MECON
SAFETY CONTROL

MAG-FLUX® HTL

Portable hydrant tester for measuring flow, pressure, temperature* and turbidity*

**optional*

made
in
Germany

EN OPERATING MANUAL

IMPRINT

CONTENT

1 SAFETY INSTRUCTIONS

1.1 Intended use

Magnetic-inductive flow meters (MID) are precision measuring instruments that are suitable for the linear flow measurement of almost all electrically conductive liquids. Due to the magnetic field, they can be used for flow velocities up to 12 m/s (39.4 ft/s) and for a minimum conductivity of 50 µS/cm with a synchronised DC field.

The complete measuring system consists of a battery-powered flow meter and pressure transmitter.

This documentation contains the information required for the intended use of the product described therein. It is addressed to qualified personnel. Such personnel must have read and understood these operating instructions and follow the instructions within them!

NOTICE!

The operator of these measuring devices is solely responsible for the suitability, intended use and corrosion resistance of the selected materials. Particular effort must be made to ensure that the materials selected for the wetted parts of the flow meter are suitable for the process media to be measured.

The meter must not be exposed to external loads.

1.2 Certifications

» CE marking

CE

Fig. 1: CE marking

By affixing the CE mark, the manufacturer certifies that the mag-flux HTL mobile hydrant tester is approved according to the following guidelines:

» 2014/30/EU (EMC)
» 2014/53/EU (RED)

1.3 Manufacturer's safety instructions

The manufacturer is not liable for damages of any kind caused by the use of the device, including, but not limited to, direct, indirect, incidental, punitive and consequential damages.

For every product purchased from the manufacturer, the warranty only applies when used according to the relevant product documentation and the valid terms and conditions.

The manufacturer reserves the right to revise the content of the documents, including this disclaimer, without notice, and is not liable in any way for the possible consequences of such changes.

The responsibility for ensuring that the flow meter is suitable for the particular application rests solely with the operator. MECON GmbH assumes no liability for any damage caused by improper use, replacement parts, electrical or mechanical external influences, overvoltage or lightning. Under such circumstances the warranty lapses. Likewise, no liability whatsoever is accepted for any resulting consequential damages.

In case of a complaint the rejected components must be cleaned of hazardous substances and to be returned to the manufacturer unless otherwise agreed (see 6.3).

To prevent injury to the user or damage to the unit, it is required that you read these operating instructions carefully before starting to use the device.

These instructions are intended to cover the correct installation, operation and maintenance of the equipment.
We reserve the right to make changes to technical data as a result of technological progress.
The development and preparation of this manual have been carried out with the utmost care. Nevertheless, errors cannot be completely ruled out. The latest documents are available for download at www.mecon.de

Special designs for special applications and custom models are not covered by this documentation.

2 SCOPE OF DEVICES

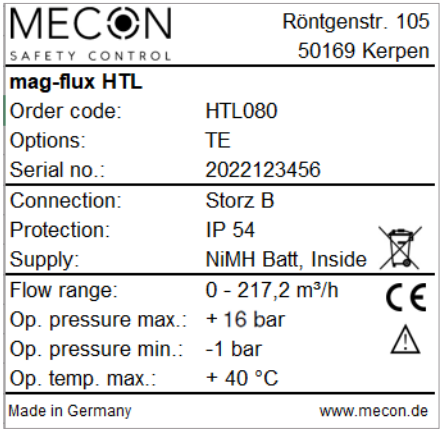
2.1 Scope of delivery

Included in the scope of delivery are:

① Hydrant tester
② Power adapter
③ Calibration certificate
④ Operating instructions

Fig. 2: Scope of delivery mag-flux® HTL

2.2 Nameplate



① Order code
② Options
③ Serial number
④ Process connection
⑤ Protection class
⑥ Power supply
⑦ Flow range
⑧ Operating pressure (-1 ... 16 bar)
⑨ Max. operating temperature

Fig. 3: Nameplate mag-flux® HTL

3 INSTALLATION UND MODE OF OPERATION

The operating instructions are to be read in their entirety before installation and commissioning. Installation and repair may only be carried out by trained personnel! The hydrant tester „mag-flux HTL“ described in these operating instructions may only be used for measuring the volume flow and pressure of electrically conductive liquids!

