Instruction manual
Air humidity meter RH1
paper moisture meter RH5
with sword-shaped sensor

Instruction manual short form

Positioning the instrument

RH1: Position your humimeter RH1 in a place that is representative for the room climate, and make sure to **prevent infiltration and unnatural temperature fluctuations**. Further the humimeter RH1 must **not be exposed to direct sunlight**. When changing the place let your device adjust to the surrounding temperature for at least one hour before measuring. Optionally a wall mount for the humimeter RH1 is available.

First push the sword-sensor into the stack only a short distance (10 cm). At brief intervals (10 seconds), push it a few more centimetres into the stack. Let your humimeter RH5 adequately adjust to the material (at least 30 minutes) before you start to measure, particularly when the material pile was stored at a different temperature than the device. When removing the sword-shaped sensor please ensure that there is no up or down movement, because this could deform the sensor. For heavy stacks and rolls please use the optionally available sword sensor holder and the tool for removing the sword sensor holder.

Measurement

To switch on the instrument, press the ⏻ key for 3 seconds.

First the logo appears, and after that the measuring window opens and the current temperature and moisture value is displayed.

The calibration curves can be changed by pressing ▲ oder ▼. The calibration curves saved can be found in the following chart.

Calibration curves

Calibration curve	Description	Unit	Instrument
relHum	Relative humidity of air	%RH	RH1 / RH5
dewpoint	dewpoint	℃ resp. ℉	RH1 / RH5
absHum	Absolute humidity of air	g/m³	RH1
EMC wood	Equilibrium moisture content of wood	%EMC	RH1

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Description of the definitions:

Relative humidity of air: indicates the relation between the current water vapour pressure and the maximal possible water vapour pressure (called saturation vapour pressure).

The relative humidity shows the degree the air is saturated with water vapour. For example:

50% relative humidity indicates that at the current temperature and the current pressure the air is half saturated with water vapour, 100 % relative humidity means that the air is totally saturated. When the air has more than 100 % of relative humidity, the excessive moisture would condense or form fog.

Absolute 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 moisture can maximally condense or how much water has to be evaporated to receive a certain desired air humidity.

Dew point temperature: The dew point indicates which temperature the not completely saturated air has to reach in order to be completely saturated with water vapour. If the room with the current relative humidity is cooled down to the dew point temperature, the water vapour begins to condense.

EMC wood: shows the equilibrium moisture content of wood (for the timber stored under these conditions) in % moisture content of wood and the temperature in the selected unit (°C or °F).

Menu level overview

| Datenspeicher |
| Logs Drucken |
| Logs Senden |
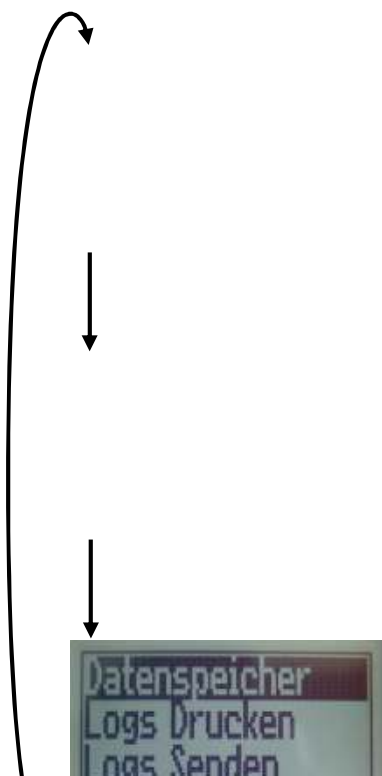
Keypad symbols

Measuring window:

↻	Rolling Menu
⏻	Power ON / OFF
▲	Switch upper
▼	Switch lower
🖫	Save
🄷	Hold
⏲🖫	Autolog
ʼᴑᴑʼ	Watch the saved data
✎	Supplier´s data can be added

Menu:

Type selection menu

rel. Feuchte %
23.2° 50.5

Next calibration curve
Previous calibration curve
Power off (3 sec.)

Store menu

rel. Feuchte %
23.3° 50.4

Show the last log
Store a new log
Power off (3 sec.)

