

# MD200

# EN

**OPERATING MANUAL**  
MAGNETOMETER



 **TROTEC**  
AT WORK.

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 The measuring device at hand was built according to current state-of-the-art technology and fulfils valid European and national directives. The conformity has been demonstrated. The corresponding declarations and documents are kept on file by the manufacturer. To keep this condition and ensure safe operation, as a user, you must observe the following safety instructions!

**01 Safety**

We accept no liability for damages caused by non-observance of this manual or unprofessional handling. Any warranty claims are voided in such cases!

**▲ Prior to using the MD200, this operating manual is to be carefully read and observed in every particular.**

For reasons of safety and conformity (CE), any unauthorised change made to the device construction or components which are to be used with the measuring device are prohibited!

- The MD200 is a solely ferromagnetic metal detector. Objects made of other metals cannot be detected with it. **Note: You can use a magnet to check whether the object is ferromagnetic! If the magnet attracts the object, it is ferromagnetic. If the magnet does not attract the object, then it is not ferromagnetic!**
- Observe the storage and operating conditions!
- Never use the rod of the metal detector for digging!
- Remove all magnetic objects the device might react to (e.g. steel-toed safety boots). These could affect the measurement.  
Devices with electromagnetic radiation, such as mobile phones, might also influence a measurement.

- The only party responsible for determining measured results to be valid, drawing conclusions and deriving actions is the user! The correctness of the results presented is excluded from any liability or guarantee. Liability for damages which have been caused by utilising the presented measured results is strictly excluded.

**02 Intended use**

The MD200 serves the purpose of detecting concealed metal (ferromagnetic) objects. The device may only be used for this intended use while complying with the specified technical data! In addition the device detects live wires with 50/60 Hz, visualized by the indication "50 Hz" on the display. If a live wire is detected while searching an object, the crossed lines will "disappear" from the "50 Hz" display. This is to protect the user from health hazards. Moreover, no live wire is to be damaged.

Attention! The device was **not** specifically designed for locating live wires. Under certain conditions it may not be able to detect these. The 50 Hz function is therefore only intended for orientation and not the determination of valid results!

**03 Scope of delivery and overview**

**3.1 Scope of delivery**

Consignment consisting of:

MD200 detector

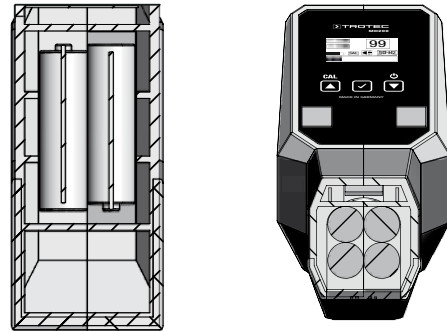


MD200 soft carrying case incl. 4 x AA batteries and operating manual



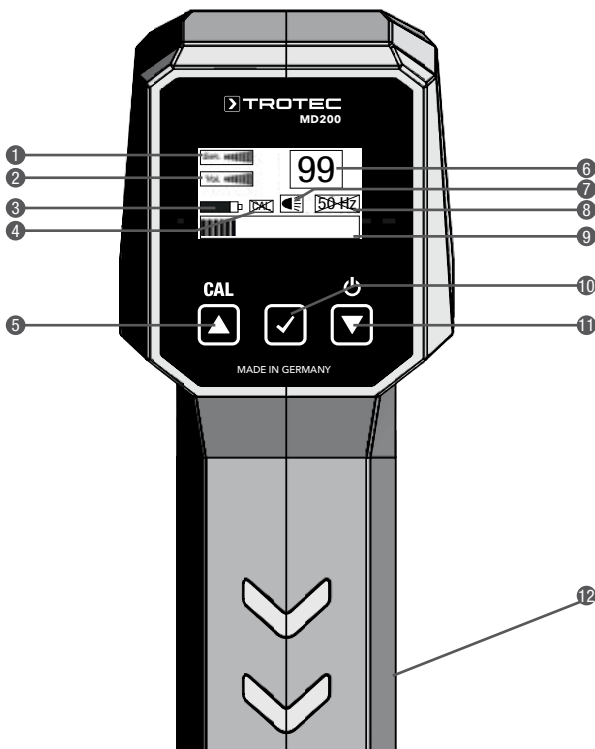
### 3.3 Battery compartment

The battery compartment can easily be opened by use of a coin or another pointed tool (screw driver, knife).



The holder for 4x AA batteries can completely be removed from the compartment. Hence, the batteries can be changed unproblematically.