The principle of flow measurement is based on Faraday‘s Law of Electromagnetic Induction, where the sensor converts the flow into a voltage proportional to the flow rate.

The pressure-sensitive element is a piezoresistive silicon chip with high sensitivity. It is protected from environmental influences by a stainless steel housing.

3.1 System design

The meter consists of a flow sensor, a transducer and a pressure sensor. The flow sensor is used to measure liquid media. The transducer generates the coil current required for the magnetic field and creates the conditions to apply the induced voltage to the electrodes.

In the piezoresistive pressure sensor, measurements are made by the variable mobility of the electrons in the crystalline structure, which has an influence on the resistivity. This is caused by mechanical stress on the encapsulated sensor.

NOTICE!

The nickel-metal-hydride high performance batteries used have a low self-discharge. For this reason it is advisable that if the hydrant tester is not in operation for a long time, it is charged regularly (at least once every four weeks).

3.2 Installation notes

NOTICE!

All instruments are carefully checked for proper functionality before shipment. On receipt, immediately check the outer packing carefully for damage or signs of improper handling.

Report any damage to the carrier and your local sales staff. In such cases, a description of the damage, the type and the serial number of the device should be given.
Unpack the unit carefully to avoid damage.

Check the completeness of the delivery against the packing list. Check the nameplate to ensure that the delivered flow meter meets your order.

3.3 System setup

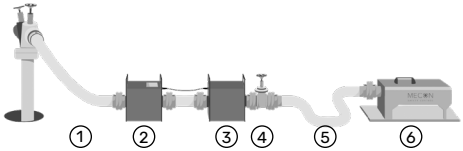


Fig. 4: Setup with turbidity sensor

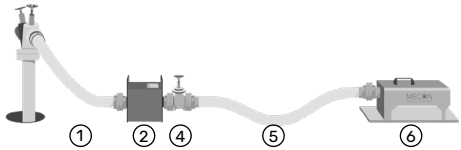


Fig. 5: Setup without turbidity sensor

① Inlet hose
② mag-flux® HTL
③ Turbidity sensor with connection hose
④ Regulation valve
⑤ Outlet hose
⑥ Pressure reducer

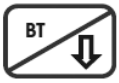
The maximum length of the inlet hose according to DIN 14462 must not exceed 2 meters. The hose should be as straight as possible. The nominal diameter must be at least equal to or larger than the nominal diameter of the measuring device.
A smaller nominal diameter will result in deviations and fluctuations.
The outlet hose should be no longer than 3 meters to avoid creating back pressure.
The ideal installation location is a pipe with a sufficiently straight section in front of and behind the measuring point. An inlet section of 5 x nominal width and an outlet section of min. 2 x nominal width is recommended, provided that no standing vortices can reach into the zone where the measured value is determined (e.g. after pipe bend, with tangential inclusion

or with a half-opened gate in front of the sensor). In such circumstances, measures should be taken to normalise the flow profile.

To ensure trouble-free operation, avoid any direct magnetic fields outside the unit.

3.4 Operating elements - functional overview

ON button
» Switching on the hydrant tester
» Arrow upwards

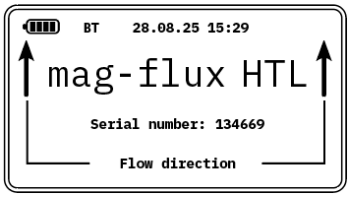


BT button
» Turn Bluetooth on / off
» Arrow down

OFF / Enter button
» Confirm the selection
» Press and hold: cancels the selected function
» Press and hold in startup screen: switch off the device

3.4.1 Startup screen

To turn on the hydrant tester press the „ON“ button. The startup screen will appear.



Notice:
“BT” is only displayed when Bluetooth is switched on.

You will be taken to the main menu by pressing the „ON“ button again.

