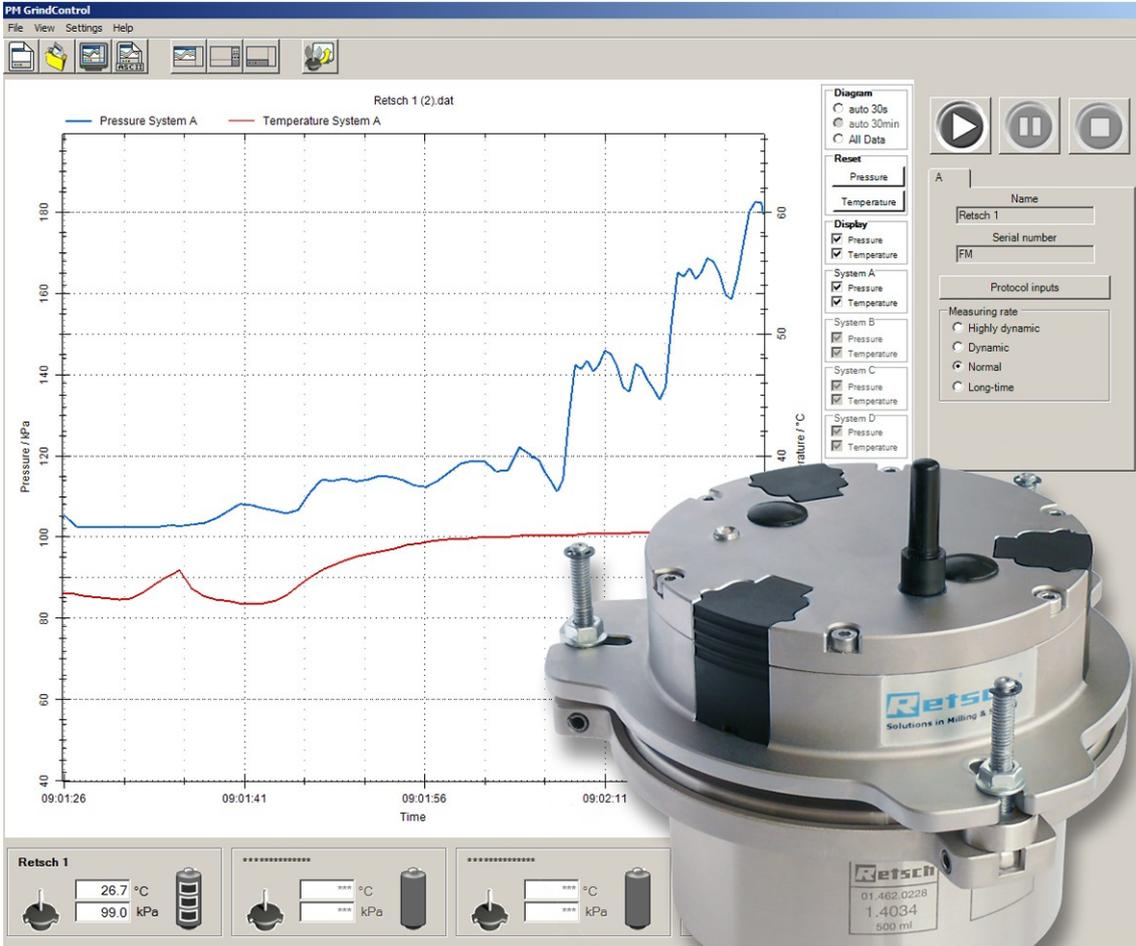


# Manual PMGrindControl Pressure and temperature measuring system



Translation



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<b>1</b>	<b>Notes on the Operating Manual</b>	<b>5</b>
<b>2</b>	<b>Confirmation</b>	<b>6</b>
2.1	Method of Operation	7
<b>3</b>	<b>Technical Data</b>	<b>8</b>
3.1	Operating Conditions	8
3.1.1	Temperature Range	8
3.1.2	Pressure ranges	8
3.1.3	Rotational speed range	8
3.1.4	Transmitter range	8
3.1.5	Operating Time	8
3.2	Transport and Storage	10
3.2.1	Packaging	10
3.2.2	Transport	10
3.2.3	Temperature Fluctuations	10
3.3	Care Instructions and Storage	10
<b>4</b>	<b>The First Start</b>	<b>11</b>
4.1	Complete Program Sequence up to First Measurement	11
<b>5</b>	<b>Software</b>	<b>15</b>
5.1	System Requirements	15
5.2	Software Installations	15
5.2.1	Installing the USB Drivers	15
5.2.2	Installation of the PM GrindControl Software	16
5.3	File System	16
5.3.1	File Endings	16
5.4	Software Interface	18
5.5	Menu and Menu Bar	18
5.5.1	Menu File - Measurement task, new	19
5.5.1.1	Steps for Creating a New Measurement Task	19
5.5.1.2	Menu File - Open Measurement Task	21
5.5.1.3	Menu File - Close Measurement Task	22
5.5.1.4	Menu File - Open Measurement Data	22
5.5.1.5	Menu File - Export Measurement Data	22
5.5.1.6	Menu File - End	22
5.5.2	Menu View	22
5.5.2.1	Menu View - Diagram	23
5.5.2.2	Menu View - Measurement Settings	23
5.5.2.3	Menu View - Status Bar	23
5.5.2.4	Menu View - Tool bar	23

5.5.3	Menu Settings .....	24
5.5.3.1	Menu Settings - Measuring Systems Management .....	24
5.5.3.2	Menu Settings - Options .....	24
5.5.4	Menu Help .....	24
5.5.5	Menu View .....	24
5.6	Status Bar for the Measuring Systems .....	26
5.7	Explanation of the Icons and Symbols .....	26
5.8	Measuring Rates .....	27
<b>6</b>	<b>Wireless Grinding Jar Cover .....</b>	<b>28</b>
6.1	Wireless Grinding Jar Cover Components .....	28
6.2	Inserting the Batteries .....	29
6.3	Turning Off the GrindControl .....	29
6.4	LED Display on the Wireless Grinding jar Cover .....	29
6.4.1	Status indications .....	29
6.5	Cleaning the Air Duct in the Pressure Sensor .....	30
6.6	Gassing Function .....	30
6.7	Exchanging the Cover Baseplate .....	31
6.8	Changing the Filter Fleece .....	32
6.9	Replacing the Filter Fleece When Using the Standard Cover Baseplate .....	32
6.10	Replacing the Filter Fleece When Using the Gassing Function .....	33
6.11	Clamping the Grinding jar with the Clamping Ring .....	33
6.12	Wet Grinding with Highly Flammable Materials .....	35
<b>7</b>	<b>Telegesis (ZigBee) USB stick .....</b>	<b>36</b>
7.1	System Requirements .....	36
7.2	Technical Data .....	36
<b>8</b>	<b>Operating Instructions for Powerline 5 LCD .....</b>	<b>37</b>
8.1	Safety Instructions .....	38
8.2	Using the Charger .....	38
8.3	Overview of the Charger Functioning .....	38
8.3.1	Indicator Lamps for Batteries (1) .....	39
8.3.2	LCD Display (3) .....	39
8.3.3	Discharge key (4) .....	39
8.4	Commissioning the Charger .....	39
8.5	Maintenance and Care of the Charger .....	39
8.6	Environment Notice .....	40
<b>9</b>	<b>Index .....</b>	<b>42</b>
	<b>Appendix .....</b>	<b>following pages</b>

## 1 Notes on the Operating Manual

This operating manual provides all the necessary information on the topics specified in the Table of Contents.

It instructs the target group(s) defined for the respective areas on the safe and purpose-conformant use. Familiarity with the relevant chapter is a precondition for the safe and purpose-conformant use of the machine.

This technical documentation is a reference work and learning guide. The individual chapters are complete by themselves.

This operating manual does not contain any repair instructions. In case of any faults or repairs being required, please contact your supplier or directly get in touch with

Retsch GmbH <http://www.retsch.com/>



**Please also follow the instructions in the operating manual for your planetary ball mill.**

This document only has instructions for the use of the PM GrindControl. Safe handling of the Planetary Ball Mill is a precondition for the use of the PM GrindControl.

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Infringements will result in damage compensation liability.

### **Changes**

Subject to technical changes.

## 2 Confirmation

I have read and taken note of the contents of the Chapters on Notes on the Operating Manual, Safety Instructions, Warnings and Summary of all Safety Instructions.

---

Signature of owner/managing operator

---

Signature of service technician

## 2.1 Method of Operation



The wireless grinding jar cover cannot be used in the PM 200.



### **Comply with the operating instructions for your planetary ball mill too.**

This document only has instructions for the use of the PM GrindControl. Safe handling of the planetary ball mill is a precondition for the use of the PM GrindControl.

This wireless grinding jar cover and the PM GrindControl software serve to continuously acquire the parameters pressure and temperature in a grinding jar. The measured values read by the sensors located in the grinding jar cover are transmitted wirelessly to a receiver system in the PC.

The temperature sensor is thermally separate from the grinding jar cover and measures only the gas temperature in the grinding chamber. As a result, even rapid or slight changes in temperature are registered.

The transmitted data is displayed and stored in the software. For every measurement, the values measured are stored in a file (dat-file) and are then available for extensive evaluations.

The wireless grinding jar cover permits the use of the system in the PM 100 and PM400.

Essentially, the following steps are necessary for using the PM GrindControl software to monitor the temperature and the pressure in the grinding jar:

1. Definition of a measurement task
2. Integration of the measurement systems involved
3. Execution of the measurement
4. Evaluation of the measurement data

The evaluation can be conducted at a separate time from the measurement, i.e. the raw data can be inputted again later and evaluated. The raw data contains all the settings and protocol inputs stored in the measurement task.

### 3 Technical Data

#### 3.1 Operating Conditions

##### 3.1.1 Temperature Range

The temperature range is determined by the max. permissible temperature inside the wireless grinding jar cover (measurement electronics) of 70°C.

An additional sensor measures the temperature of the measurement unit inside the wireless grinding jar cover. On exceeding 70°C, a warning is outputted on the screen.



