Schaller
Messtechnik / humimeter.com

Moisture meter

Operating Manual

PMSA

Single paper sheet moisture analyser

for measuring the moisture content of a single sheet of paper

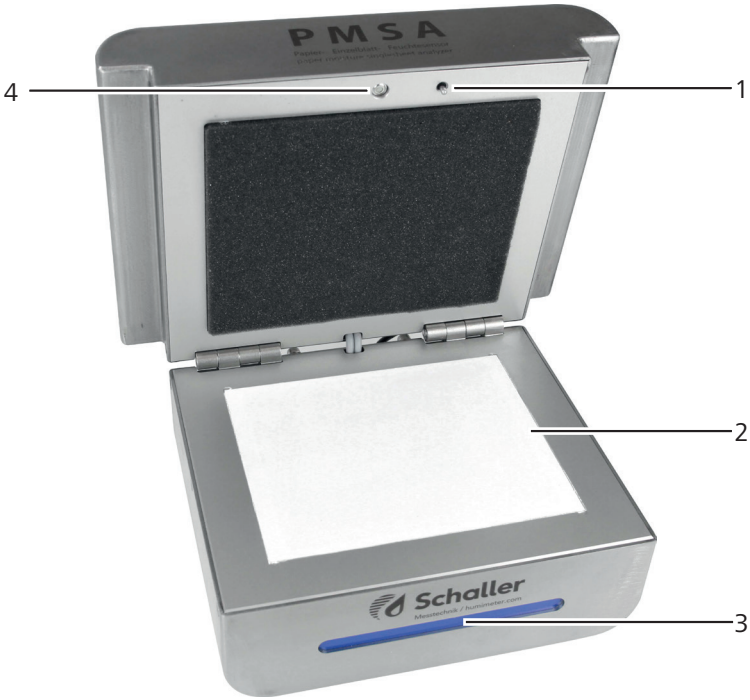
78,0 °F | 6,16% | 456 kg/m³ | −27,3 td | 0,64 aw | 51,9 %r.H. | 14,8 %abs | 100,4 g/m² | 09 m/s | 4,90 Ugl | 1

Version 2.1

Always read this operating manual before using the PMSA!

Your PSMA at a glance

The main unit



No	Name
1	Lid push button
2	Sensor plate
3	LED status bar
4	IR temperature sensor

The rear of the main unit

No	Name
1	Identification plate
2	Reset button
3	USB port

ATTENTION

Sensitive sensor plate

The white sensor surface consists of a thin ceramic plate. This plate may be destroyed by mechanical pressure!

► Take care of the sensitive sensor surface during cleaning!

Table of contents

1. Introduction

1.1 Information about this operating manual

This operating manual is designed to enable you to use the PMSA 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 PMSA. 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 of 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.

ATTENTION

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

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

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

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

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 water content of single sheets of paper
- The device must only be used for taking measurements on the products defined in the following sections of this manual (see 6. Product types).

2.2 Improper use

- The device must not be used in ATEX.
- Corrugated board cannot be measured.
- Papers and cardboard that have been carbon (graphite) blackened.
- Papers and cardboard with metallic coatings
- The device is not waterproof and must be protected from water and fine dust.

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:

- If you notice loose parts or damage on the device 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

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

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.

ATTENTION

Sensitive sensor plate
The white sensor surface consists of a thin ceramic plate. This plate may be destroyed by mechanical pressure!

► Take care of the sensitive sensor surface during cleaning!

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:

- PMSA
- USB mini B cable
- USB stick with software
- Operating manual

Optional accessories:

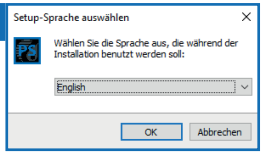
- Paper grammage precision scale
- Laboratory analysis for creation of calibration curve

4. Setting up

4.1 Setting up the PC software

1. Plug the delivered USB stick containing the evaluation software into a free USB port on your computer.
2. Open the USB Stick and start the installation file of the evaluation software (figure 1).
3. Now follow the instructions of the installation wizard.
4. After successful installation exit the installation wizard with **Finish** (figure 2).

1



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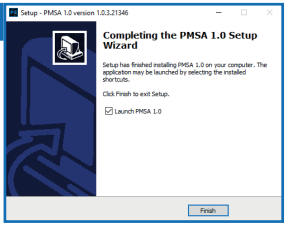


4.2 Setting up the device

- Insert the USB Mini B connector into the PMSA (figure 3).
- Insert the USB connector into the computer.