3.4.2 Menu structure

For a clear representation of the functionalities, the menu structure will now be shown schematically as follows:

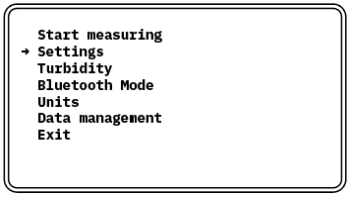
Main menu
- Start measuring
- Settings
- Turbidity
- Bluetooth Mode
- Units
- Data Management
- Exit

- Start measuring
  - Record the measurement
  - Without saving measurement
  - Exit
- Settings
  - Recording interval
  - Sensor attenuation
  - Set date
  - Set time
  - Backlight time
  - Change password
  - Standby
  - Language
  - Software version
  - Exit
- Turbidity
  - Turbidity enabled
  - Exit
- Bluetooth Mode
  - Bluetooth Mode
  - Exit
- Units
  - Pressure
  - Flow
  - Temperature
  - Exit
- Data Management
  - Delete last dataset
  - Delete all datasets
  - Exit

3.4.3 Turbidity (optional)

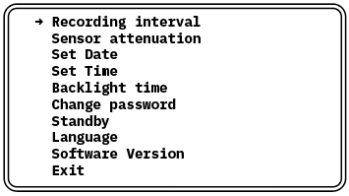
A separate sensor is required to measure turbidity.
If the device is equipped to measure turbidity, you should decide before starting the measurement whether to measure it. If turbidity measurement is desired, the separate sensor must be connected via cable and turbidity must be activated in the menu (see 4.4).

3.5 Settings

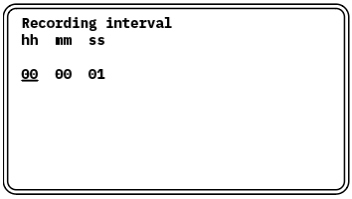


Use the “ON” and “BT” buttons to select “Settings” and confirm with the “OFF / Enter” button.

3.5.1 Recording interval



Use the arrow buttons to set the parameter marked by the underscore. Confirm by pressing the “OFF / Enter” button (hours:minutes:seconds).

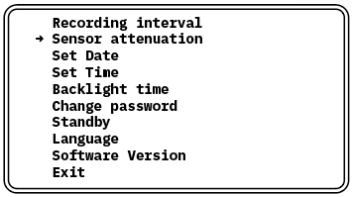


A storage interval of 1 second is preset.

3.5.2 Sensor attenuation

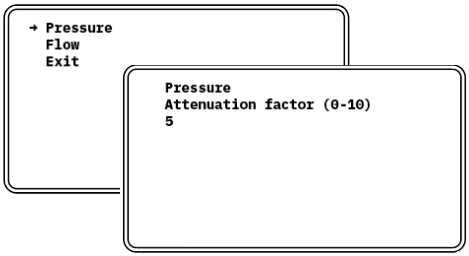
If the measurement signal appears unstable (with rapid changes in measured values), you can adjust this individually by adjusting the attenuation for pressure and flow.

Confirm the menu item “Sensor attenuation“ by pressing the “OFF / Enter“ button to open the sensor attenuation menu.



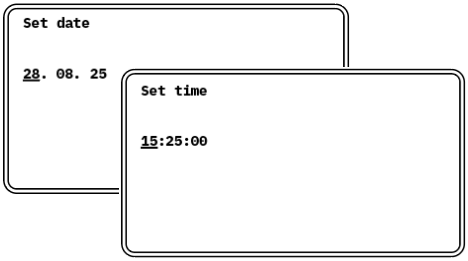
The attenuation factor can be adjusted manually in the respecitve submenus.
Select the desired menu item by pressing the “OFF / Enter“ button.

By pressing the arrow buttons you can select between the values 0 ... 10.
The value “0“ stands for the lowest and the value “10“ for the highest attenuation.
Confirm the desired value using the “OFF / Enter“ button.



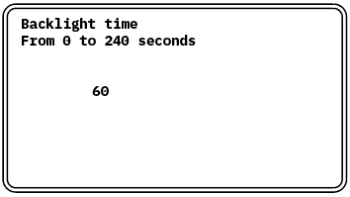
3.5.3 Date / Time

Date and time are preset already.
If necessary, you can make adjustments in the “Set Date“ and “Set Time“ menu items.



