Schaller
Messtechnik / humimeter.com

Moisture meter

Operating Manual

FSA grain moisture analyser

for determination of water content of whole grain

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

Version 3.0

Always read this operating manual before using the FSA!

Your FSA at a glance

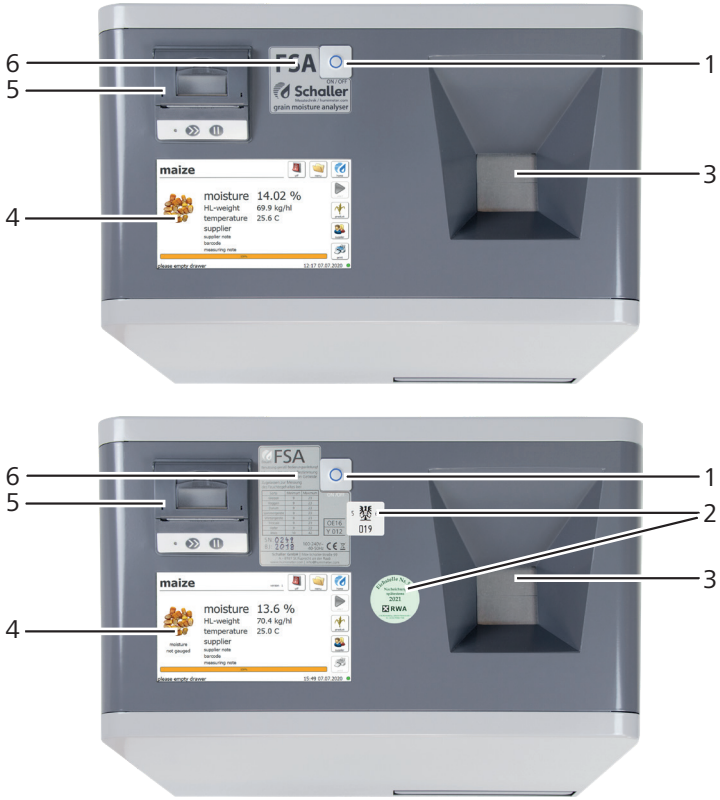
Overview ungauged device

No.	Name
1	Material funnel
2	Drawer
3	Cold appliance plug
4	Type label with serial number
5	Ethernet port
6	USB port
7	LCD display
8	Integrated printer

Overview gauged device

No.	Name
1	Material funnel
2	Drawer
3	Gauging seal
4	Cold appliance plug
5	Type label with serial number
6	Ethernet port
7	USB port
8	LCD display
9	Integrated printer

Overview top of the device - ungauged/gauged

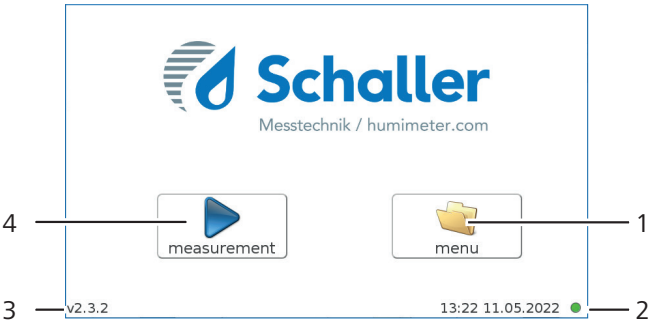


No.	Name
1	On/Off button
2	Gauging badge (only for gauged devices)
3	Material funnel
4	LCD display
5	Integrated printer
6	Device name

The menus

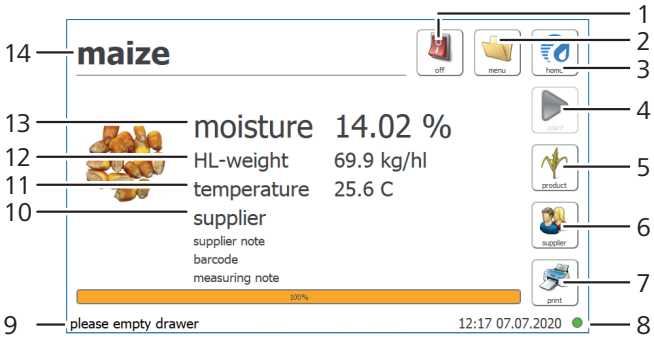
The device has three different menus: home, measuring window and main menu:

Home menu



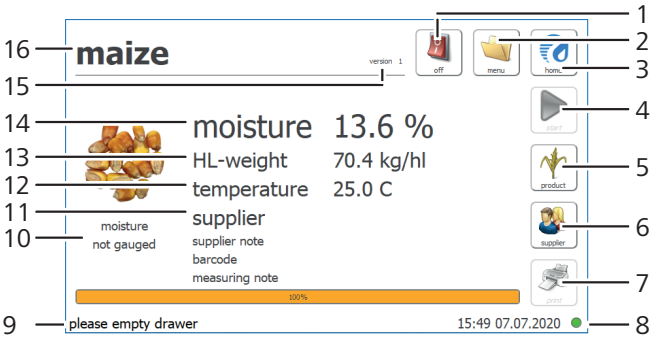
No.	Name
1	Main menu
2	Time and date
3	Version number
4	Measuring window

Measuring window ungauged device



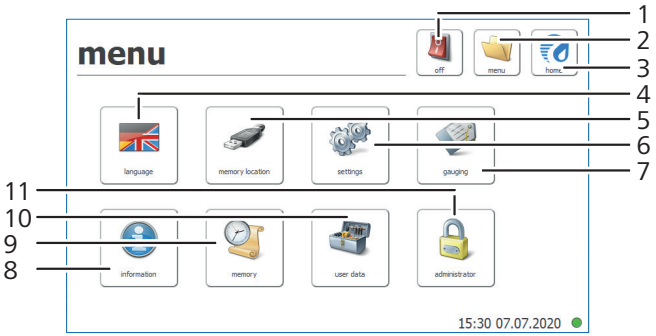
No.	Name
1	Switching off
2	Main menu
3	Home
4	Starting the measurement
5	Product selection
6	Supplier management
7	Printing the current measurement (see "5.4 Printing measured values")
8	Time and date
9	Note to empty the drawer
10	Supplier information
11	Material temperature
12	Hectolitre weight
13	Material moisture
14	Product name

