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Operating Manual Appendix

Hay and straw humidity measuring device

as of version 2.1

BaleCheck 150 with GMH 38

CE

Made in Germany

WEEE-Reg.-Nr. DE 93889386

senseca

Please note our new name:
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Documents are in the process of being changed.

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1 General Note

Read this document carefully and get used to the operation of the device before you use it.
Keep this document within easy reach near the device for consulting in case of doubt.

Mounting, start-up, operating, maintenance and removing from operation must be done by qualified, specially trained staff that have carefully read and understood this manual before starting any work.

The manufacturer will assume no liability or warranty in case of usage for other purpose than the intended one, ignoring this manual, operating by unqualified staff as well as unauthorized modifications to the device.
The manufacturer is not liable for any costs or damages incurred at the user or third parties because of the usage or application of this device, in particular in case of improper use of the device, misuse or malfunction of the connection or of the device.

The manufacturer is not liable for misprints.

2 Intended Use

The BaleCheck 150 is a complete set for material moisture measuring including an handheld instrument (GMH 38 series) with moisture display and rating.

The slim and robust measuring probe (GSF 40) makes the set a first-class tool for humidity measurements of pressed straw or hay (bales) and grain.
The measuring probe included to the set is connected to the device by a BNC-plug.

Depending on the application, either the material moisture u (based on dry matter) or the water content w (based on wet total mass) can be displayed.

Please consider the information “Measuring precision” in chapter 5.4

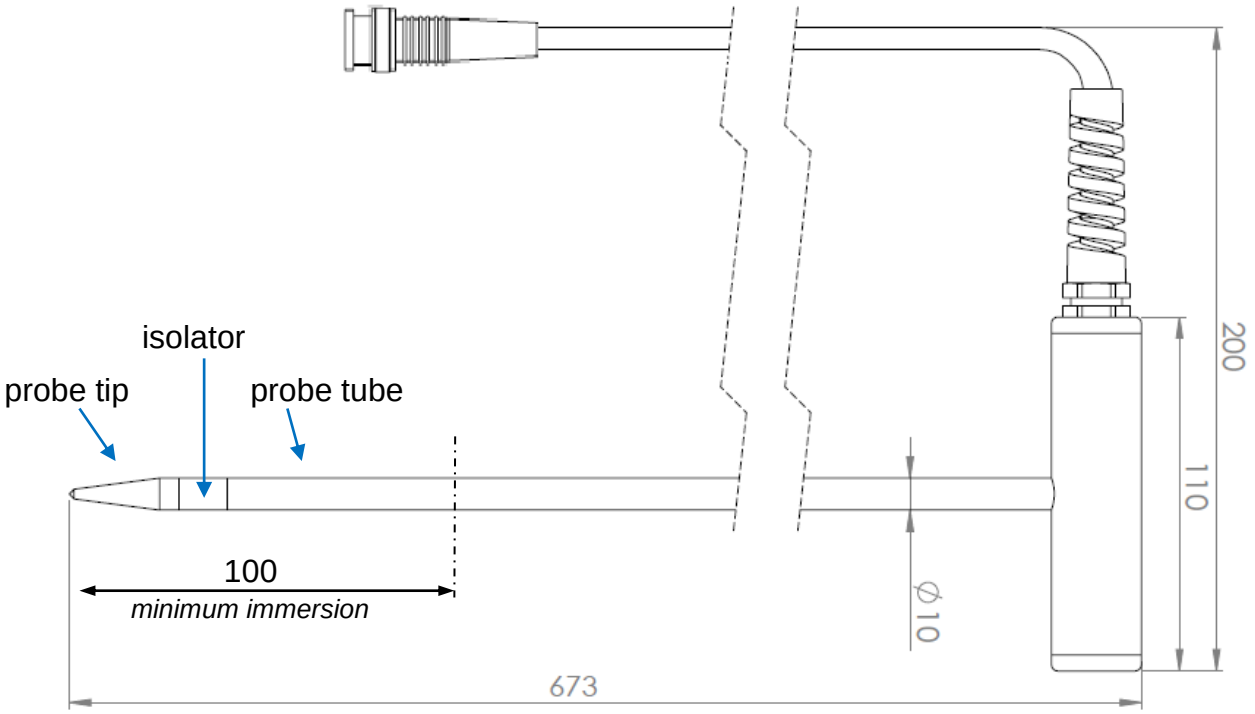
3 Product Description

3.1 Scope of supply

The set includes:

- Measuring probe GSF 40
- Handheld meter of GMH 38 series incl. 9V battery and operating manual
- Protection bag ST-KR
- Operating Manual Appendix BaleCheck 150

3.2 The measuring probe GSF 40



4 Handling

4.1 Start of operation

Switch the device on with the on/off key. After segment test the device is ready for measuring.

