

Operating Instructions

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HYDROMETTE BL H 40 / HT 70



EN

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→ Graphical short operating instructions in the centre ←

0.1 Publication Statement

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GANN Mess- u. Regeltechnik GmbH, Gerlingen, Germany.
07.11.2014

0.2 WEEE Directive 2002/96/EC Law on Electrical and Electronic Equipment

Disposal of packaging, the battery and the device must be undertaken in accordance with the legal requirements at a recycling centre.

The device was manufactured after 1 October, 2009

0.3 General Notes

This measuring device fulfils the requirements of the applicable European and national directives (2004/108/EC) and standards (EN61010). Appropriate declarations and documentation are held by the manufacturer. To ensure trouble-free operation of the measuring device and operational reliability, the user must carefully read the operating instructions. The measuring device may only be operated under the climatic conditions specified. These conditions can be found in Chapter 3.1 "Technical data". This measuring device may likewise only be used under the conditions and for the purposes it was designed for. Operational reliability and functionality are no longer ensured if the device is modified or adapted. Gann Mess- u. Regeltechnik GmbH is not liable for any damage arising from such modifications or adaptations. The risk is borne by the user alone.

- The device must not be stored or operated in aggressive air or air containing solvents!
- **Static charge** - at low levels of air humidity aided by external factors (friction during material transport, high insulation of the surrounding area), static electricity can build up with high voltages, which can not only lead to strong swings in measured values or minus values, but also to the destruction of electrical components in the device. The operator of the measuring device can also, unintentionally, contribute to the build-up of static charge from his/her clothing. A significant improvement can be achieved by ensuring the operator and the measuring device remain completely still during the measurement process and by grounding (touching conducting metal, water or heating pipes, etc.).
- Frozen wood cannot be measured.

- The notes and tables in these 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 for the correctness of this information. The conclusions to be drawn from the measurement results are related to the individual conditions and the knowledge drawn from professional experience for each user.
- The measuring device maybe operated in residential and commercial areas, as the stricter class B for emitted interference (EMC) has been adhered to.
- The measuring device and any accessories may only be properly used as described in these instructions. Keep the device and accessories out of the reach of children!
- Wood and other materials should not be measured on conductive surfaces.

Gann Mess- u. Regeltechnik GmbH accepts no liability for damage resulting from non-adherence to the operating instructions or by not taking proper care during transport, storage and handling of the device during operation, even if this requirement for care is not specifically addressed in the operating instructions.

0.4 Safety Advice



WARNING: There is a risk of injury from the measurement probes of the electrodes. Before inserting the electrode pins into wooden panels or similar, use suitable methods to ensure that there are no electrical wires, water pipes or other supply lines at this point.

1 Introduction

1.1 Description

The Hydromette BL H 40 / HT 70 is an electronic wood moisture measuring device for precise measurement of sawn timber (up to 180 mm thick), chipboard and veneers with a high-quality measurement amplifier and 3-line LCD display.

