

# User manual

## AGRETO HFM II

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# 1 Introduction

Thank you for choosing an AGRETO hay- and straw moisture meter. You have got a robust tool for daily practice. Please read this manual carefully before operating the unit.

## 2 Scope of delivery

- 1 meter 50 cm measuring lance (or 25/100/200 cm depending on model)
- 1 battery 9 V
- 1 packaging box
- 1 user manual

## 3 Intended use

The HFM II AGRETO hay- & straw moisture meter is designed for measurement of moisture and temperature in compressed hay bales (square bales, round bales and large bales) by inserting the probe into the bale at right angles.

To obtain meaningful values, the measurement at several points in the bale must be carried out, and an average can be formed.

In practice it is usually not an exact moisture percentage, but a review of the barrel in terms of quality and storability. The higher values in the bale must be given priority.

Not pressed material must be compressed before measurement in a suitable form, for example by compressing in a bucket.

To measure the temperature the probe must remain in the material until a constant temperature is displayed.

### User information:

- Store the device on a dry place.
- Do not immerse the probe in water!
- Make sure that the lance is not tilted or bent during insertion. This is especially true for the long lances (100/200 cm).

## 4 Security

### 4.1 Safety instructions for the buyer



Important!

Make sure that each person who works for the first time with the AGRETO HFM II has read and understood this manual.



Danger!

Make sure that the AGRETO HFM II is kept in a place that is not accessible to unauthorized persons.

### 4.2 Safety instructions for the operator



Danger!

The AGRETO HFM II may only be operated by persons who are familiar with the operation of the device.



Precaution!

Keep the work area clean! Soiled areas contributes to accidents.

### 4.3 Personal protective equipment



WARNING!

For people who work with the device, the wearing of safety gloves is required.



WARNING!

For people who work with the device, the wearing of safety shoes is required.

#### 4.4 Residual hazards

Working with the device residual risks may arise for persons and objects that cannot be prevented by design or technical protection measures.



**Danger!**

During the handling of the device there may be a risk of injuries because of the pointed measuring lance tip.



**WARNING!**

The AGRETO HFM II must not be operated in the area of live parts and wiring. There is a risk of electric shock!



**WARNING!**

The AGRETO HFM II must not be operated in explosive areas.

## 5 Technical Specifications

- Box dimensions: 800x78x54 mm (LxWxH) (version with 50 cm lance)
- Device dim: 772x70x48 mm (LxWxH) (version with 50 cm lance)
- Weight incl. battery: 650 g (version with 50 cm lance)
- Stainless steel lance with plunge length 50 cm (50 cm version)
- Dust-and splash-resistant housing
- Stable, ergonomically shaped wooden handle
- Keypad with 4 keys
- LCD display with 13 mm high digits
- Moisture range 9 to 70%
- Temperature range 0 to 100 °C or 32 to 212 °F
- Resolution of the display 0,1 %; Accuracy 0,8 %
- Ongoing display of the measured value during the measurement procedure for the rapid determination of moisture content at various points in bales
- Hold-function; Count-function; Average-function
- Display the battery voltage
- Automatic backlight
- Automatic shutdown
- Acoustic warning in case of too high moisture
- Power supply by 9 V battery

## 6 Commissioning

When supplied, the supplied battery is disconnected. Open the battery compartment, connect the battery and close the battery compartment.

## 7 Working with the device

### 7.1 Keypad



### 7.2 Switching on the device

The device does not have a power button. It automatically turns on when you press one of the [Temperature] or [Moisture] button.

### 7.3 Making Measurements

Once the device is turned on continuously (2x per second) either moisture or temperature values are displayed depending on the selected mode. The current display is signalled by the flashing decimal point, the displayed values are of course only meaningful if the probe is in the material.

To change the mode, press the button [Moisture] or [Temperature] briefly.

To carry out moisture measurements, proceed as follows:

## AGRETO HFM II

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- Penetrate the probe on one of the side surfaces of the bale.
- With the current display you can already read the measured value during the slow penetrating. When pulling out the lance, the values are not meaningful.
- Moisture values are displayed between 9 and 70 %.
- Moisture values below 9 % are displayed as „L“.
- At moisture values over 50 the display flashes with the message „H“.
- Repeat the measurement at different places in the bale to obtain a better overview of the situation in bales.
- The display lighting turns on automatically when making measurements with moisture above 12 %. To enable it manually press the [moisture] or [temperature] key. After 10 seconds without pressing a button and without measurements above 12 % the light is turned off.
- After 2 minutes without pressing a button and without measurements above 12 % the unit switches off completely. To turn on again, press the [moisture] or [temperature] key.
- If a battery sign appears on the display, the battery voltage is below 8 volts and the battery should be replaced.

### To carry out temperature measurements, proceed as follows:

- Insert the probe on one of the side surfaces of the bale and read the display.
- Wait until the temperature is stable, it can take up to several minutes. Read the value only, when the display shows a steady value.
- Note that the lance can warm up itself by repeatedly piercing. Allow it to cool down before you make further measurements.
- Repeat the measurement at different places in the bale to obtain a better overview of the situation in bales.
- To switch the unit between Celsius and Fahrenheit hold down the [Temperature] key for 5 seconds. The setting Celsius is indicated on the display by the symbol °C.

## 7.4 Freezing of displayed values (Hold function)

If you cannot see the display while the moisture measurement, for example if you measure a bale on a trailer, you can freeze the currently displayed moisture



value for 5 seconds by pressing the [Moisture] key. During this time, the current display is frozen and displayed and the held value is displayed with a non-flashing decimal point. Then the device starts again with the automatic display of the current measured value.

