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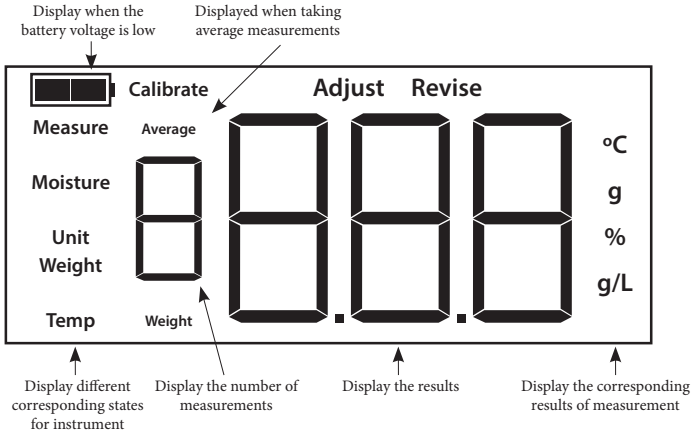
Agricultural Electronics 1-800-SENSOR-1

Version 1
Instruction Manual
S1-LDS

I Schematic

LCD Diagram:



Note: Words and Symbols on the display shall be shown according to various working status.

II Preparation before Use

1. Remove the dedicated shockproof protective cover on the moisture analyzer measuring transducer, also make sure that there are no substances in the transducer, otherwise the analyzer will not work properly;

2. Open the battery compartment cover at the bottom of the instrument and install 4 AA alkaline (1.5V) batteries according to the polarity indicated (rechargeable batteries are not allowed), or plug in the external AC power adapter (100V-240V 50Hz-60Hz)

3. Place the instrument on a flat, shock resistant, table with no wind, and place the funnel cover on the blanking tube;

4. Prepare the sample to test: make initial screening of samples to remove impurities, then place the sample in the instrument to achieve temperature equilibrium;

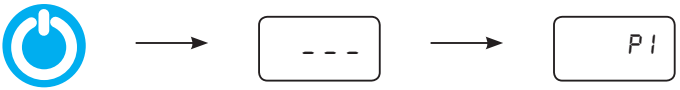
5. On the LCD Display select category code (for convenience, the category calibration parameters are pre-set to factory default) by selecting "Category Code Table" you can select the appropriate category to conduct direct moisture measurement;

6. If instrument calibration and error correction are needed, the moisture value of the sample measured according to the 105°C standard oven method shall be regarded as the standard value, otherwise the measurement accuracy cannot be guaranteed.

7. When the instrument is used for trade settlement, safe storage and other occasions for high precise measurement, our company strongly urges the user to adopt calibration and error correction of measured categories under certain conditions so as to ensure accuracy and maintain user interest.

III Moisture Measurement

1. Press the Power Switch, the instrument starts self-test, and the category code will be shown:



2. Press "△" or "▽" to select a category code according to the category code table; For example, corn is P5.

3. Put the test sample in the filling tube to the lower open of the funnel (see Fig.A):

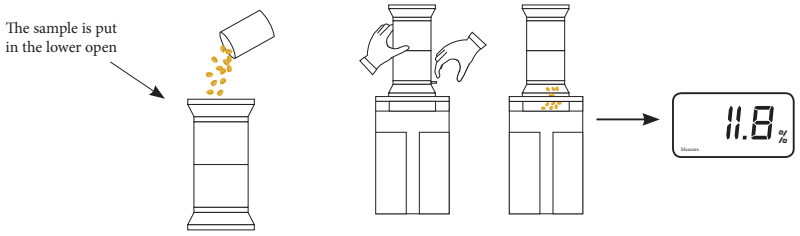


Fig. A Fig. B

4. Install the filling tube on the instrument transducer port, use one hand to hold the filling tube, and with the other hand, gently press the switch of the material door (as shown in Fig. B), so all samples are dropped into the transducer evenly. Do not press any buttons, the instrument will automatically start, and the moisture value will be presented after the radix point flashes several times:

5. Close the door of the filling tube and pour out the samples in the transducer to prepare for the next measurement.

6. In order to reduce measurement error, please pay attention to maintaining the consistency of operating practices;

The same sample (especially large particle samples such as corn, etc) should be for more time and take the mean value; press the "Enter" button and the mean value for several measurements will be displayed.