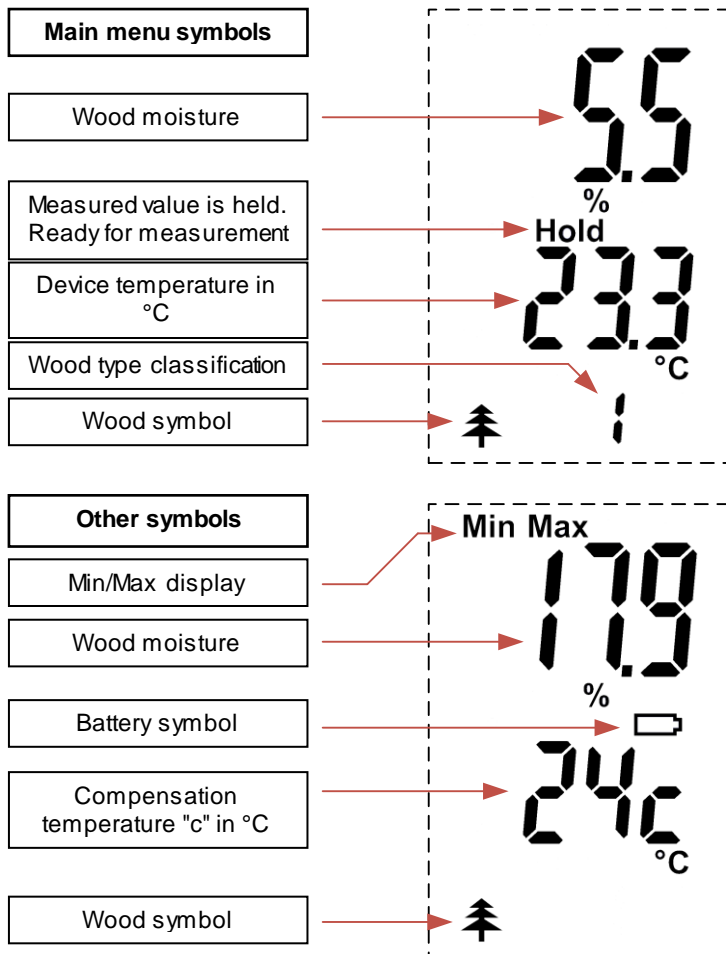
The device has a wood type switch to automatically correct measurement values for over 300 types of wood, and there is also a wood temperature compensation. The HT 70 also offers a connection for various temperature measuring devices. In addition, 5 customer-specific wood characteristic curves can be programmed (only 2 characteristic curves are available in the H 40).

The electrode is inserted into the respective material to be measured and allows the measurement of moisture in sawn timber, chipboard, veneers and wood fibre materials up to 180 mm thick (with electrode M 18).

1.2 Device Layout and Button Assignment




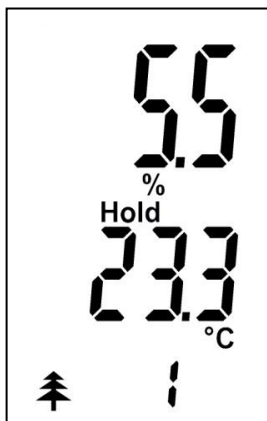
1.3 Display Symbols



2 Basic Functions

2.1 Switch on Device

The device is switched on by pressing the **On** button .



Last measured value in %

"Hold" symbol

Last measured device temp. in °C

Wood symbol and classification number

Figure 2-1 Main Menu

In this menu, a new measurement can be started by pressing the measurement button "**M**". See also Chapter 2.2 "Measuring mode".

2.2 Display in Measuring Mode

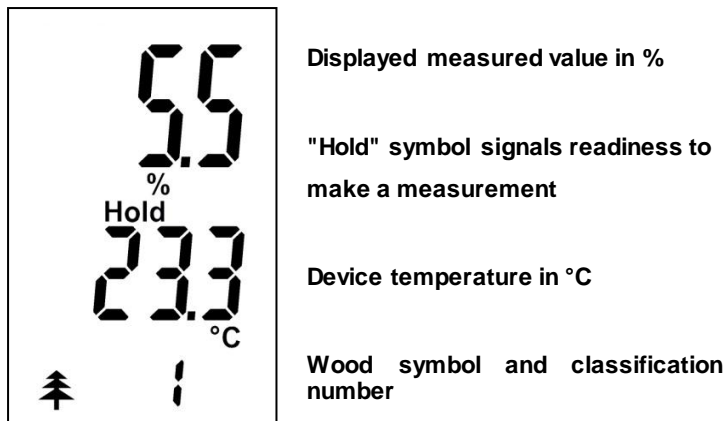


Figure 2-2 Measuring Mode

A measurement is started by pressing the "M" button.

2.3 Setting Menus

The following menus can be selected one after the other by repeated pressing of the "Up" and "Down" buttons. On the following page, the sequence of the setting menus that is seen by pressing the "Down" button is shown.

