Manual

Pressure and temperature measuring system GrindControl

Translation

Retsch®

Table of Contents

1 Notes on the manual

This manual provides technical guidelines for the safe operation of the device. Read this manual through carefully before installing, putting into service and operating the device. Reading and understanding this manual is essential for handling the device safely and as intended.

This manual does not contain any repair instructions. Please contact your supplier or contact Retsch GmbH directly if anything is unclear or you have questions about these guidelines or the device, or in the case of any faults or necessary repairs.

You can find further information about your device at **https://www.retsch.com** on the pages for the specific device concerned.

1.1 Disclaimer

This manual has been prepared with great care. We reserve the right to make technical changes. We assume no liability for personal injuries resulting from the failure to follow the safety information and warnings in this manual. No liability will be assumed for damage to property resulting from the failure to follow the information in this manual.

1.2 Copyright

1.3 Explanation of signs and symbols

The following signs and symbols are used in this manual:

Signs and symbols	Meaning
ⓘ	Indicates a recommendation and/or important information.
Bold type	Indicates an important term.
• < Point 1> • < Point 2> • < Point 3>	List of equivalent points.
⇨	Steps for following an instruction.

1.4 Explanations of the Safety Instructions

DANGER D1.0000

Risk of fatal injuries
Source of danger

– Possible consequences if the danger is ignored.

- **Instructions and information on how to avoid the risk.**

Fatal or serious injuries may result if the “Danger” sign is disregarded. There is a **very high risk** of a life-threatening accident or lasting personal injury. The signal word **DANGER** is additionally used in the running text or in instructions.

WARNING W1.0000

Risk of life-threatening or serious injuries
Source of danger

– Possible consequences if the danger is ignored.
- **Instructions and information on how to avoid the risk.**

Life-threatening or serious injuries may result if the “Warning” sign is disregarded. There is an **increased risk** of a serious accident or of a possibly fatal personal injury. The signal word **WARNING** is additionally used in the running text or in instructions.

CAUTION C1.0000

Risk of injuries
Source of danger

– Possible consequences if the danger is ignored.
- **Instructions and information on how to avoid the risk.**

Average to slight injuries may result if the “Caution” sign is disregarded. There is an average or slight risk of an accident or personal injury. The signal word **CAUTION** is additionally used in the running text or in instructions.

NOTICE N1.0000

Type of damage to property
Source of the damage to property

– Possible consequences if the information is ignored.
- **Instructions and information on how to avoid the damage to property.**

Damage to property may result if the information is disregarded. The signal word ***NOTICE*** is additionally used in the running text or in instructions.

1.5 Confirmation Form for the Managing Operator

This Manual contains fundamental information concerning the use of this software which must be followed. It must be read by the operator and by the technical personnel responsible for the software prior to use of the software. This Manual must be available at the application site at all times.
The operator of this software hereby confirms to the operating company (owner) that he has received sufficient instruction in operation of the software. The operator has been given and has taken note of the Manual, and consequently has all information required for safe use of it and is sufficiently familiar with the software.
For your own protection as operating company, have your staff confirm that they have received instruction on how to use the software.

I have taken note of all chapters in this Manual and of all safety instructions and warnings.

Operator
Last name, first name (in capitals)
Position within the company
Signature

Service technician or operator
Last name, first name (in capitals)
Position within the company
Place, date and signature

2 Scope of delivery

2.1 Scope of delivery of the GrindControl for MM 500 nano, MM 500 control or Emax

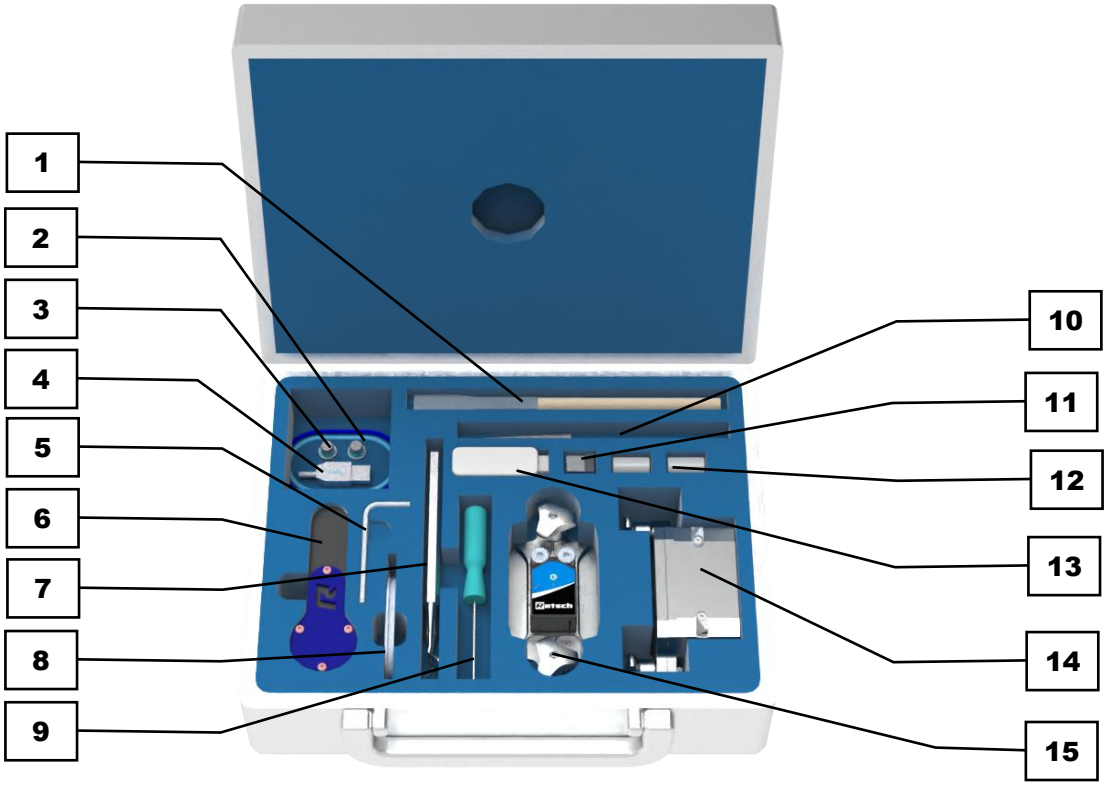

Abb. 1: Scope of delivery

No.	Component
1	Cleaning brush
2	Large O-rings
3	Sinterfilter with small O-ring
4	USB extension cable
5	Allen key, 4 mm
6	Opening aid
7	Cleaning hook and spatula
8	Lid base plate
9	Hexagon screwdriver, 1,5 mm
10	Cleaning brush
11	USB dongle
12	Battery type SL-550/S ½ AA
13	USB stick with GrindControlCenter software
14	Grinding jar
15	Grinding jar lid with GrindControl

2.2 Scope of delivery of the GrindControl for PM 100, PM 300 or PM 400

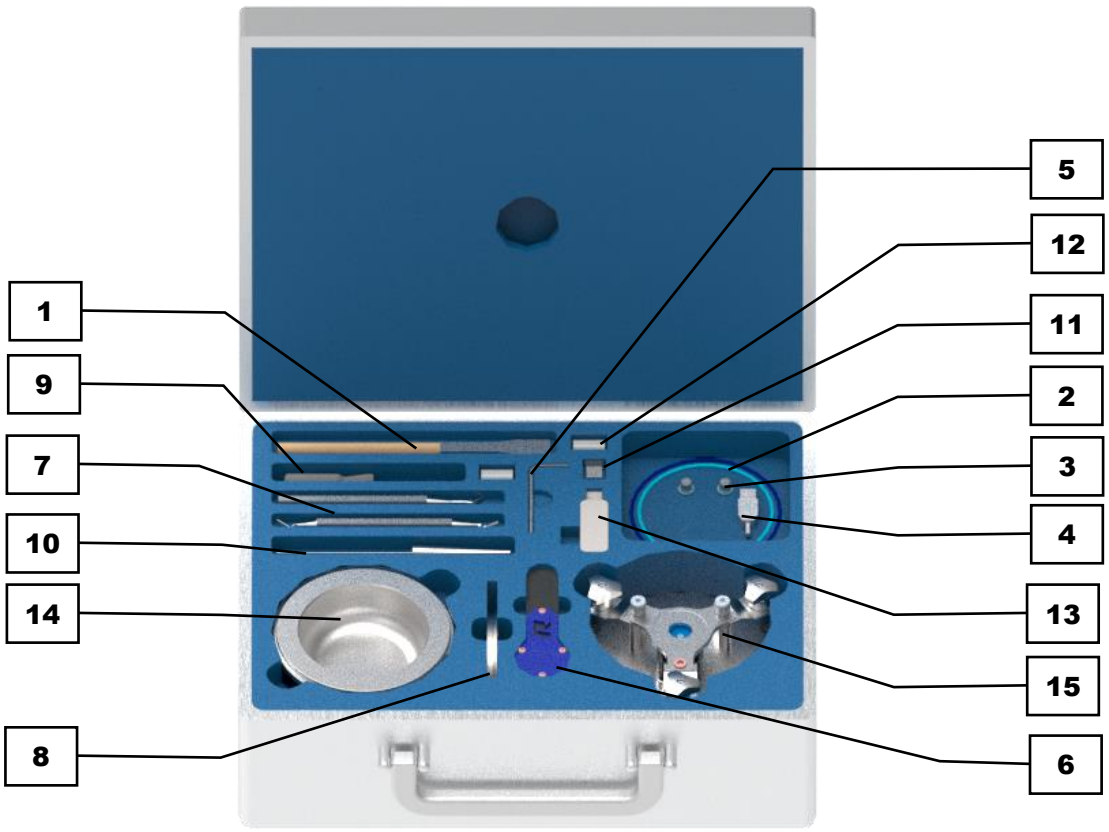

Abb. 2: Scope of delivery

No.	Component
1	Cleaning brush
2	Large O-rings
3	Sinterfilter with small O-ring
4	USB extension cable
5	Allen key, 4 mm
6	Opening aid
7	Cleaning hook and spatula
8	Lid base plate
9	Hexagon screwdriver, 1,5 mm
10	Cleaning brush
11	USB dongle
12	Battery type SL-550/S ½ AA
13	USB stick with GrindControlCenter software
14	Grinding jar
15	Grinding jar lid with GrindControl

3 Technical Data

3.1 Operation

ⓘ The GrindControl can be used together with the following Retsch mills:

- MM 500 nano
- MM 500 control
- Emax
- PM 100
- PM 100 CM (discontinued model)
- PM 300
- PM 400

NOTICE The GrindControl for the planetary ball mills is only compatible with the EasyFit grinding jars. Grinding jars in comfort design have different dimensions and are not compatible.