**Monitor the temperature of the measurement unit inside the wireless grinding jar cover at regular intervals to avoid damage to the measurement electronics.**

When you move the mouse cursor over the text box of the grinding jar, the momentary temperature inside the wireless jar cover is displayed as a small tool tip beside the mouse cursor. (See image: Temperature inside the wireless grinding jar cover)

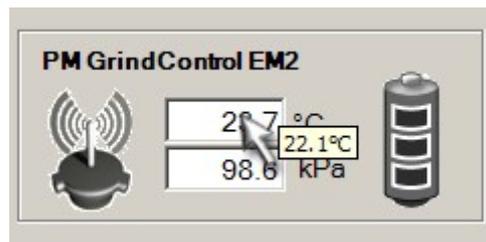


Fig. 1: Temperature inside the wireless grinding jar cover

**Measurement Resolution of the Temperature Measurement : 0.1 °C**

**Accuracy of the Temperature Measurement: ±1%**

##### 3.1.2 Pressure ranges

- Maximum permissible pressure range inside the grinding beaker: up to 5.0 bar (500 kPa)



**Screw the clamping screws on the clamping ring tight!**

Maximum internal pressures of 5.0 bar are only permissible where there is sufficient initial tension on the clamping ring.

##### 3.1.3 Rotational speed range

Rotational speed range: corresponds to the maximum rotational speeds of the PM 100 or PM 400 respectively

##### 3.1.4 Transmitter range

Transmitter range: approx. 15 m in buildings

##### 3.1.5 Operating Time

Operating time with full battery charge:

- highly dynamic measuring rate (200 Hz) - 40h
- long-time measuring rate (0.2 Hz) - 80h

### 3.2 Transport and Storage

#### 3.2.1 Packaging

The packaging has been adapted to the mode of transport. It complies with the generally applicable packaging guidelines.

Please retain the packaging for the duration of the warranty period because returning in unsuitable packaging in the event of a complaint can jeopardize your warranty claims.

#### 3.2.2 Transport

Do not subject the PM GrindControl to impacts, jolts or vibrations during transportation as this can damage the electronic and mechanical components.

#### 3.2.3 Temperature Fluctuations

Where temperature fluctuates greatly (during shipment by air, for instance), protect the PM GrindControl from condensation. The electronic components could otherwise be damaged.

### 3.3 Care Instructions and Storage

The two cover baseplates are made of hardened stainless steel (1.4034).

Hardened steel has a lower chromium content and so it does not form any oxide protective layer. Therefore, it distinguishes itself not by its corrosion resistance, but by its greater hardness.

We therefore use a special oil to protect these grinding tools. Please remove the oil before using it the first time; water and detergent are enough for this purpose. Please dry the grinding tool well.

After the grinding operations, the grinding tools must be cleaned in as dry a state as possible. However, if they are extremely dirty, they can be cleaned with a damp cloth and some household detergent. It is important to ensure sufficient drying.

If the grinding tools are to be stored for a long time, we recommend the use of a corrosion protection oil. If corrosion occurs nonetheless, it can be removed with household scouring agents.

Also recommendable for long-time storage is to store the parts in the accompanying VCE bags. (blue plastic bags).



**Caution – Damage to electronic components!**

Do not clean the radio grinding jar cover under running water.

## 4 The First Start

### 4.1 Complete Program Sequence up to First Measurement

The following sequence presents only the steps necessary for the first activation and the test to see if the wireless grinding jar cover is functioning perfectly.



**Read all chapters in this operating manual!**

This description of the first activation of a wireless grinding jar cover does not replace the need to read the operating instructions. Read the other chapters in this manual too.

Please also read and observe the operating instructions for your planetary ball mill!

1. First, charge the three storage batteries completely using the charging adapter in the accompanying charger. Read the chapter on OPERATING INSTRUCTIONS *POWERLINE 5 LCD* beforehand
2. Follow the instructions in the Software Installation chapter and install the USB driver for the ZigBee USB – wireless unit, the USB driver for the TG-ETRXn USB port and the PM GrindControl software.
3. Start the PM GrindControl software.



**Do not pull the Telegesis (ZigBee) USB Stick out of the USB port as long as the PM GrindControl software is active.**

If the PM GrindControl software does not find the USB wireless unit (Telegesis), you must connect the USB-stick manually once again. This requires the following steps:

- Confirm the warning with **OK**.  
(the PM GrindControl software starts)
- In program, PM GrindControl program select **Settings > Options > .**
- Click on the **Connect Again** button

4. Insert the 3 fully charged batteries **1** into the wireless grinding jar.

The status indicator lamp starts to flash red and then glows a steady red.

Execute the following command in the PM GrindControl software::

5. Menu File → **Measurement task, new**



6. Assign a new name to the first measurement task and **save** the file to a local drive (e.g. C:\).



**The measurement tasks must be saved to a local drive.**

The Configure Measurement Systems program window is displayed.

7. Go to the MAC address field and enter your grinding jar's MAC address number sequence.

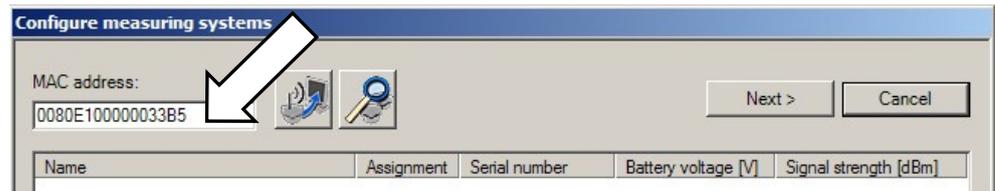


Fig. 2: Enter into the MAC address field.

You will find the MAC address on the cover page of your operating manual:



Fig. 3: MAC address



**After 15 minutes without assignment to a measurement task, the wireless grinding jar cover switches off. If the status indicator lamp is not glowing red any longer, take out one of the batteries and then put it back in again.**

8. Click on the button **Add measurement system..**



Once the system corresponding to the MAC address has been found,

9. confirm with the **OK** button.

The status indicator lamp now glows green.

The System Information program window is displayed.

10. In the Name field, enter a name for the wireless grinding jar cover.

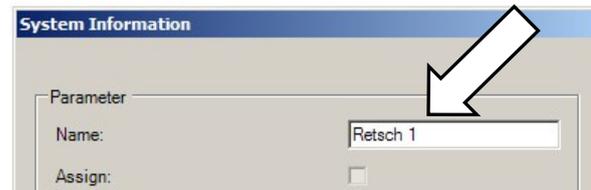


Fig. 4: Name field

11. After clicking on the **Accept** button,
12. you can end the procedure by clicking on the **Close** button.

The changed name is the name that is stored in the measurement system. On connecting the next time, the measurement system will identify itself with this new name.

13. Double-click to open the active system and click on the **Assign** field

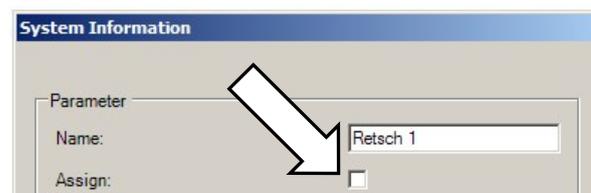


Fig. 5: Assign active system to the measurement.

This adds the wireless grinding jar cover to the current measurement task as one of the four possible measurement systems.

14. After clicking on the **Accept button**, you can end the procedure by clicking on the **Close** button.
15. Now, click on the **Continue** button in the **Assign measurement systems** program window.

In the Measurement Task window, you can input a remark for the measurement task.

16. Click on the **Continue** button.
17. In the measurement file window, input a name for the first measurement of the measurement task.

In the measurement file window, you can also input the operator and a remark for the measurement.

18. You can end the creation of the measurement task with the **Finish** button.
19. In the program window, in the Run Settings area, click on the **protocol inputs** button.

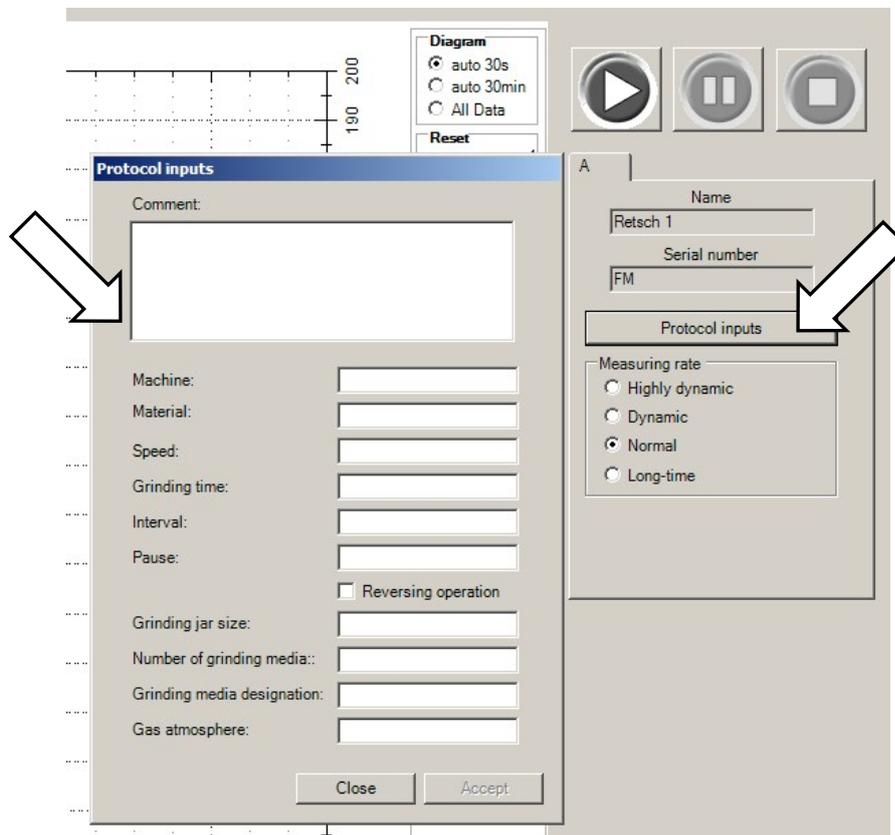


Fig. 6: Protocol Inputs

20. After making these inputs, you can store the data with the **Accept button**
21. With the **Close** button, you are taken back to the program window.
22. Start the measurement with the **Start** button.

