
Grain&Tapioca Moisture Tester PB-3103



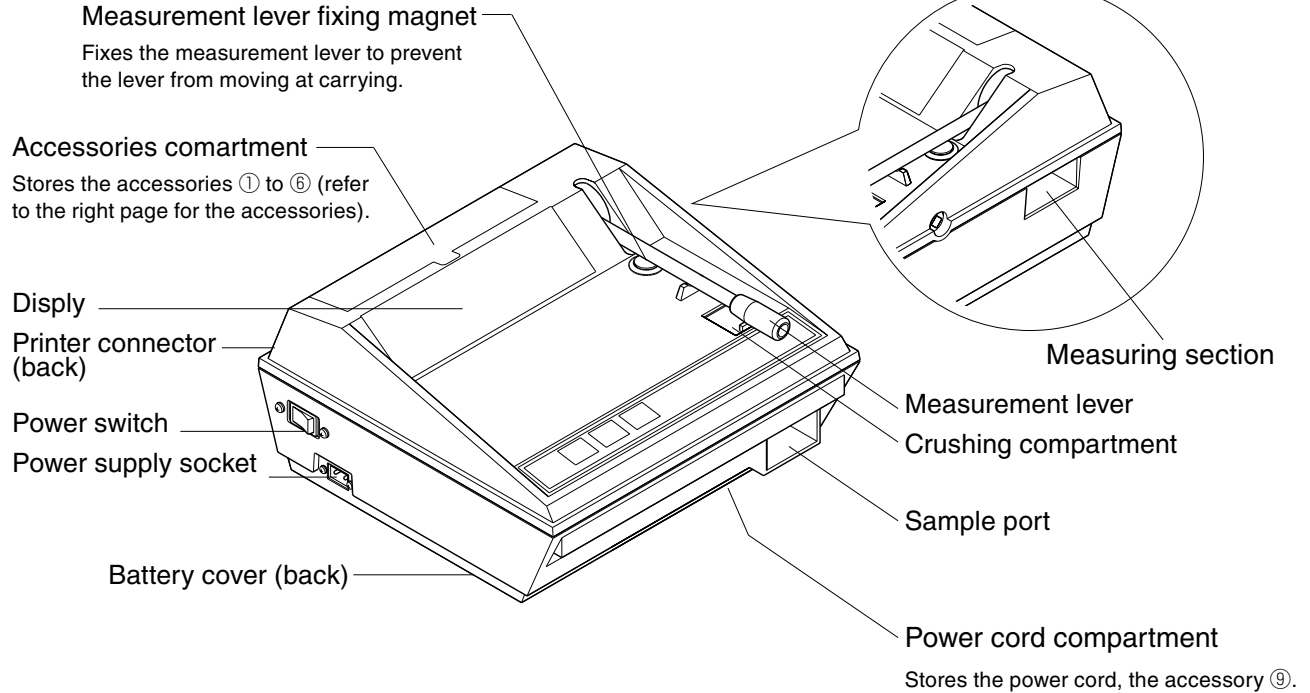
Operating Manual

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1. Part Names

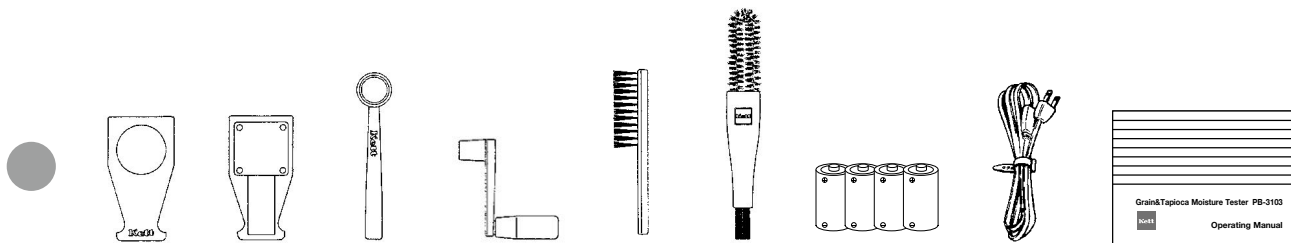
<Main Unit>



<Switches>



<Accessories>



- ① Metal plate ② Sample dish ③ Checker ④ Measuring Spoon ⑤ Crushing Handle ⑥ Brush ⑦ Spiral Brush ⑧ Batteries ⑨ Power cord
(1.5 V Alkaline "D" size, x4) ⑩ Operating manual

These accessories are stored in the accessories compartment on the top part of the main unit.

