

Moisture meter

User manual

humimeter RHL

Grain moisture meter

for measurements in the grain storage or grain silo



78,0 °F | 6,16% | 456kg/m³ | -27,3td | 0,64aw | 51,9%r.H. | 14,8%abs | 100,4g/m² | 09m/s | 4,90Ug/L | 1

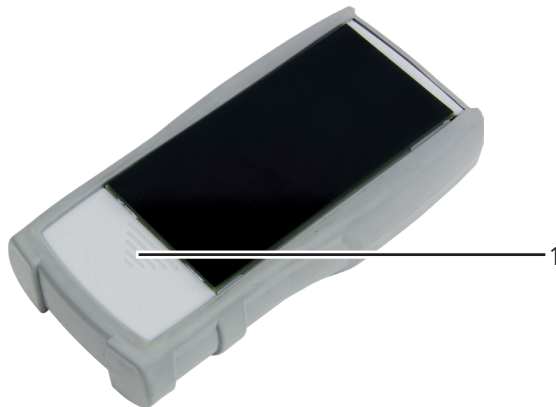
Overview of your humimeter RHL

Overview basic unit



No	Name
1	Connection for sensors
2	USB interface (optional)
3	Display
4	Keypad
5	Rubber protection

Overview back side



No	Name
1	Battery case

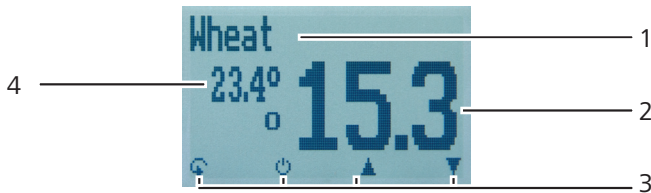
Overview external sensor



No	Name
1	Sensor connector
2	Sensor head with removable cap
3	Handle

Measurement	Measuring range	Resolution
aw value	0 to 1	0.001 aw
rel. humidity	0 to 100 % RH	0.1 %
abs. humidity	0 to 130 g/m ³	0.1 g/m ³
grain moisture	10 to 18 % WC	0.1 %
Calibration	10 to 90 % RH	
Temperature °C	-20 °C to +120 °C	0.1 °C
Temperature °F	-4 °F to 248 °F	0.2 °F













Overview display



No	Name
1	Calibration curve
2	Humidity value (definition see " 7.1 Definition of calibration curve ")
3	Display symbols
4	Temperature display

Overview display symbols

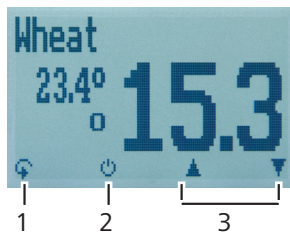
Symbol	Name	Symbol	Name
	Enter		No
	Up		Change input level
	Down		OK
	Back		Change menu

	Enter numbers		Enter data
	Enter letters		View measurements
	Forward / Right		Delete measurements
	Left		On/Off display light
	Yes		Save measured value
	Save Auto Log		Hold function

Overview menus

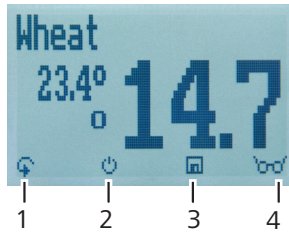
The device has three different menus: product selection, Data Log and main menu:

Product selection



No	Name
1	Change menu
2	Display illumination / device on/off
3	Navigate between calibration curves

Data Log menu



No	Name
1	Change menu
2	Turn on display light/ turn off device
3	Save measurements
4	View last saved measurements

Main menu

The main menu includes the following menu items:

- **Data Log:**
Manual Logs, Auto Logs, Clear Logs
- **Print Logs:**
Last log, All logs, Delete logs
- **Send Logs:**
Manual logs, Auto logs, Delete logs
- **Options:**
Bluetooth, Date/Time, Log Time, Emission ratio, Language, Unlock, °C/°F, BL On Time, Off Time, Calibrate, Materialcalib., Online Send, Password, Reset
- **Status**

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1. Introduction

1.1 Information on this user manual

This user manual enables safe and efficient use of the RHL humimeter. The user manual is an essential part of the device and must be kept close to the humimeter and be accessible to the user at any time.

Before starting any work, the user must carefully read and understand this manual. Basic requirement for safe work is to follow all safety and handling instructions specified in this user manual.

1.2 Limitation of liability

All of the information and instructions provided in this user 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 damages associated with the following, which also voids the warranty:

- Non-observance of this user 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.

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

1.3 Symbols used in this manual

All safety instructions in this user manual are identified by symbols.



ATTENTION

Non-observance can lead to physical damage.



Information

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



WARNING

In case of non-observance, light or medium injuries can occur.

1.4 Customer service

For technical advice, please contact our customer service department at

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Telefon: +43 (0)3178 28899

Fax: +43 (0)3178 28899 - 901

E-Mail: info@humimeter.com

Internet: www.humimeter.com



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i Information

Your purchased measuring instrument can be calibrated, and the adjustment checked by using suitable test ampoules / calibration ampoules. For this purpose, use only the calibration solutions distributed by Schaller Messtechnik GmbH. You can download a calibration certificate for your test ampoules / calibration ampoules with the batch number printed on the ampoules from <https://www.humimeter.com/certificates/>.

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 associate with a number of residual hazards.

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

2.1 Proper use

- Fast measuring device for water activity determination of foods
- Fast measuring device for water content determination of grain
- Fast measuring device for climate and environmental applications

2.2 Improper use

- The device should not be used in ATEX areas.
- The device is not waterproof, protect it from water and fine dust.



ATTENTION MEDIA COMPATIBILITY

Exposure of the sensor to harmful media, especially solvents, acids, alcohols and preservatives, can damage the sensor or cause changes in sensor calibration.

- The user is responsible to check the media compatibility before using the RHL. If necessary, a consultation with the sales partner or the manufacturer has to made.

2.3 User qualifications

The device should only be handled by persons who are expected to carry out the work reliably. Persons whose reactions are influenced, by drugs, alcohol or medication, are not permitted to use the device.

Persons who use this device must have read and understood the user manual and follow its instructions.

2.4 General safety information

Follow the safety instructions below to avoid personal injury and material damage:

- Remove the batteries from the device if it is not to be used for a prolonged period (4 weeks).
- If you notice loose parts or damage on the device, remove the batteries and contact your distributor.

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

Not covered by warranty:

- Damages caused by non-observance of the user manual
- Damages caused by third-party intervention
- Products that have been used improperly or modified without authorization
- Products with missing or damaged warranty seals
- Damages caused by majeure, natural disasters, etc.
- Damages due to improper cleaning
- Damage due to leaking batteries

3. First steps

3.1 Unpacking the device

- Unpack the device.
- Next, make sure that it is not damaged and that no parts are missing.

