Operators Manual
COFFEEPRO
MOISTURE MAC PLUS
Coffee & Cocoa Moisture Tester

ENGLISH
DOCU-M0142 1212

Contents

All information, illustrations and specifications in this manual are based on the latest information available at the time of publication. The right is reserved to make changes at any time without notice.

Operation

COMPONENTS

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KEY	PART NO.	DESCRIPTION
1	*PLAS-C0308	CAP
2	*PLAS-D0307	BATTERY DOOR
3	*PLAS-USB1	USB DOOR
4	*670 USB	USB CABLE
5	*670 06053	CARRYING CASE
. . . . . .	*670 MAC	TESTER

* Indicates manufacturer's part numbers.

4

2 →

3

5 →

ERROR MESSAGES

Symbol   **Definition**
ERROR (---)   Tester is in need of service

NOTE: Contact manufacturer if an ERROR message occurs (See page 25-1).

Operation

OPERATING CONDITIONS

Test cell and sample MUST be free of any condensation or surface moisture. Moisture on beans or in test cell will cause high readings. Very hot or cool beans will pick up moisture when it warms or cools. The pressure cap of the tester can squeeze moisture from high moisture beans into the bottom of the test cell.

Because coffee and cocoa are irregularly shaped,and may not always pack the same way in the test cell, minor variations in readings may occur. To enhance accuracy, always take three (3) successive readings of the total sample being tested and average the results. Empty and refill the tester with new beans from the sample between each test.

The tester is most accurate when sample and tester are between 60˚F (16˚C) and 90˚F (32˚C). The unit will, however, operate at temperatures between 33˚F (1˚C) and 120˚F (49˚C). For best results, bean temperature should not be below 40˚F (4˚C) or above 110˚F (43˚C). If the bean temperature is 20˚F (11˚C) more or less than the temperature of the unit, preheat the tester per instructions on page 10-4. Condensation on the beans or test cell is best avoided by having the tester and grain at about the sample temperature.

The environment to which a sample is exposed, can appreciably change its moisture content. Exposed to the open air, coffee beanscan gain or lose 1% to 2% indicated moisture in only a few minutes. If a sample is to be held for even a short time before being tested, it should be placed into a tightly closed, air-tight container, such as a re-closable bag or preferably a glassjar.

Operation

## SCREEN AND BUTTON INFORMATION

BUTTON FUNCTIONS
A - Power button is used to turn the tester on or off
B - Back arrow is used to go back to the previous menu. When the back arrow is used any changes made in a previous menu will not be saved.
C - Up arrow is used to scroll up through a list of menu items or increment a value
D - Forward arrow is used in some menus to advance to the next item
E - Down arrow is used to scroll down through a list of menu items or decrement a value
F - Enter button is used to select a menu item or accept and save changes made in a menu
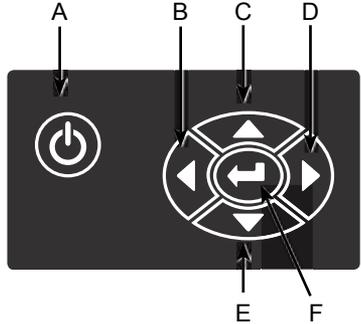
MENU SCREENS (GRAIN MENU SHOWN)
A - The name of the menu that is currently displayed
B - The list of menu items to select from
C - The button bar indicates which buttons are active in the menu
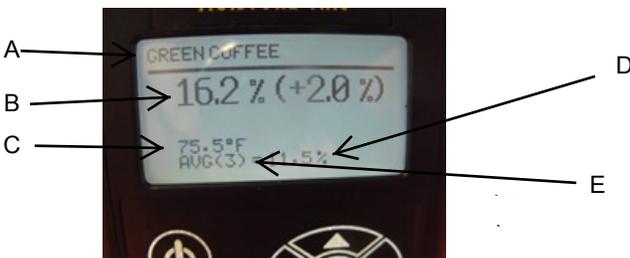
GRAIN RESULTS SCREEN
A - Name of the sample tested
B - Current moisture result
C - Temperature of the sample
D - Averaged moisture result
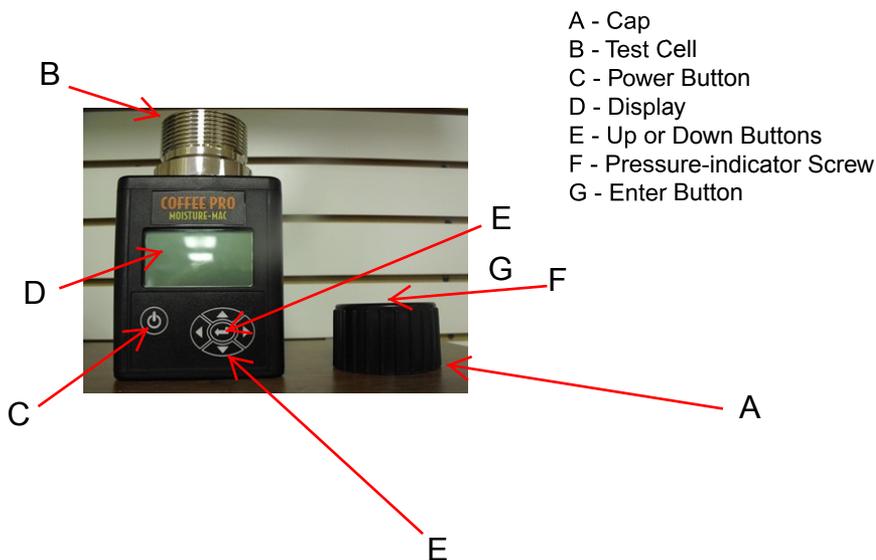E - Number of tests averaged

