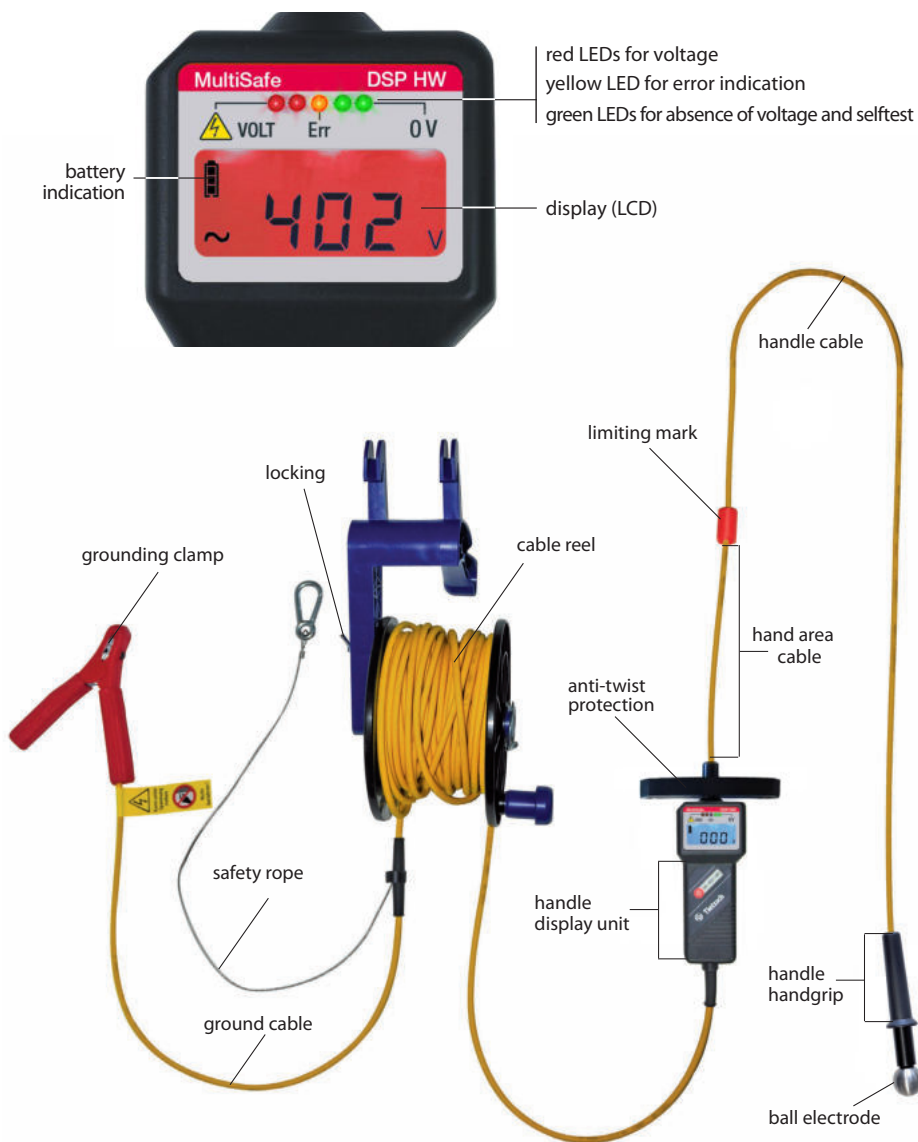


## User Instructions

### MultiSafe DSP-HW 2

Voltage warning device  
for flooded electrical systems





### Symbols on the instrument



Attention! Observe user instructions!



Attention! Electric voltage!

**TRon**

On-time at highest nominal voltage



Do not touch!



Indicates EC conformity



Device for live working



This device has to be disposed of according to the applicable regulations and laws (for Europe: WEEE 2012/19/EU). Please contact [service@tietzsch.de](mailto:service@tietzsch.de) in regard to the return of old devices.