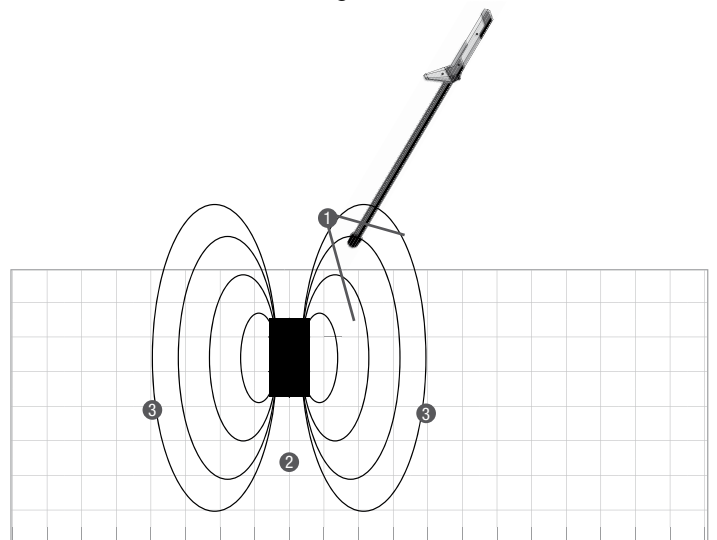
### 3.2 Display and operating functions



- ① sensitivity
- ② volume
- ③ battery status
- ④ calibration
- ⑤ + key (Up) and Erase function
- ⑥ numeric signal strength display
- ⑦ display illumination
- ⑧ "50 Hz" indication
- ⑨ graphic signal strength display
- ⑩ menu selection and confirmation key
- ⑪ - key (Down) and On/Off function
- ⑫ speaker

### 04 Introduction, theory of object detection

The MD200 locates ferromagnetic objects by detecting their influence on the Earth's magnetic field. The sensor rod comprises two "Fluxgate" sensors ① continuously measuring the Earth's magnetic field at a certain distance and exact angle to one another. If the Earth's magnetic field is undisturbed, the flux lines are running parallel and both sensors measure the same signal. If there is a ferromagnetic object ② buried in the ground, this object influences the Earth's magnetic field and deflects the flux lines ③. This deflection is more apparent in the lower Fluxgate sensor than in the upper one, which leads to a deviation of the electrical signal and can be measured.

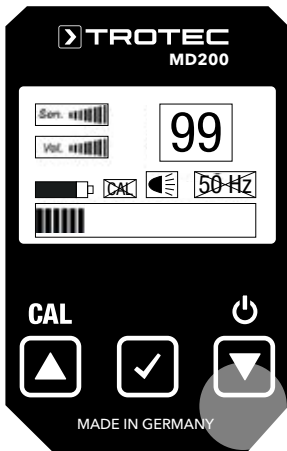


The bigger the object and the closer you are to it, the more noticeable the deflection.

**05 Start-up and application**

Described below are the keys and their function.

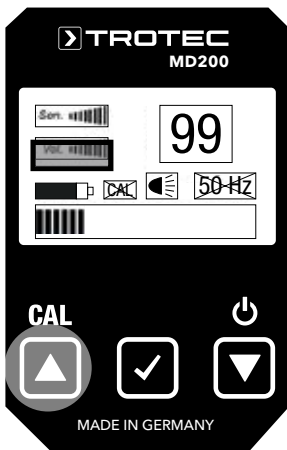
**Switch-on**



briefly

To switch on the device, briefly press the Down key until the display switches on.

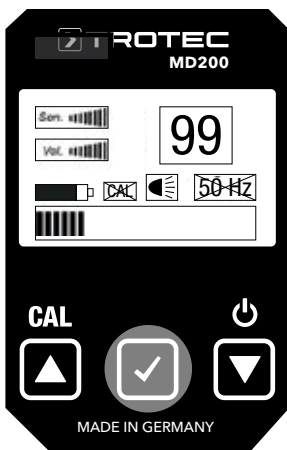
**Menu sensitivity adjustment**



briefly

If the menu item “sensitivity” is activated (Sen black inverted), you can adjust the sensitivity by briefly pressing the Up or Down key.