3.2 Checking the delivery content

Use the following list to check if the delivery is complete:

3.2.1 Scope of supply

- humimeter RHL
- 4 pieces AA alkaline batteries
- Rubber protection
- User manual

Required accessories:

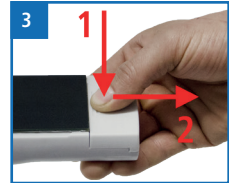
- LF_TB 120 sensor with 300 mm length
- alternatively: LF_TB 120 sensor with special tube length (possible length: 200 to 2000 mm)

Optional accessories:

- humimeter USB data interface module - USB flash drive with software and USB-cable or download using humimeter.com/software
- Plastic case
- Calibration ampoules - for self check of the humimeter RHx device series
- Calibration equipment - for self check of the humimeter RHx device series
- humimeter USB data interface module - USB stick with LogMemorizer software (measurement data recording and evaluation software) and USB cable
- Portable thermo printer (can only be used in combination with humimeter USB data interface module) - Described in a separate user manual


3.3 Inserting the batteries

1. Remove the rubber protection of the device. Pull it off the top of the housing (figure 1 and 2). If the sensor is screwed on, it must be first unscrewed or, in the case of an optional USB interface, the protective cover of the USB socket has to be removed first.
2. Take the device in one hand and press with your thumb on the marked area of the battery compartment (1). Now slide the battery cover downwards from the device (2) (figure 3).
3. Insert the batteries with negative and positive terminals matching those indicated on the battery compartment. Press the batteries down firmly, so that they lay flat on the bottom of the housing (figure 4).
 - » When all the batteries are inserted, the device turns on automatically.
4. Slide the battery cover back onto the housing until it clicks into place (figure 5). Then put the rubber protection onto the housing - start with the side where the battery cover is.



4. Using the device - Basics






4.1 Turn on the device

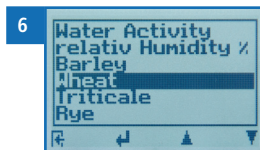
- Press the  button for 3 seconds.
- » The display will then show the status indicator (see "9. Checking the device's status") for about 3 seconds.
- » The device turns on automatically after inserting batteries.

4.2 Selecting the calibration curve

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

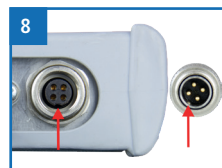
For an overview of the different calibration curves and the criteria for selecting them, please refer to "7. Calibration curves"es".

1. Press the  or  button to move from one product to the next Or
2. Press the  or  button for 2 seconds to open the calibration curve overview (figure 6).
3. Use the arrow keys to move from one calibration curve to the next and keep any of them pressed to scroll through the types.
4. Confirm your selection by pressing .
 - » The calibration curve you selected will now be shown at the top of the display.



4.3 Exchanging the sensor

- If a sensor is already connected, unscrew it counterclockwise.
- Then plug the desired sensor into the device until both threads are in contact.
 - » Pay attention to the elevation in the connector and its correct positioning (figure 8).
 - » The sensor should connect without force.
- Now tighten the thread.




4.4 Performing a measurement

- The measurement is described in chapter "5. Measurement".

4.5 Turning off the device



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

- Press the  button for 2 seconds.

5. Measurement

5.1 Preparing a measurement

To do so: The device has to have nearly the same temperature as the product being measured. It is recommended to let your humimeter device adjust to the surrounding temperature for at least 30 minutes before the measurement.

- Turn on the device (see "4.1 Turn on the device").
- Connect the desired sensor to the device (see "4.3 Exchanging the sensor").
- » If no sensor is connected, the display will show **No Sensor** (figure 9).
- Select the desired calibration curve (see "7. Calibration curves"es") by pressing  or  (see "4.2 Selecting the calibration curve"rve").
- Select a representative measuring point in your container, silo or warehouse.



5.2 Performing a measurement

To do so: The device has to have nearly the same temperature as the product being measured (see "5.3 Adjustment behaviour of the sensor").

- Make sure you have a representative measuring point in your container, silo or warehouse.
- » Insert the measuring head of the device straight into the material being measured.
- » Do not bend or drop the measuring head!
- » Let the device adjust to the material being measured for an adequate time period (see "5.3 Adjustment behaviour of the sensor" Seite 21).
- » The measuring values are shown on the display of the device.
- » Now you can save the displayed measured value on the device (see "6.2 Manual memory function" or "6.3 Auto save function (time-based)").





ATTENTION

Injury hazard

Risk of injury by the measuring head

- ▶ Keep the measuring electrodes away from your body during all activities.
- ▶ Keep the measuring electrodes away from other people' bodies during all activities.



Information - Measuring accuracy

This rapid and non-destructive measuring procedure allows you to quickly take moisture readings at a number of different points. When saving the individual readings, the device will automatically calculate the readings' average (see "[6.2.2 Saving several readings \(measurement series\)](#)").



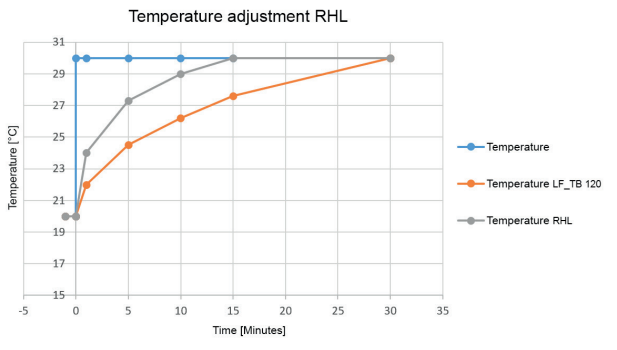
Information - Incorrect readings

Make sure to select the correct calibration curve for the material you are measuring. This prevents taking incorrect readings (see "[13. Faults](#)").

5.3 Adjustment behaviour of the sensor

In humidity and temperature measurement, several parameters are responsible for the adjustment behaviour (time until the actual measured value is displayed). The parameter that can cause the highest measurement error is the temperature difference between the sensors, as well as the entire measuring device, and the material to be measured, or the air.

Therefore, allow your humimeter device to adjust until the displayed temperature corresponds to the actual temperature. The graph below shows how long it takes to adjust from 20 °C to 30 °C.



To demonstrate the importance of temperature adjustment, the table below shows the measuring errors due to a temperature difference between the measuring instrument and the material being measured of only 1 °C / 1.8 °F at different ambient temperatures.

	10 °C (50 °F)	20 °C (68 °F)	30 °C (86 °F)
10 % r.h.	+/- 0,7 %	+/- 0,6 %	+/- 0,6 %
50 % r.h.	+/- 3,5 %	+/- 3,2 %	+/- 3,0 %
90 % r.h.	+/- 6,3 %	+/- 5,7 %	+/- 5,4 %

At room temperature (20 °C / 68 °F) and an assumed humidity value of 50 % relative humidity a temperature difference between the measuring sensor and the material being measured of 1 °C / 1.8 °F causes a measurement error of 3.2 % relative humidity. A temperature difference of 3 °C / 5.4 °F would cause a measurement error of more than 10 % relative humidity.













