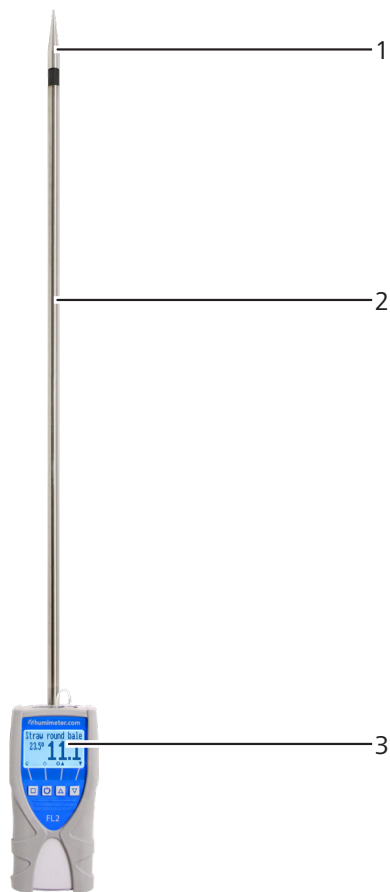Moisture meter

Operating Manual
humimeter FL2

Moisture meter with insertion probe

for measuring the moisture content of hay and straw

78,0°F ı 6,16%ı 456kg/m³ı −27,3td ı 0,64aw ı 51,9%r.H. ı 14,8%abs ı 100,4g/m²ı 09m/s ı 4,90Ugl ı 1

Version 2.5   Always read this operating manual before using the humimeter FL2

Your humimeter FL2 at a glance

The main unit

No	Name
1	Measuring head
2	Insertion probe
3	Electronics in plastic housing

The main unit in detail

No	Name
1	USB port (optional)
2	Display
3	Keypad
4	Rubber protection cover

Rear of the main unit
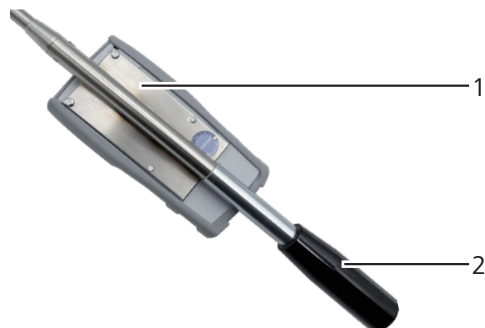
No	Name
1	Battery compartment
2	Handle bar

The measuring head
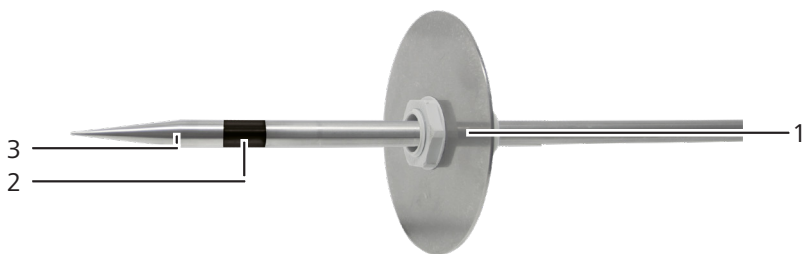
No	Name
1	Compression plate
2	Isolator
3	Measuring tip

The display
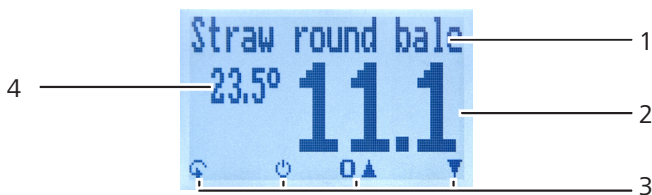
No	Name
1	Calibration curve
2	Moisture content % ("6.2 How moisture is defined")
3	Display symbols
4	Temperature display

The display symbols

Symbol	Name	Symbol	Name
↵	Enter	✗	No
⬆	Up	⇧	Change input level
⬇	Down	OK	OK
⬅	Back	↻	Change menu
0..9	Enter numbers	▨	Enter data
A..Z	Enter letters	👓	View measurements
▶	Continue / go right	⏧	Delete measurements
◀	Left	⏻	On/off button, display light
✓	Yes	▣	Save measured value

The menus

The device has three different menus: product selection, Data Log and main menu:

Product selection menu
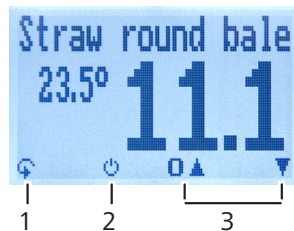
No	Name
1	Change menu
2	Display illumination / device on/off
3	For changing the calibration curve

Data Log menu
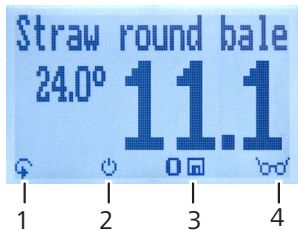
No	Name
1	Change menu
2	Display illumination / device on/off
3	Save measured value
4	Show the last recorded values

Main menu

The main menu comprises the following menu items:

- **Edit Logs:**
  Manual Logs, Clear Logs
- **Print Logs:**
  Last Log, All Logs, Clear Logs
- **Send Logs:**
  Manual Logs, Clear Logs
- **Options:**
  Bluetooth, Date/Time, Log Time, Language, Unlock, °C/°F, Userlevel, BL On Time, Auto Off Time, Materialcalib., Online Send, Password, Reset
- **Status**

Table of contents

1.   Introduction

1.1   Information about this operating manual

This operating manual is designed to enable you to use the humimeter FL2 safely and effectively. It is part of the device, has to be stored nearby and must be easily accessible to users at all times.

All users are required to carefully read and make sure that they have understood this operating manual before using the humimeter FL2. All of the safety and operating instructions detailed in this manual have to be observed to ensure the safety of the device.

1.2   Limitation of liability

All of the information and instructions provided in this operating manual have been compiled on the basis of the current standards and regulations, the state of the art, and the extensive expertise and experience of Schaller Messtechnik GmbH.

Schaller Messtechnik GmbH does not accept any liability for damage associated with the following, which also voids the warranty:

- Non-observance of this operating manual
- Improper use
- Inadequately qualified users
- Unauthorised modifications
- Technical changes
- Use of unapproved spare parts

This fast measuring procedure can be affected by a range of different factors. For this reason, we recommend periodically checking the device's measurements with a standardised oven-drying method.

We as the manufacturer do not accept any liability for any incorrect measurements and associated consequential damage.

1.3   Symbols used in this manual

All the safety information provided in this manual is shown with a corresponding symbol.

⚠️ **CAUTION**

It is essential to observe this warning. Non-compliance can lead to injury.