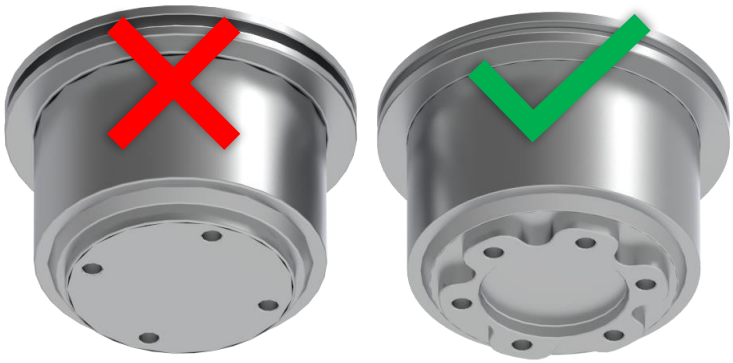

Fig. 3: Grinding jar in comfort design (left) and EasyFit design (right)

⚠ WARNING W2.0000

In addition comply with the manual for your ball mill!

This document is only intended as a guide to use of the GrindControl. Its safe use with a ball mill is the prerequisite for deployment of the GrindControl.
Play particular attention to information in your ball mill manual concerning ball sizes and loading.

The present sensor unit and the GrindControl software are used for continuous recording of the state variables pressure and temperature in a grinding jar. The measured values of the sensors located in the grinding jar cover are transmitted wirelessly to a receiving system on the PC. The temperature sensor is thermally decoupled from the grinding jarcover and measures the gas temperature in the grinding chamber. The pressure sensor measures the difference between the gas pressure inside the grinding bowl and the ambient pressure.

The transmitted data are displayed and stored in the software. The data can be exported from the software. The following steps are required in this context:
1. Creation of a measurement
2. Preparation of the device, sensor unit(s) and software

3. Execution of the measurement
4. Export measurement data

The measurement data includes all settings and log entries stored in the measurement task.

3.2 Temperature range

The temperature inside the grinding jar may range between -25°C and 90°C. If the temperature exceeds 90°C, a warning message will be displayed on the screen.
The sensor unit on the lid must not exceed a maximum temperature of 110 °C.

NOTICE Monitor the temperature of the sensor unit at regular intervals in order to prevent any damage to the measurement electronics.
NOTICE Low temperature ranges may affect the lifetime of the battery andthus result in a shortened battery life.

Measured value resolution of the temperature: 0.2 °C
Accuracy of the temperature measurement:± 1 %
This accuracy can only be guaranteed for the temperature range from 0 °C to 70 °C.
If the sensor unit is operated beyond this temperature range, measured value deviations may occur.

3.3 Pressure range

Maximum permissible pressure range inside the grinding jar: 5.0 bar (500 kPa)

Measured value resolution of the pressure: maximum 50 mbar

3.4 Speed range

All speeds that can be set on the GrindControl compatible devices are permissible.

3.5 Transmission range

The transmission has a range of up to 5 m.
However, the actual available range depends on the local conditions as well as the interference signals on site.

The most stable connection between the transmitter (sensor unit within the device) and the receiver (USB dongle) is achieved when there are no sources of interference between the device in which the grinding is carried out and the USB dongle. Sources of interference are, for example, electronics in the form of the display and control unit. It is recommended to place the USB dongle on the left side of the device during operation.

3.6 Transmission rate

Measured value transmission from sensor unit to software: 1 value/second

3.7 Operating time

Operating time when the battery is fully charged: 40 hrs - 80 hrs
The duration depends on location-dependent factors, such as temperature and measurement-specific parameters, for instance, duration and frequency of use.

4 Software

4.1 System requirements

- Windows 10(32/64bit)
- Screen resolution1920 x 1080 or 1920 x 1200
- USB interface (version 2.0 or higher)
- The user must have local administrator rights for the installation.
- All energy saving functions of the PC system must be switched off.
- Use a CPU with at least two computing cores (dual-core CPU).

4.2 Installation of the GrindControl Center software

- Use Windows Update in order to check whether any important updates for .Net Framework are available.
- Start the Setup.exe from the supplied USB stick and then follow the user guidance.
- The programme will be installed in the folder C:\Program Files (x86)\Retsch\GrindControlCenter\.
- A shortcut will be placed on the desktop.

Abb. 4: Shortcut on the desktop

NOTICEPrior to the installation of a new software version, all previously saved measurement results should be exported to avoid any data loss.

4.3 Starting the GrindControl Centre software

Start the software by double-clicking on the link. Use the enclosed Bluetooth USB dongle in order to have full access to all functions of the software.
Do not remove the USB dongle during the entire use of the GrindControl software because any unsaved measurement data will be lost!

NOTICEIf the GrindControl software is started without using a Bluetooth USB dongle, the software switches to offline mode and the following message will be displayed:

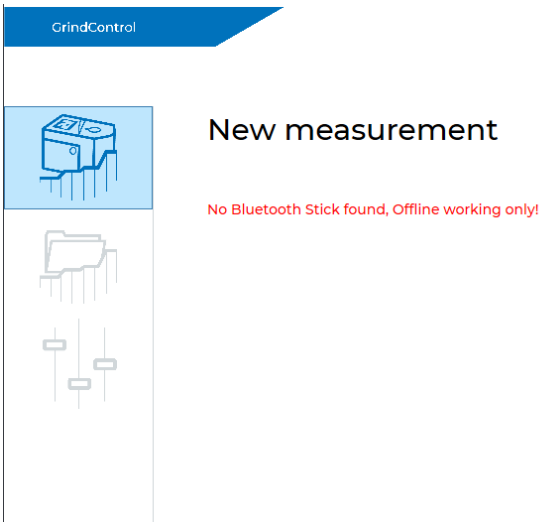

Abb. 5: Starting the software without a Bluetooth USB dongle

NOTICENo new measurements can be created in offline mode.
However, existing measurements can be managed.

4.4 Software interface

After starting the GrindControl Center software, the programme window opens, from which all software functions may be accessed. The software is split into three functional areas.

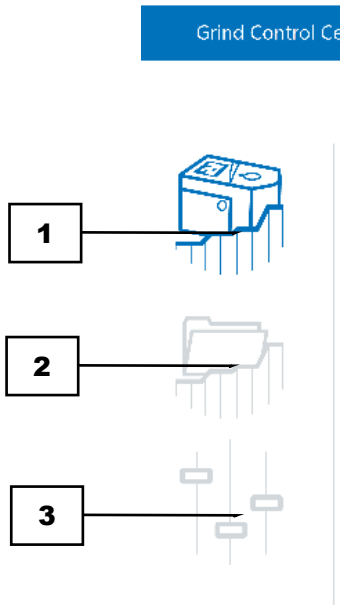

Abb.6: Functional areas of the GrindControl Center software

No.	Component	Function
S1	New test run	In this area, new test runs may be created and templates may be saved.
S2	Manage measurement	All existing measurements are listed in this area.
S3	Settings	The general settings for the GrindControl Center software may be set up here, e.g. setting up existing sensors or managing the display settings.

4.4.1 New test run

In the New Test Run (S1) functional area, new test runs may be created and templates saved.