» The required driver was installed with the evaluation software in the previous step and should now be ready for use.

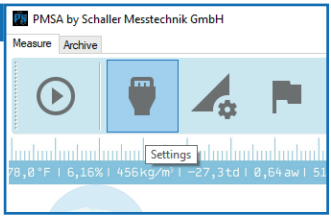
3

4.3 Setting the COM Port

1. Start the evaluation software on your computer.
2. Open the sensor settings by clicking on the "Settings" button (figure 4)  .
3. Select the COM interface of the PMSA from the drop-down menu.
4. After selecting the COM interface, the connection to the PMSA can be tested via the "Test" button.

» After successful completion of the test, a message appears and the LED bar of the device lights up blue.

4



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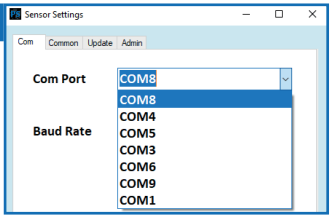


5. The measuring process

To do so: The connection between the device and the evaluation software has been established successfully.

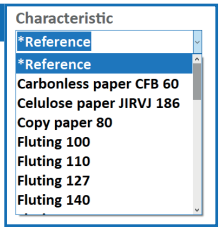
1. Select the desired product type from the drop-down menu (figure 6).
2. Click the "Start"  or "F1" button to start the measuring process.

» The window "Measurement progress" opens (figure 7).

3. Make sure that there is no paper in the machine and close the lid (figure 8).
4. Continue the measurement process by clicking the "OK" button  .
5. Now the device performs a blank measurement.

» During the blank measurement, the progress window closes.

6



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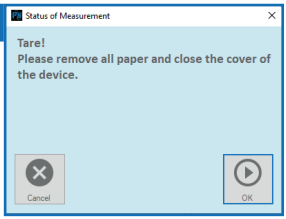

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6. After successful completion of the blank measurement, the progress window opens again (figure 9).

7. Now place the paper to be measured in the device and close the lid (figure 10).

8. Continue the measurement process by clicking the "OK" button  .

9. Now the device performs the measurement.

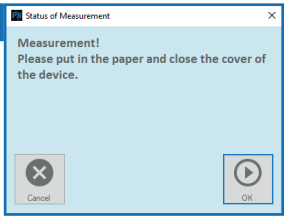
   » During the measuring process the LED bar on the device flashes.

10. After successful completion of the measurement, the window "Measurement Valid" opens, displaying the measured values and options to enter further additional data (figure 11).

    » It is possible to deactivate the opening of the window "Measurement Valid" (see section 8.1.1 Deactivating the "Measurement Valid" window).

11. By clicking the button "Save"  the measuring results including entered additional data are saved.

9



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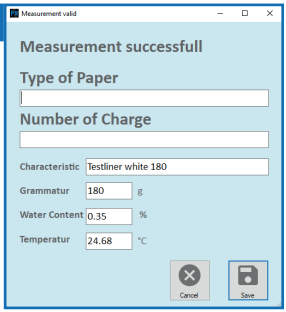


ATTENTION

Risk of injury

Crushing due to the lid of the device

► Pay attention to the position of your fingers when closing the lid.

Information - Incorrect readings

Always make sure to select the correct product type for the material you are measuring. This prevents taking incorrect readings (see 10. Faults).

6. Product types

Product type	Paper type	Grammage [g/m²]
*Reference	! Only used for testing the moisture meter !	
Carbonless paper CFB 60		60 g/m²
Fluting 100		100 g/m²
Fluting 110		110 g/m²
Fluting 127		127 g/m²
Fluting 140		140 g/m²
Fluting 160		160 g/m²
Fluting 80		80 g/m²
Fluting 90		90 g/m²
Copy paper 80		80 g/m²
Kraftliner 125		125 g/m²
Kraftliner brown 280		280 g/m²
Kraftliner brown 300		300 g/m²
Kraftliner brown 400		400 g/m²
Kraftliner white Top 140		135 g/m²
Kraftliner white Top 200		200 g/m²
Lumi Silk 150		150 g/m²
Mango Star 90		90 g/m²
Maximago 110		110 g/m²
Nopa Coat 300		300 g/m²
Pre-Print R39 205		205 g/m²
Schrenz 90		90 g/m²
Testliner 100		100 g/m²
Testliner 125		125 g/m²
Testliner brown 135		135 g/m²
Testliner brown 170		170 g/m²
Testliner brown 210		210 g/m²
Testliner white 140		140 g/m²
Testliner white 180		180 g/m²