Measuring window gauged device



No.	Name
1	Switching off
2	Main menu
3	Home
4	Starting the measurement
5	Product selection
6	Supplier management
7	Printing the current measurement (see "5.4 Printing measured values")
8	Time and date
9	Note to empty the drawer
10	Gauging information for selected calibration curve
11	Supplier information
12	Material temperature
13	Hectolitre weight
14	Material moisture
15	Gauging version
16	Product name

Main menu



No.	Name
1	Switching off
2	Main menu
3	Home
4	Language
5	Memory location
6	Settings
7	Gauging (only accessible for gauging authority)
8	Information
9	Memory
10	User data
11	Administrator

Table of contents

1. Introduction

1.1 Information about this operating manual

This operating manual is designed to enable you to use the FSA grain moisture analyser 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 FSA grain moisture analyser. 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.

WARNING

It is essential to observe this warning. Non-compliance can lead to serious irreversible or fatal injury.

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)
- Electrical equipment (Low Voltage Directive, LVD)
- Electromagnetic compatibility (EMC)
- Machinery

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

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

2.1 Proper use

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

2.2 Improper use

- The device must not be used in ATEX areas.
- The device is not suitable for measuring frozen material or material with a temperature of less than 5°C (gauged) and more than +40 °C (gauged).
- The device is not suitable for measuring frozen material or material with a temperature of less than 10°C (ungauged) and more than +50 °C (ungauged).
- The material must be clean or free of heavy contamination and/or foreign matter.
- The device is not waterproof and must be protected from water and fine dust (IP40).

2.3 User qualifications

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

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

2.4 Danger from electric current

WARNING

Electric shock

Danger to life due to electric shock when operating with a defective mains cable or defective device.

► Disconnect the device from the power supply and secure it against being switched on again.

Observe the following safety instructions to avoid hazards from electric current:

- Do not use a damaged power cable.
- A damaged power cable may only be replaced by the manufacturer, customer service or a similarly qualified person.
- Do not open any firmly screwed covers from the housing of the unit.
- Do not use the device if it shows any externally visible damage, e.g. to the housing, controls or connection cables, or if it malfunctions.
- A defective device may only be replaced by the manufacturer, customer service or a similarly qualified person. Do not repair the device yourself.
- Do not make any changes to the device, its components or accessories.

2.5 General safety information

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

- Do not reach into the interior of the device during operation.
- Keep the device and its power cable away from children under the age of 8.
- Disconnect the device from the power supply if it is to be left unattended for an extended period of time.
- Attention: Danger of tipping! Ensure that the device stands on a stable and level surface.

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.

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.
- Do not discard the packaging! In case of shipping the device, authorize a freight forwarder and use the original packaging. If your device has been delivered with an additional overpack (bigger cardboard box), always ship the device packed in both cardboard boxes.

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:

- FSA incl. transport lock
- drawer
- Schuko cable (CEE 7/7)
- measuring cup 0.5 litre
- 5 pcs. of paper rolls for printer
- Operating manual

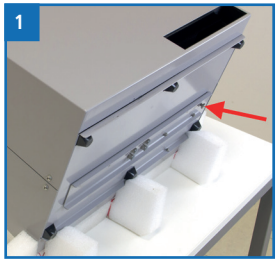
Optional accessories:

- humimeter USB data interface module - USB flash drive with software and USB-cable or download using humimeter.com/software
- Test equipment
- Laboratory analysis for creating a new calibration curve (product type)
- Entry of an existing calibration curve

3.3 Removing the transport lock

- Devices of serial number 0050 or higher are delivered with a transport lock (screw figure 1).
- Before starting the first measurement, the transport lock has to be removed.

» To loosen the screw, the device may only be tilted onto the rear side carefully.

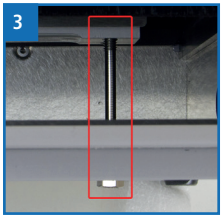

1

- Remove the marked screw (figure 2).

» Keep the screw in a safe place, as only the original screw has to be used for any further shipment.

- Before each transport, insert the screw again (figure 3).
- It is important that the screwing is done without any force. It should be screwable without much effort.

» If this is not possible, please contact Schaller Messtechnik GmbH.



3.4 Setting up the device

Note the following:

- Do not leave the device out in the rain. The device and its measuring chamber are not waterproof.
- Do not position the device in damp rooms.
- Place the device on a stable, level and dry surface.
- Do not expose the device to large quantities of dust.
- Do not expose the device to extreme temperatures.
- Protect the device from strong mechanical shocks and loads.
- Keep a sufficient distance of about 10 cm from the wall and other objects.
- Ensure that the power cable cannot be damaged by edges or hot surfaces.

CAUTION

Danger of tipping

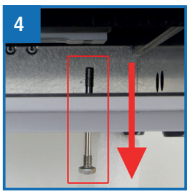
Risk of injury due to tipping device

► Place the device on a stable and level surface.

4. Using the device - Basics

4.1 Inserting the drawer

- Make sure that the transport lock has been removed (figure 4).
- Slide the drawer into the device (figure 5).



4.2 Plugging in the device

1. Make sure that the socket you want to use has the same electrical voltage as described on the name plate of the device.
2. Plug the power cable into the device (figure 6).
3. Plug the power cable into the power socket.

4.3 Switching the device on

» After plugging in the power cable, the device switches on automatically Or

- Press ○.
- The device will now power up.

» This may take a few seconds.

