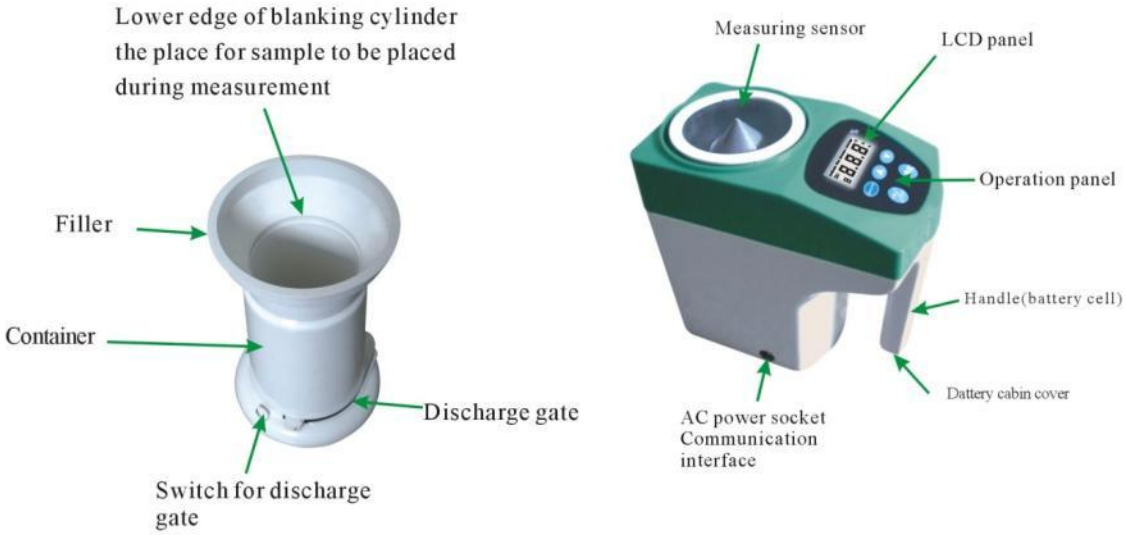
GM001 Grain Moisture Meter

Computerized Moisture Meter
User s Manual

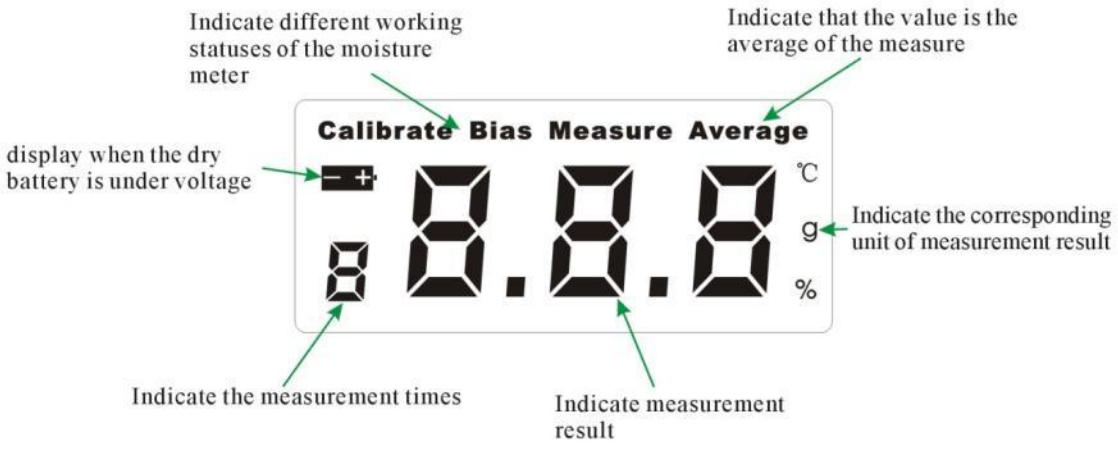
- ★ Quick, accurate, convenient
- ★ AC/DC power supply compatible
- ★ High-brightness backlight LCD, clear and energy-saving
- ★ Multipoint calibration, error correction
- ★ Low power consumption, automatic shutdown
- ★ Automatic weighing and temperature compensation
- ★ Volume-weight conversion display

Thank you for buying and using our product. In order to maximize the effect of this product, please read this User's Manual carefully and keep safely.

1. Structure Diagram



Schematic drawing of LCD panel



2. Preparations before Use

1. Take out protective foam blocks filled around the measurement sensor of the moisture meter ("the meter" for short), and meanwhile confirm that the sensor is free of any substance, otherwise the meter will not work properly;
2. Open the cover of battery compartment at the bottom of the meter, load in four 5# alkaline (1.5V) dry batteries (rechargeable batteries must not be used) according to polarity indication, or plug into AC power source (200V±10%, 50Hz) with AC adapter which is provided together with the meter;
3. Put the meter on a wind-free and shake-proof horizontal platform and make the funnel closely attached to sample container.
4. Get ready the sample to de tested: conduct preliminary sample screening, get rid of impurities, and put the sample in the meter for as long as possible to achieve temperature balance;
5. Check the list to identify category code: for ease of operation, the calibration parameters for representative categories have been preset during shipment of the meter. During application, all you need to do is check the "category-code list" attached to this User's Manual and chooses the corresponding Category code for moisture measurement.
Note: when the meter is used for trade settlement and safe storage which needs higher precision, we strongly recommend that you adopt standard sample of the category to be measured and conduct calibration and error correction of the meter so as to ensure measuring precision and safeguard your interest.

