td>
</tr>
<tr>
<td>3.4 Calibrating the touch screen</td>
<td>24</td>
</tr>
<tr>
<td>Contents</td>
<td>Page</td>
</tr>
<tr>
<td>----------</td>
<td>------</td>
</tr>
<tr>
<td><strong>4</strong> Settings ........................................................................................................25</td>
<td></td>
</tr>
<tr>
<td>4.1 Overview .............................................................................................................25</td>
<td></td>
</tr>
<tr>
<td>4.2 Settings in the measurement menu .......................................................................26</td>
<td></td>
</tr>
<tr>
<td>4.2.1 Method ..............................................................................................................26</td>
<td></td>
</tr>
<tr>
<td>4.2.2 Type ..................................................................................................................27</td>
<td></td>
</tr>
<tr>
<td>4.2.3 Hearing protection .............................................................................................27</td>
<td></td>
</tr>
<tr>
<td>4.2.4 Activation keys ..................................................................................................28</td>
<td></td>
</tr>
<tr>
<td>4.2.5 Timer ................................................................................................................28</td>
<td></td>
</tr>
<tr>
<td>4.2.6 Duration ............................................................................................................29</td>
<td></td>
</tr>
<tr>
<td>4.3 Setting the application ..........................................................................................30</td>
<td></td>
</tr>
<tr>
<td>4.4 Settings in the Device menu ..................................................................................31</td>
<td></td>
</tr>
<tr>
<td>4.4.1 Switching off the device ....................................................................................32</td>
<td></td>
</tr>
<tr>
<td>4.4.2 Switching off the backlight ...............................................................................32</td>
<td></td>
</tr>
<tr>
<td>4.4.3 Position detection ..............................................................................................33</td>
<td></td>
</tr>
<tr>
<td>4.4.4 Automatic brightness .........................................................................................33</td>
<td></td>
</tr>
<tr>
<td>4.4.5 Brightness ..........................................................................................................33</td>
<td></td>
</tr>
<tr>
<td>4.4.6 Time ...................................................................................................................34</td>
<td></td>
</tr>
<tr>
<td>4.4.7 Date .....................................................................................................................34</td>
<td></td>
</tr>
<tr>
<td>4.4.8 Date format .........................................................................................................34</td>
<td></td>
</tr>
<tr>
<td>4.4.9 Time format ........................................................................................................35</td>
<td></td>
</tr>
<tr>
<td>4.4.10 Language ...........................................................................................................35</td>
<td></td>
</tr>
<tr>
<td>4.4.11 Information .......................................................................................................35</td>
<td></td>
</tr>
<tr>
<td>4.4.12 Calibration .......................................................................................................35</td>
<td></td>
</tr>
<tr>
<td><strong>5</strong> Maintenance .......................................................................................................36</td>
<td></td>
</tr>
<tr>
<td>5.1 Charging the batteries ............................................................................................36</td>
<td></td>
</tr>
<tr>
<td>5.1.1 Charging the batteries in the case ......................................................................36</td>
<td></td>
</tr>
<tr>
<td>5.1.2 Charging batteries using the AC/DC adapter or vehicle cable .........................37</td>
<td></td>
</tr>
<tr>
<td>5.2 Care .......................................................................................................................38</td>
<td></td>
</tr>
<tr>
<td>5.3 Maintenance ...........................................................................................................38</td>
<td></td>
</tr>
<tr>
<td><strong>6</strong> Appendix ...........................................................................................................39</td>
<td></td>
</tr>
<tr>
<td>6.1 Technical data .......................................................................................................39</td>
<td></td>
</tr>
<tr>
<td>6.1.1 A 200 receiver ....................................................................................................39</td>
<td></td>
</tr>
<tr>
<td>6.1.2 TS 200 carrying rod .........................................................................................40</td>
<td></td>
</tr>
<tr>
<td>6.1.3 BM 200 and BM 230 ground microphone .......................................................41</td>
<td></td>
</tr>
<tr>
<td>6.1.4 TM 200 touch microphone ...............................................................................42</td>
<td></td>
</tr>
<tr>
<td>6.1.5 UM 200 universal microphone .........................................................................42</td>
<td></td>
</tr>
<tr>
<td>6.2 Symbols on the touch screen of the A 200 receiver ............................................43</td>
<td></td>
</tr>
<tr>
<td>Section</td>
<td>Title</td>
</tr>
<tr>
<td>---------</td>
<td>----------------------------------------------------------------</td>
</tr>
<tr>
<td>6.3</td>
<td>Significance of LED signals</td>
</tr>
<tr>
<td>6.3.1</td>
<td>A 200 receiver</td>
</tr>
<tr>
<td>6.3.2</td>
<td>TS 200 carrying rod</td>
</tr>
<tr>
<td>6.4</td>
<td>Suitability of the microphones for the applications</td>
</tr>
<tr>
<td>6.5</td>
<td>Operating the system using the activation key or sensor area</td>
</tr>
<tr>
<td>6.6</td>
<td>Accessories</td>
</tr>
<tr>
<td>6.7</td>
<td>EC Declaration of Conformity</td>
</tr>
<tr>
<td>6.8</td>
<td>Note about the firmware (open source software)</td>
</tr>
<tr>
<td>6.9</td>
<td>Advice on disposal</td>
</tr>
<tr>
<td>7</td>
<td>Index</td>
</tr>
</tbody>
</table>
1 Introduction

1.1 Warranty

The following instructions must be complied with in order for any warranty to be applicable regarding functionality and safe operation of this equipment.

- Read these operating instructions prior to operating the product.
- Use the product only as intended.
- Repairs and maintenance must only be carried out by specialist technicians or other suitably trained personnel. Only spare parts approved by Hermann Sewerin GmbH may be used when performing repairs.
- Changes or modifications to this product may only be carried out with the approval of Hermann Sewerin GmbH.
- Use only Hermann Sewerin GmbH accessories for the product.

Hermann Sewerin GmbH shall not be liable for damages resulting from the non-observance of this information. The warranty conditions of the General Terms and Conditions (AGB) of Hermann Sewerin GmbH are not broadened by this information.

In addition to the warnings and other information in these Operating Instructions, always observe the generally applicable safety and accident prevention regulations.

The manufacturer reserves the right to make technical changes.
1.2 Purpose

**AQUAPHON** is a system for the acoustic location of water leaks and water pipes.

The **AQUAPHON** system can be used for:
- Leak detection
- Pipeline location

---

**Note:**
All descriptions in these operating instructions refer to the system as delivered (factory settings). The manufacturer reserves the right to make changes.

---

1.3 Intended use

The **AQUAPHON** system is designed for professional industrial and commercial use. The appropriate specialist knowledge is required to operate the system.

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**Note:**
If necessary, learn more about the theory before commencing practical work with the system.

---

The system must only be used for the applications specified in section 1.2.
1.4 General safety information

This product was manufactured in keeping with all binding legal and safety regulations. It corresponds to the state-of-the-art and conforms to EC requirements. The product is safe to operate when used in accordance with the instructions provided. However, if you handle the product improperly or not as intended, the product may present a risk to persons and property. For this reason, always observe the following safety information.

