Operating Instructions

Version 4.0

HYDROMETTE

BL E

EN

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All relevant national, regional and local safety regulations must always be observed when installing and using this device. For reasons of safety and to ensure compliance with the documented system data, only the manufacturer is authorised to carry out repairs to components. Failure to observe this information may result in injury or damage to the equipment.

Table of Contents

1 Foreword

1.1 User Description

These instructions are intended for the end user of the product. The end user of the product is a person who has read and understood these operating instructions, is an experienced user of similar devices and is aware of all possible dangers and can act accordingly.

The device may only be used by persons aged 14 and over who have read and understood these operating instructions, are familiar with the operation of similar products and are aware of all possible dangers and act accordingly.

The device is intended for use by persons who have experience with moisture measurements (structural moisture, wood moisture, climate, etc.).

All personnel involved in the operation, installation, inspection and maintenance of the product must be qualified to carry out the associated work. If the personnel concerned do not already have the required knowledge and skills, appropriate training and instruction must be ensured.

All local regulations must be observed.

1.2 Intended Use

The Hydromette BL E is an electronic structural moisture and wood moisture measurement device. In addition to measuring resistance with stick-in electrodes, the Hydromette can also measure non-destructively with the connectable B 55 BL active electrode.

It can be used to measure the moisture content of various building, insulating and insulating materials as well as various hardwoods and softwoods. The Hydromette BL E is also used to detect moisture distribution in walls, ceilings and floors.

GANN Pt 100 temperature sensors and the B 55 BL active electrode can be operated via an additional connection.

The Hydromette BL E may only be used for structural moisture and wood moisture measurements as well as temperature measurements.

1.3 Non-Intended Use

The device is not intended for any applications that are not listed in these operating instructions.

The device, accessories, tools, software, etc. must be used in accordance with these instructions, taking into account the working conditions and the work to be performed. Using the product for work other than that for which it is intended will result in a hazardous situation.

The device may only be used together with the original accessories. The device must only be used within the specified performance limits as described in these instructions.

1.4 Explanation of the General Warnings

The following danger levels are used in this operating manual to indicate potentially dangerous situations and important safety instructions:

Danger Level	Description
 GEFAHR	Danger / Indicates a hazardous situation which, if not avoided, will result in death or serious irreversible injuries.
 WARNUNG	Warning / Indicates a hazardous situation which, if not avoided, could result in death or serious irreversible injuries.
 VORSICHT	Caution / Indicates a hazardous situation which, if not avoided, could result in minor or moderate injuries.
 INFORMATION	Indicates important information.

1.5 General Safety Instructions

It must be ensured that the complete instructions and all safety instructions have been read and understood before using this device.

All instructions must be followed. This prevents accidents that can result in property damage or minor or moderate injuries.

INFORMATION

All safety information and instructions must be kept for future reference and passed on to subsequent users of the product.

The manufacturer shall not be liable for any damage to property or injuries to persons that can be attributed to incorrect handling or non-compliance with the safety instructions. In such cases, the warranty shall be void.

1.5.1 Persons at Risk

Persons with reduced physical, sensory or mental capabilities or lack of experience and knowledge must be supervised or instructed in the safe use of the device and understand the associated hazards.

Children must be supervised to ensure that they do not play with the device. The device is not a toy. There is a risk of swallowing small parts of the device (e.g. battery compartment cover) or an accessory (e.g. TF-Stick, not for all BL device types).

This device is not intended for use by persons with reduced physical, sensory or intellectual capabilities, or lack of experience and/or knowledge.

WARNING

Risk of suffocation, injury or permanent disability. The device must not be used by persons under the age of 14!

Risk of suffocation! Keep packaging away from children.

1.5.2 Preparation and Start-up

Never store or place the device in a location where it can fall or be drawn into water or other liquids.

To avoid the risk of electric shock, never immerse the device in water or other liquids.

Always remove all packaging before operating the device.

WARNING

Fire hazard!
Do not use a damaged device.

In the event of visible damage, strong odours or excessive heating of components, the battery must be removed immediately and the appliance must not continue to be used.

1.5.3 Use / Operation

CAUTION

Risk of damage. The device is a highly sensitive measuring instrument. Only use the device in a controlled electromagnetic environment.

Do not let the device drop onto hard surfaces. This can result in malfunctions or functional failures. Normal use of the device, without excluding hazards to the user, cannot be guaranteed.

The device is fragile.

To avoid overheating, the device must not be covered or used near heat sources or direct sunlight and only be used at ambient temperatures between 0 °C and 40 °C.

The device may not be stored or operated in aggressive atmospheres or atmospheres containing solvents!

The measuring device may be operated in residential and commercial areas.

Measurements **must not** be carried out on conductive surfaces.

Static charge - At low humidity levels, static electricity with high voltage can build up, favoured by external circumstances (friction during material transport, high insulation value of the surrounding area), which can lead to strong fluctuations in measured values. Even the instrument operator may - inadvertently - contribute to the build-up of a static charge by the clothing worn. A considerable improvement can be achieved by the operator and the measuring instrument being absolutely still during measuring, as well as by earthing (contact with conducting metal, water or heating pipes, etc.).

1.5.4 Care, Maintenance and Inspection

CAUTION

Remove the battery before cleaning the product. Do not use abrasive cleaning cloths or chemicals to clean the product as these can damage the surface.

Stop using the product in the case of visible damage, strong odour development or excessive overheating of components.

Only use original accessories.

Changes to the device and technical modifications are not permitted without the written consent of the manufacturer.

All connection options and the device itself must not be sprayed directly or indirectly with water when cleaning (connections depend on the device! e.g. BNC-, 2.5 mm, 3.5 mm jack receptacle and mini-USB port).

Our recommendation: To ensure functionality, have all your measuring equipment checked by the manufacturer every 2–3 years (depending on the frequency of use).

1.5.5 Troubleshooting

Do not repair the device yourself. Contact the manufacturer if the device is not functioning properly.

1.5.6 Disposal

Electrical equipment, accessories and packaging must not be disposed of together with household waste (only for EU countries) and must be disposed of in compliance with the European Directive 2012/19/EU on waste electrical and electronic equipment and its implementation in accordance with national law. Electrical equipment that has reached the end of its service life must be collected separately and sent to an environmentally compatible recycling facility.

The WEEE symbol draws attention to the need for disposal.

The device contains a battery. Batteries must not be disposed of with normal household waste. They may contain toxic heavy metals and are subject to the hazardous waste ordinance. For this reason, dispose of the battery at a local collection point for the recycling of waste electrical and electronic equipment. Caution, there is a risk of explosion if the wrong type of battery is inserted. Handle used batteries according to the manufacturer's instructions.

Gann Mess- u. Regeltechnik GmbH accepts no liability for damage caused by non-compliance with the operating instructions or by violation of a duty to care during transport, storage or operation of the instrument, even if this duty to care is not specifically discussed in the operating instructions.

1.6 Specific Warnings

CAUTION

There is a risk of injury from the measuring pins of the electrodes for resistance measurement. There is also a risk of injury due to careless handling when piercing / knocking into the material to be measured. Before the electrode pins are pressed / driven into walls or ceilings (e.g. wooden panels or similar), it is essential to ensure by suitable means that there are no electrical cables, water pipes or other supply lines in this location.

CAUTION

When using the **ET 10 BL push-in sensor**, there is a risk of injury due to careless handling of the measuring tip when piercing the material to be measured or when measuring temperatures in liquids. Before pressing the electrode tip into solids or bulk materials, it is essential to ensure by suitable means that there are no electrical cables, water pipes or other supply lines at this point.

2 Specifications

2.1 Technical Data

Hydromette

Display:	LCD segment display with three lines
Display resolution:	0.1% for humidity
	0.1 digits in scan mode
Response time:	< 2 s
Storage conditions:	+ 5 to + 40 °C - 10 to + 60 °C (for a short time)
Operating conditions:	0 to + 50 °C - 10 to + 60 °C (for a short time) < 85 % R.H. non-condensing
Power supply:	9-V-block battery
Types that can be used:	Types 6LR61 and Type 6F22
Dimensions:	185 x 50 x 30 (L x W x H) mm
Weight:	approx. 170 g
Protection class:	III
Protection rating:	IP20

2.2 Prohibited Environmental Conditions

- Condensation. humidity continuously too high (> 85% R.H.) and wetness
- Permanent presence of dust and combustible gases. vapours or solvents
- Ambient temperatures continuously too high (> +50 °C)
- Ambient temperatures continuously too low (< 0 °C)

2.3 Transport- & Storage Conditions

Die Hydromette BL E may **only be stored in the packaging provided by the manufacturer or available from the manufacturer as an accessory**. The manufacturer shall not accept any liability or warranty for damage that may occur to the device or to the sensor system as a result of non-compliance.

INFORMATION

In particular, **avoid keeping or storing the devices in foams not supplied by the manufacturer**, as these can damage the sensors due to possible outgassing and result in incorrect measurements.

2.4 Measuring Range

Structural moisture (resistive measuring)

Dimensionless parameter: 2 to 87 digits

Cement screed:	2.3 to 4.8	% by weight	and	1.2 to 3.2 CM-%
Anhydrite screed:	0.1 to 4.5	% by weight	and	0.1 to 4.5 CM-%
Concrete C20/25:	0.9 to 2.8	% by weight		
Cement mortar:	1.2 to 8.9	% by weight	and	0.3 to 6.6 CM-%
Lime mortar:	0.8 to 8.8	% by weight	and	0.8 to 8.7 CM-%
Gypsum plaster:	0.3 to 9.6	% by weight	and	0.3 to 9.6 CM-%
Sand-lime brick:	0.9 to 11.3	% by weight		
Styrofoam:	7.9 to 41.5	% by weight		
Gas concrete (Hebel):	2.8 to 30.0	% by weight		
Gas concrete (Ytong PPW4)	1.6 to 42.2	% by weight		
Gypsum screed:	0.3 to 7.8	% by weight	and	0.3 to 7.8 CM-%
Pressed cork:	4.6 to 60.0	% by weight		
Natural cork	5.0 to 24.0	% by weight		
Xylolite acc. to DIN	11.4 to 18.8	% by weight		
Bricks	0.1 to 40.4	% by weight		
Wood cement screed	6.0 to 19.0	% by weight		
Glass mineral wool	0.7 to 2.4	% by weight		

Wood moisture (resistive measuring)

wood species group 2:	5.5 to 54.0 %
wood species group 3:	5.5 to 58.0 %

Structural moisture (capacitive measuring)
Scan mode: 0 to 200 digits

Temperature (external Pt100 sensor):
-50 to +350°C (depending on sensor)

3 General Information

3.1 Standards and Directives

This measuring instrument fulfils the requirements of the applicable European and national directives (2014/30/EU) and standards (EN 61010). Appropriate declarations and documentation are held by the manufacturer.

To ensure trouble-free operation of the measuring instrument and operational reliability, the user must carefully read and understand the operating instructions.

3.2 Warranty

The measuring instrument may only be operated under the specified climatic conditions. These are listed in chapter 2.1 "Technical Data of the Hydromette".

This measuring instrument may only be used under the conditions and for the purposes that it has been designed for. Operational reliability and functionality are no longer ensured if the device is modified or adapted. Gann Mess- u. Regeltechnik GmbH shall not be liable for any damage arising from such modifications or adaptations. The risk is borne solely by the user.

The measuring instrument and any accessories may only be properly used as described in these instructions. Keep the device and accessories out of the reach of children!

The device must not be stored or operated in air that is corrosive or contains solvents!

The notes and tables in these instructions regarding permitted or normal humidity conditions in practice and the general definitions of terms have been taken from the specialist literature. Therefore, the manufacturer cannot guarantee the correctness. The conclusions to be drawn from the measurement results depend for each user on the individual circumstances and the knowledge gained from his professional experience.

The measuring instrument may be used in the residential and commercial sectors.

The measuring instrument may only be stored in the packaging provided by the manufacturer or available from the manufacturer as an accessory. The manufacturer accepts no liability for damage that may occur to the device or the sensor system as a result of non-compliance.

Gann Mess- u. Regeltechnik GmbH accepts no liability whatsoever for damage caused by non-compliance with the operating instructions or by breach of the duty of care during transport, storage and handling when operating the device, even if this duty of care is not specifically referred to in the operating instructions.

4 Description of the Product

The Hydromette BL E is a multi-purpose measuring device for recording structural moisture, wood moisture and temperature.

For building materials (e.g. screeds, mortar, plasters, concrete, bricks, insulation and insulating materials), all electrodes based on the resistance measuring principle can be connected. This allows exact moisture profiles and depth measurements of the affected areas to be carried out.

Characteristic curves for various building materials are stored in the device. This enables direct display of the measured values in per cent by weight (wt.-%) or CM per cent (CM-%).

A capacitive structural moisture electrode can also be connected. This allows for non-destructive measurement and moisture tests in ceilings, walls, floors and other building materials.

Wood moisture is also measured using the resistance measuring principle. This enables precision measurements of sawn timber (up to 180 mm thick), chipboard and veneers. All common types of wood can be measured.

In addition to surface temperatures, material temperatures (based on Pt100) can also be measured.

The Hydromette BL E has a 3-line LCD display. The silicone buttons give haptic feedback for important functions.

An internal memory is available for storing data.

