

# First Guide

Thank you for purchasing this product. Please read this brochure first!



KB-230 provides moisture converting the absorption of near-infrared of the measuring object using a formula "calibration curve". The calibration curve differs depending on the measuring object. Therefore, it is required to make and register the calibration curve for each object. Once the calibration curve is registered referring to this brochure, this unit can be used as an optimized moisture analyzer or the measuring object.

So, this device is just a box without registering a calibration curve. That's how it works. Let's set it up together!

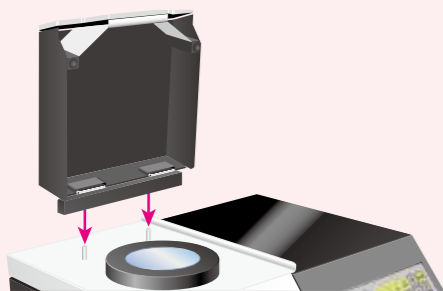
## 1. Preparing the main unit

### 1.1 Check the packing content.



### 1.2 Attach the light shielding cover.

Attach the light shielding cover by inserting the columns provided on the top surface of the unit into the mounting holes on the cover.

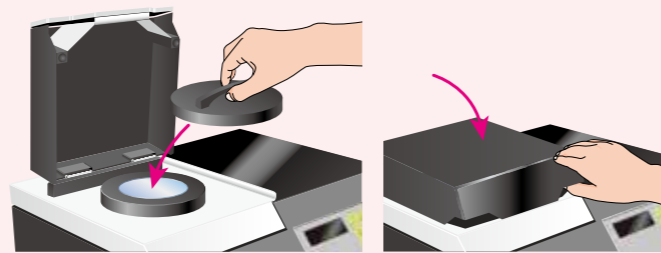


### 1.3 Connect the power cable.

Connect the power cable to the unit, and plug into the socket. Also, make sure to ground.

### 1.4 Attach the zero-adjustment plate.

Open the light shielding cover, and set the zero-adjustment plate onto the rotation table of the unit. Then, close the cover.



### 1.5 Turn off the power switch.

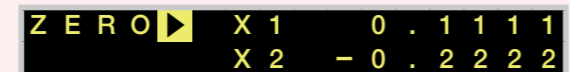
Turn on the power switch located at the rear of the unit.

### 1.6 Warm-up of the unit will start.

When the unit is powered on, the rotation table will automatically start rotating to warm-up. At the same time, a message "SET THE STD PL." will be displayed. Set the zero-adjustment plate if it was not set in step 1.4.



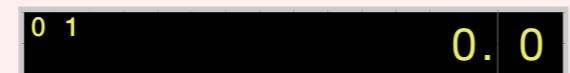
When the warm-up is done (after 5 to 6 minutes), the indication "WARMING UP" turns off and the zero-calibration screen will be displayed.



### 1.7 Perform zero-calibration.

Press the [ENTER] key to execute zero-calibration.

The zero-calibration will proceed while displaying the absorbance in real-time. When the calibration is completed, the initial screen will be restored.




If the power is once turned off, please restart from step 1.6. In that case, also make sure that the zero-adjustment plate is set.

## 2. Setting the measurement conditions


### 2.1 Select a sample cell (container) from four types listed in the following.

Make sure that the selected one fully covers the measurement window, and also use the same one in making calibration curve and actual measurement.

**1**  It is suitable for uneven grains, large grains, or grains whose moisture degree largely fluctuates. **Beans, etc.**


\* Use the standard accessory

- It is reusable.
- The sample can be covered, and it will reduce the moisture change while storing the sample.
- The light shielding cover can be used.
- A measurement using the rotation table is possible.
- Clean and dry is required at every measurement to prevent mixture of samples.
- Carefully handle so as not to break.