Risk of personal injury (health risk)

- Handle the components carefully and safely both during transport and when working.
- Proceed with extreme caution in the vicinity of electrical lines.

Hazards for the product and other property

- Always handle the components with care.
- Do not drop the components.
- Never set the components in places where they are at risk of falling.
- Before starting work, check that the components are in good working order. Never use damaged or faulty components.
- Ensure that no dirt or moisture can get into the ports on the components.
- Always observe the permitted operating and storage temperatures.
2 AQUAPHON system

2.1 General information about the system

2.1.1 Communication

The components of the AQUAPHON system communicate by bidirectional SDR (SDR: Sewerin Digital Radio). Wireless communication allows the user considerable freedom of movement. The sound quality of the acoustic playback is not affected by swinging cables.

2.1.2 Hearing protection

The AQUAPHON system protects the user's hearing against sudden, loud interference noise. This type of interference noise can occur, for example, when vehicles drive by or when the user with a touch microphone slips off the contact point.

The hearing protection function activates when the individual hearing protection threshold setting is exceeded. Once the source of interference goes quiet, the hearing protection automatically switches back off again.

The way the hearing protection works depends on the settings (Measurement menu > Hearing protection).

---

**Note:**
Another way of protecting your hearing against loud noises is to only set the volume as high as is absolutely necessary.

---

2.1.3 Operating concept

Working with the AQUAPHON system requires specialist knowledge of leak and pipeline location. You do not, however, require any special skills to use the system itself, as it can guide you through the process.
Note:
To ensure successful location with the AQUAPHON system, all users must know:
- What is to be located (Application)?
- Where it is to be located (Contact point)?

2.1.3.1 Switch-on mode

The receiver always automatically determines the switch-on mode. There are two options:

- **Startup with user guide**
- **Direct startup**

The situation when the receiver is switched on determines which switch-on mode is used. The receiver checks whether or not certain steps have already been performed. These steps include:

- System components have been connected (e.g. carrying rod and a ground microphone).
- System components have already been switched on before the receiver.

For more detailed information about switching on dependent on switch-on mode, please refer to section 3.2 on page 21.

**Startup with user guide**

Target group: Users with little experience of using the system.

- The user is unsure of which system components to select for a certain application and the corresponding contact point.

The user first switches on the receiver. Once an application and the contact point have been selected, the receiver provides detailed instructions about which components are to be connected and switched on in what order.
Direct startup

Target group: Experienced users.

– The user knows which components of the system to select for a certain application and the corresponding contact point.

The user starts by selecting the suitable components himself. He connects any components that need to be connected mechanically. He then switches on the components before switching on the receiver last. The receiver automatically recognises the components as it is switched on.

With Direct startup, the system is ready to use as soon as the receiver is switched on.

2.1.3.2 Applications

The names of the applications corresponds to their possible uses. The system can be used for:

• Leak detection
• Pipeline location

2.1.3.3 Contact points

Each application allows the system to be used on certain contact points. The contact point is the area on which a microphone is placed.

The following contact points can be selected:

• Paved
  The contact point has a smooth, firm surface (e.g. asphalt, concrete, plaster).

• Unpaved
  The contact point has an uneven surface, which may sometimes give way (e.g. gravel, Macadam, grass).

• Fitting (only for leak detection)
  The contact point is, for example, a hydrant or slide gate.
2.2 System components

2.2.1 Overview

The AQUAPHON is a modular system. The main components of the systems are:

- **A 200** receiver
- **F6** wireless headphones
- **TS 200** carrying rod
- **UM 200** universal microphone
- **AQUAPHON A 200** case

The carrying rod is required when using the following microphones:

- **BM 200** ground microphone
- **BM 230** ground microphone (with tripod)
- **TM 200** touch microphone

A probe tip and possibly an extension are required for the touch microphone.

- **UM 200** universal microphone

The system can be transported and stored in the case. The batteries for the components A 200, TS 200 and F6 can be simultaneously charged in the case using AC/DC adapter L.

Accessories can be added to the system at any time.

---

**Note:**

Information about F6 wireless headphones can be found in the relevant operating instructions.
2.2.2 A 200 receiver

2.2.2.1 Setup

Overviews with the names of all the parts of the receiver can be found inside the front cover (Fig. 1 and Fig. 2).

Its symmetrical housing means that it can be operated by both right-handed and left-handed users with ease.

**Touch screen**

The receiver features a touch screen. Certain areas of the touch screen are touch-sensitive. Actions are performed by touching these areas (buttons).

All of the buttons have a thick, dark grey outline.

Only your finger or a touch pen should be used to operate the touch screen.

- Always touch the buttons briefly without exerting too much pressure.

---

**WARNING! Risk of damage**

The surface of the touch screen is sensitive.

- Do not use any hard or sharp objects (e.g. pens) to operate the screen.
- Protect the touch screen against aggressive substances (e.g. acidic or abrasive detergents).

For more detailed information on calibrating the touch screen, please refer to section 3.4 on page 24.

**Light sensor**

The light sensor analyses the ambient lighting conditions.

If the automatic brightness setting is enabled, the light sensor always adjusts the brightness of the touch screen to the ambient lighting conditions.

Information about the automatic brightness setting can be found in section 4.4.4 on page 33.
ON/OFF key
The ON/OFF key is used to switch the receiver on and off. Information on switching on and off can be found in section 2.3 on page 18.

Activation keys
The receiver has two activation keys. Only one of the two keys needs to be pressed to start a measurement.

LED
The LED indicates the operating status. Information about what the LED signals mean can be found in section 6.3.1 on page 45.

Ports
The receiver features the following ports:
- Charging socket
  For recharging the battery.
- Microphone socket
  For connecting the UM 200 universal microphone.
- USB port
  The USB port is only used by SEWERIN Service staff for maintenance work.

Connectors
Carrying systems (Vario, lap belt, hand loop) can be attached to the connectors.

The connectors are parts of TENAX quick-release fasteners.
2.2.2.2 Carrying the system

The receiver is usually carried in front of the body so that the user looks diagonally down at the touch screen.

SEWERIN recommends: Use a carrying system for locating operations. The carrying system prevents you from tiring during work. It also reduces the possibility of radio interference. Radio interference can occur if the user accidentally covers certain components in the receiver.

2.2.2.3 Playing back noises

The connected microphone records noises. When a measurement is ongoing, the noises are played back through the headphones. You can set the volume of the playback.

The noises are also recorded. Recorded noises can be saved. Both recorded and saved noises can be played back.

2.2.2.4 Displaying the measurement values

Various measurement values are calculated from the recorded noises (e.g. current noise level, extreme value of the measurement).

The measurement values can be displayed in two ways:

- Visually
- Numerically

Visual representation

The measurement values are displayed visually on the touch screen in the main view (volume button).

- Current noise level (level display)
- Extreme value (black line)

Numerical representation

The measurement value for the noise level is displayed as a numeric value in the centre of the main view on the touch screen.

This measurement value is an extreme value. Whether the extreme value is a minimum or maximum depends on the settings (Measurement menu > Type).
2.2.2.5 Automatic power off

The power supply to the receiver is designed in such a way that a fully charged battery will allow one full day’s work without interruption. However, it is still recommended to conserve energy whilst working.