5 Device Layout and Button Assignment

Figure 5-1: Front view of the Hydromette BL E

5.1 Display Symbols

5.1.1 Main Menu Symbols

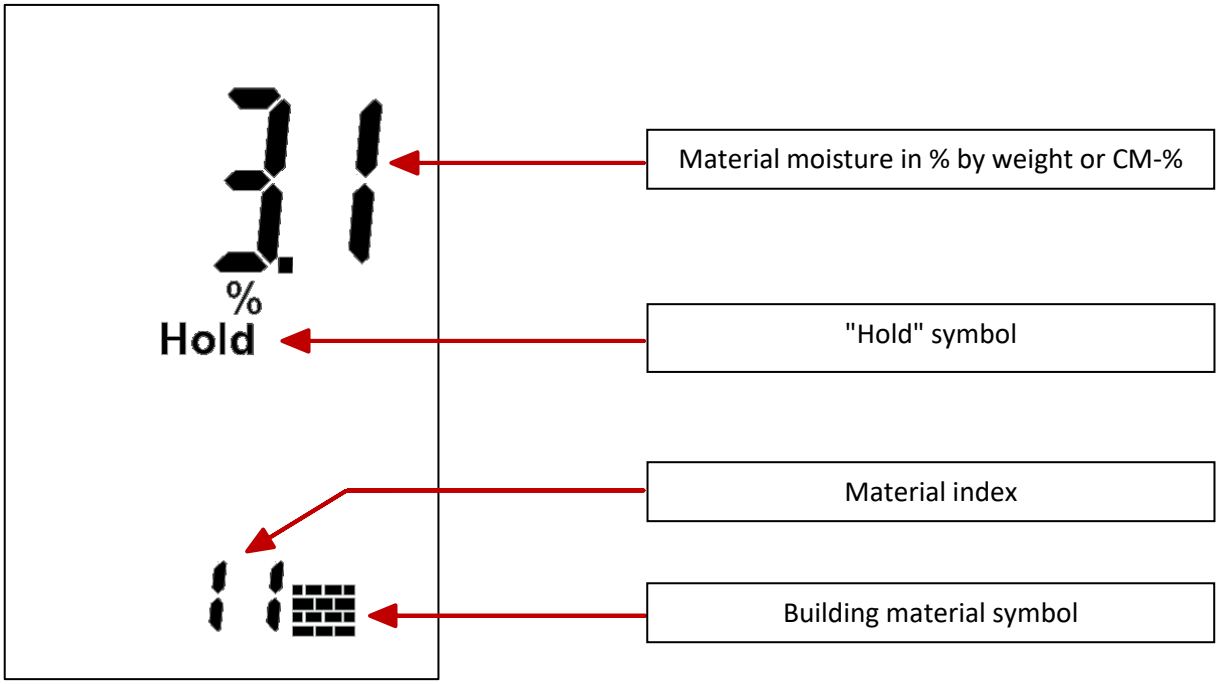


Figure 5-2: Main menu symbols

5.1.2 Other Symbols (Resistive Measuring)

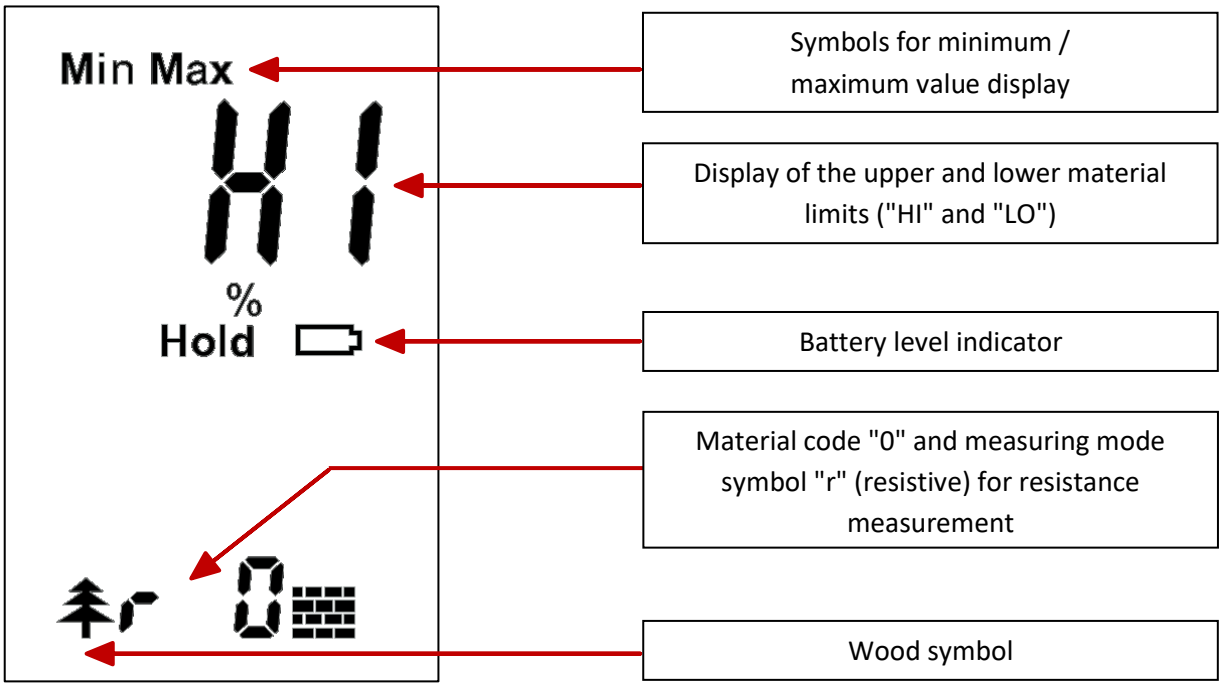


Figure 5-3: Other symbols resistive measuring

5.1.3 Symbols for non-destructive Measurement

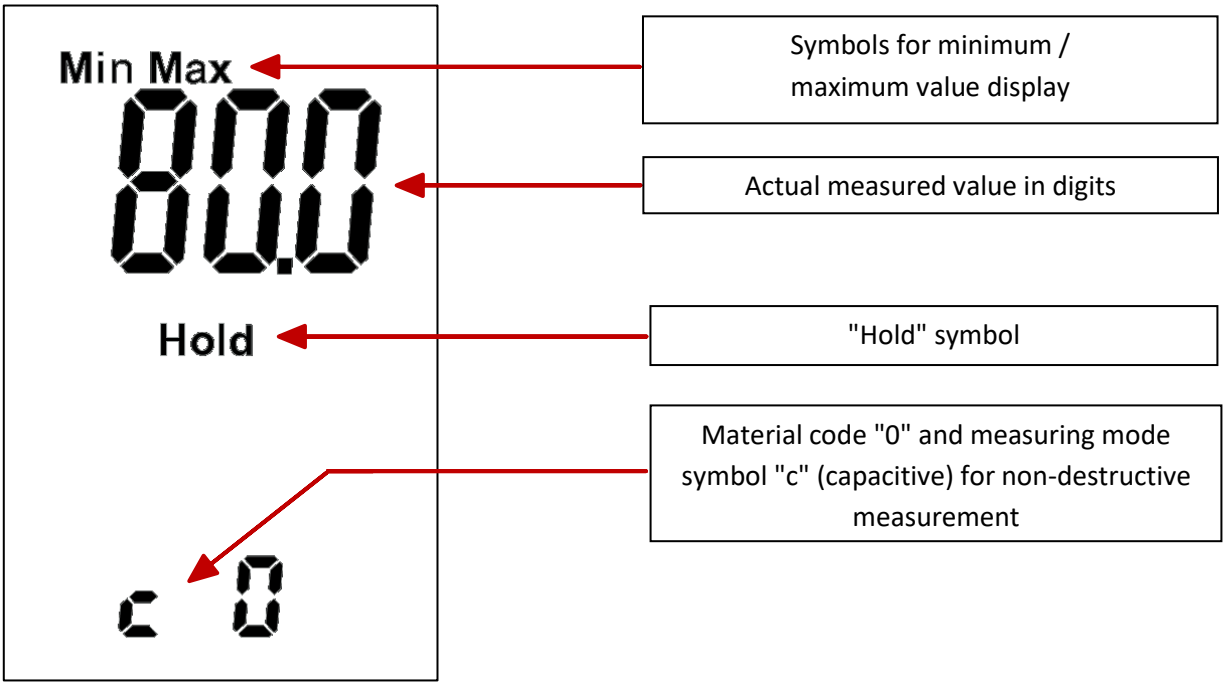


Figure 5-2: Symbols for non-destructive measurement

5.1.4 Symbols when Measuring Temperature

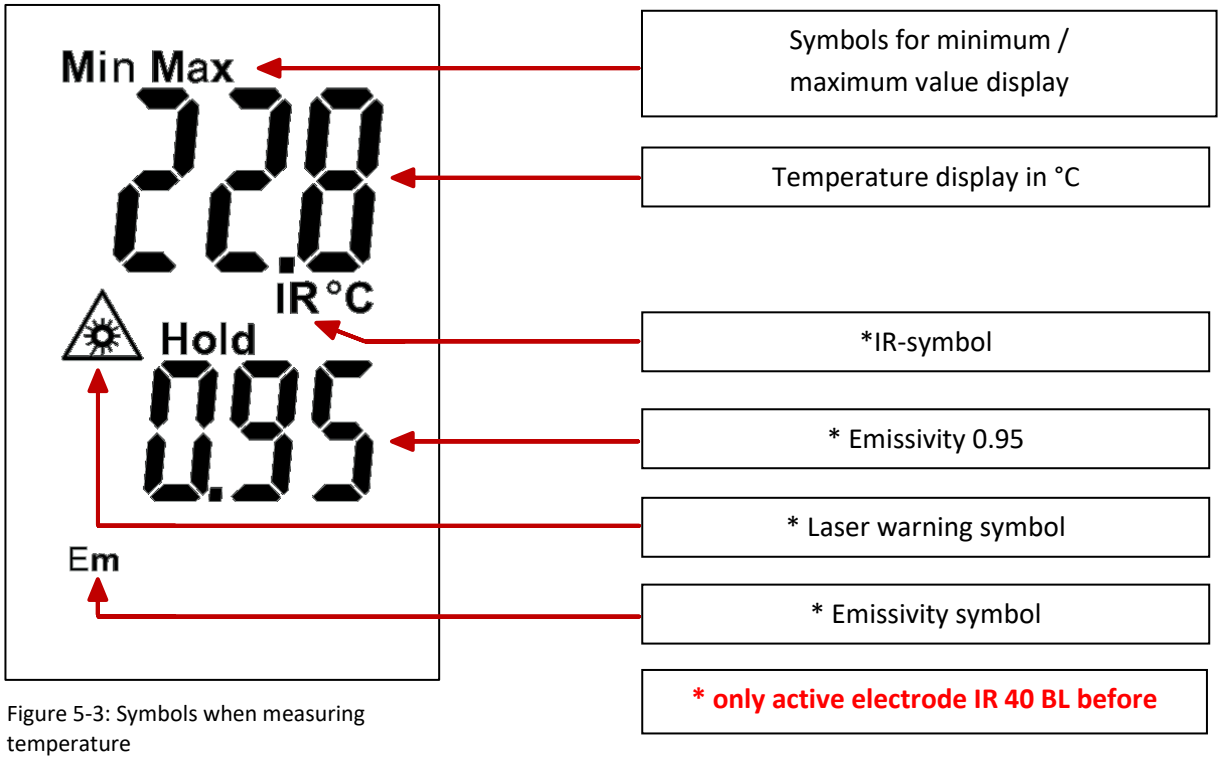


Figure 5-3: Symbols when measuring temperature

5.2 Switching the Device On and Off

The device is switched on and off by pressing the "**On / Off**" button. The device starts in the measuring menu or main menu. The measuring process can be carried out here [see Chapter 5.3.1 "Measurement menu (main menu)"].

By default, the Hydromette BL E is delivered with the material code "r 0" (resistance measurement or resistive measurement in digits) as the factory setting.

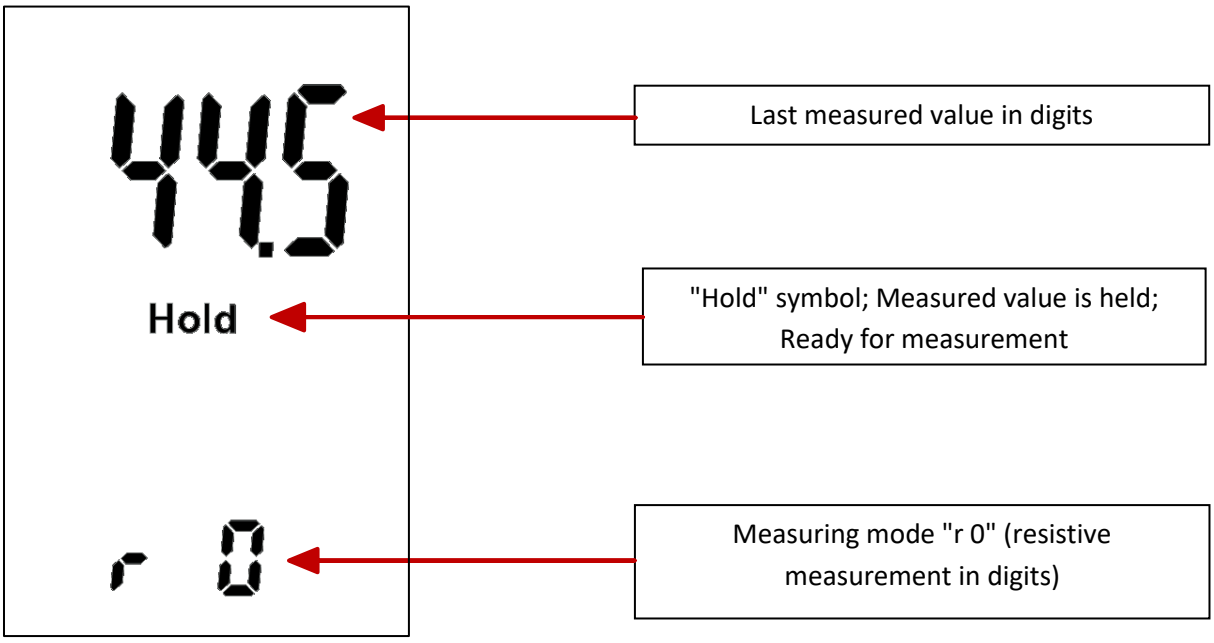


Figure 5-4: Main menu symbols

5.3 Setting Menus

The following menu items can be selected one after the other by repeatedly pressing the "**Down**" button:

1. **Measuring Menu** (main menu): The measuring process can be performed here.
2. **Material setting**: The material can be selected here.
3. **Maximum value display**: The largest measured value is shown here.
4. **Minimum value display**: The smallest measured value is shown here.
5. **Memory Menu**: The last 5 measured values can be stored here. The oldest value is overwritten after each measurement.