6. Memory function

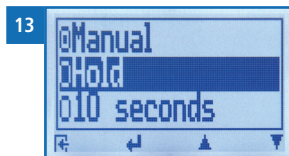
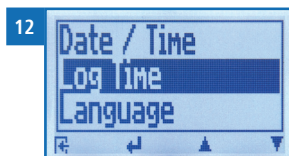
6.1 Hold function - Freezing the displayed values

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 used if the measured value should remain on the display.

6.1.1 Activate the Hold function in the options



To do so: The device is turned on and in the product selection menu.

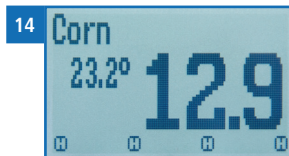
1. Press  twice or hold for 2 seconds.
2. Select **Options** by pressing the  or  button and confirm with .
3. Select **Log Time** (figure 12). Press the  or  button and confirm with .
4. Select **Hold** (figure 13). Press the  or  button and confirm with .
- » The setting has been saved.
5. Press  to leave the **Options** menu.
6. Press  to leave the main menu.



6.1.2 Using the Hold function

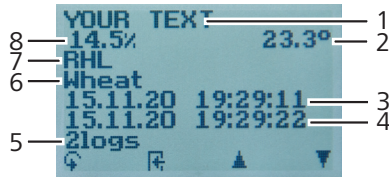
To do so: The device is turned on and is in the memory mode.

- Press .
- » The current reading will be frozen. All of the four symbols will now be displayed as  (figure 14).
- Press any button to reactivate the frozen display.



6.2 Manual memory function

All of the readings can be saved, edited and viewed on the device. The figure below shows the overview screen of a single saved series of measurements.













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 value (average)

6.2.1 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 save function) is the device's default setting.

Activating the manual save function in the Options menu

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











1. Press  twice or hold for 2 seconds.
2. Select **Options** by pressing the  or  button and confirm with .
3. Select **Log Time** by pressing the  or  button and confirm with .
4. Select **Manal** (figure 15) by pressing the  or  button and confirm with .

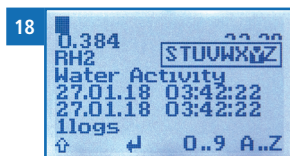
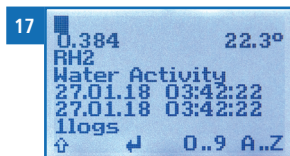


- » The setting has been saved.
5. Press  to leave the **Options** menu.
 6. Press  to leave the main menu.

Using the manual save function


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

1. Press .
 - » Figure 16 appears on the display. The number one now appears in front of the measured value.
2. Press  to add a name to the stored measured value and complete the measurement.
 - » Figure 17 appears on the display.
3. The entered data can be overwritten at any time.
4. **Add letters:**
Press and hold  to quickly scroll to the required letter and either press it for 3 seconds or press  to confirm the selected letter (figure 18).
5. **Add numbers:**
Press and hold  to quickly scroll to the required number and either press it for 3 seconds or press  to confirm the selected number.
6. **Navigate forward/backward:**
Press  to switch to another input level. Press  or  to move forward or backward.
7. Confirm your entry by pressing .
 - » The data you entered has been saved.

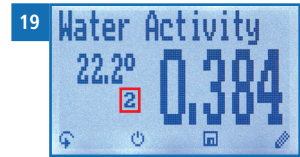



6.2.2 Saving several readings (measurement series)

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

1. Take several readings (see "5. Measurement").
2. To save a reading, press  as soon as the reading has been taken.

» Figure 179 appears on the display. The marked number increases with each saving.





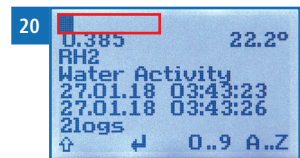
3. Press  to add a name to the stored measured value and complete the measurement.

» Figure 20 appears on the display.



4. The entered data can be overwritten at any time.

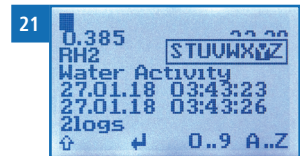
5. Add letters:

Press and hold  to quickly scroll to the required letter and either press it for 3 seconds or press  to confirm the selected letter (figure 21).







6. Add numbers:

Press and hold  to quickly scroll to the required number and either press it for 3 seconds or press  to confirm the selected number.

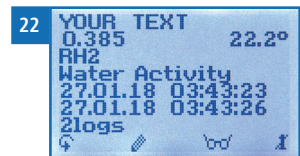


7. Navigate forward/backward:

Press  to switch to another input level. Press  or  to move forward or backward.

8. Confirm your entry by pressing .

» The data you entered has been saved.















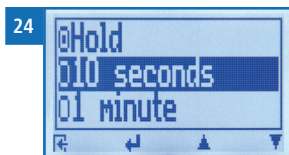
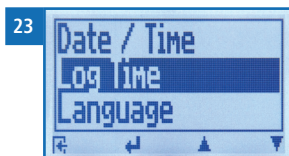
6.3 Auto save function (time-based)

The device can be configured in such a way that it will automatically save a reading (log) at a selected time interval.

6.3.1 Activating the Auto save function in the Options menu



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

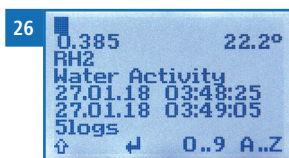
1. Press  twice or hold for 2 seconds.
2. Select **Options** by pressing the  or  button and confirm with .
3. Select **Log Time** (figure 23) by pressing the  or  button and confirm with .
4. Navigate to the desired time interval (figure 24) by pressing the  or  button and confirm by pressing .
5. The setting has been saved.
6. Press  to leave the **Options** menu.
7. Press  to leave the main menu.









6.3.2 Auto save function: Saving measured values

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





1. Press .
 - » The device will save a reading at the selected time interval. The number of data saves will increase by one every time a reading is saved. On the display appears figure 25.
2. Press  to add a name to the stored measured value and complete the measurement.
 - » On the display appears figure 26.
3. The entered data can be overwritten at any time.

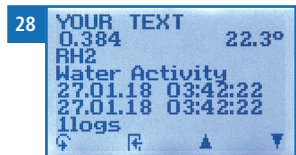


4. **Add letters:**
 Press and hold **A..Z** to quickly scroll to the required letter and either press it for 3 seconds or press  to confirm the selected letter.
5. **Add numbers:**
 Press and hold **0..9** to quickly scroll to the required number and either press it for 3 seconds or press  to confirm the selected number.
6. **Navigate forward/backward:**
 Press  to switch to another input level. Press  or  to move forward or backward.
7. Confirm your entry by pressing .
 - » The data you entered has been saved.

6.4 Viewing individual readings








To do so: One measurement (e.g. 1 log) has been saved. On the display appears .