4.4 Taking a measurement

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

4.5 Switching the device off

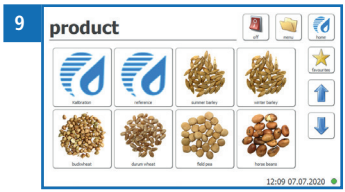
- Press ○ or ⏻ off.
- On the display appears the query of figure 7.
- Confirm by pressing **Yes**.

5. The measuring process

5.1 Preparing a measurement

To do so: The display has to show the measuring window (figure 8).

1. Press the button **Product**  .
2. Now select the required product type from all the types stored in the device (figure 9).



» A measuring process without selecting a product is not possible!

3. Before starting the measurement, you can create and select different supplier names (see "5.3 Managing supplier data").

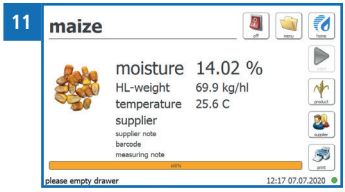
» The supplier's data is saved together with the measuring data and can also be found at the printout.

» The supplier's data can be modified or deleted at any time.

4. Now fill the material funnel with the material sample (approx. 450 ml) (figure 10).

» If there is not enough material in the measuring chamber, a new measurement has to be started.

5.2 Taking a measurement



- Press the button **Start**  . The measuring procedure will take about 30 seconds.
- As soon as the measurement is completed, the display shows the measuring results (figure 11). Supplier's data, barcode and a note have to be entered before starting a measurement.
- Finally empty the drawer. Only then a new measurement can be started.

ATTENTION

Crushing hazard

Risk of crushing due to the movement of the flap in the material funnel

► Keep any parts of the body away from the material funnel of the device.

Information - Measuring accuracy

To increase the measuring accuracy, take three measurements of the same material.

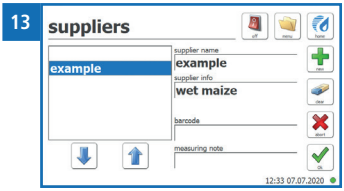
Information - Incorrect readings

Select the right product for your material and do not mix grain of different types. This prevents taking incorrect readings (see "12. Faults").

5.3 Managing supplier data

- To select or manage the suppliers stored on the device press the button **Supplier** .
- » The first line is empty. This line can be used when no supplier's name should be displayed (figure 12).
- » If no other supplier is selected, this "empty supplier" is used by default and no supplier data is displayed.
- In addition to the supplier data, further information can be added.
- » For that purpose, the fields **Barcode** and **Measuring note** can be used.

5.3.1 Creating a new supplier



- Press the button **New** .
- Enter the name of the supplier.
- » Additionally, further information about the supplier can be stored.
- Confirm by pressing **Ok** .

5.3.2 Selecting a supplier

- Select the required supplier from the list of stored suppliers (figure 14).

» Select the "empty supplier" if no supplier data should be displayed.

- Confirm by pressing **Ok**  .

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5.3.3 Modifying supplier data

- Select the required supplier from the list of stored suppliers.
- Modify the desired fields and confirm by pressing **Ok**  .

5.3.4 Deleting a supplier

- Select the supplier you want to delete from the list of stored suppliers (figure 15).
- Press the button **Clear**  .

» On the display appears the query of figure 16.

- Confirm by pressing **Yes**.

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5.4 Printing measured values

Pressing the button **Print**  , the current measurement will be printed.

To do so: A measurement has been carried out. The display shows figure 17.

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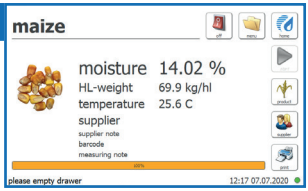
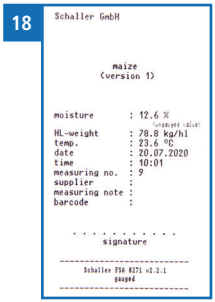
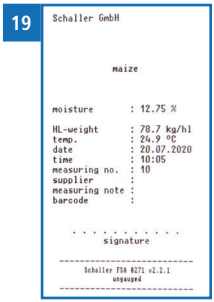


5.4.1 Gauged device

- Due the calibration law, a mandatory printout is made after verified measurements.
- The current measuring value is printed out (printout figure 18).



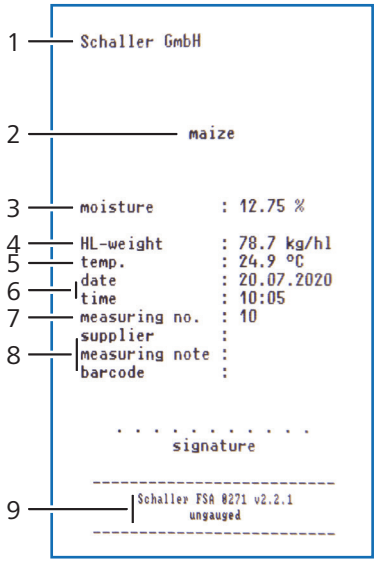


5.4.2 Ungauged device

- Press the button **Print**  .
- The current measuring value is printed out (printout figure 19).

5.4.3 Printout

- The printout contains the following information:



No.	Description
1	My device
2	Product
3	Water content
4	Hectolitre weight
5	Temperature
6	Date / Time
7	Current measurement number
8	Optional additional data
9	Device info

5.5 Viewing all measuring data (data storage)

To do so: A measurement was carried out.

- Press the button **Menu**  .
» The display will now show the main menu (figure 20).
- Press **Memory**  .
» The display will now show the previous measuring data (figure 21).
- Navigate through the measuring data using the buttons  and  .

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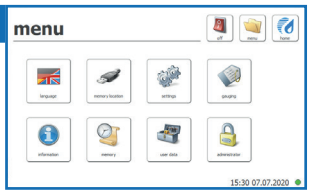

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5.5.1 Exporting all measuring data (data storage)

- Make sure that you have connected an USB stick to the device.
- Press the button **Export**  .
» There is the option of applying a filter for the measurements to be exported (figure 22).
» For using the filter function press the button **Filter**  .
- Press **Export**  .
» The selected measuring data is exported to the USB stick in form of a csv file.