Operation

MOISTURE TESTING PROCEDURE

IMPORTANT: If the temperature of the sample is 20˚F (11˚C) more or less than the temperature of the tester, then follow the preheat testing procedure, otherwise follow the normal testing procedure.

PREHEAT TESTING PROCEDURE
1. Remove cap (A) and inspect test cell (B) to be sure that it is clean and empty.
2. Press and release the "POWER" button (C) to turn on tester. The display (D) will first show, "PROPERTY OF:" then display the menu with the last sample tested selected.
3. When the sample to be tested has been selected, by using the "UP OR DOWN" buttons (E), fill the test cell (B) even to the top of the cell with the desired sample.
4. Replace cap loosely. **DO NOT TIGHTEN.**
5. After 30 seconds, empty test cell and immediately refill with fresh sample.
6. Replace cap (A) and tighten until pressure-indicator screw (F) is flush with the top of cap (A). Use finger to level beans and remove excess from the test cell.
7. Immediately press the "ENTER" button (G). The words "TESTING", the sample being tested, and a moving gear will be displayed for about 5 seconds while the tester measures the moisture. Once the test is complete the moisture %, temperature and the average moisture will be displayed.
8. The results will stay on the screen and not return to the GRAIN menu until the "BACK ARROW" or "ENTER BUTTON" is pressed.

A - Cap
B - Test Cell
C - Power Button
D - Display
E - Up or Down Buttons
F - Pressure-indicator Screw
G - Enter Button

10-4
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MOISTURE TESTING PROCEDURE (CON'T)

NORMAL TESTING PROCEDURE
1. Remove cap (A) and inspect test cell (B) to be sure that it is clean and empty.
2. Press the "POWER" button (C) to turn on tester. The display (D) will first show, "PROPERTY OF:" then display the GRAIN menu with the last grain tested selected.
3. When the grain to be tested has been selected by using the "UP OR DOWN" buttons (E), fill the test cell (B) even to the top of the cell with sample to be tested.
4. Replace cap (A) and tighten until pressure-indicator screw (F) is flush with the top of cap (A). Use finger to level grain and remove excess from the test cell.
5. Immediately press the "ENTER" button (G). The words "TESTING", the grain being tested, and a moving gear will be displayed for about 5 seconds while the tester measures the grain. Once the test is complete the moisture %, temperature and the average moisture will be displayed.
6. The results will stay on the screen and not return to the GRAIN menu until the "BACK ARROW" or "ENTER BUTTON" is pressed.
7. Once a test has been taken empty the test cell if another test is needed refill with a fresh grain sample.

NOTE: For best results always take at least three tests of the grain being sampled and use the average of the results as the grain samples moisture.

