

GRAINPRO® MOISTURE METER
INSTRUCTION MANUAL
MA4064RAD0918-2



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1. INTRODUCTION

The **GrainPro® Moisture Meter** is a resistance-type handheld device that provides a direct readout of moisture content levels for different types of grains and seeds. It is used to guide farmers or users in determining whether the crop is already safe for processing or storage.

GrainPro® Moisture Meter is a digital moisture meter with automatic temperature compensation for more reliable readings. It is a pocket-sized grain moisture meter where the grain is ground and compressed in one operation. Compression, grinding and automatic temperature compensation deliver highly accurate readings of the moisture contents of grains and seeds. This portable instrument with a built-in grinder is easy to use even in the field.

1.1. FEATURES:

- 1.1.1. Portable
- 1.1.2. Measures up to 19 grains and seeds
- 1.1.3. Digital readout up to one-decimal point accuracy
- 1.1.4. Combined grinding and compression mechanism
- 1.1.5. Built-in measuring cups
- 1.1.6. Automatic temperature compensation
- 1.1.7. Automatic calculation of average value
- 1.1.8. Individual calibration for all grain types
- 1.1.9. Grinder made of hardened galvanized steel
- 1.1.10. Shockproof/ resistant plastic casing
- 1.1.11. Wide measuring range
- 1.1.12. 10 years product life.
- 1.1.13. Can be operated for 2 years with 9V Alkaline battery

1.2. PRODUCT GUARANTEE:

- 1.2.1. In accordance with the terms and conditions herewith, GrainPro Inc. fully guarantees the quality of this product provided it is used according to the instructions in this manual.
- 1.2.2. Please read and understand the manual thoroughly before using the Moisture Meter.

1.3. COMMENTS, COMPLAINTS, AND/OR CLARIFICATIONS:

- 1.3.1. Please contact customercare@grainpro.com.
- 1.3.2. All queries will be answered by our team of post-harvest solution experts.

2. CHECKLIST

Please inspect your GrainPro® Moisture Meter package to ensure it includes the following items:

PART NAME	DESCRIPTION	IMAGE
2.1. Moisture Meter	2.1.1. GrainPro® Moisture Meter with built-in grinder for 19 commodities.	
2.2. Battery	2.2.1. 9V Alkaline Battery, 1 pc.	
2.3. Brush	2.3.1. Brush, 1 pc.	
2.4. Hard Case	2.4.1. Plastic Hard Case, 1 pc.	
2.5. Instruction Manual	2.5.1. Instruction Manual for GrainPro® Moisture Meter	