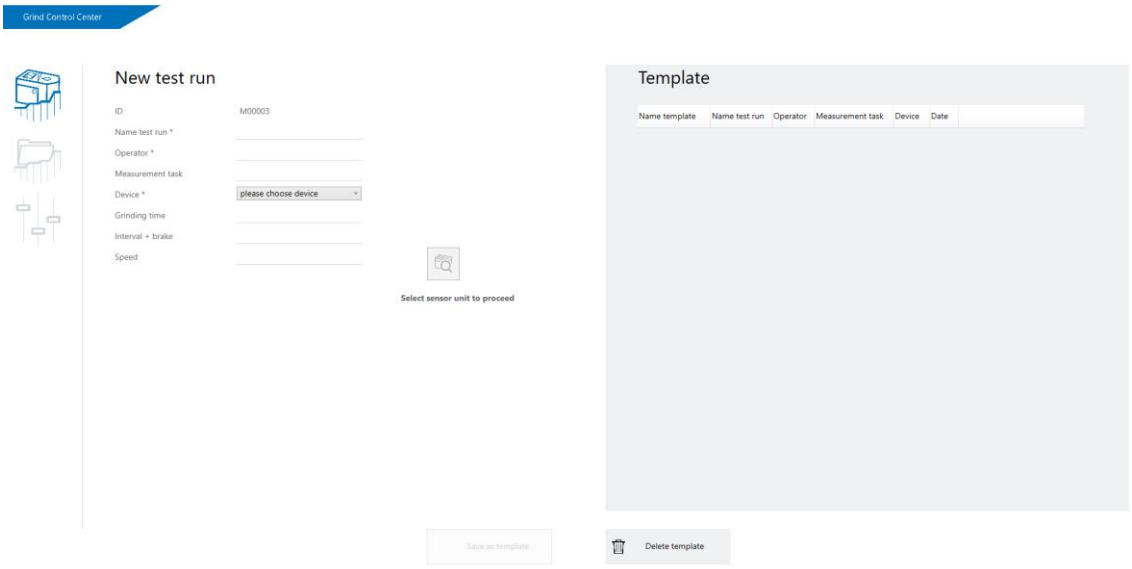

Abb.7: Functional area – New Test Run

The software automatically assigns a unique ID to each test run (1.1). A name (1.2) and an operator (1.3) must be entered for the test run and the device (1.4) must be selected. This information is mandatory. After the entry, the button for selecting the sensor unit (1.5) is activated. Select the button to open the selection window.

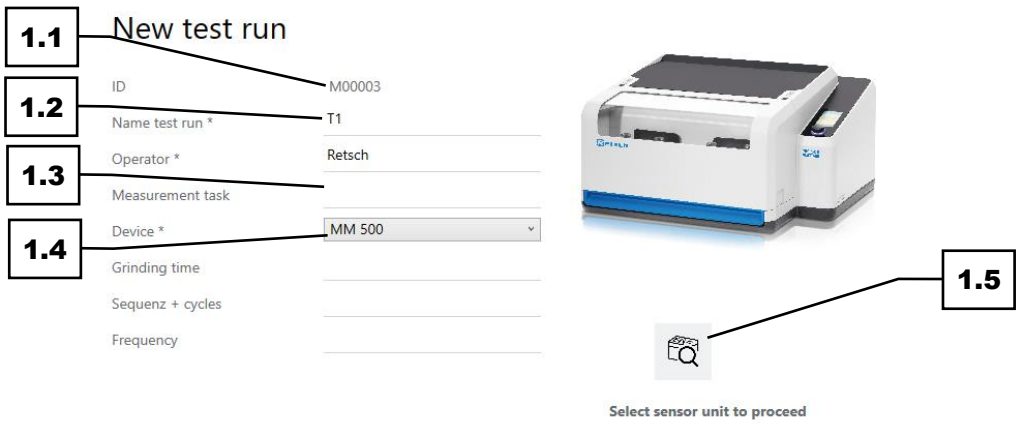

Abb. 8: Setting up a new test run

No.	Component	Function
1.1	Test run ID	Value automatically assigned by the system for the test run. This value cannot be changed.
1.2	Name of the test run	Individually assigned name for the test run.
1.3	Test run operator	Operator who creates or carries out the test run.
1.4	Device	To select on which device the test run is to be carried out.
1.5	Button for selecting the sensor unit	Opens another window to select the sensor unit for the test run.

To select the sensor unit(s) to be used for the measurement, click on the greyed-out button (1.6). The button of the selected sensor unit(s) turns green.
One or two sensor units may be used simultaneously for a test run. This depends on the device used for grinding.

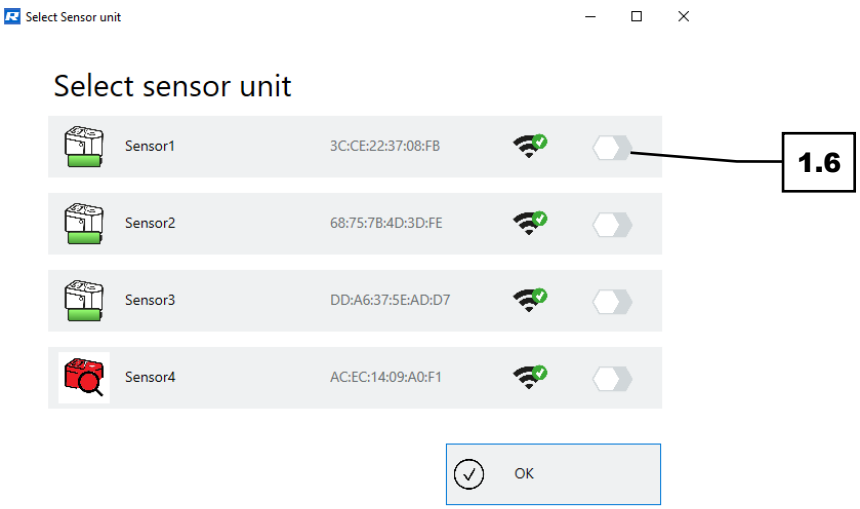

Abb.9: Display of the available sensor units

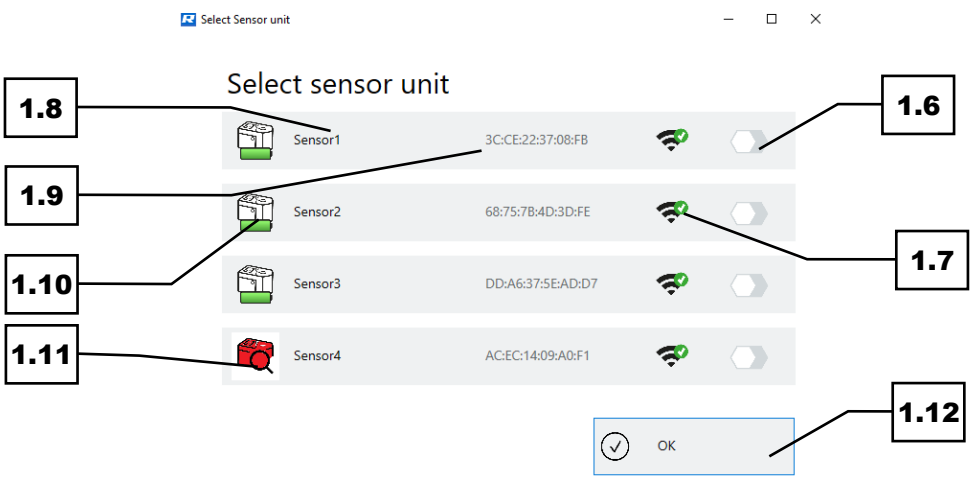

Abb. 10: Selecting the sensor unit

No.	Component	Function
1.6	Sensor unit selection button	Selection of the sensor unit for the test run. A grey status means not selected. A green status means selected.
1.7	Bluetooth connection	Status of the Bluetooth connection between the sensor unit and the Bluetooth USB dongle. The green tick icon indicates an active connection. The icon without a tick indicates no connection.
1.8	Sensor unit name	Name assigned to the sensor unit. The name may be adjusted in the settings.
1.9	MAC address	MAC address of the sensor. This value cannot be changed.
1.10	Battery indicator	Charge status of the battery for the sensor unit. Green indicates a sufficient charge. Red indicates a low charge. The sensor unit needs to be charged.
1.11	Sensor unit defective	The sensor unit is defective and cannot be used.
1.12	OK button	Confirmation of the selected sensor unit(s).

Confirm the selection with OK (1.12) to return to the New Test Run (1) functional area. Previously selected sensor units (1.13) are displayed there, and specific parameters (1.14) may be added for each sensor unit. To do this, you must click on the sensor unit (1.13).

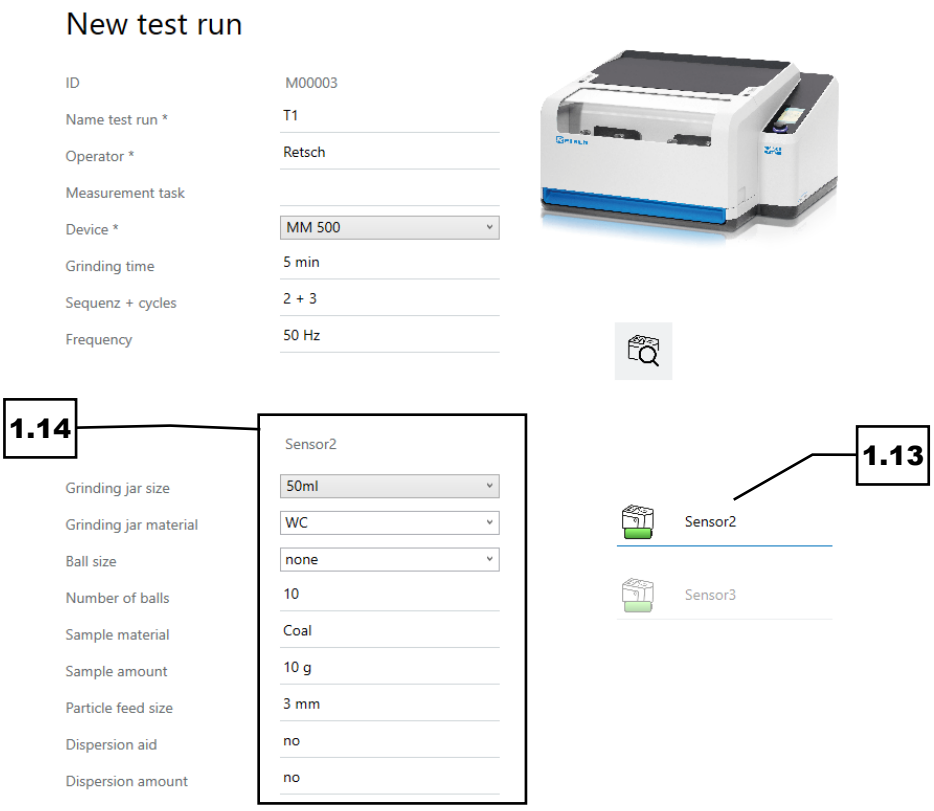

Abb. 11: Storing additional information in the sensor

Any data entered does not have to be used immediately for the test run, but may be saved as a template (1.15). To do this, select the Save Template (1.16) button. The template may then be called up at a later time. Each template is saved with a manually assigned name. Templates may be changed and deleted at a later point (1.17). To do this, double-click on a saved template (1.15).

