

## CHAPTER 5

### OPERATION AND TESTING OF THE PERTEN AM5200-A

5.1	APPROVED CALIBRATIONS.....	Page 5-1
5.2	ENVIRONMENTAL CONDITIONS.....	Page 5-1
5.3	MAINTENANCE.....	Page 5-1
5.4	OPERATION.....	Page 5-5
5.5	CHECK TESTING OFFICIAL MOISTURE METERS.....	Page 5-9
5.6	REPAIR OF OFFICIAL MOISTURE METERS.....	Page 5-10



## 5.1 APPROVED CALIBRATIONS

Refer to Program Directive 9180.61, Official Moisture Meter Calibrations, for a listing of official calibrations, and meter models that can be used for specific grain types.

## 5.2 ENVIRONMENTAL CONDITIONS

UGMA meters should be operated in relatively controlled and clean environments where:

- a. Room temperatures are within 45-100 °F (7-38 °C). To reduce the chance for error codes and minimize the effects of temperature in official inspection, it is recommended that the room temperature be maintained within the range of 60-85 °F (15-30 °C).
- b. The instrument is maintained and operated in a level condition. The Perten AM5200-A is equipped with a level indicator and adjustable feet for this purpose. The feet should be adjusted to be in firm contact with the table surface to ensure that the instrument does not rock during operation. Remove top cover to view level indicator
- c. The instrument is not subjected to perceptible vibrations when in operation.

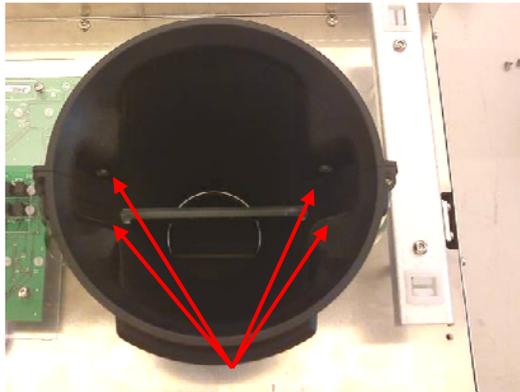
The instrument is not placed in close proximity to radio frequency transmitters such as mobile phones, wireless routers, two-way radios etc. Generally, no such transmitters should be operated within 5 feet of the instrument. If the instrument shows error messages such as “Empty Cell Measurement out of Spec,” any transmitters in the vicinity of the instrument should be moved further away from it to avoid erroneous moisture results.

## 5.3 MAINTENANCE

- a. Cleaning Machine.
  - (1) Cleaning sample sensors
    - (a) Switch the power off and pull out the power cable.
    - (b) Lift off the top cover



- (c) Inspect the four sensor lenses inside the funnel



- (d) If the sensor lenses need to be cleaned, first use a gentle compressed air jet (such as “canned air” used for PC servicing). If this is inadequate, use a damp soft cloth to remove residue build up. Snap the top cover back on before plugging in the power cable.

- (2) Cleaning the RF cell

- (a) Prior to turning the power off, select

**Menu,**

**General Settings,**

**Maintenance,**

**Check Scale,**

**Read Empty.**

This opens the grain dump door to better access the RF cell.

- (b) Switch the power off and unplug the power cable.
- (c) Lift off the top cover



- (d) Tilt back the black inner funnel



- (e) After you have tilted back the inner black funnel, you will have access to the metal RF cell inside the instrument (only if you have completed 2(a)). If the cell needs to be cleaned, first use a gentle compressed air jet (such as “canned air” used for PC servicing). If this is inadequate, use a damp soft cloth to remove residue build up.
- (f) The plastic door on the bottom of the RF cell may also be accessed for cleaning by placing the instrument on its back and removing the grain box. The plastic door may be moved and cleaned with a damp soft cloth.
- (g) Reassemble and make sure to snap the top cover back on before plugging in the power cable.

