AQUAPHON®

AF 50 receiver

Operating Instructions

AF 50 receiver

Display

Arrow keys
- Up key
- Down key

Activation key

Filter key

Menu key

Enter key

Fastener knobs

Headphone socket

Belt clip

Charging socket

Connection for
microphone/search coil

Fig. 1: Receiver **AF 50** viewed from various angles

AF 50 receiver

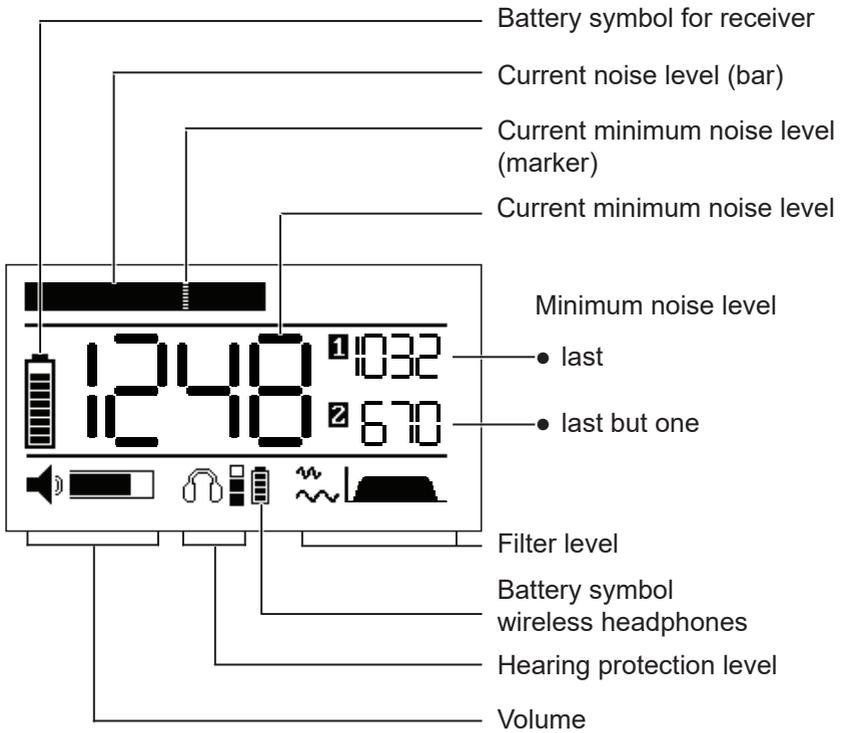Battery symbol for receiver

Current noise level (bar)

Current minimum noise level (marker)

Current minimum noise level

Minimum noise level

● last

● last but one

Filter level

Battery symbol wireless headphones

Hearing protection level

Volume

Fig. 2:   Display with main view during water leak detection

Field strength

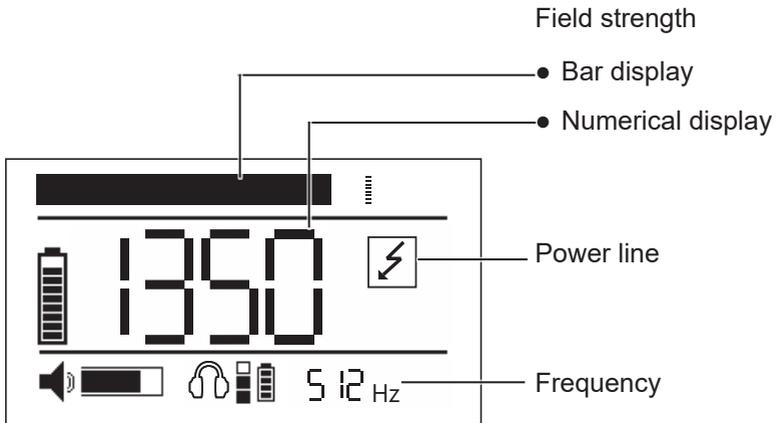● Bar display

● Numerical display

Power line

Frequency

Fig. 3:   Display with main view during pipeline location

Illustration of warnings in this document

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

⚠ **CAUTION!**
Risk of personal injury. Could result in injury or pose a risk to health.

NOTICE!
Risk of damage to property.

1 Introduction

1.1 Information about this document

This document is a component part of the product.

- Read the document before putting the product into operation.
- Keep the document within easy reach.
- Pass this document on to any subsequent owners.
- Unless otherwise specified, the information in this document refers to the product as delivered (factory settings) and applies to all product variants.

Translations

Translations are produced to the best of our knowledge. The original German version is authoritative.

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1.2 Purpose

The **AQUAPHON** system with the **AF 50** receiver is designed for water leak detection and pipeline location, especially in buildings.

The system can be used for:

- Preliminary detection of water leaks in fittings (e.g. hydrant, slide gate)
- Pinpointing water leaks on paved surfaces (e.g. asphalt, concrete, paving, flush-mounted)
- Locating and tracking lines

Note:

These operating instructions describe the functions of the **AF 50** receiver with firmware version 1.xxx.