The menu items are selected in reverse order by pressing the **"Up"** button.

5.3.1 Measuring Menu (Main Menu)

After switching on, the device is in the measuring menu (main menu). The other menus can be accessed from here by pressing the **"Up"** or **"Down"** buttons.

In the measuring menu, the last measured values are displayed according to the material selection made with the associated units and the note **"Hold"**.

A new measurement is started by pressing the **"M**" button *(> 2 seconds).*

During the measuring process, the "Hold" symbol disappears from the display. After releasing the **"M"** button, the measured value is held and automatically stored in the ring memory. This overwrites the oldest stored value. The **"Hold"** symbol is displayed again.

If the new measured value is larger than the previous maximum value, **"Max"** flashes on the display. If the new value should be accepted, the **"M"** button must be pressed briefly (< 1 second). If the value should not be saved, a new measurement can be started by pressing and holding (> 2 seconds) the **"M"** button without changing the previous maximum value.

If the new measured value is smaller than the previous minimum value, **"Min"** flashes on the display. If the new value should be accepted, the **"M"** button must be pressed briefly (< 1 second). If the value should not be saved, a new measurement can be started by pressing and holding (> 2 seconds) the **"M"** button without changing the previous minimum value.

If the measuring range of a selected material is exceeded or not reached, a flashing measured value warns you, which is also marked alternately with **"LO"** or "**HI".**

By default, the Hydromette BL E is supplied with the material code **"0"** (scan mode) as the factory setting.

The **material index "0"** stands for a measurement in digits. The scaling for the resistance measurement is then in the range 0 to 87 digits. This measuring mode allows generating individual measurements or complete moisture profiles, irrespective of the material properties to be measured.

INFORMATION

Digital values are dimensionless measurement values and not real moisture values as a percentage! For this reason, the measurement values are displayed in digits WITHOUT %!

5.3.2 Material Setting

Measuring menu ⇨ **Press Down button once**

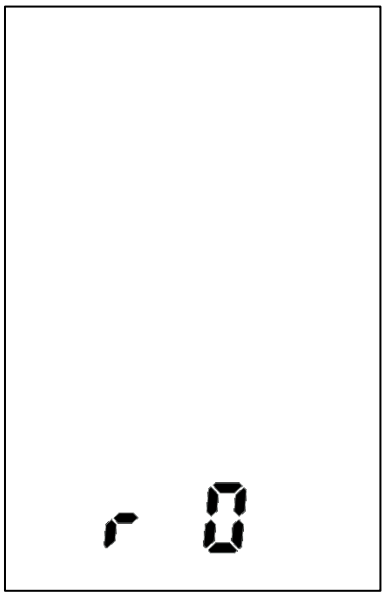


Figure 5-5: Display of measuring mode "r 0"

The device is delivered with the measuring mode "r0" (resistive measurement in digits) as factory setting.

To be able to make the material settings, the device must be switched on and in main measuring mode. Then press the **"Down"** button once to access the material settings. If you now want to change the setting for the material, press the **"M"** button briefly (< 1 second).

The measuring mode display flashes and can be set using the **"Up"** and **"Down"** buttons. The change is saved by briefly *(< 1 second)* pressing the **"M"** button again.

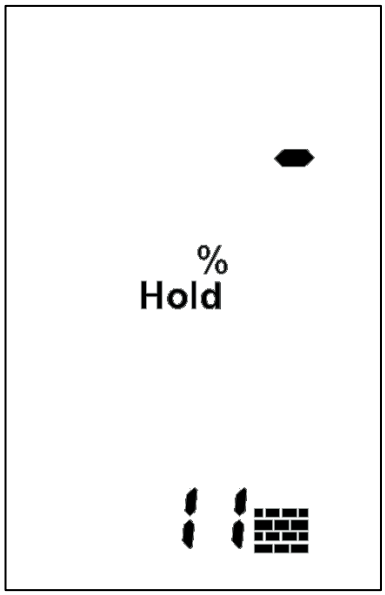


Figure 5-6: Display after changing the material setting

After confirming the change, the display automatically jumps to the measuring menu of the (newly) selected material. This removes the values of the previous measuring mode from the display. Any stored **"Max"** or **"Min"** values remain in the memory of the respective measuring mode.

Now a new measurement can be performed by pressing and holding *(> 2 seconds)* the **"M"** button.

The corresponding material indices can be found in the material table (Chapter 9.1) in the appendix.

The Hydromette BL E has a 2-stage wood type correction (type 2 and 3). The setting for the wood to be measured is taken from column "1..4". This type selection covers the types of wood commonly found on the building site.

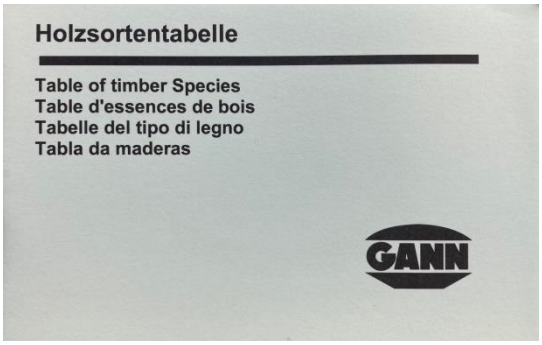


Figure 5-9: Front of wood type table

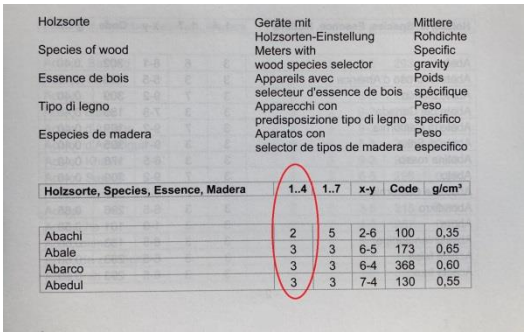


Figure 5-10: Using the wood type table

A wood type table is enclosed with the instrument on delivery.

5.3.3 Maximum Value Display

Measuring menu ⇨ **Press Down button twice**

The highest measured value of a measurement series is displayed together with the **"Max"** display symbol.

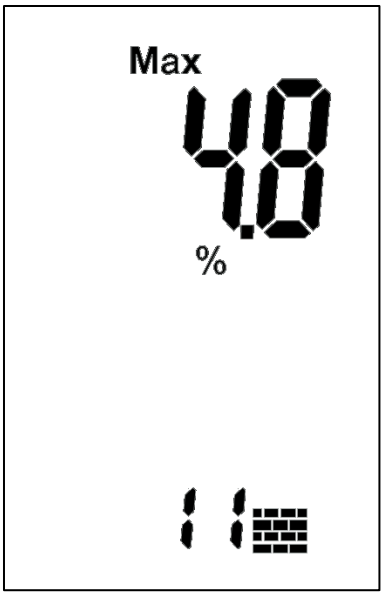


Figure 5-7: Maximum value display

A dash at the position of the measured value indicates that there is no maximum value (yet).

If an existing maximum value should be deleted, the displayed value must be selected by *briefly (< 1 second)* pressing the **"M"** button.

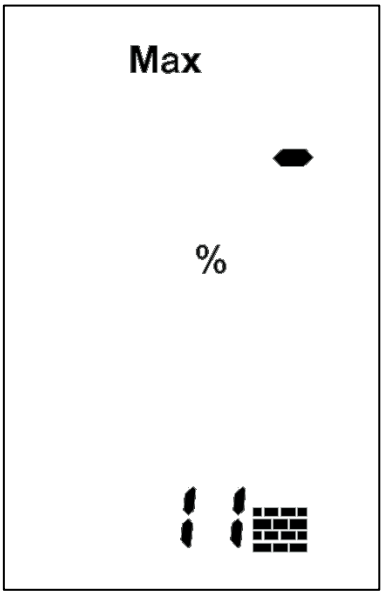


Figure 5-8: Deleted maximum value

The value flashes and can now be deleted by pressing and *holding (> 1 second)* the **"M"** button. A dash at the position of the measured value indicates the successful deletion of the value.

The device returns to the measuring mode by *briefly (< 1 second)* pressing the **"M"** button again.

A new measurement can then be performed immediately by pressing and holding (> 2 seconds) the **"M"** button.

5.3.4 Minimum Value Display

Measuring menu ⇨ **Press Down button 3 times**

The lowest measured value of a measurement series is displayed together with the **“Min"** display symbol.

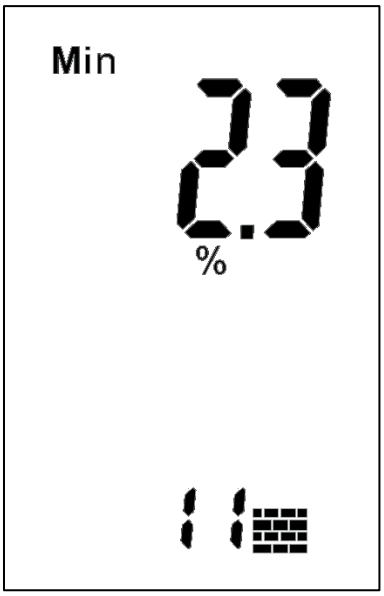


Figure 5-9: Minimum value display

A dash at the position of the measured value indicates that there is no minimum value (yet).

If an existing minimum value should be deleted, the displayed value must be selected by *briefly (< 1 second)* pressing the **"M"** button.

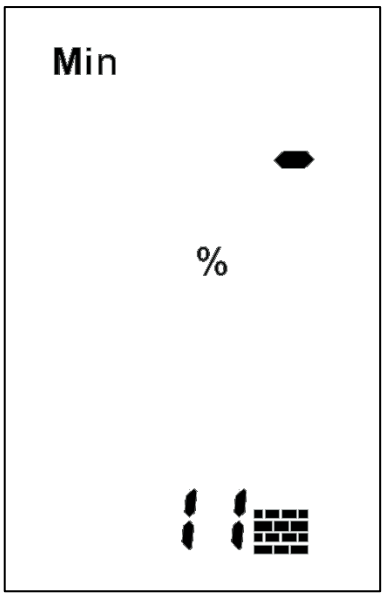


Figure 5-10: Deleted minimum value

The value flashes and can now be deleted by pressing and holding *(> 1 second)* the **"M"** button. A dash at the position of the measured value indicates the successful deletion of the value.

The device returns to the measuring mode by *briefly (< 1 second)* pressing the **"M"** button again.

A new measurement can then be performed immediately by pressing and holding (> 2 seconds) the **"M"** button.

5.3.5 Memory Menu

Measuring menu ⇨ **Press Down button 4 times**

The ring memory symbol **"o"** and the corresponding memory location number are displayed.

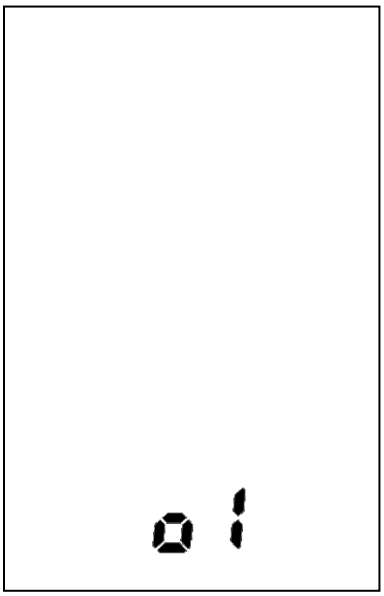


Figure 5-13: Memory location "o1"

As soon as you select the memory menu, the memory location number **"o1"** is displayed for approx. 1 second, and then the last measured saved value contained there is displayed.

By *briefly (< 1 second)* pressing the **"M"** button, the next memory location **"o2"** can be selected and the value it contains displayed.

The last 5 measured values are automatically saved and stored in the memory locations **"o1" – "o5".** The last measured value is in memory location **"o1"**. The memory is designed as a ring memory. As soon as a sixth measured value is recorded, the oldest measured value in memory location **"o5"** is automatically removed from the memory.

After reaching the 5th memory location, the value of the 1st memory location is displayed again. Manual deletion of a memory value is not possible.

If the **"M"** button is pressed (and held) for *longer than 2 seconds*, the display of the memory value vanishes, only the memory location number is displayed. This signals that the user is still in the Memory Menu and not in the Measuring Menu. The memory value is retained in the background.

The saved values displayed can be identified by the fact that there is **no "Hold" symbol** in the display.

6 Other Functions

6.1 Automatic Switch-Off

If no button is pressed within approx. 90 seconds, the device switches off automatically. The current values are retained and are displayed again after the device is switched on again.

6.2 Battery Monitoring

If the battery symbol  is shown in the display, the battery is dead and must be replaced.
A list of battery types that can be used can be found in chapter "2.1 Technical Data".

The device serial number is also located in the battery compartment.

6.3 Querying the Device Firmware

To query the firmware version of the device, the "Down" button (▽) and the "Up" button (△) must be pressed simultaneously for approx. 2 seconds when the device is switched on. A **"V"** appears in the first line of the display, the firmware version number in the second line and a specific ID number (device-dependent) in the third line.

Briefly press the **"M"** button to return to measuring mode.

7 Application Notes

7.1 Comparative Measurement or Reference Measurement

With this type of measurement, almost all (set) building materials or mixed materials or mixed structures can be measured comparatively. It is important that these measurements are only carried out on the same materials or structures.