- (3) Fuse Replacement. The fuses mounted inside the instrument shall only be replaced by qualified service personnel. **There are no user serviceable parts inside the instrument.**
- (4) Electrical Connections. To prevent operator injury or damage to the instrument, verify that the line voltage is correct before connecting to the main power. You find this information on the name plate of the instrument. Also ensure the main power cable is connected to a power outlet with protective earth ground.

In case the power cable connector must be replaced, the replacement must be made only by qualified service personnel. .

b. Moisture Meter Record Log. A permanent log book shall be established and maintained for each Perten AM5200-A. The book shall be kept with the meter at the official use site. The log will be used as an important historical record to indicate:

- (1) Serial Number.
- (2) Meter test dates, results, and comments.
- (3) Date and type of each repair.
- (4) Date and location for each transfer to a new site and associated weight check results
- (5) Date and initials for each calibration change. (both official and unofficial).
- (6) Date, time, and initials when checking audit trail, calibrations version, weight accuracy etc., following return from cross utilization.
- (7) Other notable events.

Log Book Example

DATE	ACTION	NAME OF PERSON MAKING THE ENTRY
8-15-12	Rec'd s/n 1152201	
	from Perten	ZL
9-2-12	Returned from Repair	
	-Lead Sensor	BF
9-4-12	Moved to XYZ Lab	
	Passed weight check	BF
9-10-12	Calibration Change	ZL
9-12-12	Audit Trail Check	ZL
9-29-12	Weight Check - Passed	BF
10-15-12	Checked Calibrations for	
	Corn, Soybeans, + Sorghum	ZL

## 5.4 OPERATION

a. Cross-utilized Equipment. When moisture meters are used by both official agency and unofficial (elevator) personnel, the elevator shall not make any changes to the meter set-up unless approved and witnessed by the official agency. When a meter has been out of official agency control, the official agency shall clean (if necessary), follow installation guidelines (**Section 5.2**), and check the operation of the meter before commencing daily operations. This should include a weighing accuracy test, calibration version verification, and review of audit trail.

(1) Weighing Test. If the instrument has not been tested in the most recent checktest cycle, perform the official checktest—including the “weighing accuracy test” as described in **Section 5.5** under the Check Test Instructions. Otherwise, follow the instructions below.

(a) Navigate to the **Grain Weight Check** mode and proceed to test a soybean sample (use wheat if soybeans not available). After the instrument gives a weight reading, weigh the same sample recovered from the test cell on an approved scale. Compare the two readings. If the difference is within +/- 1.0 gram, then the machine is within tolerance (for one test). **If it is within this tolerance proceed to verify the calibration version (Step 2), otherwise continue to Step 1(b).**

**Note: If a location does not have an approved scale on site, record the weight from the meter then double-bag the grain portion (to prevent moisture weight loss) and transport the bagged portion to another laboratory for weighing on an approved scale (within 48 hrs at most). Make sure to record this event and results in the log book.**

(b) Repeat step 1(a) four more times and average all 5 results. If the average difference is within +/- 0.5 grams then the machine is within tolerance. Weight errors exceeding +/- 0.5 grams require instrument repair.

(2) Calibration Version Verification. Follow instructions outlined in **Section 4.5**.

- (3) Review of Audit Trail. Review the Audit Trail log and make sure there have been no system modifications while the instrument has been out of official agency control. Any changes that relate to system functionality and testing are recorded and stored on the instrument. The Audit Trail will provide a log of these changes.
- b. If problems are found, remove the unit from official service until corrected. Whatever method of security check is performed, it must be recorded in the Log Book and the entry initialed.
  - c. Maintain Current Date and Time for accurate records. (See Operators Manual)
  - c. Test Weight per Bushel. This function is not approved for official use.
  - d. Power-On. The power switch is on the rear of the unit, beside the main power inlet. It will take a few moments to initialize and to warm up. After the warm up is complete a notice will appear reminding the operator to make sure the grain box is empty and in its proper position. Once the **OK** button is pressed the product selection screen will appear indicating it is ready for use.



On/Off switch

- e. **Grain Selection.** Once the product screen appears select the desired product by pressing the corresponding button in the list. Use the arrow keys to scroll up and down in the list to display more products.