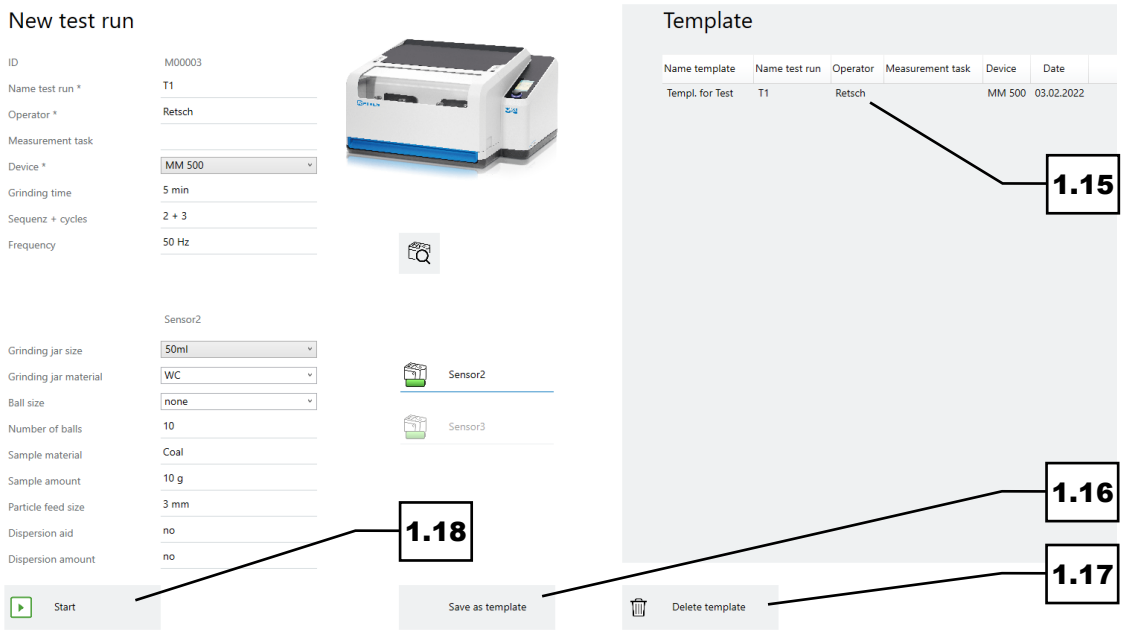

Abb.12: Saving test runs as a template

No.	Component	Function
1.13	Selected sensor unit	Overview of the previously selected sensor unit(s).
1.14	Parameters	Setting the sensor unit's specific parameters.
1.15	Template parameters	Required parameters for the sensor units may be saved as a template.
1.16	Save template	Click button to save previously stored parameters as a template.
1.17	Delete template	Click button to delete the selected template.
1.18	Start test run	Click button to start the test run.
1.19	Stop test run	Click button to stop the active test run.

4.4.2 Starting the test run

After selecting the sensor unit(s) and specifying the required parameters and data, the test run may be started using the Start (1.18) button. The screen view changes to the current test run. The measured values are constantly updated and the test run is displayed in real time. To stop the test run, select the Stop (1.19) button.

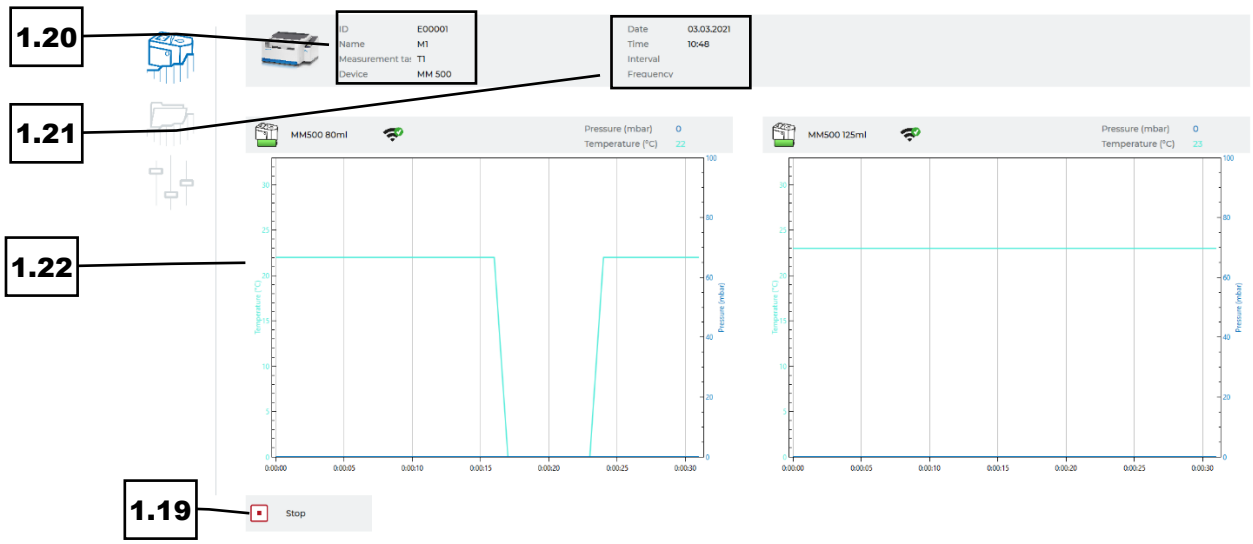

Abb.13: Active test run

No.	Component	Function
1.20	Overview of data from the New Test Run area	Display of the data entered for the New Test Run area. Test run ID, name of the test run, description of the test run and the device used
1.21	Overview of date and time	Display of the date and start time of the test run as well as the set interval and frequency
1.22	Display of the active test run	A graph of the active test run per sensor

After stopping the test run, a message is displayed that the test run has been completed and the test results have been saved. Confirm the message by clicking OK (1.23).

NOTICE The GrindControl Center software is not a database system that guarantees permanent storage of all data. It is recommended to export the data of the test runs after each testing process and to save it independently.

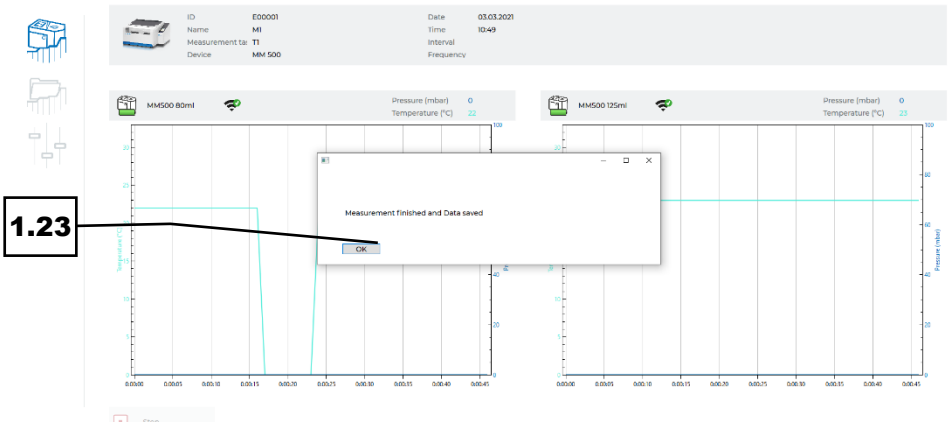

Abb.14: Notice after completing a test run

4.4.3 Manage measurement

In the Manage Measurement (S2) functional area, an overview of all test runs carried out together with the test parameters is displayed.
The software creates a separate file (2.1) for each sensor unit used in a test run. By double-clicking on the measurement, a detailed view with all test run data is opened.