MOISTURE LIMIT GUIDELINES - DISPLAY READING

(Specifications and design subject to change without notice.)

COMMODITY	MOISTURE RANGE	
	LOW LIMIT	HIGH LIMITG
GREEN COFFEE	7.0%	44.0%
PARCHMENT COFFEE	7.0%	44.0%
COCOA	7.0%	20.0%

NOTE: If grain temperature is 40˚F (4˚C) or below, or 110˚F (43˚C) or above, and the grain moisture is near either the high or the low limit of the unit (listed above), the tester is programmed to reduce its range of operating limits.

TESTING SAMPLES THAT ARE ABOVE OR BELOW THE LIMITS

If the sample being tested is above or below the limits,
 the tester will display a < (less than) or > (greater than) symbol followed
by the upper or lower moisture limit. Even though the tester can't
display a valid moisture result this information is still useful because you still
know the range above or below that the tester can display.

NOTE: Samples that are above or below the limits are not stored for averaging.

DISPLAYING THE AVERAGED MOISTURE RESULTS

1.   Each time a moisture test is taken the averaged moisture result is automatically displayed along with the current moisture and temperature.
2.   The averaged results are stored for each selected commodity, so when switching between channels there is no need to clear the averaging results as the tester calculates the average for each channel individually.
3.   The tester by default will display the averaged results of the last selected number of tests performed on the tested sample.
      (The default is the average of the last 3 tests)

CLEARING AVERAGES

1.   You can clear the average result for the current selection (Last one tested) or all channels.
2.   To clear the average, while in the channel selection menu, press the "UP OR DOWN" buttons until "OPTIONS" is selected, then press the "ENTER" button.

3.   The "OPTIONS" menu will now be displayed, press the "UP OR DOWN" buttons until "CLEAR AVG" is selected then press the "ENTER" button.
4.   The "CLEAR AVG" menu will be displayed. Press the "UP OR DOWN" buttons to select either "CURRENT GRAIN" or "ALL GRAINS". If "CURRENT GRAIN" is selected, the current grain's average will be cleared. If "ALL GRAINS" is selected, all grain averages will be cleared.
5.   Once you have selected the correct selection press the "ENTER" button the words "CLEARING" and a trash can will be displayed to confirm that your averages have been cleared.
6.   If you don't want your selection to be saved simply press the "BACK ARROW" button and you will be returned to the previous menu without saving your selection.

Operation

SELECT THE NUMBER OF TESTS TO AVERAGE
1. The tester can automatically average 3, 6 or 9 tests. (default is 3)
2. To change the number of averages, while in the grain menu press the "UP OR DOWN" buttons until "OPTIONS" is selected then press the "ENTER" button.
3. The "OPTIONS" menu will now be displayed, press the "UP OR DOWN" buttons until "# TO AVG" is selected then press the "ENTER" button.
4. The "# TO AVG" menu will be displayed press the "UP OR DOWN" buttons to select the number of averages you would like the tester to perform.
5. Once you have selected the correct number to average press the "ENTER" button the words "SAVING" and a moving gear will be displayed to confirm that your selection has been saved.
6. If you don't want your selection to be saved simply press the "BACK ARROW" button and you will be returned to the previous menu without saving your selection.

SELECT A DIFFERENT LANGUAGE
1. To change languages, while in the grain menu press the "UP OR DOWN" buttons until "OPTIONS" is selected then press the "ENTER" button.
2. The "OPTIONS" menu will now be displayed, press the "UP OR DOWN" buttons until "LANGUAGE" is selected then press the "ENTER" button.
3. The "LANGUAGE" menu will then be displayed, press the "UP OR DOWN" buttons to select the language you would like to use.
4. Once you have selected the correct language press the "ENTER" button the words "SAVING" and a moving gear will be displayed to confirm that your selection has been saved.
5. If you don't want your selection to be saved simply press the "BACK ARROW" button and you will be returned to the previous menu without saving your selection.