Main menu
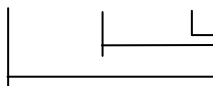
Switch upper
Switch lower
Open this menu/Enter

Edit Logs
   Manual Logs
   Auto Logs
   Clear Logs

Print Logs
   Last Logs
   All Logs
   Clear Logs

Send Logs
   Manual Logs
   Auto Logs
   Clear Logs

Options
   Date / Time
   Log Time
   Language
   Unlock
   ℃/℉
   User lever
   Light ON Time
   Auto Off Time
   Calib.
   Material calib.
   Setting
   Password
   Reset
Status

Operating the instrument

Switching on: Press ⏻ for 3 seconds.

Changing the calibration curve: ▲ or ▼.

Setting the time: Press ⟳ three times - Options – Date / Time

Here you can set the date and time, according to the format indicated (JJ.MM.TT), by pressing the button 0..9. When you have finished the input of the year, press the button ❯ to adjust the month and then again the button ❯ to adjust the day. For jumping from date to time also press the button ❯ . When you have finished, press OK for saving date and time.

Datalog: Select your desired interval on the menu level *Options – Log Time* using the arrow keys, and confirm by pressing **OK**. Now in the measuring window appears in the store menu the symbol ⟳▥. By pressing this ⟳▥ symbol you can activate the AutoLog.

Info! For conserving battery power the device switches off automatically when selecting a log interval of or longer than 1 minute, and activates again for saving the logs!

For completing the AutoLog, switch on the device (if necessary) and press the ⟳▥ button. If you want to add supplier´s data please press the ✎ button. You can also work on the supplier´s data subsequently.

Switching on the display lighting: Press the ⏻ key briefly; the display lighting switches off automatically after approx. 20 seconds. Pressing any key activates the display lighting again, and the period for switching off again is prolonged to 4 minutes (The display lighting time can be modified on menu level *Options – Light ON Time*).

Switching off: Press the ⏻ key for 5 seconds. The instrument switches off when you stop pressing the key. The instrument switches off approx. 4 minutes after the last key has been pressed (The turn-off time can be modified on menu level O*ptions – Auto Off Time).*

Other instrument functions – overview
- Manual saving of single measuring values in a measurement series
- Display of measuring series and measuring values directly on the instrument
- Printing the saved measuring series (only with PC interface and printer)
- Transfer and saving of measuring series on a PC (only with PC interface)
- Automatic single-point adjustment at 50% humidity standard.
- Display of the memory and battery status
- Selection of the menu language (DE, EN, FR, IT, ES, RU)
- Temperature can be shown in degrees Celsius or degrees Fahrenheit

- Activation of a simple user operation
- Further instrument functions can be seen on www.humimeter.com

NEW! Single-point adjustment at 50% humidity standard

From software version 1.50!!!

For the adjustment you need the appropriate calibration equipment for your device and certified calibration ampoules of 50% rel. humidity.

Details of proceeding

Preparation

To ensure as good as possible inspection results it is essential that the measuring device, the calibration equipment and the calibration ampoules have approximately the same temperature.

This temperature has to be between 20℃ and 26℃.

The best way to ensure the same temperature of the different components is to store all components together in a room with only small temperature fluctuations minimum over night – better for 24 hours.

Mounting the sword-sensor in the calibration equipment:

On this picture you can see the components of the calibration equipment plus a calibration ampoule beside the humimeter RH1 resp. RH5 measuring devices.

Assembling the calibration equipment for humimeter RH5
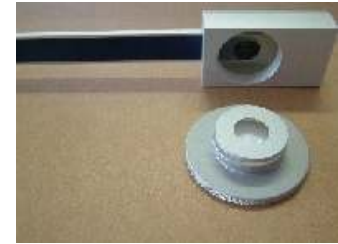
Assemble the first gasket ring into the upper part.
Plug in the sword-sensor as shown into the upper part.
Now assemble the second gasket ring into the upper part.

Insert the textile pad into the bottom part, open the ampoule and carefully spill the liquid onto the pad.

Assemble the third gasket ring into the bottom part, and put the aluminium panel onto the gasket ring.

Put the upper part together with the humimeter RH5 carefully onto the bottom part. Uplift the humimeter RH5 together with the calibration equipment **STRAIGHT** in the air and **DON´T TURN IT ROUND**. As shown on the picture screw it firmly.
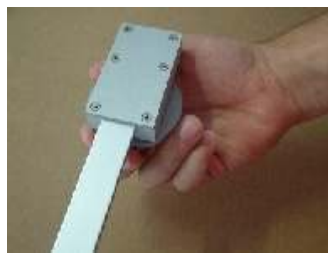
Assembling the calibration equipment for humimeter RH1

Insert the textile pad into the bottom part, open the ampoule and carefully spill the liquid onto the pad and screw it firmly onto the upper part.