4.2 Selection of the characteristic curve

Selection of characteristic curve: by pressing 

the characteristic curve can be selected.

☞ The use of inappropriate characteristics can cause faulty measurements!

Selectable material characteristics: (via “Sort”-function preselected, please refer to operating manual GMH 38xx)

Display	Characteristic curve
rEF	Reference characteristic
h.462	Wheat
h.463	Barley
h.464	Hay
h.465	Straw

☞

By means of additional equipment (not within scope of supply) wood and building materials of many kinds can be measured – therefore the user has to add the referring characteristic curves to the Sort- Preselection, or deactivate it completely.

4.3 Temperature Measurement

The temperature will be displayed temporarily when key is 

ssed.

As long as no temperature sensor is connected, the device temperature is assumed to be the temperature of the material. With ATC = Off configurated, a manual temperature entry is displayed.

5 Principles of the measurements

5.1 Moisture rating (WET - MEDIUM - DRY)

In addition to the measuring value there is a moisture rating via bar graph.

☞ This rating can only be a first approximate value, because factors like the application field of the measured material have to be taken into account for the final rating. Experience and knowledge can only be supported by this instrument, not replaced!

5.2 Moisture *u* and water content *w*

Either moisture u or water content w is needed according to the application. The BaleCheck 100 is supposed to be used the unit moisture u (relating to oven-dry mass). In some cases, like rating of combustibles, the water content w may be more suitable.
The instrument can be configured to both of the values, please refer to GMH 38xx manual.

Moisture u (relating to oven-dry mass) – recommended setting

$$moisture\ u[\%] = ((mass_{wet} - mass_{dry}) / mass_{dry}) * 100$$

or:

$$moisture\ u[\%] = (mass_{water} / mass_{drv}) * 100$$

The unit is %u (also common: % atro, weight percent)

Example: 1 kg wet hay that contains 500 g water has a moisture u of 100%

Water content w (= moisture relating to wet total mass, please refer to operating manual GMH 38xx)

5.3 Temperature compensation

The temperature compensation is important for a reliable moisture-measuring.
The temperature of the measured material should therefore correspond well with the temperature of the instrument or with the manually entered temperature (ATC=Off)..

According to the selected material characteristic curve the device will use the associated temperature compensation.

5.4 Measuring Practice

The measuring values

For storability and evaluation of quality and purpose the BaleCheck measuring is a valuable decision support – Beside other criteria like smell (mouldy?)– consistency (dust…) and look (colour, dirt…).

For freshly harvested material like straw, hay and grain the following can be recommended:

below 16 % u	Material is sufficiently dry and storable
16 - 20 % u	Material contains significant moisture, eventually dry it before storage
above 20 % u	**Material contains excess moisture, stop harvesting if possible or dry before storing!**

Irregular moisture distributions

Please consider: depending on storage and harvesting procedure, there can be irregular distributions of moisture within the bales or grain heaps/stores.

Measuring precision

The BaleCheck 150 is designed for approximate determination of material moisture in hay, straw and grain. Depending on state and sort of material there may be deviations. The strength of the measuring system lies within the ability, due to the construction and usability, to gather fast and comfortably many measurements spread over the bale/store (deep inside, at the floor, at critical weathered places..) – in practical use this often is much more valuable than single precision measurements and also is a valuable supplement to single precision measurements!

Minimum immersion / minimum amount of material

For best measuring results, the black isolator at the probe tip has to be completely immersed into the material plus at least 5 cm of the stainless steel shaft has to be in good contact to the material. When measuring grain, try to use at least ~ 500ml of grain, covering the probe tip and ensure to have enough contact/compressed grain around the probe – In heaps/stores higher than 30 cm and minimum immersions of 20 cm no additional measures have to be taken; otherwise the measurement values may be too low.

Keep probe clean!

Especially when measuring in wet hay, the probe may be soiled very strong, this may produce to low measuring displays.

Soilded probe -> wrong measuring!

In hard cases we suggest fine grinding fleece o rat least suitable household sponges for cleaning. Do not use steel wool!

Display values at air

If the probe is not correctly in contact to material, the instrument may display any value!
This is caused by the design and measurement method.

At values above 25% u the measurement precision decreases!
But decision making in this range is: Wet is wet, no matter how wet!