The receiver therefore offers the following automatic power-off options:

- **Switch off device**
  The receiver switches off if it is not operated for a specified period of time. It must be switched back on again when you want to continue work.

- **Switch off backlight**
  The receiver backlight switches off if it is not operated for a specified period of time. The receiver remains switched on.

If and when the automatic power off is activated depends on the settings (*Device* menu > *General* > *Switch off device* or *Switch off backlight*).

2.2.2.6 Main view

The touch screen of the receiver displays the main view when the system is ready for use.

![Main view](image)

Fig. 6: Main view
AQUAPHON system

The measurement value for the noise level is displayed in the centre of the main view. The main view also contains the following buttons:

- **Volume**
- **Audio player**
- **Filter**
- **Settings**

These buttons can be used to open submenus. The buttons also display information. The information displayed depends on the situation.

**Volume**

The **Volume** button displays the following information:

- Current noise level
- Extreme value
- Hearing protection threshold setting
- Volume setting
- Hearing protection level setting

![Volume button diagram]

**Fig. 7:** **Volume** button
1 Current noise level, 2 Extreme value, 3 Hearing protection threshold, 4 Hearing protection level, 5 Volume
The **Volume** menu is opened using the **Volume** button. The following settings can be made in this menu:

- Hearing protection level and corresponding hearing protection threshold
- Volume

**Audio player**

The **Audio player** button displays the following information for the most recent measurements:

- Measurement value

  The measurement value is displayed as a numeric value and a bar.

Up to seven measurements are shown. The current measurement appears on the left and the oldest measurement on the far right.

![Fig. 8: Audio player button](image)

The **Audio player** menu is opened using the **Audio player** button. The following actions can be performed in this menu:

- Play back, delete, save noise
- Load and play back noise from the memory
- View information about noise

**Filter**

The **Filter** button displays the following information:

- Frequency analysis of the current noise with currently selected filter range (bandpass)
The **Filter** menu is opened using the **Filter** button. The following settings can be made in this menu:

- Filter limits (limit frequencies of the bandpass)
- Scale for the frequency axis

![Fig. 9: Filter button](image)

**Settings**

The **Settings** button displays the following information:

- Application or connected microphone
- Set type of extreme value
- Connected components and information about the charge of the relevant batteries
- Time

![Fig. 10: Settings button](image)

1 Application or microphone, 2 Type, 3 Components and charge of relevant batteries, 4 Time
The **Settings** menu is opened using the **Settings** button. The following settings can be made in this menu:

- Measurement
- Application
- Device

For more detailed information on the **Settings** menu, please refer to section 4 on page 25.

### 2.2.3 TS 200 carrying rod

The **TS 200** carrying rod is for use with **BM 200**, **BM 230** and **TM 200** microphones. The selected microphone must be attached to the carrying rod.

Overviews with the names of all the parts of the carrying rod can be found inside the front cover (Fig. 3 to Fig. 5).

For more detailed information about the microphones, please refer to section 2.2.4 on page 16.

**Safety information for using the TS 200**

- Handle the carrying rod carefully and safely both during transport and when working.
  
  Be particularly careful when the touch microphone and probe tip are screwed onto the carrying rod.

- Do not lean on the carrying rod.

**Fastening screw**

The fastening screw on the adapter comes in two versions:

- Star-knob screw
- Screw with Allen head

Information on attaching microphones to the carrying rod can be found in section 3.1 on page 20. Please note in particular the warning.
Sensor area

A measurement can be started by touching the sensor area. The sensor area can be operated in two different modes. Information about the modes can be found in section 4.2.4 on page 28.

---

**Note:**
Instead of using the sensor area on the carrying rod to start a measurement, you can also press an activation key on the receiver. For more detailed advice on selecting a control, please refer to section 6.5 on page 48.

---

Do not touch the sensor area while switching on the carrying rod.

Light key

The light key on the carrying rod is used to switch the light source for the **TM 200** touch microphone on and off.

---

**Note:**
Only the **TM 200** touch microphone features a light source to illuminate the measuring point.

---

2.2.4 Microphones

The system can be fitted with various microphones. The application determines which microphone is used.

Safety information for using the UM 200

A contact adapter can be attached to the **UM 200** universal microphone. This contact adapter contains a powerful magnet.

It is important to note the following safety information when using the contact adapter:

- People with pacemakers must keep their distance.
- Keep the adapter away from magnetic storage media (hard disks, credit cards etc.), monitors (PC, TV) and clocks.
<table>
<thead>
<tr>
<th>Microphone</th>
<th>Symbol</th>
<th>Connection to</th>
<th>Application</th>
<th>Contact point</th>
<th>Remark</th>
</tr>
</thead>
<tbody>
<tr>
<td>TM 200 touch microphone</td>
<td>TS 200</td>
<td></td>
<td>Leak detection (prelocation)</td>
<td>Fitting</td>
<td>• Only ready for use when probe tip is screwed on</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>• Extensions available for the probe tip</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>• Integrated light source to illuminate the measuring point</td>
</tr>
<tr>
<td>BM 200 ground microphone</td>
<td></td>
<td></td>
<td>Leak detection (pin-pointing)</td>
<td>Paved</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Pipeline location</td>
<td>Unpaved Paved</td>
<td>• If ground is very soft, use extra spike</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>• Orientation of tripod can be changed (180° rotation)</td>
</tr>
<tr>
<td>BM 230 ground microphone</td>
<td></td>
<td></td>
<td>Unpaved Paved</td>
<td></td>
<td></td>
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<tr>
<td>UM 200 universal microphone</td>
<td></td>
<td></td>
<td>Leak detection</td>
<td>Unpaved Paved</td>
<td>• Connected to A 200 with cable</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Unpaved Fitting</td>
<td></td>
<td>• Cable is permanently connected to UM 200</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Universal</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Pipeline location</td>
<td>Unpaved Paved</td>
<td></td>
</tr>
</tbody>
</table>
2.3 Switching on and off

2.3.1 Components
Each of the following components features a dedicated ON/OFF button:

- **A 200** receiver
- **TS 200** carrying rod
- **F6** wireless headphones

The components can be switched on and off independently using the ON/OFF key.

Microphones are not switched on or off.

2.3.2 System

Switching on
When the system is turned on, the order in which the individual components are switched on determines the so-called switch-on mode.

If you want the system to start in a specific switch-on mode, you have to switch on the components in a certain order. The switch-on mode also determines whether the system is switched on manually or automatically.

When the system is switched on, a radio connection is established between the components of the system. (Applies to all components that are not connected by cables.)

For more detailed information on switch-on mode, please refer to section 2.1.3.1 on page 5.

For more detailed information on switching on the system, please refer to section 3.2 on page 21.

Switching off
When the receiver is switched off, the carrying rod and headphones also switch off automatically.
2.4 Power supply to the components

The following components are powered by a special, inbuilt rechargeable lithium-ion battery.

- **A 200** receiver
- **TS 200** carrying rod

The **F6** wireless headphones come with a rechargeable NiMh battery.