Afterwards plug in the sword-sensor.

Put the humimeter RH1 or RH5 carefully on a table, and go on with the procedure.

Conditioning of the sword-sensor

This is essential to ensure as good as possible inspection results.

Let the sword-sensor adjust for 2 hours.

The temperature has to be between 20℃ and 26℃.

If the shown measuring value differs more than the factory tolerance (1,5% r.h.) , we recommend to carry out a recalibration as follows:

Offset adjustment

1. Leave the measuring device in the calibration equipment, and switch it on.
2. Press the Rolling Menu button ⟳ until you are in the main menu
3. Select the menu level *Options* by pressing the button ▼ and confirm by pressing OK.
4. Navigate by pressing ▼ to the menu item *Unlock* and press OK.

5. Enter the superuser password using the buttons 0..9 resp. A..Z and confirm by pressing ↵.

    - The superuser password after consignment is the serial number of the device, apparent after switching on the device or in the menu item *Status*.

6. Select the menu item *Setting* using the button ▼ and confirm by pressing OK.

7. It appears a query if a setting is desired. Confirm by pressing ✓.

8. Wait until the bar has risen completely. The device adjusts by itself and automatically jumps to the measuring window again. The adjustment is now completed.

9. Check the result before you remove the device from the calibration equipment. Press the Rolling Menu button as long as you reach the measuring window. Depending on the temperature the display should show a humidity around 50% now.
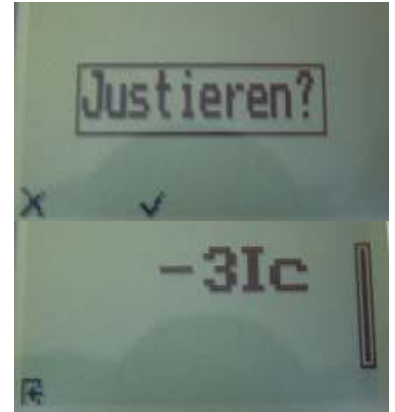
If you have made a mistake during the setting, you can reset to the factory calibration as follows:

Reset to factory calibration

1. Press the ⬆ button 3 times to reach the menu point *Options* and unlock by selecting *Unlock* if necessary.

2. Select the menu item *Reset* by pressing the ▼ button and confirm by pressing OK.

    - The query │ **reset?** │ appears on the display.

3. Press the button ✓ for resetting the device to the factory calibration.

    - The software reloads the factory calibration data and reboots the device. This will need about 15 to 20 seconds.

4. By pressing the button ✗ you can exit without any changes.

Conditioning characteristics of the sensor

During humidity and temperature measurement there are many parameters which affect the time required until the real measurement value is displayed.

The parameter which may cause the largest measuring errors, is the difference in temperature between the sensors or between the measuring instrument and the substance to be measured or the air.

To shorten the time required for the sensors/instrument to reach the same temperature as the substance or air, proceed as follows:

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- **RH1:** Move around the instrument in the air
  - o Hold the instrument securely in your hand and move it carefully backwards and forwards.
    Do not hit other objects with the instrument!
- **RH5:** How to move the sword-sensor into the paper pile
- o First push the sword-sensor into the stack only a short distance (10 cm). At brief intervals (10 seconds), push it a few more centimetres into the stack.
- ▪ If there is a high temperature difference the proceeding should be repeated – if necessary a few times!
- o If the sword-sensor holder for protecting the sword-sensor is used, make sure that they are both the same temperature.
- ▪ In this case push the sword-sensor holder little by little into the stack stack and leave the sword-shaped sensor in the cover long enough to ensure a correct measurement result.

Care instructions

Do not drop the instrument or expose it to excessive temperatures. Only clean it with a lint-free, **dry** cloth. The instrument is not waterproof. Do not immerse the sensor in liquid.

How often you need to check the instrument depends on the use and the required level of accuracy. In general the drift of the sensor according to the degree of use (constant humidity or use within the whole moisture measuring range) is beneath 1,5 % per year. You can check **humimeter RHx** instruments by yourself using the calibration equipment (see optional accessories). For a fee, Messtechnik Schaller GmbH can also carry out a calibration at their factory. On demand you will also receive a calibration certificate.

Changing the batteries:

Use a finger to press the arrow on the battery cover and pull it back.

Remove the flat batteries and replace them with four

new **1.5 Volt AA Alkaline** batteries. Make sure you place the battery poles in the right positions.

