

MAGTEST

MSA 19.910



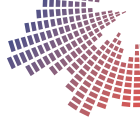


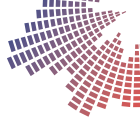
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N.B. :

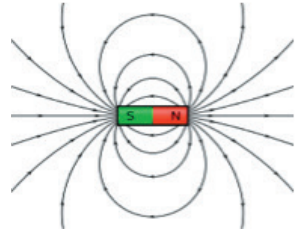
Press the function keys for about half a second to activate them.





1. THE MAGNETIC FIELD

A magnetic field is manifested by a force affecting certain materials in its environment, acting on moving electrical charges. The magnitude of this force decreases as a function of the distance between the magnetic field emitter and its action point. Magnetization is a vector quantity which characterizes on a macroscopic scale the magnetic behaviour of a material sample. It is measured in amperes per metre (A/m) or in Tesla (T). (1)

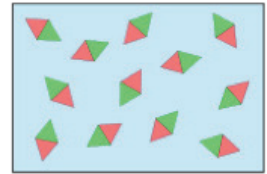


(1)

Ferromagnetism designates the ability of certain material samples to become magnetised under the effect of an external magnetic field, and to retain part of this magnetisation. On a microscopic scale, a ferromagnetic material can be described as a set of independent magnetic domains (Weiss domains).

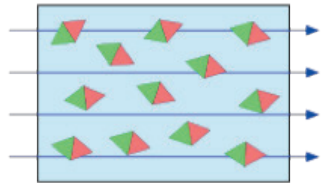
When the magnetic moments of the domains are not aligned, the total magnetostatics energy of the material is minimised: the material is not magnetised.

(2)

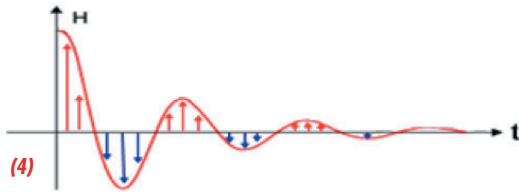


(2)

For demagnetization purposes, a damped magnetic excitation field is applied so that certain domains are reversed more than others, depending on the magnetic excitation force passing through them. This leads to a state of magnetic disorder equivalent to the state of a non-magnetized material. (3 and 4)



(3)



(4)

There are relatively intense magnetic fields all around us in daily life. It goes without saying that mechanical watches are influenced by them, and thereby undergo potentially significant operating variations, i.e. which affect the rate precision.

It should be noted that the Earth's magnetic field varies between 25 and 65 μT , depending on geographic position.

The most significant items in everyday life which can affect the rate of a mechanical watch by means of a magnetism effect are computers, mobile phones, TVs, refrigerators, etc. Magnetic flux measurements (taken at 10 cm from the source) have revealed values of 60 μT for an electric toothbrush, 75 μT for a mobile phone and 110 μT for a computer. Consider too that watchmaking tools often have a magnetic charge capable of disrupting the rate of a watch !

The distance at which a watch is placed from the magnetising object is an important factor. Although watch manufacturers regularly equip their cases with protective materials or opt for non-magnetic components, nevertheless rate problems due to magnetism remain very common.



2. DESCRIPTION

The HOROTEC® MAGTEST is an electronic device for the detection of magnetism in μTesla (μT), demagnetization and control of magnetic remanence of watches, movements, tools and watch parts.

It combines the measurement function with the demagnetization function in a single device.

After demagnetization, the residual magnetism value in μT can be checked again.

A. Detection of the degree of magnetism in μTesla with display of the magnetic remanence.

DETECT

B. Demagnetization cycle.

DEMAG

3. HOW TO INTERPRET THE MAGNETIC FIELD WITH THIS DEVICE

Large metal parts, such as a movement, modify the lines of the earth's magnetic field. For this reason, an indicative value of up to $50 \mu\text{T}$ can be considered without any influence or consequence on the functioning of the movement.

For small parts, such as screws, the displayed values must be considered as real remanence values.

4. OPERATION

DETECT ZONE : Surface for detecting the degree of magnetism.