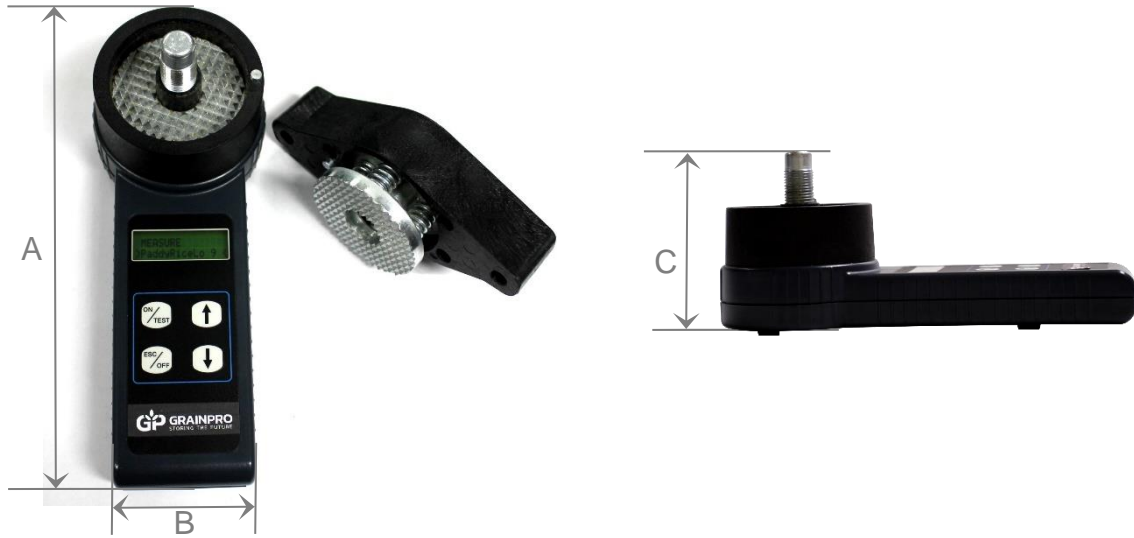
3. COMPONENTS



Figure 1. GrainPro® Moisture Meter

COMPONENTS	DESCRIPTION / FUNCTION
3.1. Cap	Made of resistant plastic and grinder made of hardened galvanized steel. Used for grinding and compression of sample grain.
3.2. LCD Display	2-line LCD display that shows the moisture content reading of the sample commodity.
3.3. ON/TEST Button	This key is used to turn-on the Moisture Meter, to enter into a specific mode, to confirm a selected command and to get the moisture content reading of the sample commodity.
3.4. Arrow UP Key / Arrow DOWN Key	This key is used to select the desired Mode, to select the commodity to be measured and to increase or decrease the calibration value.
3.5. ESC/ OFF Button	This key is used to change into other modes and to turn off the Moisture Meter.
3.6. Brush	Used to clean the sampling port after using.

4. SPECIFICATIONS



PARAMETER	STANDARD
Measuring principal	5 - 50% (depending on the crop type)
Resolution	0.1%
Battery	9V Alkaline
Accuracy, %	± 0.25%
Calibration adjustment	± 3.9%
Temperature Range, °C (° F)	0 - 45 (32 - 113)
Product weight, kg (lbs)	1 (2.2)
Product Dimension (A x B x C), cm (inch)	21 x 7.5 x 7.5 (8 x 3 x 3)
Packed Weight (including case), kg (lbs)	1.6 (3.5)
Packed Dimension (L x W x H), cm (inch)	32 x 28 x 11.5 (12.6 x 11 x 4.5)
Warranty, year	1
Product Life, years	10

APPLICATION AND MEASURING RANGES			
ITEM NO.	AGRICULTURAL COMMODITY	RECOMMENDED QUANTITY OF SAMPLE (ml)	MEASURING RANGES (%MC)
1	Wheat	9	11.7 - 26.9
2	Sunflower	9	4.3 - 27.5
3	Broken Rice	9	8.1 - 13.8
4	White Rice	9	11.7 - 26.5
5	Brown Rice	9	10.9 - 25.9
6	Buckwheat	9	10.1 - 20.8
7	Cocoa	11	4.7 - 18.7
8	Green Grams (Mung Beans)	11	11.0 - 19.4
9	Corn	11 / 18	11.7 - 50.0
10	Corn Grit	11	12.0 - 25.0
11	Peas	11	11.4 - 18.5
12	Paddy Rice Short	9	9.9 - 26.5
13	Paddy Rice Long	9	10.0 - 26.0
14	Peanuts	11	6.0 - 19.9
15	Green Coffee (Robusta)	11	9.1 - 22.5
16	Green Coffee (Arabica)	11	9.2 - 21.8
17	Soybean	11	8.6 - 27.5
18	Sesame	11	6.3 - 22.5
19	Sorghum	9	10.9 - 27.8

5. WARNINGS!

- 5.1. Do not expose GrainPro® Moisture Meter to large temperature fluctuations.
- 5.2. Do not allow the unit to be exposed to the rain or water as it affects the accuracy of the reading.
- 5.3. Avoid dropping the unit as it might cause damage and may disconnect the wiring connections.
- 5.4. Do not leave the battery installed when not in use.
- 5.5. Do not keep GrainPro® Moisture Meter unclean. The cap and bolt must be lubricated with a thin layer of oil.

6. INSTRUMENT OPERATING PROCEDURES

6.1. Battery Installation

6.1.1. Insert the 9V alkaline battery in the GrainPro® Moisture Meter. Make sure that the positive (+) and negative (-) connections are correct.