## 1. Application

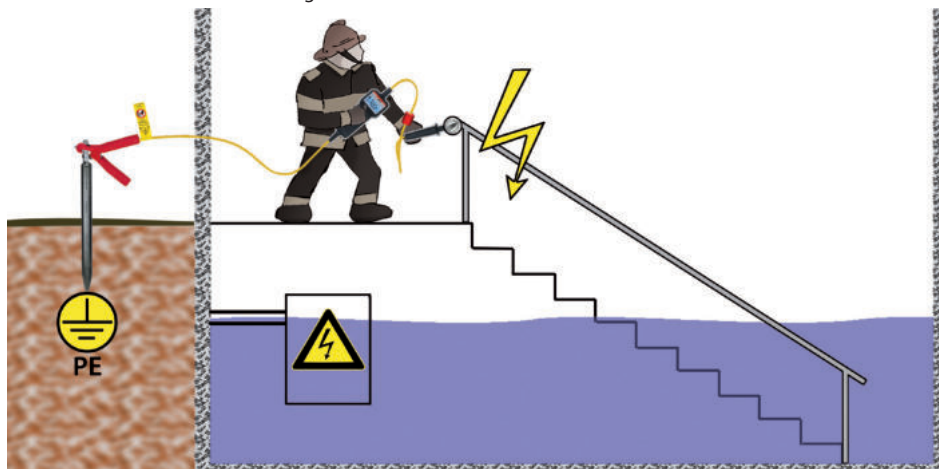
In certain situations, floods can be live in electrical systems. This can happen, for example, if the water in the basement rises above the level of the feed-in fuses and the power company fuses are not switched off or through feed-in or storage devices from solar systems.

The MultiSafe DSP-HW 2 is a voltage warning device for the detection of dangerous voltages from 25 V AC / 40 V DC to 1000 V AC / 1500 V DC in water or similar conductive liquids.

The MultiSafe DSP-HW 2 is suitable for the following test tasks:

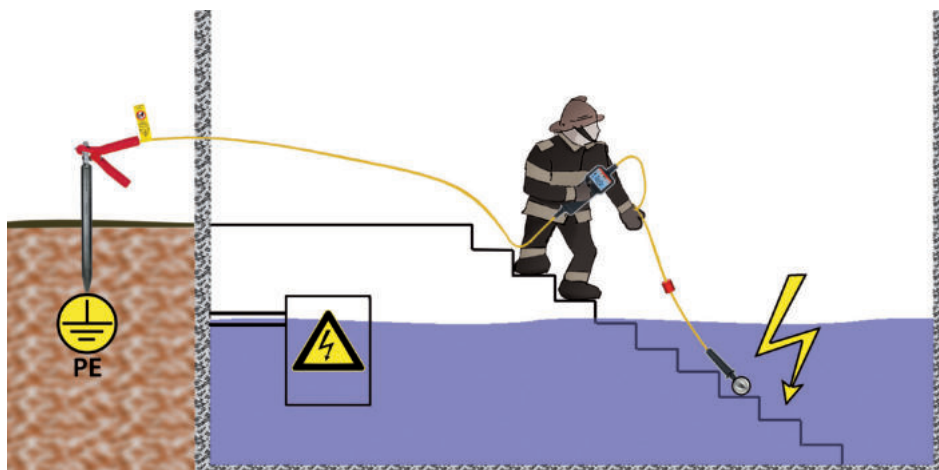
### 1.1 Testing of metallic banisters or other conductive objects

While approaching the flooded area, metallic banisters or other conductive objects that protrude into the water can be checked for voltage.



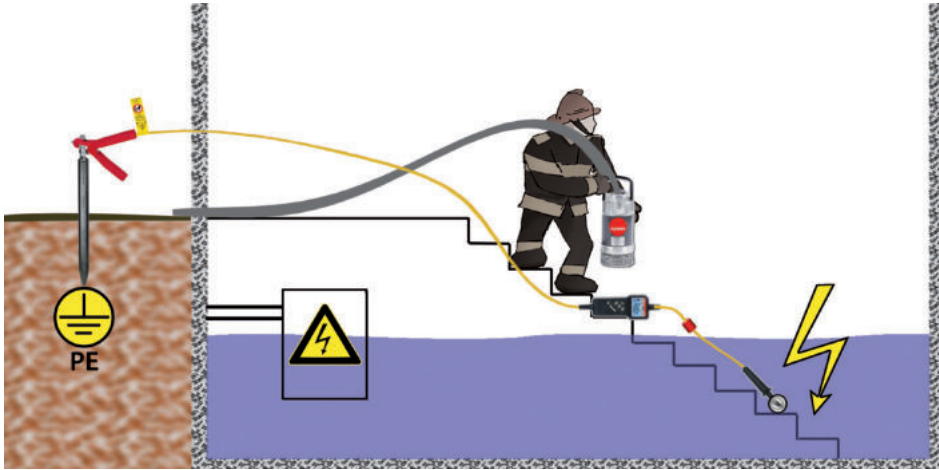
### 1.2 Checking liquids for tension

At the edge of the flooded area, the water can be checked for voltage.