SELECT THE UNITS TO DISPLAY FOR TEMPERATURE
1. The tester can display in either ºC or ºF.
2. To change the temperature units, while in the grain menu press the "UP OR DOWN" buttons until "OPTIONS" is selected then press the "ENTER" button.
3. The "OPTIONS" menu will now be displayed, press the "UP OR DOWN" buttons until "TEMPERATURE" is selected then press the "ENTER" button.
4. The "TEMPERATURE" menu will then be displayed, press the "UP OR DOWN" buttons to select the temperature units you would like to use.
5. Once you have selected the correct temperature unit press the "ENTER" button the words "SAVING" and a moving gear will be displayed to confirm that your selection has been saved.
6. If you don't want your selection to be saved simply press the "BACK ARROW" button and you will be returned to the previous menu without saving your selection.

Operation

SELECT THE TIME TO AUTO SHUTOFF
1. The tester can automatically turn off in 30 seconds, 1 minute or 5 minutes.
2. To change the time while in the grain menu press the "UP OR DOWN" buttons until "OPTIONS" is selected then press the "ENTER" button.
3. The "OPTIONS" menu will now be displayed, press the "UP OR DOWN" buttons until "AUTO SHUTOFF" is selected then press the "ENTER" button.
4. The "AUTO SHUTOFF" menu will then be displayed, press the "UP OR DOWN" buttons to select the time you would like to use.
5. Once you have selected the correct time press the "ENTER" button the words "SAVING" and a moving gear will be displayed to confirm that your selection has been saved.
6. If you don't want your selection to be saved simply press the "BACK ARROW" button and you will be returned to the previous menu without saving your selection.

DISPLAYING THE SOFTWARE VERSION OF THE TESTER
1. To display the software version of the tester while in the grain menu press the "UP OR DOWN" buttons until "OPTIONS" is selected then press the "ENTER" button.
2. The "OPTIONS" menu will now be displayed, press the "UP OR DOWN" buttons until "VERSION" is selected then press the "ENTER" button.
3. The software version will then be displayed for a few seconds.

TURNING THE BACKLIGHT ON OR OFF
1. The display and keypad lighting can be turned on or off.
2. To toggle the backlight while in the grain menu press the "UP OR DOWN" buttons until "OPTIONS" is selected then press the "ENTER" button.
3. The "OPTIONS" menu will now be displayed, press the "UP OR DOWN" buttons until "BACKLIGHT" is selected then press the "ENTER" button.
4. The "BACKLIGHT" menu will then be displayed, press the "UP OR DOWN" buttons to select either on or off.
5. Once you have selected the correct setting press the "ENTER" button the words "SAVING" and a moving gear will be displayed to confirm that your selection has been saved.
6. If you don't want your selection to be saved simply press the "BACK ARROW" button and you will be returned to the previous menu without saving your selection.

SELECT A DIFFERENT FONT SIZE
1. The tester has two different font sizes: standard and large to allow for easier viewing.
2. To select the font size while in the grain menu press the "UP OR DOWN" buttons until "OPTIONS" is selected then press the "ENTER" button.
3. The "OPTIONS" menu will now be displayed, press the "UP OR DOWN" buttons until "FONT SIZE" is selected then press the "ENTER" button.
4. The "FONT SIZE" menu will then be displayed, press the "UP OR DOWN" buttons to select either standard or large.
5. Once you have selected the correct setting press the "ENTER" button the words "SAVING" and a moving gear will be displayed to confirm that your selection has been saved.
6. If you don't want your selection to be saved simply press the "BACK ARROW" button and you will be returned to the previous menu without saving your selection.

ADJUSTING THE CONTRAST ON THE DISPLAY
1. The tester's display contrast can be adjusted from 50% to 100%.
2. To adjust the tester's contrast, while in the grain menu press the "UP OR DOWN" buttons until "OPTIONS" is selected then press the "ENTER" button.
3. The "OPTIONS" menu will now be displayed, press the "UP OR DOWN" buttons until "CONTRAST" is selected then press the "ENTER" button.
4. The "CONTRAST" menu will be displayed press the "UP OR DOWN" buttons to adjust the contrast percentage.
5. Once you have adjusted the contrast press the "ENTER" button the words "SAVING" and a moving gear will be displayed to confirm that your adjustment has been saved.
6. If you don't want your selection to be saved simply press the "BACK ARROW" button and you will be returned to the previous menu without saving your selection.