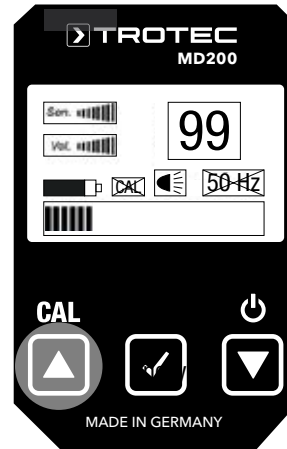
**Menu sensitivity confirmation**



Pressing the “confirmation key” again confirms the

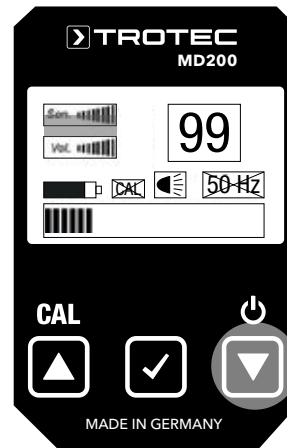
presently set sensitivity. The volume can be adjusted analogous to the sensitivity!

**Menu scrolling**



briefly

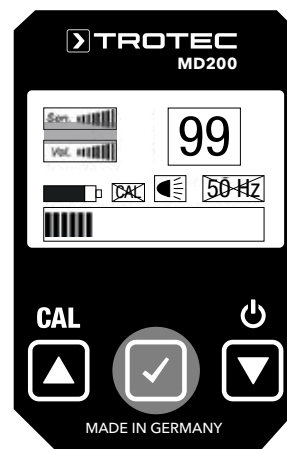
or



briefly

By briefly pressing the Up or Down key you can scroll through the menu (the respectively selected submenu will be edged in bold black).

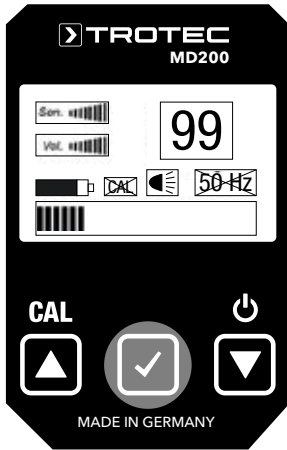
**Menu selection**



briefly

Actuation of the "confirmation key" activates the selected submenu. It will be displayed in black inverted.

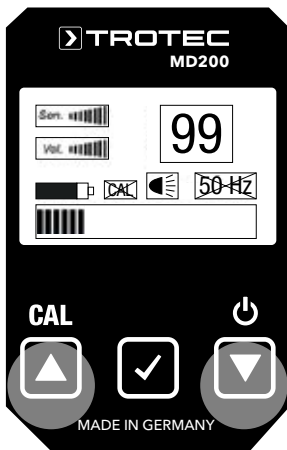
**Menu switching on the illumination**



briefly

If the menu item "illumination" is activated, you can switch the illumination on or off by briefly pressing the "confirmation key".

**Menu display rotation**



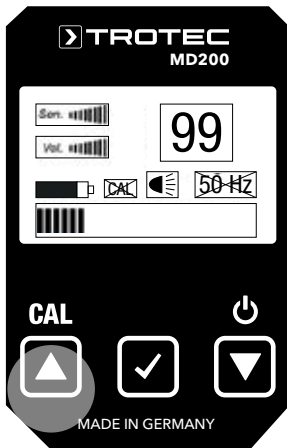
1. briefly

2. briefly

press simultaneously

If no submenu is selected, the display can be rotated by 180° by means of simultaneous actuation of the "Up" and "Down" keys.

**Menu calibration (Erase function)**



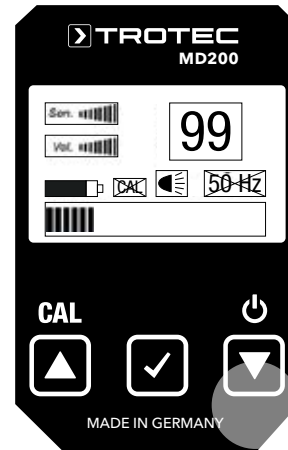
3-4 seconds

Press the "Up key" for approx. 3 to 4 seconds. Two acoustic signals can be perceived and calibration is activated. The

crossed lines disappear from the "CAL" box in the display. The present ferromagnetic basic signal is "cut" and the measuring detectors only react to signals stronger than the basic signal. With activated CAL menu you can carry out a calibration any number of times.

Press and hold the "Up key" for approx. 7 s to exit "CAL" mode again. Three acoustic signals can be perceived and "CAL" is disabled again.

**Switch-off**



3-4 seconds

Pressing the "Down key" for approx. 3-4 seconds switches the device off.