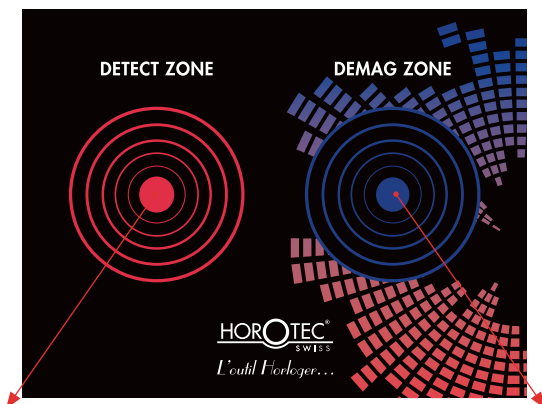
A. Measures the micro Tesla value (μT) of the degree of magnetization.

DEMAG ZONE : Demagnetization surface.

B. Demagnetization.

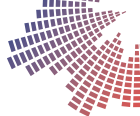
C. Compass mode.

D. Settings.



A. Detection of the degree of magnetism

B. Demagnetization



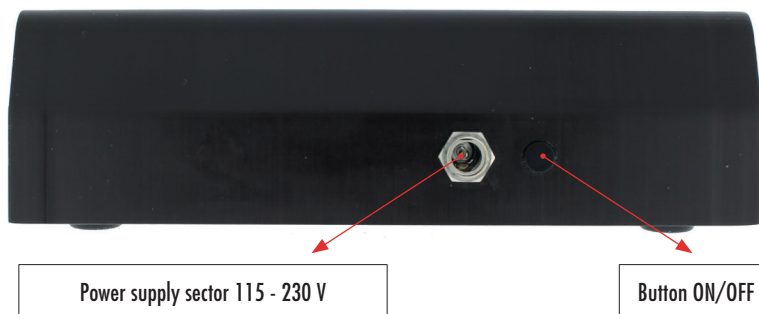
5. CONNECTIONS

1. AC adapter : connect the adapter to rear jack of the device **HOROTEC® Magtest**. Connect the cord of the AC adapter to the mains supply (115 or 230 V).

2. Switching on the device on : press the ON/OFF button located at the rear panel of the device.

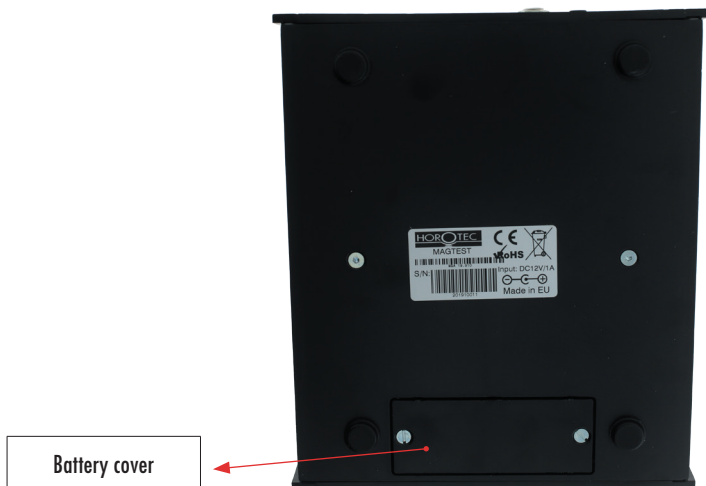
3. Switching off the device off : press the ON/OFF button located at the rear panel of the device.

Connections on the rear panel of the device :



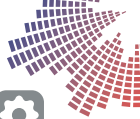
4. Battery : unscrew the battery cover on the back of the **HOROTEC® Magtest** and insert the 9 V battery delivered with the device.

Note : change the battery if the «low battery» symbol appears on the screen when the device is turned on.



The **HOROTEC® Magtest** is delivered with an adapter (input 115 - 230 V AC / output 12 V DC), a 9 V battery and instructions for use.