3. Calibration of electronic balance

In transport or unexpected factors ,may bring the inner scale lose balance,Our corp firmly advise that the user before using our moisture meter ,pls emendate it .we can emendate as follows:
1. Horizontally place the meter in shutdown state and take everything out of the sensor. Press and hold the "Species" key, then press the "ON/OFF" key for startup and the meter will buzz. Release the "Species" key then release "ON/OFF" "key, and the meter will display a figure, indicating the meter is under balance calibration status;
2. Press the "OK" "key and the decimal point on the display screen flickers several times,showing a flick ering 200g, which means that a 200g weight shall be added;
3. Put the fixed weight supplied with the meter (or 200g standard weight) gently on the black tip in the center of measuring sensor, and press the "OK" key again. After the meter shows 200g ,press" ON/OFF " Key turn off the meter and take away the weight.

4. Moisture Measurement

1. Press down the power switch and the meter starts self-check.It will dispaly the species code after self-check.

2. Press the "▲" or "▼" key to choose the code of category to be measured (refer to the attached list for details);

3. Put the sample into the blanking cylinder to the lower edge of funnel for later use (see figure A);
4. Put the container on the instrument sensor, support the blanking cylinder with
One hand and press gently the switch for discharge gate (shown in figure B) to make the sample fully and evenly fall into the measuring sensor. Without pressing any key, the meter will automatically start the measurement and the moisture value will be displayed after the decimal point flickers several times;

5. Close the discharge gate of the blanking cylinder, empty the sensor of the sample and prepare for the next measurement.
6. In order to reduce measurement error, pay attention to the consistency in operating method.
7. the same sample (especially large-grain samples such as maize) shall be subject to several measurements, whose results will be averaged: press the "OK" key once and the average value of previous measurements will be shown Measure Average 3 11.0% .

5. Error Correction

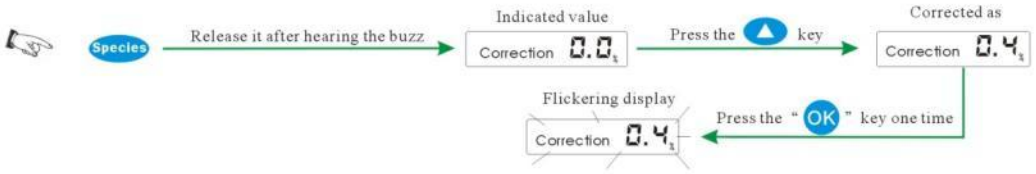
Due to objective factors in regions and category difference, preset calibration parameters with the meter shipment may have limitation and measurement error is likely to occur. The moisture value can be corrected with the following method so as to guarantee or improve measuring precision:

1. Determine error correction value: as a rule, the moisture value measured through 105℃ standard drying oven method is adopted as the standard value. The correction value is obtained by deducting the measured value from the standard value. For instance, the moisture value measured by the meter is 13.6%, but actual moisture value to be displayed is 14.0%. So correction value is +0.4, which means that The calibration is 0.4 upward. If the correction value is negative, that means the downward calibration is necessary;

2. Enter into correction status: take the sample out of the meter, press and hold the "Species" key and release it after hearing the buzz. By this time, the character "Correction" flickers on the LCD panel, which means the meter has been in correction status, and the set error correction value (the default correction value before shipment is 0.0) is also displayed;

3. Correct error: press the "▲" key to raise the correction value (e.g., 0.4), and then press the "OK" key to save the value. The meter will flicker for confirmation. Turn off the meter or press the"Species"key to exit from correction status.

The entire correction process is shown below:



6. Bias

Calibration means conducting new configuration of the meter's parameters with samples whose standard moisture value has been already known. Calibration is used to increase measurement categories or correct precisely the measurement error of existing categories.

The meter can be calibrated with up to 4 standard samples in the following method:

1. Prepare standard sample: adopt 105℃ standard drying oven method to prepare standard sample; to make representative and accurate calibration, the maximum and minimum moisture value of standard sample shall be at the two ends of the range of actually measured moisture values, with 3~6 percentage points as the interval between different levels. If the range of measured moisture does not exceed 6 percentage points, only three standard samples (high, middle, low) or two standard samples (high, low) are required (e.g., wheat, standard moisture values are arranged according to high, middle 1, middle 2, low, i.e., 22%, 18%, 14%, 10% respectively);

2. Notices:

(1) The calibration must be performed in the order of low, middle, high moisture values;

(2) The meter shall not be shut down during calibration;

(3) The sensor shall be emptied prior to calibration.