## **7.5 Forming averages**

To form an average of several measurements of moisture, or to count the number of measurements, proceed as follows:

- Perform the initial measurement.
- When the reading on the display is stable, press the button briefly [Summing]. The displayed value is written to memory. On the display the number of measurements that are already in memory appears for 5 seconds. Then the unit will return to the automatic display of the moisture.
- Repeat the process as many times as you like with different measurements or measurements of several bales.

## **7.6 Retrieving the average value**

To display the average of the stored measurements, proceed as follows:

- Press and hold the [Summing] key for about 4 seconds.
- The average moisture value of all stored measured values appears on the display. This value is flashing alternating with the number of measurements.
- The total memory is not cleared.
- To return to the current display, press the [Moisture] key.

## **7.7 Deleting the total memory**

To delete the total memory manually turn the device off and on again. After automatic turn off the total memory is not cleared.

## **7.8 Display of Battery Voltage**

To display the battery voltage, briefly press the button [Off]. The battery voltage in Volts appears on the display for about 3 seconds. The unit automatically switches back to the current display mode.

## 7.9 Acoustic warning

When the moisture measurement is over the set limit, an acoustic signal sounds. For setting the limit (between 12 and 50 %) press and hold the button [Moisture] for about 4 seconds. The set value is displayed. A short press on the button [Moisture] increases the limit by one percentage point. After setting 50 the setting 12 follows again. After about 5 seconds without pressing a button, the unit returns to original mode.

## 7.10 Switching off the device

After 2 minutes without any key operation and without making measurements above 12 % moisture the device switches off automatically.

To turn off the device manually press and hold the [Off] key for about 3 seconds. When you turn off manually the total memory is erased.

## 8 Factors influencing moisture testing

### 8.1 Bale density

Hay and straw bales are of different density. In practice, the bale density may usually not be determined. In addition, the density within a bale can be very different, intentionally or unintentionally.

The calibration of AGRETO HFM II is designed for an average bale density. In bales with higher density a higher moisture level will tend to appear and at lower density bales a lower value will be displayed. This fact is advantageous in practice in many cases, because, with higher density bales increased sensitivity is advised with respect to quality and storability.

### 8.2 Material

A hay or straw bale consists of various plant parts drying unevenly. Also, the material in the bale is not always stored uniformly. The leaf / stem ratio is not always the same in the entire bale.

Accordingly, the moisture inside a bale is different. Bales with higher moisture typically have higher moisture differences within the bale. With increasing drying the differences become smaller.

The AGRETO HFM II measures the moisture and the temperature only in the region of the material that rests directly around the tip of the device.

### 8.3 Sweating

In the first days after the pressing, the moisture value can rise slightly. In marginal bales you should constantly perform control measurements these days.

### 8.4 Preservatives

Some preservatives change the electrical properties of the material. In the period in which the preservative is added, it may lead to an increased moisture value for several days to a few percentage points.

## 9 Cleaning and maintenance

- After making measurements with high humidity, dry the dip until the “L” symbol appears on the display.
- Clean the tip and the lance of the instrument before the season and when visibly soiled with fine steel wool and / or alcohol.
- Store the device on a dry and clean place.
- If you are not using the unit for a long time, it is advisable to disconnect the battery.

## 10 Troubleshooting

### 10.1 Battery is empty

If the device displays the battery symbol, the battery needs to be replaced. Any displayed measurement values can be wrong.

### 10.2 Wrong measurement values

If you think the displayed measurement values are not correct proceed as follows:

- Note the information in the section "Factors influencing moisture measurements"
- Note the fact that even in dry bales moist areas may occur and / or locations with higher temperature.
- Make sure that the tip and the probe are dry. In the initial state on the display "L" must appear. If a value is displayed without insertion of the lance, then the tip is not dry.
- Make sure that the tip and the lance are not contaminated.
- For temperature measurements, note that the probe must remain in the material as long as the temperature display does not change.

### 10.3 Damages on the device

- Please contact the manufacturer or your dealer

## 11 Warranty

Over and above statutory warranty for AGRETO HFM II following warranty provisions apply:

- The AGRETO electronics GmbH guarantees the function and repairs or replaces all the parts that have a material or manufacturing damage within the warranty period.
- Warranty services will be performed by the AGRETO electronics GmbH.
- The decision on the existence of a warranty claim is sole responsibility of the AGRETO electronics GmbH.
- The warranty period begins with the first accounting to an end customer and ends 5 years from this date of invoice.
- Prerequisite for warranty service are the presentation of the original invoice and compliance with all elements of this instruction manual.
- Excluded from warranty are wear, normal wear and tear, damage due to misuse, negligence or accident.
- When processing a warranty claim transport costs incurred will be charged to the buyer.

## 12 Disposal



Dispose of the HFM II in the definitive shutdown or parts of environmentally friendly (metal to the respective metal scrap, plastic to plastic waste, etc. - Do not dispose as household waste!) Detailed information can be found in Directive 2002/96/EC.

# 13 Declaration of Conformity



## EC Declaration of Conformity

For the following named product

### AGRETO HFM II Hay-&Straw Moisture Tester

This is to confirm that it complies with the essential protection requirements of Council Directive on the approximation of the laws of Member States relating to electromagnetic compatibility (2004/108/EC) and Low Voltage (2006/95/EC).

For the evaluation regarding electromagnetic compatibility, the following standards were applied:

EN 61000-6-1:2007  
EN 61000-6-3:2007 +A1:2011  
EN 61326-2-3:2006

This explanation is given by the manufacturer

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10.03.2015



legally binding signature

## 14 Imprint

All information, specifications and illustrations are as of 2019, subject to technical changes or design changes.

All information in this manual are supplied without liability despite careful preparation. A liability by the author is excluded.

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