ℹ️ **ATTENTION**

It is essential to observe this warning. Non-compliance can lead to damage to property or equipment.

i   Information

This symbol indicates important information that enables users to use the device more efficiently and cost-effectively.

1.4   Customer service

For technical advice, please contact our customer service department at:

Schaller Messtechnik GmbH
Max-Schaller-Straße 99
A - 8181 St.Ruprecht an der Raab

Telefon: +43 (0)3178 28899
Fax: +43 (0)3178 28899 - 901

E-Mail: info@humimeter.com
Internet: www.humimeter.com

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# 2.	For your safety

The device complies with the following European directives:

- Restriction of Hazardous Substances in Electrical and Electronic Equipment (RoHS)
- Electromagnetic compatibility (EMC)

The device corresponds to state-of-the-art technology. However, it is still associated with a number of residual hazards.

These hazards can be avoided through strict observance of our safety information.

## 2.1	Proper use

- Easy to use device for quickly measuring the moisture content of hay and straw
- The device must only be used for taking measurements on the products defined in the following sections of this manual (see "6. Calibration curves").

## 2.2	Improper use

- The device is not suitable for measuring mouldy or rain wet hay/straw.
- The device is not waterproof and must be protected from water and fine dust (IP40).

## 2.3	User qualifications

The device must only be operated by people who can be expected to reliably take the measurements. The device must not be operated by people whose reaction times may be slowed due to, e.g. the use of drugs, alcohol or medication.

All persons using this device must have read, understood and follow the instructions provided in the operating manual.

2.4   General safety information

The following safety information has to be observed at all times to avoid damage to objects and injury to people:

- Remove the batteries if the device isn´t used for a prolonged period of time.
- Keep the measuring head away from your body throughout all activities.
- Keep the measuring head away from other people throughout all activities.
- In case of damages or loose parts on the device, remove the batteries and contact Schaller Messtechnik GmbH or your dealer.

All of the device's technical features have been inspected and tested before delivery. Every device has a serial number. Do not remove the tag with the serial number.

2.5   Warranty

The warranty does not apply to:

- Damage resulting from non-observance of the operating manual
- Damage resulting from third-party interventions
- Products that have been used improperly or modified without authorisation
- Products with missing or damaged warranty seals
- Damage resulting from force majeure, natural disasters, etc.
- Damage from improper cleaning
- Batteries older than six months
- Damage resulting from improper strain (pressure, bending) of the insertion probe or the measuring head
- Damage by dropping the measuring head

3. On receipt of your device

3.1 Taking the device out of its packaging

- Take the device out of its packaging.
- Next, make sure that it is not damaged and that no parts are missing.

3.2 Making sure that all of the components have been included

Make sure that all of the components have been included by checking the package contents against the following list:

- humimeter FL2
- 4 pieces of AA Alkaline batteries
- Rubber protection cover
- Compacting plate
- Wooden case
- Operating manual

Optional accessories:

- humimeter USB data interface module - USB flash drive with software and USB-cable or download using humimeter.com/software
- Battery operated portable thermal printer (only possible together with humimeter USB data interface module) - Described in a separate operating manual
- Bluetooth module (only possible together with humimeter USB data interface module) - Described in a separate operating manual
- Test block

3.3   Insert batteries and attach handle bar

1. Remove the rubber protection cover. To do so, hold the rubber protection cover at the upper side and pull it over. If your device is provided with an optional USB port, remove the protection cap of the USB socket before (figure 1 and 2).

2. Remove the handle bar by unscrewing it counter clockwise (figure 3).

3. Take hold of the device with one hand, press your thumb onto the engraved area of the battery compartment (1) and drag downwards (2) (figure 4).

4. Insert the batteries with negative and positive terminals matching those indicated on the battery compartment. Press down the batteries so that they lay flat on the bottom of the housing (figure 5).

    »   As soon as all batteries have been inserted, the device switches on automatically.

5. Push the battery cover onto the housing until it clicks into place. Then mount the rubber protection cover onto the housing, beginning at the end where the battery compartment is situated (figure 6).

6. Now screw the handle bar back on clockwise (figure 7).
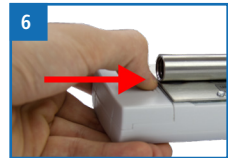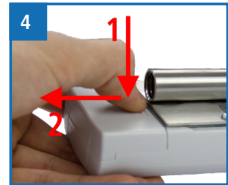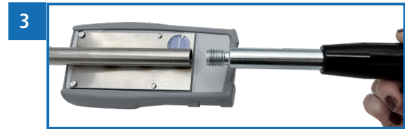
4.   Using the device - Basics

4.1   Switching the device on

- Press the ⏻ button for 3 seconds.

» The display will then show the status indicator (figure 8).

» After inserting the batteries, the device switches on automatically.

```
8   humimeter    2001
                 2.000
```
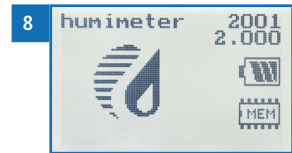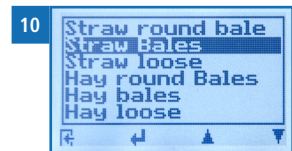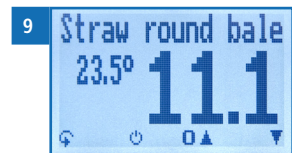
4.2   Selecting the calibration curve

To do so: The device has to be in the product selection menu (figure 9).

For an overview of the different calibration curves and the criteria for selecting them, please refer to "6. Calibration curves".

1. Press the ▽ or △ button to move from one product to the next Or

2. Press the ▽ or △ button for 3 seconds to open the calibration curve overview (figure 10).

3. Use the arrow keys to move from one calibration curve to the next

4. and keep any of them pressed to scroll through the types.

5. Confirm your selection by pressing ⏎.

» The calibration curve you selected will now be shown at the top of the display.

```
9   Straw round bale
    23.5°  11.1
```

```
10  Straw round bale
    Straw Bales
    Straw loose
    Hay round Bales
    Hay bales
    Hay loose
```

4.3   Taking a measurement

- For information on how to take a measurement, see section "5. The measuring process".

4.4   Switching the device off

To do so: The device has to be in the product selection, the Data Log or the additional function menu. It is not possible to switch off the device when it is in the main menu.

- Press the ⏻ button for 3 seconds.

5. The measuring process

5.1 Preparing a measurement

To do so: The device has to have nearly the same temperature than the product being measured. It is recommended to let your humimeter device adjust to the surrounding temperature before the measurement.