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 product is suitable for the following uses:

● professional

● industrial

● commercial

The product must only be used for the applications specified in section 1.2.

Note:

The appropriate specialist knowledge is required for using this product.

1.4 Safety information

This product was manufactured in keeping with all binding legal and safety regulations.

The product is safe to operate when used in accordance with the instructions provided. However, when handling the product, there may be risks to persons and property. For this reason, observe the following safety information without fail.

● Observe all the applicable safety standards and accident prevention regulations.

● Use the product only as intended.

● Do not make any changes or modifications to the product unless these have been expressly approved by Hermann Sewerin GmbH.

- Only use accessories and consumables approved by Hermann Sewerin GmbH.
- Always observe the permitted operating and storage temperatures.
- Handle the product carefully and safely, both during transport and when working.
- Always adequately cordon off the work area.
- When you are wearing headphones, you are not fully aware of ambient noise. Be especially vigilant, especially in environments with an increased risk of accident (e.g. road traffic).
- Do not use the product if it is damaged or faulty.
- Protect the ports and sockets against dirt, and electrical ports in particular against moisture.

2 AQUAPHON system

2.1 Acoustic water leak detection

Water leak detection includes preliminary detection and pinpointing. A microphone must be connected to the **AF 50** receiver to be located acoustically with the **AQUAPHON** system. The microphone picks up noises and plays them back through a set of headphones. This means that leak noise can be detected in pipelines.

2.2 Pipe location

An alternating current must flow through a line to be located. The **SK 3** search coil displays the field strength from the **AF 50** receiver and transmits it as an audible signal to the connected headphones.

A distinction is made between the following location techniques:

● Passive
● Active

2.2.1 Passive pipeline location

For lines that are not only energized but also under load, the alternating current required for location is already available. The appropriate receiving frequency can be set at the **AF 50** receiver:

● 50 Hz
● 60 Hz

2.2.2 Active pipeline location

The alternating current is produced using a generator (e.g. generator **FG 50**). The following frequencies can be set at the **AF 50** receiver:

● 512 Hz
● 1.1 kHz
● 9.95 kHz

Display of current-carrying lines

If there is an energized line near the search coil, the receiver will display the **power line** symbol.
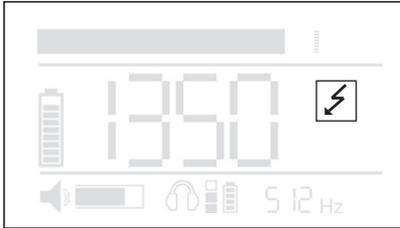
Fig. 4: Display of a current-carrying line (**power line** symbol)

2.3 Hearing protection

The system features a hearing protection function, which protects the user from sudden loud sound interference. Such sound interference can occur, for example, when the user slips off the contact point using a microphone.

Hearing protection is activated when the predefined hearing protection threshold is exceeded. When the noise from the source of interference ceases, hearing protection switches off again automatically.

The way in which hearing protection works depends on the settings (section 4.5 and section 4.6).

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

2.4 System components

2.4.1 Overview

The **AQUAPHON** is a modular system. The main system components are as follows:

- **AF 50** receiver with SDR[1] radio module
- Headphones, e.g.
  - **F8** wireless headphones
  - **K3** headphones (wired)

Additional components for **water leak detection**:
- Microphones, e.g.
  - **UM 50**

Microphones have to be used in conjunction with accessories:
- Probe tips and extensions (available in various lengths)
- **M 10** tripod
- **M 10** contact adapter

Additional components for **pipeline location**:
- **SK 3** search coil

For active pipeline location, the following is also required:
- Generator (e.g. **FG 50** generator)
- **Universal** set of cables

The components of the system can be transported, stored and loaded in the **SK 10** case.

Additional accessories can be added to the system at any time.

Note:
Detailed information about the headphones and the **FG 50** generator can be found in the associated operating instructions.

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[1] Sewerin Digital Radio

2.4.2   AF 50 receiver

2.4.2.1 Setup

For overviews including all part names for the receiver, see the front cover flap (fig. 1).

Keys

The receiver has the following keys:

- Activation key

  Water leak detection:
  For starting and ending a measurement (listening to noises).
  Pipeline location:
  For automatic amplifier adjustment.

- Filter key

  Water leak detection:
  For switching between the main view and the **Filter** view.
  Pipeline location:
  For selecting the receiving frequency.

- Arrow keys

  For adjusting the volume.
  For changing settings and filter limits.

- Menu key

  For switching between the main view and the **Settings** view.

- Enter key

  In the **Filter** and **Settings** views:
  For selecting the variables to be set.

Ports

The receiver has the following connections:

- Charging socket   For charging the rechargeable battery.
  The following can be connected:
  – **M4 AC/DC** adapter
  – **M4** vehicle cable

- Connection for micro- For connecting a microphone or a
  phone/search coil   search coil.
  The following can be connected:
  – **UM 50** universal microphone
  – **SK 3** search coil

- Headphone socket   For connecting the **K3** headphones.