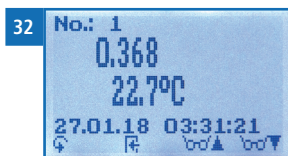
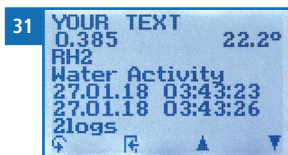
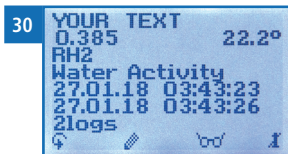
1. Press .
2. Select the required reading. To do this press  or .
 - » On the display appears figure 28.
 - » Press  to leave this screen.



6.5 View individual measured values of a measurement series










To do so: A measurement (e.g. **2 Logs**) has been saved. On the display appears .

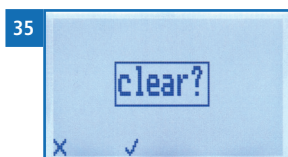
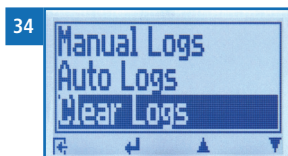
1. Press .
2. Navigate to the required measurement by pressing  or .
 - » On the display appears figure 30.
3. Press  to switch to another input level.
 - » On the display appears figure 31.
4. Press  again.
 - » On the display appears figure 32.
5. Navigate to the required reading (**No.: 1**, **No.: 2**, **No.: 3**) by pressing .
6. Press  to leave this screen.




6.6 Delete all measured values (data log)


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







1. Press  twice or hold for 2 seconds.
2. Select **Edit Logs** (figure 33) by pressing  or  and confirm with .
3. Select **Clear Logs** (figure 34) by pressing  or  and confirm with .
4. On the display appears the message **clear?** (figure 35).
5. Confirm with .
 - » The data log has been deleted.
6. Press  to leave the **Edit Logs** menu.

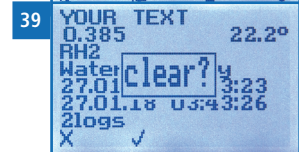
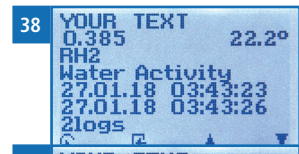
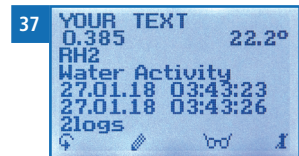


7. Press  to leave the main menu.


6.7 Delete single measurement series











To do so: A measurement (**1 Log**) or a measurement series (e.g. **3 Logs**) has been saved. On the display appears 

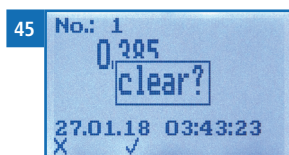
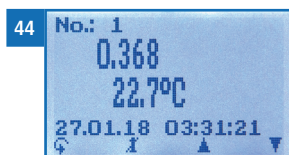
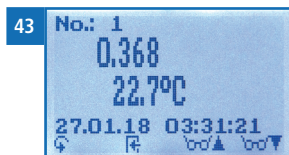
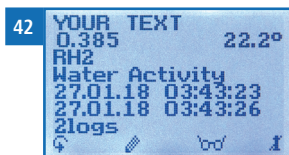
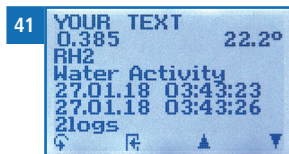
1. Press .
2. Navigate to the required measurement by pressing  or .
 - » On the display appears figure 37.
3. Press  to switch to another input level.
 - » On the display appears figure 38.
4. Press .
 - » On the display appears the message **clear?** (figure 39).
5. Confirm with .
 - » The measurement has been deleted.



6.8 Deleting individual values from a single series of measurements

To do so: A measurement series with at least 2 logs has been saved. On the display appears .

1. Press .
2. Navigate to the required measurement by pressing  or .
 - » On the display appears figure 421.
3. Press  to switch to another input level.
 - » On the display appears figure 412.
4. Press .
5. On the display appears figure 43.
6. Navigate to the required measurement by pressing  or .
7. Press  to switch to another input level.
 - » On the display appears figure 44.
8. Press  to delete the displayed value.
 - » On the display appears the message **clear?** (figure 45).
9. Confirm with .
 - » The data log has been deleted.
 - » Deleted measuring values will be transferred to the LogMemorizer (see "8. Using the LogMemorizer program") and have to be deleted separately.



7. Calibration curves

The following calibration curves are available:

Calibration curve	Definition	Unit	Measuring range	Calibrated range
Absolute humidity g/m ³	absolute humidity	g/m ³	0 to 130 g/m ³	-
Relative humidity	relative humidity	% RH	0 to 100 %	10 to 90 %
Wheat	equilibrium moisture content of wheat	% WC	10 to 18 % WC	12 to 16 %
Barley	equilibrium moisture content of barley	% WC	10 to 18 % WC	12 to 16 %
Rye	equilibrium moisture content of rye	% WC	10 to 18 % WG	12 to 16 %
Triticale	equilibrium moisture content of triticale	% WC	10 to 18 % WC	12 to 16 %
Corn	equilibrium moisture content of corn	% WC	10 to 20 % WC	12 to 18 %
aw-value	water activity	aw	0 to 1	0.1 to 0.9
Free 1 - 5	free calibration curves for self-calibration			

7.1 Definition of calibration curve

Absolute humidity

The absolute air humidity shows the contained amount of water in gramme per cubic metre of air. The absolute humidity is a direct degree for the amount of water vapour contained in a certain air volume. It shows how much condensate can precipitate or how much water has to be evaporated in order to obtain the desired humidity.

Relative humidity

Relative humidity indicates the ratio between the current water vapor pressure and the highest possible pressure, known as saturation vapor pressure.

The relative humidity shows the degree the air is saturated with water vapor.

Examples:

50% relative humidity: At the current temperature and pressure, the air is half saturated with water vapor. 100% relative humidity means that the air is totally saturated

with water vapour.

If the air has more than 100% humidity, the excessive humidity would condense or precipitate as mist.

Equilibrium moisture content of grain

Displays the grain equilibrium moisture in % water content and the temperature in the selected unit (°C or °F).

aw-value

Water activity (Activity of Water) is also described as free or non-cellularly bound water in products such as food. The water activity is described in chapter "7.2 Definition water activity".

Free calibration curves

There are free calibration curves in the measuring device, which can be used for measuring special fruits or products.

Schaller Messtechnik GmbH can also develop customer-specific calibration curves for your product on request.

7.2 Definition water activity

Water activity is the ratio of the water vapor partial pressure in food (p) to the saturation vapor pressure of pure water (p_0). It is an important indicator of product quality in food, tobacco or pharmaceutical industries and is represented in a_w from 0 to 1.