This code is stored in the power cord compartment on the bottom part of the main unit.

2. Specifications

| | |
|-----------------------|--|
| Measurement Format | : AC Resistance Format |
| Cereals Measured | : Paddy, Milled Rice, Parboiled Rice, Parboiled Paddy, Tapioca Pellet, Tapioca Flour |
| Measurement Range | : Paddy : 11~35% |
| | : Milled Rice : 11~20% |
| | : Parboiled Rice : 6~22% |
| | : Parboiled Paddy : 6~30% |
| | : Tapioca Pellet : 6~30% |
| | : Tapioca Flour : 6~30% |
| Accuracy | : $\pm 0.1\%$ (manufacture), $\pm 0.5\%$ (drying method) |
| Display | : 128×64 Dot matrix LCD |
| Display content | : Moisture(%), Number of measurement, Average value, Measurement items |
| Response Time | : Approximately 3 seconds |
| Sample Temperature | : Automatic compensation using thermistor |
| Compensation Format | (features automatic sample temperature compensation function) |
| Operating Temperature | : 5~40°C |
| Operating Humidity | : 95%R.H. or less (no condensation) |
| Output | : Printer output (RS-232C) |
| Power supply | : AC220V, Batteries (1.5 V alkaline “D” size, x4) (Approximately 23 hours continuous operation) |
| Power consumption | : 5W |
| Dimensions and weight | : 250(W)×240(D)×125(H)mm, 3.5kg |
| Accessories | : Metal plate, Sample dish, Checker, Measuring spoon, Crushing handle, Brush, Spiral brush, Batteries (1.5 V Alkaline “D” size, x4), Power cord, Operating manual |
| Option | : Printer (VZ-330) |

3. Before Making Measurements

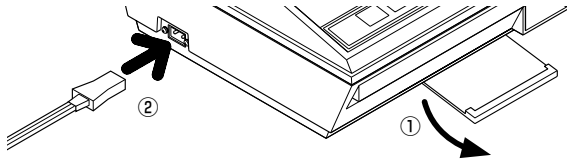
- Before use, leave this unit at the using site to make the temperature difference between the unit and ambience within 2°C. If the temperature between the unit and ambience is not homogeneous, the temperature correction is not properly performed, which may lead to differences in measured values.

- How to display the unit temperature
Turn on the POWER Switch while holding down the [SELECT] key in the power-off state. To hide the temperature, turn off the power.

1. Please use a AC220V power supply or Batteries (1.5 V Alkaline "D" size, x4) as the power supply for the PB-3104.

<When using an AC220V power supply>

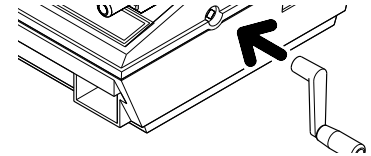
- ① Remove the power cord from the power cord accessories compartment.
- ② Connect the plug to the socket on the main unit.



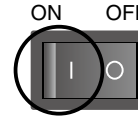
<When using batteries as the power supply>

Insert 4 size "D" batteries into the battery compartment on the bottom of the unit, making sure to align the positive ⊕ and negative ⊖ ends correctly. In the case of using batteries, the power-saving mode is activated, in which the light amount of the LCD backlight becomes half.

2. Insert the crushing handle in the correct position.



3. Press the POWER Switch. The Initial screen is displayed.



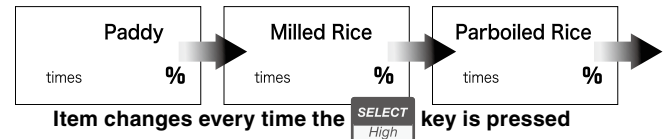
If characters on the display are too dark or light, perform contrast adjustment (see page 12).

