USER MANUAL

GRAIN MOISTURE METER

PCE-GMM 15

ENGLISH



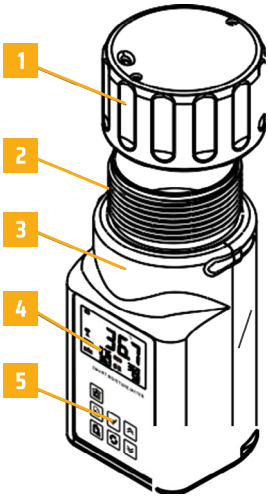
User manuals in various languages (français, italiano, español, português, nederlands, türk, polski) can be found via our product search on:
www.pce-instruments.com

INTRODUCTION

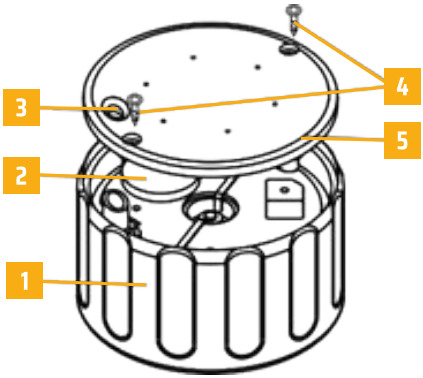
Thank you for purchasing our moisture meter. This product will be irreplaceable device in your activity. Due to its special design (and pressing the sample before the measurement), you will accurately determine your grain humidity.
The manufacturer is always ready to support their users with their knowledge and simultaneously reserves the right to introduce changes and improvements to the design and the software. We also reserve the right to introduce changes to the present instruction manual.
Before using the device, please, read this instruction manual carefully. It will guarantee safety for the user and long, reliable functioning of the grain moisture meter.

CONSTRUCTION OF THE DEVICE

1 - Tightening cap with a sound signaling a proper force of clamping,
2 - Measuring chamber,
3 - High quality ABS body,
4 - LCD backlit display,
5 - Button membrane keyboard,
6 - Chamber for 4 batteries 1.5V type LR03.

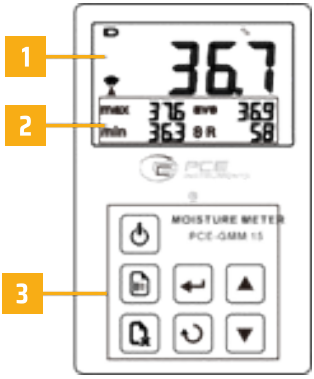






1 - The cap's body is made with addition of fibreglass,
2 - Battery 3V (type CR-2032) of the sound buzzer,
3 - The slot to remove grain residuals,
4 - Screws 2.5x8710,
5 - Lid of the cap.

1 - Main display area
2 - Statistics area
3 - Keyboard



KEYBOARD FUNCTIONS

	Turn on/off the device, Press and hold for 5 seconds to enter the correction function Press and hold for 6 seconds to enter the AL1 alarm function setting (low limit) Press and hold for 8 seconds to enter the AL2 alarm function setting (high limit)
	Measurement data viewing
	To start measurement To confirm program function
	Add key for settings or queries
	Short press, single deletion (browsing status) Short press, recount (measure- ment status) Press and hold for more than 5 seconds to delete all (measure ment status)
	Item code
	Decrease key for settings or queries

START THE DEVICE

The PCE-GMM 15 is ready to operate if the battery chamber contains properly inserted batteries (it is necessary to pay attention to polarity).
Turn ON the device using the POWER button.
NOTICE! If the batteries are too low to carry on operating, it means that the batteries have to be replaced by new ones. In order to save the source of power supply, when the keys are not used, the devices will be turned off automatically.
Turn Off the device using the POWER button.