1. Switch on the device (see "4.1 Switching the device on").

2. Select the desired calibration curve (see "6. Calibration curves") by pressing the 🌾 or 🌿 (see "4.2 Selecting the calibration curve") (figure 12).
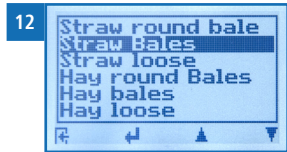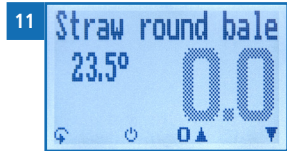
5.1.1 Measuring loose hay/straw

Assembly of the compression plate

1. Loosen the fixing nut.

2. Guide the compression plate over the measuring head onto the insertion probe (figure 13).

» The fixing nut has to face towards the device.

3. Position the compression plate on the insertion probe and fasten the fixing nut by hand (figure 15).

» The recommended distance between isolator and compression plate amounts to approx. the length of the measuring tip (figure 16).

» The compression plate must not be moved by moderate contact pressure.
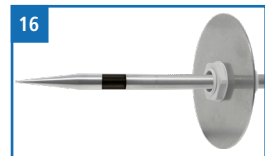
5.2   Taking a measurement

5.2.1   Measuring hay and straw bales

To do so: The device has to have nearly the same temperature than the product being measured.

- Insert the measuring head of the device straight into the hay or straw bale (figure 17).
- » Do not bend or drop the measuring head!
- » Both round bales and rectangle bales have to be measured on the face side of the bale!
- The device will now instantly display the moisture content on the display (figure 18).
- » The displayed value flashes when the moisture content exceeds the measuring range of the selected calibration curve (figure 19). A flashing value signals lowered accuracy of the measurement. The measuring range is dependent on the calibration curve (see "6. Calibration curves").
- » Once the reading has been taken, it can be saved on the device (see "5.5 Saving individual readings" or "5.6 Saving several readings (a measurement series) at the same time").

Straw round bale
24.0° 11.1

Straw round bale
24.0° 50

5.2.2   Measuring loose hay/straw

To do so: The device has to have nearly the same temperature than the product being measured. There has to be enough material to ensure adequate compaction.

1. Insert the measuring head of the device straight into the hay or straw (figure 20).
- » Do not bend or drop the measuring head!
2. Use the insertion probe to collect material and compress it (figure 21 and 22).
- » A contact pressure must be noticeable.
- » The measuring tip must not penetrate into the ground.
3. While compacting, have an eye on the display.

» Continue to compact as long as the display shows a constant measuring value (figure 23).

» The displayed value flashes when the moisture content exceeds the measuring range of the selected calibration curve (figure 19). A flashing value signals lowered accuracy of the measurement. The measuring range is dependent on the calibration curve (see "6. Calibration curves"es").

» Once the reading has been taken, it can be saved on the device (see "5.5 Saving individual readings" or "5.6 Saving several readings (a measurement series) at the same time").
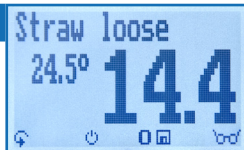
⚠ CAUTION

Risk of injury
Risk of injury due to the measuring head
► Keep the measuring head away from your body throughout all activities.
► Keep the measuring head away from other people throughout all activities.

🛈 ATTENTION - HIGH MEASURING INTERVAL

The measuring head will heat up when taking a high amount of measurements on bales with high compressed density, in a rapid succession. This will decrease the accuracy of the measurement significantly.

ℹ Information - Measuring accuracy

This rapid and non-destructive measuring procedure allows you to take moisture readings at a number of different points. When saving the individual readings, the device will automatically calculate the readings' average (see "5.6 Saving several readings (a measurement series) at the same time").

ℹ Information - Incorrect readings

Always make sure to select the correct calibration curve for the material you are measuring. This prevents taking incorrect readings (see "11. Faults").

5.3 Simplified user

The device can be configured in such a way that the access of the user can be reduced to the product selection menu combined with the hold function.

5.3.1 Activating/deactivating the simplified user

- For information on how to activate/deactivate the simplified user, see section "9.7 Changing the Userlevel".

5.3.2 Using the simplified user

The simplified user offers the following limitations:

- The only useable menu is a slightly modified product selection menu (figure 24).
- » No access to the Data Log or main menu.
- Hold function replaces the function to switch between the different menus (see "5.4 Hold function - Freezing the displayed values").
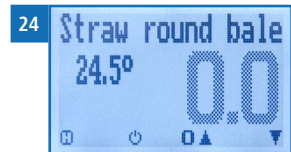
5.4 Hold function - Freezing the displayed values

The device can be configured in such a way that the information being shown on the display will freeze at the touch of a button until a new button is pressed. This function can be very useful when e.g. taking readings in spaces where it is not possible to see the display (e.g. overhead).

5.4.1 Activating the hold function in the options menu

To do so: The device has to be switched on and be in the product selection menu.

1. Press 🔄 twice or hold for 2 seconds.

2. Select **Options**. To do so, press ▼ or ▲ and confirm by pressing ↵.

3. Select **Log Time** (figure 25). To do so, press ▼ or ▲ and confirm by pressing ↵.

4. Select **Hold** (figure 26). To do so, press ▼ or ▲ and confirm by pressing ↵.

- » The setting has been saved.
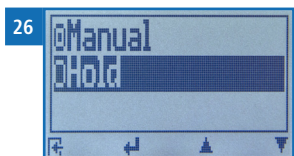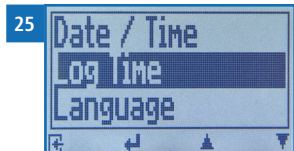
5. Press to leave the **Options** menu.

6. Press to leave the main menu.

5.4.2 Using the hold function

To do so: The device has to be switched on and be in the Data Log menu (see "The menus" page 5).

- Press .

» The current reading will be frozen. All of the four symbols will now be displayed as (figure 27).

- To reactivate the frozen display, simply press any button.

27 Straw round bale
24.0° **14.8**
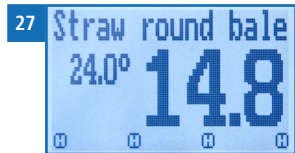
5.5 Saving individual readings

The device can be configured in such a way that the device will save a reading every time a button is pressed. This option (manual saving function) is the device's default setting.

5.5.1 Activating the manual saving function in the options menu

To do so: The device has to be switched on and be in the product selection menu.

1. Press twice or hold for 2 seconds.

2. Select **Options**. To do so, press or and confirm by pressing .

3. Select **Log Time** (figure 28). To do so, press or and confirm by pressing .

28 Date / Time
Log Time
Language

4. Select **Manual** (figure 29). To do so, press or and confirm by pressing .

» The setting has been saved.

29 ⊙Manual
○Hold

5. Press to leave the **Options** menu.

6. Press to leave the main menu.

5.5.2   Using the manual saving option

To do so: The device has to be in the Data Log menu (see "The menus" page 5). The device is set to Data Log time - Manual.

1.   Press 🖵.

»   The display will now appear as shown in figure 31 and the disc symbol will be preceded by the digit one.