4. Press the [SELECT] key to match the grain to be measured, and then select the measurement item.

[Note]

When the name of the grain to be measured is already displayed, this operation is unnecessary.

The measurement item is displayed on the screen in the following order every time the [SELECT] key is pressed: "Paddy" → "Milled Rice" → "Parboiled Rice" → "Parboiled Paddy" → "Tapioca Pellet" → "Tapioca Flour" → "TEST" → "Paddy" and so on. When the grain to be measured is displayed, selection is completed.



4. Sample Taking and Crushing

The method of sample taking and crushing depends on the products.

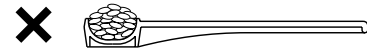
<Notes concerning taking of samples>

- The sample amount must be one level of the supplied measurement spoon without fail.
- When taking samples, extract portions which are believed to have moisture contents representative of the average for the entire quantity of cereal. For example, samples taken from portions which are exposed to sunlight or in contact with the bottom of the container are not appropriate representative samples.
- Avoid directly extracting samples by hand, as moisture from the hands may make it impossible to make accurate moisture measurements.
- PB-3103 has an automatic sample temperature compensation function. However, the sample should be the same temperature as the environment, when the best possible accuracy is required.

Just a spoonfull



Too much

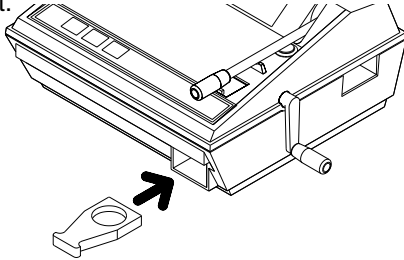


Too little



A. Paddy, Milled Rice, Parboiled Rice, Parboiled Paddy, Tapioca Pellet

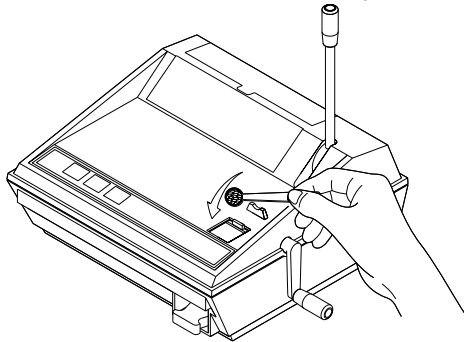
1. Insert the sample dish into the sample port completely so that the front edge comes into contact with the back of the port.



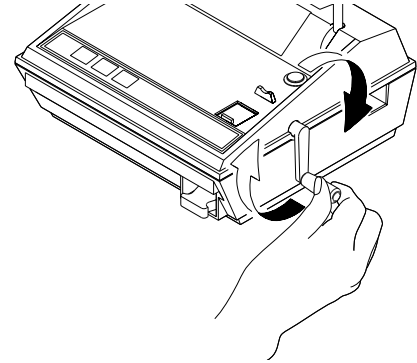
2. Fill to the top of the supplied measurement spoon with the sample and level off the spoon.



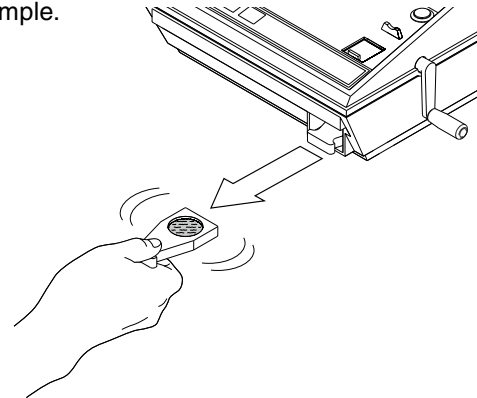
3. Raise the measuring lever, open the crushing compartment cover, and insert the sample.