Water activity is equivalent to equilibrium humidity - the relative humidity at which the product is in equilibrium with the surrounding air. However, equilibrium humidity is expressed as a percentage.

The a_w -value is temperature dependent, for an a_w -value determination at the desired temperature the instrument and the sample should be pre-stored at this temperature. The humimeter RHL a_w -value measuring device is suitable for measuring materials such as grain products, coffee, cocoa, cereals, butter, dried fruit mixtures, spices, granulates, mushrooms, sugar, xylitol, cookies or even dried sausage as well as many other food products for which a testing of the a_w -value is necessary. The a_w value measuring device is generally not suitable for liquids and juices (syrup), acidic foods such as onions and tropical fruits as well as fruit or alcoholic beverages and foods such as filled chocolates. Vinegar and acids destroy the calibration and the sensor.

Materials with a moisture content above the fiber saturation point, i.e. with an a_w -value above 1, cannot be measured either. In this case, only the water content of the sample can be determined.

The water activity should not be mistaken for the water content - the percentage of water in a product! The water content is used to calculate the dry content of food and materials, it indicates the ratio of water to the total mass as a percentage (kg/kg) x 100.

Water activity affects the following properties of a product:

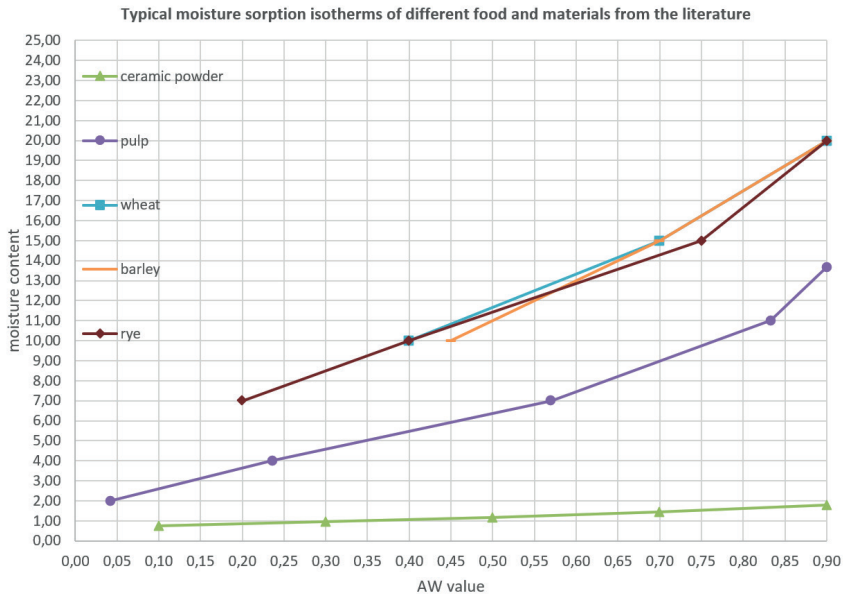
- microbiological stability
- chemical stability
- enzymatic stability
- color, flavor and nutritive value
- protein and vitamin content
- composition stability
- expiration date
- storage and packaging

Every life form depends on water. Water activity indicates the amount of water available to microorganisms such as bacteria, fungi, molds, etc. Each microorganism species has a minimum water activity value below which no growth is possible.

Typical minimal water activity values from the literature:

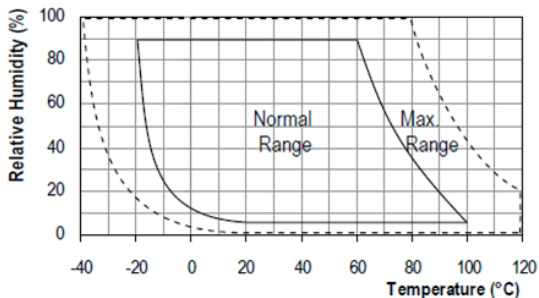
Water activity	Organism
aw = 0.91 - 0.95	Bacteria
aw = 0.88	Yeasts
aw = 0.80	Mould
aw = 0.75	Halophilic bacteria
aw = 0.70	Osmiophilic yeasts
aw = 0.65	Xerophilic moulds

Typical sorption isotherms of various foods and materials from the literature:



7.3 Application range

The device functions in the normal application range (normal range) within the specified accuracy. Long-term use outside the normal application range (max. range), especially at humidity above 80 %, can lead to higher measurement deviations (+3 % after 60 h). When returning to the normal application range, the sensor returns to the specified accuracy by itself.



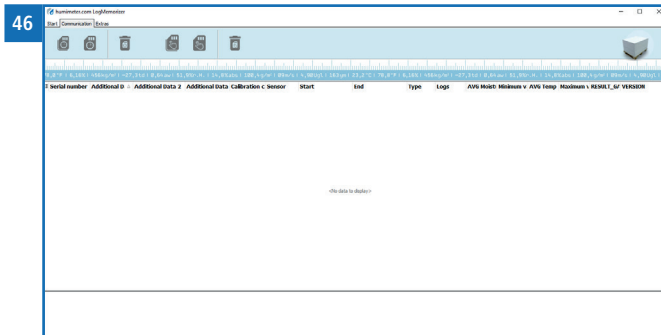
8. Using the LogMemorizer program

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.



8.1 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 LogMemorizer user interface appears on the screen (figure 46).



- » Before using the LogMemorizer program, the USB COM port must be configured according to the LogMemorizer user manual.

The LogMemorizer program is described in a separate user manual.








8.2 Send values to PC

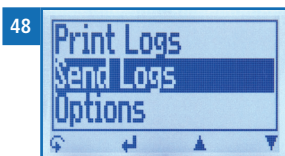
To do so: You have installed the LogMemorizer software. One or more measurements have been performed and saved.

Option: The transfer of the measured values can be started from the humimeter RHL or from the PC.

Exporting moisture readings from the humimeter RHL

Connect the humimeter RHL to your computer using the supplied USB cable.

1. Insert the USB Mini B connector into the humimeter RHL (figure 47).
2. Insert the USB connector into the computer.
3. Open LogMemorizer on your computer.
4. Turn on the humimeter RHL.
1. Press  twice or hold for 2 seconds.
2. Navigate to **Send Logs** (figure 48) by pressing  or  and confirm with .
3. Navigate to **Manual Logs** or **Auto Logs** (figure 49) by pressing  or  and confirm with .
4. On the display appears **Send** (figure 50).
 - » All of the measuring values saved on the humimeter RHL will now be sent to your PC.



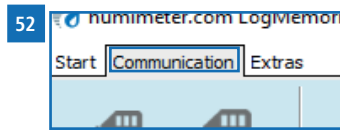
Initiating the data export at your computer

Connect the humimeter RHL to your computer using the supplied USB cable.