3. Choose category code: press the "▲" or "▼" key to choose the code of the category to be calibrated (the previous calibration parameter under this code will be overlaid);

4. Enter into calibration status: press and hold the "OK" key (approx. 5~6s) and release it after hearing the buzz. The character "Calibration" flickers at the bottom left corner of the LCD panel, and Bias --- is displayed, which means that the meter has entered into the calibration status and the first standard sample shall be put in;

5. Calibrate low moisture: take the low-moisture standard sample and put it into the sensor through the blanking cylinder. After the meter indicates the measured value (e.g., 11%), press the "▲" or "▼" key to modify the displayed value into the standard value (e.g., 10%), then press the "OK" key to save the modification result. The meter displays the flickering Bias 10.0% , which means that the one-point calibration is completed. See the following diagram:

Note: the one-point calibration also acts as an error correction method. If the meter is shut down at this time, it is equivalent to the completion of error correction.

6. Calibrate the second point: Empty the sensor of low-moisture standard sample and the meter will display Bias 2-- which means that the second standard sample shall be put in. Complete the calibration of the second point in the same method as specified in the above step 5;
7. Continue calibration: continue calibration in the above procedures. After the calibration of the fourth standard sample is completed, the meter will automatically exit from the calibration status; if there is no third or fourth standard sample, you may press the " Species " key or shut down the meter to exit from the calibration status;
8. Bias standard sample: if the measuring error is≤0.5%, it means the success of the calibration. If the measuring error is to big, recalibration is necessary.
Note: in case of any mis-operation during calibration, press and hold the " Species " key and release it only after hearing the buzz. Return to the initial calibration status and restart the calibration.

7. Volume weight measure

Volume weight conversion: the volume of the blanking cylinder supplied with the meter is about 232cm3 (ml) without using the funnel. The sample shall be stickled with the funnel along the edge of blanking cylinder before being put into the meter for measurement. After showing the moisture value, press the " OK " key to display the sample weight. Then press the OK " key again to starts automatic conversion, shortly after which the volume weight of the sample will be displayed, e.g., Measure L 780g . This value, of course, is for reference only.

8. Restoration of Calibration Data with Shipment

If you want to restore the meter's default calibration data with shipment, the following operations shall be performed:
Choose the code of the category to be restored. Press the " OK "key, and press again and hold the" OK " key. Release it after hearing the buzz, and then press and hold t Bias 1-- " key until the buzz is heard. The meter displays flickering which means the default parameter has been restored. Shut down the meter and exit the restoration

9. Status Display

The meter has self-check functionality upon startup, which can give prompt signals according to different working status:

★ E-1 : shows that there is a sample in the sensor during startup or something wrong with the meter. The sample shall be taken out or the meter shall be inspected;

★ Er1 Er2 Er3 : show that a fault occurs to the meter's moisture measuring circuit, temperature measuring circuit and weighing circuit respectively;

★ dr1 : shows that the moisture difference between standard samples is less than one percentage point during calibration;

★ dr2 : shows that during calibration, there is something wrong with the sequence of standard samples' moisture value in terms of size;

★ flickering display of + − at the top left corner of LCD panel: shows that the battery voltage is insufficient and timely replacement is required;

★ There is a constant display of + − at the top left corner of LCD panel, and meanwhile U-L appears on the LCD panel: shows that the batteries have been used up and the meter will be automatically shut down in 30 seconds.

10. Subsidiary Functions with the Meter (for reference)

1. Indicating sample weight: After the meter displays the first measured moisture value or the average value, press the " OK " key to display the sample weight in gram

2.Indicating sample temperature: under the status of weight indication, press the "Species" key to display the sample temperature in ℃; and press the " OK " key again to redisplay the moisture value.

11. Accessories of the Meter

The instrument case shall include the following accessories:
AC adapter, cleaning brush, user's manual, quality conformity certificate and quality warranty card, blanking cylinder, funnel, calibration weight for each meter; four 5# alkaline batteries.

12. Major Technical Data

Measuring object: foodstuff and other non-metal granular samples, such as rice grain, wheat, corn, soybean and rapeseed, etc.

Measuring error: ≤±0.5%
Repetitive error:≤0.2%
Measuring range: 0~40%
Measuring time:≤10s
Environmental temperature: 0~40℃□
Net weight: 910g
Power supply: four 5# alkaline batteries or external 9VDC stabilized power source
Display mode: high-brightness backlight LCD

13. Maintenance and Servicing

1. As a precision electronic product, the meter must be handled with care and be protected against shock and dampness. It must be placed horizontally during use and safekeeping, and be subjected to regular cleaning and maintenance;
2. Dry batteries shall be taken out if the meter is not used for a long time or in transit;

14. Category-Code List

Category name	Code	Category name	Code	Category name	Code
Japonica rice	P1	Large-grain corn	P9	Soybean meal	P17
Soybean	P2	White wheat	P10	Cotton meal	P18
Wheat	P3	Peanut kernel	P11	Rapeseed meal	P19
Rapeseed	P4	Chinese sorghum	P12	Pellet feed	P20
Corn	P5	Black sesame seed	P13		P21
Barley	P6	Sunflower seed	P14		P22
Indica rice	P7	Watermelon seed	P15		P23
Rice	P8	Cotton seed	P16		P24