2.   Press ✎ to enter a name for the saved reading and to finish the measuring process.

»   The display will now appear as shown in figure 32.

3.   The data you have inputted can be overwritten at any time.
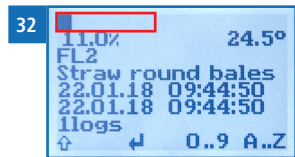
4.   Inputting letters:
Press and hold A..Z to quickly scroll to the required letter and either press it for 3 seconds or press ↵ to confirm the selected letter (figure 33).
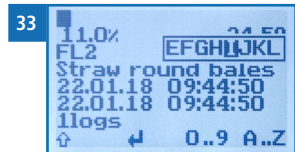
5.   Inputting numbers:
Press and hold 0..9 to quickly scroll to the required number and either press it for 3 seconds or press ↵ to confirm the selected number.

6.   Moving forward/back:
Press ⇧ to switch to another input level. Press ▶ or ◀ to move forward or back.

7.   Confirm your entry by pressing ↵.

»   The data you entered has been saved.

5.6   Saving several readings (a measurement series) at the same time

To do so: The device has to be in the Data Log menu
(see "Data Log menu" page 6).

1. Take several measurements at different points
    of the same haystack (see "5. The measuring
    process").

2. After each measurement, press ⬛ to save the
    reading.

    »   The display will appear as shown in figure 34. The
        marked number shows the number of readings
        that have already been saved.

3. Press ✎ to enter a name for the saved measure-
    ment series and to finish the measuring process.
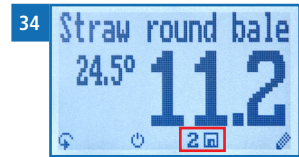
    »   The display will now appear as shown in figure 35.

4. The data you have inputted can be overwritten at any time.
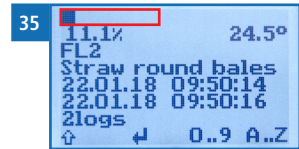
5. Inputting letters:
    Press and hold A..Z to quickly scroll to the
    required letter and either press it for 3 seconds or
    press ⏎ to confirm the selected letter (figure 36).
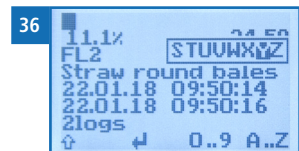

6. Inputting numbers:
    Press and hold 0..9 to quickly scroll to the
    required number and either press it for 3 seconds or press ⏎ to confirm the
    selected number.

7. Moving forward/back:
    Press ⬆ to switch to another input level. Press ▶ or ◀ to move forward or
    back.

8. Confirm your entry by pressing ⏎.

    »   The data you entered has been saved.

   »   The device automatically determines the average moisture content of the saved
        measuring values.

» The display will show the following information:
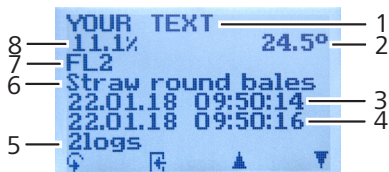

| No	Name
1	Name of the measurement series (editable)
2	Temperature (average)
3	Date & start time of the measurement series
4	Date & end time of the measurement series
5	Number of saved readings
6	Calibration curve
7	Device name
8	Moisture content (average)

5.7   Viewing individual readings

To do so: You must have saved a reading (e.g. **1 Log**).
The display will now appear as shown in figure 37.

1. Press ⌐o⌐.

2. Select the required reading. To do so, press ▼ or
    ▲.

    » The display will now appear as shown in figure 38.

    » Press 🔁 to leave this screen.
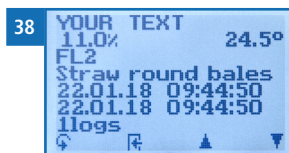
5.8   Viewing individual readings from a series of measurements

To do so: You must have saved a series of measurements
(e.g. **2 logs**).
The display will now appear as shown in figure 39.

1. Press ⌐o⌐.

2. Navigate to the required measurement series. To
    do so, press ▼ or ▲.

    » The display will now appear as shown in figure 40.

3. Press 🔁 to switch to another input level.

    » The display will now appear as shown in figure 41.

4. Press ⌐o⌐ again.

    » The display will now appear as shown in figure 42.

5. Navigate to the required reading (**No.: 1, No.: 2, No.:
    3**). To do so, press ⌐o⌐/▲ or ⌐o⌐/▼.

6. Press 🔁 to leave this screen.
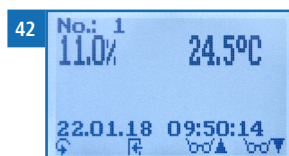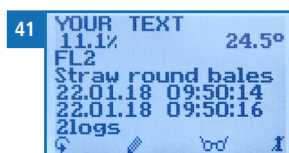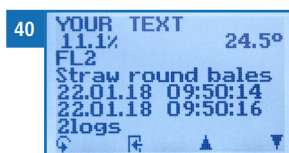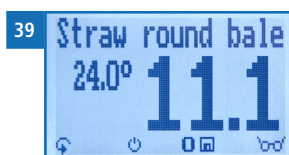
5.9   Deleting all measured values (data log)

To do so: You must have taken and saved one or several readings.

1.   Press ![icon] twice or hold for 2 seconds.

2.   Select **Edit Logs** (figure 43). To do so, press ![icon] or ![icon] and confirm by pressing ![icon].

3.   Select **Clear Logs** (figure 44). To do so, press ![icon] or ![icon] and confirm by pressing ![icon].

»   The display will show the message **clear?** (figure 45).

4.   Confirm by pressing ![icon].

»   The data log has been deleted.

5.   Press ![icon] to leave the **Edit Logs** menu.

6.   Press ![icon] to leave the main menu.
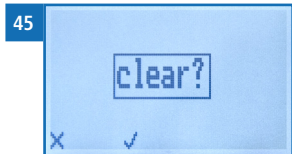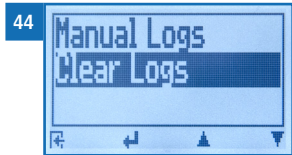
5.10   Deleting individual measurement series

To do so: You must have saved a measured value (e.g. **1 log**) or a series of measurements (e.g. **3 logs**). The display will now appear as shown in figure 46.

1.   Press ![icon].

»   The display will now appear as shown in figure 47.

2.   Select the required reading. To do so, press ![icon] or ![icon].

3.   Press ![icon] to switch to another input level.

»   The display will now appear as shown in figure 48.

4.   Press ![icon].
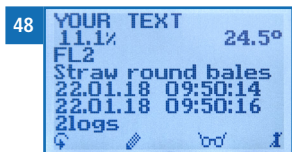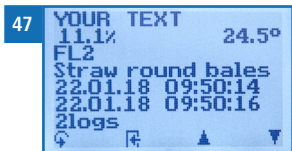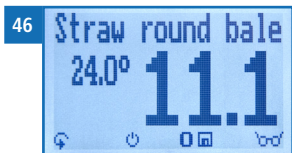
» The display will then show the message **clear?** (figure 49).