**06. Visual and acoustic object localization**

**Preliminary observations**

A successful detection of ferromagnetic metals much depends on the surroundings and the material of the object to be located. Accordingly please ensure that you carry no magnetic objects on your body and that there are no devices or appliances radiating within the electromagnetic wavelength spectrum in the immediate vicinity.

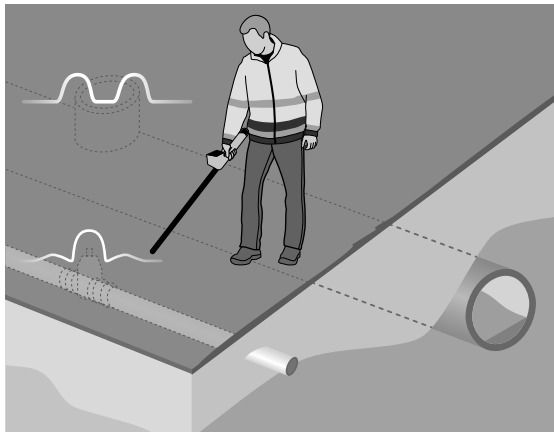
Safety boots or mobile phones, for instance, can have a negative effect on the sensors of the MD200.

Also observe, that non-magnetic metal objects such as beverage cans (aluminium) or crown caps cannot be detected, for these are generally not made of ferromagnetic metals.

**Measuring procedure**

Pick a starting point for the measurement, which preferably does not feature any ferromagnetic parts in the immediate vicinity (e.g. fence).

As part of the next working step switch on the MD200, hold the metal detector in a comfortable position (approx. 20° to 40° to the surface) and slowly oscillate the measuring device from side to side (see fig.). If the sound is enabled (Vol. display), a signal will be audible.



Then, in the next step, check the sensitivity indication on the display. Should it not set to maximum mode, adjust the sensitivity accordingly. If then the numeric signal strength lights up displaying number 99, the sensitivity is set too high. Successful object detection cannot be effected, since the signal of the object to be located is superimposed by foreign object signals. It is also possible that you are positioned directly above a ferromagnetic object.

Change the starting position or gradually down-regulate the sensitivity (Sens. indication) until the numeric signal strength is displayed with approx. 6 to 12.

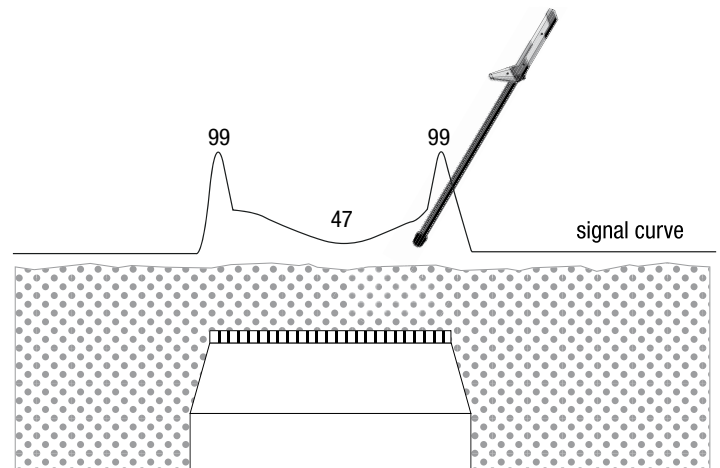
**Note:** If the maximum signal strength of 99 continues to be illuminated despite the changed position or reduced sensitivity, you can also press the CAL button at the MD200 for approx. 3 seconds. The present ferromagnetic basic signal is "cut" and the measuring detector only reacts to signals stronger than the basic signal.

In this basic mode you may now pace the test area, observe the numeric signal strength and possibly the acoustic signal. If the interval between the acoustic signals grows shorter and the numeric signal strength increases, you are approaching a ferromagnetic object.

Listed below are typical objects and their signal curves.