Newsprint 45		45 g/m²
Celulose paper JIRVJ 186		186 g/m²

6.1 Selecting the product type

Due to the wide range of different types of papers in use, there are no default product type categories. For the different product types of the PMSA, the grammage of the paper sheet and the paper type are decisive.

The product type overview contains suggestions for different paper types and their associated grammage [g/m²].

To achieve an accurate measuring result, it is necessary to create a specific calibration curve.

The recording of a new calibration curve can be carried out by Schaller Messtechnik GmbH or by the customer (with separate instructions).

If required, please request the manual for creating calibration curves from Schaller Messtechnik GmbH.

6.2 How moisture content is defined

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

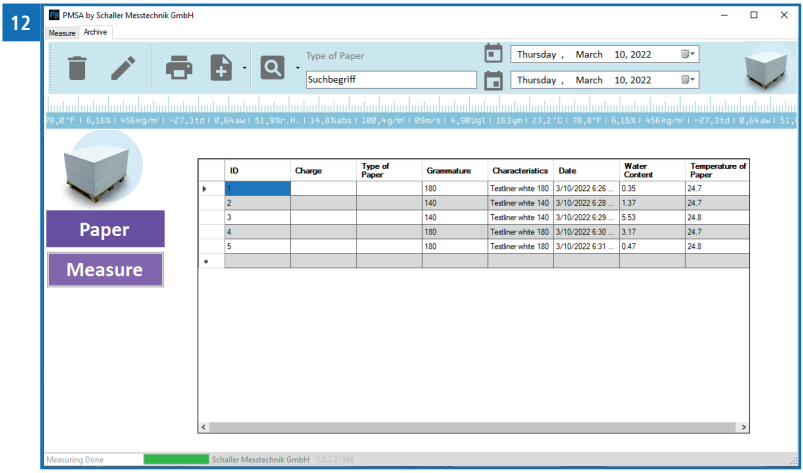
$$\%WG = \frac{M_n - M_t}{M_n} \times 100$$

M_n: Mass of the sample with average moisture content

M_t: Mass of the sample with zero moisture content

%MC: Moisture content (in accordance with EN ISO 287)

7. Database / Archive



In the database all stored measuring values can be displayed.

Each stored measurement has its own identification number.

7.1 Filter

To facilitate the search, filters can be applied to the stored measurements in the database. When leaving the archive, the applied filters are reset.

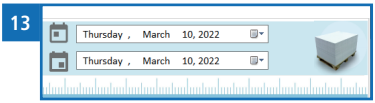
7.1.1 Filter by date

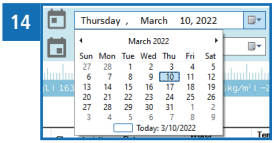
1. When using the date filter, select Period to display all measurements taken within this period.

2. In the first field, enter the start date of the desired time period (figure 13).

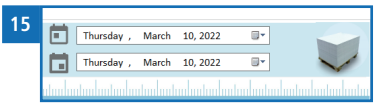
   » The start date can be chosen on the calendar (figure 14) or entered manually in the format (**TT-MM-JJJJ**).

   » Clicking on "today" the current date is entered.





3. In the second field enter the end date of the desired time period (figure 15).



» By default, the current date is selected as the end date.

» The end date can be chosen on the calendar or entered manually in the format (**TT-MM-JJJJ**).

» Clicking on "today" the current date is entered.

7.1.2 Filter by keyword

1. It is also possible to filter the database according to entered specific data such as the type of paper, batch number or grammage.

2. Click on the drop-down arrow (figure 23) of the button "Search in " and choose the desired filter option.

3. Enter the required search term.

4. The search term is applied to the database after entry.

» Press the Enter key or the "Search in" button to manually apply the search term to the database.

» To filter even more precisely, it is also possible to combine date filter and filter by search term.