Operation

PERSONALIZING AND UPDATING THE TESTER
1. The tester is equipped with a USB port and when connected to a computer will allow diagnostics and updates to its software and grain calibrations.
2. Visit www.coffeelabequipment.com/COFFEEPROMOISTURE MAC.html to use your USB port for personalization (adding user name), scale, firmware

    and diagnostic updates.

ADJUSTING A CALIBRATION TO ANOTHER MOISTURE ANALYZER

IMPORTANT: Always obtain three (3) test results from the moisture analyzer for the sample being compared. Average these three (3) results and compare this average with the averaged result of your moisture tester before making any adjustments.

1. Each grain scale can be individually adjusted up to 5.0% by increments of 0.1% to more closely match the results of an elevator tester.
2. To adjust the calibration, while in the grain menu press the "UP OR DOWN" buttons until "OPTIONS" is selected then press the "ENTER" button.
3. The "OPTIONS" menu will now be displayed, press the "UP OR DOWN" buttons until "CALIBRATION" is selected then press the "ENTER" button.
4. The "CALIBRATION" menu will be displayed showing the last grain that was tested and the calibration that is applied.
5. If the grain that is being displayed is not the grain you wish to adjust or you want to simply look through the grains calibrations press the "FORWARD ARROW" button to toggle through the list of grains.
6. Once the grain to adjust is displayed press the "UP OR DOWN" buttons to adjust the grains calibration.
7. Once you have adjusted the calibration press the "ENTER" button the words "SAVING" and a moving gear will be displayed to confirm that your adjustment has been saved.
8. If you don't want your selection to be saved simply press the "BACK ARROW" button and you will be returned to the previous menu without saving your selection.

NOTE: Adjustment can NOT be made to factory calibration to produce moisture readings in a tester that shows "BELOW LIMIT" or "ABOVE LIMIT" readings.
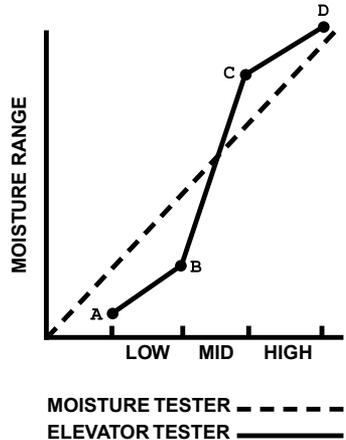
CALIBRATION CONSIDERATION / LIMITS

Typically the moisture tester will be consistent with most elevator testers over a broad range of moisture levels. However, there are some things to consider when thinking about your moisture tester calibration.

NOTE: Graph 1 provided is for illustration purposes only and does not reflect actual test data.

1. **Tester Differences:** Your moisture tester unit may not match a given elevator tester. None of the testers exactly match the actual weighted moisture of any given grain. There is no national standard for elevator testers. The difference between moisture testers and various U.S.D.A. approved elevator testers is not a constant value. A correction at one moisture level may not be valid for a different moisture level. Graph 1 illustrates how the moisture tester might compare to an elevator tester over a broad range of moisture levels. The moisture tester and most elevator testers (shown in graph by solid line) will closely match those of the moisture tester (shown by dashed line) for that range, as illustrated. However, as we get away from mid-range into the high and low moisture levels, differences between elevator tester and moisture tester not only become greater, but may switch from a moisture tester reading higher than elevator tester to a reading lower than the elevator tester. For example, in Graph 1, the area between B and C represents the mid-range moisture. Moisture tester readings match elevator tester readings in this area with an accuracy of plus or minus 0.5 percent. The area between A and B represents the low moisture range. Moisture tester readings differ more from elevator tester readings, and are LOWER than elevator tester readings. The area between C and D represents the high moisture range. Moisture tester readings again differ more from elevator tester readings than they did at mid-range moisture, but now the readings are HIGHER than elevator tester readings.

MOISTURE TESTER – – – – –
ELEVATOR TESTER ————

GRAPH 1:
Moisture Tester - Elevator Tester Comparison

2. **Calibration Requirements:** Graph 1 illustrates that moisture tester readings closely match elevator tester readings for mid-range moisture levels. (Graph 1 is for illustration purposes only and does not reflect actual test data.) Calibration changes required for grain in this moisture range will be small, if any. However, if grain is very dry (Low Moisture Range) or very wet (High Moisture Range), it may be necessary to calibrate your moisture tester unit against the elevator tester using a sample of your grain in both testers. Record the calibration correction required. It will be valid for all testing in that moisture range for that grain.