1. **Measurement menu** (main menu): The measuring process can be carried out here.
2. **Wood type setting**: The wood type can be selected here.
3. **Temperature menu**: The temperature compensation can be set here.
4. **Maximum value display**: The highest value measured is shown here.
5. **Minimum value display**: The lowest value measured is shown here.
6. **Memory menu**: The last 5 values measured can be called here.

2.3.1 Measurement Menu (Main Menu)

The last measurement with the note "**Hold**" is shown here. The device temperature and the current type are also shown on the display.

In this menu, a new measurement can be started by pressing the "**M**" button.

During the measuring process, the "**Hold**" symbol disappears from the display and the % symbol blinks. If the measured value is stable, the % symbol remains switched on, and after releasing the "**M**" button the measured value is saved. The "**Hold**" symbol is displayed again.

If the new measured value is higher or lower than the previous maximum or minimum value, "**Max**" or "**Min**" appears flashing on the display. If the value is to be saved as the Min. or Max. value, the "**M**" button must be pressed briefly. If the value is not to be saved, a new measurement can be started with a long press on the "**M**" button without changing the previous saved maximum or minimum values.

If the measurement range is not reached or exceeded (**H 40**: < 5%, > 40%; **HT 70**: < 5%, > 70%) a blinking measured value shows a warning, which is alternately marked in addition with "LO" or "HI".

2.3.2 Wood Type Setting



The classification number set is displayed with the symbol for the wood moisture.

Wood symbol and classification number

Figure 2-3 Wood type setting

If the wood type is to be changed, the "M" button is pressed *briefly*.

The wood type classification number blinks and can be set with the "Up" and "Down" buttons. The change is saved by pressing the "M" button again *briefly*.

The detailed wood type table is included.

2.3.3 Temperature Menu

If the preset for the compensation temperature is to be changed, the "M" button is pressed *briefly* (<1s) in the temperature menu.

The temperature display now starts to blink. By pressing the "M" button for longer (> 2s), you can change between the user-defined compensation temperature and the device temperature.

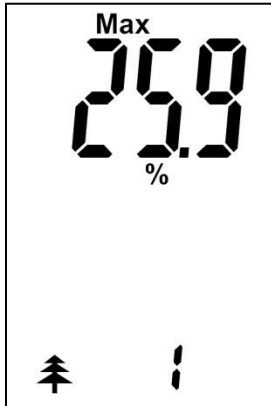
With a *short* (< 1s) press of the "M" button, the setting is confirmed and you are back in the measurement mode.

Setting the user-defined compensation temperature:

If you have selected the user-defined compensation temperature (identified with a "c") in the temperature menu, you can change the compensation temperature in steps of 1 °C with the "Up" and "Down" buttons.

The change is saved by pressing the "M" button again *briefly* (< 1s). You are then back in the measurement mode.

2.3.4 Maximum Value Display



The highest moisture measurement in a measurement sequence is displayed together with the "Max" display symbol