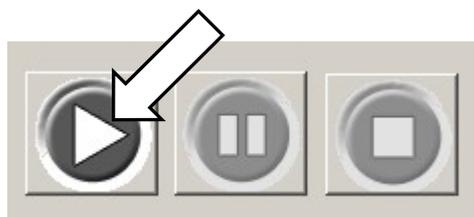


Fig. 7: Start - Pause - Stop

## 5 Software

### 5.1 System Requirements

- Windows XP SP II and Windows Vista
- USB port (Version 1.1 or 2.0)
- The user must have local administrator rights.
- All energy saving functions on the PC system must be turned off.
- No screen saver with password input may be turned on.
- No programs that consume additional resources may be active.
- Use a CPU with at least two cores (dual-core CPU)

### 5.2 Software Installations

#### 5.2.1 Installing the USB Drivers



**Do not pull the Telegesis (ZigBee) USB Stick out of the USB port as long as the PM GrindControl software is active.**

Before you can install the software for PM GrindControl, the driver software of the ZigBee USB wireless unit must be installed:

- Insert the installation CD included in the scope of supply into the CD ROM drive in your PC.
- Insert the ZigBee USB wireless unit (Telegesis) into a free USB port on your PC. And follow the installation instructions
  1. "Wizard for searching for new hardware"
    - Select "Yes, only this time"
  2. "Wizard for searching for new hardware" window
    - Select "Automatically install software (recommended)" and click on <Continue>.
  3. "Hardware Installation" window
    - In the following windows warning, select "Continue installation"



**After the software for the Telegesis USB device has been installed, the installation for the TG-ETRXn USB port follows automatically.**

1. "Wizard for searching for new hardware" window
  - Select "Yes, only this time"
2. "Wizard for searching for new hardware" window
  - Select "Automatically install software (recommended)" and click on <Continue>
3. "Hardware Installation" window
  - At the following Windows safety instruction select "Continue installation"

### 5.2.2 Installation of the PM GrindControl Software

- Start the setup.exe from the accompanying installation-CD-ROM and follow the instructions that appear.
- Check with Windows Update whether important updates for .Net Framework are available.
- Start the PM GrindControl software.



**If you followed the instructions from chapter "The first Start", you can proceed to point 4 of the corresponding chapter.**

## 5.3 File System

For each new measurement task create a new folder with the standard Windows functions. This folder may be located only on the local computer system and not in the network.

When a new measurement task is created, a new folder will be set up automatically for the measurement data and a measurement file (.afg) created. This file contains information on the measurement task, the measurement systems involved and a list of the measurements carried out.

For every new measurement, the software generates a new folder (in the measurement task folder). This folder has the name of the current measurement and is numbered serially by the software. It contains the data record of the measurement systems involved. Once a file exceeds a certain size, it is divided.



### Reading in data after a measurement

The measurement data in the PM GrindControl software can only be viewed if the originally created data structure has not been changed.

The file for the measurement task (.afg) and its folder must be stored in the same folder.

### 5.3.1 File Endings

The PM GrindControl software uses the following file endings:

File ending	Meaning
.mms	measurement system file
.tvl	temperature and voltage logfile
.dat	(measurement) data

These files are in the measurement task folder and may not be deleted or processed.

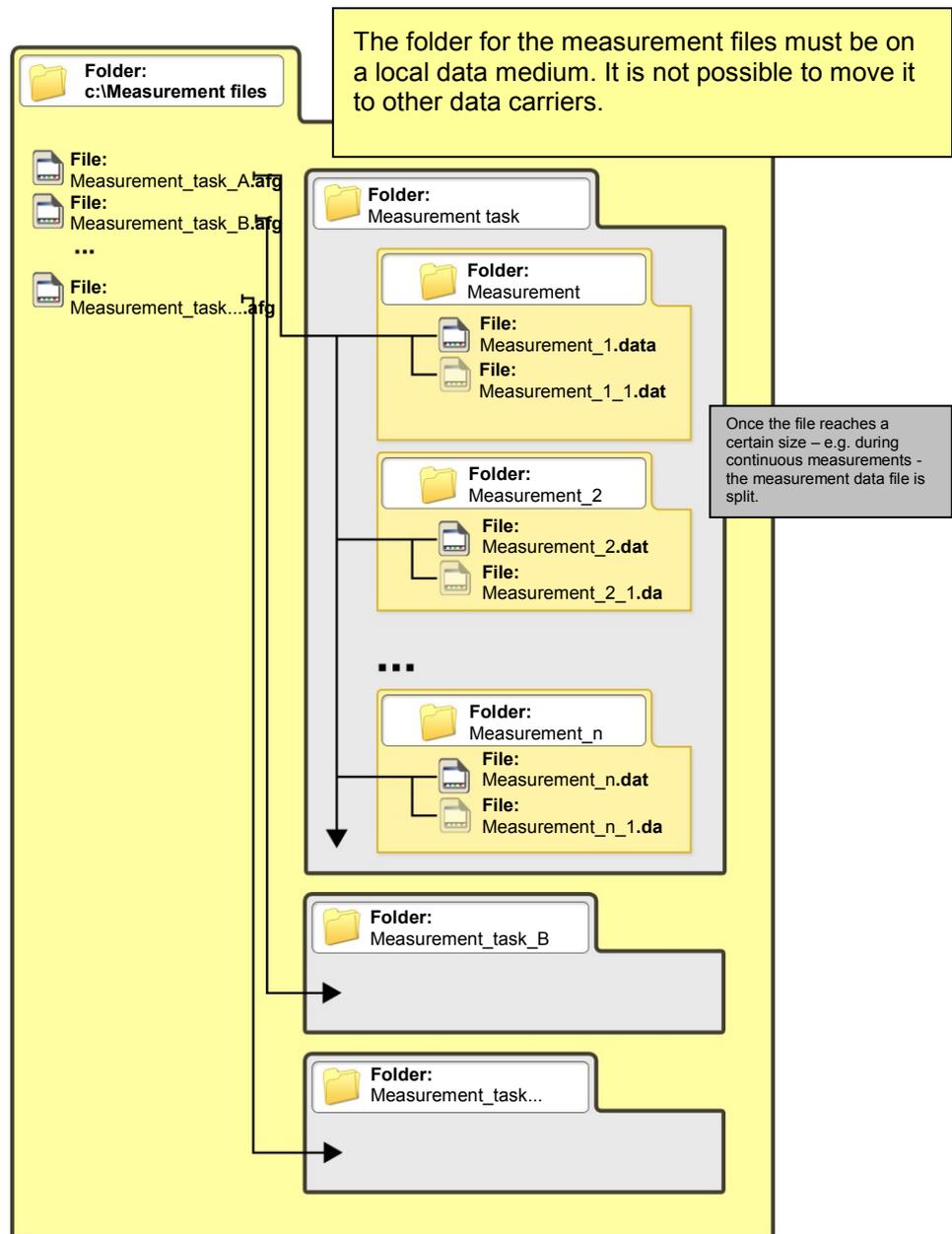


Fig. 8: File Structure

### 5.4 Software Interface

The program window for the PM GrindControl software breaks down into the following function areas:

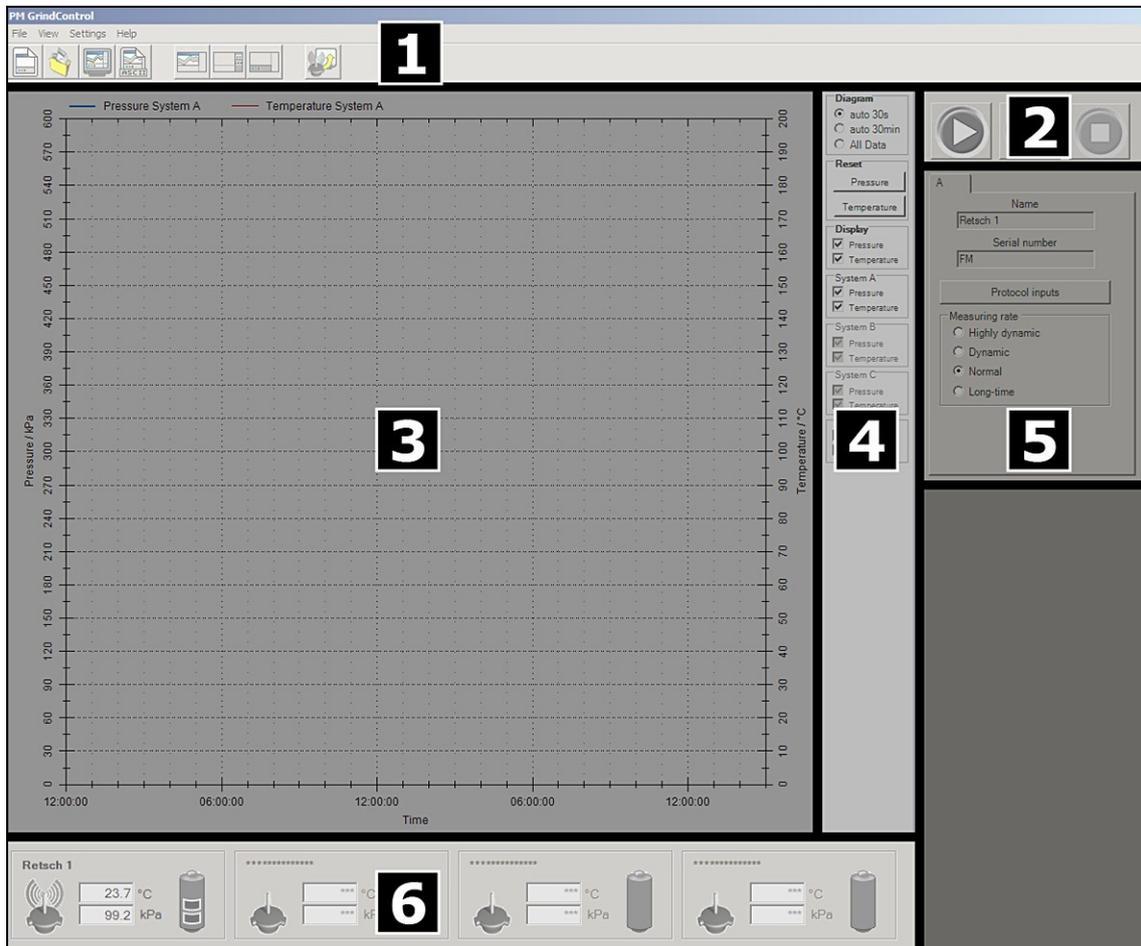


Fig. 9: Function areas for the PM GrindControl software

- 1 Menu and menu bar
- 2 Measurement Start - Pause - Stop
- 3 Diagram (graph box)
- 4 View menu to show the diagram
- 5 Protocol inputs and measurement rate setting
- 6 Status bar for the measurement systems

### 5.5 Menu and Menu Bar



Fig. 11: **Menu bar**

5.5.1 Menu File - Measurement task, new

Use this command to create a new empty measurement task and at the same time end the current measurement task.