6. PARAMETERS



MUTE

1. **Mute** : silent mode or sound mode. [see paragraph 10D2](#)

INFO

2. **Info** : hardware and software version. [see paragraph 10D3](#)

RESET

3. **Reset** : sensors resetting. [see paragraph 10D4](#)

AUTO

4. **Auto** : activate or deactivate the automatic mode. The object can be moved from the DETECT ZONE to the DEMAG ZONE without having to press the key . [see paragraph 10D5](#)

7. SCREEN INFORMATION



When this symbol is visible, the device is in automatic mode.

To activate/deactivate the  function, [see paragraph 10D5](#)



When this symbol is visible, the device emits sound signals.

When this symbol does not appear on the display, the  function is activated, and the device is silent.

To activate/deactivate the  function, [see paragraph 10D2](#)



When this symbol is visible, the device is connected to the 115 - 230 V mains supply.



When this symbol is visible, the device runs on the battery. The number of green bars indicates the battery charge level.



Compass mode. [see paragraph 10C](#)

1. Display of the compass mode.

2. North compass calibration.



Return to the main menu.

Press this key at any time to return to the main menu.



Settings. [see paragraph 10D](#)

Sleep mode screen :

1. When the device is connected to the mains supply (115 - 230 V), the screen goes to sleep mode after 2 minutes without use. To reactivate its operation, press the ON/OFF button located at the rear panel of the device.

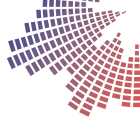


Display in sleep mode.

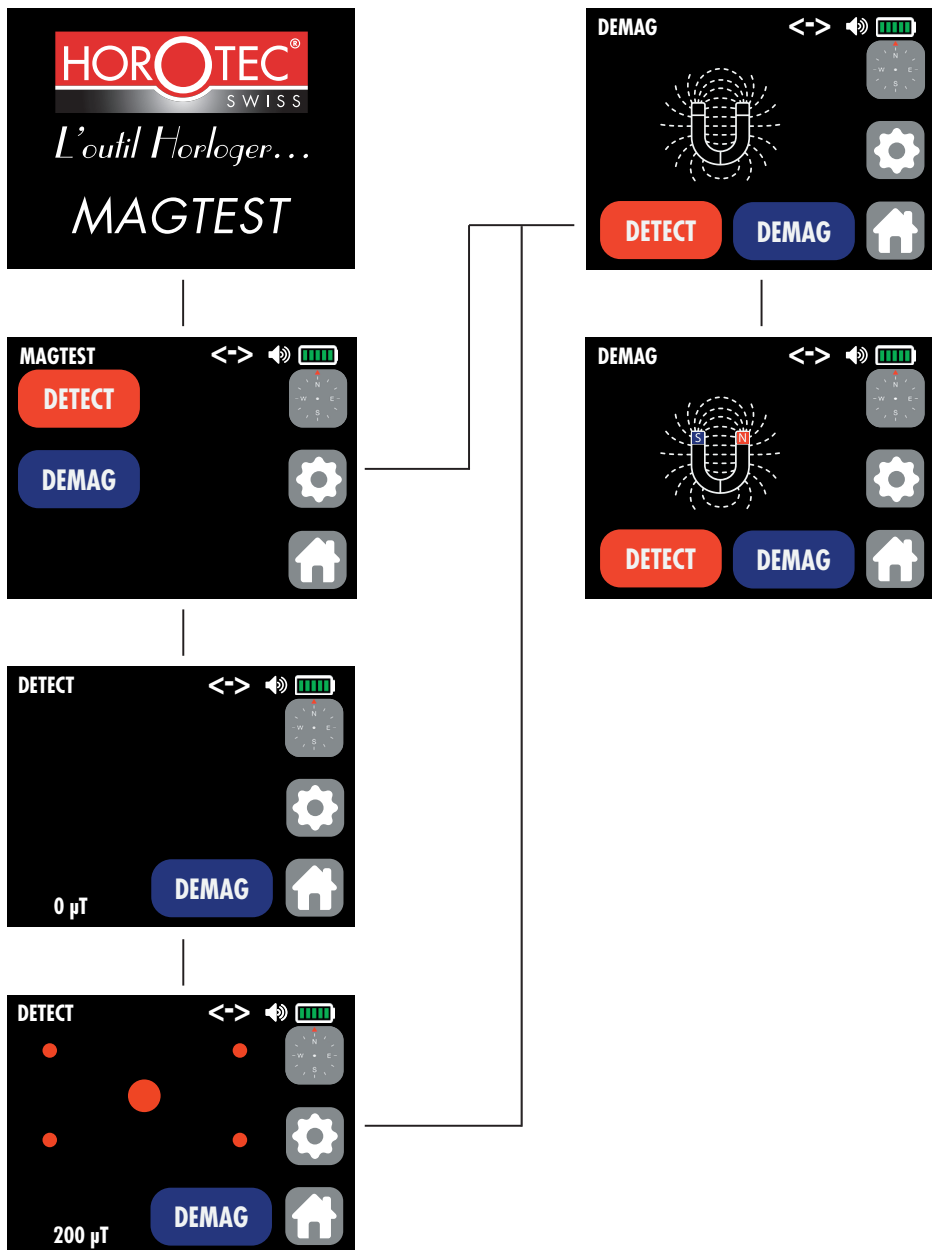
Touch the screen to return to the main menu.