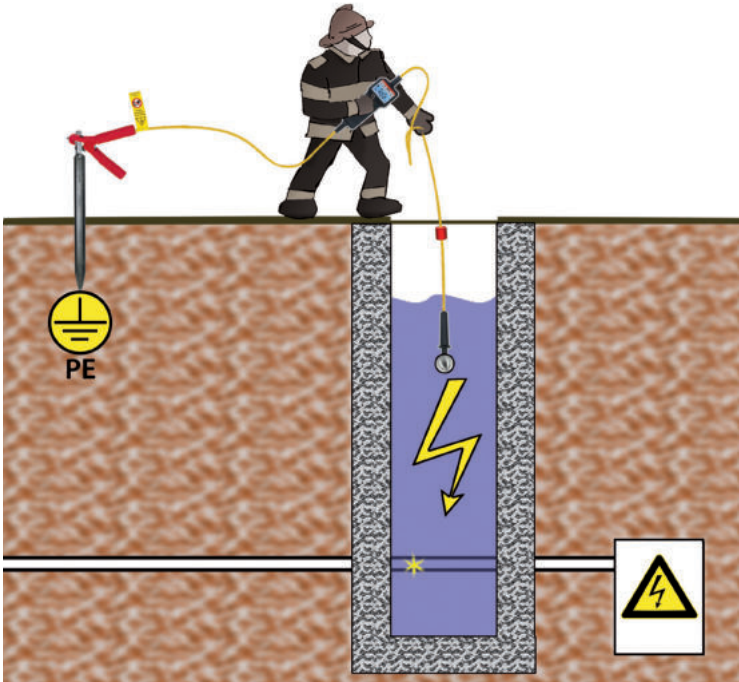
### 1.3 Check while installing / removing pumps

The water can be checked for voltage before and during the installation / removal of a pump in the flooded area. This means that the pump can be safely inserted into or removed from the water.



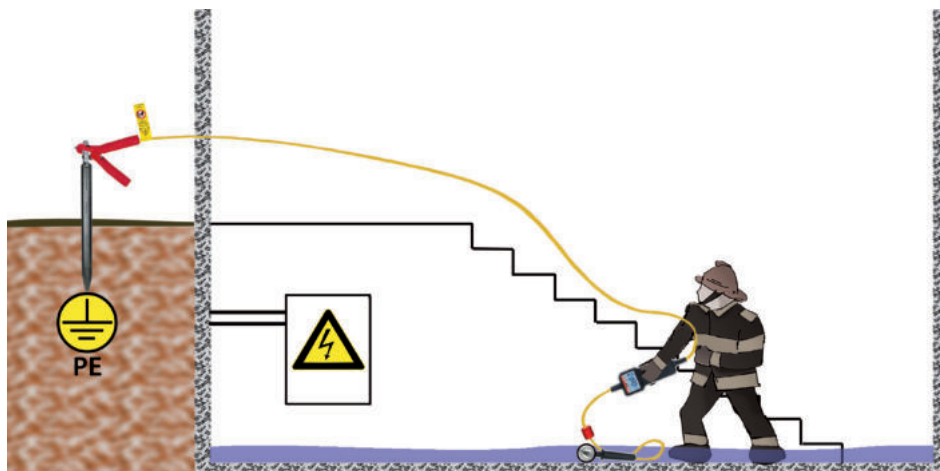
### 1.4 Checking flooded maintenance shafts

In the case of flooded maintenance shafts, the ball electrode can be lowered into the water and this can be checked for voltage.



## 1.5 Absorption of residual water

After the water level has dropped so far that a pump can no longer pump out, the working area in the residual water must still be checked for voltage. If necessary, the pump can be moved to an inspection shaft or work can be continued with a water suction device or wiper.



## 1.6 Intended Use

This device is intended for use in applications as described in the operating instructions only. Thus, it is imperative to observe the notes on safety and the technical data in conjunction with the ambient conditions.

Any other form of usage is not permitted and can lead to accidents or destruction of the unit. Any misuse will result in the expiry of all guarantee and warranty claims.

## 1.7 Authorized users

The device may only be used by authorized persons!

For authorization, the user must be trained and authorized for use by the manager responsible for him. The training is carried out by a qualified electrician according to the manufacturer's specifications.

This training must include:

- possible electrical hazards at the place of use
- protective devices and protective measures
- basic functions of the device
- practical exercise with the device

The documents for the training can be found at:



[www.tietzsch.de](http://www.tietzsch.de)

The authorization by the responsible manager must be documented. It must be checked annually whether the instructions are being followed and work is being carried out safely.