Using standard Windows functions, create a new folder for each new measurement task. This folder may only be stored on the local computer system and not in the network.

When creating a new measurement task, a new folder is created automatically for the measurement data and a measurement file (.afg). This file contains information on the measurement task, the measurement systems involved and a list of the measurements carried out.

For each new measurement, the software generates a new folder in the measurement task folder. This folder has the name of the current measurement and is numbered consecutively by the software. It contains the data record of the participating measurement systems. Once a file exceeds a certain size, it is divided.

Alternatively, you can also use the following button.



Fig. 12: Button Measurement task, new

5.5.1.1 Steps for Creating a New Measurement Task

- 0. Once you click on the symbol or the command, the “Configure measurement task” window appears. Assign a new name to the first measurement task and **save** the file to a local drive (e.g. C:\).



**The measurement tasks must be saved to a local drive.**

The Configure Measuring Systems program window appears. If you wish to add a new measuring system, follow steps 1. to 6.

- 1. Enter your grinding jar’s MAC address number sequence into the MAC address field in the Configure Measuring Systems program window.

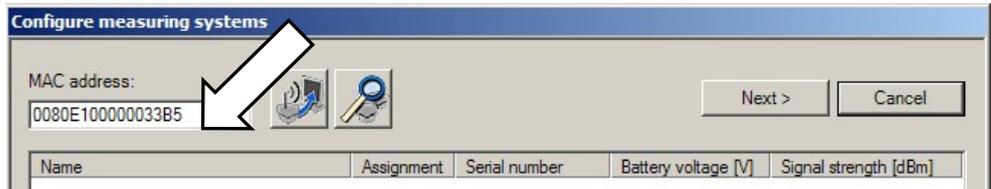


Fig. 13: Enter into the MAC address field

You will find the MAC address on the cover page of your operating manual:



Fig. 14: MAC Address



After 15 minutes without assignment to a measurement task, the wireless grinding jar cover switches off. If the status indicator lamp is not glowing red any longer, take out one of the batteries and then put it back in again.

2. Click on the **Add measurement system**  button.

Once the system that corresponds to the MAC address has been found,

3. confirm with the OK button.

The status indicator lamp now glows green.

The "System Information" program window is displayed.

4. In the Name field, enter a name for the wireless grinding jar cover.

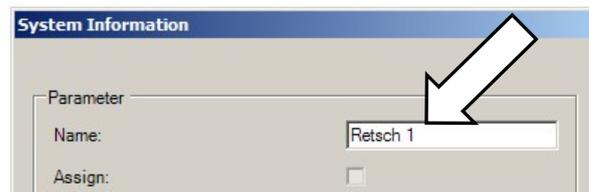


Fig. 15: Name field

5. After clicking on the **Accept** button,

6. you can end the procedure by clicking on the Close button.

The changed name is the name that is stored in the measurement system. On connecting the next time, the measurement system will identify itself with this new name.

7. If one or more measuring systems are logged in with the MAC address already, these are displayed in the "Configure Measuring Systems" program window:

---

#### Inactive Systems:

The measuring system is switched off or is outside the transmitter range.

#### Active Systems:

The measuring system can be added to the measurement task.

---

If you switch on a measuring system at a later point in time or bring it into the transmitter range, this is not automatically displayed in the list of active systems.

With the **Search for Known Measuring Systems** button you can start a new search for measuring systems.



Fig. 10: Search for Known Measuring Systems button

8. Open the active system by double-clicking on it and then click on the **Assign** field.



Fig. 11: Assign the active system to the measurement

This adds the wireless grinding jar cover as one of the four possible measurement systems for the current measurement task.

9. After clicking on the **Accept** button, you can end the procedure by clicking on the **Close** button.

10. Now click on the **Continue** button in the **Configure Measuring Systems** program window.

In the "Measurement Task" window, you can input a remark for the measurement task.

11. Click on the **Continue** button.

12. in the "Measurement File" a name must be inputted for the first measurement of the measurement task.

You can also input the operator and a remark for the measurement in the "Measurement File" window.

13. You can end the creation of the measurement task by clicking on the **Finish** button.

#### 5.5.1.2 Menu File - Open Measurement Task

**Use this command to open an existing measurement task. Another measurement will be added.**

**Alternatively, you can also use the following button.**



Fig. 12: Add New Measurement File to a Measurement Task button

**Once you click on this symbol or the command, the "Open" window opens.**

1. **Select the measurement task to which you wish to add another measurement and click on Open.**

**The "Search for Assigned Measuring Systems" opens and you can see the list of the inactive systems.**

If you switch on a measuring system at a later point in time or bring it into the transmitter range, this is not automatically displayed in the list of active systems.

You can use the **Search for Known Measuring Systems** button to start a new search for measuring systems.



Fig. 13: "Search for Known Measuring Systems" button

If you double-click on the active measuring systems, information on these systems will be displayed.

2. **Click on the Continue button.**

**The measurement task window opens and displays which measuring systems are involved in the new measurement.**

3. **Click on the Continue button.**

**The Measurement File window opens.**

4. **Select a file in the "Existing Measurement Files" list. This accepts the protocol inputs from the corresponding measurement.**
5. **Enter a tick into the Add Counter checkbox. This inserts a counter after the file name or updates an existing counter.**
6. **Click on the Finish button.**

#### 5.5.1.3 Menu File - Close Measurement Task

***This command closes and saves an opened and an active measurement task and the active measurement.***

#### 5.5.1.4 Menu File - Open Measurement Data

***Viewing the RunFiles in a measurement task***

**Reading in data after a measurement**



The measurement data in the PM GrindControl software can only be viewed if the originally created data structure has not been changed.

The measurement task file (.afg) and its folder must be saved in the same folder.

***Alternatively, you can also use the following button.***



Fig. 20: Show Existing Measurement Data button

#### 5.5.1.5 Menu File - Export Measurement Data

***Exports the data in an opened RunFile into an ASCII file.***

***Alternatively, you can also use the following button.***



Fig. 21: Export measuring data button

#### 5.5.1.6 Menu File - End

Use this command to end the program.

Any information that has not been stored already is saved now and all program processes are ended.

**End Program**



The program can only be closed with the Menu File → End command. For that reason the program does not have the customary window symbols used in Windows.

#### 5.5.2 Menu View

***In the View menu item you will find the following entries:***

- diagram
- measurement setting
- status bar

- tool bar

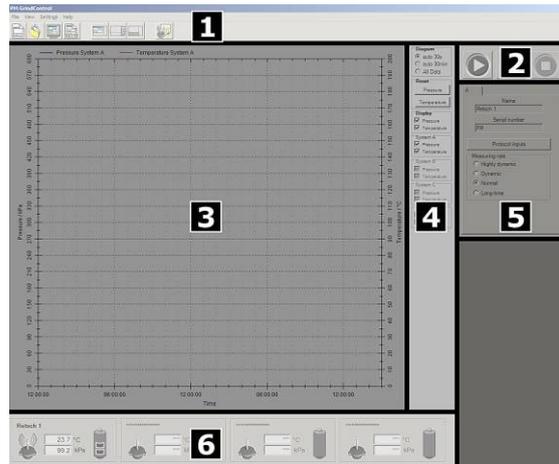


Fig. 22: **PM GrindControl Software function areas**

5.5.2.1 **Menu View - Diagram**

Activates or deactivates the display of the measurement diagram.

**Item numbers [3]+[4] in the "Function Areas of the PM GrindControl software" figure.**

**Alternatively, you can also use the following button.**



Fig. 23: Show Diagram button

5.5.2.2 **Menu View - Measurement Settings**

Activates or deactivates the display of the measurement settings and **measurement Start - Pause - Stop.**

**Item numbers [2]+[5] in the "Function Areas of the PM GrindControl Software" figure.**

**Alternatively, you can also use the following buttons.**



Fig. 24: Show diagram button

5.5.2.3 **Menu View - Status Bar**

Activates or deactivates the status bar display.

**Item number [6] in the "Function Areas of the PM GrindControl Software" figure.**

**Alternatively, you can also use the following button.**



Fig. 23: Status Bar Display button

5.5.2.4 **Menu View - Tool bar**

Activates or deactivates the display of the tool bar.

***Item number [1] in the "Function Areas of the PM GrindControl Software" figure.***

### **5.5.3 Menu Settings**

***In the Settings menu item you will find the following entries:***

- Measuring Systems Management
- Options...

#### **5.5.3.1 Menu Settings - Measuring Systems Management**

Opens the "Measuring Systems Management" window.

#### **5.5.3.2 Menu Settings - Options**

Opens the "Options" window.