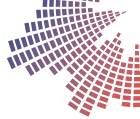
2. When the device is running on the battery, the screen goes to sleep mode after 2 minutes without use. To reactivate its operation, press the ON/OFF button located at the rear panel of the device.



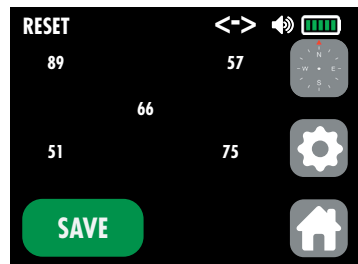
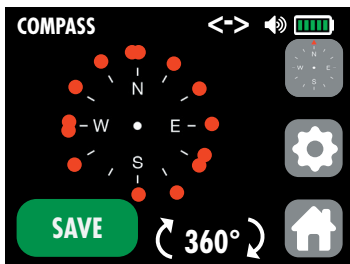
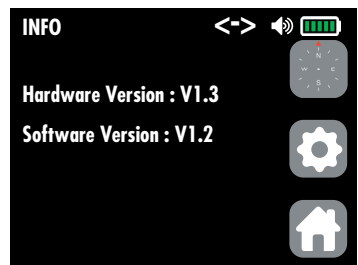
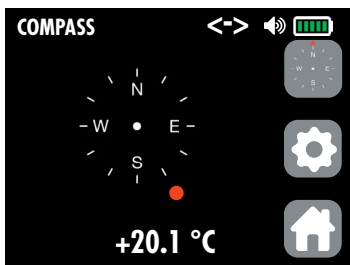
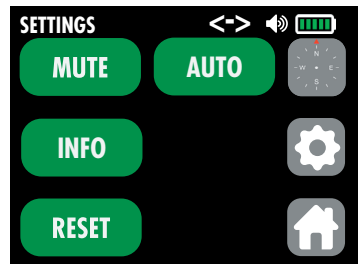
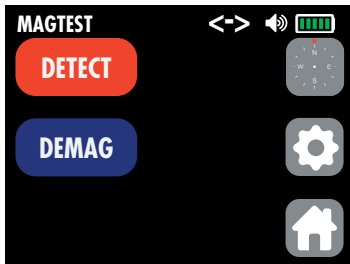


8. FUNCTIONS





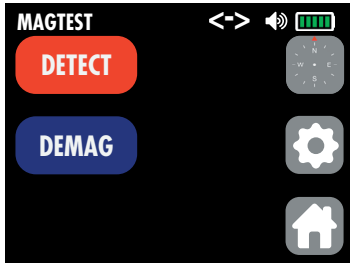
9. SETTINGS



10. SWITCHING ON THE DEVICE

Press the ON/OFF button located at the rear panel of the device to turn it on.