## 2. Safety precautions

In order to maintain the safety-related faultless condition and to ensure safe use, it is essential that you read these operating instructions completely before using your device and that you follow them in all points, otherwise there is a risk to life!

Please note the following safety precautions:



- Before work on a flooded area, the responsible energy supplier / electricity network operator must be informed and the flooded area must be switched off / deactivated.  
This allows the electrical hazard in flooded area nevertheless not be ruled out! Solar systems, energy storage systems or improper connections can still conduct voltage into the water. Before using a submersible pump or the like, it is therefore essential to check with the voltage warning device.



- Do not touch water or parts protruding into the water (e.g. railings)!  
These parts can be live!  
Do not touch the water even after it has been determined to be de-energized!  
Dangers can arise at any time due to changing water levels.



- Do not enter flooded areas, even after it has been determined that there is no voltage! The water can suddenly become live due to changing water levels.  
Exception: absorption of residual water, see 4.6.



- Only hold the display part by the handle so as not to obscure the display.  
When testing with the grip line and ball electrode, the grip line may only be brought into the water up to the red limit mark.  
The handle line may only be touched in the hand area between the limit mark and the display part.  
A sufficient safety distance to the water must be maintained so that it is not touched.
- The grounding clamp for the earth connection can be live during the test!  
The risk of electric shock is prevented by the protective elements in the device.



- Voltage testers must be dry and clean.  
Only the handle with the ball electrode and the handle line up to the red limit mark may be led into the water.  
The display unit is waterproof. If this falls into the water, it must be brought back on the still dry grounding line and the display part must then be dried off.  
The water must not be touched!



- The battery compartment must be closed before use.
- Unauthorized persons are not allowed to disassemble the display part, with the exception of the battery compartment.



- Before testing the absence of voltage, the cable must be connected to an earth electrode and secured against inadvertent disconnection.
- Incorrect earthing on unearthed masts, downpipes, banisters, etc. can prevent the display of absence of voltage (green) and dangerous voltage (red).  
It is essential to check the earth with the self-test, see 3.4.



- The voltage specifications on the DSP-HW 2 are nominal values. The voltage warning device may only be used in systems up to a maximum of 1000 V AC / 1500 V DC.
- The permitted temperature range for use is - 15 ° C to + 55 ° C.
- The permissible duty cycle is 2 minutes at 1000 V AC / 1500 V DC.  
This means that when there is a voltage signal (red), the ball electrode must be pulled out of the water after 2 minutes. If the display shows no voltage (green), the ball electrode can remain in the water indefinitely.  
The DSP-HW 2 switches itself off after approx. 20 minutes.
- The red LEDs only serve as a warning of dangerous voltages and not as a measured value.
- The response time (change from green to red indication) is less than 1 second.
- No special protective equipment for work is prescribed by the manufacturer.



- Before use, the housing of the display unit and the earth line including the clamp must be checked for damage. If damage can be seen, the device must no longer be used. If the device is very dirty, it must be cleaned before use.
- Voltage testers must be checked for function shortly before use.  
Check the device using the self-test / function test.  
If the display of one or more systems fails, the device may no longer be used.



- Only authorized persons are allowed to work with this product.  
The user must be familiar with the dangers of voltage measurement and the observance of the precautionary measures as well as the correct use of the voltage warning device, see 1.6.



- The test of the voltage in the water is only carried out locally.  
The test radius around the ball electrode is 1 m and is indicated by the red limit mark on the test lead. The limit mark must not be sunk in the water in order to always be able to recognize the test radius.
- The voltage is checked 1m around the ball electrode.  
Any further work may only be carried out at this measuring point.  
Other areas of the water are not tested as a result.  
A separate on-site test must be carried out for each area, see 4.2.



- The tester has to be stored in a clean and dry environment.



### 3. Commissioning, earthing and self-test

#### 3.1 Unwind the grounding line



Loosen the lock on the drum and unroll the cable completely or so far that the test point can be easily reached from the earthing point.

**Note:** For quick operation, both ends of the cable (test device and clamp) are unwound from the drum at the same time and are fixed in the middle (at 15 m).



**Note:** For better handling, the line can be separated from the drum. The middle is marked by a loop.



#### 3.2 Establish ground connection

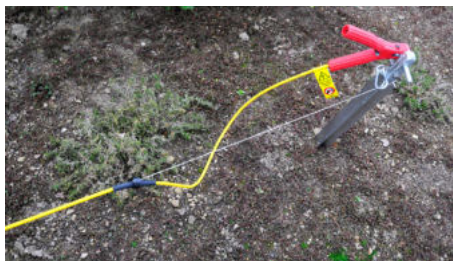
Connect the clamp to the earth potential.