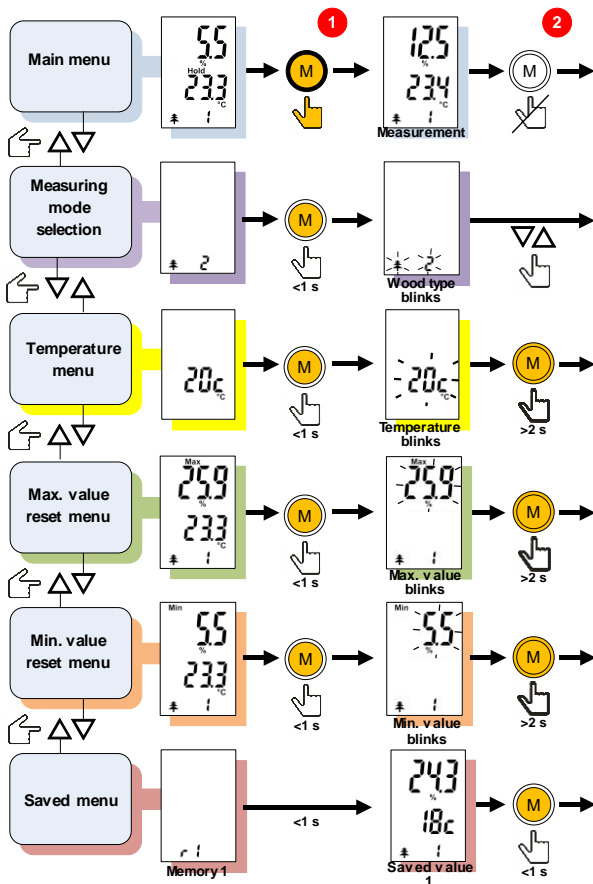
Wood symbol and classification number

Figure 2-4 Maximum value display

If a maximum value is to be deleted, the displayed value is selected with a *short* press on the "M" button.

The value and the % symbol now blink and the value can be deleted by a *long* press on the "M" button. After deleting the value, only the % symbol still blinks. With a repeated *short* press of the "M" button, the deletion of the value is confirmed and the % symbol disappears. The device now returns to Ready mode.

With the "M" button, a new measurement can then be carried out.



ON/OFF button. The device deactivates after 40 s inactivity



Press measurement button any length of time



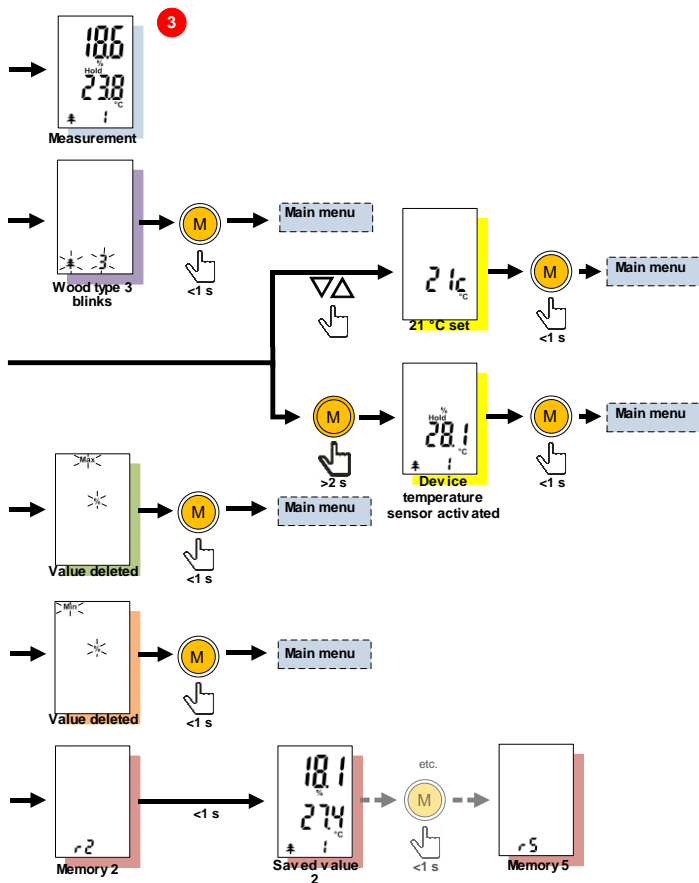
Release measurement button



Hold measurement button pressed longer than 2 seconds



Press measurement button briefly



Press the "Up" or "Down" button



"Up" or "Down" for menu selection

Route to simple measurement:

Switch on device – main menu is displayed

1

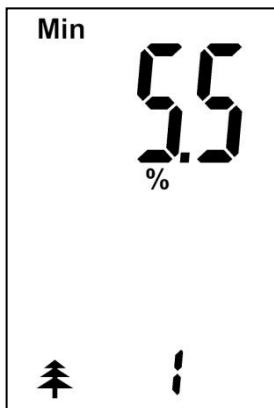
Hold measurement button pressed as long as wanted to carry out a measurement