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5.6 Deleting all measuring data (data storage) (only ungauged)

To do so: One or more measurements were carried out.

- Press the button **Menu**  .
» The display will now show the main menu (figure 23).
- Select the button **User data**  .
» The display will now show the options for deleting the measuring data or deleting the supplier's data (figure 24).
- Press **Delete measuring data**  .
» All saved measuring data has been deleted.

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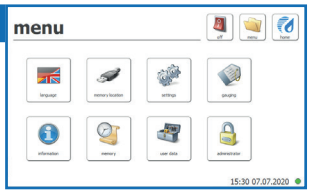

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6. Products and Calibration curves

Product name	Note	Complete measuring range	Gauged measuring range
durum wheat		8 - 25 %	9 - 23 %
oats		5 - 25 %	9 - 23 %
maize		8 - 50 %	10 - 42 %
rye		8 - 25 %	9 - 23 %
spring barley		8 - 25 %	9 - 23 %
triticale		8 - 25 %	9 - 23 %
wheat		8 - 25 %	9 - 23 %
winter barley		8 - 25 %	9 - 23 %
horse beans		8 - 20 %	-
buckwheat		5 - 20 %	-
spelt peeled		8 - 25 %	-
spelt unpeeled		8 - 20 %	-
field peas		8 - 20 %	-
millet peeled		5 - 20 %	-
millet unpeeled		5 - 20 %	-
scarlet runner beans		10 - 40 %	-
pumpkin seeds		3 - 15 %	-
linseed		5 - 14 %	-
rape		4 - 18 %	-
rice peeled		8 - 20 %	-
soybeans		8 - 25 %	-
sunflower seeds		8 - 25 %	-
sorghum millet		8 - 40 %	-
calibration	! Only for calibration and checking of the device !		
reference	! Only for calibration and checking of the device !		

On request, Schaller Messtechnik GmbH can develop customer-specific calibration curves for special product types. It is also possible to subsequently enter optionally available calibration curves into the device.

6.1 How moisture 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

%WG: Moisture content (in accordance with EN ISO 665:2001-02-01, EN ISO 712:2010-04-01 and EN ISO 6540:2010-07-15)

6.2 Notes for comparative measurement with oven-drying method

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

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

In the standards EN ISO 665:2001-02-01, EN ISO 712:2010-04-01 and EN ISO 6540: 2010-07-15 it is declared that the drying oven method provides no absolute values, but only comparable values.

6.3 Note regarding tolerances for deviations

For calibrated devices, the responsible gauging office (in Austria the BEV Bundesamt für Eich- und Vermessungswesen) stipulates tolerance variations, so-called calibration error limits and operating management error limits for the measurement of calibrated material types. Due to these tolerances, even validly calibrated devices from different producers may display slight deviations in the displayed measured values.

In Austria, the calibration error limits for cereals are +/- 3% of the displayed measured value.

(At 15% water content is this equal to +/- 0.45 %)

In Austria, the calibration error limits for maize are +/- 4% of the displayed measured value.
(At 25% water content is this equal to +/- 0.75 %)

In Austria, the operating management error limits for cereals are +/- 4 % and for maize +/- 6% of the displayed measured value
(At 20% water content is this equal to +/- 1.00 % or +/- 1.20 %)

7. Using the LogMemorizer program

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

7.1 Installing / opening the program

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

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

2. Open the **setup** application.
3. Follow the installation instructions.
4. Open LogMemorizer.

» The screen will now display the LogMemorizer's interface (figure 25).

» Before using LogMemorizer, please refer to the separate LogMemorizer operating manual for the correct configuration of the IP address.

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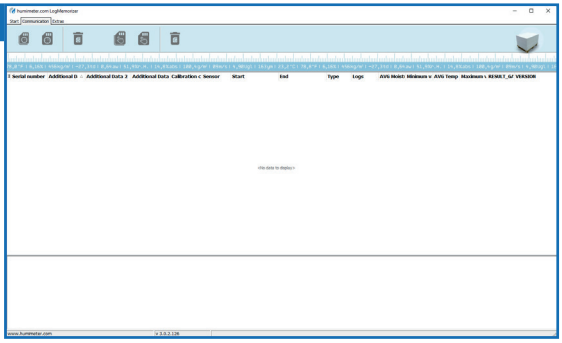

For more information on LogMemorizer, please refer to the separate LogMemorizer operating manual supplied with the device.

7.2 Exporting measured values to a computer

To do so: LogMemorizer must be installed. And you must have taken and saved one or several moisture readings.

The export can only be initiated at your computer.

Initiating the data export at your computer

Connect the FSA and PC to the same network:

1. Make sure that the PC is connected to a network.
2. Connect the network cable to the FSA (figure 26) and connect it to the same network the PC has been connected.
3. Open LogMemorizer on your computer.
4. Open the **Communication** tab in LogMemorizer (figure 27).
5. Select and click on one of the two buttons **Import all manual logs** (for importing all manually saved readings or **Import most recent manual log** (for importing the most recent manually saved log) (figure 28).

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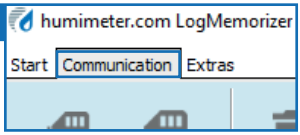

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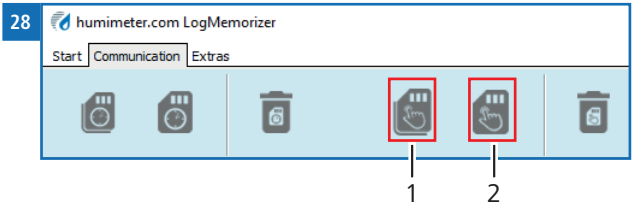


No.	Name
1	Import all manual logs
2	Import most recent manual log

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

8. Data access via REST interface

To do so: The REST interface has been activated on the device and is connected to the network.