For example, the following can be suitable as ground contact:

- heating pipes made of copper
- equipotential bonding bars
- lightning rod
- protective conductor
- earthing stakes driven into the moist soil
- lampposts (unpainted) ...



Incorrect, not connected to earth potential ground connection can prevent dangerous voltages from being displayed! Checking with the self-test (3.4) is absolutely necessary!



Grounding with a ground spike



Earthing on a mast with the help of a screw clamp



Grounding on a downpipe



Earthing at the foundation earth

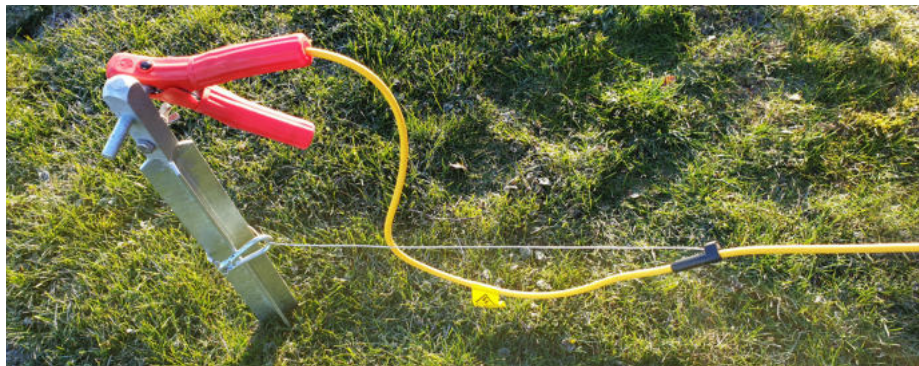


### 3.3 Secure earthing

Secure the clamp against being pulled off! Use the safety rope for this.



The grounding clamp for the earth connection can be live during the test!  
The risk of electric shock is prevented by the protective elements in the device.



### 3.4 Self-test

The self-test checks the function of the voltage warning device, the line and the ground connection.




If a display fails even partially during the self-test or if there is no display, the voltage warning device must no longer be used!


In accordance with EN 50110-1 voltage testers must be checked if they function correctly, briefly before and whenever possible after the use.



#### Step 1 - Test the display

The device must be switched off for the self-test. Press and hold button . All display segments light up on the display, the backlight switch between red and white. Additionally all LEDs lights up as well as a buzzer sound can be heard.



Release the button  „TEST“ is indicated on the display and the function test is required.



#### Step 2 - Test the test circuit and protective resistors

Contact earth potential with the ball electrode.

When „Rdy“ is displayed and the green LEDs light up, the DSP-HW 2 is ready for use and the connection to earth has been checked.

#### Note:

If the function test was not successful, the following must be checked:

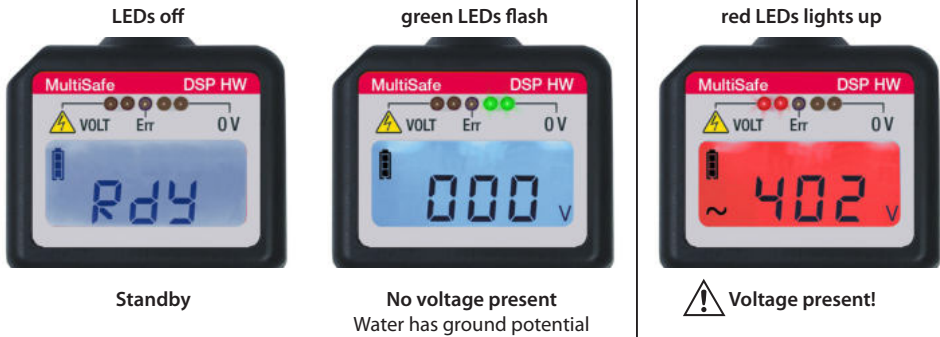
- Ball electrode and earth connection connected to earth potential?
- Battery empty?
- Switch device off and on again, repeat self-test!

#### 4. Testing voltage



**Do not touch the water or objects protruding into the water (e.g. banisters)!**  
These parts can be live! Do not touch the water even after it has been determined to be free of voltage! Dangers can arise at any time due to changing water levels.