3.5.4 Backlight time

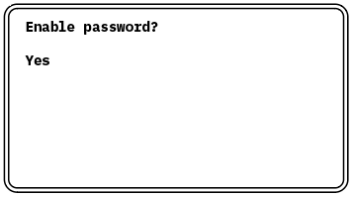
Set the lighting time of the LCD display (in seconds) by using the arrow buttons and confirming with the “OFF / Enter“ button
With the value “0“ you can set a steady light.



The backlight time is preset to 60 seconds.

3.5.5 Change password

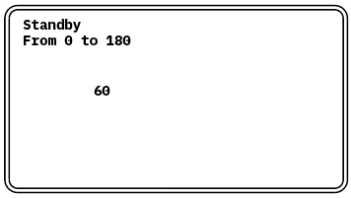
No password protection is preset.
To protect the device‘s operation with a password, use the arrow buttons to set the password activation to “Yes“. Confirm your entry with the “OFF / Enter“ button.



“Password: 0000“ appears. Use the arrow buttons to enter a four-digit password. Confirm your entry with the “OFF / Enter“ button. Password protection is now active. The device can only be operated after entering the four-digit password you specified.

3.5.6 Standby

The device does not switch off automatically after a measurement is completed.



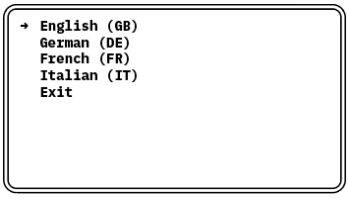
You can enter a time period (in minutes) after which the device will automatically switch off. Set the value using the arrow buttons. Confirm your entry with the “OFF / Enter“ button.

The value “0“ means no automatic shutdown.

An automatic switch-off after 60 minutes is preset.

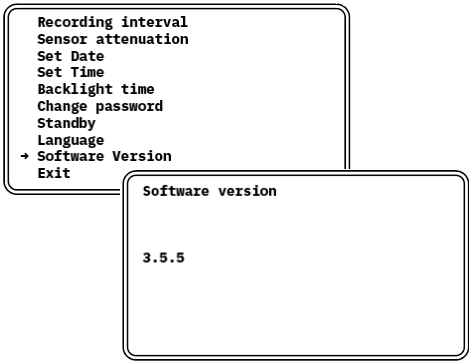
3.5.7 Language

Select the language by using the arrow buttony. Confirm your selection with the “OFF / Enter“ button.



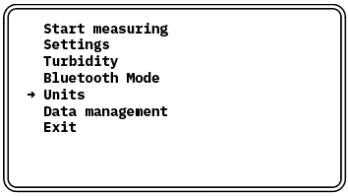
3.5.8 Software version

The current software version is displayed here for service purposes.



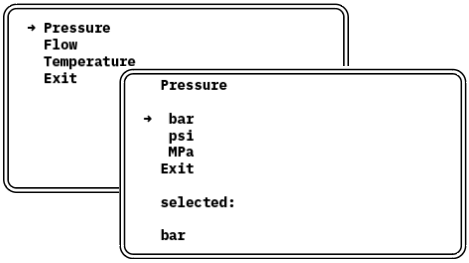
3.6 Select units

With the arrow buttons you can select the menu item “Units“.

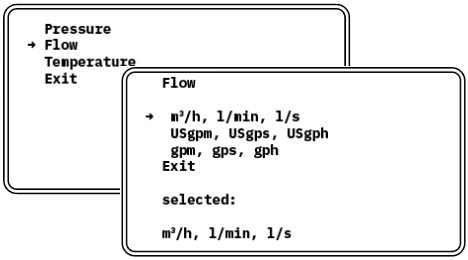


Selecting the measured value takes you to the selection of possible measuring units. Press the “OFF / Enter“ button to save the selected unit. The current unit is displayed under “selected“. After selecting a unit, or by selecting “Exit“, you return to the previous menu.

Selection of the unit for pressure:

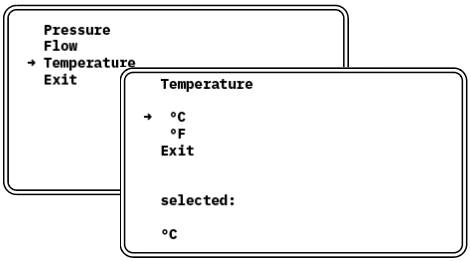


Selection of the unit for flow:



The selected units for the flow rate can be changed during the measurement by pressing the “ON“ button.