**2**  It is suitable for grains, powders, sheets, or ones whose moisture degree largely fluctuates. **Flour and papers, etc.**

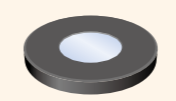
\* Use the standard accessory (→ Operating Manual P.11)

- The sample can be sealed, and it will reduce the moisture change while storing the sample.
- The light shielding cover of the unit may not be used.
- The rotation table may not be used.
- Dispose every time to prevent mixture of samples.
- In order to achieve precise measurement, avoid measuring the gusset or overlapped part.

**3**  It is suitable for large solid that may taint the measurement window. **Rice ball, boiled noodle, and uncooked noodles, etc.**

\* Use the standard accessory (→ Operating Manual P.11)

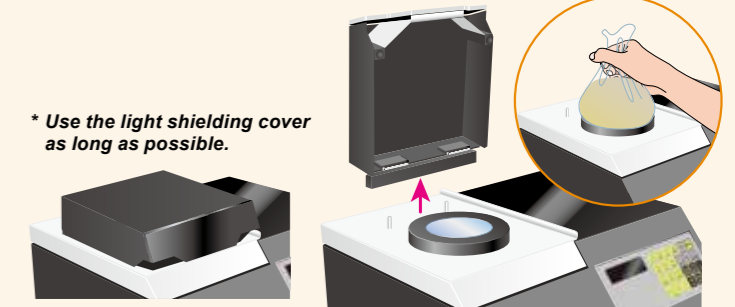
- Dispose every time to prevent mixture of samples.
- In order to achieve precise measurement, avoid measuring the gusset or overlapped part.

**4**  It is suitable for large solid that will not taint the measurement window. **Non-fried noodle or rice crackers, etc.**

- Caution is required not to scratch or taint the measurement window.

### 2.2 Attach/remove the light shielding cover.

It is preferable to measure using the light shielding cover in order to avoid external light. However, the cover may not be usable depending on the sample cell or sample. In the case of not using the cover, it can be removed.



### 2.3 Enable/disable the rotation of rotation table.

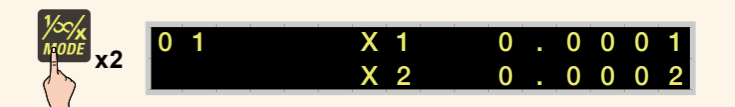
When measuring uneven shape of sample, rotating the sample will help improve averaging accuracy of the measurement values. Each time the [TABLE] key is pressed, the rotation of the rotation table can be enabled or disabled.



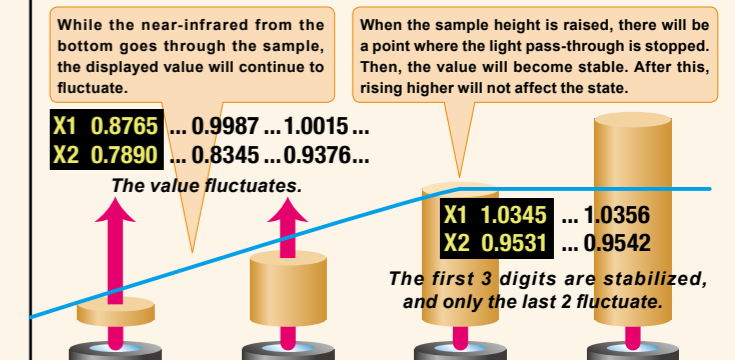
\* The rotation table may not be rotatable depending on the sample cell.  
\* When rotating the table using a petri dish, use the sampling cell holder.

### 2.4 Set the sampling amount.

Press the [MODE] key twice to display the absorbance measurement screen.



Measure the absorbance after setting the sample to the sample cell selected in step 2.1. The fluctuation of displayed absorbance will be reduced as the sample is gradually raised. The read value at the time is called "absorbance saturated sampling amount". Record the value larger than the absorbance saturated sampling amount as the sampling amount **A** (sample height) to be used in the actual measurement.



The values in the diagram are an example.

Observe the absorbance carefully. The fluctuation of last 2 digits is allowable.