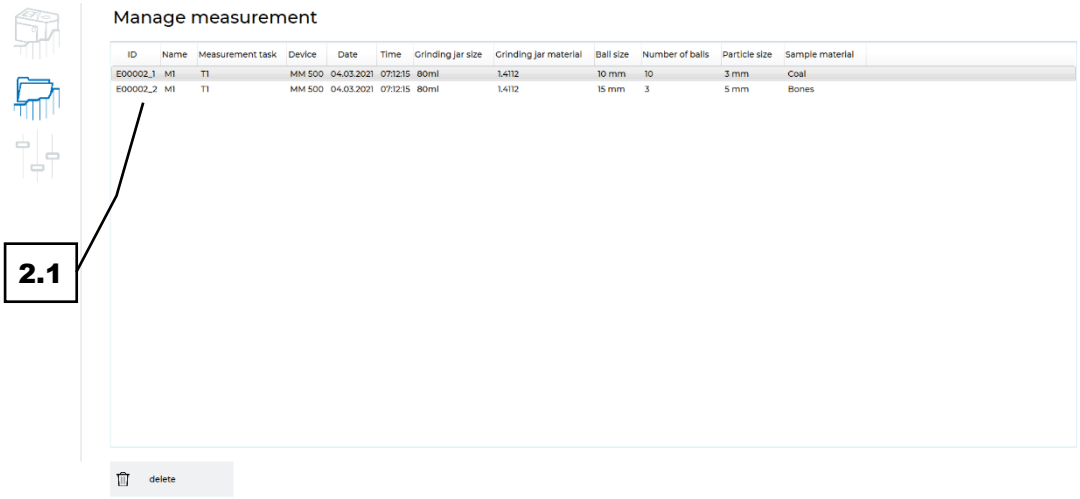

Abb.15: Managing measurements

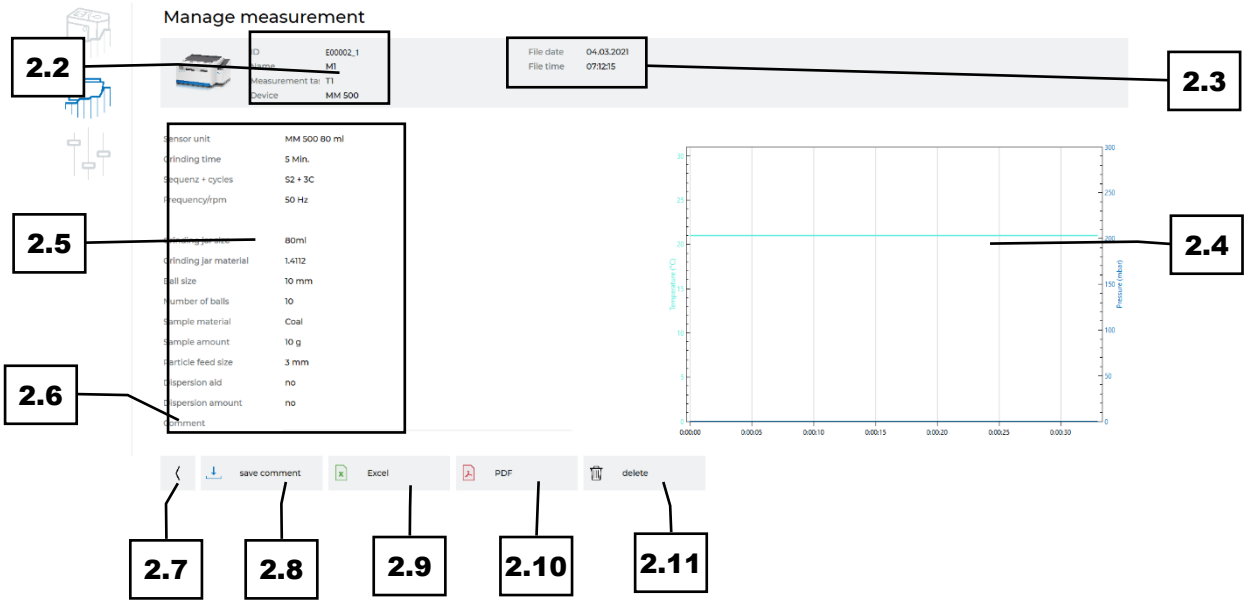

Abb.16: Detailed measurement view

With the exception of the comment function, no other parameters may be changed.

No.	Component	Function
2.1	Measurement file	Each saved measurement is saved as a separate file in the software.
2.2	Overview of data from the New Test Run area	Display of the data entered from the New Test Run area. Test run ID, name of the test run, description of the test run and the device used.
2.3	Overview date and time	Display of the date and start time of the test run.
2.4	Graphics	Graphical display of the test run.
2.5	Test parameters	Display of all parameters and data stored for the test run.
2.6	Add comment	The only data that may still be changed. An entry may be added by clicking on the comment field. The comment must be saved.
2.7	Back	Return to Manage Measurement overview.
2.8	Save comment	Saves any comments entered.
2.9	Excel file	Output of measurements as an Excel/CSV file. After clicking on the button, a window for saving the file will open. Enter the name and location for saving. By default, the software will save the file in the programme directory of the GrindControl Center.
2.10	PDF file	Generates a file in PDF format.
2.11	Delete measurement	Deletes the selected measurement. This action cannot be undone.

4.4.4 Settings

The general settings for the GrindControl Center software can be made in the Settings (S3) functional area. The area is split into the administration of the sensor units (3.1) and the display settings (3.2).

NOTICE A maximum of four sensors may be displayed in the Manage Sensor Units area. To add another sensor, an existing sensor must be deleted.

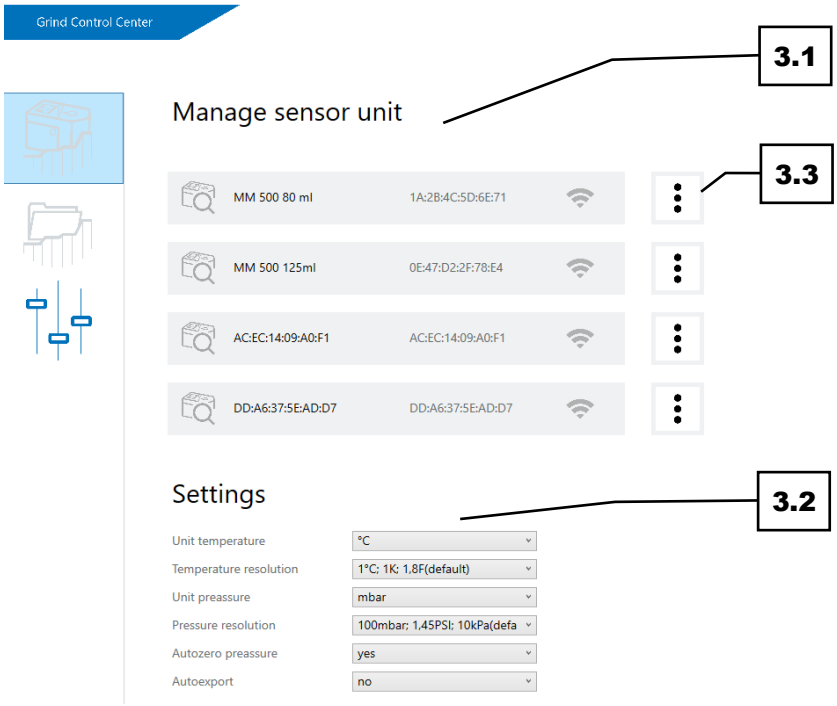

Abb.17: Manage sensor unit

In the Manage Sensor Unit area (3.1), names may be assigned to any existing sensor units. This makes it easier to find the sensors used when creating a new test run or within the measurement results. Click on the button with the three dots (3.3). A window for the sensor settings should now open.
In the Name field (3.4) you may enter a name of your choice for the unit. Confirm the change by selecting OK (3.5). All data of the sensor unit may be deleted (3.6).

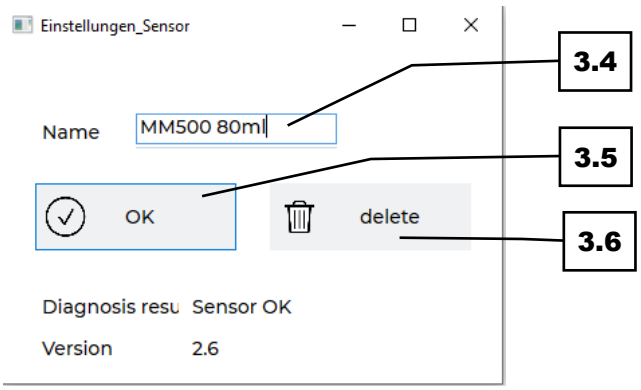

Abb.18: Sensor settings

In the display settings (3.2) area, the required units for temperature (3.7)) (°C, Kelvin or Fahrenheit) and pressure (3.8) (mbar, PSI or kPa) as well as the resolution of the measured values (3.9) may be preset
You may also select whether the pressure is automatically set to 0 when starting a test run (Autozero pressure Yes) or whether the actively measured value is used as a starting point (Autozero pressure No) (3.10).
The data saved during test runs may be exported manually or automatically (3.11). The manual export (Autoexport No) is carried out via the Manage Measurement functional area, as described in the previous chapter. For an automatic export after each test run, select Autoexport (Autoexport Yes). Two additional fields are displayed, within which the file location (3.12) and the file name (3.13) may be stored.

NOTICE These settings apply to all test runs. The units cannot be set differently for individual sensors.