Connectors

The **EA** carrying strap can be attached to the connectors.

2.4.2.2 Display rotation

The orientation of the display can be adjusted to the position in which the receiver is used. If the receiver is rotated through 180° about its longitudinal axis, the display rotates too. This function ensures that the display remains easy to read, regardless of the position in which the receiver is used.

2.4.2.3 Carrying the system

The receiver can be carried as follows when in use:

- worn around the neck (with the **EA** carrying strap)
- clipped to the waistband (with the belt clip)
- held in the hand

2.4.2.4 Activation key

The function of the Activation key varies according to the application.

Water leak detection

The Activation key is used to start and stop measurements. There are two operating modes available for this:

- Hold mode

  The Activation key is held down for the duration of the measurement.

- Toggle mode

  The Activation key is pressed briefly to start the measurement. The Activation key is pressed briefly again to end the measurement.

The operating mode is selected in the settings (section 4.3).

Pipe location

The Activation key activates automatic amplifier adjustment (section 3.5.3).

2.4.3 Display of the results in the main view

The main view on the display differs depending on the application.

Water leak detection

Noise levels are measured during water leak detection. The following noise levels are simultaneously shown on the display (fig. 5):

- Current noise level

  The current noise level is always displayed as soon as the system is ready for use. It is displayed in the form of a black bar.

- Minimum noise level

  The minimum noise level relates to an ongoing or completed measurement.

  − Current minimum noise level

    The current minimum noise level is displayed in the middle of the main view as a numerical value and as a marker in the bar.

− Previous minimum noise level

When a measurement has been completed, what was until then the current minimum noise level is displayed as the last minimum noise level next to [1].

− Last but one minimum noise level

When the next measurement has been completed, the last minimum noise level becomes the last but one minimum noise level and is displayed next to [2].
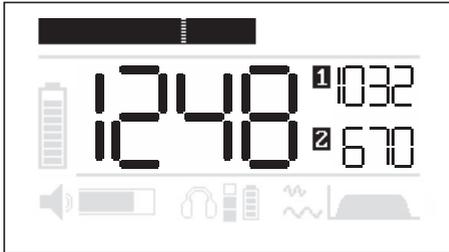
Fig. 5:   Graphical and numerical noise level display for water leak detection
Top: current noise level (bar) and
                current minimum noise level (marker in bar)
Middle: current minimum noise level (here: 1248)
Right: [1] previous minimum noise level (here: 1032) and
                [2] last but one minimum noise level (here: 670)

Pipe location

During pipe location the strength of electromagnetic fields is measured. The field strength measured is displayed on the display both numerically and as a bar.

Fig. 6:   Chart and numerical display of the field strength during pipe location
Top: bar display
Middle: numerical display (*here:* 1350)

2.4.4 Power supply

The **A 50** receiver is powered by a special, permanently installed lithium ion rechargeable battery.

NOTICE! Reduced battery life when not in use

The battery in the receiver can discharge (self-discharge) even when the receiver is not in use.

● You should charge the battery at least once every 6 months.

Information about charging the rechargeable battery can be found in section 5.1.

NOTICE! Risk of damage when changing the lithium ion battery

There are parts in the receiver that can be damaged mechanically or by electrostatic discharge when changing the battery.

● Only SEWERIN service personnel or other authorised specialists may replace the lithium ion rechargeable battery.

WARNING! Risk of explosion due to short-circuit

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

● Components containing faulty lithium ion batteries must not be shipped.

2.4.5   UM 50 universal microphone

The **UM 50** universal microphone can be used for both preliminary detection and pinpointing.

The **UM 50** universal microphone has a permanently attached cable which is used to connect it to the receiver.

Fig. 7:   **UM 50** universal microphone with microphone protector

The following accessories are available for the **UM 50** universal microphone:

- Probe tip, usually with extensions
- **M 10** tripod
- **M 10** contact adapter

⚠ **CAUTION!**
The **UM 10** contact adapter for the **UM 50** universal microphone contains a strong magnet.
- Keep the contact adapter away from magnetic storage media (e.g. hard drives, credit cards) and medical devices (e.g. pacemakers, insulin pumps).

Microphone protector

A rubbered casing is available to protect the **UM 50** universal microphone from external damage. The microphone protection can be purchased as an accessory.

2.4.6 SK 3 search coil

The **SK 3** search coil is used for pipe location. The **SK 3** search coil has a permanently attached cable which is used to connect it to the **AF 50** receiver.

Fig. 8:   **SK 3** search coil

2.5 Differences between applications when locating

The behaviour of the receiver when locating varies according to the application.

Water leak detection

As soon as a microphone is connected, the receiver automatically switches to water leak detection. To listen to noises, you must start a measurement. During the measurement, the current noise level is displayed both numerically and as a bar as well as various minimum noise levels.