For information on charging the batteries, please see 5.1 on page 36.

---

**WARNING! Risk of damage when changing lithium-ion batteries**

The battery compartments of the components contain parts that could get damaged when the batteries are being replaced.

- Only SEWERIN service personnel or other authorised specialists may replace rechargeable lithium-ion batteries.

---

**WARNING! Risk of explosion due to short circuit**

Faulty lithium-ion batteries can explode due to an internal short circuit.

- Do not send components with a faulty lithium-ion battery.
3 System in use

3.1 Attaching the microphone to the carrying rod

The carrying rod and microphone are neatly connected to each other.

**WARNING! Risk of malfunctions caused by dirt or water seepage**

Moisture and dirty contacts can impair the system's functionality. The microphone connection must be clean and dry for attachment.

The seal of the fastening screw must not be dirty or damaged, otherwise water could get in through the thread.

- If dirty, clean the contacts on the carrying rod adapter with a damp cloth. Never use compressed air or a water jet for cleaning. (Microphones can be rinsed under running water.)
- Dry the entire microphone connector if necessary.
- Never unscrew the fastening screw all the way out of the thread to minimise the risk of getting dirty.

1. Push the microphone into the adapter.
2. Turn the carrying rod until it clicks into the stop.
   - The carrying rod and microphone are neatly connected to each other.
3. Hand tighten the fastening screw.
   - The carrying rod is ready for use.
3.2 Switching on the system

If you want the system to start in a specific switch-on mode, you have to switch on the components in a certain order. If the components are switched on in any order, the receiver selects the appropriate switch-on mode.

Information about the switch-on mode can be found in section 2.1.3.1 on page 5.

---

Note:
When switching on the A 200 receiver, the ON/OFF key must be held down until the LED lights up green. This can take a few seconds.

---

3.2.1 Startup with user guide

Starting with the user guide works from the following starting point:

- All components are switched off.
- A microphone has not yet been selected or connected.

1. Switch the A 200 receiver on.

A start screen appears briefly on the touch screen. The Application menu will then appear.

![Application menu](image)

Fig. 11: Application menu

2. Select the desired application. The menu for the respective application appears.
3 System in use

3. Select the contact point according to the conditions at the measuring point. The **Searching...** menu appears.

This menu contains instructions. The symbols of the corresponding components are shown in grey beside each step.

4. Follow the instructions in the specified order.

As soon as a step is complete, the corresponding symbols appear in colour.

- **Blue**
  
  The specified component has been connected.

- **Red**
  
  A different component than that specified has been connected.

Once all the specified components have been connected, the receiver automatically switches to the main view.
If components other than those specified have been connected, the switch-on process can be completed manually or cancelled.

- Tap **Confirm** if you want to complete the switch-on process manually.

### 3.2.2 Direct startup

With Direct startup, the receiver automatically recognises the connected components.

Direct startup works from the following starting point:

- An appropriate microphone has been selected. The microphone is connected:
  - **BM 200**, **BM 230** or **TM 200** microphones to **TS 200** carrying rod
  - **UM 200** universal microphone to **A 200** receiver
- All components are switched off.

1. Switch on the **TS 200** carrying rod.

**Note:**
Do not touch the sensor area of the carrying rod when switching it on.

2. Switch on the **F6** wireless headphones.
3. Switch the **A 200** receiver on.
   - The start screen appears briefly on the touch screen.
   - The main view appears. The system is ready for use.
3.3 Starting a measurement

To start a measurement you must use either:

- Activation key on A 200 receiver
- Sensor area on TS 200 carrying rod

More detailed advice on which controls are best suited to which microphone can be found in section 6.5 on page 48.

3.4 Calibrating the touch screen

The touch screen comes calibrated. If the touch screen does not respond (correctly) when operated, it can be recalibrated.

Calibration involves two stages, which occur automatically in succession. Firstly the areas are reset. Then the reset areas need to be confirmed.

SEWERIN recommends: Use a touch pen for the calibration procedure.

1. Tap the Settings button in the main view. The Settings menu appears.
2. Tap the Device button. The Device menu appears.
4. Tap Calibration. The calibration begins.
5. Follow the instructions.
   - The individual steps must be completed within a limited time. If you are too slow to respond, the calibration process will be cancelled.
   - The active area is marked with crosshairs. Non-active areas are grey.
     - Blue crosshairs: Set area
     - Red crosshairs: Confirm area
   - Try to hit the active area as accurately as possible.

Once the screen has been successfully calibrated, the receiver automatically switches back to the Service view.
4 Settings

4.1 Overview

All settings are managed using the A 200 receiver; both the settings for the system and for the receiver.

The settings can be changed at any time. The following menus are available:

- **Measurement**
  The settings affect the system.

- **Application**
  The application can be set via the menu.

- **Device**
  The settings only affect the receiver.
4.2 Settings in the measurement menu

Note:
The settings in the Measurement menu affect the system.

The menu can be opened from the main view.
1. Tap the Settings button. The Settings menu appears.
2. Tap the Measurement button. The Measurement menu appears.

<table>
<thead>
<tr>
<th>Method</th>
<th>&gt; true RMS</th>
<th>f RMS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type</td>
<td>&gt; MIN</td>
<td>MAX</td>
</tr>
<tr>
<td>Hearing protection</td>
<td>&gt; Muted</td>
<td>Silent</td>
</tr>
<tr>
<td>Activation keys</td>
<td>&gt; Touch</td>
<td>Switch</td>
</tr>
<tr>
<td>Timer</td>
<td>&gt; Forwards</td>
<td>Backwards</td>
</tr>
</tbody>
</table>
| Duration    | > 10 s     | 20 s  | ...

Fig. 14: Measurement menu

3. Adjust the settings as required.
   The settings options are explained in the next sections.
4. Finally, tap the Back button. The Settings menu appears.
5. Tap the Back button again to switch to the main view.

4.2.1 Method

The average noise level is displayed. There are two ways of calculating the average noise level. The difference between the two methods is whether or not the frequencies are taken into account.
The options are:

- **true RMS**  
  (abbreviation for: true route mean square)  
  This method does not take the frequencies into account.

- **f RMS**  
  (abbreviation for: frequency based route mean square)  
  This method takes the frequencies into account. High frequencies are given greater consideration than low frequencies.

### 4.2.2 Type

The displayed extreme value can be either the quietest or the loudest noise of a measurement.

The options are:

- **MIN**  
  The lowest measurement value (minimum) is displayed.

- **MAX**  
  The highest measurement value (maximum) is displayed.

SEWERIN recommends: Select **MIN** for leak detection.

### 4.2.3 Hearing protection

There is a hearing protection threshold for acoustic playback of the noise. The hearing protection activates when the set hearing protection threshold is exceeded. Hearing protection can work in two ways.

The options are:

- **Muted**  
  The noise is muted so that it can just about be heard above the hearing protection threshold.

- **Silent**  
  The noise cannot be heard above the hearing protection threshold.
4.2.4 Activation keys

Note:
This setting determines how the activation keys on both the receiver and the sensor area on the carrying rod are operated.