The following screen displays :

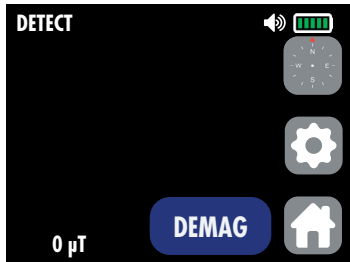


Display of the main menu **MAGTEST**

A. Magnetism detection

1. Press the **DETECT** key on the main menu **MAGTEST** to check the degree of magnetization of the object (watch, movement or any other watch piece).

The following screen displays :



Display of the submenu **DETECT**

The search for magnetic remanence is active.

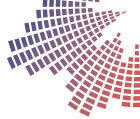
If the displayed value is greater than «0 µT», it is recommended to reset the sensors. [see paragraph 10D4](#)

A2. Sensors

There are 5 sensors and one of them is located in the centre of the detection surface. The others are in the corners of a 1.5 cm square. They can measure the magnetism force as well as the position. A dot on the LCD screen shows a sensor with its position and the dot size is proportional to the magnetic force.



To check the degree of magnetism of small parts (screws for example), it is recommended to place them in the white areas of the example shown here. The sensor placed in the centre and the two zones between the 3 outer circles (in red) will not detect the degree of magnetism of the small parts.

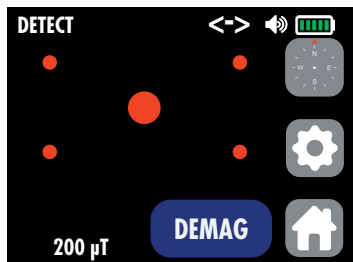


Place the object to be tested on the DETECT ZONE surface.

- If the screen remains neutral (as in the image above), it means that the object placed on the detection surface is not magnetized
- If red dots appear on the screen and a positive value in μT (as shown in the image below), it means that the object placed on the detection surface is magnetized.

A3. In case of magnetic remanence

The following screen displays :



Display of the submenu **DETECT** with a magnetized object placed on the DETECT ZONE surface

In case of magnetic remanence, the value displayed in μT , is the difference between the value of the Earth's magnetic field and the magnetism of the object being tested.

In addition to the value displayed in μT , red dots (up to 5) appear on the display indicating :

- By their presence, the magnetization surface
 - By their size (diameter of the red dot more or less large), the importance of magnetism between the various sensors.
- The value displayed in μT , will always be the highest value detected by the 5 sensors.

Place the object on the DEMAG ZONE surface and press the key **DEMAG** to demagnetize the object.

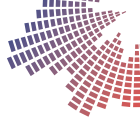
If the screen displays the presence of magnetism without any object on the detection surface DETECT ZONE, it is recommended to reset the sensors.  + **RESET** see paragraph 10D4

Information :

In automatic mode, the device switches directly from DETECT mode to DEMAG mode.

Once the detection is complete (screen with red dots), remove the object from the DETECT ZONE surface. The device automatically switches to DEMAG mode. Place the object on the DEMAG ZONE surface and press the DEMAG button to start demagnetizing the object.





B. Demagnetization (without going through the **DETECT** function)

B1. Press the key **DEMAG** on the main menu **MAGTEST** to demagnetize the object.

The following screen displays :



Display of the submenu **DEMAG**

B2. Place the object to be demagnetized on the demagnetizing surface DEMAG ZONE and press the **DEMAG** key. The device starts its demagnetization cycle.

The following screen displays during the demagnetization cycle :

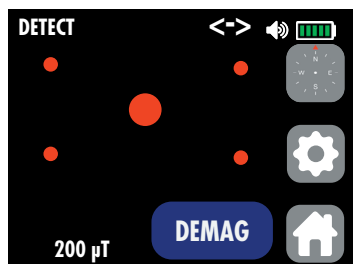


Display of the submenu **DEMAG** in demagnetization mode (beeps are heard during the cycle. We will also see that the **S** and **N** poles flash and cross each other throughout the cycle)

Note :

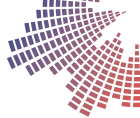
At the end of the cycle, move the object to the DETECT ZONE surface and press the **DETECT** key.