Pipe location

As soon as a search coil is connected, the receiver automatically switches to pipe location and performs permanent measurement. The field strength is displayed on the display both numerically and as a bar.

A signal that varies in pitch depending on the field strength is transmitted to the connected headphones.

3 Using the system

3.1 Preparing the system

Accessories must be selected depending on the intended application.

Water leak detection

A microphone must be selected and prepared for the intended use. The microphone can only be used in conjunction with screwed-on accessories.

● Attach the appropriate accessories to the microphone.

Pipe location

The **SK 3** search coil must be used for pipe location. There are no other accessories attached to the search coil.

3.2 Starting up the system

To start up the system, perform the following steps in any order:

● Connect the microphone or search coil.
● Connect the headphones.

3.2.1 Connecting the microphone or search coil

The receiver switches on as soon as a microphone or the **SK 3** search coil is connected.

● Insert the plug of the microphone or search coil into the receiver connection.

  The receiver switches on. A start screen appears briefly on the display. The main view then appears.

3.2.2 Connecting headphones

3.2.2.1 F8 wireless headphones

The **A 50** receiver automatically detects the **F8** wireless headphones when they are within range.

● Switch on the headphones.

Once connected, the small battery symbol for the wireless headphones will appear in the main view.
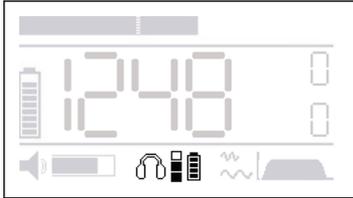

Fig. 9: **F8** wireless headphones ready for use
(battery symbol for wireless headphones visible)

3.2.2.2 K3 headphones

The **K3** headphones are connected to the receiver by cable.

1. Use the **K3** headphones only with the 3.5 mm phone jack. Remove the adapter (6.3 mm) from the phone jack if necessary.

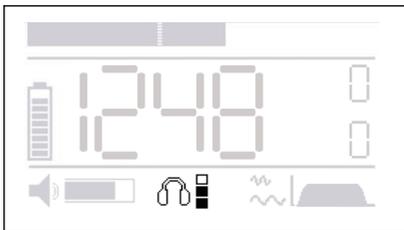2. Plug the phone jack into the headphone socket on the receiver.

Fig. 10: **K3** headphones ready for use

3.3   Adjusting the volume

The volume determines the loudness for the playback of noises via the headphones.

Any change can be heard immediately through the headphones.

⚠ **CAUTION! Health hazard**
Excessive noise can damage the hearing and lead to ir-reversible damage to health.
- Always adjust the volume to the current situation.
- Choose as low a volume as possible.

The volume of the headphones is controlled at the receiver.

The main view is open.
- Press the Down key to lower the volume.
- Press the Up key to increase the volume.

Information about hearing protection and hearing protection thresholds can be found in section 4.5 and section 4.6.

3.4   Performing water leak detection

3.4.1   Starting and ending a measurement

Measurements are started and ended using the Activation key. How the Activation key is used depends on the selected operating mode.

Information about the operating modes can be found in section 2.4.2.4.

The system is ready for use. The display shows the main view. The headphones symbol is crossed out (fig. 11).
- Use the Activation key to start and end a measurement, according to the selected operating mode.

As long as a measurement is running, noises can be heard via the headphones. The headphones symbol is not crossed out.
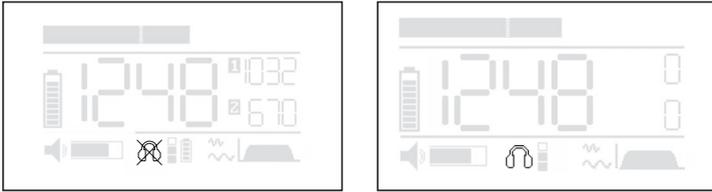
Fig. 11: Headphones symbol when the system is ready for use
Left-hand figure: symbol crossed out, i.e. no measurement in progress or hearing protection threshold exceeded during a measurement
Right-hand figure: symbol not crossed out, i.e. measurement ongoing

If the headphones symbol is crossed out during a measurement ...

● The hearing protection threshold has been exceeded during the measurement. As soon as the noise level falls below the hearing-protection threshold again, the symbol appears without a cross through it.

● No measurement is in progress because the measurement was not started correctly. Check the operating mode setting for the Activation key. Did you operate the Activation key correctly?

3.4.2 Adjusting the filter

Interference frequencies are filtered out by the filters.

The following filters can be adjusted:

● Bandpass

● Notch filter

3.4.2.1 Adjusting the bandpass

The bandpass filter limits can be set to filter out interference frequencies in the upper or lower frequency range. Any change to the filter limits can be heard immediately through the headphones.

Various filter limits are available for adjusting the bandpass. The bandpass must be at least 300 Hz wide.

Information about the available filter limits can be found in section 6.2.1.1.