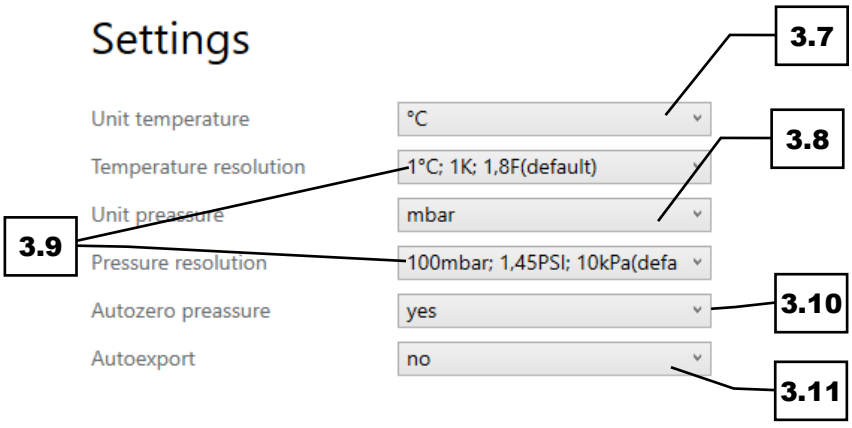

Abb. 19: Sensor settings

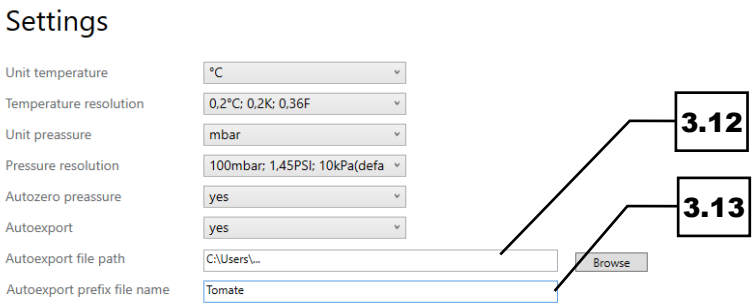

Abb. 20: Automatic export

No.	Component	Function
3.1	Manage Sensor Unit area	Sensor unit settings.
3.2	Display Settings area	Setting the parameters temperature, pressure, measurement reading resolution and export of the test results.
3.3	Button for Display Settings area	Click to go to the Display Settings panel.
3.4	Field name	Enter the name of the sensor unit.
3.5	OK button	Confirmation of the name entered.
3.6	Delete	Click the button to delete all stored data for the sensor unit.
3.7	Temperature unit	Selection of the temperature unit (°C, Kelvin, Fahrenheit).
3.8	Pressure unit	Selection of the pressure unit (mbar, PSI or kPa).
3.9	Measurement reading resolution	Selection of the scale for displaying the measurement reading resolution.
3.10	Autozero pressure	Selection for resetting the pressure to the value 0 per start of measurement.
3.11	Autoexport	Selection for manual or automatic export of the saved measurement results.
3.12	Autoexport file path	Directory for automatic export.
3.13	Autoexport prefix file name	Name of the file for automatic export.

5 GrindControl Operating

NOTICE The radio module of the sensor unit, which is located on the top side, must not get wet! Any contact with water will damage the electronics.

NOTICE No acidic or oxidising samples may be ground in the grinding jar or come into contact with the sensor unit, as this will damage the sensor unit.

5.1 GrindControl components

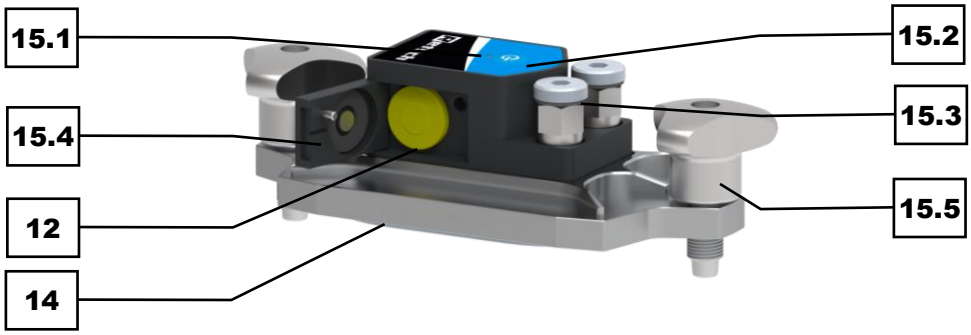

Fig. 21: Top side of the sensor unit Mixer Mill

Fig. 22: Top side of the sensor unit Planetary Ball Mill

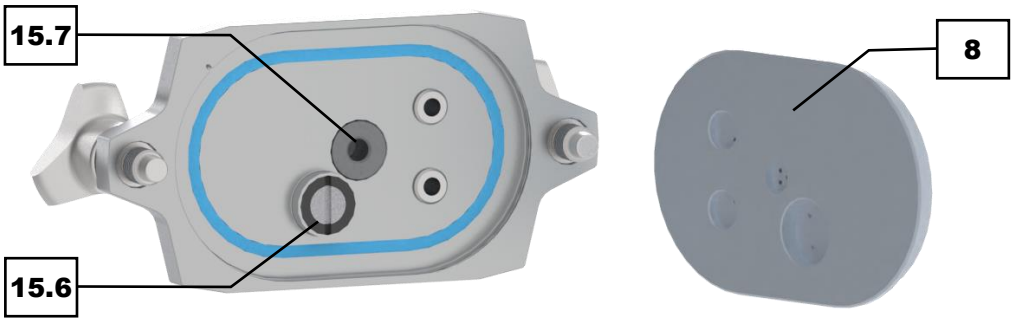

Fig. 23: Bottom side of the sensor unit Mixer Mill

Fig. 24: Bottom side of the sensor unit Planetary Ball Mill

NOTICE The temperature sensor is a component that can easily be damaged. Never attempt to unscrew the sensor or the like and always handle the component with care.

No.	Component	Function
8	Lid base plate (with air ducts)	Replaceable plate of the sensor unit, which may vary in size depending on the grinding jar volume
12	Battery	Battery type SL-550/S ½ AA
15	Grinding jar lid	The lid of the grinding jar which is used for the measuring process within the device
15.1	Status indicator light	Indicates the status of the sensor unit
15.2	On/off button	Used in order to switch the sensor unit on and off.
15.3	Valve connection	For gassing and rinsing the grinding jar
15.4	Battery compartment lid	Locking device for the battery compartment in order to protect the battery
15.5	Clamping screw	For fastening and fixing the grinding jar lid on the grinding jar. The clamping screws are mounted on the grinding jar lid to ensure that they cannot be lost.
15.6	Temperature sensor	Sensor of the sensor unit for measuring the temperature inside the grinding jar.
15.7	Sinterfilter	Reusable filter made of stainless steel which protects the pressure sensor from any contamination that comes out of the grinding chamber. A wear part which needs to be replaced,if necessary.

5.2 Inserting the battery

In order to remove the old battery and replace it by a new one, please proceed as follows.

1. Open the cover of the battery compartment (15.4) with the enclosed 1.5 mm hexagon screwdriver (9).

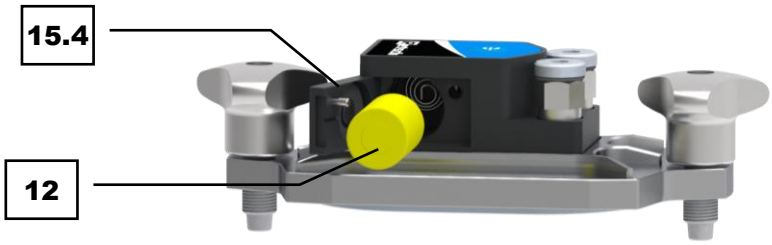

Fig. 25: Removing the battery

2. If there is a battery (12) inserted, please remove it. Subsequently, insert a new battery with the negative pole first.
3. Close the cover of the battery compartment.

Please use this battery only when operating the GrindControl:
LTC Battery SL-550/S ½ AA.
System: Lithium Thionyl Chloride
Nominal voltage: 3.6 V
Nominal capacity: 0.9 AH
Rated current: 0.6 mA
Maximum continuous discharge current: 50 mA
Pulse current capability: 100 mA

Temperature range: -55°C to 130°C

ⓘ Batteries do not belong into the household waste. Therefore, return used batteries to your dealer or battery collection centre.

5.3 Switching the GrindControl on

The sensor unit is switched on by pressing the switch-on button (15.2) on top of the housing. The status indicator light (15.1) flashes blue.

If the sensor unit is not used for several minutes, it switches off automatically. The connection is re-established by switching it on again.

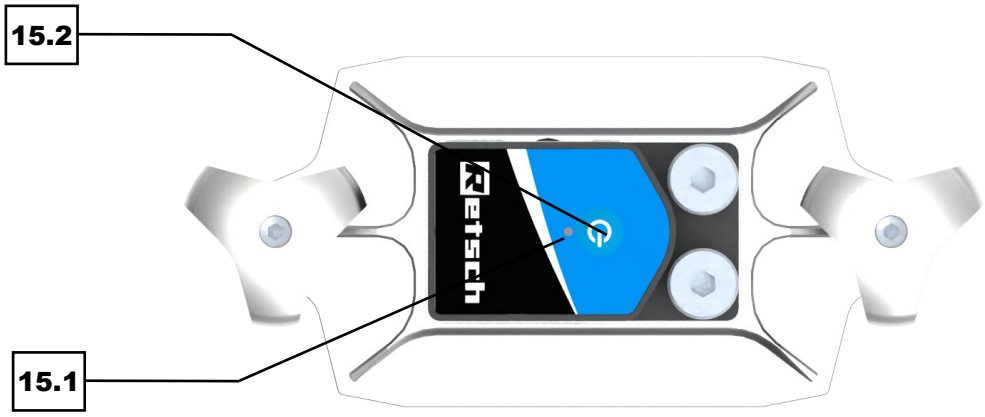

Fig. 26: Switching on the GrindControl

5.4 LED status displays

- Flashing blue light: GrindControl is switched on
- LED off: GrindControl is connected to the software via Bluetooth or the GrindControl has been switched off

5.5 Gas flush function

In order that the sensor unit can also be used for grinding in a protective atmosphere, the cover has connections for the gas flush function (15.3) (connection thread M8x1).