Selection of the unit for temperature:



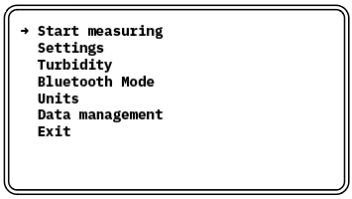
The selected units are saved and only need to be selected once.

4 COMMISSIONING

4.1 Start measuring

The device is switched on with the “ON“ button. Press the “ON“ buttonagain to return to the main menu.

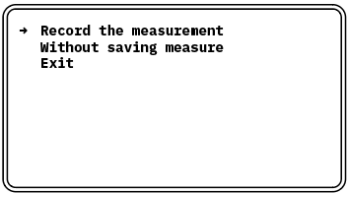
Select the menu item “Start measurement“ with the arrow buttons to start the measurement.



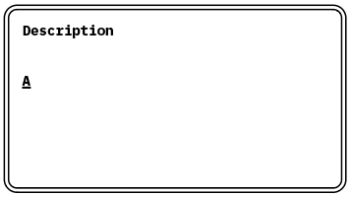
With the arrow buttons you can select between a measurement with or without saving the data.

4.2 Record the measurement

When measuring with data storage in the device (and the option of subsequent processing using the optionally available software Wasserkarte.info), you make the following selections:



The following display appears for the alphanumeric description of the measuring point:



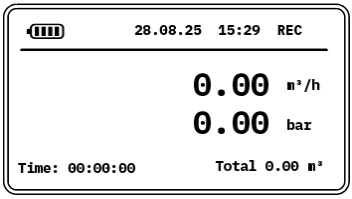
The underscored letter can now be replaced by pressing the arrow buttons, either with a different letter, number or special character. The following contents can be displayed (maximum 15 characters):

Letters:	A … Z / a … z
Numbers:	0 … 9
Special characters:	_ : ( ) + -

Confirm the change with the “OFF / Enter“ button.

This allows the measured values to be assigned to a measuring point description.

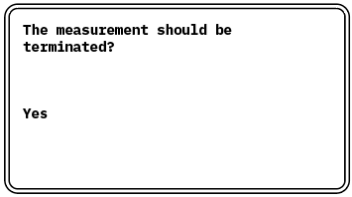
By holding the “OFF / Enter“ button longer, the following display appears:



From now on, all measured values will be stored - the information “REC“ for record will appear in the display at the top right. In addition to the current measured values of flow rate and relative pressure, the total flow rate is displayed in the lower right corner of the display.

Notice:
To switch the display to l/min or l/s, the “ON“ button must be pressed.

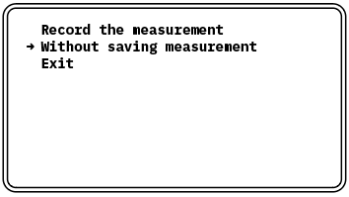
If you want to stop the measurement, press and hold the “OFF / Enter“ button and then the following appears:



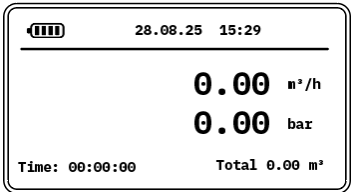
Afterwards, press the “OFF / Enter“ button. The measurement is now complete and the start screen appears.

4.3 Without saving measurement

When measuring without saving the data, make the following selections:



Press the “OFF / Enter“ button. Entering a measurement point or label is not necessary. The following screen appears:



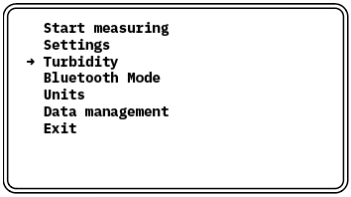
The measurement begins. In addition to the current flow rate and relative pressure measurements, the total flow rate is displayed in the bottom right corner of the display.