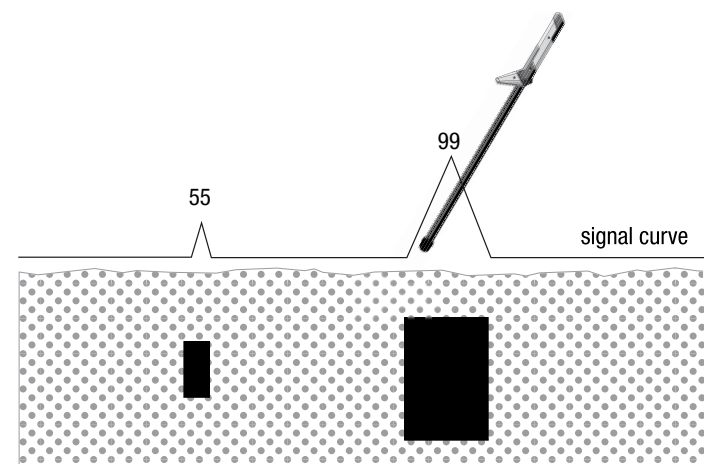
**Manhole covers**

The rim of the manhole cover causes the highest signal deflection. The cover's centre can be located by swinging the metal detector back and forth. The centre is the position with the smallest deflection.



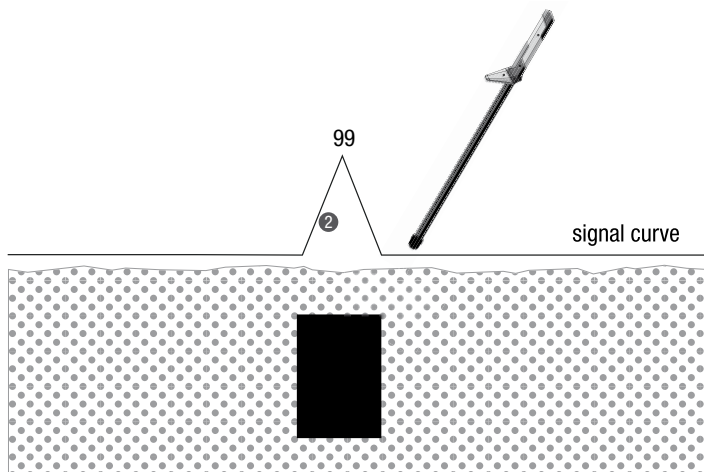
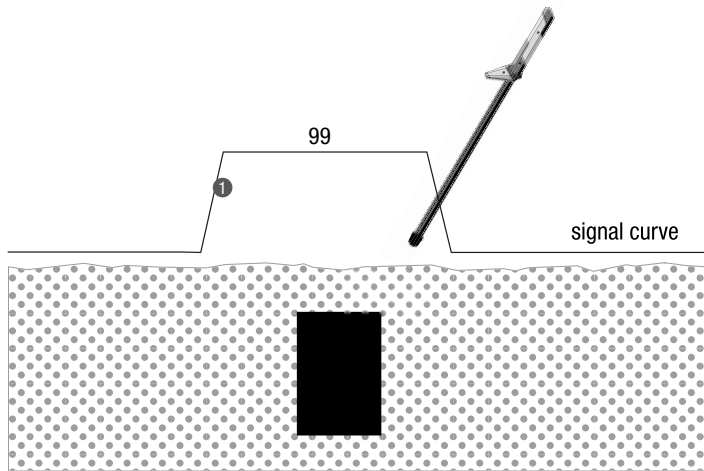
**Different object sizes and depths**

Generally applicable: Larger objects cause a higher signal deflection than smaller objects and the closer an object is to the surface, the stronger will be the resulting signal deflection.



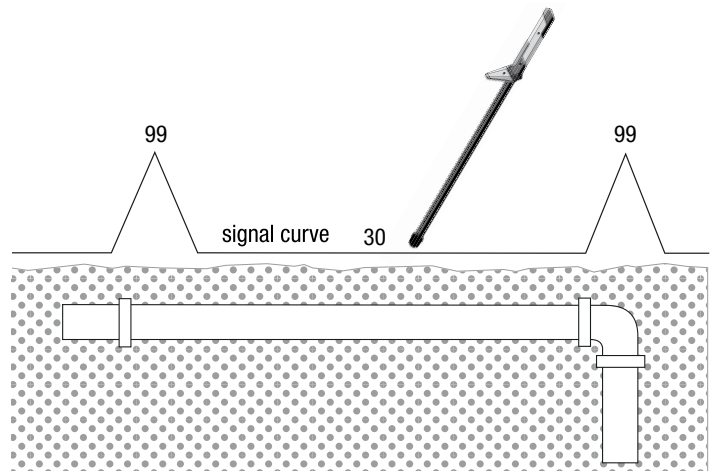
**Point objects in upright position**

If the sensitivity of the metal detector is set too high or the object in the ground very large, the signal deflection will be at a max over a larger ① area. Gradually reduce the sensitivity to detect the position with the absolute maximum -> this is where the object is located ② !