NOTES FOR MEASUREMENTS

- Before you start the measurements, it is necessary to check if the measuring chamber is clean and dry. It is important to remember to remove the grain from the chamber as soon as the measurement is finished.
- Fill the measuring chamber with the grain to the edge and then twist the tightening cap until you hear a sound signal. It is forbidden to add the grain after the sample has been pressed. For some fluffy species, such as grass seeds, they can be filled and compacted before twisted to the ends to perform measurements.
- If the sound signal of the tightening cap is too weak, it is necessary to untwist the cap and replace the battery to a new one. It is forbidden to bend the plates which cause that the buzz produces a signal.
- During the measurements residual grain may penetrate to the screw of the cap. In order to make twisting the cap easier, you should regularly clean the screw, do not use any sharp tools for that purpose.
- Please, remember to dean the chamber carefully so that not to damage the sensor which is located at the bottom of the measuring chamber.
- The water which is cumulated on the surface of the sample (for example, dew) can have an influence on the measurement results, that is why it is necessary to avoid those situations and before the measurement you need to **air** the sample.
- It is necessary to remember that the device has an automatic temperature compensation. That is why pay attention to the temperature of the measuring chamber, it should be similar to the temperature of the tested sample (the cold sample should not be tested in the device which has been exposed to the sun, and vice versa).
- If you notice some important deviations in the results for a certain species which increase or decrease the value in the whole measurement range in comparison to the laboratory method (drying and weighing method), it is recommended to modify the measurements (see chapter: Modification of results).
- Every species has a different range of the measured humidity. However, its exceed is signaled by a proper sign, for example: **L D** (below the range), when the humidity of the tested sample is less than 8.5%.

HUMIDITY MEASUREMENTS

- Turn on the device with the POWER button,
- With the ↻ button, select the CODE of the species which you are going to test and then confirm with the ↵ button,
- Fix the tightening cap on the thread of the measuring chamber until you hear a sound made by the cap. This sound means that the force of the tightening is correct. However, in order to save the battery of the cap you need to untwist it slightly until the signal disappears (**NOTICE:** In the case of too soft grain the cap may not produce and sound. Then you need to twist it to the end of the thread),
- When the grain is properly pressed, start the measuring with the ↵ button.
- In a few seconds the display will show the moisture percent result (%) ,The moisture measurement result is presented taking into account the corrections connected with the temperature of the sample (automatic temperature compensation),
- When the measurement is finished, untwist the tightening cap and empty the measuring chamber. You need to do it carefully so that not to cause any mechanical damage to the sensor which is at the bottom. Since the measuring chamber is empty, the device is ready for further operation. In order to perform measurements of another sample of the same species, fill the measuring chamber again and twist the cap properly. Then start the measurement with the ↵ button,
  NOTICE! Proper cleaning of the measuring chamber is very important when you change the species of the sample and when you measure the samples with different and increased humidity,
- When you finish the measurements, in order to save the source of power supply, it is necessary to switch off the device press the POWER button.

STATISTICAL FUNCTIONS

This machine has a statistical function to automatically display the maximum, minimum and average values on the screen. You can do 240 sets of statistical values, and after more than 240 groups, the first measured value will be auto matically overwritten. After pressing the Delete key during the statistics process, delete the previous statistics and restart the statistics.

» **Storage**
Each measurement is automatically stored in the host computer.

» **View**

Press the key, the lower part of the screen S switches to R, enter the data viewing mode, when the left symbol ▲ becomes , press the UP and DOWN keys to browse the data in the host, and the record value also changes. As more data is stored, it will slow to enter the browsing state. Therefore, please clean up the stored data intime.

» **Delete**

In the measurement state, press the button to clear the current statistics and measurement status. Press and hold the key for more than 5 seconds to delete all data, and all statistics are displayed as zero. In the browsing state, the measurement data under the current record can only be deleted at a time.

MODIFICATION OF RESULTS

The PCE-GMM 15 has humidity curves saved in its memory. They were developed on the basis of normalized samples. Thanks to them the results are accurate and repeatable. However, it might happen that in a certain year (due to different factors), the user's harvest is slightly different from the normalized grain and then deviations in humidity results may occur.

These factors are as follows:
» Shape of the grain and its ripeness (plumpness),

» Variety qualities of the grain,

» Level of contamination and tailings,

» Level of devastation of the grain by pests and fungi.

NOTICE!
Please, remember to compare the measurements only to laboratory drying and weighing method but not to other moisture meters because they may mislead you.
Press and hold the POWER key in the measurement state until the screen appears **AdJ release**, the screen displays the current correction value of 0.0, adjust to the desired value by UP/DOWN key.
For example, if the measured value is 18.0 and you want to correct it to 20.5, adjust the correction value to 2.5 by using the UP key. After the adjustment is complete, press the key to exit.
The correction value is 0.0 by default, and after modification, it will be saved in the internai memory chip of the instrument until the user modifies it again, and the normal power on and off data will not be lost.