5. By clicking on the column headings (e.g. ID), the list can be sorted in ascending or descending order.

7.2 Additional database functions

All data from the database can be deleted, further processed or exported.

7.2.1 Deleting measurements

- Mark the desired measurement series by clicking on the empty field in front of the "ID" column.

» To select an entire area, keep the Shift key pressed.

» To select several individual measurement series, keep the Ctrl key pressed.

- Click on the button "Delete"  to delete the marked measurement series.

» The marked measurements are irrevocably deleted from the database!

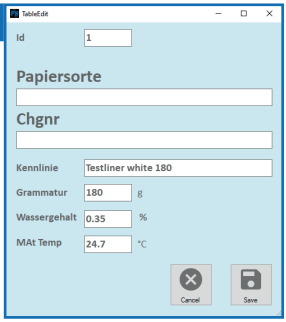
7.2.2 Edit measurements

1. Mark the desired measurement series by clicking on the empty field in front of the "ID" column.
2. Click on the button „Edit“  to edit the marked measurement series.

» The "TableEdit" window opens (figure 16).

3. Now you can change the paper type as well as the batch number.
4. Confirm your entry by clicking on Save  .

16



7.2.3 Printing measurements

- Click on the button „Print“  to print all measurements shown in the table.

» If a filter is set, only the records corresponding to the filter are printed.

7.2.4 Exporting measurements

- Click on the button "Export"  to export all measurements shown in the table.

» The export is possible in CSV, HTML or XML format.

» If a filter is set, only the records corresponding to the filter are exported.

8. Configuring the device

8.1 Sensor settings

- Open the sensor settings by clicking on the button "Settings"  .

8.1.1 Deactivating the "Measurement Valid" window

- Navigate to the tab "Common".
- Remove the tick from the setting "Show Measurement Valid Window".

» Now the "Measurement Successful" window is no longer displayed after a measurement has been completed.

» **If the "Measurement Valid" window is deactivated, your measurements are not saved in the archive.**

8.1.2 Updating the PMSA Firmware

Before starting the update

- Before starting the Firmware Update, contact Schaller Messtechnik GmbH (support@schaller-gmbh.at) to clarify if an update is necessary for your PMSA device.
- Attach the file „pmsa.log“ and the serial number of your device.

» The file „pmsa.log“ can be usually found in your public documents folder:

» "C:\Users\Public\Documents\Schaller Messtechnik GmbH\PMSA\log"

- If necessary, you will receive a new file from Schaller Messtechnik GmbH, which is matched to the serial number of your PMSA.

» **Do not install the update on another PMSA with a different serial number!**

ATTENTION

Do not install the update on another PMSA with a different serial number!
You can potentially render your device unusable trying to install a wrong update.

► Only install the update on the PMSA for the correct serial number.

Performing the Firmware Update

1. Check if the correct COM port is set (see 4.3 Setting the COM Port).
2. Navigate to the tab "Update" (figure 17).
3. Drag the Hex file into the text field (figure 18) or click [...] and select it using the file explorer.
4. Reset the PMSA (see 9.1 Resetting the hardware/device).
5. **Within 5 seconds** after resetting the device, click the button "Update" [Update].
6. The update starts now (figure 19).

   » The update process can take up to 2 minutes.
7. After the update has been completed your PMSA device is ready for use again.
8. If an "Error" message appears on the display (figure 20), please check whether the correct COM Port is set (see 4.3 Setting the COM Port).
9. Reset the PMSA again (see 9.1 Resetting the hardware/device) and **within 5 seconds** click the button "Update" [Update].

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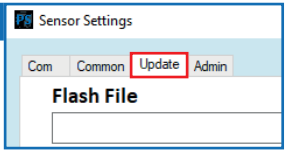

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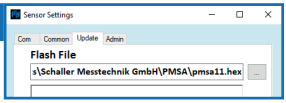

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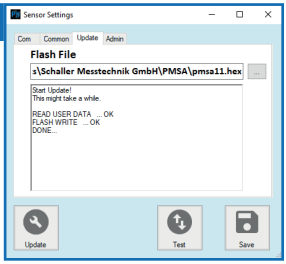

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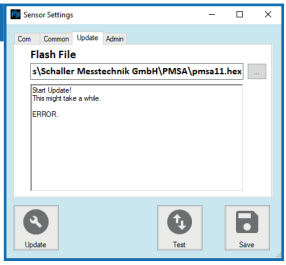

8.1.3 Entering the Admin password

- Navigate to the tab "Admin".
- Enter the Admin password.