3.4.2.2 Activating the notch filter

When the notch filter is activated, the mains frequency (50 Hz or 60 Hz) is filtered out. This eliminates the influence of current-carrying lines on the noise.
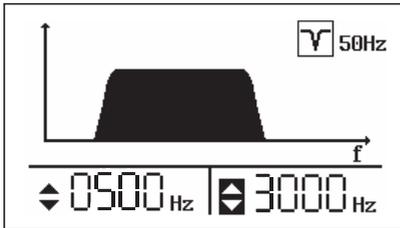

Fig. 12: **Filter** view
Top right: notch filter (*here:* 50 Hz)
Bottom left: lower filter limit (*here:* 500 Hz)
Bottom right: upper filter limit (*here:* 3000 Hz)
The symbol for the upper filter limit is inverted, which means that this filter limit can be adjusted.

The main view is open.

1. Press the Filter key. The **Filter** view appears.

2. Change the settings.

   a) Keep pressing the Enter key until the symbol in front of the filter you wish to change is inverted.

   b) For the filter limits:

      − Press the Up key to increase the value.

      − Press the Down key to lower the value.

      For the notch filter:

      − Press one of the arrow keys to change the setting.

3. Press the Filter key to apply the settings. The receiver will switch back to the main view.

3.5 Performing pipe location

Note:
The **AF 50** receiver continuously measures pipe location as soon as a search coil is connected.

3.5.1 Setting the frequency

The receiving frequency must correspond to the frequency of the energized line.

● Keep pressing the Filter key until the receiving frequency corresponds to the transmitting frequency of the generator.

3.5.2 Using the maximum or the minimum method

The signal curve near a line depends on the orientation of the search coil to the line. Lines can be located using the maximum or the minimum method.
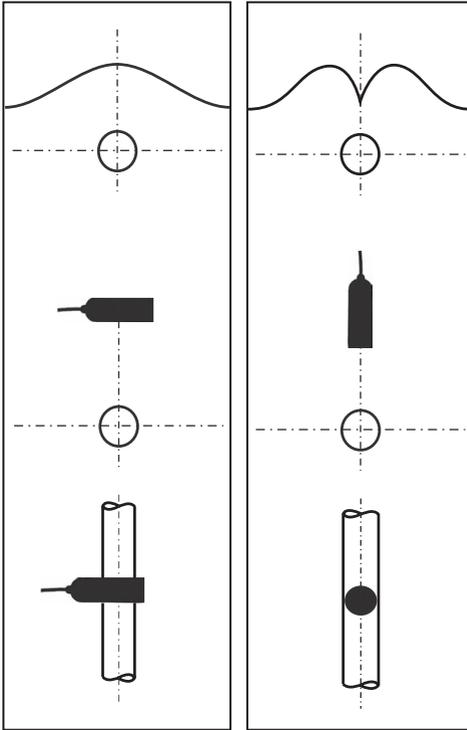
Fig. 13: Signal curve (above) and orientation of the **SK 3** search coil over a line
Left-hand figure: maximum method
Right-hand figure: minimum method

maximum method

The field strength steadily increases when the coil approaches the line and reaches the maximum level when directly above it. The maximum method is well suited to preliminary detection.

To use the maximum method:

● Hold the **SK 3** search coil as fig. 13 shown in the left-hand figure.

minimum method

The field strength initially increases significantly when the coil approaches the line. Directly over the line it is minimal. The minimum method is well suited to precise location and pipe analysis.

To use the maximum method:

● Hold the **SK 3** search coil as fig. 13 shown in the right-hand figure.

3.5.3 Applying automatic amplifier adjustment

Automatic amplifier adjustment allows display of the signal strength to be adjusted to local conditions during location.

Amplifier adjustment is always advisable when location is not clear due to the signal strength being too low or too high. Amplifier adjustment results in weak signals being amplified and strong signals being reduced.
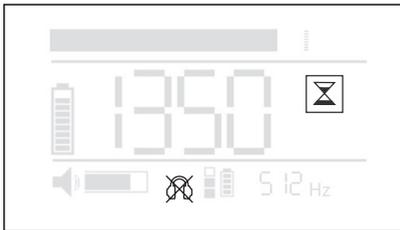

Fig. 14: Display during automatic amplifier adjustment
　　　　Right:　　symbol **Wait**
　　　　Bottom:　symbol for headphones crossed out

The receiver is switched on and the **SK 3** search coil is connected. For automatic amplifier adjustment use the maximum method (section 3.5.2).

1. Keep the search coil still.

2. Briefly press the Activation key to activate automatic amplifier adjustment. The **Wait** symbol appears.

3. Wait until the **Wait** symbol disappears.

   The display is optimised.

3.6 Switching off the system

The system is switched off as follows:

● Disconnect the microphone or search coil from the receiver. To do this, pull the phone jack out of the connection at the **AF 50** receiver. The receiver switches off.