A deliberately dry spot must be determined on the structure to be measured. Select up to 5 measuring points within an imaginary square with a side length of approx. 20 cm. A dry sample of material with minimum dimensions of 20x20x5 cm can also be used as a reference. When measuring using a sample piece, it is important that this measurement is carried out on a non-conductive surface (e.g. polystyrene). The mean value is now to be calculated from these up to 5 measured values. This forms the reference value for the dry condition of the material or structure. Larger areas can thus be analysed using increased display values, e.g. with regard to the maximum moisture or the extent of moisture damage, and a two-dimensional moisture profile can be created. Drying progress can also be checked and observed by repeating measurements at defined measuring points.

When assessing the display values using the **capacitive measuring method**, it should be noted that metal in the substrate (iron armouring, cables, pipes, plaster rails, etc.) can lead to an increase in the measured value depending on the overlap height. Furthermore, it must be ensured that the minimum distances of 8–10 cm to corners, angles and edges are observed. Measurements in drilled holes or mortises are always incorrect measurements and cannot be used for assessment. Please note that digit measurements taken with devices with a measuring range of 0–100 digits and devices with a measuring range of 0–200 digits are not comparable.

When assessing the display values using the **resistance-based measuring method**, it is essential that you use suitable means to ensure that there are **no** electrical cables, water pipes or other supply lines in this location **before** drilling holes for probes or before knocking electrode pins into walls, ceilings, floors, etc.

INFORMATION

Digit readings obtained using the resistance-based measurement methods are not comparable with digit readings obtained using the capacitive measurement method.
Digit values are non-dimensional measured values and no real humidity values in per cent (%)! For this reason, the measured values are displayed in digits WITHOUT %!

7.2 General Notes on Structural Moisture Measurement

The structural moisture is mainly displayed in "digits" (depending on the device). Digit values are non-dimensional measured values and no real humidity values in per cent (%)! This can be used to measure almost all set building materials or mixed materials or mixed structures by comparative measurements within the same material or structure.

Pure building materials with corresponding characteristic curves are specified with weight percentages (wt. %) in relation to the dry weight or also in CM-% (moisture determination according to the calcium carbide method). Depending on the type of GANN Hydromette used, this is done using programmed characteristic curves or independent conversion using tables.

If a material is in a certain ambient climate for a longer period of time, it takes on a moisture content corresponding to this climate, which is also referred to as **equilibrium moisture** or practical moisture content. On reaching the equilibrium moisture content, the material no longer loses moisture if the surrounding climate remains the same and also no longer absorbs any moisture. The equilibrium values generally mentioned refer to a climate of 20 °C and 65 % relative humidity. However, these values must not be confused with the values at which the material can be worked or processed.

Floor coverings and paints must be considered and assessed in conjunction with the diffusion capacity of the material used. For example, when laying a PVC floor covering, the subsequent average levelling moisture content must be taken as a basis, i.e. in a centrally heated room with an anhydrite screed, installation should wait until a moisture content of approx. 0.6% by weight has been reached. In contrast, wood parquet flooring can be laid on a cement screed with normal stove heating at a moisture content of 2.5 - 3.0% by weight.

The respective long-term ambient climate must also be taken into account when assessing **wall surfaces**. The lime mortar plaster in an older vaulted cellar may well contain a moisture content of 2.6% by weight, but a gypsum plaster in a centrally heated room would have to be labelled as too damp from a moisture content of 1.0% by weight.

When evaluating the moisture content of a material, the surrounding climate is the primary consideration. All materials are subject to continuously changing temperatures and air humidity. The influence of the material moisture depends significantly on the heat conductibility, the thermal capacity, the resistance to water vapour diffusion and the hygroscopic properties of the material.

The "target humidity" of a material is the humidity that corresponds to the mean value of the equilibrium humidity under changing climatic conditions to which it is constantly exposed. The humidity values in living spaces in Central Europe are approx. 45 - 65 % RH in summer and approx. 30-45 % RH in winter. These fluctuations can cause damage in centrally heated rooms in winter.

It is not possible to lay down generally applicable values. Much more it always requires the technical and expert experience to correctly evaluate the measured values.

Different building materials, such as clay building materials, etc. cannot be measured with the usual accuracy due to their different mineral admixtures or burning times. However, this does not mean that comparative measurements in the same building material and on the same object are not meaningful. Different display values can be used, for example, to localise the extent of a moisture

field (water damage), or comparative measurements on dry interior walls and damp exterior walls can be used to determine progress in drying out.

Attention:

The notes and tables in these operating instructions on permitted or normal humidity conditions in practice and the general definitions of terms have been taken from the specialist literature. No responsibility can therefore be assumed by the manufacturer of the measuring instrument for the correctness of this information. The conclusions to be drawn from the measurement results are related to the individual conditions and the knowledge from professional experience for each user.

7.3 Notes on resistance-based Structural Moisture Measurement

The GANN Hydromettes work according to the electrical resistance and conductivity measurement method that has been known for years. This process is based on the fact that electrical resistance is highly dependent on the amount of moisture in the material. The conductivity of oven-dried material is very low, or the resistance is so high that no current worth mentioning can flow. The more water that is present, the greater the conductivity of the material, or the lower the electrical resistance.

In order to achieve the highest quality measurement result, the materials to be measured should be measured at several points. To do this, the electrode pins must be pressed or driven into the material. To prevent measuring errors and breakage of the measuring pins, the fastenings of the electrode pins must always be tightened well and the area between the tip holders kept clean.

INFORMATION

Attention: We do not recommend pressing / driving the electrode pins into hard building materials (screed, concrete, etc.), as this can lead to a considerable measurement difference (the value displayed is too low/dry). The contact between the electrode pins and the material to be measured is problematic.

Where it is not possible to press in or drive in due to the hardness of the material (screed, concrete, etc.), appropriate holes must be predrilled. The diameter of the hole depends on the accessories available. A sharp drill bit and a low speed are very important here. If the drilled hole is hot after drilling, wait at least 10 minutes before inserting the electrodes or the contact paste.

The following applies in principle:

INFORMATION

- Generally, both electrode pins are to be applied to the **same** contiguous material to be measured.

CAUTION

- Before drilling holes for probes or hammering electrode pins into walls, ceilings, floors, etc. make absolutely sure by suitable means that there are no electrical cables, water pipes or other supply lines in this location.

With uninsulated pins, the measured value is formed at the wettest point (the driven in electrode pins). If the moisture distribution in the material is homogeneous, this means measuring the entire depth between the driven-in pins.

It should be noted that only the increased surface moisture is measured, particularly in the case of moisture ingress from outside, e.g. rain or condensation, regardless of the penetration depth of the electrode pins.

The measurement of frozen material is not possible.

Insulating materials, e.g. rock/glass wool, plastic foams, etc., cannot be measured accurately when dry due to their high insulating properties. In most cases, measured values (continuously running values) are faked by the body's own statics or negative values are displayed (depending on the device). Moist to wet insulation materials are displayed relatively easily recognisable in the range of 20–100 digits. However, conversion into weight or volume percentages is not possible. It is important here that the insulation material is not completely penetrated. As the building material under the insulation material is usually already soaked beforehand, an incorrect value may be displayed if the measuring electrode is penetrated.

It is difficult to make a generally valid statement on the accuracy of measurement in relation to weight or mass percentages. Pure building materials with specific characteristic curves can be measured with good accuracy, whereas mixed masonry and laminates made of different materials are less accurate. However, exact percentages are often not necessary and so-called comparative measurements are completely sufficient.

In soft construction materials, the M 20 electrode should be used, while the M 6 or M 21/100 electrode pairs should be applied to floor screed or concrete using a contact paste.

For depth measurements in concrete or masonry up to 25 cm, the M 21/250 electrode pair is available. For measuring insulated flat roofs, back-vented façades, or half-timbered buildings, the M 20-Bi electrode can be used with 200 mm or 300 mm long insulated pins fitted to the stem.

For surface measurements, e.g. on concrete etc., special measuring caps (M 20-OF 15 model) are available. They can be used only in combination with the M 20 electrode.

For measurements in the impact sound or thermal insulation under the screed, the flat electrodes M 6-Bi 200/300 can be inserted into the floating joint. Particularly thin electrodes (M 6-150/250) are available for measurements in tiled areas (cross joints).

The brush electrodes M 25–100/300 made of V2A steel can be used for measurements in hard, set building materials without additional contact material up to a depth of 300 mm.

7.3.1 **Test Adapter for resistance-based Structural Moisture Measurement**

The test adapter available with order no. 31006071 for checking the construction building moisture measuring part can be used to check the functionality of the device, the measuring cable MK 8 and the electrodes M 6 and M 20.

To do this, connect the device with the MK 8 measuring cable and plug the 4 mm plugs of the cable into the sockets of the test adapter. If the electrode is also to be tested, connect the cable to the electrode and hold the pins of the electrode to the sockets of the test adapter.

Select the material setting on the measuring instrument that corresponds to the imprint on the test adapter or the description in the operating instructions for the test adapter. No active sensor may be connected.

7.4 Using the Hydromette BL E

The Hydromette BL E is a multi-purpose measuring instrument for measuring structural moisture, wood moisture and temperature. The device utilises both the resistance measuring principle and the non-destructive capacitive measuring principle. This means that the device can be used in conjunction with different (active) electrodes depending on the measuring task.

The electrodes for resistance-based measurement must be connected to the measuring instrument using the appropriate MK 8 measuring cable. On the instrument side, the cable is fitted with a BNC plug. The outer retaining ring of the plug is to be rotated clockwise until it engages, when the plug is attached to the measuring instrument. When disconnecting the cable, rotate the retaining ring anti-clockwise and pull the plug backward. Do use excessive force – do not pull on the cable!

The active electrode B 55 BL or the Pt100 sensors must be connected to the measuring instrument via the 3.5 mm jack receptacle. Ensure that the octagonal plug is firmly seated. The measuring instrument now automatically recognises the connected accessories. To activate the corresponding measuring mode, press the **"M"** button for longer than 2 seconds.

If electrodes are connected to the BNC socket and the 3.5 mm jack receptacle at the same time, the measurement via the 3.5 mm jack receptacle has priority and the instrument switches off the BNC socket. This means that no material settings are possible.

To (re-)activate the BNC socket or the resistance-based measurement, the accessory must be unplugged from the 3.5 mm jack receptacle and the measurement button pressed for longer than 2 seconds.

INFORMATION

Measure:

Press and hold the **"M"** button for longer than 2 seconds. A measuring process is carried out as long as the measurement button is pressed. After releasing the **"M"** button, the measuring process is interrupted and the **"Hold"** symbol is displayed.

7.4.1 M 20 Drive-in Electrode

For depth measurements in soft and set construction materials (e.g. Drywall panels, plaster, Ytong brand etc.) up to a maximum of 70 mm in depth, tap the electrode with both pins into the material to be measured (the electrode body is made of impact-resistant plastic). Make sure that the full length of both pins of the electrode is placed only in that part of the construction material that is to be measured.

When pulling them out, light prying movements can be used to loosen the pins. Where possible, the lock nuts should be tightened using a spanner or pliers before beginning a measurement series. Loose electrode pins break off easily.

When the measuring instrument is initially delivered with an M 20 electrode, 10 replacement pins of 16 and 23 mm in length each are included. These are suited for measuring up to a maximum of 20 or 30 mm in depth. If measurements are to be carried out in greater depths, the electrode pins can be replaced by longer versions (40 or 60 mm). However, the risk of breakage will increase with longer pins.

INFORMATION

Please note:

When tapping the electrodes into hard construction materials (floor screed, concrete, etc.) without using contact paste, significant deviations in the measured values may result (low measured value).

7.4.2 M 20-OF 15 Surface Measuring Caps

The surface measuring cap pair M 20-OF 15 is used in conjunction with the M 20 electrode for resistance-based measurement of moisture on surfaces without damaging the material being measured. In the area of building moisture, it can be used to measure concrete, plasters or screeds before a coating such as epoxy resin is applied. Before measuring, the two hexagon coupling nuts of the M 20 drive-in electrode must be unscrewed and replaced with the surface measuring caps. For measuring, firmly press both contact faces onto the workpiece to be measured. It is important to ensure that the elastic transducers are pressed firmly onto the surface but that the metal holders do NOT touch the material to be measured (contact pressure approx. 3 kg).

The measuring depth is approx. 2–5 mm. Any particles adhering to the measuring surface must be regularly removed. If the elastic, plastic measurement sensors are damaged, they can be reordered (no. 31004316) and glued on using commercially available cyanate-based instant adhesive.

INFORMATION

Please note:

Any surface contaminants (e.g. formwork release oil) may cause errors.

7.4.3 M 6 Stick-in Electrode

The two electrodes that are intended to measure set construction materials only are to be pushed into the material to be measured with approx.8 - 10 cm clearance. Where this is not possible because of the hardness of the material to be measured (floor screed, concrete etc.), holes of approx. 6 mm in diameter are to be drilled and to be filled using contact paste. Then the pins of the two electrodes are to be pushed into the contact paste. Generally, both electrodes are to be applied to the **same** contiguous material to be measured.

INFORMATION

Please note:

When tapping the electrodes into hard construction materials (floor screed, concrete, etc.) without using contact paste, significant deviations in the measured values may result (low measured value).

When the M 6 stick-in electrodes are initially delivered, 10 replacement pins of 40 and 60 mm in length each are included. These are suited for measuring up to a maximum of 50 or 70 mm in depth. The lock nuts should be tightened using a spanner. To ensure proper contact, particularly make sure that the pre-drilled holes are completely filled in their full depth.