6.2. Power On

6.2.1. Inspect the test cell (grinding disc) to make sure it is clean and empty.



6.2.2. Press ON/TEST Key to turn on the Moisture Meter.



6.3. Initialization

6.3.1. During initialization, the instrument will display the company name and the battery status.










6.3.2. After which, the Main Menu "MEASURE" will automatically appear in the display.












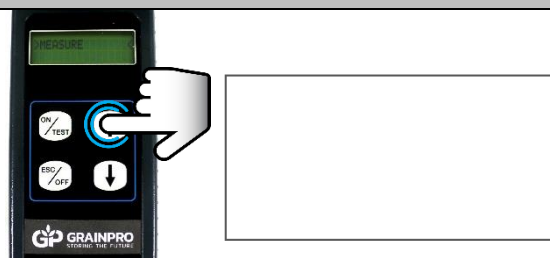



6.4. Measure Mode

6.4.1. From the Main Menu, press ON/TEST Key to set into measure mode.



<p>6.4.2. Use the ARROW Keys (Up or Down) to select the desired commodity.</p>	
<p>6.4.3. Use the built-in measuring cups in the upper part of the grinder to get an exact amount of sample.</p>	
<p>NOTE: The number displayed after each commodity (9 or 11) is the exact amount of sample to be used. Refer to Application and Measuring Ranges Table.</p>	
<p>6.4.3. Put the sample commodity on the sampling port. Position the cap on the grinder.</p>	
<p>6.4.4. Rotate the cap clockwise until the 2 stop pins lock.</p>	
<p>6.4.5. Press ON/TEST Key to get the reading (approximately after 15 seconds)</p>	
<p>NOTE: The left side %MC is the moisture content of the sample while the %MC on the right side is the average of the last 4 readings. The symbol “Hi” means that the moisture content is above the upper limit. The symbol “Lo” means that the moisture content is below the lower limit.</p>	

<p>6.4.6. Press the ESC/OFF Key once to change into another mode.</p>	
<p>6.5. Battery Mode</p>	
<p>6.5.1. From the Main Menu, press the Arrow DOWN Key once to determine the current level of the battery.</p>	
<p>6.6. Calibration Mode</p>	
<p>6.6.1. From the Main Menu, press the Arrow DOWN Key twice to get into Calibration Mode.</p>	
<p>6.6.2. Press ON/TEST Key to enter Calibration Mode.</p>	
<p>6.6.3. Use the Arrow UP/ DOWN Keys to select the desired commodity to be calibrated.</p>	
<p>6.6.4. Press ON/TEST Key to confirm.</p>	

<p>6.6.5. Use the Arrow UP/ DOWN Keys to input the exact value of %MC to be adjusted.</p>	
<p>6.6.6. Press ON/TEST Key to confirm.</p>	
<p>NOTE: The commodity that has been adjusted will have an asterisk (*) symbol after each value.</p>	
<p>6.7. Clear Average Mode</p>	
<p>6.7.1. From the Main Menu, press the Arrow UP Key once to get to Clear Average Mode.</p>	
<p>6.7.2. Press ON/TEST Key to clear all the average readings.</p> <p>NOTE: Successfully clearing average readings will prompt "OK" in the display.</p>	
<p>6.7.3. After the successful clearing, the display will show the Main Menu.</p>	
<p>6.8. Turning OFF the Moisture Meter</p>	
<p>6.8.1. Press and hold ESC/OFF Key to turn off the device. It will also automatically turn off after 90 seconds of inactivity.</p>	

7. STORAGE MOISTURE CONTENT OF COMMODITIES

COMMODITY	RECOMMENDED STORAGE MOISTURE CONTENT (%)
Broken Rice	12
Brown Rice	12
Buckwheat	12 - 13
Cocoa	7
Corn	14
Corn Grit	12
Green Coffee (Arabica)	12
Green Coffee (Robusta)	12
Green Grams (Mung Beans)	12
Paddy Rice Long	14
Paddy Rice Short	14
Peanuts	7
Peas	14
Sesame (seeds)	6
Sorghum	12
Soybean	14
Sunflower (Seeds)	8
Wheat	13
White Rice	12

8. MAINTENANCE AND CARE

- 8.1. It is recommended to store the GrainPro® Moisture Meter in an enclosed transport packaging.
- 8.2. Do not expose instrument to large temperature fluctuations.
- 8.3. Keep it free of moisture or water.
- 8.4. If the Moisture Meter is taken into a warmer environment from a cold storage location, it is recommended to acclimatise the instrument to prevent condensation in order not to affect the results of the measurement.
- 8.5. After using the Moisture Meter, wipe all the surfaces with well-wrung damp cloth and remove the battery from the instrument.
- 8.6. Clean the parts of the cap, the bolt and lubricate with a thin layer of oil.