8.1 Determining the network address of the device

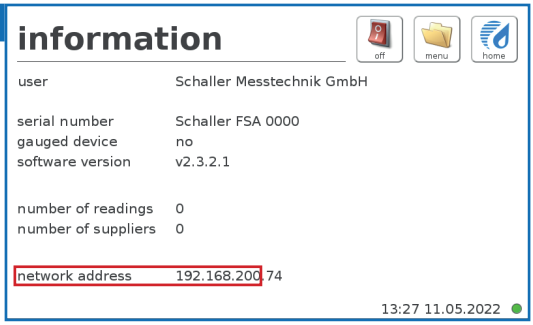
- When connecting to the network, your device should automatically be assigned a network address.

» Assigning a static network address directly on the device is not possible.

- Open the main menu and navigate to **Information** .

» The display will now show device information, such as the network address (figure 29).

29



- If your device has not been assigned a network address, disconnect and reconnect it to the network.

» In case no network address has been assigned despite disconnecting and reconnecting the network, please restart the device.

8.2 Retrieving measurement data via a browser

- To retrieve the data, the following data has to be entered in the address bar of the browser: IP address of the device determined in point 8.1, the port 8081, the storage location of the data and which data is requested.

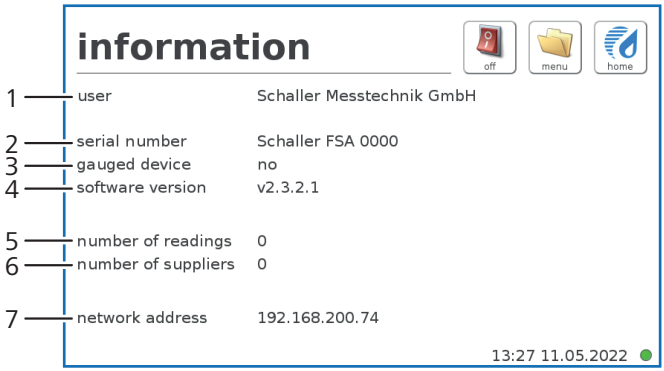
» The storage location of the data is **db**.

» There are 2 possibilities which data is requested: the last saved reading (**last**) or all saved readings (**all**).

» Example: 192.168.200.93:8081/db/last

9. Checking the device's status

- Open the main menu.
» Press the button **Menu**  .
- Press the button **Information**  .
» The display will now show the following information:



No.	Name
1	User (see "10.5 My device")
2	Serial number
3	Gauging status
4	Software version
5	Number of measurements
6	Number of suppliers
7	Network address

10. Configuring the device

10.1 Selecting a language

1. Press the button **Menu**  .
   » The display will now show the main menu.
2. Press the button **Language**  .
   » The display will now show all selectable languages.
3. Navigate through the selectable languages using the arrow keys  and  .
4. Select your desired language.
   » The setting has been saved and you are back in the main menu.

10.2 Adjust the date/time

1. Press the button **Menu**  .
   » The display will now show the main menu.
2. Press the button **Settings**  .
   » The display will now show the settings.
3. Press the button **Date/time**  .
   » Now adjust date and time.
4. Confirm by pressing **Save**  .
   » The settings have been saved and you are back in the settings.

10.3 Selecting °C/°F

1. Press the button **Menu**  .
   » The display will now show the main menu.
2. Press the button **Settings**  .
   » The display will now show the settings.
3. Press the button **Temperature**  .
   » Now you can select the desired temperature scale.
   » You can choose Celsius **°C** or Fahrenheit **°F.**
4. Confirm by pressing **Save**  .
   » The settings have been saved and you are back in the settings.

10.4 Device test

For the device test, see chapter "11.4 Checking the calibration".

10.5 My device

1. Press the button **Menu**  .
   » The display will now show the main menu.
2. Press the button **Settings**  .
   » The display will now show the settings.
3. Press the button **My device**  .
   » Here you can enter your company name and a note.
4. Confirm by pressing **Save**  .
   » The settings have been saved and you are back in the settings.

10.6 Log file

- Press the button **Menu**  .
» The display will now show the main menu.
- Press the button **Settings**  .
» The display will now show the settings.
- Press the button **Log file**  .

10.6.1 Log types

Three different log types can be selected:

1. **Info** 
» The device logs all device information.
2. **Error** 
» The device logs all errors that occur.
3. **Serious errors** 
» The device only logs the serious errors that occur on the device.

- For changing the log type, press the button corresponding to the desired type.
- Confirm by pressing **Save**  .
» The setting has been saved and you are back in the settings.

10.6.2 Export of saved logs

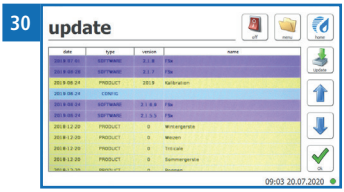
There is the possibility to export the logs that are already stored on the device.

- Make sure that an USB stick is connected to the device.
- Press the button **Export**  .
» Now the stored logs are transferred to the USB stick.
- Confirm by pressing **Save**  .
» The settings have been saved and you are back in the settings.

10.7 Update

There is the possibility to perform an update of the software or the calibration curves.

1. If you receive an update file from Schaller Messtechnik, the file has to be copied into the main directory via USB stick.
2. Plug in the USB stick containing the update into the device.
3. Press the button **Menu**  .
   » The display will now show the main menu.
4. Press the button **Settings**  .
   » The display will now show the settings.
5. Press the button **Update**  .
   » The display will now show the already performed updates in a navigable list (figure 30).



6. Press the button **Update**  .
7. Press **Yes** to start the update.
8. The device will restart now.
   » The update has been performed and you are back on the home screen.

10.8 Switch-off time

1. Press the button **Menu**  .
   » The display will now show the main menu.
2. Press the button **Settings**  .
   » The display will now show the settings.
3. Press the button **Switch off time**  .
   » Here you can set the time in minutes after which the device switches off.
4. Confirm by pressing **Save**  .
   » The settings have been saved and you are back in the settings.