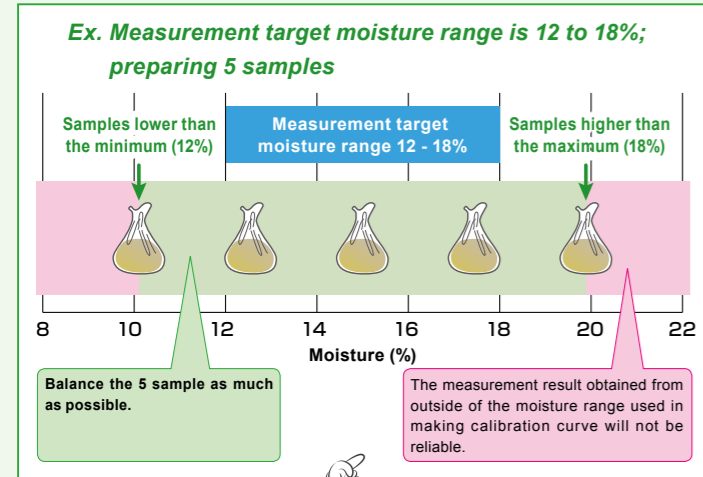
\* Make sure to use the same amount in making calibration curve and measurement.  
\* Refer to P.29 of Operating Manual, if the absorbance saturated sampling amount cannot be prepared.

# 3. Making a calibration curve

## 3.1 Set the measurement range and the number of samples.

Set the moisture range and the number of samples required for making calibration curve. The samples with different moisture that fully covers the measurement range are required. It is recommended to prepare five samples by moisture preparation\*. At least three samples are required to make a calibration curve.

\* Refer to P.15 of Operating Manual for the moisture preparation.



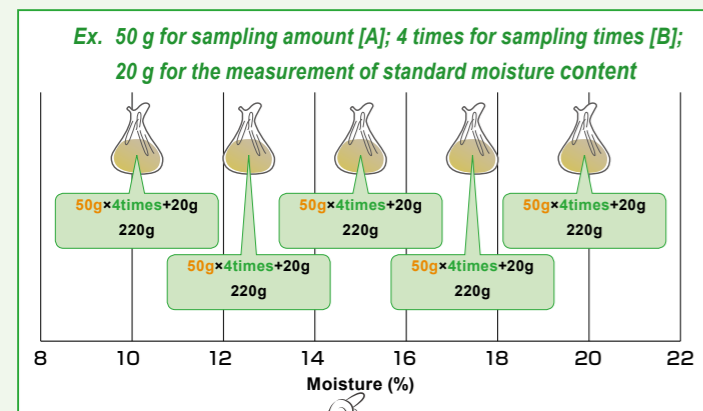
**In this case, five of 10 to 20% samples need to be prepared.**

## 3.2 Set the sampling times.

Set the sampling times **B** for each sample with different moisture set in 3.1. Generally, three to five times is appropriate. However, if the shape of sample is not consistent, set a larger number.

## 3.3 Prepare the samples.

The sampling amount is **A** set in step 2.2; the sampling times per sample is **B** set in step 3.2. Therefore, at least the amount of samples **A x B** is required. In addition, it is recommended to prepare samples to be used in the measurement of standard moisture content **C** (described in section 3.4).



**In this case, 220 g of samples is required per moisture. 1,100 g is required in total of 5 samples!**

\* Refer to P.29 of Operating Manual, if the absorbance saturated sampling amount cannot be prepared.

## 3.4 Measure the standard moisture content

Precisely measure a part of each sample in the over-drying method\* or the like, and consider the obtained moisture data as the standard moisture content **C**. The sample cannot be reused if moisture is measured in the over-drying method. Therefore, if the sampling amount is not sufficient or when performing the measurement of standard moisture content and actual measurement using the same samples, perform the optical measurement described in section 3.5 first, then measure the standard moisture content.

\* The official method or a measurement using an infrared moisture analyzer is available.