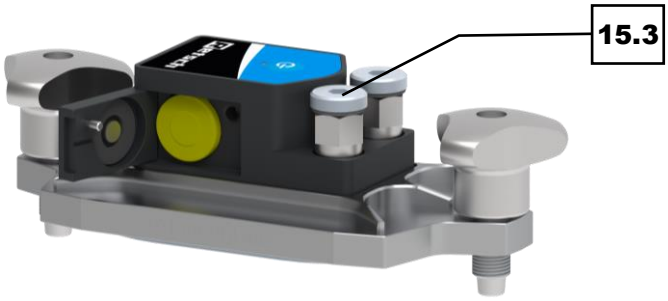

Fig. 27: Connections for the gas flush function

ⓘ When using the gas flush function, please make sure that the ventilation holes underneath the sensor unit are clear.

NOTICE The following applies to all planetary ball mill-compatible units: A sinter filter (identical to the sinter filter which protects the pressure sensor) can be used in order to avoid any deposits in the openings of the valve connections. This protects the valve connections and reduces the cleaning effort.

NOTICE The ventilation holes must be cleaned with the enclosed tool if they become dirty.

5.6 Replacing the cover base plate

In order to ensure that the material of the lid matches the material of the jar, the lid base plate may be replaced. In this context, it is important to make sure that the correct lid base plate is selected which matches the grinding jar volume.

The following steps are required to replace the lid base plate.

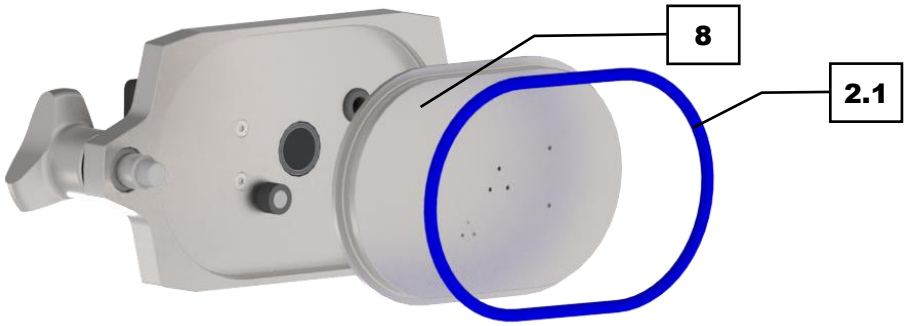

Fig. 28: Replacing the lid base plate

1. Carefully remove the outer sealing ring (2.1) by using the enclosed tool (7).

2. Remove the cover base plate (8).

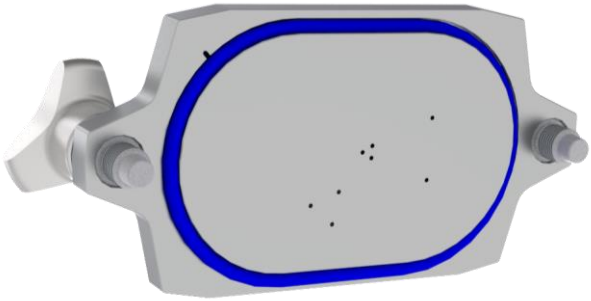

Fig. 29: Inserting the lid base plate

3. Insert the new lid base plate (8).
4. Install the previously removed outer sealing ring (2.1) on the lid base plate (8). For this purpose, press the sealing ring firmly into the groove by using the enclosed tool (7).

5.7 Grinding jar

NOTICEThe radio module of the sensor unit, which is located on the top side, must not get wet! Any contact with water will damage the electronics.

NOTICENo acidic or oxidising samples may be ground in the grinding jar or come into contact with the sensor unit, as this will damage the sensor unit.

5.7.1 View of the grinding jar

Fig. 30: Grinding jar

No.	Component	Function
14	Grinding jar	For holding grinding balls and sample material.
15	Grinding jar lid	Lid of the grinding jar that is used for the measuring process within the device.
15.5	Clamping screws	For attaching and fixing the grinding jar lid on the grinding jar. The clamping screws are captively mounted on the grinding jar lid.

5.7.2 Opening aid

An opening aid is included within the GrindControl.
The clamping screws on the grinding jar lid are tightened or loosened using the opening aid.

ⓘ Be sure to use the opening aid to close the grinding jars, since tightening the clamping screws by hand is insufficient.

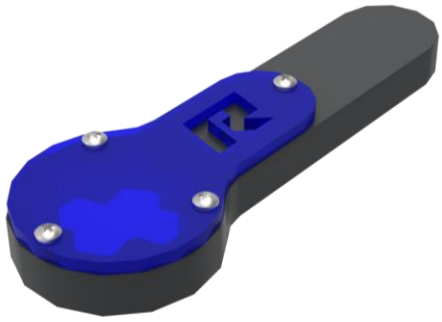

Fig. 31: Opening aid

5.7.3 Closing the grinding jar

⚠ CAUTION

C2.0024

Danger of burns and scalds
Heated grinding jars and/ or sample material

- During grinding, the sample material and the grinding jars can become very hot.

- **Only touch the grinding jars with protective gloves after grinding.**
- **Never open hot grinding jars.**
- **Allow the grinding jars to cool down to room temperature before opening.**

⚠ WARNING **Pleasealso observe the operating instructions for your ball mill!**
This document only guides you on how to use the GrindControl. Safe handling of the ball mill is a prerequisite for using the GrindControl.

⚠ WARNING **Do not use grinding balls with a diameter of less than or equal to 1 mm! The air ducts may become blocked.**

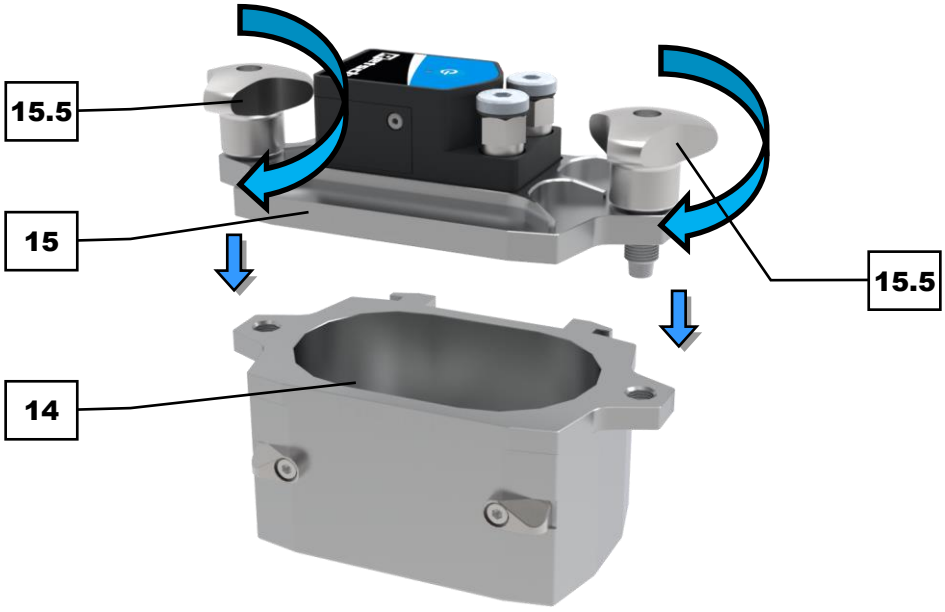

Fig. 32: Closing the grinding jar

WARNING To securely fix the grinding jar lid in place, tighten the clamping screws of the clamping ring. If too much force is applied with the opening aid, the clamping screws may tear off.

Close the grinding jar as follows:

- ⇨ Make sure that the joint surface between the grinding jar (14) and the grinding jar lid (15) is free of foreign objects to ensure tightness.
- ⇨ Place the grinding jar lid (15) on the grinding jar (14) so that it fits and closes the grinding chamber.
- ⇨ Tighten both clamping screws (15.5) of the grinding jar lid evenly to avoid tilting and to close the grinding jar (14).
- ⓘ For a tight seal, use the opening aid to tighten the clamping screws.
  Tightening the clamping screws by hand is insufficient to seal the grinding jar completely tight.

5.8 Wet Grinding with Highly Flammable Materials

⚠ CAUTION

C3.0024

Risks of burns and scalding
Hot grinding jar and/or sample material

- The sample material and grinding jar can get very hot during the grinding process.
- **After grinding, always wear protective gloves when handling the grinding jar.**
- **Never open hot grinding jars!**
- **Allow grinding jars to cool down to room temperature before opening them.**

Wet grinding with the use of highly flammable materials is permitted provided that certain precautions are taken.

When using highly flammable materials as grinding aids, such as hexane, isopropanol, ethanol, petrol or similar materials, it must be assumed that the inside of the grinding jars is to be grouped in zone 0, **permanently present explosive mixture!**
It must therefore be prevented that explosive vapours is able to escape from the clamped grinding jars during the grinding process, especially due to the heating which takes place, or can reach areas where the necessary ignition energy is present.

We therefore strongly recommend that the operator (employer) of the ball mill assesses the existing hazards according to the local conditions in a coherent explosion protection concept before using appropriate solvents and, if necessary, records supplementary organisational measures in writing in an explosion protection document.
In the EU, this procedure is regulated according to EC Directive 89/391/EEC under the Articles 118 and 118a.
In other countries outside the EU, please observe comparable regulations.

In this context, the following prerequisites are to be assumed:

- When choosing the solvents, the resistance of the O-rings must be taken into account. The following are therefore permissible: alcohols (except methanol and ethanol),isopropanol andisopropylether.
- After filling the grinding jars, close them with the provided lids.
- Please note that the grinding jars can heat up to more than 100°C depending on the grinding jar size, the ball filling, the speed and the grinding time. Wear protective gloves when removing the grinding jar.
- Remove the grinding jar only together with the locking mechanism and open it only at a safe position (suction device) after cooling down.