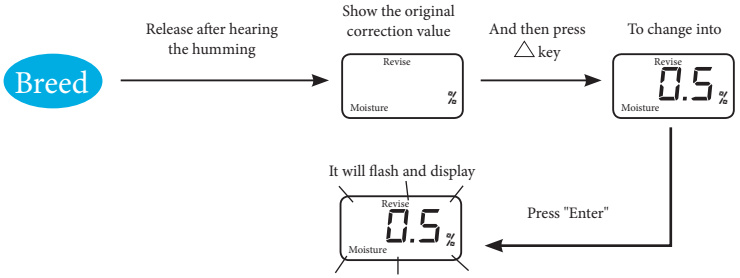
IV Error Correction

Due to objective reasons and geographical differences, certain limits exist in the pre-set parameters in the factory default for calibration, which may cause errors during measurement. In this case, moisture value can be corrected according to the following methods to ensure and improve the measurement accuracy.

1. Determine the error correction value: in general, the moisture value measured by 105°C standard oven method is the standard value, minus the measured value, and the correction value will be obtained. For example, the measured moisture value is 13.5% and the actual moisture to display is 14%, therefore the correction value is +0.5%, which means it should be tuned up 0.5. If the obtained correction value is negative, it needs to be turned down.

2. Correction: pour the sample into the instrument, press "Breed" key until you hear the beep. The word "Revise" should flash on the display, and the originally set error correction is shown as well (the factory default correction value is 0.0) Press"△ " or " ▽ " key to adjust the correction value, click the "Enter" button to save the new settings, which will flash for confirmation. Shutdown the instrument or click "Breed" key to exit the correction status.

The entire Correction Process is shown as follows:



V Calibration

Calibration means to make a new setting for the instrument parameters with the known standard moisture sample. Its effect is to increase the measured species or correct the measurement error of the existing categories accurately.

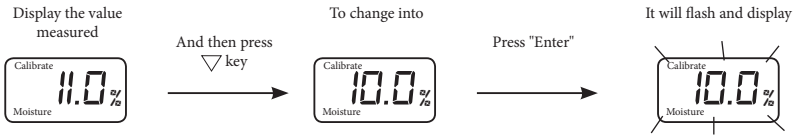
The instrument can use calibration with four standard samples at most, as follows:
1. Standard sample preparation: prepare the standard sample with 105°C standard oven method; to make the calibration with the most accuracy, the highest and lowest moisture value of the standard sample shall be on both ends of the actual measured moisture scope, where the distance of 3-6 percentages between levels is ideal. Should the measured moisture scope not exceed 6%, samples can be divided into high, medium and low three standards, or high and low two standards. (For example: wheat, water at high standards, intermediate 1, intermediate 2, low moisture, 22%, 18%, 14%, 10%).

2. Notes:
(1) Pour all items into the transducer before calibration operation.
(2) Do not shutdown the instrument during the calibration process.
(3) Carry out the calibration process in the order or low, medium, and high moisture value.

3. Select the category code: Press "△" or "▽" key to select the category code required for calibration (The originally labeled parameters in the category will be overwritten).

4. Enter the calibration mode: Long press the "Enter" button (about 5-6 seconds) and release after hearing the beep. It is indicated that the instrument has entered calibration mode, and put in the first standard sample. 

5. Mark the low moisture calibration: take the standard sample with low moisture and put it in the transducer through the filling tube, wait for the display measuring result (such as 11%), then press "△" or "▽" to change the displayed value into standard value then click the "Enter" button to save the modified result. The instrument flashes 10%, indicates that the first point calibration is done; as shown below:



(Tip: First point calibration error correction can also be used as a method for error correction; if you shutdown and exit now, it is the equivalent to the completion of error correction.)

6. Mark the second point: pour out the standard sample with low moisture, the instrument displays 

; put in the second standard sample as indicated; complete the calibration operation for the second point as indicated in point 5.

7. Continue the calibration operation: as shown in the above methods; after finishing the calibration for the fourth standard sample, the instrument will exit this mode automatically; if the third and fourth standard sample do not exist, press the "Breed" button to exit the Continue calibration mode;

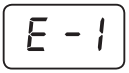
8. Re-test the standard sample: if the measured error≤ 0.5% it means that the calibration is successful; If the error is too large, it needs to be re-calibrated.

VI Restore the factory Calibration Data

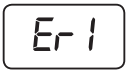
If a user wants to reset the default calibration data to factory defaults, Select the category code needing to be reset, press the "Enter" button, and release after hearing the beep. Then press the "Breed" button and release after hearing a beep. The instrument flashes, indicating the parameters have been reset to their defaults. Shutdown and exit the reset mode.