7.4.4 M 6-Bi 200/300 Flat Electrode Pair

The two probes, which are only intended for measuring insulation material via the wall connection joint of the screed, should be pushed forward at a distance of approx. 8 - 10 cm through the edge joint past the screed to the insulation. It is important that this is done carefully and without great resistance. The shrink tubing surrounding the probes must not be damaged, as otherwise a damp screed can lead to incorrect measurements. Inserting a flat iron or similar beforehand makes it easier to use the flat electrodes without damaging them.

The lock nuts should be tightened using a spanner or pliers. The probes are designed to be used only in conjunction with the M 6 electrode pair.

7.4.5 M 6-150/250 Stick-in Electrode Pins

The extra-thin probes have been specially developed for measuring moisture in building and insulation materials where larger drill holes are not acceptable.

The M 6-250 probes with 2 mm Ø are made of flexible stainless steel and can be inserted into the insulation, e.g. via the floating joint of the screed. The distance should be approx. 8 to 10 cm.

For the M 6-150 probes with 3 mm Ø, which were specially developed for measuring through a spacer cross, a special carbide drill bit with a length of 160 mm and a diameter of 3 mm is required. This can be used to drill through the screed layer to the insulation. The distance between the probes should be approx. 8–10 cm. The probes can be used with the M 6 electrode pair as well as with the M 20 electrode.

7.4.6 M 21-100/250 Electrode Pair for Deep Measurement

The two electrodes that are intended to measure set construction materials only allow measurements to be carried out down to depths of maximum 100 or 250 mm. The insulated sleeves prevent the measuring results from being corrupted by higher surface humidity levels caused by thaw or rain.

Two blind holes of ø 8 or 10 mm are to be drilled in stages at intervals of approx. 8 - 10 cm (the measuring section must be contiguous and consist of the same material).

Both very sharp drill and low speed are of high importance. If the drilled hole is hot after drilling, wait at least 10 minutes before inserting the electrodes or the contact paste. Vertically insert the pipe tip into the contact paste for 30 mm and remove the tip filled with the contact paste. Clean the electrode pipe up to the tip and insert it into the blind hole up to the stop.

Connect the electrode rod to the bunch plug of the measuring cable and insert it into the electrode pipe. By pushing the rod, press the contact paste down the drilled hole up to its end. Connect the measuring cable to the measuring device, press the measurement button, and read the measured value.

The same drill holes can be used when creating a moisture profile or for layer-by-layer measurements. To measure, repeat the procedure described above to the desired measuring depth.

INFORMATION

Please note:

The measured values may be corrupted, if the electrode pipe is excessively filled by contact paste or if an electrode pipe to which contact paste adheres is repeatedly removed and inserted.

7.4.7 Contact Paste

The contact paste is supplied in a screw cap plastic container containing approx. 400/450 g. It is used to provide proper contact between the electrode tip and the construction material to be measured or to additionally extend the electrode pins (M 6 electrode). The water contained in the highly conductive agent is added to the material to be measured to replace the humidity that was displaced by the drilling process.

Because of the high conductivity, make sure that the contact paste is not spread across the surface of the material to be measured. When using the M 6 electrodes, it is useful to build a thin string from an appropriate amount of contact paste and to push this string into the drilled hole using the rear side of the drill bit.

By adding drinking water, the contact paste can always be kept in a condition, in which it is able to be worked. In general, the quantity of the contact paste will last for 30 to 50 measurements.

7.4.8 M 20-Bi 200/300 Stick-in Electrode Pair

It is designed to carry out depth measurements on the beams in old buildings or half-timbered houses, particularly for determining moisture in insulated flat roofs and on insulated or back-vented facades.

To prevent the insulation of the pins from being damaged, electrodes should not be driven through construction materials of higher hardness levels (plaster, drywall panels etc.). Of course, insulating materials such as foamed polystyrene or mineral wool may be penetrated. Otherwise, use an Ø10mm drill bit for pre-drilling. Any corrupting impact is eliminated to a large extent by the insulated pins. Remove the hex lock nuts together with the standard electrode pins from the M 20 electrode and replace by M 20-Bi electrode pins. Tighten them firmly!

7.4.9 M 25 100/300 Brush Electrodes

The two brush probes made of V2A steel were specially developed for depth measurements on hard, set building materials (e.g. screed, concrete, etc.) without the use of additional contact pastes. By using the depth measuring electrodes, a moisture profile of the material to be measured can be created by taking measurements layer by layer. Two 6 mm Ø holes must be drilled 8 - 10 cm apart for the measurement. To obtain sufficient contact, the holes must be at least 2 cm deep. Both electrodes must be inserted into the same, contiguous material to be measured. When measuring screed, the holes must be drilled to a depth of 75 % of the screed thickness. To achieve a long service life, the electrodes should always be turned in and out clockwise when inserting and removing them. Take care when using pliers etc.

7.5 General Information on Wood Moisture Measurement

The wood moisture in the GANN Hydromettes® is displayed in per cent by weight (wt.-%) in relation to absolutely dry wood (bone-dry).

If wood is stored for extended periods in a given climate it assumes a moisture content corresponding to this climate, which is also termed equilibrium moisture or **wood moisture equilibrium**. When the equilibrium moisture is reached the wood does not give off or absorb any further moisture for constant ambient climatic conditions. The wood moisture equilibrium in the winter months is approx. 6.0% to 7.5% wood moisture (corresponds to 30–40% rel. humidity and 20-

25 °C) and in the summer months approx. 10.5% to 13.0% (corresponds to 60–70% rel. humidity and 25 °C).

Wood shrinks when it gives off moisture to the surrounding air below the fibre saturation range. In contrast, wood swells when it absorbs moisture from the surrounding air below the fibre saturation range.

7.6 Notes on resistance-based Measuring Wood Moisture

The GANN Hydromettes works by measuring electrical resistance or conductivity, a principle which has been well-known for many years. This process is based on the fact that electrical resistance is highly dependent on the amount of moisture in the wood. The conductivity of oven-dried wood is very low, or the resistance is so high that no current worth mentioning can flow. The more water that is present, the greater the conductivity of the wood, or the lower the electrical resistance.

Above the fibre saturation point (from approx. 30 % wood moisture), the measurement loses accuracy as the wood moisture increase, depending on the type of wood, bulk density and wood temperature. At low wood moisture levels below 10 % or at low air humidity levels, **static electricity** with high voltage can build up, favoured by external circumstances (friction during material transport, high insulation value of the surrounding area), which can lead to strong fluctuations in measured values. The operator of the measuring instrument can also unintentionally contribute to the build-up of static charge from the users clothing. A significant improvement can be achieved by ensuring the operator and the measuring instrument remain completely still during the measuring process and by earthing (by touching conducting metal, water or heating pipes, etc.).

In order to achieve the qualitatively best possible measurement results, the wood used for the sample should be measured at multiple points. For this purpose, the electrode pins must be pressed or hammered in at right angles to the fibre direction up to at least 1/4 and at most 1/3 of the total wood thickness. To avoid measurement errors and the risk of the measuring pins breaking, the fastenings of the electrode pins must always be tightened properly and the area between the pin holders must be kept clean.

With uninsulated pins, the measured value is formed at the wettest point (the driven in / pressed-in electrode pins). If the moisture distribution in the wood is homogeneous, this means measuring the entire depth between the driven in / pressed-in pins.

Please note that:

- in order to determine any increased core moisture, the electrode pins must be driven in approx. 1/3 of the entire wood thickness.
- particularly in the case of moisture ingress from outside. e.g. rain or condensation, only the increased surface moisture is measured, regardless of the penetration depth.

The **temperature of the wood to be measured** has a major impact on the electrical wood moisture measurement. The electrical resistance of wood changes not only with the water content, but also

with the temperature. Assuming a constant water content, the resistance decreases with increasing temperature, whereas decreasing temperature results in an increase. This temperature dependence is not constant but increases with increasing wood moisture. It is not possible to measure frozen wood above 20 % moisture content.

Simple wood moisture measuring instruments are generally designed for a wood temperature of 20°C, so that if there are deviations from this temperature value, the display no longer corresponds to the actual wood moisture. At temperatures < 20 °C the wood moisture values displayed are too low, at temperatures > 20 °C they are too high. It is therefore necessary to correct the values obtained using an appropriate correction table. Various GANN Hydromettes® are already equipped with such temperature compensation, i.e. the wood temperature can be set directly on the measuring instrument and is automatically taken into account in the wood moisture display. For measuring instruments that do not have such **temperature compensation**, you can roughly calculate a measured value deviation of approx. 1 % wood moisture for every 10 °C deviation from 20 °C, provided the wood is dry. In addition, the GANN Hydromettes® have a wood temperature compensation table in the appendix of the operating instructions.

7.6.1 Test Adapter for resistance-based Wood Moisture Measurement

The test adapter for checking the wood moisture measuring section, available under order no. 31006070, can be used to check the functionality of the device and any existing accessories such as the MK 8 measuring cable or the M 18, M 19 and M 20 electrodes.

Depending on the device used, the measuring pins of the instrument must be held directly to the sockets of the test adapter or the device must be connected to the MK 8 measuring cable and the 4mm plugs of the cable plugged into the sockets of the test adapter. If an electrode is also to be tested, connect the cable to the electrode and hold the pins of the electrode to the sockets of the test adapter.

Select the (material) setting on the measuring instrument that corresponds to the imprint on the test adapter or the description in the operating instructions for the test adapter. No active sensor may be connected.

7.6.2 M 20 Drive-in Electrode

The M 20 drive-in electrode is made of impact-resistant plastic and is suitable for measuring wood thicknesses of up to 50 mm. When the drive-in electrode M 20 is first delivered, 10 replacement pins of 16 and 23 mm length are included in the delivery.

The two electrode pins of the drive-in electrode must be pressed or hammered into the wood to be measured at right angles to the fibre direction. When removing them, light prying movements can be used at right angles to the grain to loosen the pins.

To change the electrode pins, the coupling nut must be unscrewed. The pins can then be simply replaced. Where possible, the coupling nuts should be tightened before beginning a measurement

using a spanner (WAF 12) or pliers. Loose electrode pins tend to break more easily and cause unstable measured values.

If thicker wood is to be measured, the electrode pins can be replaced with a suitably longer version. With increasing tip length, however, increased danger of breakage or bending (particularly when pulling out) must be expected. It is therefore recommended to use the M 18 ram-in electrode for thicker or particularly hard woods.

With uninsulated pins, the measured value is formed at the wettest point (the driven in electrode pins). If the moisture distribution in the wood is homogeneous, this means measuring the entire depth between the driven-in pins.

INFORMATION

Please note that:

- In order to determine any increased core moisture, the electrode pins must be driven in approx. 1/3 of the entire wood thickness.

- Particularly in the case of moisture ingress from outside, e.g. rain or condensation, only the increased surface moisture is measured, regardless of the penetration depth.

7.6.3 M 20-HW 200/300 Stick-in Electrode Pair

If the hex nuts with standard electrode pins on the M 20 electrode are removed, they can be replaced with the M 20-HW electrode pins. These must be fastened tightly!

For measurements in shavings and wood wool, it is advisable to compact the material to be measured a little. To do so, wood shavings should be pressed together with a weight of approx. 5 kg. No compression is necessary for balls of wood wool.

7.6.4 M 20-OF 15 Surface Measuring Caps

The surface measuring cap pair M 20-OF 15 is used in conjunction with the M 20 electrode for resistance-based measurement of moisture on surfaces without damaging the material being measured. In the area of wood moisture, it can be used to measure workpieces that have already been processed or to measure veneers or multi-layer parquet / multi-layer planks. Before measuring, the two hexagon nuts on the M 20 electrode must be unscrewed and replaced with the surface measuring caps. For measurement, the two contact surfaces must be pressed onto the workpiece to be measured at right angles to the fibre direction. It is important to ensure that the elastic transducers are pressed firmly onto the surface but that the metal holders do NOT touch the material to be measured (contact pressure approx. 3 kg). The measuring depth is approx. 2–5 mm; therefore several veneer layers must be placed on top of each other, especially when measuring veneers.

Surface measurements should only be made with wood moisture levels under 30 %. Do not measure on metal surfaces! When measuring stacks of veneer, to expose the measuring point, the veneer is lifted and not pulled over the remaining stack (avoid friction: electrostatic charge!).

Any wood particles adhering to the measuring surface must be regularly removed. If the elastic, plastic measurement sensors are damaged, they can be reordered (no. 31004316) and glued on using standard cyanate-based instant adhesive.

7.6.5 M 20-DS 16 and M 20-DS 16-i Conversion Kit

The M 20-DS 16 conversion kit is used to measure the moisture content of wood up to 30 mm thick. The particularly thin pins (1.6 mm [Ø]) leave barely visible puncture marks in the material (e.g. skirting boards or veneers).

The M 20-DS 16-i conversion kit reduces the impact of surface moisture during measurement. If other electrode nuts are used, the measured values can be falsified by surface contact (e.g. the measuring pins are driven in too deeply). The insulated electrode nuts are also very suitable for measuring wood fibre insulation boards.

To use a conversion kit, first unscrew the coupling nuts of the electrode with standard electrode pins. The hexagon nuts and matching pins can then be easily replaced. Where possible, the coupling nuts should be tightened before beginning a measurement using a spanner (WAF 12) or pliers. Loose electrode pins tend to break more easily and cause unstable measured values.

7.6.6 M 19 Stick-in Electrode

The stick-in electrode M 19 is made of impact-resistant plastic and is suitable for measuring finished thermal insulation composite systems (e.g. wood fibre insulation materials). The initial delivery of the stick-in electrode M 19 includes 10 Teflon-insulated electrode pins, each 60 mm long.

To change the electrode pins, the coupling nut must be unscrewed. The pins can then be simply replaced. Where possible, the coupling nuts should be tightened before beginning a measurement using a spanner (WAF 12) or pliers. Loose electrode pins tend to break more easily and cause unstable measured values.