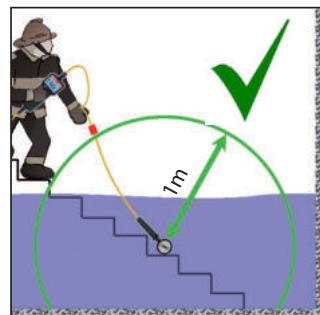
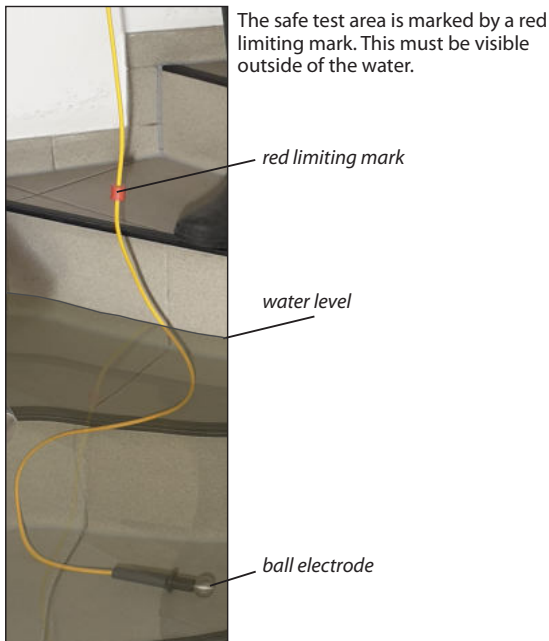
##### 4.1 Display



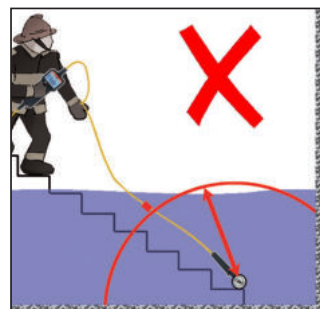
**Note:** If the yellow Err LED lights up and „Err“ is shown in the display, the test must be stopped immediately. The DSP-HW 2 is equipped with internal error monitoring. This monitors the measuring electronics, the software and the battery status during the test. Check the battery and repeat the self-test. If operational readiness is not displayed, the DSP-HW 2 must not be used.

##### 4.2 Safe testing area

The safe test area of the DSP-HW 2 is 1 m spherical from the ball electrode.  
Work may only be carried out within this tested area.



limiting mark outside of the water



### 4.3 Check banisters

Only grasp the handgrip with the ball electrode by its handle.

Use the ball electrode to touch the banisters and other conductive objects that may protrude into the water and check for voltage.



#### No voltage detected



*Do not touch the banisters!*

*The banister may not protrude into the water or it may not be conductive.*

#### No voltage



*Do not touch the banisters!*

*Bannister currently has ground potential and no voltage.*

*Approach the water and carry out further tests in the water, see 4.4.*

#### Voltage present!



***Danger!***

*Do not touch the banisters!*

*Leave the danger area immediately!*

*Do not use a pump!*

*Immediately stop all work in the danger area.*



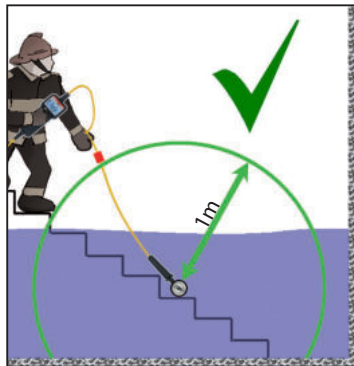
Do not touch the banister even when there is no voltage!

Unexpected changes in the conditions (e.g. changes in level) can suddenly put objects protruding into the water under voltage.

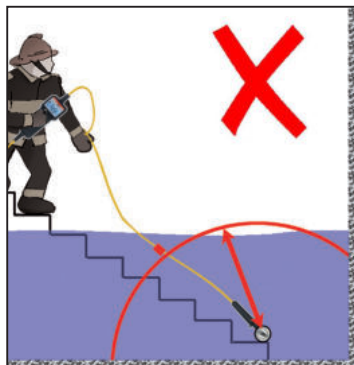
#### 4.4 Test water

Only touch the DSP-HW 2 by the handle of the display unit and in the hand area of the handle cable. Lower the handle with the ball electrode into the water.

**Note!** The red limiting mark indicates the maximum test radius. Do not sink this into the water in order to identify the test radius.



Note the limit mark (red).  
The limiting mark indicates the maximum tested safety area!



The limiting mark (red) must not be sunk into the water!

#### Operational readiness to check!



Do not touch water!

Check the ground connection  
of the DSP-HW 2!

#### No voltage



Start work at this point,  
taking care not to step into  
the water.

Water currently has earth  
potential and no voltage.

#### Voltage present!



⚠ Do not touch water!