The activation keys / sensor area can be operated in two different modes.
The options are:
- **Touch**
  - Activation key
    The activation key is held down for the duration of the measurement.
  - Sensor area
    Keep your thumb on the sensor area for the duration of the measurement.
- **Switch**
  - Activation key
    The activation key is pressed briefly to start the measurement. Pressing the activation key again ends the measurement.
  - Sensor area
    Briefly press the sensor area with your thumb to start the measurement. Pressing the sensor area again ends the measurement.

4.2.5 Timer

A timer can be displayed on the touch screen. The timer shows how long a measurement has been running for. The timer can work in two different modes.
The options are:
- **Forwards**
  Time is counted upwards (0 s, 1 s, 2 s, 3 s, etc.).
- **Backwards**
  Time is counted down (3 s, 2 s, 1 s, 0 s, etc.). The timer works in countdown mode.
  Once the specified time is up, the measurement does not end automatically.
  The duration of the countdown is set under **Duration** in the menu.

- **Off**
  The timer is disabled.

### 4.2.6 Duration

**Note:**
**Duration** only appears in the menu when the **Backwards** options has been set under **Timer**.

The duration of the countdown can be set for a countdown timer.

The options are:

-  **10 s | 20 s | 30 s | 40 s | 50 s | 60 s**
  Duration that can be selected.
4.3 Setting the application

An application can be selected via the Application menu. This allows you to change the application when the receiver is switched on.

Typically you might want to change application in the following locating situations:

- When changing from prelocation to pinpointing during leak detection.
- When a locating procedure is already underway and you want to continue with a different microphone (e.g. if the surface at the measuring location changes from paved to unpaved).

The menu can be opened from the main view.

1. Tap the Settings button. The Settings menu appears.
2. Tap the Application button. The Application menu appears.
3. Switch off the carrying rod.
4. Select the desired application. The Application menu appears.
5. Select the type of contact point according to the conditions at the measuring point. The Searching... menu appears.
6. Follow the instructions in the specified order.

Once all the specified components have been connected, the receiver automatically switches to the main view.
4.4 Settings in the Device menu

Note:
The settings in the Device menu only affect the receiver.

The menu can be opened from the main view.
1. Tap the Settings button. The Settings menu appears.
2. Tap the Device button. The Device menu appears.

![Device menu table]

Fig. 15: Device menu
3. Adjust the settings as required.

   The **Device** menu is divided into the four views **General, Time/Date, Region** and **Service**.
   
   − Switch between the views using the **Scroll** buttons.
   
   The settings options are explained in the next sections.

4. Finally, tap the **Back** button. The **Device** menu appears.

5. Tap the **Back** button again to switch to the main view.

### 4.4.1 Switching off the device

The receiver can switch off automatically if it is not operated for a specified period of time.

---

**Note:**

This function helps to save energy. It means that the receiver can be used for longer without being recharged.

---

The options are:

- **30 min | 1 h | 3 h**
  
  Duration that can be selected.

- **Off**
  
  The receiver does not switch itself off.

### 4.4.2 Switching off the backlight

The touch screen backlight can switch off automatically if it is not operated for a specified period of time. The receiver remains switched on.

---

**Note:**

This function helps to save energy. It means that the receiver can be used for longer without being recharged.
The options are:

- **30 s | 1 min | 15 min | 30 min**
  
  Duration that can be selected.

- **Off**
  
  The backlight does not switch itself off.

### 4.4.3 Position detection

The receiver can detect the alignment of the touch screen. This function can be enabled or disabled.

- If the function is enabled, the touch screen automatically switches off when it is in a vertical position.

- As soon as the receiver is in a horizontal position again, the touch screen comes back on.

### 4.4.4 Automatic brightness

The brightness of the touch screen can automatically adjust to the ambient lighting conditions thanks to the light sensor. This means that the touch screen is clearly legible in every situation.

This function can be enabled or disabled.

- When this function is disabled, you can set the brightness manually.

  Information about setting the brightness manually can be found in section 4.4.5 on page 33.

### 4.4.5 Brightness

---

**Note:**

**Brightness** only appears in the menu when the **Automatic brightness** function is disabled.

---

When the **Automatic brightness** function is disabled, a permanent value can be set for the brightness of the touch screen.
4.4.6 Time
The receiver features an internal clock. The set time is displayed in the main view on the Settings button. The time is also used to identify the measurements.

Note:
The format of the time can be set under Time format in the menu.

4.4.7 Date
The date is used to identify the measurements.

Note:
The format of the date can be set under Date format in the menu.

4.4.8 Date format
The date can be written in various ways.
The options are:
- DD.MM.YY
- YYYY-MM-DD
The letters refer to the following:
D: day
M: month
Y: year
4.4.9 Time format
The time can be written in various ways.
The options are:
- **12 h**
  12 hour clock
- **24 h**
  24 hour clock

4.4.10 Language
The text on the user interface can be displayed in various languages.
There is a range of languages to choose from.

4.4.11 Information
The relevant current technical information is stored in each receiver.
The following information will be displayed:
- Firmware version number
- Hardware version number

4.4.12 Calibration
The touch screen can be calibrated by the user.
For more detailed information on calibration, please refer to section 3.4 on page 24.
5 Maintenance

5.1 Charging the batteries

The batteries of the following components must be charged as required:

- **A 200** receiver (lithium-ion rechargeable battery)
- **TS 200** carrying rod (lithium-ion rechargeable battery)
- **F6** wireless headphones (NiMH rechargeable battery)

The typical charging time is approx. four hours. The batteries are protected against overcharging. The components can, therefore, remain connected to the power supply after they are fully charged.

Always observe the permitted temperature range during charging. If the temperature falls below or exceeds the limit values, charging stops until the temperature returns to within the permitted range.

There are two ways of charging the components:

- All components at the same time in the **AQUAPHON A 200** case
- Each component individually using the AC/DC adapter or vehicle cable

5.1.1 Charging the batteries in the case

The batteries of the components can all be charged simultaneously in the **AQUAPHON A 200** case. The case is connected to the power supply using AC/DC adapter **L**.

The AC/DC adapter is available to buy as an accessory.

The case contains three connection cables for the components. There is a connection socket on the outside of the case for connecting to the power supply (230 V).
1. Place the components in the dedicated spaces in the **AQUAPHON A 200** case.

2. Connect the components using the connection cables.

3. Connect the case to the power supply (230 V) using AC/DC adapter **L**. Charging starts automatically.

After approx. four hours the charging process is complete.

### 5.1.2 Charging batteries using the AC/DC adapter or vehicle cable

The components are connected directly to the power supply (230 V or vehicle voltage) for charging using **AC/DC adapter M4** or **vehicle cable M4**. Each component is charged individually.

The AC/DC adapter and vehicle cable are available to buy as accessories.

When the battery is fully charged, the LED on the **A 200** receiver and **TS 200** carrying rod emits a double flash (green).
5.2 Care

All that is necessary to care for the components is to wipe them down with a damp cloth.

SEWERIN recommends: Always remove significant contamination immediately.

Special points to note are set out below.