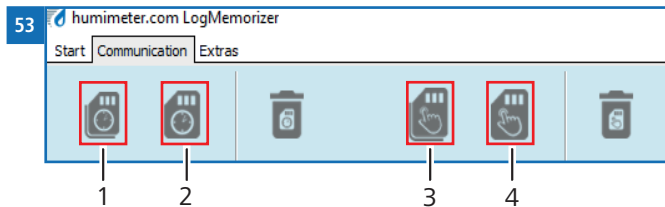
1. Insert the USB Mini B connector into the humimeter RHL (figure 51).
2. Insert the USB connector into the computer.
3. Open LogMemorizer on your computer.
4. Turn on the humimeter RHL.



5. Open the **Communication** tab in LogMemorizer (figure 52).







6. Select and click on one of the buttons shown in figure 53:
- » **Import all auto save logs** (for importing all automatically saved readings)
 - » **Import most recent auto save series** (for importing the most recent automatically saved logs)
 - » **Import all manual logs** (for importing all manually saved readings)
 - » **Import most recent manual log** (for importing the most recent manually saved logs).

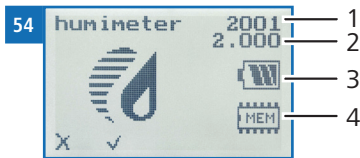


No	Name
1	Import all auto save logs
2	Import most recent auto save series
3	Import all manual logs
4	Import most recent manual log


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

9. Checking the device's status

1. Press  twice or hold for 2 seconds.
2. Navigate to **Status** by pressing  or  and confirm with .
 - » On the display appears **humimeter**.
 - » The display shows the following information (figure 54):



No	Name
1	Serial number
2	Software version
3	Battery status
4	Memory status








3. Confirm with .
4. Press  to leave the main menu.



10. Configuring the device


10.1 Bluetooth settings






Bluetooth is described in a separate user manual.

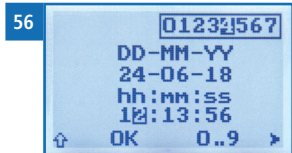
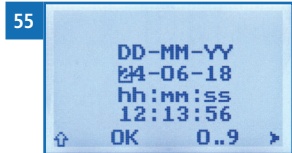
10.2 Set date/time

1. Press  twice or hold for 2 seconds.
2. Navigate to **Options** by pressing  or  and confirm with .
3. Navigate to **Date/Time** by pressing  or  and confirm with .
4. On the display appears figure 55.
 - » The format for the date is **DD-MM-YY** (Day-Month-Year).
 - » The format for the time is **hh:mm:ss** (hour:minutes:seconds).
5. **Add numbers:**










Press and hold  to quickly scroll to the required number and either press it for 3 seconds or press  to confirm the selected number (figure 56).
6. **Navigate forward:**

Navigate forward between **DD-MM-YY** and **hh:mm:ss** by pressing .
7. **Navigate backward:**


Press  to switch to another input level. To move backward between **DD-MM-YY** and **hh:mm:ss** press .
8. Confirm the date/time by pressing 
 - » The settings have been saved.
9. Press  to leave the **Options** menu.
10. Press  to leave the main menu.







10.3 Setting the emission ratio

1. Press  twice or hold for 2 seconds.
2. Navigate to **Options** by pressing  or  and confirm with .
3. Navigate to **Emission ratio** by pressing  or  and confirm with .
4. Overwrite the current emission ratio. Press and hold  to quickly scroll to the required number and wait for 3 seconds or press  to confirm the selected number.













Navigate backward:

Press  to switch to another input level.

Navigate back with .

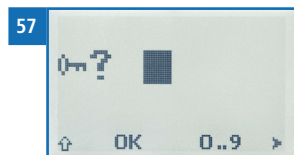
5. Confirm the new emission ratio by pressing .
 - » The setting has been saved.
6. Press  to leave the **Options** menu.
7. Press  to leave the main menu.















10.4 Selecting a language

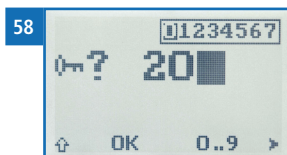
1. Press  twice or hold for 2 seconds.
2. Navigate to **Options** by pressing  or  and confirm with .
3. Navigate to **Language** by pressing  or  and confirm with .
4. Navigate to the required language by pressing  or  and confirm with .
 - » The setting has been saved.
5. Press  to leave the **Options** menu.
6. Press  to leave the main menu.

10.5 Unlock options

To do so: Certain options are deactivated.



1. Press  twice or hold for 2 seconds.
2. Navigate to **Options** by pressing  or  and confirm with .
3. Select **Unlock** by pressing  or  and confirm with .
4. On the display appears figure 57.
 - » On delivery, the four-digit password is the serial number of the device.
5. **Add numbers:**
Press and hold  to quickly scroll to the required number and wait for 3 seconds or press  to confirm the selected number (figure 58).
6. **Navigate backward:**
Press  to switch to another input level.
Navigate back with .
7. Confirm the four-digit password by pressing .
- » The setting has been saved.
- » The **C/°F, BL On Time, AUTO OFF Time, Calibrate, Materialcalib., Online Send, Password, Reset** options are activated now.
8. Press  to leave the **Options** menu.
9. Press  to leave the main menu.















10.6 Lock options

After turning the device off and on, **°C/°F, BL On Time, AUTO OFF Time, Calibrate, Materialcalib., Online Send, Password, Reset** options will be deactivated again.

10.7 Set °C/°F













To do so: All options are activated (see "10.5 Unlock options").

1. Press  twice or hold for 2 seconds.
2. Navigate to **Options** by pressing  or  and confirm with .
3. Navigate to °C/°F by pressing  or  and confirm with .
4. Navigate to the preferred temperature scale Celsius(°C) or Fahrenheit (°F) by pressing  or  and confirm with .
- » The setting has been saved.
5. Press  to leave the **Options** menu.
6. Press  to leave the main menu.

10.8 Power saving mode setting













10.8.1 Display illumination setting

To do so: All options are activated (see "10.5 Unlock options").

1. Press  twice or hold for 2 seconds.
2. Navigate to **Options** by pressing  or  and confirm with .
3. Navigate to **BL On Time** by pressing  or  and confirm with .
4. Navigate to the preferred time for the display to remain lit (30 seconds/2 minutes/5 minutes/10 minutes) by pressing  or  and confirm with .
- » The setting has been saved.
5. Press  to leave the **Options** menu.
6. Press  to leave the main menu.

10.8.2 Automatic power off setting ("Auto Off Time")

To do so: All options are activated (see "10.5 Unlock options").

1. Press  twice or hold for 2 seconds.
2. Navigate to **Options** by pressing  or  and confirm with .
3. Navigate to **Auto Off Time** by pressing  or  and confirm with .
4. Navigate to the preferred time for the device to remain on (3 minutes/5 minutes/10 minutes) by pressing  or  and confirm with .
5. The setting has been saved.
6. Press  to leave the **Options** menu.
7. Press  to leave the main menu.

10.9 Calibrating the device










Instructions for the device calibration are available on request.

10.10 Sort calibration setting

Sort calibration setting is described in a separate user's manual.