5. Confirm by pressing ✓.

» The value has been deleted.

5.11 Deleting single values from a series of measurements

To do so: You must have saved a series of measurements comprising of at least 2 logs. The display will now appear as shown in figure 50.

1. Press 👓.

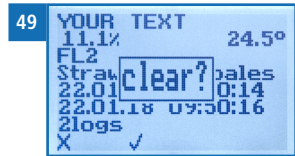» The display will now appear as shown in figure 51.

2. Select the required reading. To do so, press ▼ or ▲.

3. Press 🔼 to switch to another input level.

» The display will now appear as shown in figure 52.

4. Press 👓.

» The display will now appear as shown in figure 53.

5. Select the required measured value. To do so, press 👓▲ or 👓▼.

6. Press 🔼 to switch to another input level.

» The display will now appear as shown in figure 54.

7. Press 🔧 to delete the value shown.

» The display will then show the message **clear?** (figure 55).

8. Confirm by pressing ✓.

» The value has been deleted.

6. Calibration curves
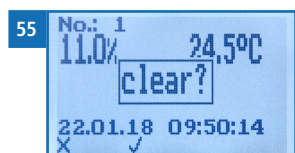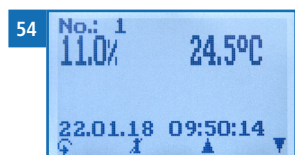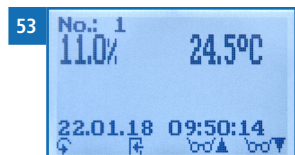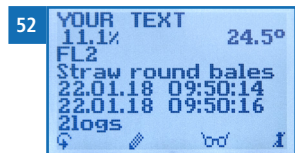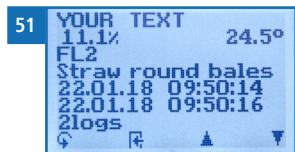
Product name	Calibration curve	Compressed density	Measuring range
Straw round bales	Straw round bales	> 130 kg/m³	8.5 % - 30 %
Straw bales	Straw rectangle bales	100 - 130 kg/m³	8.5 % - 30 %
Straw loose	loose straw		8.5 % - 30 %
Hay round bales	Hay round bales	> 130 kg/m³	8.5 % - 25 %
Hay bales	Hay rectangle bales	100 - 130 kg/m³	8.5 % - 25 %
Hay loose	loose hay		8.5 % - 25 %
Cellulose	Insulating material - special product	38 - 65 kg/m³	10 % - 35 %
Empty 1	free curve for special products		
Empty 2	free curve for special products		
Digit			0 - 100
Reference	! Only for testing the moisture meter !		

» A divergent compressed density may lead to deviations in the measuring result.

6.1 Digit calibration curve

The Digit calibration curve has a unitless measuring range from 0 to 100, which corresponds to the entire measuring range of the device. Special materials can be measured with this calibration curve.

The higher the displayed value, the wetter the material. With the aid of a comparative measurement taken with a reference procedure, a table of comparative values can be created.

very dry: 0%   very wet: 100%

6.2   How moisture is defined

The device measures and shows the material moisture content. The moisture content readings are calculated in relation to the material's overall mass:

$$\%WG = \frac{M_n - M_t}{M_n} \times 100$$

M_n: Mass of the sample with average moisture content

M_t: Mass of the sample with zero moisture content

%WG: Moisture content (in accordance with EN ISO 18134-2)

6.3   Selecting the calibration curve

If you are not sure which calibration curve is the best suited for your material, it is recommended to carry out a reference measurement by kiln-drying (EN ISO 18134-2).

Schaller Messtechnik GmbH will be happy to advise you on the selection of the right calibration curve for special hay and straw types.

The insertion direction for both round and rectangle bales is from the face side of the bale as shown on the following figures. Measurements taken from any other direction may lead to incorrect readings.

Straw round bales

Straw rectangle bales

Hay round bales

Hay rectangle bales

Hay loose

Incorrect measurement

6.4 Notes for comparative measurement with oven-drying method

The device uses a much higher sample quantity than the drying oven (12-fold to 20-fold quantity of kiln-drying method). Furthermore, to determine a more accurate average moisture value in case of inhomogeneous material, there can be effected several measurements within a short time.

Considering a sampling error due to the considerably smaller sample quantity as well as the content of volatile matters (resin etc.) that are not water, the kiln-drying method will practically reach an accuracy of approx. +/-3 %. Therefore, if the measuring values of these two very different methods of determining the water content are compared, differences of +/-3 % can be considered to be normal.

In the standard EN ISO 18134-2 is declared that the drying oven method provides no absolute values, but only comparable values.

7.   Using the LogMemorizer program

To do so: The device is provided with USB interface, and the USB stick with LogMemorizer software and USB cable are available. Otherwise, you can also install the software at humimeter.com/software or by scanning the QR code.

7.1   Installing / opening the program

1.   Insert the USB stick with the LogMemorizer program into the USB port on your computer or

   »   download the LogMemorizer software at humimeter.com/software or use the QR code.

2.   Open the **setup** application.

3.   Follow the installation instructions.

4.   Open LogMemorizer.

   »   The screen will now display the LogMemorizer's interface (figure 62).
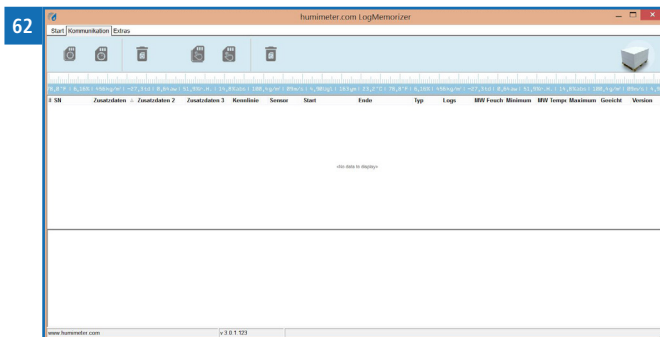
   »   Before using LogMemorizer, please refer to the the separate LogMemorizer operating manual for the correct configuration of the USB COM Port.

For more information on LogMemorizer, please refer to the separate LogMemorizer operating manual supplied with the device.

7.2   Exporting measured values to a computer

To do so: The LogMemorizer program is installed. You must have taken and saved one or several moisture readings.

Options: You can export moisture readings from the humimeter FL2 or initiate the export at your computer.