2

Release measurement button. The measured value is held ("Hold" appears in display)

3

2.3.5 Minimum Value Display



The lowest moisture measurement in a measurement sequence is displayed together with the "Min" display symbol

Wood symbol and classification number

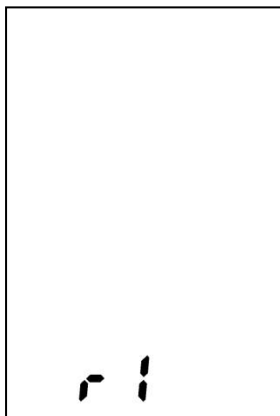
Figure 2-5 Minimum value display

If a minimum value is to be deleted, the displayed value is selected with a *short* press on the "M" button.

The value and the % symbol now blink and the value can be deleted by a *long* press on the "M" button. After deleting the value, only the % symbol still blinks. With a repeated *short* press of the "M" button, the deletion of the value is confirmed and the % symbol disappears. The device now returns to Ready mode.

With the "M" button, a new measurement can then be carried out.

2.3.6 Memory Menu



Symbol: memory "r1"

Figure 2- 6 Memory location "r1"

As soon as you select the saved menu, the memory location number "r1" is displayed for approx. 1 second, and then the last measured saved value contained there is displayed.

The last 5 measured values are automatically saved and stored in memory locations "r1" to "r5". The last measured value is in memory location "r1". This is a ring buffer: as soon as the sixth measured value is recorded, the first measured value is automatically removed from the buffer.

With a *short* press of the "**M**" button, the next memory location "r2" is selected and the value contained there is displayed. After reaching the 5th memory location, the first is shown again.


You can recognize saved values displayed as there is **no "Hold"** symbol in the display.

2.4 Other Functions

2.4.1 Automatic Switch-off

If no button is pressed within approx. 40 seconds, the device switches itself off automatically. The current values are retained and are displayed again after it is switched back on.

2.4.2 Battery Monitoring

If the battery symbol  appears in the display, the battery is dead and must be renewed.

A list of battery types that can be used can be found in the "Technical data" chapter.

2.4.3 Changing the Electrode Pin

To change the electrode pin (M 18 / M 20), the hex nuts must be screwed out. The pins can then be simply replaced.

To prevent measurement errors and breakage of the electrode pins, the hex nuts must be well tightened and the area between the pins kept clean.

3 Specifications

3.1 Technical Data

Display:	3-line display
Display resolution:	0.1 %
Response time:	< 2 s
Storage conditions:	+ 5 to + 40° C - 10 to + 60° (short-term)
Operating conditions:	0 to + 50° C - 10 to + 60° (short-term)
Power supply:	9 V block battery
Approved types:	type 6LR61 or type 6F22
Dimensions:	200 x 50 x 30 (L x W x H) mm
Weight:	approx. 160 g without accessories

3.2 Prohibited Environmental Conditions

- Condensation, air humidity continuously too high (> 85 %) and damp
- Permanent presence of dust and combustible gases, fumes and solutions
- Ambient temperatures continuously too high (> +40° C)
- Ambient temperatures continuously too low (< +5° C)

3.3 Measuring Ranges

Wood moisture:

- H 40: 5 to 40 % (type and temperature dependent)
- HT 70: 5 to 70 % (type and temperature dependent)

Compensation temperature:

- Device temperature sensor
- Manual compensation in steps of 1 °C:
 - H 40: -10 °C to 40 °C
 - HT 70: -10 °C to 50 °C or with active sensor probe: -10 °C to 80 °C

7-stage wood type correction plus 2 (or 5 with the HT 70) customer-specific characteristic curves

4 Application Instructions

The measurement of wood moisture is carried out with the Hydromette BL H 40 / HT 70 using resistance measurement. This enables the direct display of the moisture in percent by weight. The display range is from 5 to 40 % (HT 70: to 70 %) with a 7-stage wood type correction.