4 Settings

4.1 Overview

The receiver operating mode, the type of hearing protection and the hearing protection threshold can be configured individually.

The individual settings are permanently saved until the next change. The factory settings can be restored at any time.

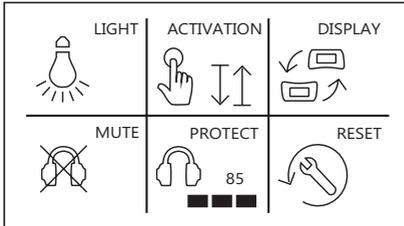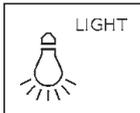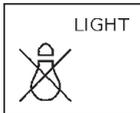The settings are changed in the **Settings** view.

Fig. 15: Settings **view**

4.2 Backlight (LIGHT)

The receiver display features a backlight.

  Backlight activated

  Backlight deactivated

Changing the LIGHT setting

The system is ready for use. The display shows the main view.

1. Press the Menu key. The **Settings** view appears.
2. Keep pressing the Enter key until **LIGHT** is inverted.

3. Change the setting.
   − Press the Down key to deactivate the function.
   − Press the Up key to activate the function.
4. Press the Menu key to apply the settings. The receiver will switch back to the main view.

4.3 Operating mode (ACTIVATION)

There is a choice of two operating modes for the Activation key.

 Hold mode

 Toggle mode

Information about the operating modes can be found in section 2.4.2.4.
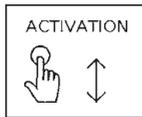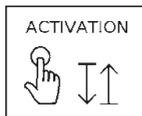
Changing the ACTIVATION setting

The system is ready for use. The display shows the main view.
1. Press the Menu key. The **Settings** view appears.
2. Keep pressing the Enter key until **ACTIVATION** is inverted.
3. Change the setting.
   − Press the Down key to activate Toggle mode.
   − Press the Up key to activate Hold mode.
4. Press the Menu key to apply the settings. The receiver will switch back to the main view.

4.4   Display rotation (DISPLAY)

If the receiver is rotated through 180° about its longitudinal axis, the display follows the movement.

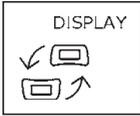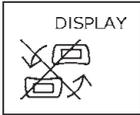 Display rotation activated

  Display rotation deactivated

Changing the DISPLAY setting

The system is ready for use. The display shows the main view.

1. Press the Menu key. The **Settings** view appears.
2. Keep pressing the Enter key until **DISPLAY** is inverted.
3. Change the setting.
   − Press the Down key to deactivate the function.
   − Press the Up key to activate the function.
4. Press the Menu key to apply the settings. The receiver will switch back to the main view.

4.5   Hearing protection (MUTE)

The hearing protection function determines whether noises above the hearing protection threshold can be listened to via the headphones.
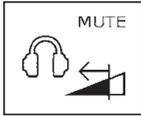
 Listen to muted noise

 Do not listen to noise

Changing the MUTE settings

The system is ready for use. The display shows the main view.

1. Press the Menu key. The **Settings** view appears.
2. Keep pressing the Enter key until **MUTE** is inverted.
3. Change the setting.
   − Press the Down key to listen to muted noise.
   − Press the Up key to choose not to listen to the noise.
4. Press the Menu key to apply the settings. The receiver will switch back to the main view.

4.6   Hearing protection threshold (PROTECT)

The hearing protection threshold is the volume limit above which hearing-protection is activated.

 Hearing protection threshold (*here:* level 4)

The hearing protection threshold can be set to four levels.

Level	Display	Protective effect	Hearing protection threshold
1	□□□	none	—
2	■□□	low	approx. 105 dB
3	■■□	medium	approx. 95 dB
4	■■■	high	approx. 85 dB

Changing the PROTECT setting

⚠ **CAUTION! Health hazard**
Excessive noise can damage the hearing and lead to ir-reversible damage to health.
This risk also applies to sudden loud sound interference. If the hearing protection threshold is set very high, hearing protection will only activate with very loud noises. This means that there is little protection for the hearing.
● Always adjust the hearing protection threshold to the current situation.
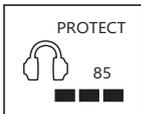● Set the hearing protection threshold as low as possible.

The system is ready for use. The display shows the main view.

1. Press the Menu key.

   The **Settings** view appears.

2. Keep pressing the Enter key until **PROTECT** is inverted.

3. Change the setting.

   − Press the Down key to select a lower hearing protection threshold.

   − Press the Up key to select a higher hearing protection threshold.

   SEWERIN recommends pressing the Activation key to hear the effect of the change on the noise playback.

4. Press the Menu key to apply the settings. The receiver will switch back to the main view.

4.7 Factory settings (RESET)

This function restores all individual settings to the factory settings. Factory settings are the settings with which the receiver was supplied to the customer.
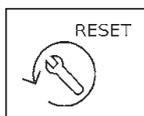
 Restoring settings to factory settings

An overview of the factory settings can be found in Sect. 6.2.