### **5.5.4 Menu Help**

***You will find the following entries in the Help menu item:***

- on the PM GrindControl
- User guide

### **5.5.5 Menu View**

***In the View menu item you will find the following entries:***

- diagram
- measurement setting
- status bar
- tool bar

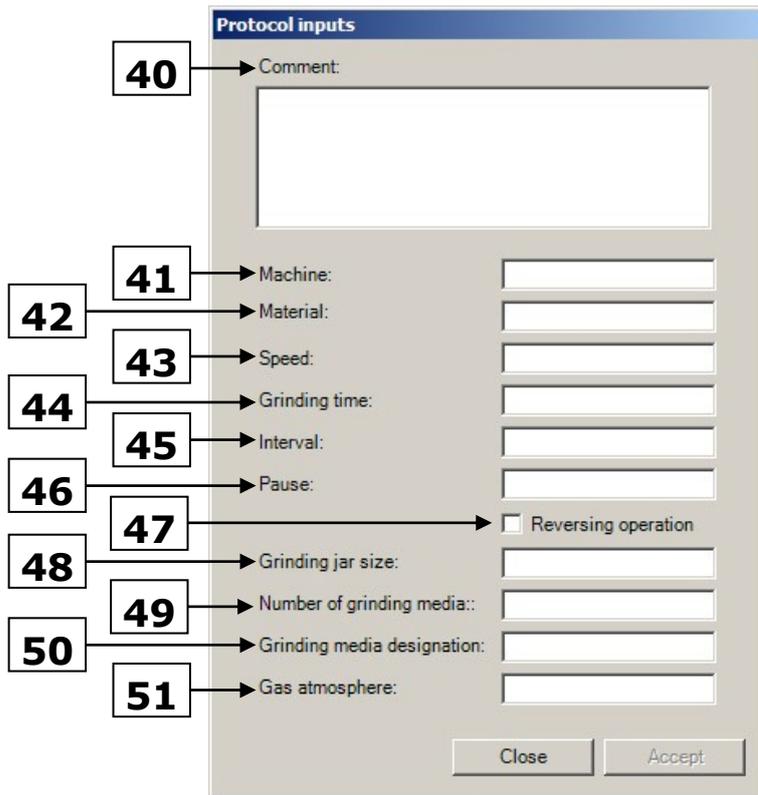


Fig. 14: Program window for protocol inputs  
The protocol details are saved in the .afg file.

You can save the following parameters:

- 40 Comments
- 41 Material
- 42 Machine
- 43 Speed
- 44 Grinding time
- 45 Interval
- 46 Pause
- 47 Reversing operation
- 48 Grinding jar size
- 49 Number of grinding media
- 50 Grinding media designation
- 51 Gas atmosphere

### 5.6 Status Bar for the Measuring Systems

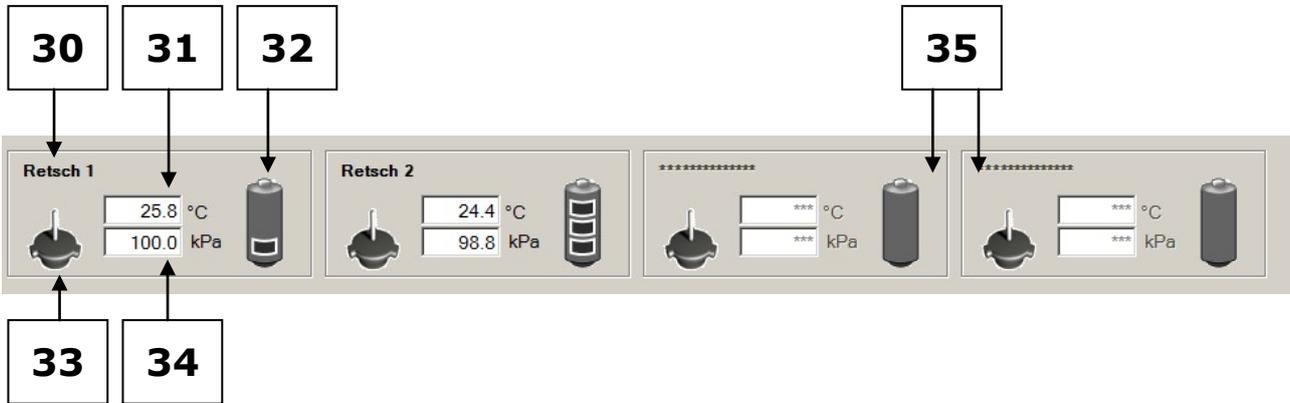


Fig. 15: Status Bar for the Measuring Systems

- 30 Name of the measuring system
- 31 Temperature inside the grinding jar
- 32 Battery level status
- 33 Transmission status of the measuring system
- 34 Pressure inside the grinding jar
- 35 Empty fields for more measuring systems

When you move the mouse cursor over the text box of the grinding jar, the current temperature inside the wireless jar cover is displayed as a tool tip. (see image)

When you move the mouse cursor over the battery symbol the voltage in the measuring system is displayed as a tool tip (see image).

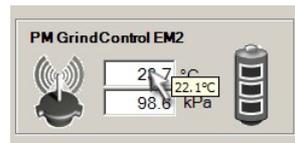


Fig. 16: Temperature inside the wireless grinding jar cover

### 5.7 Explanation of the Icons and Symbols



Fig. 29: Program menu item symbols



Fig. 30: Create new measurement task



Fig. 31: Add new measurement file to a measurement task.



Fig. 32: Show existing measurement data



Fig. 33: Export measurement data



Fig. 34: Display diagram



Fig. 35: Display measurement settings



Fig. 36: Display status bar



Fig. 37: Measuring systems management

## 5.8 Measuring Rates

Highly Dynamic Measuring Rate (200 Hz) - 40h

Long-time Measuring Rate (0.2 Hz) - 80h

Consider which measuring rate is best for your application. If possible, select a low measuring rate (normal). This reduces the volume of data.

## 6 Wireless Grinding Jar Cover

### 6.1 Wireless Grinding Jar Cover Components

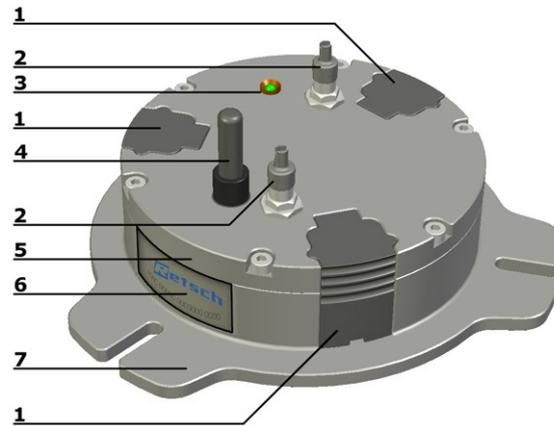


Fig. 38: Wireless grinding jar cover, top view

- 1. • Battery
- 2. • Gassing valves / or cover caps
- 3. • Status indicator lamp
- 4. • Wireless antenna
- 5. • Cover plate
- 6. • MAC wireless address
- 7. • Grinding jar cover

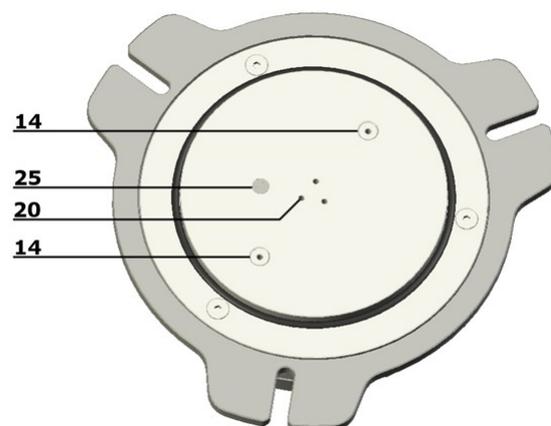


Fig. 39: Wireless grinding jar cover, bottom view

- 14 Opening for the deaeration valves (cover baseplate with venting holes)
- 25 Temperature sensor
- 20 Air ducts for measuring pressure

## 6.2 Inserting the Batteries

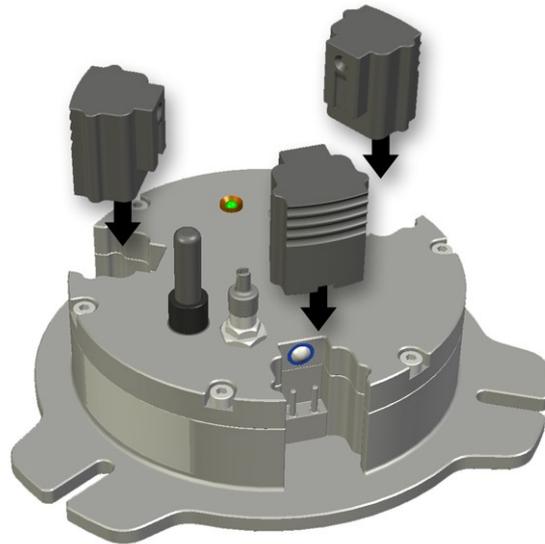


Fig. 17: Inserting the batteries



Batteries may not be disposed of with the household trash. Bring the used batteries to your dealer or to the battery collection point.

## 6.3 Turning Off the GrindControl

- Remove one of the storage batteries to switch the PM GrindControl off.
- If necessary, insert the battery the other way around to store it. This keeps the PM GrindControl turned off.

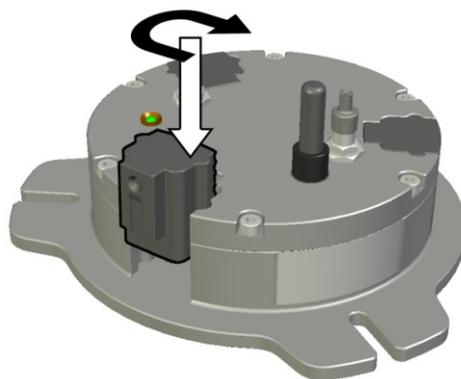


Fig. 18: Turning off the PM GrindControl

## 6.4 LED Display on the Wireless Grinding jar Cover

### 6.4.1 Status indications

- Red (switched on and initialized)
- Green (connected)
- Red flashing (initializing flickering)

- Green flashing (measurement was started and measurement values are being transmitted)

### 6.5 Cleaning the Air Duct in the Pressure Sensor

The air ducts (20) in the pressure sensor can be cleaned with a vacuum cleaner too if they get dirty.