8.2 Product types

- The creation of a new product type is described in a separate operating manual.

8.3 Selecting a language

- Open the language settings by clicking on the "Language" button  .

9. Cleaning and maintenance

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

9.1 Resetting the hardware/device

If the device has stopped operating for some reason, the hardware/device can be reset.

- Press the reset button on the back of the device (see "The rear of the main unit" page 3).
- The device will restart as soon as the reset button has been pressed.

9.2 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.
- During transport, secure the lid of the device against unintentional opening.
- Back up the measurement database at regular intervals.
- In the case of changes of the product types, also save the calibration curve database at regular intervals.

9.3 Cleaning the device

ATTENTION

Do not clean with fluids
Water or cleaning fluid getting inside the device can destroy the device.

► Only clean with dry materials.

ATTENTION

Sensitive sensor plate
The white sensor surface consists of a thin ceramic plate. This can be destroyed by mechanical pressure!

► Take care of the sensitive sensor surface during cleaning!

Metal housing

Clean the metal housing with a cloth and cleaning alcohol.

Infrared sensor

Do not touch the infrared sensor. Clean it by gently and carefully by blowing air on it (do not use compressed air.)

Sensor plate

Clean the sensor plate by carefully blowing it off (do not use compressed air).

10. 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. I.e. the material's temperature is lower than +10 °C or higher than +40 °C	The temperature of the material being measured has to be between +10 °C and +40 °C.
	Wrong product type	Check whether you have selected the right product type (product) before taking a reading. See 6.1 Selecting the product type).
	Insufficient grammage	Only paper with a grammage over 30 g/m² can be measured.
	Graphite paper	The device is not suitable for measuring moisture in paper containing graphite.
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 for your Log-Memorizer program.
The device does not respond	Software has crashed	Reset the device (perform a hardware reset). (See 9.1 Resetting the hardware/device).
Lid doesn´t close	Paper thickness higher than 0.8 mm	In this case contact Schaller Messtechnik GmbH.

11. Storage and disposal

11.1 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
- Storage temperature: -20 °C to +60 °C

11.2 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.

12. Device information

12.1 EC declaration of conformity

CE KONFORMITÄTSERKLÄRUNG
DECLARATION OF CONFORMITY

Name/ Adresse des Herstellers: *Name/ address of manufacturer:*	**Schaller Messtechnik GmbH** **Max-Schaller-Straße 99** **A – 8181 St. Ruprecht**
Produktbezeichnung: *Product designation:*	**Schaller**
Typenbezeichnung: *Type designation:*	**PMSA**
Produktbeschreibung: *Product description*	**Messgerät zur Bestimmung des Wassergehalts in Papier** ***Measuring instrument for determining the water content in paper***

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

Schaller
Messtechnik / humimeter.com
Schaller Messtechnik GmbH
Mag. - Schaller - Straße - 99
AT - 8181 St. Ruprecht a. d. Raab
www.humimeter.com | info@humimeter.com

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

UK CA DECLARATION OF CONFORMITY

Name/ address of manufacturer:	**Schaller Messtechnik GmbH** **Max-Schaller-Straße 99** **A – 8181 St. Ruprecht**
Product designation:	**Schaller**
Type designation:	**PMSA**
Product description:	**Measuring instrument for determining the water content in paper**

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
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12.2 Technical data

Measuring range	1 % to 20 % moisture content (product type dependant)
Resolution of the measure-ment	0.01 % moisture content 0.1 °C / 0.3 °F temperature
Operating temperature	+10 °C to +40 °C
Storage temperature	-20 °C to +60 °C
Temperature compensation	automatic
Paper sheet size	at least 180 x 180 mm
Paper sheet thickness	up to max. 0.8 mm (thicker on request)
Paper grammage	30 to 800 g/m²
Power supply	Power supply via PC 5VDC (USB connection)
Power consumption	60 mA
Menu languages	English, German, Portuguese
Dimensions	274 x 202 x 128 mm
Weight	4.7 kg
IP rating	IP 30

13. Notes

Climate
Environment

Materials

Food

Buildings

Bioenergy

Paper / Board

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

Schaller Messtechnik GmbH

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