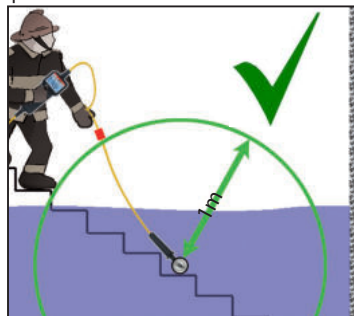
Leave the danger area  
immediately!

Do not use a pump!  
Immediately stop all work in  
the danger area.

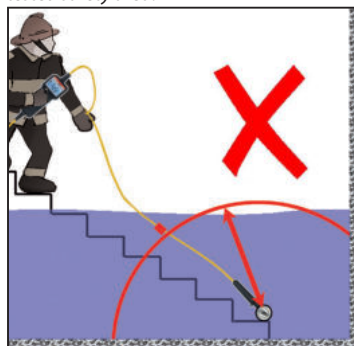
#### 4.5 Test water and setup pump

Only touch the DSP-HW 2 by the handle of the display unit and in the hand area of the handle cable. Lower the handle with the ball electrode into the water. Place the display outside of the water so that the LEDs are clearly visible.

**Note!** The red limiting mark indicates the maximum test radius. Do not sink this into the water in order to identify the test radius. It must be checked at the place where a pump is to be used.



Note the limit mark (red).  
The limiting mark indicates the maximum tested safety area!



The limiting mark (red) must not be sunk into the water!

**Operational readiness to check!**



Do not touch water!

Check the ground connection of the DSP-HW 2!

**No voltage**



Do not enter the water!  
Insert the pump at this point while observing the green LEDs.

Water currently has earth potential and no voltage.

**Voltage present!**



⚠ Do not touch water!

Leave the danger area immediately!

Do not use a pump!  
Immediately stop all work in the danger area.

**Note:** The DSP-HW 2 switches off automatically after 20 minutes. If you want to check further:

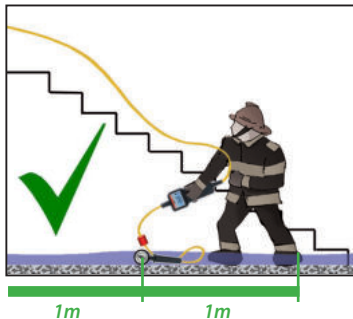
Leave the ball electrode in the water, press the button, if there is voltage this is displayed directly or if the potential is 0V, the self-test shows „Rdy“ and the display jumps to 000 V. If the message „Test“ remains, the grounding must be checked.



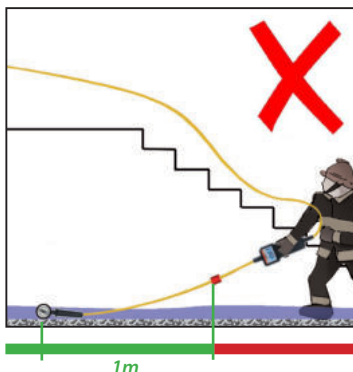
#### 4.6 Absorption of residual water

**Attention!** This working method may only be used after the water level has dropped to a few centimeters and pumping from the edge is no longer possible. It must be ensured that no more water flows in.

**Note!** The red limiting mark indicates the maximum test radius. Place the ball electrode in the water as close as possible to the user. It must be tested wherever people work or walk. The test must be continued while the work is in progress.



*Test close to the user.*



*Do not work outside the tested safety area!*

**No voltage detected**



*Work can be carried out in the area.*

**No voltage**



*Work can be carried out in the area.*

*Water currently has earth potential and no voltage.*

**Voltage present!**



**⚠ Water is under voltage!**

**Don't touch anything**  
- not even other people!

*Take small steps to the stairs and jump out of the water with both legs at the same time.*



## 5. Battery

### 5.1 Battery indication

The latest battery status is symbolised by a three-stage battery indicator.



indication of battery status



battery empty - you still can perform a few tests  
(flashing symbol: no more measurements allowed)

#### Attention!

If the yellow LED lights up and the message „Lo Bat“ appears in the display, measurements are no longer possible and the battery must be changed immediately.

The device works with a 9 V block battery IEC 6LR61 / 6LF22 / 6LP3146 (alkaline manganese).

### 5.2 Replacing the battery

Loosen the screw at the back of the instrument which secures the battery compartment lid, remove the lid. Let the battery drop out of the battery compartment with its CAT IV protection cover and exchange it. Therefore, snap the battery contacts onto the 9 V block battery and insert the battery together with the CAT IV protection cover into the battery compartment. Put the lid back on the battery compartment and screw it tight.