**Kett's infrared moisture analyzer can be used comfortably and speedy.**

## 3.5 Perform an optical measurement.

**X=0 ZERO** Make sure the paper is set, and press the [ZERO] key.

**ZERO X1 0.0012 X2 -0.0034** Go to the zero-calibration screen.

**ENTER** Press the [ENTER] key.

**01 0.0** The zero-adjustment is started. The initial screen appears when adjustment is done.

**MENU** Press the [MENU] key.

**PASS ?** Go to the PASS code input screen.

**9 WXYZ x4** Enter "9999" with the numeric keypad. \* The PASS code is changeable. (→ Operating Manual P.21)

**1. CH PARAMETER 2. CH DUPLICATE** Go to the MENU screen.

**3. CALIBRATION 4. CH RESET** Press the [↓] key twice. Move the cursor over "3. CALIBRATION", and press the [ENTER] key.

**3.01 02** Select the CH No. using the [↑]/[↓] key, and press the [ENTER] key.

**CH01 NAME ?** CH name input screen. The cursor is at the left end.

**01 NAME ? FLOUR** Input the CH name from the 1st character using the numeric keypad, moving the cursor one by one with the [Enter] key. Up to 6 characters can be entered. After input is done, move the cursor to the right end [→].

**ENTER** Press the [ENTER] key.

**01 N01 CONTENT ?** The standard moisture content **C** input screen appears. Input the 1st standard moisture content "N01", with numeric keypad. Then, move the cursor to the right end [→] with the [ENTER] key. The standard moisture content can be left blank and input later.

**1 WXYZ ENTER**

**01 N01 CONTENT ? 13.1**

**ENTER** Press the [ENTER] key again.

**01 N01 X1 MEA X2** The absorbance measurement screen appears. Input the absorbance performing optical measurement.

**0.5456 0.5115** Set the sample to the measurement window, and press the [MEA] key.

**ENTER** Press the [ENTER] key.

**01 N01 X1 0.5456 MEA X2 0.5115** The absorbance will be input automatically. (If measurement is failed, press the [MEA] key again to retry.)

**ENTER** Press the [ENTER] key.

**01 N01 NEXT. N = 02** Press the [ENTER] key when "NEXT, N=02" is displayed after 1st input is done. Proceed to 2nd input.

**ENTER**

**01 N02 CONTENT ?** Input the second moisture and absorbance, "N02", in the same manner as the 1st one.

**01 N02 X1 MEA X2**

**01 N05 NEXT. N = 06** Input the standard moisture content and absorbance of all the samples.

**SAVE. EXIT**

**ENTER** Press the [↓] key.

**01 N05 SAVE. EXIT CANCEL. EXIT** Select [SAVE.EXIT].

**ENTER** Press the [ENTER] key.

**3.01 FLOUR 02** A check mark (✓) will appear when input is done.

✓ If a check mark is indicated, the unit cannot be used for measurement yet. Proceed to calculate.  
 ✓ For the marks (✓ / X) → Operating Manual P.18

## 3.6 Execute calculation.

**3.01 FLOUR 02** Make sure that the cursor is on the created CH.

**CALC.** Press the [CALC] key.

**3.01 r: 0.99955 Se: 0.03320** The calculation is executed internally, and the result screen is displayed.

**5** Move the cursor to "SAVE" using [↓] key.

**3.01 FLOUR 02** Press the [ENTER] key.

**SAVE CANCEL** The CH name is unchecked, and the calibration curve is made.

**Done! Congratulations. You made a special calibration curve.**

**Since you have already operated the unit, the measurement will be easy!**

# 4. Measurement

## Perform a measurement.

**3.01 FLOUR 02**

**EXIT x2** Press the [EXIT] key twice.

**01 FLOUR** The initial screen is restored.

**MEA** Set the sample in the same measurement condition as making calibration curve.

- Sample type
- Sample cell
- Sampling amount (height)
- Using/not using the light shielding cover
- Rotating/not rotating the rotation table

**MEA** Press the [MEA.] key.

**01 FLOUR 15.5** Moisture will be displayed.

**Now the moisture analyzer has been optimised for your sample! Optional software is available for continuous measurement or editing calibration curves. To learn more, please read the operating manual as well.**