ALARM SETTINGS

Depressing the POWER key and don't release until **AL1** showed on display, then press UP key or DOWN key to choose your suitable value according to your needs, press ↵ key again back to the operation state.
Setting the **AL1** just the same way as **AL2.**
Usually ,AL2 must be larger than AL1, if the AL2 is less than AL1 during the setting process, then the instrument will be returned back to the factory setting, just to say,

AL1 = 13 , AL2=18.
green: Test value<13
yellow: 13<Test value<18
red: Test value> 18

REPLACE BATTERIES

When battery symbol showed on display, it must replace the batteries in time.
The moisture meter is powered by four 1.5 V type LR03, AAA batteries. In order to change the batteries:

- open the caver of the battery compart ment with the help of the ribbon tip,
- place the ribbon across inside of the battery compartment, so that its tip cornes beyond the caver,
- insert new batteries in accordance with their polarity +/- (pressing the ribbon inside),
- put the caver again. When you hear a click, it means that the security device is properly locked and there is no risk that the batteries fall out. Change of batteries in the tightening cap with a buzzer. One battery 3V (type CR- 2032) powers the buzzer in the tightening but of the measurement chamber. When the sound becomes weak or disappears, it is necessary to change the battery.

To change the battery you should:

- unscrew two screws which are in the cap,
- lift the lid and delicately lever the battery from the base, -insert a new battery in accordance with polarity +/-,
- put the lid of the tightening cap again and screw it with two screw (2.5x10).

FINAL NOTES

- The grain moisture meter should be protected against direct impact of water. Avoid using it in alternately extreme temperatures. You cannot allow water vapour condense on the metal parts of the device because it might have an influence on the measurement results.
- At the end of a season, when you finish working with the device, you need to clean and dry the measuring chamber and the tightening cap properly. The device must be kept in a dry and warm room. Proper maintenance and storage conditions guarantee long life and reliability of the device.
- If you are not going to use the device for a longer time, it is recommended to take out the batteries from the battery compartment in order to limit the risk of damage of the device due to leakage of the electrolyte. It is recommended to use batteries of recognized manufacturers.
- If any problems appear with the device or when interpreting the results, it is recommended (before sending the device to the service) to contact the manufacturer or the nearest authorized distributor. This contact is important especially before sending the device to the warranty servicing because most of the problems can be solved remotely. However, when you send properly operating device groundlessly, you will be charged with costs of maintenance and shipment.
- It is forbidden to dismantle the device, to interfere or maintain it by unauthorized people, because it might cause permanent damage and it will invalidate the warranty.

TECHNICAL DATA

Dimensions	16.5x7.1 x7.4cm
Weight	432 g (with batteries and the tightening cap)
Way of filling the chamber	manual
Sample‘s capacity	about 90 ml
Power supply	4 batteries 1.5V type AAA + 1 battery 3V type CR-2032
Measuring range	3 ... 80% (general) 5 ... 30% (special)
Resolution	0.1%
Accuracy	± 0.5 % for normalized grain ± 1 % in the range up to 10 % of humidity ± 1.5 % in the range over 10 % of humidity and can increase if the sample‘s humidity increases
Display	graphie LCD back lit

- Temperature compensation considered automatically,
- Save measurements to the memory, Data transmission to PC, Modification of humidity results, Calculation of the average result,
- Automatic temperature compensation,
- Special software to manage the data saved on PC (generation of reports, spreadsheets, diagrams, prints)

CODE TABLE

CODE	GRAIN
Cd01	Wheat/Rye
Cd02	Maize/Corn
Cd03	Soya Beans
Cd04	Paddy
Cd05	Rice
Cd06	Barley/Oats
Cd07	Sorghum/Milo
Cd08	Buckwheat
Cd09	Peas
Cd10	Oilseed Rape
Cd11	Mustard Seed
Cd12	Sunflower seed
Cd13	Sugarbeet Seed
Cd14	Coffee
Cd15	Coffee Green
Cd16	Cocoa Beans
Cd17	Linseed
Cd18	Lentils
Cd19	Ground nuts Hulled
Cd20	Grass Seed/Rye grass
Cd21	Grass Seed/Cocksfoot

CODE	GRAIN
Cd22	Claver/White Seed
Cd23	Claver/Red Lucerne Seed
Cd24	Brassicas/ Brussels Sprout, Cabbage seed
Cd25	Beans/Tic/Winter

The code is for reference only, please adjust according to the actual situation, the default CD00 code is the first time you boot up.

DISPOSAL

For the disposal of batteries in the EU, the (EU) 2023/1542 directive of the European Parliament applies. Due to the contained pollutants, batteries must not be disposed of as household waste. They must be given to collection points designed for that purpose. In order to comply with the EU directive 2012/19/EU we take our devices back. We either re-use them or give them to a recycling company which disposes of the devices in line with law. For countries outside the EU, batteries and devices should be disposed of in accordance with your local waste regulations. If you have any questions, please contact PCE Instruments.

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