4.1 Introduction

The Hydromette BL H 40 / HT 70 works on the electrical resistance/conductivity measurement process known for years. This process is based on the fact that the electrical resistance is heavily dependent on the respective wood moisture. The conductivity of oven-dried wood is very low, or the resistance so high that no current worth mentioning can flow. The more water is present, the greater the conductivity of the wood, or the lower the electrical resistance.



Figure 4-1 Measuring across the fibre direction with M 20

To achieve the qualitatively best possible measurement results, the wood used for the sample should be measured at multiple points. To do so, the electrode pins must be inserted across the fibre direction to between 1/4 and 1/3 of the overall thickness of the wood. To prevent measurement errors and breakage of the measuring pins, the hex nuts must always be well-tightened and the area between the pin holders kept clean.

The measurement of frozen wood is not possible.

4.1.1 Hammer Electrode M 20

The electrode is hammered into the wood to be measured with the needles across the fibre direction (electrode body is made of impact resistant plastic). When removing, light sideways movements at right angles to the fibres can be used to loosen the needles.

To determine the core moisture content, the electrode pins must reach to between 1/4 and 1/3 of the overall wood thickness.

On delivery of the measuring device with electrode M 20, 10 replacement pins each of 16 and 23 mm length are included. These are suited for measuring wood thicknesses up to a max. of 30 and 50 mm respectively.

If thicker wood is to be measured, the electrode needles can be replaced with a suitably longer version. With increasing needle 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.

Where possible, the hex nuts should be tightened with a spanner or pliers before beginning a measurement sequence. Loose electrode pins break easily.

4.1.2 Surface Measurement Cap M 20-OF 15

Surface measurements should only be made with wood moisture levels under 30 %. For surface measurements on workpieces that have already been processed, or for measuring veneers, both hex nuts on the M 20 electrode are unscrewed and replaced with the surface measurement caps. For the measurement, both contact surfaces are pressed onto the workpiece to be measured or onto the veneer at right angles to the fibre direction. The measurement depth is approx. 3 mm, therefore multiple sheets of veneer must be laid on top of each other for the measurement. Do not measure on

metal surfaces! When measuring stacks of veneer, to unearth the measuring point, the veneer is **lifted** and **not pulled** over the remaining stack (**avoid friction: electrostatic charge!**). Wood particles adhering to the measuring surface must be regularly removed. If the elastic, plastic measurement sensor is damaged, they can be reordered (no. 4316) and glued on using standard cyanate-based instant adhesive.

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

If the hex nuts with standard electrode pins on the M20 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.

4.1.4 Ram-in Electrode M 18

Both needles of the ram-in electrode are to be hammered to the required measurement depth at right angles to the fibre direction with the slide hammer. To determine the core moisture content, the electrode pins must reach to between 1/4 and 1/3 of the overall wood thickness.

Pulling out the needles is also done with the slide hammer with the impact direction upwards. Where possible, the hex nuts should be tightened with a spanner or pliers before beginning a measurement sequence. Loose electrode pins break easily.

**Warning:**

Do not completely drive in the electrode pins. There should be approx. 4 - 5 mm space between the wood surface and the hex nut. This is especially true when using Teflon-insulated pins.

Figure 4-2 ram-in electrode M 18

When delivered, ram-in electrode M 18 is supplied with 10 replacement pins of 40 and 60 mm length (not insulated). These are suited for measuring wood thicknesses up to approx. 120 and 180 mm respectively.

If wood is to be measured with a large difference in the spread of moisture (e.g. accumulations of water), we recommend the use of Teflon-insulated electrode pins, which enable very precise measurement of zones and layers. They can be supplied in packets of 10 in lengths of 45 mm (order no. 4450) and 60 mm (order no. 4500).