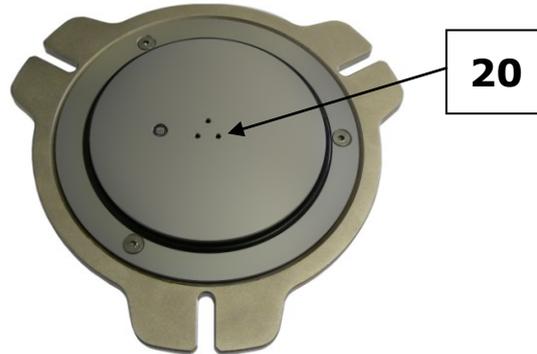


Fig. 19: Air ducts

### 6.6 Gassing Function

To enable the PM GrindControl to be used for grinding in a controlled atmosphere also, the kit contains a cover baseplate with venting holes for the gassing function (centring plate with venting holes).



**When using the gassing function, make sure the gassing channels are free.**

The venting holes can also be cleaned with a vacuum cleaner too if they get dirty.

**6.7 Exchanging the Cover Baseplate**

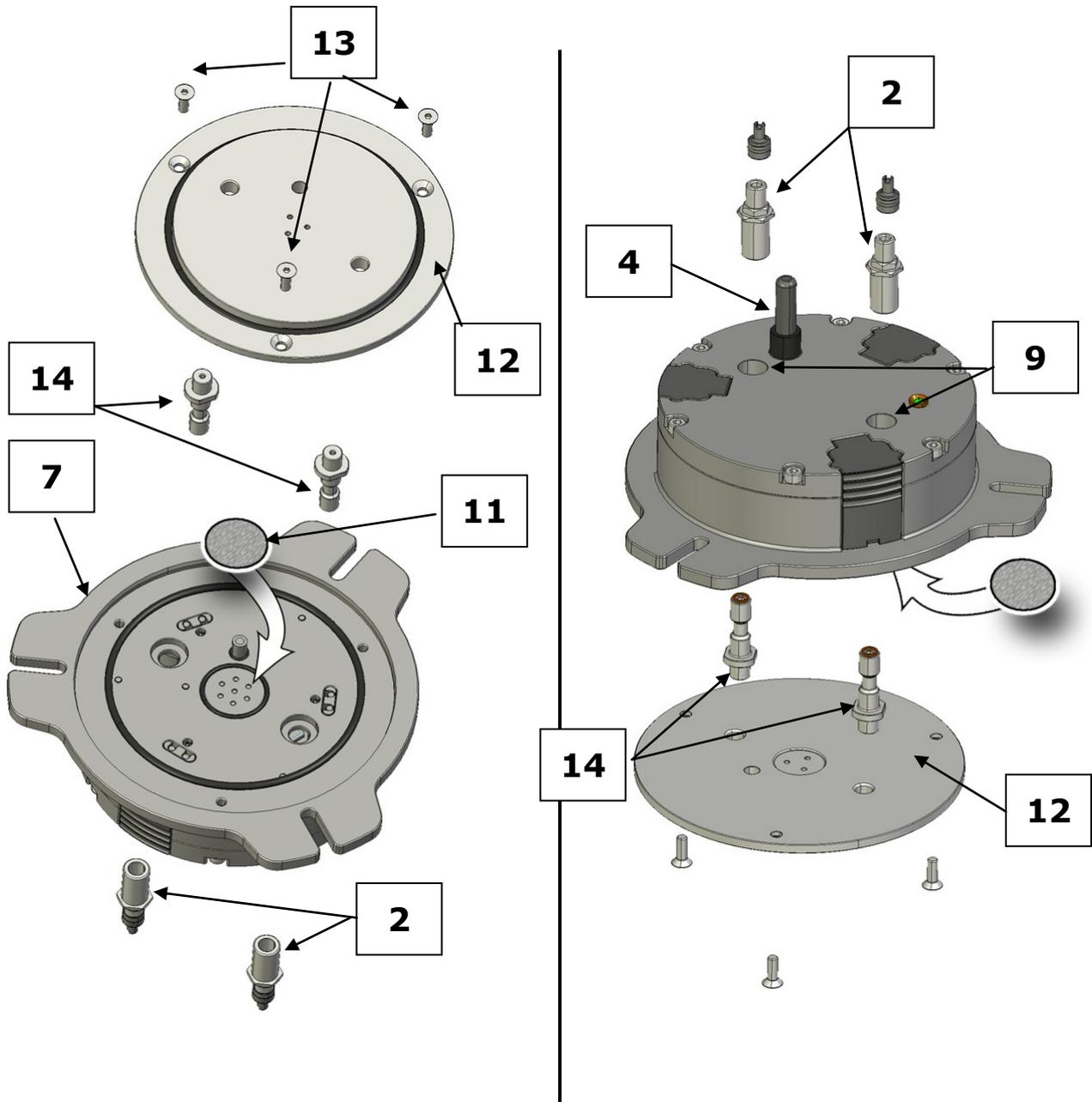


Fig. 43: Assembly of the cover baseplate and the de-aeration parts

The following steps are required to replace the pre-assembled standard cover baseplate (centring plate standard) with the cover baseplate which has venting holes for the gassing function (centring plate with ventilation holes):

**Required tools:**

- 13-mm open-jaw wrench
- Hexagon socket screw key 2.5 mm

- Unscrew the antenna (4).
- Remove the two black caps from the venting holes (9).
- Remove the three screws (13) on the pre-assembled standard cover baseplate and lift the plate up from the cover housing.
- Place the cover baseplate with the venting holes (12) in front of you with the recess for the filter fleece (8) pointing upwards.
  - **Caution!** When inserting the two de-aerating tubes (14), the surface with which the tubes are fitted (flat) (10) must point downwards. After tightening, this flat fits on the cover baseplate.

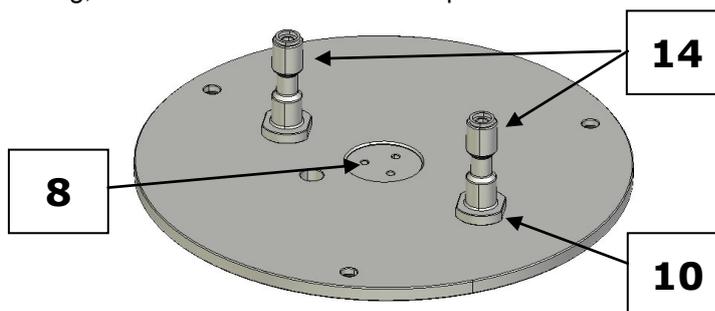


Fig. 44: Position of the de-aerating tubes

- Screw the two de-aerating tubes (14), as described, from the top downwards into the cover baseplate (12) and tighten it with a 13-mm open-jaw wrench.
- Before assembly, check the state and the correct position of the seals and the filter fleece.
- Now, insert the cover baseplate with the de-aerating tubes mounted on it into the cover housing; when doing so, pay attention to the position of the filter fleece (11).
- Next, tighten the cover baseplate with the three screws (13).
- Screw the two de-aerating valves (2) into the venting holes (9) and tighten them with a 13-mm open-jaw wrench.
- Screw the antenna (4) onto the grinding jar cover.

## 6.8 Changing the Filter Fleece

Depending on the application and the period of use, it may be necessary to replace the filter fleece that is located in the grinding jar cover.

Replace the filter fleece if it is very dirty.

## 6.9 Replacing the Filter Fleece When Using the Standard Cover Baseplate

### Tools required:

Hexagon socket screw key 2.5 mm

- Unscrew the antenna (4).
- Remove the three screws (13), on the pre-assembled standard cover baseplate and lift the plate up from the cover housing.

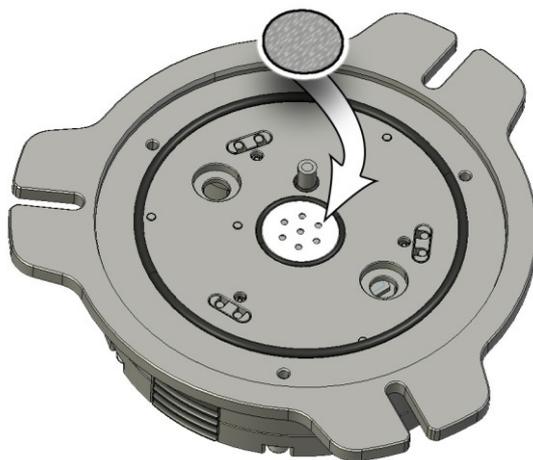


Fig. 13: Replacing the filter fleece

- Replace the filter fleece.
- Before assembly, check the state and the correct position of the seals and the filter fleece.
- Now, insert the cover baseplate back in the cover housing; when doing so, pay attention to the position of the filter fleece (11).
- Next, tighten the cover baseplate with the three screws (13).
- Screw the antenna (4) onto the grinding jar cover. Tauschen Sie das Filtervlies aus.

## 6.10 Replacing the Filter Fleece When Using the Gassing Function

### Tools required:

13-mm open-jaw wrench

Hexagon socket screw key 2.5 mm:

- Unscrew the antenna (4).
- Remove the two de-aeration valves (2), using a 13-mm open-jaw wrench.
- Remove the three screws (13) on the pre-assembled standard cover baseplate and lift the plate up from the cover housing.
- Replace the filter fleece (see fig. Replacing the filter fleece)
- Before assembly, check the state and the correct position of the seals and the filter fleece.
- Now, insert the cover baseplate with the mounted de-aeration tubes in the cover housing und when doing so, pay attention to the position of the filter fleece (11).
- Next, tighten the cover baseplate with the three screws (13).
- Screw the two de-aeration valves (2) into the venting holes (9) and tighten them with a 13-mm open-jaw wrench.
- Screw the antenna (4) onto the grinding jar cover. Schrauben Sie die Antenne (4) ab.

## 6.11 Clamping the Grinding jar with the Clamping Ring



The wireless grinding jar cover cannot be used in the PM 200.



The wireless grinding jar cover cannot be used in the PM 200.



**Comply with the operating instructions for your ball mill too.**

This document only has instructions for the use of the PM GrindControl. Safe handling of the planetary ball mill is a precondition for the use of the PM GrindControl.