Exporting moisture readings from the humimeter FL2

Connect the humimeter FL2 to your computer using the supplied USB cable:

1.   Insert the USB Mini B connector into the humi meter FL2 (figure 63).

2.   Insert the USB connector into the computer.

3.   Open LogMemorizer on your computer.

4.   Switch on the humimeter FL2.

5.   Press 🔄 twice or hold for 2 seconds.

6.   Select **Send Logs** (figure 64). To do so, press ▼ or ▲ and confirm by pressing ↵.

7.   Select **Manual Logs** (figure 65). To do so, press ▼ or ▲ and confirm by pressing ↵.

»   The display will then show the message **Send** (figure 66).

»   All measuring values saved on the humimeter FL2 will now be sent to your computer.
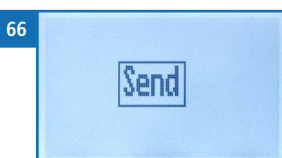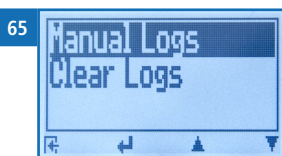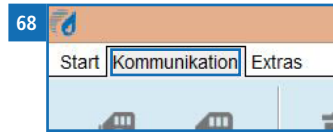
Initiating the data export at your computer

Connect the humimeter FL2 to your computer using the supplied USB cable:

1.   Insert the USB Mini B connector into the humime- ter FL2 (figure 67).

2.   Insert the USB connector into the computer.

3.   Open LogMemorizer on your computer.

4. Switch on the humimeter FL2.

5. Open the **Communication** tab in LogMemorizer (figure 68).

6. Select and click on one of the two buttons shown in figure 69.

    »   **Import all manual logs** (for importing all manually saved readings) or
   »   **Import most recent manual log** (for importing the most recent manually saved logs).

No	Name
1	Import all manual logs
2	Import most recent manual log

    »   The measuring values saved on the humimeter FL2 will now be sent to your computer.

8. Checking on the device's status

1. Press 📷 twice or hold for 2 seconds.

2. Select **Status**. To do so, press 📷 or 📷 and confirm by pressing 📷.

   » The display will then show the status indicator **humimeter**.

   » The display will show the following information:
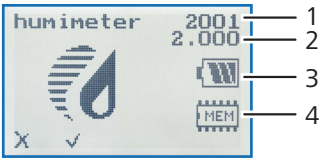
| No	Name
1	Serial number
2	Software version
3	Battery status
4	Memory status

3. Confirm by pressing 📷.

4. Press 📷 to leave the main menu.

9. Configuring the device

9.1 Turning on Bluetooth

The information on Bluetooth is provided in a separate operating manual.

9.2 Adjust the date/time

1. Press ⬆ twice or hold for two seconds.

2. Select **Options**. To do so, press ▼ or ▲ and confirm by pressing ↵.

3. Select **Date/Time**. To do so, press ▼ or ▲ and confirm by pressing ↵.

   » The display will now appear as shown in figure 70.
   » The format for the date is **DD-MM-YY** (Day-Month-Year).
   » The format for the time is **hh:mm:ss** (Hour:Minutes:Seconds).

4. Inputting numbers:
   Press and hold 0..9 to quickly scroll to the required number and either press it for 3 seconds or press ↵ to confirm the selected number (figure 71).

5. Moving forward:
   To move forward between **DD-MM-YY** and **hh:mm:ss**, press ▶.

6. Moving back:
   Press ⬆ to switch to another input level. To move backward between **DD-MM-YY** and **hh:mm:ss**, press ◀.

7. Confirm the date/time by pressing OK.

   » The settings have been saved.

8. Press ⬆ to leave the **Options** menu.

9. Press ⬆ to leave the main menu.
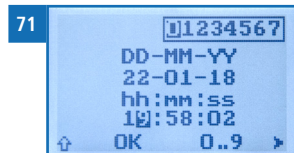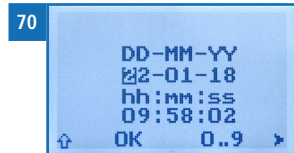
9.3   Selecting a language

1.   Press ![icon] twice or hold for two seconds.

2.   Select **Options**. To do so, press ![icon] or ![icon] and confirm by pressing ![icon].

3.   Select **Language**. To do so, press ![icon] or ![icon] and confirm by pressing ![icon].

4.   Navigate to the required language. To do so, press ![icon] or ![icon] and confirm by pressing ![icon].

   »   The settings have been saved.

5.   Press ![icon] to leave the **Options** menu.

6.   Press ![icon] to leave the main menu.

9.4   Activating options

To do so: Some of the options must be deactivated.

1.   Press ![icon] twice or hold for two seconds.

2.   Select **Options**. To do so, press ![icon] or ![icon] and confirm by pressing ![icon].

3.   Select **Unlock**. To do so, press ![icon] or ![icon] and confirm by pressing ![icon].

   »   The display will now appear as shown in figure 72.
   »   On delivery, the four-digit password is the device's serial number.

4.   Inputting numbers:
     Press and hold ![icon] to quickly scroll to the required number and either press it for 3 seconds or press ![icon] to confirm the selected number (figure 73).

5.   Moving back:
     Press ![icon] to switch to another input level. To move back, press ![icon].

6.   Confirm the four-digit password by pressing ![OK icon].

» The settings have been saved.

» The **°C/°F**, **BL On Time**, **Auto Off Time**, **Materialcalib.**, **Password**, **Reset** options are now activated.

7. Press ⊞ to leave the **Options** menu.

8. Press ⬆ to leave the main menu.

9.5 Deactivating options

Once the device has been switched restarted, the **°C/°F**, **BL On Time**, **Auto Off Time**, **Materialcalib.**, **Password**, **Reset** options will be deactivated again.

9.6 Selecting °C/°F

To do so: All of the options must be activated (see "9.4 Activating options").
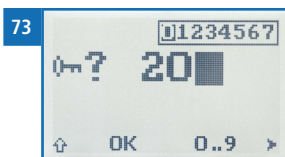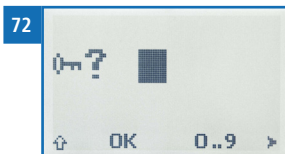
1. Press ⬆ twice or hold for two seconds.

2. Select **Options**. To do so, press ▼ or ▲ and confirm by pressing ↵.

3. Select **°C/°F**. To do so, press ▼ or ▲ and confirm by pressing ↵.

4. Navigate to the required temperature scale, i.e. Celsius (**°C**) or Fahrenheit (**°F**). To do so, press ▼ or ▲ and confirm by pressing ↵.

» The settings have been saved.

5. Press ⊞ to leave the **Options** menu.

6. Press ⬆ to leave the main menu.

9.7   Changing the Userlevel

9.7.1   Changing from advanced to simplified user

To do so: All of the options must be activated (see "9.4 Activating options").