Receiver touch screen

Usually it is sufficient to wipe the touch screen with a damp cloth. If you use a detergent, make sure it does not contain any aggressive ingredients (e.g. acidic or abrasive components).

Carrying rod

If dirty, clean the contacts on the carrying rod adapter with a damp cloth. Never use compressed air or a water jet for cleaning.

Microphones

Microphones can be rinsed under running water.

5.3 Maintenance

SEWERIN recommends: Have the system serviced regularly by SEWERIN Service or an authorised professional. Only regular servicing can ensure that the system is always ready for use.
6 Appendix

6.1 Technical data

6.1.1 A 200 receiver

Device data

<table>
<thead>
<tr>
<th>Dimensions (W x D x H)</th>
<th>225 x 62 x 155 mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight</td>
<td>1.2 kg</td>
</tr>
<tr>
<td>Material</td>
<td>Polycarbonate (housing)</td>
</tr>
</tbody>
</table>

Features

<table>
<thead>
<tr>
<th>Display</th>
<th>5.7&quot; TFT display 640 x 480 pixels (VGA), LED backlight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interface</td>
<td>Micro USB</td>
</tr>
<tr>
<td>Data memory</td>
<td>90 MB (internal)</td>
</tr>
<tr>
<td>Processor</td>
<td>32 bit RISC processor Digital signal processor</td>
</tr>
<tr>
<td>Control</td>
<td>Touch screen, ON/OFF key, two activation keys</td>
</tr>
</tbody>
</table>

Operating conditions

<table>
<thead>
<tr>
<th>Operating temperature</th>
<th>-20 °C – +60 °C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Storage temperature</td>
<td>-25 °C – +50 °C (briefly +60 °C)</td>
</tr>
<tr>
<td>Humidity</td>
<td>15% – 90% r.h., non-condensing</td>
</tr>
<tr>
<td>Protection rating</td>
<td>IP65/IP67</td>
</tr>
<tr>
<td>Non-permitted operating environments</td>
<td>In potentially explosive areas</td>
</tr>
</tbody>
</table>

Power supply

<table>
<thead>
<tr>
<th>Power supply</th>
<th>2 lithium-ion rechargeable batteries</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating time, typical</td>
<td>&gt; 10 h</td>
</tr>
<tr>
<td>Battery capacity</td>
<td>6700 mAh, 23 Wh</td>
</tr>
<tr>
<td>Battery voltage</td>
<td>3.6 V</td>
</tr>
<tr>
<td>Charging time</td>
<td>&lt; 7.5 h</td>
</tr>
<tr>
<td>Charging temperature</td>
<td>0 °C – +40 °C</td>
</tr>
<tr>
<td>Charging voltage</td>
<td>12 V</td>
</tr>
<tr>
<td>Charging current</td>
<td>1 A</td>
</tr>
<tr>
<td>Charger</td>
<td>AC/DC adapter L for charging in the case</td>
</tr>
</tbody>
</table>
Data logging

| Filter | Bandpass: adjustable between 0 Hz and 12 kHz
|        | Passband, minimum: 300 Hz
|        | Steps, minimum: 50 Hz
| Sampling rate | 16 bit, 24 kHz

Data transmission

| Transmission frequency | 2.408 – 2.476 GHz, 38 channels
| Radio range | > 2 m
| Transmission bandwidth | 0 – 12 kHz
| Communication | SDR (Sewerin Digital Radio)
| Power | 10 mW

Additional data

| Attachment option | Tenax
| UN number | Lithium-ion rechargeable battery (separate): UN 3480, certified to UN 38.3
| A 200 receiver with lithium-ion rechargeable battery: UN 3481

6.1.2 TS 200 carrying rod

Device data

| Dimensions (W x D x H) | 50 x 216 x 702 mm
| Weight | 780 g
| Material | Plastic, aluminium

Features

| Control | Membrane keypad with 2 keys
|         | Capacitive sensor area

Operating conditions

| Operating temperature | -20 °C – +60 °C
| Storage temperature | -25 °C – +50 °C (briefly +60°C)
| Humidity | 15% – 90% r.h., non-condensing
| Protection rating | IP65 (without microphone)
|                  | IP67 (with microphone)
| Non-permitted operating environments | In potentially explosive areas
### Power supply

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Power supply</td>
<td>Lithium-ion rechargeable battery</td>
</tr>
<tr>
<td>Operating time, typical</td>
<td>&gt; 10 h at 23 °C</td>
</tr>
<tr>
<td>Battery capacity</td>
<td>2.2 Ah, 8 Wh</td>
</tr>
<tr>
<td>Battery voltage</td>
<td>3.6 V</td>
</tr>
<tr>
<td>Charging time</td>
<td>&lt; 4 h</td>
</tr>
<tr>
<td>Charging temperature</td>
<td>0 °C – +45 °C</td>
</tr>
<tr>
<td>Charging voltage</td>
<td>12 V</td>
</tr>
<tr>
<td>Charging current</td>
<td>0.6 A</td>
</tr>
<tr>
<td>Charger</td>
<td>AC/DC adapter L for charging in the case</td>
</tr>
</tbody>
</table>

### Data transmission

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Transmission frequency</td>
<td>2.408 – 2.476 GHz, 38 channels</td>
</tr>
<tr>
<td>Radio range</td>
<td>&gt; 2 m</td>
</tr>
<tr>
<td>Transmission bandwidth</td>
<td>0 – 12 kHz</td>
</tr>
<tr>
<td>Communication</td>
<td>SDR (Sewerin Digital Radio)</td>
</tr>
<tr>
<td>Power</td>
<td>10 mW</td>
</tr>
</tbody>
</table>

### Additional data

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>UN number</td>
<td>Lithium-ion rechargeable battery (separate): N 3480, certified to UN 38.3 TS 200 carrying rod with lithium-ion rechargeable battery: UN 3481</td>
</tr>
</tbody>
</table>

### 6.1.3 BM 200 and BM 230 ground microphone

#### Device data

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Dimensions (H × Ø)</td>
<td>BM 200: 178 × 163 mm BM 230: 198 x 149 mm</td>
</tr>
<tr>
<td>Weight</td>
<td>BM 200: 3 kg BM 230: 2.84 kg</td>
</tr>
<tr>
<td>Material</td>
<td>Glass fibre-reinforced polyamide (housing) BM 200: EPDM rubber (base) BM 230: Aluminium (tripod)</td>
</tr>
</tbody>
</table>

#### Operating conditions

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating temperature</td>
<td>-20 °C – +60 °C</td>
</tr>
<tr>
<td>Storage temperature</td>
<td>-25 °C – +70 °C</td>
</tr>
<tr>
<td>Protection rating</td>
<td>IP65 (without TS 200 carrying rod) IP67 (with TS 200 carrying rod)</td>
</tr>
</tbody>
</table>
Non-permitted operating environments | In aggressive media
---|---
| In potentially explosive areas
Normal position of use | Vertical

### 6.1.4 TM 200 touch microphone

**Device data**

<table>
<thead>
<tr>
<th>Dimensions (H × Ø)</th>
<th>155 x 45 mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight</td>
<td>725 g</td>
</tr>
<tr>
<td>Material</td>
<td>Stainless steel</td>
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</table>