Press the batteries down so that you can close the cover.

Liability

The manufacturer is not liable for any incorrect measurements and resulting damages.

As this rapid measurement procedure is influenced by product-specific and application-specific conditions, we recommend you to carry out a plausibility check on the measurement results. Each instrument has a serial number and warranty seal. If this is broken we cannot provide warranty. If the instrument is defective, contact Messtechnik Schaller GmbH via **www.humimeter.com** or your supplier.

If the battery symbol appears in the measuring window resp. if a critical charge of battery is shown in the status, the batteries have to be changed IMMEDIATELY.

If you do not use your humimeter RHx device for a longer period, remove the batteries. For eventual resulting damages we cannot provide any warranty.

Optional accessories:

- **Wall holder / table stand** - Two-in-one holder for the RHx instrument series made of acrylic glass.
- **Interface** for printing saved data on a portable printer and/or transferring data to a PC incl. software humimeter LogMemorizer
- **humimeter LogMemorizer** data recording and analysis software for Windows® PCs based on a database; for recording data, direct analysis of measurement values in the programme, numerous export functions; download a demo version on **www.humimeter.com/wiki**.
- **Portable measurement value printer** – battery-powered direct thermal printer
- **Sword sensor holder for RH5** to protect the sword-shaped sensor for use with heavy stacks
- **Tool for removing sword sensor holder for RH5** for removing the sword cover from heavy stacks
- **Calibration equipment and calibration ampoules**: For checking your own humimeter RHx

Technical data

Measurement:	Measuring range/Resolution/ Accuracy		
rel. humidity:	0 to 100%RH	/ 0,1%	/ ±1,5% (0 - 90% at 25℃)
Temperature Pt1000 DIN B ℃:			
	-10 to +60℃	/ 0,1℃	/ ±0,4℃ (at 25℃)
Temperature ℉:	14 to 140℉	/ 0,3℉	/ ±0,7℉ (at 77℉)
Dewpoint ℃:	-55 to +60℃	/ 0,1℃	
Dewpoint ℉:	-67 to 140℉	/ 0,3℉	
abs. humidity:	0 to 130g/m³	/ 0,1g/m³	
Equilibrium moisture content of wood:	2 to 30%	/ 0,1%	/ ±0,5% (at 25℃)
Operating temperature range:	-10℃ to 60℃ / 14 to 140℉		
Storage temperature:	-20℃ to 60℃ / -4 to 140℉		
Temperature compensation:	automatic		
Memory for measuring values:	approx. 10.000 measuring values		
Menu languages:	German, English, French, Italian, Spanish, Russian		
Power supply:	4 x 1,5Volt AA Alkaline batteries (approx. 1.800 measurements)		
Switch-off time:	after approx. 4 minutes		
Power consumption:	55 mA (with display lighting)		
Display:	128 x 64 matrix display, with LED backlighting		

Dimensions:	Housing	Sensor	Weight (incl. batt.)
RH1:	145 x 63 x 24mm	100mm x Ø 12mm	approx. 210g
RH5:	145 x 63 x 29mm	295mm x 20mm x 4mm	approx. 285g
Protection class		IP 40	
Delivery includes		Wooden case 4 x 1,5Volt AA Alkaline batteries Short instruction manual	

!IMPORTANT! Essential reading

Common reasons for incorrect measurements

- **Sunlight or other sources of heat or cold which do not correspond to the ambient temperature**
- **Measuring errors due to too short conditioning time**
- **Measuring errors due to differences in temperature**

To show how important it is that the temperature of the instrument is the same as the temperature of the substance to be measured, the table below shows measuring errors due to a temperature difference of only 1°C / 1.8°F between the measuring instrument and the substance to be measured at different ambient temperatures.

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

At room temperature (20°C/68°F) and assumed paper m oisture value of 50%r.H. a deviation of 1°C / 1.8°F between the meas uring sensor and the substance to be measured results in a measuring error of 3.2%r.H. A deviation of 3°C / 5.4°F would result in a measurin g error of over 10%.

Further examples are given in the „Mollier i-x" diagram.

- **Dripping or sprayed water**
- **Irreversible damage of the sensor element due to aggressive gases**
- **Danger of condensation following temperature changes**
- **Dirty moisture sensor**
- **Foreign objects on the sensor**

Technical Support – User Support

You will find technical support and comprehensive application support at http://support.humimeter.com