- f. **Grain Analysis.**

- (1) After the desired grain is selected, pour sufficient sample into the hopper where there is enough sample in the hopper to reach the hopper full sensors. The machine will automatically start the analysis. Should you realize that you made a mistake and need to go back to the Products menu, press **Cancel**. The sample will remain in the funnel. Should you need to empty the sample into the sample box, press **Abort**.



- (2) Enter Sample ID and press **Done** (only if sample ID is activated) to confirm and get to Analysis Results screen. The instrument can be set to use Sample ID to keep track of analyzed samples. If you use this feature, the instrument will now ask for a Sample ID. Press the white field, and an on-screen keyboard will be displayed. If the Sample ID field is grey, there will be no **Confirm** button and the instrument will automatically go to the Analysis Results screen and record results.

(3) Addressing Suspected Erroneous Results:

- (a) If the result appears to be a gross error (meaning there is reason to believe the error is more than 2 percent moisture different from the expected value or that of a similar lot of grain), one subsequent test may be performed. (Before repeating the test, check the cleanliness of the instrument, verify that the correct calibration was selected, and remove from the sample any large debris that may have hindered the flow of grain into the test cell.)
- (b) If the second test result is within 1 percent of the first, report the original result
- (c) If the second test result is not within 1 percent of the original, perform a third test and report the average of the two results that are closest to each other.

**Note: This policy may only be used when the official operator suspects that a gross error has occurred; it must not be used to justify retesting to obtain a desired moisture reading. The original inspection otherwise consists of one drop. The interested party may request a review and/or appeal inspection according to established procedures.**

Example:

The expected value is around 14.7% moisture.

Original Inspection result = 17.4%

$$\begin{array}{r} 17.4 \\ - 14.7 \\ \hline 2.7 \end{array}$$

2.7 from expected value therefore

Subsequent Inspection result = 15.0%

$$\begin{array}{r} 17.4 \\ - 15.0 \\ \hline 2.4 \end{array}$$

2.4 from the original result therefore

Third Inspection result = 14.8%

$$\begin{array}{r} 15.0 \\ + 14.8 \\ \hline 29.8 \end{array} \longrightarrow 29.8 \div 2 = 14.9 \text{ is the average (this result would be used)}$$

- (4) Empty the Sample Box and put it back again.

**Note: Keeping the sample box in place prevents rodents from entering the unit and causing damage.**



- (5) To analyze the next sample of the same sample type, just pour the sample into the funnel. To switch to a different sample type, press **Products** and follow instructions in step 1 above.
- g. **Sample Temperature.** The maximum temperature range limit is 0 to 113°F (-18 to 45°C). If the grain sample has a temperature outside this range it causes an error message will be displayed. The moisture sample temperature is more restricted for some grain types and moisture ranges.
- h. For additional instructions, refer to the Perten AM5200-A operator's manual.

## 5.5 CHECK TESTING THE PERTEN AM5200-A

Refer to the UGMA-Compatible Moisture Meter Checktesting Procedures, Attachments A and B for instruction:

<http://www.gipsa.usda.gov/fgis/equipment.html>

Refer to the UGMA-Compatible Moisture Meter Checktesting Procedures, Attachment C for the appropriate form/spreadsheet:

<http://www.gipsa.usda.gov/fgis/equipment.html>

If you have any questions regarding the check test contact Pat Jackson (816) 891-0450 or the Moisture Lab (816) 891-0445.

## **5.6 REPAIR OF OFFICIAL MOISTURE METERS**

- a. General. All repairs to official meters shall be made by the manufacturer. Users shall not attempt to make repairs or adjustments other than as outlined in this handbook or the Perten AM5200-A operator's manual.
- b. To aid the manufacturer in determining the types of repairs needed, thoroughly describe the malfunction or operational difficulty, and provide any other pertinent information concerning the condition of the meter.
- c. When packing the meter for shipment, be sure to follow the operator's manual instruction.
- d. Upon return from repair, the meter shall be check tested.