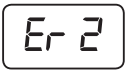
VII Status Indication

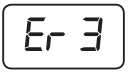
The instrument has a power-on self-test function, which will show the appropriate indicators according to different modes, shown as follows:

★ 

Indicates the moisture transducer fails or there is a sample inside the instrument needs to be poured out or repaired. (See Maintenance section)

★ 





Represent the water, temperature and weight circuit failure

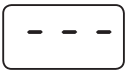
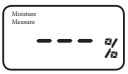
★ 

Indicates that the moisture value difference between samples during calibration is less than 1%

★ 

Indicates there is an error in the moisture low-high order of moisture value during calibration

★ 
Flashing battery sign appears on the top left corner: indicating low power in the battery which needs to be replaced.

★		Battery symbol and the word "U-L" appear simultaneously: indicating that the battery has run out and needs to be replaced immediately.
★		Indicates that the weight self-test fails: conduct maintenance in accordance with step 3 in the "Maintenance" section.
★		Indicates that the sample quantity is too little.

VIII Instrument Ancillary Functions (Reference Use)

1. Shows the sample weight: when showing the measured moisture value, press "△" button, and the weight of the sample can be shown; Press "Enter" again to return to the measurement mode.

2. Display the sample temperature: when displaying weight, press "Breed" key, the sample temperature is displayed; Press "Enter" again to return to the measurement mode.

3. Mean value: when the instrument measures the same category more than twice, the mean value measured several times before can be displayed.

4. Volume conversion: when the funnel is not installed in the filling tube attachment, the volume is about 232 cubic centimeters (cc), which only needs to be measured during sampling, and put the sample in the filling tube after being leveled. When the moisture is shown, press "▽" key without pouring out the sample, and then the sample volume is shown, where the unit is a gram per Liter (g/L). Of course the value is only for the convenience of on-site estimation. When the volume indicator is used for trading settlement and other occasions, the measurement result of official volume-weight instruments shall prevail.

When Measuring the volume weight, take out the sample by the following:

1. Take out the sample with the charging barrel

2. Remove the funnel on the filling tube

3. Use the edge of the funnel to level the sample along the edge of the filling tube

4. Prepare for measurement

IX Main Technical Indicators

Measurement object: food and other non-metallic granular samples, such as rice, wheat, corn, soybeans, rapeseed, etc:

Measurement error: ≤+0.5% (main moisture range)

Repeat error ≤0.2%

Measurement range: 3-35%

Measurement time ≤ 10S

Weight: 790g

Ambient Temperature: 0-40 ºC / 32- 140 ºF

Power: Four AA Alkaline batteries or external 6V DC power supply

Display: Back-lit LCD highlighted

Subsidiary Functions: Volume Translated Display, sample weight display, temperature display, mean moisture value calculation.

Complete Accessories: external AC power adapter, cleaning brush, manual, certificate of warranty card, filling tube, funnel, calibration weights, four AA alkaline batteries.

X Category Code Table of Preset Calibration Parameters

Category Name	Category Code	Category Name	Category Code	Category Name	Category Code
Japonica Rice	P1	Large Corn	P9	Soybean Meal	P17
Soybean	P2	White Wheat	P10	Cottonseed Meal	P18
Wheat	P3	Peanut Kernel	P11	Rapeseed Meal	P19
Rapeseed	P4	Sorghum	P12	Pellet Feed	P20
Corn	P5	Black Sesame	P13		P21
Barley	P6	Sunflower Seed	P14		P22
Indica Rice	P7	Watermelon Seed	P15		P23
Rice	P8	Cottonseed	P16		P24

XI Maintenance

1. The instrument is a high-precision electronic instrument product that must be picked up and put down gently, avoid shock and moisture, also it must be placed horizontally when using and being stored. It should be cleaned and maintained regularly.

2. The batteries should be removed when not using or during transportation.

3. Electronic Balance Calibration: If the Instrument built-in electronic scale is inaccurate, calibration can be conducted according to the following methods:

a. Place the instrument horizontally in shutdown status and remove everything from the transducer. First long-press the "Breed" key, then press the power button to start. The instrument will beep. Then release the "Breed" button and numbers are shown in the instrument indicating that it is in balance calibration mode;

b. Press the "Enter" key again, the radix point on the display flashes and shows 200g' indicating that 200g weight can be put on;

c. Gently place the fixed weight that comes with the instrument (or 200g standard weight) on the clack tip in the center of the measurement transducer; then press "Enter" again. After 200g is shown on the instrument, shutdown and remove the weight.

4. If there is an E1 error.

a. Keep the machine in shutdown status, long press the "Enter" Button (do not release), meanwhile, press the "On/Off" button to start. Keep pressing the enter button until you hear a "beep" sound, then release the "Enter" button.

b. The instrument will start in "Calibration" mode, then press "Enter". "0.0" should appear, press "Enter" again. "0 x 0.0" should appear, then turn off the machine.

c. Follow these steps with the Electronic Balance Calibration found in step 3 on the previous page.

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