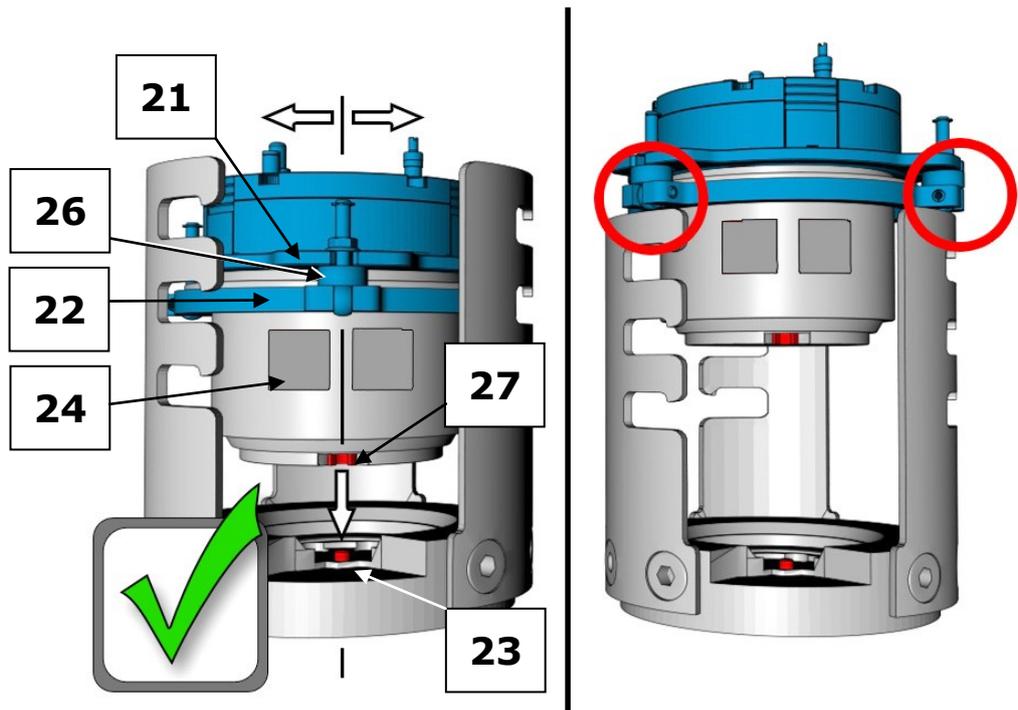


Fig. 46::Position of the clamping ring

For the measurement of the grinding jar's inner pressure to work correctly, the grinding jar cover must be braced with the clamping ring, which is included in the scope of supply.

- The spacer (26) must be between the cover lug (21) and the clamping ring.
- When bracing it, it is necessary to align one of the cover lugs (21) with the labelling areas (24) in order to ensure that the catching hole (27) in the grinding jar can engage with the catching pin (23).



**Risk of the grinding jar being hurled out!**

Make sure before starting the machine that the grinding jar is clamped in position.



With due consideration to the degree of risk presented by the particular material you are grinding, please take appropriate precautions to ensure that there will not be any danger to people.



**Risk of burning your hands.**

It is essential to wear safety gloves when removing or opening the heated grinding jar.

**6.12 Wet Grinding with Highly Flammable Materials**

Wet grinding using easily inflammable materials is admissible providing certain precautions are taken.

When using highly flammable materials as grinding aids, such as for example, hexane, isopropanol, ethanol, benzene and suchlike, it must be assumed that the inside of the grinding jar is classifiable as zone 0 with a **continually present explosive mixture**.

It must therefore be ensured that the explosive vapours that arise during the grinding process, in particular because of the heating that occurs then, cannot escape from the clamped-in grinding jars or reach areas that contain the required ignition energy.

We therefore urgently recommend that before using such solvents the operator (employer) of the planetary ball mill should assess the existing hazards and draw up a coherent explosion protection policy, taking account of local conditions and, if necessary, providing written definitions of supplementary organisational measures in an explosion protection document.

**In the EU, this procedure is regulated by articles 118 and 118a of EC Directive 89/391/EEC.**

Please observe comparable regulations in countries outside the EU.

For this purpose, assume the following prerequisites for the PM100/200:

- Only type “C” grinding jars are admissible for wet grinding with highly flammable materials.
- When selecting solvents, the O-rings’ resistance must be taken into account. The following are therefore permissible: alcohol (apart from methanol and ethanol), isopropanol, diisopropylether.
- Once the grinding jars have been filled, seal them with the clamping rings included in the scope of supply.



**Tighten the camping screws on the clamping ring securely!**

Tighten the clamping screws on the clamping ring securely. Only then are inside pressures up to a max. 5.5 bar permissible.

- Please note that depending on the size of the grinding jar, the ball filling, speed and grinding time, the grinding jar can by all means reach a temperature of over 100°C.
- The PM100 and PM200 are fitted with a fan which extracts only directly from the grinding chamber. The extraction volume per hour is more than 20 times the volume of the grinding chamber. The fan has a standstill monitor with an acoustic alarm.
- The air stream produced by the fan during grinding must be conducted to an extractor.

- Before removing the grinding bowl, make sure that the clamping ring is sitting securely.
- Only remove the grinding bowl with the closing device. Before opening it, let it cool down and make sure it is in a safe position (suction equipment).

## 7 Telegesis (ZigBee) USB stick



**Do not pull the Telegesis (ZigBee) USB Stick out of the USB port as long as the PM GrindControl software is active.**

### 7.1 System Requirements

Your PC must meet the following technical requirements to allow the use of the Telegesis (ZigBee) USB stick:

- Windows XP or Windows Vista
- USB 2.0 (1.1)

### 7.2 Technical Data

Frequency band:	2.4GHz ISM band
Transmission rate:	250kbit/s over the air data rate – NB: actual usable data throughput with ZigBee® is about 20kbps
Transmission power:	Typically 17dBm (50mW) output power
Damping:	High sensitivity of -97dBm Typ (at 1% packet error rate)

## 8 Operating Instructions for Powerline 5 LCD



Charge new batteries completely before using them for the first time. This extends the service life of your batteries.

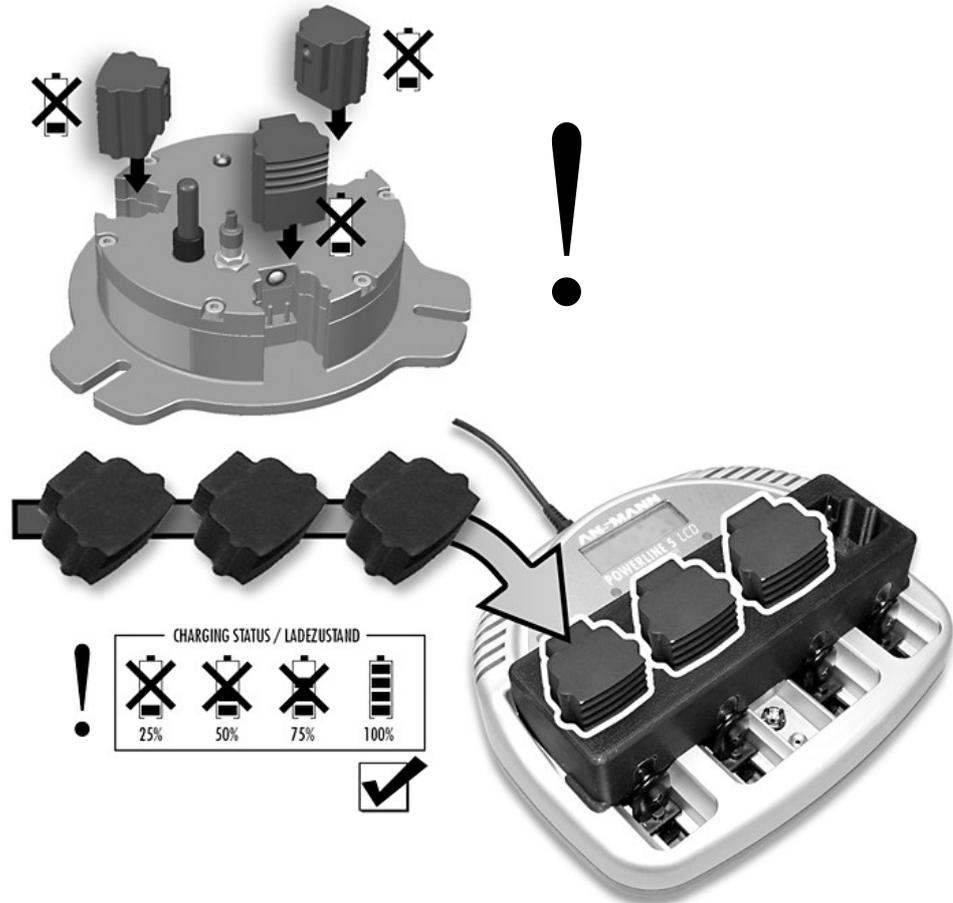


Fig. New batteries must be charged completely first before they are inserted.

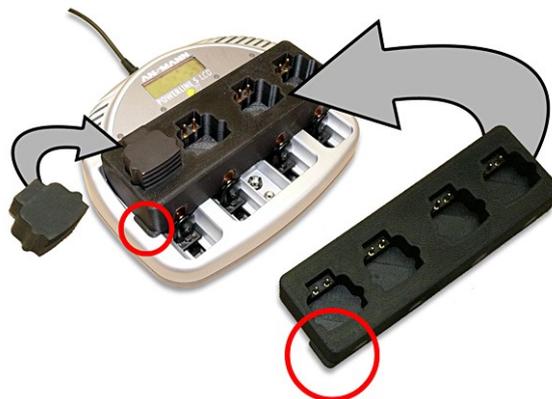


Fig. 47: Inserting the charging adapter



**Read the operating instructions carefully before commissioning the appliance!**

## 8.1 Safety Instructions



### **Warning – General dangers!**

- The appliance may only be operated in closed, dry rooms.
- To eliminate the danger of fire or of an electrical shock, the appliance must be protected from moisture and rain.
- Please ensure that the ventilation slits are free so that the appliance can work perfectly.
- Do not operate the appliance if the mains plug or housing is damaged.
- Do not open or modify the appliance.
- Have repairs carried out only by an authorized dealer.
- Keep out of reach of children.
- Do not run the appliance unsupervised.
- After use, disconnect the appliance from the mains supply.
- Pull out the mains plug before doing any cleaning or maintenance work.