The stick-in electrode M 19 can be pushed through the plaster into the external thermal insulation composite system (using a hammer if necessary). To protect the Teflon coating, you can also pre-drill with a drill bit (2.5 mm [Ø]) if necessary.

INFORMATION

Do not completely drive in the electrode pins! To rule out the effects of surface moisture and avoid measurement errors, there should be a gap of at least 1–2 mm between the plaster surface and the hexagon nut. The electrode support made of special plastic can be reordered as a spare part (order no. 31003509).

7.6.7 M 18 Ram-in Electrode

The ram-in electrode M 18 is made of corrosion-resistant V2A steel and is suitable for (depth) measurements in up to 180 mm thick or hard wood, wood fibre insulation materials and wood composites. When first delivered, the ram-in electrode M 18 is supplied with 10 replacement pins of 40 and 60 mm length (not insulated).

The two electrode pins of the ram-in electrode must be driven to the required measuring depth crosswise to the grain direction with a slide hammer. Pulling out the electrode pins is also done with the slide hammer with the impact direction upwards.

To change the electrode pins, the coupling nut must be unscrewed. The pins can then be simply replaced. Where possible, the coupling nuts should be tightened before beginning a measurement using a spanner (WAF 12) or pliers. Loose electrode pins tend to break more easily and cause unstable measured values.

With uninsulated pins, the measured value is formed at the wettest point (the driven in electrode pins). If the moisture distribution in the wood is homogeneous, this means measuring the entire depth between the driven-in pins.

INFORMATION

Please note that:

- In order to determine any increased core moisture, the electrode pins must be driven in approx. 1/3 of the entire wood thickness.

- Particularly in the case of moisture ingress from outside, e.g. rain or condensation, only the increased surface moisture is measured, regardless of the penetration depth.

Teflon-insulated electrode pins in lengths of 45 mm (order no. 31004550) or 60 mm (order no. 31004500) are available as special accessories for the M 18 ram-in electrode, each containing 10 pieces. These are suitable for measuring wood thicknesses of up to approx. 120 mm and enable precise zone and layer measurements in wood with widely varying moisture distribution (e.g. surface moisture, water pockets).

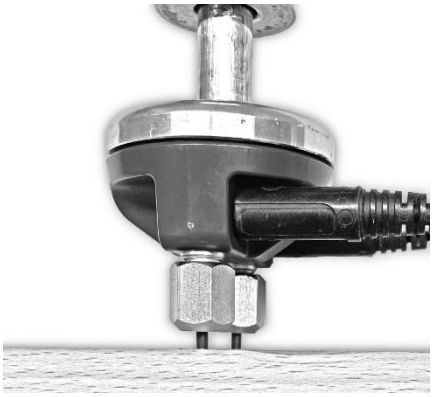


Figure 7-1: Use of Teflon-insulated pins

INFORMATION

Information: Do not completely drive in the electrode pins! To rule out the effects of surface moisture and avoid measurement errors, there should be a gap of at least 1–2 mm between the plaster surface and the hexagon nut. The electrode support made of special plastic can be reordered as a spare part (order no. 31003509).

7.7 Notes on non-destructive Structural Moisture Measurement

The non-destructive structural moisture measurement is based on an electrical capacitance determination depending on the dielectric constant (DK) of the measurement object. During the measurement, water molecules are polarised by applying an electric field. The dielectric constant of water is very high compared to the building material and therefore determines the measurement result.

The measuring field is formed between the active sphere on the top of the device and the substrate mass to be analysed. The change in the electric field caused by the material and moisture is recorded and shown digitally on the display of the measuring device.

The bulk density of the building material has a measurable influence on the measured variable. With a higher bulk density, a higher dielectric constant is to be expected.

It is only possible to draw conclusions about the absolute moisture content in per cent by weight or the moisture content in per cent CM if the drying process is normal. If the building material dries out too quickly (e.g. due to warm air, dehumidifiers, underfloor heating, etc.), the measured values may be too low due to the low surface moisture.

It is difficult to make a generally valid statement on the accuracy of measurement in relation to weight or mass percentages. Pure building materials with specific characteristic curves can be measured with good accuracy, whereas mixed masonry and laminates made of different materials are less accurate. However, exact percentages are often not necessary and so-called comparative measurements are completely sufficient.

The following points must also be observed for capacitive measurement:

- Capacitive measuring devices are moisture indicators and not measuring devices with 100 % reliable measured value statements.
- The conversion tables or characteristic curves for capacitive measuring devices generally refer to pure building materials (not to layered building materials, e.g. plaster on masonry etc.).
- The measurement results obtained with the capacitive measuring devices alone are not reliable or sufficient for expert reports. The measurement results should always be backed up by a second measurement method (e.g. resistance or CM measurement).
- There are no exact values for the penetration depth. The depth effect depends, among other things, on the bulk density, the current moisture content, the roughness of the surface, the pore size and quantity and the moisture distribution in the material. Therefore, no binding statements can be made in this regard.

Of course, this problem does not only apply to capacitive measuring instruments from GANN, but is the physical basis for all moisture probes and sensors that work dielectric constant (DK), high-frequency or microwave basis.

7.7.1 Using the Active Electrode B 55 BL

The active electrode B 55 BL must be connected to the measuring instrument via the 3.5 mm jack receptacle. Ensure that the octagonal plug is firmly seated. The measuring instrument now automatically recognises the connected accessories. To activate the capacitive measuring mode, press the **"M"** button for *longer than 2 seconds*.

INFORMATION

In conjunction with the active electrode B 55 BL, the Hydromette BL E only works in digit scan mode (setting "c 0"). A material setting or direct display in weight or CM % is not possible.

Please refer to the corresponding chapters for the use of the menu items "Maximum value display" (see Chapter 5.3.3), "Minimum value display" (see Chapter 5.3.4) and "Memory menu" (see Chapter 5.3.5).

To prevent the user's hand from influencing the electrode, only the lower half of the electrode may be covered by the hand during the measurement and control process. The upper half of the electrode must remain free.

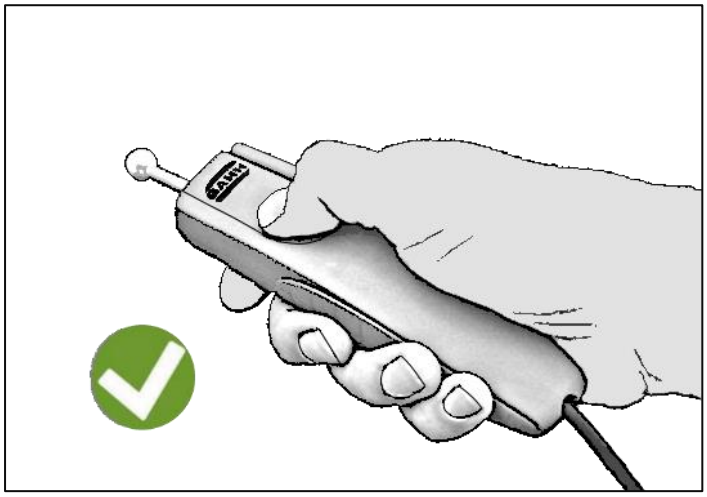


Figure 7-2 Proper handling

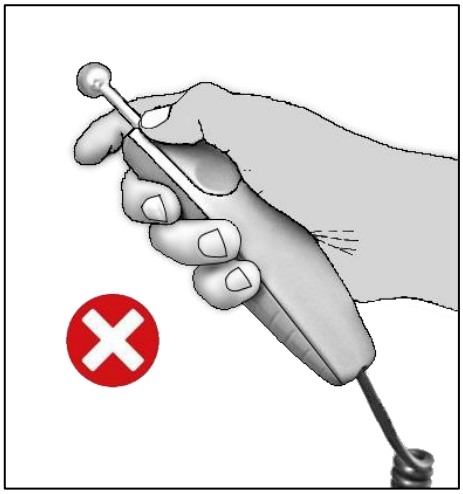


Figure 7-3: Improper handling

INFORMATION

Check:

Connect the electrode connecting cable to the measuring instrument. Hold the electrode at the rear end and hold it in the air. Press and hold the measuring button **"M"** button for longer than 2 seconds. The display value must be between 0.0 and 5.0. Take a measurement in the palm of your hand. The display value must be above 170.0.

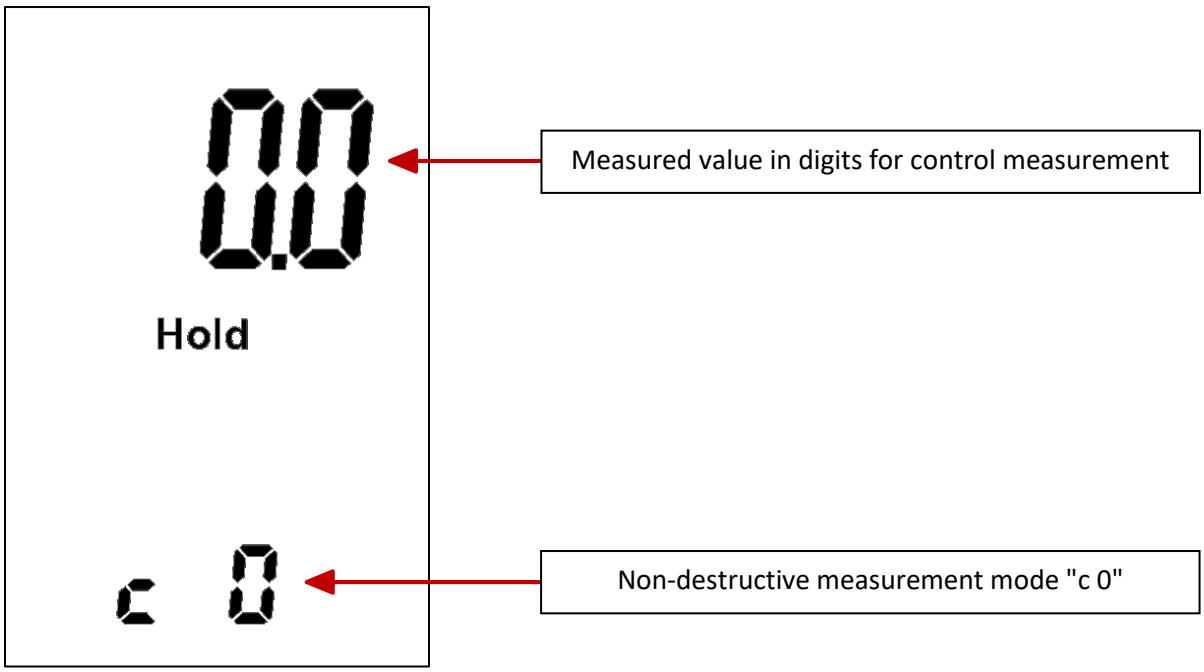


Figure 7-4: Capacitive measuring mode "c 0" display

Measuring:

INFORMATION

Press the measurement button **“M”** for longer than 2 seconds, and scan the area to be inspected. The electrode must rest firmly on the building material and be held as vertically as possible (approx. 90°) to the area. A measuring process is carried out as long as the measurement button is pressed. After releasing the **"M"** button, the measuring process is interrupted and the **"Hold"** symbol is displayed.

Measurements in drill holes lead to faulty measurements. This results in an overlay of the measuring field and thus an increase in the measured value.

Figure 7-5 Incorrect use – measurement in drill hole

In the corner/angle area, it is essential to maintain a distance of approx. 8 - 10 cm from the edge/angle.

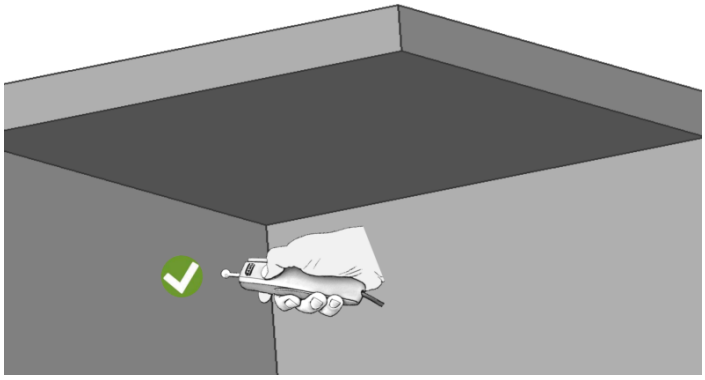


Figure 7-6: Correct use of distances when measuring

Measurements directly in the corner/angle area lead to an overlapping of the measuring field and thus change the measured value!

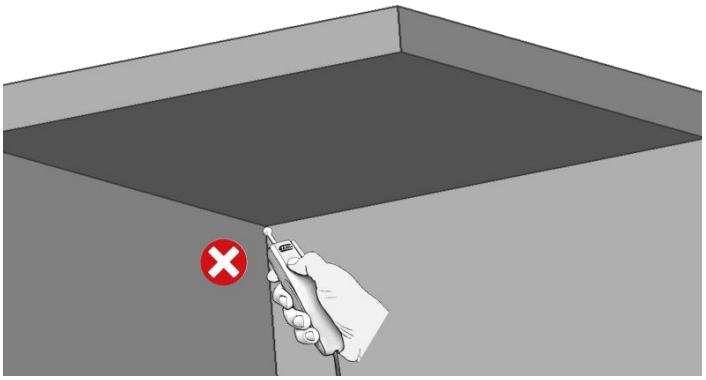


Figure 7-7: Incorrect use in corner/angle area

INFORMATION

To (re-)activate the BNC socket or the resistance-based measurement, the accessory must be unplugged from the 3.5 mm jack receptacle and the measurement button pressed for longer than 2 seconds.

7.8 Notes on Temperature Measurement

For correct temperature measurement using our mechanical sensors, a temperature equalisation must be established between the sensor and the object to be measured. This is easily possible when measuring large quantities of liquids or objects with a high heat content. It is important to ensure that the sensor (entire metal tube, measuring head, sensor plate, etc.) is not influenced by a different temperature (ambient air temperature) at certain points.