Regularly make sure that the battery of your device does not leak. In case it does, you have to replace the electrolyte completely and to insert a new battery.

In case of a long storage period, remove the battery from the device.

**Note!** Included in the scope of delivery is one battery. These battery is not to be re-charged. Attempting to recharge it may cause risk to personal safety and damage to the equipment.

The battery may not to be opened. Depleted batteries must not be disposed with the domestic waste.

Please, return batteries at a local retailer or municipal recycling depot. Return is free of charge and required by law.

## 6. Limited Warranty and Liability Limitation

By continuous quality checks and production controls, most modern electronics and high quality materials we guarantee that the tester will be free from defects in material and workmanship for two years.

This warranty does not cover batteries, improper handling, not intended purpose, opening the housing, improper storage or damages from accidents.

No other warranties such as fitness for a particular purpose will be given.

We are not liable for any indirect, incidental or consequential damages or losses arising from any cause or theory.

## 7. Repair

Repair is only allowed by the manufacturer or explicitly authorised repair shops.

In case of damages on the device or failure of the function test or for detailed inspection/calibration, please contact: [service@tietzsch.de](mailto:service@tietzsch.de) or send the device and a description of failure back to the manufacturer.

## 8. Maintenance / Storage

The DSP-HW 2 is absolutely maintenance-free. Nevertheless, observe the following information in order to maintain safe operation:

- Always keep the voltage tester dry and clean.
- The housing can be cleaned with a cloth dampened with isopropyl (alcohol) or soapy water.

## 9. Technical data

### MultiSafe DSP-HW 2

### Voltage warning device

<b>Standards:</b>	BG requirements „Spannungswarner Wasser“ GS-ET-43 based on EN/IEC 61243-3:2014 + Cor.: 2015  DIN VDE 0100-410 (IEC 60364-4-41) „Schutzmaßnahmen - Schutz gegen elektrischen Schlag“ für Spannungsgrenzen Fire brigade accident prevention regulations GUV-V C53 Impulse voltage resistance according to EN / IEC 60071 EMC requirements DIN-EN 61326 / Directive 2014/30/EU
<b>Nominal voltage range:</b>	12 ... 1000 V AC / 1500 V DC
<b>Frequency:</b>	DC / 15 ... 500 Hz
<b>Input resistance:</b>	445 kΩ at 50 - 1000 V AC / DC
<b>Current (Peak value Is):</b>	3,4 mA at 1000 V AC/DC
<b>Display:</b>	2 red LEDs for voltage from 25 V AC / 40 V DC on 2 green LEDs for absence of voltage 1 yellow LED for error indication two line LCD with bicolour backlight white / red for display of voltage, type of voltage, battery status
<b>On-time:</b>	2 min at 1000 V AC / 1500 V DC unlimited with no voltage
<b>Self-test:</b>	checking of function, protective resistances and earthing contact
<b>Test area:</b>	1 m spherical around the ball electrode, marked by a red limiting mark
<b>Surge voltage category:</b>	CAT IV 600 V / CAT III 1000 V
<b>Construction:</b>	for indoor and outdoor installations
<b>Operating temperature:</b>	-15°C ... + 55°
<b>Power supply::</b>	9 V block IEC 6LR61 / 6LF22 / 6LP3146 alkali-manganese
<b>Protection class:</b>	IP 65, dust and waterproof
<b>Design:</b>	<ul style="list-style-type: none"><li>• Two-pole voltage warning device with permanent connection to earth</li><li>• 30 m PUR sheathed cable yellow (1500 V) with wear / damage indicator</li><li>• Permanently connected, insulated grounding clamp with safety rope</li><li>• display unit with robust, dustproof plastic housing with unbreakable display cover</li><li>• firmly connected handle cable 1.2 m with handgrip and ball electrode</li></ul>
<b>Dimensions / weight:</b>	device without accessories approx. 330 x 240 x 200 mm, 2,5 kg

## 10. Repeated inspection

According to EN 61243-3 it is recommended to carry out repeated examinations.

It should not exceed the time-limit of 6 years. Depending on operation conditions and frequency, a previous inspection may be recommendable.

The serial number with the date of manufacturing (WWJJNN=Woche Jahr Nummer) is imprinted on the battery cover of the display unit.

Repeated inspections are offered by the manufacturer and indicated by the inspection plate.

## 11. Accessories optional

- bag
- screw clamp for earthing on masts
- demo box for training and practical exercise
- ground spike

Further information at [www.tietzsch.de](http://www.tietzsch.de)