10.9 Special products

1. Press the button **Menu** 

.

» The display will now show the main menu.

2. Press the button **Settings** 

.

» The display will now show the settings.

3. Press the button **Special products** 

.

» You will now be asked to enter the password for the product type calibration.

» The standard password up to version number 1.5.0 is the serial number of the device preceded by the letter "fsa".

» From version number 2.1.0 the standard password is only the serial number of the device.

4. The display will now show all product types stored in the device (figure 31).

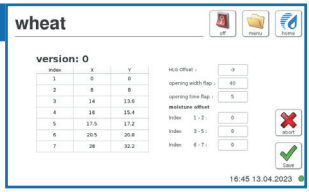
31

5. Select the desired product.

» The display will now show the stored calibration values (figure 32).

» Now you can modify the calibration values (see "10.9.1 Setting the offset").

32



6. Confirm your changes by pressing **Save** 

.

» The settings have been saved and you are back in the product list.

For changes of the calibration values, Schaller Messtechnik GmbH doesn't assume any liability!

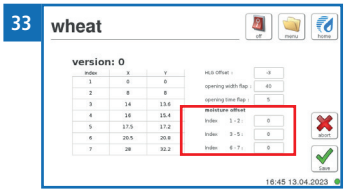
10.9.1 Setting the offset

By changing the offset, the displayed measurement values can be adapted to other norms/standards. The displayed measuring value is corrected by the entered offset.

Example:
An offset of 1.5 % applied to a measurement value of 10.0 % results in a displayed measurement value of 11.5 % in the selected range.
An offset of - 0.5 % applied to a measurement value of 10.0 % results in a displayed measurement value of 9.5 % in the selected range.

To do so: The device must be switched on and be in the special products menu level.

1. Select the required product.
2. The display now shows the detailed view of the selected product.
   - » In the detail view, three water content ranges are displayed (figure 33), for each of which an offset can be defined.
   - » The three water content ranges are calculated by the device per product.



3. Enter the desired offset at the associated water content range.
   - » Setting a negative offset is also possible!
   - » If a non-valid offset is entered, an error message appears on the display.
4. Confirm your changes by pressing **Save** Speichern.
   - » The set offset is now applied to the selected calibration curve and shown in the display.
   - » **The displayed measurement value now deviates from the standard calibration!**

11. Cleaning and maintenance

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

11.1 Care instructions

- Do not leave the device out in the rain. The device is not waterproof.
- Do not set up the device in damp rooms.
- Place the device on a stable, level and dry surface.
- Avoid excessive dust.
- Do not expose the device to extreme temperatures.
- Protect the device from strong mechanical shocks and loads.
- Keep a sufficient distance of about 10 cm to the wall and other objects.
- Ensure that the power cable cannot be damaged by edges or hot surfaces.

11.2 Cleaning the device

ATTENTION

Risk of crushing when the device is switched on

Danger of crushing due to the movement of the flap of the feed hopper

► Only clean the device when it is switched off.
► Before cleaning, switch off the device, unplug and secure it against being switched on again.

ATTENTION

Do not clean with fluids

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

► Only clean with dry materials.

Drawer

- Clean the drawer with dry compressed air, a cloth or a soft brush.

Interior of the device

- Before the cleaning, remove the drawer.
- » If necessary, tilt the device slightly forwards and backwards.
- Remove possible residues or dirt by blowing dry compressed air through the opening for the drawer or through the material funnel on the top of the device.
- » If necessary, slowly slide open the flaps of the material funnel.

Display / housing surfaces

- Clean the display and the housing surfaces with a cloth or a soft brush.

11.3 Replacing the printer paper roll

To do so: New paper roll required

1. Lift the tab of the printer all the way up (figure 34).
   - » The printer cover pops open.
2. Remove the empty paper roll.
3. Place a new, opened paper roll into the printer (figure 35).
4. Keep hold of the beginning of the paper roll and close the printer cover.
   - » The printer is now ready for use again (figure 36).

34

35

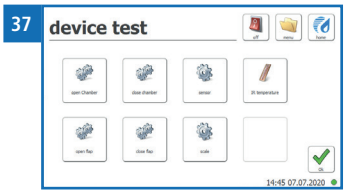
36

11.4 Checking the calibration

The device's calibration should be checked regularly.

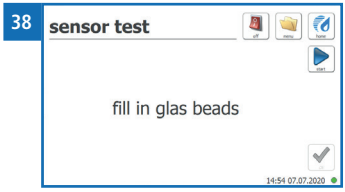
To do so: Optionally available test medium required

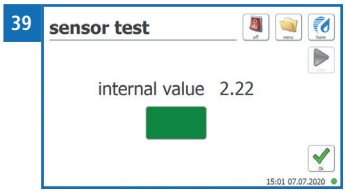
- Press the button **Menu**  .
» The display will now show the main menu.
- Press the button **Settings**  .
» The display will now show the settings.
- Press the button **Device test**  .
» The display will now show the options for checking the measuring accuracy (figure 37).



11.4.1 Sensor test

1. Press the button **Open Chamber** 
» By opening the measuring flaps completely, the flap opening adjusts itself correctly for the sensor test.
2. Check that the measuring chamber is free of impurities and other materials.
3. Press the button **Sensor**  .
4. Fill the material funnel with the optionally available glass beads.
» Make sure that no other material is in the material funnel.
5. Press the button **Start**  for starting the measurement (figure 38).
» Make sure that the measuring chamber is full with glass beads.





6. The display will show the current measuring value and the result of the test (figure 39).
» The result of the test is a green bar (if the test is ok) or a red bar (if the test is not ok).

7. Confirm the test by pressing **Ok**  .

» Now you are back in the device test menu.

11.4.2 Scale test

1. Press the button **Scale**  .

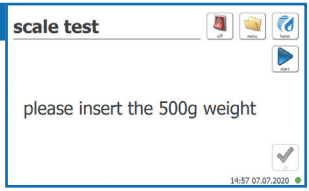
» The device now automatically determines the value without test weight (tare value) (figure 40).