We therefore recommend that you ensure that the sensors are fully immersed or that a shield is fitted. A piece of polystyrene with a diameter of at least 30 mm and a corresponding length or an equivalent piece of foam of good (dense) quality should be used for this purpose. For the surface sensor, a corresponding cuboid with an edge length of at least
30 mm is sufficient for the surface sensor, e.g. to keep out convection heat or cold during wall temperature measurements.

Correct temperature measurement with mechanical sensors is often not possible for technical reasons on insufficiently heat-conducting materials or materials with a low heat content (e.g. polystyrene, rock wool, glass, etc.). In order to achieve usable results, either the ambient temperature must be used or approximate measurements must be carried out.

7.8.1 Handling the Pt100 Temperature Sensors

The Pt100 temperature sensors ET 10 BL, OT 100 BL and TT 40 BL must be connected to the measuring instrument via the 3.5 mm jack receptacle. Ensure that the octagonal plug is firmly seated. The measuring instrument now automatically recognises the connected accessories. To activate the temperature measuring mode, press now the **"M"** button for longer than 2 seconds.

INFORMATION

In conjunction with the Pt100 temperature sensors, the Hydromette BL E [BL UNI 11] operates exclusively in temperature display mode. A material setting or direct display in weight or CM % is not possible.

Please refer to the corresponding chapters for the use of the menu items "Maximum value display" (see Chapter 5.3.3), "Minimum value display" (see Chapter 5.3.4) and "Memory menu" (see Chapter 5.3.5).

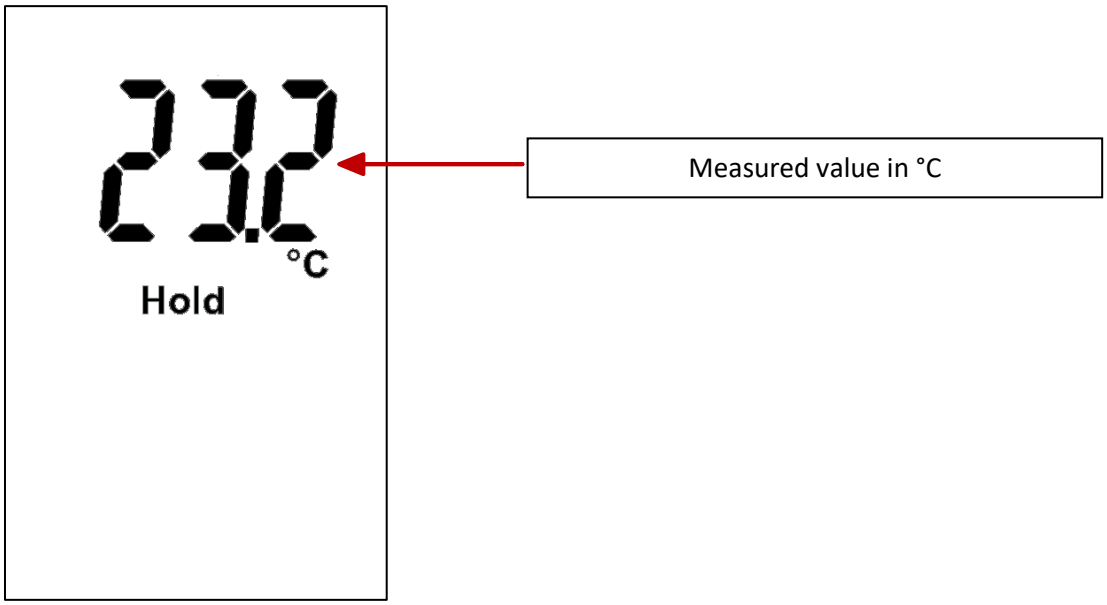


Figure 7-8: Temperature measurement display

INFORMATION

Measure:

Press and hold the **"M"** button for *longer than 2 seconds*. A measuring process is carried out as long as the measurement button is pressed. After releasing the **"M"** button, the measuring process is interrupted and the **"Hold"** symbol is displayed.

7.8.2 Push-in Electrode ET 10 BL

The ET 10 BL is a simple penetration temperature sensor for measuring temperatures in semi-solid materials (e.g. frozen goods), bulk materials, liquids and for measuring core temperatures in a drill hole.

INFORMATION

Immerse the sensor tip at least 4 cm into the liquid to be measured or insert it into the product to be measured and trigger the measuring process. When measuring core temperatures, keep the drill hole as small as possible. Remove dust from the drill hole and wait for the temperature to equalise (due to the heat generated by drilling). Coat the sensor tip with commercially available silicone heat-conducting paste if necessary and insert it. Small drill holes can be filled directly with a little heat-conducting paste.

Depending on the material to be measured, the response time for T90 is between approx. 20 (liquids) and 120 seconds (T^{90}).

- Measuring Range: -50 to + 250 °C

- Sensor pipe: length 100 mm, Ø 3 mm

7.8.3 Surface Temperature Sensors OT 100 BL

The OT 100 BL is a special sensor with a particularly low mass for measuring temperatures on surfaces. It has a spring-mounted sensor tip with thermal separation and the resulting optimised measured value acquisition, e.g. on solid wall surfaces.

INFORMATION

The sensor plate must be in full contact. There must be no air (only a very thin layer of heat-conducting paste) between the sensor plate and the object to be measured. Trigger the measurement process as described. Depending on the material to be measured, the response time is between approx. 10 and 40 seconds (T^{90}). In order to achieve good measurement results, the material to be measured must have a sufficient heat content and good thermal conductivity.

Caution:

- If the surface is rough, apply a small amount of silicone heat-conducting paste to the sensor head (sensor plate) and press it against the object to be measured.
- Damage is possible due to excessive pressure or kinking of the spring-loaded tip.

- Measuring Range: -50 to + 250 °C

- Sensor pipe: length 110 mm, Ø 5 mm

7.8.4 Immersion and Flue Gas Temperature Sensor TT 40 BL

The TT 40 BL is a special sensor for measuring temperatures in liquids and core temperatures in a drill hole and in smoke/flue gases from burners. The length of the sensor pipe is 380 mm.

INFORMATION

Immerse the sensor tip at least 6 cm deep into the medium to be measured and trigger the measuring process. When measuring core temperatures, keep the drill hole as small as possible. Remove dust from the drill hole and wait for the temperature to equalise (due to the heat generated by drilling). Coat the sensor tip with commercially available silicone heat-conducting paste if necessary and insert it.

Depending on the material to be measured, the response time is between approx. 10 (liquids) and 180 seconds (T^{90}).

- Measuring Range: -50 to + 350 °C

- Sensor pipe: length 380 mm, Ø 5 mm

8 Accessories

8.1 Accessories for Structural Moisture Measurement

Structural moisture test adapter (order no. 31006071)

Test adapter for structural moisture, for checking structural moisture measuring instruments with accessories.

M 20 drive-in electrode (order no. 31003300)

The drive-in electrode M 20 is made of impact-resistant plastic and can be used for measurements in soft, set building materials (e.g. plaster, gypsum or aerated concrete) as well as insulating materials. When the drive-in electrode M 20 is first delivered, 10 replacement pins of 16 and 23 mm length are included in the delivery.

Reorder electrode pins, packaging unit 100 pieces:

- 16 mm long (order no. 31004610) with 10 mm penetration depth
- 23 mm long (order no. 31004620) with 17 mm penetration depth
- 40 mm long (order no. 31004640) with 34 mm penetration depth
- 60 mm long (order no. 31004660) with 54 mm penetration depth

Reorder cap nut, packaging unit 1 piece:

- order no. 31003510

M 20-OF 15 surface measuring caps (order no. 31004315)

The surface measuring cap pair is suitable for moisture measurements on surfaces without damaging the material to be measured in conjunction with the M 20 electrode (e.g. veneers, solid or multi-layer parquet). Depth effect 2–5 mm.

Reorder plastic transducer, packaging unit 4 pieces:

- order no. 31004316

M 6 stick-in electrode pair (order no. 31003700)

The M 6 stick-in electrode pair can be used for resistance-based building moisture measurement in hard, set building materials (e.g. sand-lime brick, cement screed or concrete) in conjunction with contact compound or in soft building materials (such as mortar joints, plaster or drywall panels). The scope of delivery includes 10 electrode pins, each 40 and 60 mm long.

The M 6 electrode heads also serve as a base system for various other electrode pairs.

Reorder electrode pins, packaging unit 100 pieces:

- 40 mm long (order no. 31004640) with 34 mm penetration depth

- 60 mm long (order no. 31004660) with 54 mm penetration depth

Reorder cap nut, packaging unit 1 piece:

- order no. 31003510

M 6-Bi 200/300 flat electrode pair

The flat electrode pairs M 6-Bi 200 and M 6-Bi 300 are used for resistance-based moisture measurement in screed or insulating materials. Their special shape makes it possible to measure in edge and floating joints. The insulation on the stem prevents unwanted influence of surface moisture on the measurement result. A pair of M 6 electrodes (order no. 31003700) is required for use.

- length 200 mm (order no. 31003702)

- length 300 mm (order no. 31003703)

M 6-150/250 stick-in electrode pin pairs

The stick-in electrode pins M 6-150 and M 6-250 are used for resistance-based moisture measurement in building and insulating materials. The extra thin pins enable measurement in floating joints or through a spacer cross. A pair of M 6 electrodes (order no. 31003700) or the M 20 electrode (order no. 31003300) is required for use.

- length 150 mm Ø 3 mm (order no. 31003706)

- length 250 mm Ø 2 mm (order no. 31003707)

M 21-100/250 electrode pair for deep measurement

The depth measuring electrode pairs M 21-100 and M 21-250 have been developed for measuring building moisture, especially for depth measurements in building materials.

By using the depth measuring electrodes, a moisture profile of the material to be measured can be created by taking measurements layer by layer. The use of contact mass is required to ensure conductivity between the material to be measured and the electrode pins.

- length 100 mm (order no. 31003200)

- length 250 mm (order no. 31003250)

Contact paste (order no. 31005400)

The contact mass is required for measuring hard and set building materials (e.g. screed, concrete) which have to be drilled and the M 6 and M 21 electrodes are used.

M 20-Bi 200/300 stick-in electrode pair

The stick-in electrode pins have been developed for depth measurement in insulation, roofs and soft, set building materials. They can be used for layer-by-layer measurements or measurements at depth, as the insulation on the shaft reduces the influence of moisture near the surface.

A pair of M 6 electrodes (order no. 31003700) or the M 20 electrode (order no. 31003300) is required for use.

- length 200 mm Ø 4 mm (order no. 31004360)

- length 300 mm Ø 4 mm (order no. 31004365)

M 25-100/300 brush electrode pair

The two brush probes made of V2A steel were specially developed for depth measurements and layer measurements in hard, set building materials without the use of additional contact pastes.

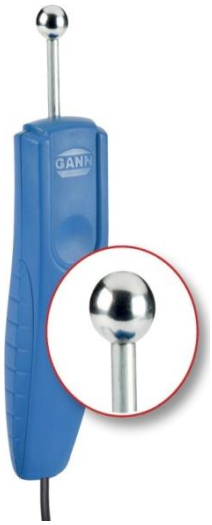
- length 100 mm (order no. 31003740)

- length 300 mm (order no. 31003743)

MK 8 Measuring cable - length 1 m (order no. 31006210)

For connection of electrodes for resistance measurement

Active Electrode B 55 BL (order no. 31013755)



The B 55 BL is an electronic building moisture indicator for non-destructive measurement in building materials using the dielectric constant/high frequency measurement method. It is an ideal pre-tester for all CM devices and resistance-based measuring devices.

Applications

- Moisture measurement with the spherical head in the wall, ceiling or floor
- Non-destructive building moisture measurement with the ball electrode

8.2 Accessories for Wood Moisture Measurement

Wood moisture test adapter (order no. 31006070)

Test adapter for wood moisture, for check of wood moisture measuring instruments with accessories.

M 20 drive-in electrode (order no. 31003300)

The drive-in electrode M 20 is made of impact-resistant plastic and is suitable for measuring wood thicknesses of up to 50 mm (e.g. sawn timber, chipboard, wood fibreboard). When the drive-in electrode M 20 is first delivered, 10 replacement pins of 16 and 23 mm length are included in the delivery.

Reorder electrode pins, packaging unit 100 pieces:

- 16 mm long (order no. 31004610) with 10 mm penetration depth

- 23 mm long (order no. 31004620) with 17 mm penetration depth

Reorder cap nut, packaging unit 1 piece:

- (order no. 31003510)

M 20-HW 200/300 stick-in electrode pair

The stick-in electrode pair is suitable for measuring in chips, wood wool and bulk materials. The stick-in electrodes can only be used in conjunction with the M 20 drive-in electrode.

The electrode pins are available in two lengths:

- length 200 mm Ø 4 mm (order no. 31004350)

- length 300 mm Ø 4 mm (order no. 31004355)

M 20-OF 15 surface measuring caps (order no. 31004315)

The surface measuring cap pair is suitable for moisture measurements on surfaces without damaging the material to be measured in conjunction with the M 20 electrode (e.g. veneers, solid or multi-layer parquet). Depth effect 2–5 mm.

Reorder plastic transducer, packaging unit 4 pieces:

- (order no. 31004316)

M 20-DS 16 conversion kit (order no. 31004310) and **M 20-DS 16-i conversion kit** (order no. 31004311) in conjunction with drive-in electrode M 20

The M 20-DS 16 conversion kit is used to measure the moisture content of wood up to 30 mm thick. The particularly thin pins (1.6 mm [Ø]) leave barely visible puncture marks in the material (e.g. skirting boards or veneers).