If a remanence is detected (see the screen below with the red dots), the demagnetization process must be repeated by pressing the **DEMAG** key again. Repeat this operation until a display of 0 μT is obtained.



Press the  key to return to the main menu **MAGTEST**.





C. Compass mode



The compass mode allows the following checks :

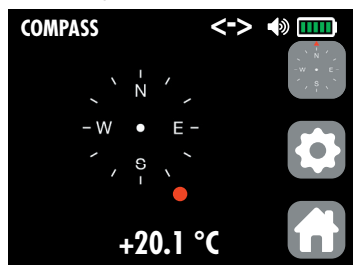
- The north of the device corresponds to the actual magnetic north
- Check the accuracy of watches equipped with a compass.

Compass calibration is rarely necessary unless there is too much gap between the device and the actual magnetic north.

Follow the instructions below to calibrate the compass.

C1. Press the  key to display the compass.

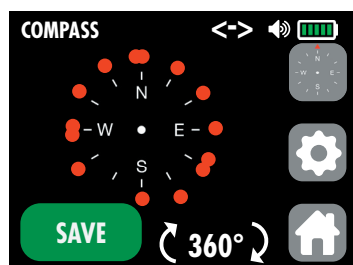
The following screen displays :



Display of the submenu **COMPASS** (the red dot indicates the actual magnetic north). It is also possible to check the accuracy of watches equipped with a compass in relation to the red dot). This sub-menu also displays the ambient temperature in ° C.

Press the  key again to calibrate the compass.

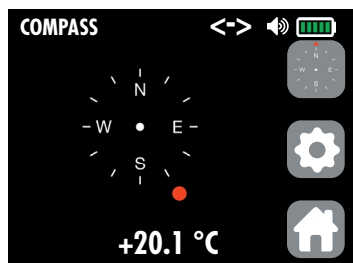
L'écran suivant s'affiche :



Display of the sub-submenu **COMPASS**
Rotate the device once or twice (360°) to display as many red dots as possible.

Wait until the red dots stabilize and press the **SAVE** button to save the new calibration.

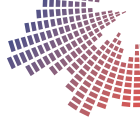
The following screen displays :



Display of the submenu **COMPASS** with the new calibration saved

Press the  key to return to the main menu **MAGTEST**.

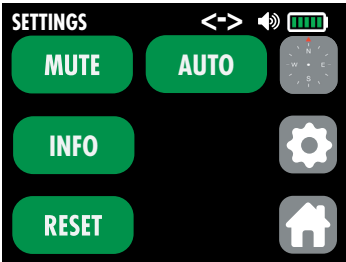




D. Settings

D1. Press the  to set the device.

The following screen displays :



Display of the submenu **SETTINGS**

D2. **MUTE** mode

Pressing the **MUTE** key, the  symbol will disappear (silent mode) or appear (sound mode).

Press the  key to return to the main menu **MAGTEST**.

D3. **INFO** mode

Press the **INFO** key to check the hardware and software version of the device.

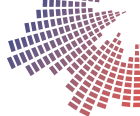
The following screen displays :



Display of the submenu **INFO**

Press the  key to return to the main menu **MAGTEST**.

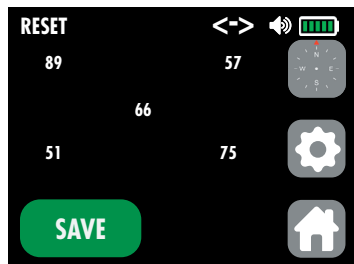




D4. **RESET** mode

Press the **RESET** key to check the hardware and software version of the device.

The following screen displays :



Display of the **RESET** submenu before resetting

Press the **SAVE** key to perform the reset.

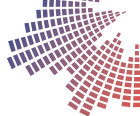
The following screen displays :



Display of the **RESET** submenu after the reset

Press the  key to return to the main menu **MAGTEST**.