9. TROUBLESHOOTING GUIDE

Problem	Solution
9.1. When measuring high moisture grain/seed there might be a possible contact of two grinding discs thus displaying "Hi".	Carry out a new measurement with an increased sample size. Try with approx. 2-3 ml (on top) more than the quantity indicated in the display. In particular when measuring maize with more than 20% moisture and above, 2 x 9ml must be measured out for grinding, as stated in the display.

10. FREQUENTLY ASKED QUESTIONS

10.1. What is the Moisture Meter?

It is an instrument used to measure the water content of grains, seeds and other agricultural commodities to guide the farmers or users to determine whether the crop is at the proper moisture content for processing or storage.

10.2. Why is grinding and compressing a grain sample advantageous?

Grains from the drier may appear to be very dry on its surface but may still have excessively high moisture levels within. The grinding ensures that unrepresentative moisture levels on the surface do not skew the measurement. The compression mechanism ensures consistency and repeatability.

10.3. What is Automatic Temperature Compensation?

Automatic Temperature Compensation is a facility that corrects the moisture measurement of a sample concerning its temperature. GrainPro Moisture Meter automatically correct for the effects of temperature on moisture readings.

10.4. What is the ideal Storage Moisture Content for a specific grain commodity?

For the storage moisture content of a specific grain or seeds, please refer to item # 6 Storage Moisture Content of Commodity.

10.5. Is the GrainPro Moisture Meter easy to handle even if taken out in the field?

Yes. It is portable and can be easily carried around the farm. The hard case makes it easier to carry. The weight of the product including all accessories is approx. 1.6kg (3.5lbs).

11. WARRANTY CLAUSE

GrainPro® hereby warrants that product sold to Buyers shall be free of defects in workmanship and materials, for a period as follows, starting from the date of shipment (B/L): One year for the GrainPro® Moisture Meter.

The warranty liability is limited to replacement of defective products within the warranty period at GrainPro's plant in accordance with the provisions specifically and expressly set forth herein.

The Buyer will pay for Products which need to be replaced under warranty, a percentage of the full list price according to the ratio between the period, which has passed until replacement, and the full warranty period.

The Buyer shall bear shipping costs for shipment of defective Products to GrainPro, and GrainPro shall bear shipping costs of returning good Products to Buyer.

The Warranty does not cover the cost of any service, work, or material required for the replacement of defective Products at the site of installation.

GrainPro shall have no obligation under the warranty to replace defective Products or parts thereof if the defect is a result of any of the following: normal wear and tear; damages occurring after delivery, accidents, acts of God, or catastrophes, fault or negligence, or improper storage installation, maintenance of the Products.

Replacement costs and shipping charges for Products found not to be under warranty as specified above would be paid in full by the Buyer before new/refurbished Products are shipped.

Notwithstanding the above, if the Products include main parts or sub-assemblies purchased by GrainPro from other vendors ("Additional Equipment"), then the period and terms of warranty for Additional Equipment are limited to the period and terms offered by the vendors of such equipment.

The Buyer agrees that the warranty liabilities of GrainPro shall be and are limited to the express foregoing terms: THE EXPRESS WARRANTIES AND OBLIGATIONS SET FORTH ABOVE, ARE AND SHALL BE IN LIEU OF ALL OTHER WARRANTIES AND OBLIGATIONS OF GRAINPRO, and EXPRESSED OR IMPLIED. EXCEPT TO THE EXTENT HEREIN PROVIDED, GRAINPRO DOES NOT MAKE AND SHALL NOT BE DEEMED TO MAKE ANY WARRANTY WHATSOEVER, TO ANY END USER OR TO ANY OTHER PERSON OR PARTY, INCLUDING, WITHOUT LIMITATION, ANY WARRANTY OF MERCHANTABILITY OR OF FITNESS FOR ANY PARTICULAR USE OR PURPOSE. GRAINPRO SHALL NOT BE LIABLE FOR ANY LOSS OF USE, SALES OR PROFIT OR FOR ANY INDIRECT, CONSEQUENTIAL, OR INCIDENTAL DAMAGES CAUSED BY OR SUFFERED AS A RESULT OF THE SALE OR USE OF THE PRODUCTS.

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