Restoring settings to factory settings

Note:
The settings are reset immediately and with no further warning.

The system is ready for use. The display shows the main view.

1. Press the Menu key. The **Settings** view appears.
2. Keep pressing the Enter key until **RESET** is inverted.
3. Press one of the arrow keys. All settings are restored to the factory settings.
4. Wait until the main view appears again.

5 Maintenance

5.1 Charging the batteries

The batteries for the following components must be recharged when necessary:

- **AF 50** receiver
- **F8** headphones
- **FG 50** generator

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 of the components simultaneously in the **SK 10** 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 **SK 10** case. The case is connected to the power supply using the **L** AC/DC adapter or the **L** vehicle cable.

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

The connection cable for the components can be found in the case. There is a connection socket on the outside of the case for connecting to the power supply.

Fig. 16: **SK 10** case
White circles: connection cable
Black arrow: connection socket (on the outside)

1. Place the components in the dedicated spaces in the case.

2. Connect the components using the connection cables.

3. Connect the case to the power supply using the **L** AC/DC adapter or the **L** vehicle cable. Charging starts automatically.

The charging process is complete after less than 6 hours.

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

The components are connected directly to the power supply for charging using the **M4** AC/DC adapter or the **M4** vehicle cable. Each component is charged individually.
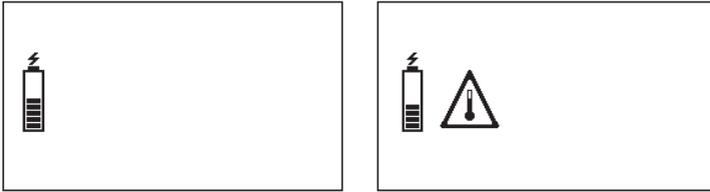
Fig. 17: Receiver display during charging
    Left-hand figure: standard charging
    Right-hand figure: warning if the temperature is outside the
                        permitted range

The **M4** AC/DC adapter and the **M4** vehicle cable are available to buy as accessories.

5.2 Handling faulty lithium ion rechargeable batteries

Lithium ion batteries are always classed as dangerous goods for transport purposes.

The transportation of faulty lithium ion batteries is only permitted under certain conditions (e.g. must not be transported as air freight). Where transportation is permitted (e.g. by road or rail), it is subject to strict regulations. Faulty lithium ion batteries must therefore always be removed before shipping. Transportation by road or rail must occur in compliance with the current applicable version of the ADR[1] regulations.

NOTICE! Risk of damage when opening housing
When opening the housing, components can be damaged mechanically or by electrostatic discharge.
● The lithium on battery may only be removed if you have legitimate grounds to suspect that the battery may be defective.
● Only SEWERIN Service personnel or an authorized specialist may replace rechargeable batteries.

_____
[1] French abbreviation for: Accord européen relatif au transport international des marchandises Dangereuses par Route, *Engl.: European Agreement concerning the International Carriage of Dangerous Goods by Road

5.2.1 Identifying faulty batteries

A lithium ion battery is considered to be faulty if one of the following criteria applies:[2]

- Housing damaged or badly deformed
- Liquid leaking from battery
- Smell of gas from battery
- Rise in temperature with the receiver switched off (more than hand-hot)
- Plastic parts melted or deformed
- Connection leads melted

5.2.2 Removing the battery from the receiver

The battery is located inside the device.

NOTICE! Risk of damage

There are parts in the receiver that may be damaged mechanically or by electrostatic discharge when removing the battery.

- It is essential to read section 5.2 and section 5.2.1 before removing the battery.
- Avoid electrostatic discharges at all costs, e.g. by using an ESD workstation.

The receiver must be switched off.

1. Undo the four screws on the bottom section of the housing.
2. Carefully lift off the bottom section of the housing.
3. Disconnect the electrical supply to the faulty battery by carefully removing the white plug on the circuit board.
4. The battery is fixed in place in the bottom section of the housing by means of a retaining plate. Loosen the three screws on the retaining plate.
5. Remove the battery.

---

[2] According to: EPTA – European Power Tool Association

6. Screw down the retaining plate again.

7. Screw the bottom section of the housing to the top section again.

5.3 Care

All that is necessary to service the **AF 50** receiver is to wipe it down with a camp cloth.

NOTICE! Risk of damage

The display surface of the **A 50** receiver is sensitive to mechanical and chemical stress.

● Always use a clean, soft cloth to clean the display surface.
● Never use cleaning agents containing aggressive constituents (e.g. acidic or abrasive constituents) to clean the display surface.

SEWERIN recommends Always remove significant contamination immediately.