1.   Press ⬇ twice or hold for two seconds.

2.   Select **Options**. To do so, press ⬇ or ⬆ and confirm by pressing ↵.

3.   Select **Userlevel**. To do so, press ⬇ or ⬆ and confirm by pressing ↵.

   »   The simplified user is now activated.

4.   Press ⬅ to leave the **Options** menu.

5.   Press ⬇ to leave the main menu.

9.7.2   Changing from simplified to advanced user

To do so: The device has to be turned off.

1.   Switch the device on (see "4.1 Switching the device on").

2.   Press and hold ⬇ and ⬆ at the same time, directly after switching the device on.

   »   The device will automatically boot into the main menu.

3.   Activate all of the options (see "9.4 Activating options").

4.   Select **Userlevel**. To do so, press ⬇ or ⬆ and confirm by pressing ↵.

   »   The advanced user is now activated.

5.   Press ⬅ to leave the **Options** menu.

6.   Press ⬇ to leave the main menu.

9.8 Reducing the device's power consumption

9.8.1 Configuring the display illumination time

To do so: All of the options must be activated (see "9.4 Activating options").

1. Press 🔲 twice or hold for two seconds.

2. Select **Options**. To do so, press 🔻 or 🔺 and confirm by pressing ↵.

3. Select **BL On Time**. To do so, press 🔻 or 🔺 and confirm by pressing ↵.

4. Select the required display illumination period (30 seconds/2 minutes/5 minutes/10 minutes). To do so, press 🔻 or 🔺 and confirm by pressing ↵.

   » The settings have been saved.

5. Press 🔲 to leave the **Options** menu.

6. Press 🔲 to leave the main menu.

9.8.2 Configuring automatic switch-off

To do so: All of the options must be activated (see "9.4 Activating options").

1. Press 🔲 twice or hold for two seconds.

2. Select **Options**. To do so, press 🔻 or 🔺 and confirm by pressing ↵.

3. Select **Auto Off Time**. To do so, press 🔻 or 🔺 and confirm by pressing ↵.

4. Select the period of time you want the device to stay switched on (3 minutes/ 5 minutes/10 minutes). To do so, press 🔻 or 🔺 and confirm by pressing ↵.

   » The settings have been saved.

5. Press 🔲 to leave the **Options** menu.

6. Press 🔲 to leave the main menu.

9.9   Configuring the material calibration function

The type calibration function is described in a separate operating manual.

9.10   Changing the password

To do so: All of the options must be activated (see "9.4 Activating options").

1. Press 🔱 twice or hold for two seconds.

2. Select **Options**. To do so, press 🔻 or 🔺 and confirm by pressing ↵.

3. Select **Password**. To do so, press 🔻 or 🔺 and confirm by pressing ↵.

    »   The display will show the current password.

    »   Overwrite the current password. To do so, press and hold 0..9 to quickly scroll to the required number and either press it for 3 seconds or press ↵ to confirm the selected number.

        Moving back:
        Press 🔼 to switch to another input level.
        To move back, press ◀.

4. Confirm the new four-digit password by pressing OK.

    »   The settings have been saved.

5. Press ◀ to leave the **Options** menu.

6. Press 🔱 to leave the main menu.

9.11   Resetting the device to its factory settings

To do so: All of the options must be activated (see "9.4 Activating options").

1.   Press ![icon] twice or hold for two seconds.

2.   Select **Options**. To do so, press ![icon] or ![icon] and confirm by pressing ![icon].

3.   Select **Reset**. To do so, press ![icon] or ![icon] and confirm by pressing ![icon].

»   The display will then show the message **Reset?** (figure 74).

4.   Confirm by pressing ![icon].

»   The device will now be reset to its factory settings. All of your personal settings will be lost.

»   The display will show the status indicator **humimeter** (figure 75).

»   Resetting the device will not affect the saved measuring values.
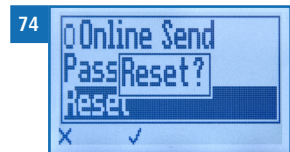
10.   Cleaning and maintenance

Regularly cleaning and maintaining the device will ensure that it will have a long service life and stay in good condition.

10.1   Changing batteries

The device constantly monitors the charge level of the batteries. The current battery status is shown on the status screen.

If the battery´s charge is very low, the battery symbol will be shown with an exclamation mark. In that case, the batteries must be changed immediately (figure 77).

For changing the batteries, see section "3.3 Insert batteries and attach handle bar".

As the device's user, you are responsible by law for properly disposing of all used batteries, which must not be disposed of as domestic waste (Battery Directive).
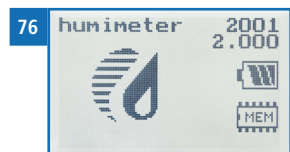
10.2   Care instructions

- Do not leave the device out in the rain. The device is not waterproof.
- Do not expose the device to extreme temperatures.
- Protect the device from strong mechanical shocks and loads.

10.3   Cleaning the device

Plastic housing

- Clean the plastic housing with a dry cloth.

Measuring head

- The measuring head can be cleaned with a cloth and cleaning alcohol.

> **ATTENTION**
>
> **Do not clean with fluids**
> Water or cleaning fluid getting inside the device can destroy the device.
>
> ►   Only clean with dry materials.

10.4 Assembling the insertion probe

1. Put the device and the second part of the insertion probe on a flat surface (e.g. on a table).

   » The two ends with cables must be adjacent to each other (figure 78).

2. Connect the plug-in connector (figure 79).

   » It is not necessary to pay attention to correct polarity.

   » You may need a pair of tweezers to pull the plug out of the insertion probe mounted on the device.

3. Put the two parts of the insertion probe together (figure 80).

   » Make sure that the holes for the screws are aligned correctly (figure 81).

4. Fix the insertion probe by tightening the two delivered screws (M3x5) (figure 82).
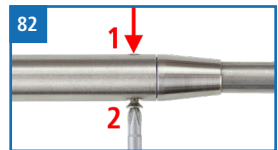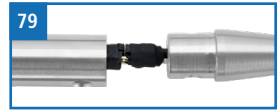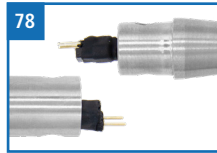
11.   Faults

If the measures listed below fail to remedy any faults or if the device has faults not listed here, please contact Schaller Messtechnik GmbH.

Fault	Cause	Remedy
Measuring error	The temperature of the material being measured is too low or high	The temperature of the material being measured has to be between 0 °C and +40 °C.
	Temperature discrepancy between device and material being measured	Let the temperature adjust to the material being measured (permitted difference of max. 3 °C).
	Wrong calibration curve	Check whether you have selected the right calibration curve (product) before taking a reading (see "6. Calibration curves").
	Mouldy or rain wet material Accuracy decreases significantly	Only measure dry, not mouldy material.
	Frozen material or material mixed with snow Accuracy decreases significantly	The measured material most not be frozen or mixed with snow.
	Insertion direction	The insertion direction has a great effect on the accuracy of the measurement (see "6.3 Selecting the calibration curve").
	Wrong compressed density	The compressed density has to correspond to the selected calibration curve(see "6. Calibration curves").