**Operating conditions**

<table>
<thead>
<tr>
<th>Operating temperature</th>
<th>-20 °C – +60 °C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Storage temperature</td>
<td>-25 °C – +70 °C</td>
</tr>
<tr>
<td>Protection rating</td>
<td>IP65 (without TS 200 carrying rod) IP67 (with TS 200 carrying rod)</td>
</tr>
<tr>
<td>Non-permitted operating environments</td>
<td>In aggressive media In potentially explosive areas</td>
</tr>
</tbody>
</table>

### 6.1.5 UM 200 universal microphone

**Device data**

<table>
<thead>
<tr>
<th>Dimensions (H × Ø)</th>
<th>123 x 45 mm (without cable)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight</td>
<td>1055 g</td>
</tr>
<tr>
<td>Material</td>
<td>Stainless steel</td>
</tr>
<tr>
<td>Models</td>
<td>2 cable lengths available</td>
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</tbody>
</table>

**Operating conditions**

<table>
<thead>
<tr>
<th>Operating temperature</th>
<th>-20 °C – +80 °C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Storage temperature</td>
<td>-25 °C – +80 °C</td>
</tr>
<tr>
<td>Protection rating</td>
<td>IP68</td>
</tr>
<tr>
<td>Non-permitted operating environments</td>
<td>In aggressive media In potentially explosive areas</td>
</tr>
</tbody>
</table>

**Additional data**

<table>
<thead>
<tr>
<th>Cable length</th>
<th>1.3 m or 2.8 m</th>
</tr>
</thead>
</table>
### 6.2 Symbols on the touch screen of the A 200 receiver

The following tables provide an overview of what the main symbols represent. The symbols can also occur in combination during the program sequence. Many symbols on the touch screen can be displayed in different ways:

- **Coloured symbol**
  - Function enabled, system component connected, etc.
- **Symbol greyed out**
  - Function disabled, system component not connected, etc.

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="Confirm" /></td>
<td>Confirm</td>
</tr>
<tr>
<td><img src="image" alt="Cancel" /></td>
<td>Cancel</td>
</tr>
<tr>
<td><img src="image" alt="Back" /></td>
<td>Back</td>
</tr>
<tr>
<td><img src="image" alt="Scroll" /></td>
<td>Scroll</td>
</tr>
<tr>
<td><img src="image" alt="A 200 receiver" /></td>
<td>A 200 receiver</td>
</tr>
<tr>
<td><img src="image" alt="TS 200 carrying rod" /></td>
<td>TS 200 carrying rod</td>
</tr>
<tr>
<td><img src="image" alt="Microphone" /></td>
<td>Microphone</td>
</tr>
<tr>
<td><img src="image" alt="No microphone connected" /></td>
<td>No microphone connected</td>
</tr>
<tr>
<td><img src="image" alt="Microphone unknown" /></td>
<td>Microphone unknown</td>
</tr>
<tr>
<td><img src="image" alt="BM 200 ground microphone" /></td>
<td>BM 200 ground microphone</td>
</tr>
<tr>
<td><img src="image" alt="BM 230 ground microphone" /></td>
<td>BM 230 ground microphone</td>
</tr>
<tr>
<td><img src="image" alt="TM 200 touch microphone" /></td>
<td>TM 200 touch microphone</td>
</tr>
<tr>
<td><img src="image" alt="UM 200 universal microphone" /></td>
<td>UM 200 universal microphone</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="Rechargeable battery" /></td>
<td>Rechargeable battery</td>
</tr>
<tr>
<td><img src="image" alt="Battery fully charged" /></td>
<td>Battery fully charged</td>
</tr>
<tr>
<td><img src="image" alt="Battery flat" /></td>
<td>Battery flat</td>
</tr>
<tr>
<td><img src="image" alt="Headphones" /></td>
<td>Headphones</td>
</tr>
<tr>
<td><img src="image" alt="Hearing protection threshold low" /></td>
<td>Hearing protection threshold low</td>
</tr>
<tr>
<td><img src="image" alt="Hearing protection threshold high" /></td>
<td>Hearing protection threshold high</td>
</tr>
<tr>
<td><img src="image" alt="Volume" /></td>
<td>Volume</td>
</tr>
<tr>
<td><img src="image" alt="Volume low" /></td>
<td>Volume low</td>
</tr>
<tr>
<td><img src="image" alt="Volume high" /></td>
<td>Volume high</td>
</tr>
<tr>
<td><img src="image" alt="Pipeline location" /></td>
<td>Pipeline location</td>
</tr>
<tr>
<td><img src="image" alt="Leak detection" /></td>
<td>Leak detection</td>
</tr>
<tr>
<td><img src="image" alt="Paved" /></td>
<td>Paved</td>
</tr>
<tr>
<td><img src="image" alt="Unpaved" /></td>
<td>Unpaved</td>
</tr>
<tr>
<td>Symbol</td>
<td>Significance</td>
</tr>
<tr>
<td>--------</td>
<td>-------------------</td>
</tr>
<tr>
<td></td>
<td>Fitting</td>
</tr>
<tr>
<td></td>
<td>Universal</td>
</tr>
<tr>
<td></td>
<td>Scan</td>
</tr>
<tr>
<td></td>
<td>Reset</td>
</tr>
<tr>
<td></td>
<td>Speed</td>
</tr>
<tr>
<td></td>
<td>Filter settings</td>
</tr>
</tbody>
</table>
### 6.3 Significance of LED signals

#### 6.3.1 A 200 receiver

<table>
<thead>
<tr>
<th>Colour</th>
<th>Type of signal</th>
<th>Activation (repeat)</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Green</td>
<td>Light permanently on</td>
<td></td>
<td>• A 200 switched on</td>
</tr>
<tr>
<td></td>
<td>Flashing</td>
<td>0.1 s on &gt; 0.9 s off (ongoing)</td>
<td>• Battery charging</td>
</tr>
<tr>
<td></td>
<td>Double flash</td>
<td>0.1 s on &gt; 0.1 s off &gt; 0.1 s on &gt; 0.7 s off (ongoing)</td>
<td>• Battery is fully charged</td>
</tr>
</tbody>
</table>
| Red    | Light permanently on |                   | • A 200 switched on  
|        | Flashing | 0.1 s on > 0.9 s off (ongoing) | • Error when charging battery (temperature below or above permitted charging temperature) |

Key:
> subsequently
### 6.3.2 TS 200 carrying rod

<table>
<thead>
<tr>
<th>Colour</th>
<th>Type of signal</th>
<th>Activation (repeat)</th>
<th>Significance</th>
</tr>
</thead>
</table>
| Green  | Light permanently on | 0.5 s on > 0.5 s off (ongoing) | - TS 200 switched on  
- Radio connection to A 200 established |
|        | Slow flash       | 0.1 s on > 0.1 s off (1 s long) | - TS 200 switches off |
|        | Flashing         | 0.1 s on > 0.9 s off (ongoing) | - Battery charging |
|        | Double flash     | 0.1 s on > 0.1 s off > 0.1 s on > 0.7 s off (ongoing) | - Battery is fully charged |
| Red    | Light permanently on | 0.5 s on > 0.5 s off (ongoing) | - TS 200 switched on  
- Radio connection to A 200 established  
- Undervoltage: Battery needs charged |
|        | Slow flash       | 0.1 s on > 0.1 s off (ongoing) | - TS 200 switched on  
- No radio connection to A 200  
- Undervoltage: Battery needs charged |
|        | Flashing         | 0.1 s on > 0.9 s off (ongoing) | - Error |
|        | Flashing         | 0.1 s on > 0.9 s off (ongoing) | - Error when charging battery (temperature below or above permitted charging temperature) |

Key:
> subsequently
### 6.4 Suitability of the microphones for the applications

The following table provides an overview of which microphones are suitable for which applications and contact points.