The M 20-DS 16-i conversion kit reduces the impact of surface moisture during measurement. The insulated electrode nuts are also very suitable for measuring wood fibre insulation boards.

M 19 stick-in electrode (order no. 31003400)

The stick-in electrode M 19 is made of impact-resistant plastic and is suitable for measuring finished thermal insulation composite systems (e.g. wood fibre insulation materials).

The initial delivery of the stick-in electrode M 19 includes 10 Teflon-insulated electrode pins, each 60 mm long.

Reorder electrode pins with insulated stem, packaging unit 10 pieces:

- 45 mm long (order no. 31004550) with 25 mm penetration depth

- 60 mm long (order no. 31004500) with 40 mm penetration depth

Reorder cap nut, packaging unit 1 piece:

- order no. 31003510

Reorder electrode holder, packaging unit 1 piece:

- order no. 31003509

M 18 ram-in electrode (order no. 31003500)

The ram-in electrode M 18 is made of corrosion-resistant V2A steel and is suitable for (depth) measurements in up to 180 mm thick or hard wood, wood fibre insulation materials and wood composites.

When first delivered, the ram-in electrode M 18 is supplied with 10 replacement pins of 40 and 60 mm length (not insulated).

Reorder electrode pins (not insulated), packaging unit 100 pieces:

- 40 mm long (order no. 31004640) with 34 mm penetration depth

- 60 mm long (order no. 31004660) with 54 mm penetration depth

Reorder electrode pins with insulated stem, packaging unit 10 pieces:

- 45 mm long (order no. 31004550) with 25 mm penetration depth

- 60 mm long (order no. 31004500) with 40 mm penetration depth

Reorder cap nut, packaging unit 1 piece:

- order no. 31003510

Reorder electrode holder, packaging unit 1 piece:

- order no. 31003509

MK 8 measuring cable - length 1 m (order no. 31006210)

For connection of electrodes for resistance measurement

8.3 Temperature Measurement Accessories

ET 10 BL stick-in temperature sensor (order no. 31013165)

The ET 10 BL is a simple penetration temperature sensor for measuring temperatures in semi-solid materials (e.g. frozen goods), bulk materials, liquids and for measuring core temperatures in a drill hole.

OT 100 BL Surface temperature sensor (order no. 31013170)

The OT 100 BL is a special sensor with a particularly low mass for measuring temperatures on surfaces. It has a spring-mounted sensor tip with thermal separation and the resulting optimised measured value acquisition, e.g. on solid wall surfaces.

TT 40 BL immersion and flue gas temperature sensor (order no. 31013180)

The TT 40 BL is a robust immersion and flue gas sensor for temperature measurement in liquids or viscous materials, e.g. glues, hot-melt adhesives, or in asphalt or tar.

9 Appendix

9.1 Material Table

Material index	Material
r 0	Display in digits / Scan mode resistive
2	Wood type 2
3	Wood type 3
11	Cement screed in weight-%
12	Anhydrite screed in weight-%
14	Cement mortar in weight-%
15	Lime mortar in weight-%
17	Gypsum plaster in weight %
18	Cement screed in CM %
19	Lime sand brick in weight-%
21	Styrofoam in weight %
50	Anhydrite screed in CM %
51	Gas concrete (Hebel) in weight-%
52	Gypsum screed in weight-%
53	Gypsum screed in CM %
54	Gypsum plaster in CM %
55	Lime mortar in CM %
56	pressed cork in weight-%
57	Xylolite in accordance with DIN in weight-%
58	Cement mortar in CM %
59	Gas concrete (Ytong PPW4) in weight-%
60	Bricks in weight-%
65	Concrete C 20/25 in weight-%
69	natural cork in weight-%
70	Wood cement screed in weight-%
71	Glass mineral wool in weight-%

c 0	Display in digits / Scan mode capacitive (only in connection with active electrode B 55 BL)

9.2 Display Values (Digits) in Relation to the Bulk Density

Bulk density kg/m³	Corresponding Relative Air Humidity in % 30 ---------- 50 ---------- 70 ---------- 80 ---------- 90 ---------- 95 ---------- 100 Display in Digits*					
	very dry	normal dry	semi dry	moist	very moist	wet
up to 600	10 – 20	20 – 40	40 – 60	60 – 90	90 – 110	above 110
600 - 1200	20 – 30	30 – 50	50 – 70	70 – 100	100 – 120	above 120
1200 - 1800	20 – 40	40 – 60	60 – 80	80 – 110	110 – 130	above 130
above 1800	30 – 50	50 – 70	70 – 90	90 – 120	120 – 140	above 140

*** Digital values are dimensionless measurement values and not real moisture values as a percentage!**

Figure 9-2 Display Values (Digits) in Relation to the Bulk Density

9.2.1 Orientation Values

The following data serves as an orientation guide for anticipated display values:

Residential spaces		**Cellars (old buildings)**	
dry	20 - 40 Digits	dry	40 - 60 Digits
moist	80 - 140 Digits	moist	100 - 150 Digits

INFORMATION

Dew point undershoots or condensation on the surface to be measured can cause higher display values and thus make the wall appear more humid than is actually the case! It is therefore always advisable to carry out an additional indoor climate measurement and dew point calculation (Hydromette BL Compact TF-IR 2, TF 3 & RH-T). This can prevent misinterpretations. If readings exceed 130 digits, condensation may already be starting to form, depending on the bulk density.

Depending on the height of the covering, metal in the subsurface (iron reinforcements, wires, pipes, stucco bars, etc.) can raise the measurement value. This should be considered when evaluating the displayed values in relation to the covering.

9.3 Display Values (Digits) by Weight Percentage or CM Percentage

Display in Digits		40	50	60	70	80	90	100	110	120	130
Cement screed	wt.-%	1.8	2.2	2.7	3.2	3.6	4.1	4.5	5.0	5.5	5.9
	CM-%	0.7	1.0	1.4	1.8	2.1	2.5	2.9	3.2	3.6	4.0
Anhydrite screed	wt.-%	0.1	0.3	0.6	1.0	1.4	1.8	2.2	2.5	2.9	3.3
	CM-%	0.1	0.3	0.6	1.0	1.4	1.8	2.2	2.5	2.9	3.3
Concrete C12/15, C20/25, C30/37	wt.-%		1.3	1.9	2.5	3.2	3.8	4.4	5.0	5.6	6.2
	CM-%		0.3	0.8	1.3	1.7	2.2	2.7	3.2	3.7	4.2
Cement mortar	wt.-%	1.8	2.7	3.5	4.6	6.0	7.0	7.8			
	CM-%	0.6	1.5	2.3	3.1	4.0	4.8	5.6			
Lime mortar	wt.-%	0.6	2.0	3.3	4.5						
	CM-%	0.6	2.0	3.3	4.5						
Lime cement mortar	wt.-%	2.2	3.6	5.0	6.4	7.8	9.2	10.6	11.0		
	CM-%	1.5	2.7	4.0	5.2	6.4	7.6	8.8	10.0		
Gypsum plaster	wt.-%	0.3	0.5	1.0	2.0	3.5	6.5	10.0			
	CM-%	0.3	0.5	1.0	2.0	3.5	6.5	10.0			

9.4 Equilibrium Wood Moisture Table

Wood Moisture Equilibrium					
	Air temperature in °C				
	10 °C	15 °C	20 °C	25 °C	30 °C
Relative air humidity	**Wood moisture content**				
20%	4.70%	4.70%	4.60%	4.40%	4.30%
30%	6.30%	6.20%	6.10%	6.00%	5.90%
40%	7.90%	7.80%	7.70%	7.50%	7.50%
50%	9.40%	9.30%	9.20%	9.00%	9.00%
60%	11.10%	11.00%	10.80%	10.60%	10.50%
70%	13.30%	13.20%	13.00%	12.80%	12.60%
80%	16.20%	16.30%	16.00%	15.80%	15.60%
90%	21.20%	21.20%	20.60%	20.30%	20.10%

9.5 Wood Temperature Compensation Table

Wood temperature in °C	Measured values													
	4	5	6	7	8	9	10	11	12	13	14	15	16	17
-10	7.0	8.5	9.5	11.0	12.0	13.5	14.5	16.0	17.0	18.5	19.5	20.5	22.0	23.0
- 5	6.5	7.5	9.0	10.0	11.0	12.5	13.5	15.0	16.0	17.5	18.5	19.5	20.5	22.0
0	6.0	7.0	8.5	9.5	10.5	11.5	13.0	14.0	15.0	16.5	17.5	18.5	19.5	21.0
+ 5	5.5	6.5	7.5	8.5	9.5	11.0	12.0	13.0	14.0	15.0	16.5	17.5	18.5	20.0
+10	5.0	6.0	7.0	8.0	9.0	10.5	11.5	12.0	13.0	14.0	15.5	16.5	17.5	19.0
+15	4.5	5.5	6.5	7.5	8.5	9.5	10.5	11.5	12.5	13.5	14.5	15.5	16.5	18.0
+20	4.0	5.0	6.0	7.0	8.0	9.0	10.0	11.0	12.0	13.0	14.0	15.0	16.0	17.0
+25	3.5	4.5	5.5	6.5	7.5	8.5	9.5	10.5	11.5	12.5	13.5	14.5	15.5	16.5
+30	3.0	4.0	5.0	6.0	7.0	8.0	9.0	9.5	10.5	11.5	12.5	13.5	14.5	15.5
+35	2.5	3.5	4.5	5.5	6.5	7.5	8.5	9.0	10.0	11.0	12.0	13.0	14.0	15.0
+40	2.5	3.5	4.0	5.0	6.0	7.0	7.5	8.5	9.5	10.5	11.5	12.0	13.0	14.0
+45	2.0	3.0	3.5	4.5	5.5	6.5	7.5	8.0	9.0	10.0	11.0	11.5	12.5	13.0
+50	2.0	2.5	3.0	4.0	5.0	6.0	7.0	7.5	8.5	9.5	10.5	11.0	12.0	12.5
+55	1.5	2.5	3.0	4.0	5.0	5.5	6.5	7.0	8.0	9.0	9.5	10.5	11.5	12.0
+60	1.0	2.0	2.5	3.5	4.5	5.0	6.0	6.5	7.5	8.5	9.0	10.0	10.5	11.5
	real wood moisture in %													

Wood temperature in °C	Measured values												
	18	19	20	21	22	23	24	25	26	27	28	29	30
-10	24.5	25.5	27.0	28.0	29.5	30.5	32.0	33.0	34.5	35.5	36.5	38.0	39.0
- 5	23.0	24.0	25.5	26.5	28.0	29.0	30.5	31.5	32.5	34.0	35.0	36.0	37.0
0	22.0	23.0	24.5	25.5	26.5	27.5	29.0	30.0	31.0	32.5	33.5	34.5	35.5
+ 5	20.5	21.5	23.0	24.0	25.0	26.0	27.5	28.5	29.5	31.0	32.0	33.0	34.0
+10	19.5	20.5	22.0	23.0	24.0	25.0	26.0	27.0	28.0	29.5	30.5	31.5	32.5
+15	19.0	20.0	21.0	22.0	23.0	24.0	25.0	26.0	27.0	28.0	29.0	30.0	31.0
+20	18.0	19.0	20.0	21.0	22.0	23.0	24.0	25.0	26.0	27.0	28.0	29.0	30.0
+25	17.0	18.0	19.0	20.0	21.0	22.0	23.0	24.0	25.0	26.0	27.0	27.5	29.0
+30	16.5	17.0	18.0	19.0	20.0	21.0	22.0	23.0	24.0	25.0	25.5	26.5	27.5
+35	16.0	16.5	17.5	18.0	19.0	20.0	21.0	22.0	23.0	24.0	24.5	25.5	26.5
+40	15.0	15.5	16.5	17.5	18.5	19.5	20.0	21.0	22.0	23.0	23.5	24.5	25.5
+45	14.0	15.0	15.5	16.5	17.5	18.5	19.0	20.0	21.0	22.0	22.5	23.5	24.5
+50	13.5	14.5	15.0	16.0	17.0	18.0	18.5	19.5	20.5	21.0	22.0	22.5	23.5
+55	13.0	13.5	14.5	15.0	16.0	17.0	17.5	18.5	19.5	20.0	21.0	21.5	22.5
+60	12.5	13.0	14.0	14.5	15.5	16.5	17.0	18.0	19.0	19.5	20.5	21.0	22.0
	real wood moisture in %												

9.6 General Concluding Remarks

The notes and tables in these operating instructions on permitted or normal humidity conditions in practice and the general definitions of terms have been taken from the specialist literature. No responsibility can therefore be taken by the manufacturer of the measuring device for the correctness of this information.

The conclusions to be drawn from the measurement results are related to the individual conditions and the knowledge from professional experience for each user. In cases of doubt, for example concerning the permitted moisture content in coating or screed substrates when laying floor coverings it is recommended to contact the manufacturer of the coating or floor covering and to take account of the recommendations of the trade associations/guilds.

Please note:

The instructions for use for the device and any accessories should be carefully observed, as supposed simplifications in handling often lead to measurement errors.

-Subject to technical changes- Status: August 2024

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10 EU Declaration of Conformity

Document no. / order no.: 30011300

Product identifier: **HYDROMETTE BL E**

We declare that the hand-held meter and related accessory correspond with the protection requirements and if used according to their intended purpose, comply with the requirements of the directives:

☒ 2014/30/EU EMC Directive

☒ 2011/65/EU RoHS

Applied harmonized standards:

☒ EN 61326-1 : 2013 General EMC requirements

☒ EN IEC 63000 : 2018 Restriction of hazardous substances

This declaration is given in responsibility for:

Gann Mess- und Regeltechnik GmbH

Schillerstr. 63

70839 Gerlingen

Germany

issued by:

name: Michael Gann

Position in the company of manufacturer: Managing Director

Place / date: Gerlingen, 12 December 2024

(Legally valid signature)