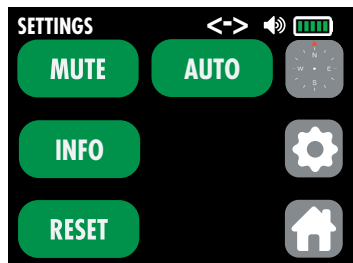




D5. **AUTO** mode

Press the **AUTO** key to activate or deactivate this function.

The following screen displays :



Display of the submenu **AUTO**

Press the **AUTO** key to deactivate the automatic mode. The symbol **<->** disappears.

Press again the **AUTO** key to reactivate the automatic mode. The symbol **<->** appears again.

Press the  key to return to the main menu **MAGTEST**.



11. IMPORTANT INFORMATION



CAUTION !

DO NOT OPEN THE DEVICE.

HIGH VOLTAGE (> 400 V) !



Do not place magnets on the device !



The maximum value that can be displayed by the device is 999 μ T.

The maximum value that can be supported by the sensors before deterioration is 100.000 μ T.

12. SAFETY PRECAUTIONS

Copyright law protects the contents of this operating manual. Law prohibits reproduction and using its elements without the written consent of the manufacturer and the importer.

Before you use the **HOROTEC® Magtest** product, read all operating instructions because it can provide optimum performances and longer service life for your device. Save all manuals and documentation for future reference.

The manufacturer reserves the right to modify or update the information contained in this guide.



CAUTION !
RISK OF ELECTRIC SHOCK
DO NOT OPEN
CAUTION : TO REDUCE THE RISK OF ELECTRICAL SHOCK,
DO NOT REMOVE THE COVER.
NO USER SERVICEABLE PARTS INSIDE.



WARNING !

Danger of electrocution.

To avoid the risk of electric shock, do not remove the cover.

No user serviceable parts inside.



An exclamation mark enclosed in a triangle alerts the user to important operating and maintenance instructions in the documentation provided with the product.



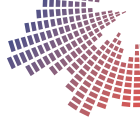
DANGER ! If the product is used without observing the information given under this symbol, serious injury or death may result.



ATTENTION ! If the product is used without observing the information given under this symbol, minor personal injury, damage to the equipment, or loss of valuable data may result.

General precautions :

Instructions for use	Read the entire instructions for use before using the product
Cleaning	Always unplug the wall outlet before starting to clean the device. Never use a liquid cleaner, aerosol or organic solvents to clean the device. Wipe the unit with a slightly damp cloth
Accessories	For your safety, use only accessories recommended by HOROTEC SA
Water/Humidity	Do not use the device near a water or moisture source
Power supply	Power this device only with the type of power supply specified on the manufacturer's label
Thunderstorms	If a thunderstorm occurs while using an AC adapter, remove it from the wall outlet immediately
Heat	Never use or store this product near any heat source such as a radiator, heat register, stove, or any type of equipment or appliance that generates heat



Handling of the HOROTEC® Magtest :

WARNING !

Never use the device near flammable or explosive gases.

Stop using the product immediately if you notice any unusual odours, noise, or smoke around it.

Do not leave the device in places where it may be subject to extremely high temperatures.

In use, the internal power source (battery or rechargeable battery) become warm.

After long-term use, the device may feel warm.

Be careful with the measuring cables. They could easily catch on stray objects and cause serious damages.



Follow these important guidelines to prevent batteries from leaking overheating, burning, exploding, or causing electrical shocks or burns.



DANGER !

Do not use any other type of network adapters than those with your device.

FOR OUR EUROPEAN CUSTOMERS :



«CE» mark indicates that this product complies with the European requirements for safety, health, environment and customer protection.



This symbol (crossed-out wheeled bin - WEEE Annex IV) indicates separate collection of waste electrical and electronic equipment in the EU countries. Please do not throw the equipment into the domestic refuse. Please use the return and collection systems available in your country for the disposal of this product.



This symbol (crossed-out wheeled bin - Directive 2006/66/EC Annex II) indicates separate collection of waste batteries in the EU countries. Please do not throw the batteries into the domestic refuse. Please use the return and collection systems available in your country for the disposal of the waste batteries.

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