5.4 Servicing

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

6   Appendix

6.1   Technical data

6.1.1   AF 50 receiver

Device data

Dimensions (W × D × H)	115 × 65 × 114 mm
Weight	0.4 kg
Material	polycarbonate (housing)

Certificate

Certificates	FCC, CE, IC, MIC

Features

Display	2" FSTN display (240 × 128 pixels, LED backlight)
Processor	DSP 16 bit
Operation	membrane keypad with 5 keys 1 activation key

Operating conditions

Operating temperature	-20 – 50 °C
Storage temperature	-25 – 50 °C
Humidity	15 – 90% r.h., non-condensing
Protection rating	IP65
Non-permitted operating environments	in potentially explosive areas

Power supply

Power supply	lithium ion battery (rechargeable) [1357-0002], built-in
Operating time, typical	> 20 h
Battery power	24 Wh
Charging time	< 6 h
Charging temperature	0 – 40 °C
Charging voltage	12 V
Charging current	0.6 A
Charger	M4 AC/DC adapter

Measurement

Filter	bandpass, adjustable filter limits:
	– lower filter limit: 0/30/60/120/250/500 Hz
	– upper filter limit:
	   300/500/850/1000/1250/1500/2000/3000/
	   4000/8000 Hz
	notch filter:
	– 50 Hz, 60 Hz, off
	locating mode with SK 3:
	– 50/60/512/1100/9950 Hz

Sampling rate	16 bit, 48 kHz
Indication range	0 – 1999 digits

Data transmission

Transmission frequency	2.408 – 2.476 GHz, 38 channels
Radio range	> 2 m
Transmission bandwidth	0 – 12 kHz
Communication	depending on the headphones used – F8 wireless headphones: SDR (Sewerin Digital Radio) – K3 headphones: by cable
Power	10 mW

Additional data

Transport	SK 10 case
Shipping instructions	UN 3481: lithium ion batteries contained in equipment or lithium ion batteries packed with equipment net weight of battery/batteries: 0.098 kg

6.1.2   UM 50 universal microphone

Device data

Dimensions (H × Ø)	90 × 29 mm (excluding cable)
Weight	330 g
Material	stainless steel

Features

Interface	phone jack 6.3 mm, straight

Operating conditions

Operating temperature	-20 – 70 °C
Storage temperature	-20 – 70 °C
Protection rating	IP68
Permitted operating environments	outdoors, in building
Non-permitted operating environments	in aggressive media in potentially explosive areas

Power supply

Power supply	external

Locating

Sensitivity	5.5 V/g without filter and amplification (at 1 kHz)

Additional data

Cable length	1.3 m or 2.8 m

6.2 A 50 receiver

6.2.1 Adjustable filters

6.2.1.1 Bandpass

Various filter limits are available for adjusting the bandpass. The bandpass must be at least 300 Hz wide.

Lower filter limit
0 Hz
30 Hz
60 Hz
120 Hz
250 Hz
500 Hz

Upper filter limit
300 Hz
500 Hz
850 Hz
1000 Hz
1250 Hz
1500 Hz
2000 Hz
3000 Hz
4000 Hz
8000 Hz

6.2.1.2 Notch filter

The notch filter can be set as follows:

Symbol	Notch filter
⋁ 50Hz	50 Hz
⋁ 60Hz	60 Hz
⋁ OFF	deactivated

6.2.2 Factory settings

The receiver is supplied with the following default settings:
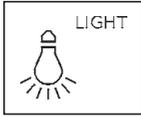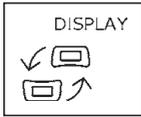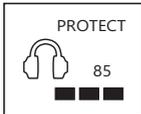
LIGHT	Backlight activated
ACTIVATION	Hold mode
DISPLAY	Display rotation activated
MUTE	Do not listen to noise
PROTECT 85	Hearing protection threshold: level 4

Bandpass

Lower filter limit		Upper filter limit
0 Hz		4000 Hz

Notch filter

Symbol	Notch filter
OFF	deactivated

The receiver can be restored to its factory settings at any time in the **Settings** under **RESET**.

6.3   Accessories

Part	Order number
EM 30 microphone protector	EM30-Z0600
UM 50 carrying clip	UM50-Z0200
Probe tip M10 / 100 mm	4000-1271
Probe tip M10 / 350 mm	4000-1213
Probe tip extension M10 / 300 mm	4000-1216
EM 20 contact adapter	EM20-Z1000
M 10 tripod	4000-0966
AC/DC adapter L 12 V	LD26-10000
Vehicle cable L 12 V	ZL05-10200
SK 10 case	ZD63-10000

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

6.4   Declarations of conformity

Hermann Sewerin GmbH hereby declares that the **A 50** receiver fulfils the requirements of the following directive:

● **2014/53/EU**

The complete declarations of conformity can be found online.

6.5   Advice on disposal

The European Waste Catalogue (EWC) governs the disposal of appliances and accessories in accordance with EU Directive 2014/955/EU.

Waste	EWC code
Device	16 02 13
Disposable battery, rechargeable battery	16 06 05 / 20 01 34

Alternatively, used equipment can be returned to Hermann Sewerin GmbH.

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