Notice:
To switch the display to l/min or l/s, the “ON“ button must be pressed.

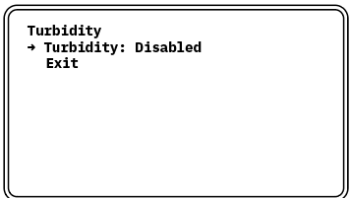
If you want to stop the measurement, hold down the “OFF / Enter” button and the start screen will appear.

4.4 Activate turbidity measurement

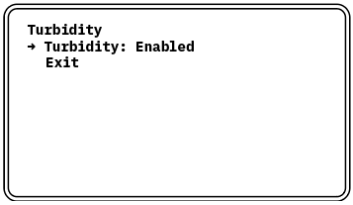
To measure turbidity, select “Turbidity” in the main menu and confirm your selection with the “OFF / Enter” button.



The turbidity is deactivated by factory.



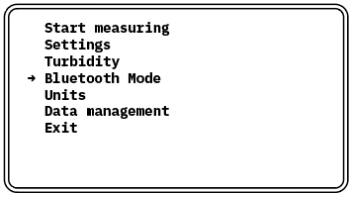
To activate the turbidity, press the button “OFF / ENTER“ in the menu item “Turbidity“.



Afterwards, the menu item “Exit“ takes you back to the main menu.

4.5 Selecting Bluetooth mode

To activate Bluetooth, select the menu item “Bluetooth mode“ by pressing the “OFF / ENTER“ button.

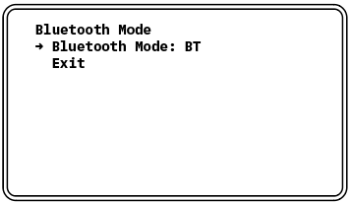


Pairing code for the 1st Bluetooth connection: -1234-

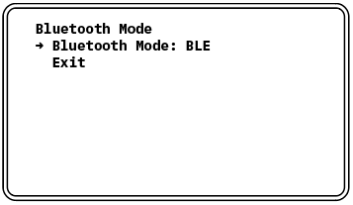
You can select between the variants BT (Bluetooth) and BLE (Bluetooth Low Energy).

The following settings are recommended depending on the operating system of the Wasserkarte.info app:

BT - Android



BLE - iOS



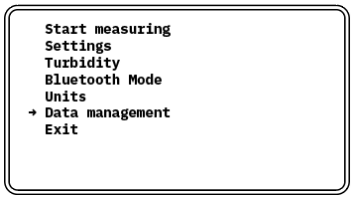
Confirm your selection with the “OFF / Enter“ button.

You can return to the main menu via the menu item “Exit“.

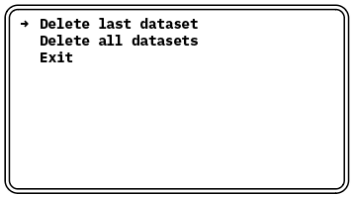
4.6 Data management

After all measurement series have been read out and saved in the Wasserkarte. info app, the used storage space can be released.

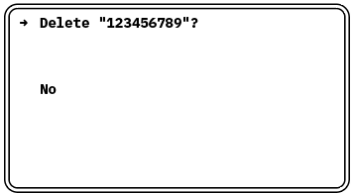
To do so, select the menu item “Storage Management“ by pressing the “OFF / Enter“ button.



You can now use the arrow buttons to select whether you want to delete only the most recently saved record or all records. Confirm your selection with the “OFF / Enter“ button.



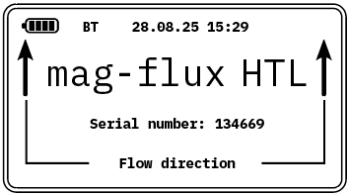
Confirm the final deletion again with the “OFF / Enter” button.



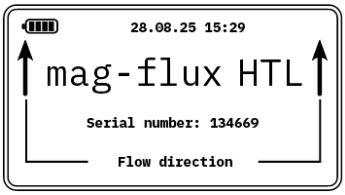
All measured values are retained in the memory, even when the battery is discharged.