<table>
<thead>
<tr>
<th>Application</th>
<th>Contact point</th>
<th>Microphone</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Leak detection</strong></td>
<td>Paved</td>
<td>BM 200</td>
</tr>
<tr>
<td></td>
<td>Unpaved</td>
<td>BM 230</td>
</tr>
<tr>
<td></td>
<td>Paved</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Unpaved</td>
<td>UM 200</td>
</tr>
<tr>
<td></td>
<td>Paved</td>
<td></td>
</tr>
<tr>
<td><strong>Pipeline location</strong></td>
<td>Paved</td>
<td>BM 200</td>
</tr>
<tr>
<td></td>
<td>Unpaved</td>
<td>BM 230</td>
</tr>
<tr>
<td></td>
<td>Paved</td>
<td>UM 200</td>
</tr>
<tr>
<td><strong>Prelocation</strong></td>
<td>Fitting</td>
<td>TM 200</td>
</tr>
</tbody>
</table>
6.5 Operating the system using the activation key or sensor area

The following table provides an overview of which controls are suitable depending on the microphone.

<table>
<thead>
<tr>
<th>Component</th>
<th>Operated using (on)</th>
<th>Operating mode</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Touch</td>
</tr>
<tr>
<td>BM 200</td>
<td>Activation key (A 200)</td>
<td>+</td>
</tr>
<tr>
<td>BM 230</td>
<td>Sensor area (TS 200)</td>
<td>o</td>
</tr>
<tr>
<td>TM 200</td>
<td>Activation key (A 200)</td>
<td>o</td>
</tr>
<tr>
<td>UM 200</td>
<td>Sensor area (TS 200)</td>
<td>+</td>
</tr>
</tbody>
</table>

Key:
+ operation recommended
o operation possible
6.6 **Accessories**

<table>
<thead>
<tr>
<th>Part</th>
<th>Order number</th>
</tr>
</thead>
<tbody>
<tr>
<td>BM 200 ground microphone</td>
<td>EM24-10000</td>
</tr>
<tr>
<td>BM 230 ground microphone</td>
<td>EM25-10000</td>
</tr>
<tr>
<td>TM 200 touch microphone</td>
<td>EM20-10200</td>
</tr>
<tr>
<td>Probe tip M10 / 350 mm</td>
<td>4000-1213</td>
</tr>
<tr>
<td>Probe tip extension 600</td>
<td>4000-1215</td>
</tr>
<tr>
<td>Probe tip extension 300</td>
<td>4000-1216</td>
</tr>
<tr>
<td>UM 200 universal microphone</td>
<td>EM20-10300</td>
</tr>
<tr>
<td>AQUAPHON A 200 SK4 case</td>
<td>ZD43-10000</td>
</tr>
<tr>
<td>Vario carrying system</td>
<td>3209-0012</td>
</tr>
<tr>
<td>Lap belt carrying system</td>
<td>EA20-Z1000</td>
</tr>
<tr>
<td>Hand loop EA 200</td>
<td>3209-0017</td>
</tr>
<tr>
<td>AC/DC adapter L</td>
<td>LD26-10000</td>
</tr>
<tr>
<td>Vehicle cable L 12 V =</td>
<td>ZL05-10200</td>
</tr>
</tbody>
</table>

Other accessories are available for the system. Please contact our SEWERIN sales department for further information.

6.7 **EC Declaration of Conformity**

Hermann Sewerin GmbH hereby declares that the **A 200** receiver and the **TS 200** carrying rod fulfil the requirements of the following directive:
- 1999/5/EC

The complete declarations of conformity can be found online.

6.8 **Note about the firmware (open source software)**

The firmware is based on open source software. The source code is provided in accordance with the licence terms for this open source software (GPL / LGPL). Hermann Sewerin GmbH stresses that it is not responsible for the source code and it does not form part of the services due.

The source code is available on request at cost price by emailing info@sewerin.com.

The full licence terms can be found online (www.sewerin.com) under Company > Download.
6.9 Advice on disposal

The European Waste Catalogue (EWC) governs the disposal of appliances and accessories.

<table>
<thead>
<tr>
<th>Description of waste</th>
<th>Allocated EWC waste code</th>
</tr>
</thead>
<tbody>
<tr>
<td>Device</td>
<td>16 02 13</td>
</tr>
<tr>
<td>Disposable battery, rechargeable battery</td>
<td>16 06 05 / 20 01 34</td>
</tr>
</tbody>
</table>

End-of-life equipment

Used equipment can be returned to Hermann Sewerin GmbH. We will arrange for the equipment to be disposed of appropriately by certified specialist contractors free of charge.
7 Index

A
Activation keys 9, 28
Application 6
   Menu 30
   Setting 30
Audio player
   Button 13
Automatic power off 11

B
Brightness 33
   Automatic 33

C
Calibration 24, 35
Carrying rod 15
   Fastening screw 15
   Light key 16
   Sensor area 16
Charging the batteries 36
   in the case 36
   using the AC/DC adapter 37
Communication 4
Contact point 6

D
Date 34
Date format 34
Detect position 33
Direct startup 6, 23
Display
   Numerically 10
   Visually 10
Display measurement value 10
Duration 29

F
Filter
   Button 13
Fitting 6
f RMS 27

H
Hearing protection 4, 27

I
Information 35

L
Language 35
Leak detection see Application
LED 9
   Carrying rod 46
   Receiver 45
Light sensor 8

M
Main view 11
MAX 27
Measurement
   Starting 24
   Method 26
Microphone
   Attaching to the carrying rod 20
   Overview 16
MIN 27
Muted 27

O
Operating concept 4

P
Paved 6
Pipeline location see Application
Play back noise 10
Playing back noises 10
Power supply 19

R
Receiver 8
   Carrying the system 10
   Connectors 9
   Ports 9
S
SDR 4
Settings
  Application 30
  Button 14
  Device 31
  Measurement 26
  Menu (overview) 25
Silent 27
Startup with user guide 5, 21
Switch off backlight 32
Switch off device 32
Switch-on mode 5
Switch (operating mode) 28
Symbols 43
System
  Components (overview) 7
  Switching off 18
  Switching on 18, 21

T
Time 34
Time format 35
Timer 28
Touch (operating mode) 28
Touch screen 8
  Calibrating 24
true RMS 27
Type 27

U
Universal 7
Unpaved 6

V
Volume
  Button 12
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