**Metal pipes**

The joints, elbows, sleeves and end fittings will cause the strongest signal deflection.



**Live wires**

The device recognizes live wires of a certain radiated field strength. By means of a defined measuring rate the device during measuring checks, whether the object is a live wire. This results in a response time of up to one second. This is to prevent permanent 50 Hz alarms under specific measuring conditions. An insufficient field strength or excessive insulation of the live wire may lead to the line not being detected!

**07 Troubleshooting**

Fault description	Potential causes	Proposed solution
Device is always at maximum deflection (99).	<p>Sensitivity set too high and/or there is too much ferromagnetic material nearby.</p> <p>Strong magnet nearby.</p> <p>Sensors in the device were not activated correctly during switch-on.</p> <p>Sensor connectors have come off (device, even after observing the above points, is still at maximum deflection and/or loose parts can be heard when shaking).</p> <p>Sensors inside the sensor rod are broken / sensor rod is visibly kinked or broken up.</p> <p>Other causes than described above.</p>	<p>Reduce the sensitivity.</p> <p>Move away from the magnetic source.</p> <p>Switch the device off and back on.</p> <p>If required, carefully remove the upper half of the housing and check the plug connections (visual inspection). Reconnect! If in doubt, please contact the manufacturer.</p> <p>Please contact the manufacturer.</p>
Device does not respond to metal objects.	<p>Metal object is not ferromagnetic.</p> <p>Sensitivity set too low.</p> <p>Other causes than described above.</p>	<p>The device ONLY reacts to ferromagnetic objects!</p> <p>Increase the sensitivity.</p> <p>Please contact the manufacturer.</p>
Device continuously displays "21" as signal strength.	<p>Sensor board is broken.</p>	<p>Please contact the manufacturer.</p>
Device does not switch on.	<p>Battery holder within the battery compartment has come off and/or battery charge is too low.</p>	<p>Open the battery compartment and check the connections. Change the batteries, if required.</p>
Speaker is not working.	<p>Speaker setting I</p> <p>Speaker defective.</p>	<p>Minimum requirement to activate the speaker is the setting II in the "Vol" menu.</p> <p>Please contact the manufacturer.</p>
Display remains dark, speaker is working.	<p>Loose plug connection inside the device.</p> <p>Display is visibly broken (crack).</p> <p>Other cause than described above.</p>	<p>Remove the upper half of the housing and check the plug connections (visual inspection). Reconnect.</p> <p>Please contact the manufacturer.</p>
50 / 60 Hz indication does not respond to live wire.	<p>Wire is currently not live.</p> <p>The radiated field of the line is insufficient for activating the 50 / 60 Hz display.</p> <p>Software bug</p> <p>Defective sensors (see point Device is always at maximum deflection (99)).</p>	<p>Test the indication by use of another live wire / device.</p> <p>Please contact the manufacturer.</p>



## 08 Cleaning, storage and transport

**⚠ The following is to be observed for cleaning, storage and transport of the device.**

### Cleaning

- Do not use any sharp objects or aggressive chemicals to clean the MD200!
- Please note, that neither the battery compartment nor the speakers are water-proof and have to be protected accordingly for cleaning.

### Storage

- Protect the MD200 from direct sunlight.
- Please note, that in case of prolonged operation in damp surroundings water may penetrate the battery compartment. Following such an application, make sure that no water has accumulated within the battery compartment!
- For longer storage disconnect the battery in the battery compartment.
- Store in dry and dust-free surroundings.
- Do not expose to aggressive media.
- Storage temperature -20 to 50 °C
- Relative humidity 80 %, non-condensing

### Transport

- Make sure that the device does not suffer any major impacts during transport.
- For transport in a vehicle observe the road traffic regulations on securing cargo.

## 09 Technical data

Power supply:	4 x AA 1.5 V batteries
Operating hours:	approx. 50 hours under normal operating conditions (Alkaline batteries)
Speaker:	Piezo
LCD display:	b/w, graphic and numeric display, battery status and 50 / 60 Hz indication, background illumination for operation in dark surroundings
Control:	3 membrane keys
Weight:	850 g incl. batteries
Length:	approx. 113 cm
Sensors:	dual Fluxgate sensors
Sensor rod:	carbon tube
Protection type sensor rod:	IP68 (until below the housing edge)
Housing:	injection-moulded ABS housing
Protection type housing:	IP64 (excluding the battery compartment)
Operating temperature:	-20 °C to 50 °C





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