Fault	Cause	Remedy
	Water film on the measuring head	After measuring wet material, on the measuring head may arise a water film. Clean the measuring head (see "10.3 Cleaning the device").
	Heating of the measuring head because of friction in bales with high compressed density	Let the device cool down.
Data transfer to Log Memorizer failed	Interface has not been configured.	The interface only has to be configured once. To do so, press the F1 key on your computer and read the Help file of the Log Memorizer program.

12.   Storage and disposal

12.1   Storing the device

The device must be stored as follows:

- Do not store outdoors.
- Store in a dry and dust-free place.
- Protect the device from sunlight.
- Avoid mechanical shocks/loads.
- Remove the batteries if the device isn´t used for a period of 4 weeks or longer.
- Store the device in its original packaging if it isn´t used for a longer period of time.
- Storage temperature: -20 °C to +60 °C

12.2   Disposing of the device

Devices marked with this symbol are subject to Directive 2012/19/EU of the European Parliament and of the Council of 4 July 2012 on waste electrical and electronic equipment (WEEE).
If the device is being operated outside the European Union, the national regulations on the disposal of such devices that apply in the country of use must be observed.

Electronic devices must not be disposed of as domestic waste.

The device must be disposed of appropriately using appropriate collection systems.

13. Device information

13.1 CE declaration of conformity

CE KONFORMITÄTSERKLÄRUNG
DECLARATION OF CONFORMITY

Name/ Adresse des Herstellers:	**Schaller Messtechnik GmbH**
Name/ address of manufacturer:	**Max-Schaller-Straße 99**
	A – 8181 St. Ruprecht

Produktbezeichnung:	**humimeter**
Product designation:	

Typenbezeichnung:	**BL2 ; BLL ; BLH ; BLW ; FL1 ; FL2 ; FLH ; FLM ; FLS ; RM1; SLW ; WLW**
Type designation:	

Produktbeschreibung:	**Messgerät zur Bestimmung des Wassergehalts in Biomasse und diversen Schüttgütern**
Product description	***Measuring device for determining the water content in bio-mass and various bulk materials***

Das bezeichnete Produkt erfüllt die Bestimmungen der Richtlinien:

The designated product is in conformity with the European directives:

EMV - Richtlinie 2014/30/EC	***EMC Directive 2014/30/EU***
RoHS - Richtlinie 2011/65/EG	***RoHS-Directive 2011/65/EU***

Die Übereinstimmung des bezeichneten Produktes mit den Bestimmungen der Richtlinien wird durch die vollständige Einhaltung folgender Normen nachgewiesen:

Full compliance with the standards listed below proves the conformity of the designated product with the provisions of the above-mentioned EC Directives:

EN 61326–1:2013	Elektrische Mess-, Steuer-, Regel- und Laborgeräte - EMV-Anforderungen *Electrical equipment for measurement, control, and laboratory use – EMC requirements*
EN IEC 63000:2019-05 *ersetzt / replaced* **EN 50581:2012**	Technische Dokumentation zur Beurteilung von Elektro- und Elektronikgeräten hinsichtlich der Beschränkung gefährliche Stoffe. *Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances.*

Für das angeführte Produkt ist eine vollständige Dokumentation mit Betriebsanleitung in Originalfassung vorhanden.

For the mentioned product a complete documentation with manual of instruction in original version is available.

Bei Änderungen, die nicht vom Hersteller spezifiziert sind, verliert diese Konformitätserklärung die Gültigkeit.

In case of any changes not agreed upon with the manufacturer, this declaration of conformity loses its validity.

St. Ruprecht a.d. Raab, 31.07.2022

....
Bernhard Maunz
Rechtsverbindliche Unterschrift des Ausstellers
Legal binding signature of the issuer

UKCA *DECLARATION OF CONFORMITY*

Name/ address of manufacturer:	**Schaller Messtechnik GmbH**
	Max-Schaller-Straße 99
	A – 8181 St. Ruprecht
Product designation:	**humimeter**
Type designation:	**BL2 ; BLL ; BLH ; BLW ; FL1 ; FL2 ; FLH ; FLM ; FLS ; RM1; SLW ; WLW**
Product description:	**Measuring device for determining the water content in bio mass and various bulk materials**

The designated product is in conformity with the following directives:

- **Electromagnetic Compatibility Regulations 2016 Great Britain**
- **RoHS-Directive 2011/65/EU Directive on the restriction of the use of certain hazardous substances in electrical and electronic equipment**

Full compliance with the standards listed below proves the conformity of the designated product with the provisions of the above-mentioned Directives:

EN 61326–1:2013	Electrical equipment for measurement, control, and laboratory use – EMC requirements
EN IEC 63000:2019-05 replaced **EN 50581:2012**	Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances.

For the mentioned product, a complete documentation with manual of instruction in original version is available.

In case of any changes not agreed upon with the manufacturer, this declaration of conformity loses its validity.

St. Ruprecht a.d. Raab, 31.07.2022

Bernhard Maunz
Legal binding signature of the issuer

13.2   Technical data

Display resolution	0.1 % moisture content, 0.5 °C/°F temperature
Measuring range	8 % to 30 % water content
Operating temperature	0 °C to +40 °C
Temperature measuring range	-20 °C to +120 °C (only measuring head)
Storage temperature	-20 °C to +60 °C
Temperature compensation	Automatic
Data memory	Up to 10,000 measuring values
Power supply	4 pcs. of 1.5 Volt AA Alkaline batteries
Current consumption	60 mA (incl. display illumination)
Menu languages	English, German, French, Italian, Spanish, Portuguese, Czech, Polish, Russian, International
Display	128 x 64 illuminated matrix display
Device dimensions	868 x 74 x 52 mm
Device weight (incl. handle, excl. batteries)	620 g
Device IP rating	IP 40

14.   Notes

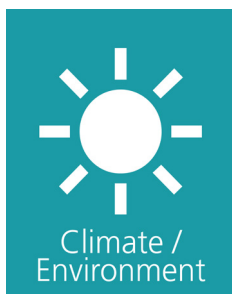|	
Climate / Environment	Material
Food	Buildings
Bioenergy	Paper / Board

Schaller Messtechnik develops, produces and sells professional moisture meters and turnkey solutions.

Schaller Messtechnik GmbH

Max-Schaller-Straße 99, A - 8181 St. Ruprecht an der Raab

Tel +43 (0)3178 - 28899 , Fax +43 (0)3178 - 28899 - 901

info@humimeter.com, www.humimeter.com