4.2 Test Adapter for Wood Moisture Measurement

With the test adapter supplied with order no. 6070 for checking the wood moisture measuring element, the functionality of the device, measurement cable and electrodes M 18 and M 20 can be tested.

For this, the device is connected with measurement cable MK 8 and the 4-mm plug of the cable in the socket of the test adapter.

The device must be set to wood type 4 and manual temperature compensation set to 20 °C. No active sensor may be connected. The display should show 21 % at top right in the first line. A deviation of +/- 0.5 % is permitted.

4.3 Static Charge

At low levels of air humidity aided by external factors (friction during material transport, high insulation of the surrounding area), static electricity can build up with high voltages, which can not only lead to strong swings in measured values or minus values, but also to the destruction of electronic components in the device. The operator of the measuring device can also, unintentionally, contribute to the build-up of static charge from his/her clothing. A significant improvement can be achieved by ensuring the operator and the measuring device remain completely still during the measurement process and by grounding (touching conducting metal, water or heating pipes, etc.)

4.4 Equilibrium Wood Moisture Content

If wood is stored in a particular climate for a long period, it takes up the moisture matching this climate, which is termed equilibrium moisture content or equilibrium wood moisture content.

On reaching the equilibrium moisture content, the wood no longer loses moisture if the surrounding conditions remain the same and also does not take up any moisture.

The equilibrium wood moisture content is between approx. 6.0 and 7.5 % wood moisture (corresponds to 30–40 % rel. humidity and 20–25 °C) in the winter months, and between approx. 10.5 and 13.0 % (corresponding to 60–70 % rel. humidity and 25 °C) in the summer months. Further values and tables can be found on the Internet.

4.5 Growth Ranges of Fungi

Dry rot	18 - 22° C,	20 - 28 % wood moisture
Wet rot	22 - 26° C,	> 55 % wood moisture
<i>Poria vaporaria</i>	25 - 28° C,	40 - 50 % wood moisture
<i>Gloeophyllum abietinum</i>		35 - 45 % wood moisture
<i>Lentinus</i>		40 - 60 % wood moisture
Blue stain fungi		> 25 % wood moisture

4.6 Swelling and Shrinkage of the Wood

Wood shrinks if it transfers moisture to the surrounding air below the fibre saturation level. On the other hand, wood swells if it takes up moisture from the surrounding air below the fibre saturation level. This is a very complex process. If you are interested, we recommend finding the relevant information on the Internet.

5 Appendix: Accessories



Hammer electrode M 20 (order no. 3300)

For surface and depth measurements up to approx. 50 mm for sawn timber, veneer, chipboard and wood fibre materials equipped with electrode pins:

-16 mm long (order no. 4610) with 10 mm insertion depth

-23 mm long (order no. 4620) with 17 mm insertion depth



Ram-in electrode M 18 (order no. 3500)

For depth measurements in thick wood up to 180 mm thick; available for this electrode:

Electrode pins without insulation

-40 mm long (order no. 4640) with 34 mm insertion depth

-60 mm long (order no. 4660) with 54 mm insertion depth

or

Electrode pins with insulated shank

-45 mm long (order no. 4550) with 25 mm insertion depth

-60 mm long (order no. 4500) with 40 mm insertion depth





Measurement cable MK8 – length: 1 m (order no. 6210)

ET-100 push-in temperature sensor
(order no. 13165)

Robust, push-in temperature sensor for solid matter, bulk goods and liquids (-50 to +250 °C).



Infrared surface temperature sensor IR 40 BL
(order no. 13150)

Electronic infrared surface temperature measuring device for contactless measurement with additional laser pointer. An ideal device for detecting thermal bridges or determining the dew point. Particularly suited to the measurement of parts with low thermal capacity, e.g. wood, glass, insulation, etc. and for position determination of heating coils. (-40 to +380 °C)