10.11 Online Send

To do so: All options are activated (see "10.5 Unlock options").



1. Press  twice or hold for 2 seconds.
2. Navigate to **Options** by pressing  or  and confirm with .
3. Navigate to **Online Send** by pressing  or  and confirm with .
4. The setting has been saved.
 - » The device now automatically sends the stored measured value to the PC each time the memory button is pressed.
5. Press  to leave the **Options** menu.
6. Press  to leave the main menu.




10.12 Changing the password

To do so: All options are activated (see "10.5 Unlock options").

1. Press  twice or hold for 2 seconds.
2. Navigate to **Options** by pressing  or  and confirm with .
3. Navigate to **Password** by pressing  or  and confirm with .
 - » On the display appears the current password.
4. Overwrite the current password. Press and hold  to quickly scroll to the required number and either press it for 3 seconds or press  to confirm the selected number.









Navigate backward:

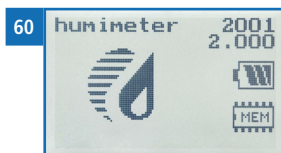
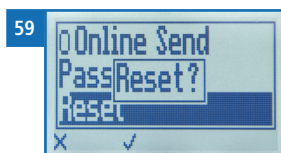
Press  to switch to another input level.
Navigate back with .

5. Confirm the new four-digit password by pressing .
 - » The setting has been saved.
6. Press  to leave the **Options** menu.
7. Press  to leave the main menu.

10.13 Resetting the device to its factory settings

To do so: All options are activated (see "10.5 Unlock options").

1. Press  twice or hold for 2 seconds.
2. Navigate to **Options** by pressing  or  and confirm with .
3. Navigate to **Reset** by pressing  or  and confirm with .
4. On the display appears **Reset?** (figure 59).
5. Confirm with 
 - » The device will now be reset to its factory settings. All of your personal settings will be lost.
 - » On the display appears the status **humimeter** (figure 60).
 - » Saved measured values will not be lost by resetting.



11. Cleaning and maintenance

Through regular cleaning and maintenance, you ensure that your device remains intact as long as possible.

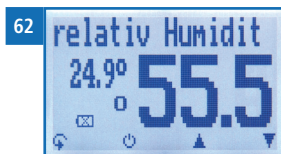
11.1 Changing the batteries

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

Should an exclamation mark appear in the battery symbol, recharge the batteries immediately (figure 61).

Proceed as described in section "3.3 Inserting the batteries" .

As the end user, you are legally obligated to return all used batteries; disposal with household waste is forbidden (Battery Directive).



11.2 Care instructions

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

11.3 Cleaning the device



ATTENTION

Device damage caused by wet cleaning

Water or cleaning fluids getting inside the device can destroy the device.

- ▶ Only clean with dry materials.

Housing

Clean the plastic housing with a dry cloth.

aw-value measuring chamber



Clean the screw glass with a cloth and cleaning alcohol.

It is not possible to clean the sensor. In case of contamination, contact your dealer.

12. Checking the calibration

The adjustment of the calibration is described in a separate user manual.

12.1 Determining the deviation

1. Allow the sensor to adjust to the humidity standard for at least 2 hours.
2. Turn on the meter (see "4.1 Turn on the device") and select the "relative humidity" calibration curve curve. For this, press  or  (see "4.2 Selecting the calibration curve"rve").
3. Read the displayed humidity value and note it down together with the displayed temperature.
4. If the temperature conditions are ideal (measuring device, aw-value measuring chamber and calibration ampoules have 23 °C), the value printed on the humidity standard can be used as a reference value.

Temperature	Calibration ampoules		
	35 %	50 %	80 %
20 °C	34.6 %	49.8 %	79.9 %
21 °C	34.8 %	49.8 %	80.0 %
22 °C	34.9 %	49.9 %	80.0 %
23 °C	35.0 %	50.0 %	80.0 %
24 °C	35.1 %	50.1 %	80.0 %
25 °C	35.2 %	50.2 %	80.0 %
26 °C	35.4 %	50.2 %	80.1 %

5. Note down the real humidity value.
6. Compare the noted displayed value with the real humidity value.
 - » If the displayed value shows a deviation of more than 1.5 % rel. humidity, it is recommended to perform a recalibration.
 - » A calibration can be performed by the company Schaller Messtechnik GmbH.
 - » It is also possible to perform the calibration on your own using the calibration ampoules:
A manual for the calibration procedure is available on request from Schaller Messtechnik GmbH or your dealer.
7. Open the measuring chamber and clean the glass vessel with plenty of water, the textile pad must be washed out well and can then be discarded.

13. Faults

If the following actions do not eliminate the faults or if other faults not listed here appear, please contact Schaller Messtechnik GmbH.

Fault	Cause	Remedy
Measuring error	Material temperature outside the application range: below -10 °C or above +60 °C	Only use the measuring device for temperatures between -10 °C and +60 °C.
	Measurement error caused by too short adjustment time	Allow the device to adjust to the environment sufficiently long (see "5.3 Adjustment behaviour of the sensor").

Fault	Cause	Remedy
	Wrong calibration curve	Before you start a measurement, check whether the correct calibration curve is set (see "7. Calibration curves"es").
	Dripping or sprayed water	The sensor can be destroyed by direct contact with dripping or sprayed water.
	Irreversible impairment of the sensor element by aggressive gases	In this case, contact your dealer.
	Condensation hazard with temperature change	Condensation on the sensor affects the calibration. Allow the device to adjust to the environmental temperature.
	Dirty humidity sensor	In this case, contact your dealer.
	Foreign objects on the sensors	In this case, contact your dealer.
Data transfer to Log-Memorizer software fails	Interface not configured	For the one-time configuration of the interface press the F1 key of your PC and read the help file of the Log-Memorizer software.

14. Storage and disposal

14.1 Storing the device

Store the device as follows:

- Do not store outdoors.
- Store dry and dust-free.
- Protect from sunlight.
- Avoid mechanical shocks and impacts.
- Always remove the batteries from the device if it is not used for more than 4 weeks.
- Storage temperature: -20 °C to +60 °C

14.2 Disposal of the device



Devices marked with this symbol are regulated by the European Directive 2012/19/EU of the European Parliament and the Council of 4 July 2012 relating to waste of electrical and electronic equipment. If the device is not used within the European Union, national disposal regulations in the country of use must be observed.

Electrical devices should not be disposed of with household waste. Please recycle the device in an environmentally friendly way using suitable recycling systems.