6 Data transfer via USB stick

ⓘ Always connect the bluegiga BLED112 USB dongle to a USB port of your computer by using the supplied USB extension cable! This is the only way to ensure a stable radio connection!

ⓘ Do not pull the bluegiga BLED112 USB dongle out of the USB port when the GrindControl software is active! Otherwise, the data transmission will be aborted.

The transmission has a range of up to 5 m.
However, the actual available range depends on the local conditions as well as the interference signals on site.

The most stable connection between the transmitter (sensor unit within the device) and the receiver (USB dongle) is achieved when there are no sources of interference between the device in which the grinding is carried out and the USB dongle. Sources of interference are, for example, electronics in the form of the display and control unit. It is recommended to place the USB dongle on the left side of the device during operation.

6.1 System requirements

The following technical requirements must be met on your PC in order to be able to use the Bluetooth Smart USB dongle bluegiga BLED112:
- Windows 10 (32/64bit)
- USB 2.0 or higher

6.2 Technical data

bluegiga BLED112 *Bluetooth*® Smart USB dongle

Bluetooth v.4.0, dongle mode compliant
Supports master and slave modes
Supports up to eight connections

Transmit power: 0 dBM to –27 dBm

Receiver sensitivity: receiver sensitivity –91 dBm

7 Servicing

CAUTION C4.0013

Risk of injury
Improper repairs

– Unauthorised and improper repairs can cause injuries.
- **Repairs to the device may only be carried out by Retsch GmbH , an authorised representative or by qualified service technicians.**
- **Do not carry out any unauthorised or improper repairs to the device!**

CAUTION C5.0015

Risk of injury
Improper modifications to the device

– Improper modifications to the device can result in injuries.
- **Do not make any unauthorised changes to the device.**
- **Only use the spare parts and accessories approved by Retsch GmbH!**

7.1 Cleaning

Cleaning work must be carried out after each grinding In order to ensure reliability and operational safety of the sensor unit.

NOTICE **The radio module of the sensor unit, which is located on the top side, must not get wet!**

The lid base plate, the sinter filter and the O-rings can be cleaned in an ultrasonic bath.

7.2 Cleaning the air ducts

CAUTION C6.0031

Risk of injury
Cleaning with compressed air

– When using compressed air for cleaning purposes dust and remnant of the sample material can be flung around and injure eyes.
- **Always wear safety glasses when cleaning with compressed air.**
- **Observe the material safety data sheets of the sample material.**

The air ducts of the lid base plate (10) can be cleaned carefully with the enclosed tool if they are contaminated.

Clean the air ducts according to the following procedure:

1. Carefully remove the outer sealing ring (2.1) by using the enclosed tool (7).
2. Remove the lid base plate (8).
3. Carefully clean the air ducts of the lid base plate (8) with the cleaning tool.

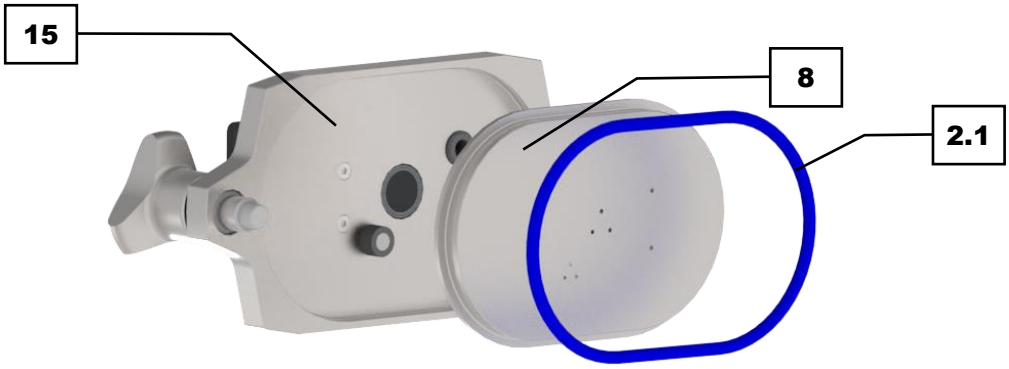

Fig. 33: Cleaning the air ducts

7.3 Cleaning of sintered filter, lid base plate and O-rings

The sinter filter, the lid base plate and the O-rings can be cleaned in an ultrasonic bath if they are contaminated.

In order to do this, disassemble the GrindControl as described in the previous chapters and place the items into the ultrasonic bath.

CAUTION These instructions do not contain any instructions for operating an ultrasonic bath. Please refer to the enclosed instructions regarding your ultrasonic bath.

7.4 Maintenance

No maintenance work is required if the device is used as intended.

7.5 Wear

CAUTION C7.0013

Risk of injury
Improper repairs

- Unauthorised and improper repairs can cause injuries.
- **Repairs to the device may only be carried out by Retsch GmbH , an authorised representative or by qualified service technicians.**
- **Do not carry out any unauthorised or improper repairs to the device!**

Depending on the frequency of grinding operation and the material being ground, grinding tools become worn. Therefore, the grinding jars as well as potentially the grinding balls or grinding sets, if they are used, should be regularly checked for any wear and replaced, if necessary. All existing seals on grinding tools should be also checked on a regular basis for any wear and replaced, if it is required.

Among others, wear parts include the following:

- Battery
- Seals
- Sinterfilter
- Grinding jars
- Grinding jar inserts

8 Return for Service and Maintenance

Fig. 34: Return form

The acceptance of devices and accessories of the Retsch GmbH for repair, maintenance or calibration can only be effected, if the return form including the decontamination declaration service has been correctly and fully completed.

⇨ Download the return form located in the download section "Miscellaneous" on the Retsch GmbH homepage (http://www.retsch.com/downloads/miscellaneous/).

⇨ When returning a device, attach the return form to the outside of the packaging.

In order to eliminate any health risk to the service technicians, Retsch GmbH reserves the right to refuse the acceptance and to return the respective delivery at the expense of the sender.

9 Accessories

Information on available accessories as well as the corresponding operating instructions can be found directly on the homepage of theRetsch GmbH (https://www.retsch.com) under the “Downloads” section of the device.

Information on wear-parts and small accessories can be found in the general catalogue of the Retsch GmbH, which is also available on the homepage.

If you have any questions about spare parts please contact the representative of the Retsch GmbH in your country or directly the Retsch GmbH.

Accessories for the GrindControl:

- Sinterfilter
- Battery
- O-ring (Art.-No. is depending on the size of the grinding jar)
- Ventilation valves (on request)

10 Disposal

In the case of a disposal, the respective statutory requirements must be observed. In the following, information on the disposal of electrical and electronic devices in the European Community are given.

Within the European Community the disposal of electrically operated devices is regulated by national provisions that are based on the EU Directive 2012/19/EU on Waste Electrical and Electronic Equipment (WEEE).

Accordingly, all devices supplied after August 13th 2005 in the business-to-business area, to which this product is classified, may no longer be disposed of with municipal or household waste. To document this, the devices are provided with the disposal label.

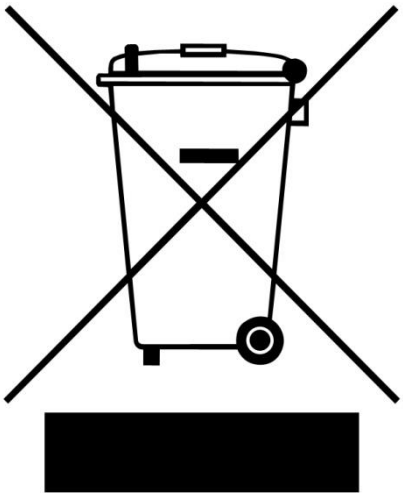

Fig. 35: Disposal label

Since the disposal regulations worldwide and also within the EU may differ from country to country, the supplier of the device should be consulted directly in case of need.

This labelling obligation is applied in Germany since March 23rd 2006. From this date on, the manufacturer must provide an adequate possibility of returning all devices delivered since August 13th 2005. For all devices delivered before August 13th 2005 the end user is responsible for the proper disposal.

11 Index

EU Declaration of Conformity
Translation

PRESSURE AND TEMPERATURE MEASURING SYSTEM

GrindControl | 22.782.xxxx

EU DECLARATION OF CONFORMITY
We, represented by the undersigned, hereby declare that the above device complies with the following directives and harmonised standards:

Radio Equipment Directive (RED) 2014/53/EU

Electromagnetic compatibility 2014/30/EU (tested at 230 V, 50 Hz)
Applied standards, in particular:

EN 55011	Industrial, scientific and medical equipment - Radio-frequency disturbance characteristics - Limits and methods of measurement
DIN EN 61326-1	Electrical equipment for measurement, control and laboratory use - EMC requirements

Restriction of hazardous substances (RoHS) 2011/65/EU
Applied standards, in particular:

DIN EN IEC 63000	Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances

Authorised person for compilation of the technical documentation:
Julia Kürten (Technical Documentation)

Furthermore, we confirm that the relevant technical documentation for the above device was created in accordance with Annex V of the Radio Equipment Directive and we undertake to submit this documentation to the market surveillance authorities.

In the event of a modification of the device not agreed on by Retsch GmbH, as well as the use of non-approved spare parts or accessories, this declaration loses its validity.

Retsch GmbH

Haan, 09/2023

Dr. Kevin Schmitz, Head of Development

CE

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