4.7 Read data

In order to establish a Bluetooth connection between a Bluetooth enable and the hydrant tester, in addition to activating the appropriate function on the mobile device, the mag-flux® HTL must be switched on with the “ON“ button. When the Bluetooth connection is activated for the first time, the pairing code -1234- must be entered on the mobile device (see also 4.5). Afterwards you have to press the “BT button“. The following screen appears:

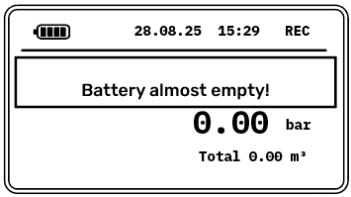


As soon as a Bluetooth connection is established between the hydrant tester and the mobile device, the Wasserkarte.info APP has access to the mag-flux® HTL. After a successful data transmission, the Bluetooth module should be switched off again by pressing the “BT“ button.



4.8 Critical battery status

When the battery level is low, an additional visual message is shown in the display to protect the battery and prevent deep discharge (see figure).
The device can now be switched off by briefly pressing the “OFF / Enter“ button.



As soon as the message occurs during a measurement, the measuring units can still be changed with the „ON“ button. Measurements in progress are saved up to this point, provided they were started in advance with „Record measurement“.

In addition, the battery symbol flashes in the display. The device should be connected to a power supply as soon as possible. (see also the note under 3.1). The device switches off atomatically to protect the batteries when the battery level is too low.

5 EQUIPMENT

5.1 Mobile App

In addition to the easy-to-read display, the measuring process can be controlled via the field-tested app from the company wasserkarte.info. All measurement data for pressure, flow rate, temperature and turbidity are transmitted live via Bluetooth from the hydrant tester to the app. The measurement protocols as well as diagrams are displayed directly as a preview.
The app provides you a comprehensive solution approach for hydrant maintenance from documentation, planning, localisation, performance to maintenance.

To the webseite:
http://wasserkarte.info/en/hydrant-measurement

wasserkarte.info

5.2 Turbidity sensor

To use the mag-flux® HTL for turbidity measurement, the separate turbidity sensor must be purchased. It is supplied with a 0.4 m hose and connecting cable, and is connected behind the mag-flux® HTL in the measuring section.

6 SERVICE

6.1 Storage

Store the emptied device in a dry and dust-free place. Keep away from direct heat and sunlight. Avoid external loads on the device. The permissible storage temperature is -20 ... 60 °C (-4 °F ... 140 °F).

6.2 Maintenance

The hydrant tester „mag-flux HTL“ is maintenance-free. It is recommended that the device be returned to the manufacturer for recalibration after two years, depending on the conditions of use (see point 6.3 Return of the device to the manufacturer). This will guarantee a long and trouble-free service life.

6.3 Returning the device to the manufacturer

Due to careful manufacturing processes and final checks on the device, the mag-flux® HTL is expected to operate trouble-free, where both installation and operation are in accordance with these instructions

Should you nevertheless return a device to MECON GmbH please observe the following points:

⚠ ATTENTION!

For reasons of legal regulations on environmental protection and occupational health and safety and to maintain the health and safety of our employees, all devices returned to MECON GmbH must be free of toxic and hazardous substances. This also applies to the cavities of the devices.

If necessary, the device must be neutralised or rinsed by the customer before being returned to MECON GmbH .

The customer must complete and confirm the corresponding form, which can be downloaded from the MECON GmbH website, and enclose it with the return shipment:

https://www.mecon.de/files/daten/downloads/en/Confirmation-of-decontamination.pdf

6.4 Disposal

⚠ ATTENTION!

Always comply with the regulations in your country when disposing of devices.

Electrical and electronic equipment must not be disposed of with household waste. As the owner of such equipment, you are required to deliver it to a separate municipal waste collection point (unsorted municipal waste).

Some of our products include batteries, some of which are rechargeable, which also must not be disposed of with household waste. Such batteries are marked with the crossed-out dustbin symbol under which the chemical symbol for classification as heavy metal containing harmful substances (Cd for cadmium, Hg for mercury or Pb for lead) is affixed. As a consumer, you are legally obliged to return used batteries. You can hand them in for professional disposal at public collection points or return them to us.