15. Device information

15.1 EC 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: **RH1 ; RH2 ; RH2 AW ; RH5 ; RH5.1 ; RH5.2 ; RH6 ; RHL ;**
Type designation: **SW1**

Produktbeschreibung: **Messgerät zur Bestimmung der rel.Feuchte und**
abgeleiteter Messgrößen
Product description **Measuring instrument for determining relative humidity**
and derived measured variables

Das bezeichnete Produkt erfüllt die Bestimmungen der Richtlinien:
The designated product is in conformity with the European directives:

EMV - Richtlinie 2014/30/EC
RoHS - Richtlinie 2011/65/EG

EMC Directive 2014/30/EU
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 Technische Dokumentation zur Beurteilung von Elektro- und Elektronikgeräten hinsichtlich der Beschränkung gefährlicher Stoffe.
Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances.
EN 50581:2012


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

 **Schaller**
Messtechnik | humimeter.com
Schaller Messtechnik GmbH
Ma - Schaller Straße 99
AT - 8180 St. Ruprecht a.d. Raab
www.humimeter.com | info@humimeter.com
.....
Bernhard Maunz
Rechtsverbindliche Unterschrift des Ausstellers
Legal binding signature of the issuer



DECLARATION OF CONFORMITY

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

Product designation: **humimeter**

Type designation: **RH1 ; RH2 ; RH2 AW ; RH5 ; RH5.1 ; RH5.2 ; RH6 ; RHL ; SW1**

Product description **Measuring instrument for determining relative humidity and derived measured variables**

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

 **Schaller**
Messtechnik / humimeter.com
Schaller Messtechnik GmbH
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www.humimeter.com | info@humimeter.com

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Bernhard Maunz
Legal binding signature of the issuer

15.2 Technical Data

Display resolution	0.1 g/m ³ abs. humidity, 0.1 % rel. humidity, 0.1 °C/ 0.3 °F temperature, 0.1 % equilibrium moisture of grain, 0.001 aw
Measuring range rel. humidity	0 % to 100 % RH
Calibration rel. humidity	10 % to 90 % RH
Measuring range dew point	-55 °C to +60 °C
Measuring range grain	10 % to 20% (sort dependent)
Grain calibration	12 % to 16 %
Measuring range aw-value	0 to 1
Calibration aw-value	0.1 to 0.9
Accuracy rel. humidity	+/- 1.5 % (at 25 °C)
Accuracy temperature	+/- 0.3 °C (at 25 °C) / +/- 0.5 °F (at 77 °F)
Grain accuracy	+/- 0.6 % (at 25 °C)
Accuracy aw-value (at 25 °C)	+/- 0.015 from 0.1 to 0.8 +/- 0.04 from 0 to 0.10 and from 0.80 to 0.98
Operating temperature	-10 °C to +60 °C
Storage temperature	-20 °C to +60 °C
Temperature compensation	automatic
Measured value memory	up to 10,000 measuring values
Power supply	4 x 1.5 Volt AA Alkaline batteries
Power consumption	60 mA (with display illumination)
Menu languages	English, German, French, Italian, Spanish, Portuguese, Czech, Polish, Russian, International
Display	128 x 64 illuminated matrix display
Device dimensions	145 x 75 x 30 mm
Device weight	266g (incl. batteries)
Device IP rating	IP 40

16. Notes

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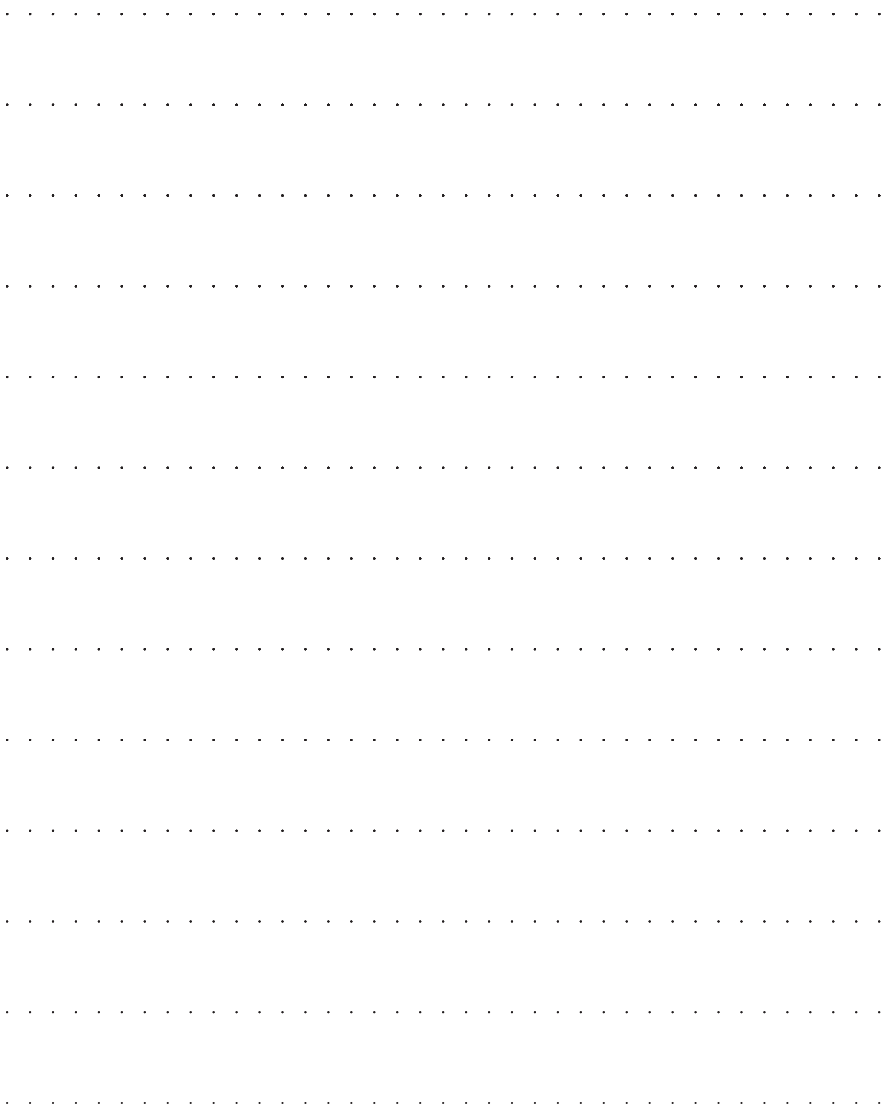
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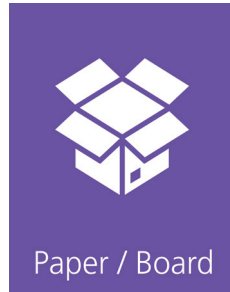
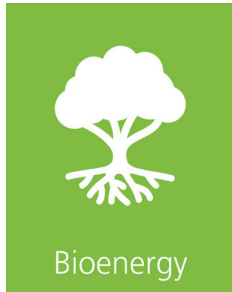
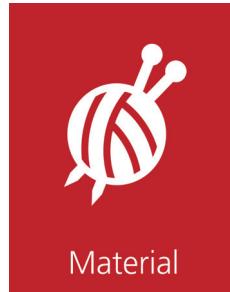
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Schaller Messtechnik develops, produces and sells professional moisture meters and turnkey solutions.

Schaller Messtechnik GmbH

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