## 8.2 Using the Charger



**Only the special batteries supplied by Retsch may be used in the POWERLINE 5 LCD charger!**



### **CAUTION:**

**Insert only Nickel/Cadmium or Nickel/Metal hydride storage batteries; there is a risk of explosion with other batteries!**

**Alkaline batteries or other primary batteries may not be charged under any circumstances**

**Never use force to open storage batteries or other kinds of batteries and never throw them into a fire.**

## 8.3 Overview of the Charger Functioning

- Separate charging procedures for every battery
- Automatic commencement of charging once contact is established;
- Microcontroller-controlled charging and monitoring of the charging status
- Automatic switching over to trickle charging
- Pre-discharge possible;

- Status indication with indicator lamps and LCD
- Battery fault detection – faulty batteries are picked out and displayed.–

### 8.3.1 Indicator Lamps for Batteries (1)

Indicator glows red: charging

Indicator flashing red: battery faulty

Indicator glows yellow: discharging

Indicator glows green: battery charged / pulse retention charging

### 8.3.2 LCD Display (3)

In addition to the indicator lamps, the display gives information on the charging state, the operating mode and the status of the inserted batteries (see drawing). The operating mode (charging or discharging) is displayed alternatively.

Thereafter, for approx. 3 seconds, the charging status is displayed in 25 % steps. "OK" indicates the end of charging / trickle charging; "BAD" indicates a faulty battery.

### 8.3.3 Discharge key (4)

Pressing the discharge key (PRESS) for approx. 3 seconds starts the discharging process.

## 8.4 Commissioning the Charger

### **Mains Operation:**

Connect the power supply plug to the charger. Connect the power supply to the mains supply.

### **Charging the special Retsch storage batteries:**

The charging starts automatically when one or more batteries are inserted.

To insert the storage batteries, it is first necessary to insert the charging adapter:

Press the contact bridge (5) down and insert the cell into the charging compartment.

The storage batteries do not have to be inserted at the same time because the batteries charge independently of each other.

It is normal for the batteries to become hot while charging. Once charging is complete, the batteries are supplied with trickle charging and can remain in the charger till they are used.

### **Discharging:**

To discharge the storage batteries, simply press the PRESS button (4) for approx. 3 seconds. Once the storage batteries have finished discharging, the appliance automatically switches over to charging. It is possible to discharge some batteries and simultaneously charge other batteries. When batteries are inserted into unoccupied charging compartments after activated discharging, they are charged and not discharged!

## 8.5 Maintenance and Care of the Charger

Pull out the mains plug before doing any maintenance and cleaning work. To ensure that the appliance will work without problems, please keep the contacts in the charging compartment free of dirt. Clean the appliance only with a dry cloth.

### 8.6 Environment Notice

By using rechargeable batteries and chargers, you can protect the environment and save at the same time. Batteries should not be disposed of with the household waste. Bring used batteries to your dealer or to the battery collection point.

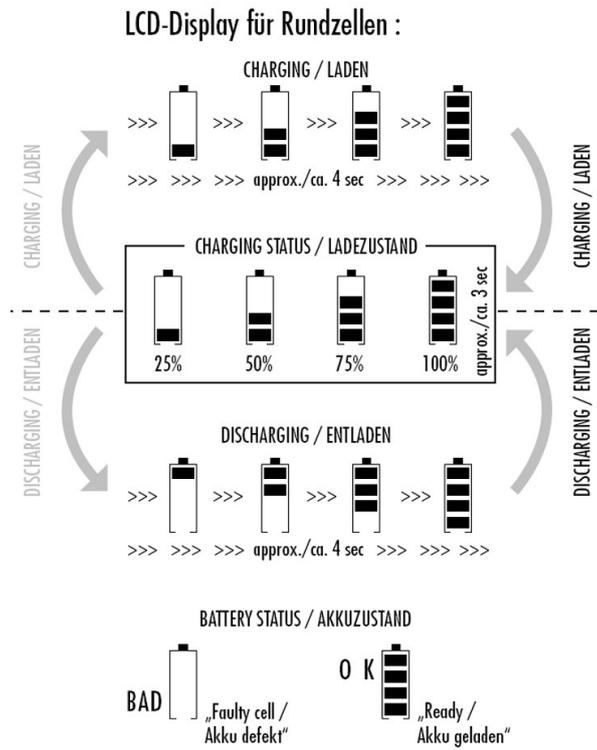
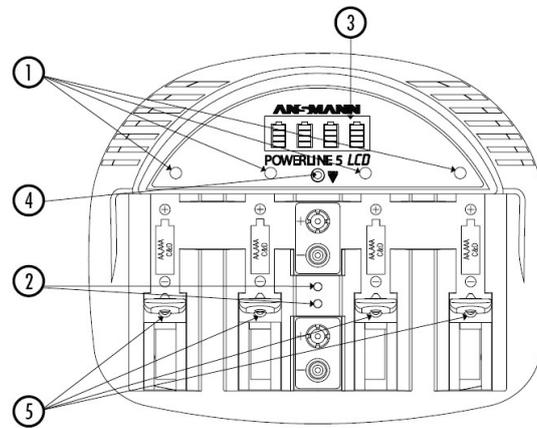


Fig. 20: LCD display, charger



**6 CHARGING TIMES (WHEN BATTERIES EMPTY)  
LADEZEITEN (BEI LEEREN AKKUS)**

TYPE/TYP	CHARGING CURRENT LADESTROM (mA)	CHARGING TIME per 100 mAh LADEZEIT pro 100 mAh	CUT-OFF ABSCHALTUNG
MICRO AAA	500	approx./ca. 15 min	automatisch / automatic
MIGNON AA	1000	approx./ca. 7,5 min	automatisch / automatic
BABY C	1000	approx./ca. 7,5 min	automatisch / automatic
MONO D	1000	approx./ca. 7,5 min	automatisch / automatic
9V BLOCK	15	approx./ca. 480 min (8h)	manual/manuell

Fig. 21: Charger function elements and charging times

## 9 Index

<b>A</b>	
Accuracy of the Temperature Measurement .....	8
Active Systems .....	20
Add Counter.....	22
ASCII.....	22
<b>B</b>	
Battery symbol .....	26
<b>C</b>	
Care Instructions and Storage .....	10
Changes .....	5
Changing the Filter Fleece.....	32
Charger Function Elements and Charging Times .....	41
Clamping the Grinding jar with the Clamping Ring .....	33
Cleaning the Air Duct in the Pressure Sensor ....	30
Close Measurement Task.....	22
Commissioning the Charger .....	39
Complete Program Sequence up to First Measurement.....	11
Configure Measurement task .....	19
Configure Measuring Systems .....	19
Confirmation .....	6
Copyright .....	5
Corrosion protection oil.....	10
Corrosion resistance.....	10
Cover Baseplate .....	31
Cover page .....	19
<b>D</b>	
Diagram .....	23
Discharge key .....	39
<b>E</b>	
End.....	22
Environment Notice .....	40
Exchanging the Cover Baseplate .....	31
Existing Measurement Files .....	22
Explanation of the Icons and Symbols.....	26
Export Measurement Data .....	22
Extreme Dirt .....	10
<b>F</b>	
File Endings .....	16
File Structure.....	17
File System .....	16
First Activation .....	11
First Measurement .....	11
Folder .....	19
Function Areas.....	18
<b>G</b>	
Gassing Function .....	30
Green .....	29
<b>H</b>	
hardened stainless steel .....	10
Highly Dynamic .....	27
Highly Dynamic Measuring Rate .....	27
<b>I</b>	
Inactive Systems.....	20
Indicator Lamps for Batteries .....	39
Inserting the Batteries .....	29
Installation of the PM GrindControl Software ....	16
Installing the USB Drivers .....	15
<b>L</b>	
LCD Display .....	39
LCD Display Charger .....	41
LED Display on the Wireless Grinding jar Cover	29
Local Computer System.....	19
Long-time .....	27
Long-time Measuring Rate .....	27
<b>M</b>	
Mains Operation.....	39
Maintenance and Care of the Charger .....	39

Measurement Resolution of the Temperature Measurement.....	8	<b>S</b>	Safety Instructions .....	38
Measurement Settings.....	23		Search for Known Measuring Systems.....	20
Measurement task, new.....	19		Software .....	15
Measuring Rates.....	27		Software Installations.....	15
Measuring Systems Management .....	24		Software Interface.....	18
Menu and Menu Bar .....	18		Special Oil.....	10
Menu file .....	18		Status Bar .....	23
Menu Help .....	24		Status Bar for the Measuring Systems .....	25
Menu Settings.....	24		Status indications.....	29
Menu View .....	22		Subsequent Switching-On of a Measuring System .....	20
Method of Operation.....	7		System Requirements.....	15, 36
<b>N</b>		<b>T</b>		
Network.....	19		Technical Data .....	8
Notes on the Operating Manual.....	5		Technical Data .....	36
<b>O</b>			Telegesis (ZigBee) USB stick .....	36
Open Measurement Data .....	22		Temperature range .....	8
Open Measurement Task .....	21		Temperature Range.....	8
Operating Conditions .....	8		Temperature sensor.....	7
Operating Instructions for Powerline 5 LCD .....	37		The First Start .....	11
Operating Time .....	8		Tool bar .....	23
Options.....	24		Tool Tip .....	26
Overview of the Charger Functioning .....	38		Transmitter range.....	8
oxide protective layer.....	10		Transport and Storage.....	10
<b>P</b>			Turning Off the GrindControl .....	29
Pressure Ranges .....	8	<b>U</b>		
Program Processes .....	22		Using the Charger.....	38
Program Sequence.....	11	<b>V</b>		
Protocol Inputs .....	22		VCE Bags .....	10
<b>R</b>			Voltage in the Measuring System .....	26
Raw data.....	7	<b>W</b>		
Red .....	29		Wet Grinding with Highly Flammable Materials .	35
Replacing the Filter Fleece When Using the Gassing Function.....	33		Windows Window Symbols Suppressed .....	22
Replacing the Filter Fleece When Using the Standard Cover Baseplate .....	32		Wireless Grinding Jar Cover .....	28
Rotational speed range.....	8		Wireless Grinding Jar Cover Components .....	28











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