» For the scale test two points are determined: the value without test weight and the value with the optionally available test weight of 500g.

40

2. After determining the tare value, you will be asked to place the 500g test weight on the measuring cell (figure 41).

41



» Position the test weight in the centre of the measuring cell. The dimensions of the test weight correspond to the width of the measuring cell (figure 42).

» The test weight must not have any contact with the material filling funnel!

42

3. Press the button **Start**  .

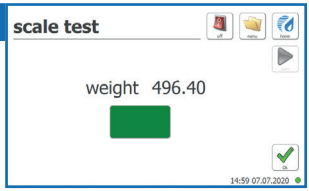
» The device now determines the value with test weight.

4. The display will show the current measuring value in grams and the result of the test (figure 43).

» The result of the test is a green bar (if the test is ok) or a red bar (if the test is not ok).

» Remove the test weight.

43



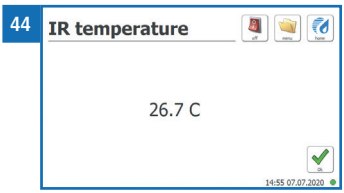
5. After removing the test weight, confirm by pressing **Ok**  .

» Now you are back in the device test menu.

11.4.3 Infrared temperature

- Press the button **IR Temperature** .
- The display will show the currently measured infrared temperature in the measuring chamber of the device (figure 44).
- Confirm the test by pressing **Ok** .

» Now you are back in the device test menu.



12. 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 outside the ungauged application range: Material below +10 °C or above +50 °C	The temperature of the material being measured has to be between +10 °C and +50 °C.
	The temperature of the material being measured is outside the gauged application range: Material below +5 °C or above +40 °C	The temperature of the material being measured has to be between +5 °C and +40 °C.
	Temperature discrepancy between device and material being measured	Let the temperature approximately adjust to the material being measured.
	Wrong calibration curve	Check whether you have selected the right calibration curve (product) before taking a reading (see "6. Products and Calibration curves").
	Mouldy or rain wet material	The accuracy decreases significantly.
	Stored and fermented corn from whole grain silage	May lead to a too high displayed measuring value.

Fault	Cause	Remedy
	Frozen material or material mixed with snow	The accuracy decreases significantly.
	Contaminated material	Highly contaminated material such as long ears of barley or foreign material can strongly influence the measuring result.
Data transfer to LogMemorizer failed	Interface has not been configurated	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 LogMemorizer program.
Measuring device does not boot any more.	The overvoltage and temperature protection of the FSA may have been triggered	Disconnect the device from the power supply and wait for about 4 hours. After that the overvoltage protection should have been reactivated. Restart the device and repeat the procedure. If the problem recurs, contact Schaller Messtechnik GmbH.
Display does not respond	Operating system crash	Disconnect the device from the power supply and restart it. If the problem recurs, contact Schaller Messtechnik GmbH.

12.1 Possible error messages

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
Sensor calibration out of tolerance ERROR: 10	Heavy contamination in the measuring chamber or defective measuring chamber	Thoroughly clean the interior of the FSA (see "11.2 Cleaning the device"). Otherwise contact Schaller Messtechnik GmbH.
Scale calibration out of tolerance ERROR: 11	Material sticks in the load cell area or defective load cell	Thoroughly clean the interior of the FSA through the lid opening (see "11.2 Cleaning the device").
Not enough material filled! ERROR: 50	Insufficient material in the filling hopper or mechanical damage of the broom mechanism in the device	If the problem recurs, increase the amount of material and observe how the material trickles into the measuring chamber. If the broom interferes with the process, contact Schaller Messtechnik GmbH.
Flap blocked! Please clean ERROR: 22	Material blocking the measuring chamber flap. Can occur with rapeseed, millet or sorts with a high starch content.	Thoroughly clean the interior of the FSA through the drawer opening (see "11.2 Cleaning the device").
Chamber blocked. Please clean. ERROR: 20	Material in the material opening or mechanism. Can occur with rapeseed, millet or sorts with a high starch content.	Thoroughly clean the interior of the FSA through the material opening (see "11.2 Cleaning the device").
Temperature out of range. ERROR: 12	Temperature of the measured material outside the ungauged application range: Material below +10 °C or above +50 C°	Use samples with a temperature above +10 °C or below +50 °C.
Temperature out of range ERROR: 12	Temperature of the measured material outside the gauged application range: Material below +5 °C or above +40 C°	Use samples with a temperature above +5 °C or below +40 °C.

Fault	Cause	Remedy
Chamber broken ERROR: 21	Multiple blockage of the material opening	Thoroughly clean the interior of the FSA through the material opening (see "11.2 Cleaning the device"). If the problem recurs, contact Schaller Messtechnik GmbH.
Flap broken ERROR: 23	Multiple blockage of the lid	Thoroughly clean the interior of the FSA through the drawer opening (see "11.2 Cleaning the device"). If the problem recurs, contact Schaller Messtechnik GmbH.
Top sensor motor broken. ERROR: 30		Restart the device. If the problem recurs, contact Schaller Messtechnik GmbH.
Bottom sensor motor broken. ERROR: 31		Restart the device. If the problem recurs, contact Schaller Messtechnik GmbH.
Sensor drawer broken. ERROR: 32	Material adhering to, or a missing drawer sensor	Clean the contact point on the back side of your measuring drawer and visually inspect the drawer and its sensor.
Fill level sensor broken. ERROR: 33	Heavy contamination in the measuring chamber by dust	Thoroughly clean the interior of the FSA (see "11.2 Cleaning the device"). Otherwise contact Schaller Messtechnik GmbH.
Sensor weight cell broken. ERROR: 34	Heavy contamination in the measuring chamber by dust	Thoroughly clean the interior of the FSA (see "11.2 Cleaning the device"). Otherwise contact Schaller Messtechnik GmbH.
Temperature sensor MLX broken ERROR: 35	Heavy contamination in the measuring chamber by dust	Thoroughly clean the interior of the FSA (see "11.2 Cleaning the device"). Otherwise contact Schaller Messtechnik GmbH.
Cannot write file. ERROR: 64		Restart the device and repeat the procedure. If the problem recurs, contact Schaller Messtechnik GmbH.