Troubleshooting

SYMPTOM A: Unit does not power up or loses power occasionally (or backlighting does not operate.)
SOLUTION 1: Press ON-OFF button for shorter time. Do NOT hold button down.
SOLUTION 2: Check batteries for 0% or higher. Replace as necessary.
SOLUTION 3: Battery contacts may be making poor contact. Remove batteries and pull metal contacts (A) up from bottom of compartment and above height of plastic knob using needle-nose pliers.
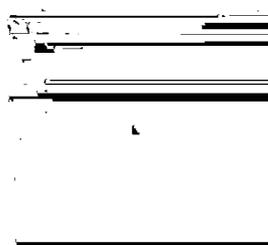
SYMPTOM B: Unit is inaccurate.
SOLUTION 1: Temperature of the grain and unit may be more than 20˚F (11˚C) different. Follow preheat procedure (See page 10-4).
SOLUTION 2: If grain is at an extreme temperature, let grain settle to reach room temperature. Retest grain.
SOLUTION 3: Sample and/or test cell may have developed surface moisture from rapid change in temperature of the grain sample. Allow grain and tester to stabilize near room temperature. Inspect for visible moisture on grain and inside test cell. Dry the test cell with a soft cloth or a blow dryer if necessary. Retest sample. (See page 10-5).
SOLUTION 4: If the tester displays SYSTEM BATTERY LOW, the test results may be inaccurate. Replace battery.
SOLUTION 5: Unit may need to be re-calibrated by factory. Return to your John Deere Dealer for repair or replacement.

SYMPTOM C: Unit reads MOISTURE BELOW LIMIT or MOISTURE ABOVE LIMIT.
SOLUTION 1: Sample may be too wet or dry to test. Check moisture limit guidelines on page 10-6 of Operating Instructions. *NOTE: Limits shown on page 10-6 are only guidelines.*

SYMPTOM D: Unit reads ERROR (---).
SOLUTION 1: Electronic failure. Return to your Dealer for repair or replacement or contact manufacturer (See page 25-1).

Service

CHECKING THE BATTERY LIFE

1. The tester is powered with two 9 volt alkaline batteries. The left battery (A) powers the backlight circuit. The right battery (B) powers the system.
2. The tester will display a percentage of battery life left in both the system and backlight batteries.
3. To select the battery check while in the grain menu press the "UP OR DOWN" buttons until "OPTIONS" is selected then press the "ENTER" button.
4. The "OPTIONS" menu will now be displayed, press the "UP OR DOWN" buttons until "BATTERY" is selected then press the "ENTER" button.
5. The tester with then display the percentages remaining for the system and backlight battery.
6. The tester system functions will operate if no backlight battery is installed or if it is low.
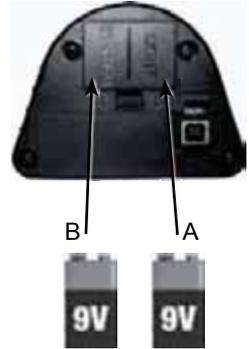
NOTE: When you first turn on the tester if the system battery is at or below 5% the tester will automatically flash the battery life on the display to let you know the battery needs to be replaced. If the backlight battery is fresh and the system battery needs replacing, the backlight battery can be used to operate the system by moving it to the system battery location.

CLEANING THE TESTER

1. Remove cap and wipe out inside of the tester with a dry paper towel.
   NOTE: Grain may become lodged in threads of cap and should be removed with a small blade screwdriver.

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Service

WARRANTY

This product is guaranteed to be free from defects in materials and workmanship for two (2) years from date of retail purchase in USA or Canada and one (1) year overseas. This warranty does not cover the battery or damage resulting from misuse, neglect, accident or improper installation or maintenance. This warranty does not apply to any product which has been repaired or altered outside an authorized factory repair facility.

The foregoing warranty is exclusive and in lieu of all other warranties of merchantability, fitness for purpose and any other type, whether expressed or implied. Coffee Laboratory neither assumes nor authorizes anyone to assume for it any other obligation or liability in connection with its product and will not be liable for consequential damages.

Contact Information.

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