Fault	Cause	Remedy
Invalid update version. ERROR: 54		Contact Schaller Messtechnik GmbH.
Printer has no paper. ERROR: 45	Printer is low on paper.	Insert a new paper roll.
Printer is offline. ERROR: 46	Communication problem between the printer and the FSA.	Restart the device. If the problem recurs, contact Schaller Messtechnik GmbH.
Touch calibration not possible. ERROR: 65	Incorrect use of the touch calibration function or defective display.	Restart the device and repeat the procedure. If the problem recurs, contact Schaller Messtechnik GmbH.
System error ERROR: 63		Restart the device and repeat the procedure. If the problem recurs, contact Schaller Messtechnik GmbH.

13. Transportation, storage and disposal

13.1 Transporting the device

ATTENTION

Damage due to improper transport

The device can be damaged or ruined by a dispatch with various parcel services or by post.

- ► Only ship the device in its original packaging.
- ► Only ship the device by a freight forwarder.

Before transporting the device, carry out the following activities:

1. Remove the drawer. It must not be inside the measuring device during transport or shipment.
2. Insert the transport lock. During transport or shipping, the transport lock must be inserted in the device.

3. Only pack the device in its original packaging.
4. Only ship the device on a pallet.
5. If your device has been delivered with an additional overpack (bigger cardboard box), always ship the device packed in both cardboard boxes.
6. Follow the instructions on the transport label on the packaging.

13.2 Storing the device

Store the device under the following conditions :

- Do not store outdoors.
- Store in a dry and dust-free place.
- Protect the device from sunlight.
- Avoid mechanical shocks/loads.
- Storage temperature: +10 °C to +50 °C
- Storage humidity: 20% rel. air humidity – 80% rel. air humidity not condensed

13.3 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.

14. Device information

14.1 CE 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:*	**FSA**
Produktbeschreibung: *Product description*	**Messgerät zur Bestimmung des Wassergehalts in Lebensmitteln** ***Measuring instrument for determining the water content in foodstuffs***

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***
Niederspannungsrichtlinie 2014/35/EU	***Low Voltage Directive 2014/35/EU***
Maschinenrichtlinie 2006/42/EG	***Machinery Directive 2006/42/EG***

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.*

EN ISO 12100:2011 **EN ISO 12100:2013**	Allgemeine Gestaltungsleitsätze - Risikobeurteilung und Risikominderung *Safety of machinery - General principles for design - Risk assessment and risk reduction*
EN ISO 13857:2020-04	Sicherheit von Maschinen - Sicherheitsabstände gegen das Erreichen von Gefahrstellen mit den oberen Gliedmaßen und unteren Gliedmaßen *Safety of machinery - Safety distances to prevent hazard zones being reached by upper and lower limbs*
DIN EN ISO 13854:2020-01 *ersetzt / replaced* **EN 349**	Sicherheit von Maschinen – Mindestabstände zur Vermeidung des Quetschens von Köperteilen *Safety of machinery - Minimum gaps to avoid crushing of parts of the human body*
EN ISO 13849-1	Sicherheit von Maschinen – Sicherheitsbezogene Teile von Steuerungen – Teil 1: Gestaltungsleitsätze *Safety of machinery - Safety-related parts of control systems - Part 1: General principles for design*

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

For the above 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, 18.07.2022

Schaller Messtechnik / humimeter.com
Schaller Messtechnik GmbH
Dipl.-Ing. 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:	**FSA**
Product description	**Measuring instrument for determining the water content in foodstuffs**

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**
- **Supply of Machinery (Safety) Regulations 2008 Great Britain**
- **Electrical Equipment (Safety) Regulations 2016 Great Britain**

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.

EN ISO 12100:2011 **EN ISO 12100:2013**	Safety of machinery - General principles for design - Risk *asassessment and risk reduction*
EN ISO 13857:2020-04	Safety of machinery - Safety distances to prevent hazard zones being reached by upper and lower limbs
DIN EN ISO 13854:2020-01 replaced **EN 349**	Safety of machinery - Minimum gaps to avoid crushing of parts of the human body
EN ISO 13849-1	Safety of machinery - Safety-related parts of control systems - Part 1: General principles for design

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, 18.07.2022

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14.2 Technical data

14.2.1 General

Display resolution	0.1 °C temperature 0.1 kg/hl hectolitre weight
Operating temperature	+10 °C to +50 °C
Storage temperature	+3 °C to +50 °C
Temperature sensor	Infrared (contactless)
Temperature compensation	automatic
Sample quantity	approx. 450 ml
Power supply	100-240 VAC 1A, 50-60 Hz
Plug	Schuko plug CEE 7/7
Display	7 inch color touch display
Dimensions (WxDxH)	440 x 310 x 430 mm
Weight	15 kg
IP rating	IP 40

14.2.2 Ungauged device

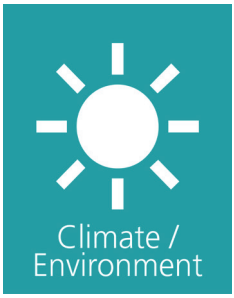
Display resolution	0.01% water content
Measuring range	3 to 50% water content (dependent on product type)
Material temperature	+10 °C to +50 °C

Use only in closed rooms between +10°C and +50°C / 20% rel. humidity - 80% rel. humidity not condensed.

14.2.3 Gauged device

Display resolution	0.1% water content
Measuring range	9 to 42% water content (dependent on product type)
Material temperature	+5 °C to +40 °C

Approved for gauged use only in closed rooms between +3°C and +40°C / 20% rel. humidity - 80% rel. humidity not condensed.



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

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