4. Turn the crushing handle to crush the sample.



5. Remove the sample dish and shake it lightly to flatten the sample.



B. Tapioca Flour

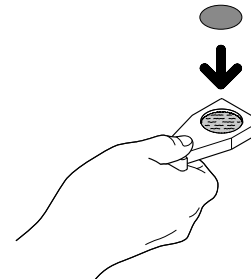
1. Fill to the top of the supplied measurement spoon with the sample and level off the spoon.
(Remove the excess sample using a pencil or the like.)



2. Spoon out the flour into the sample dish and shake it lightly to flatten the flour.



3. Place the metal plate on the sample dish.

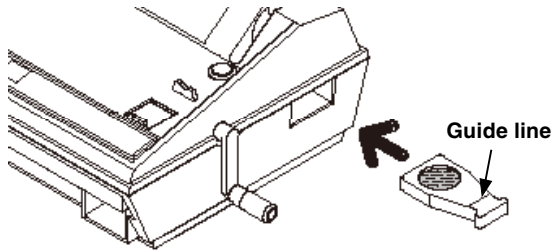


5. Measurements

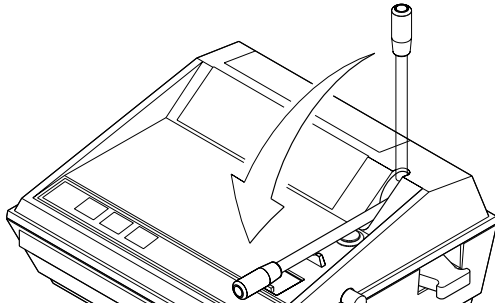
1. Insert the sample dish fully until the guide line is hid.

[Note]

When measuring tapioca, place a metal plate onto it. If the measurement lever is pushed down while the sample dish is inserted incompletely, the upper electrode or sample dish may be damaged. Be sure to fully insert the tray.



2. Push down the measurement lever until it stops.



3. Moisture value and the number of measurements is displayed on the screen.

Paddy
1 times 15.7%

The Over Indicator [oL] will be displayed if the sample's moisture content exceeds this range, and the Under Indicator [-oL] will be displayed if the moisture content is below this range.

[Note]

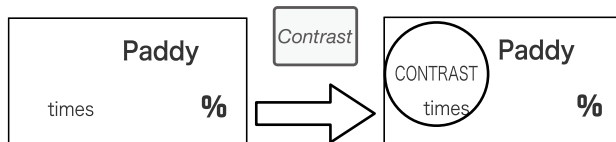
Although the valid measurement range of the PB-3103 is shown in specifications, values up to 2% of this range are actually displayed. However, the precision of moisture values displayed which are outside of the valid measurement range are not guaranteed. Use these value readings as rough guides.

4. When the same item is measured repeatedly, repeat the procedure of "4. Sample Taking and Crushing" on page 8 and later. When a different item is measured, repeat the procedure of the step 4 in "3. Before Making Measurements" on page 7 and later.
5. When the unit is not to be used over an extended period of time after a series of measurements is completed, turn off the Power Switch and unplug the power cord from the wall socket.

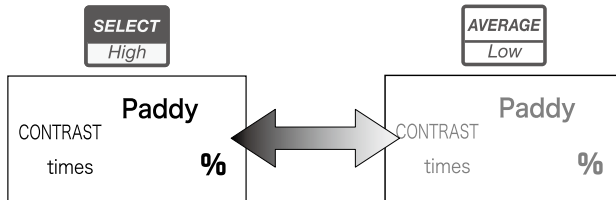
6. Other functions

<Contrast adjustment>

If characters on the display are too dark or light, perform contrast adjustment. Press the [Contrast] key. "CONTRAST" is displayed on the screen.



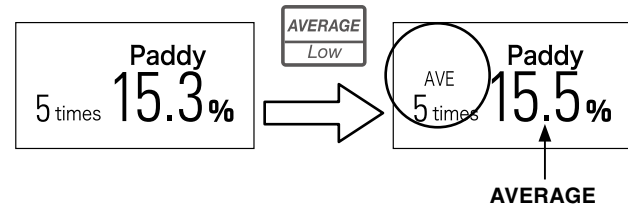
To enhance the contrast, press the [SELECT (High)] key, and to reduce the contrast, press the [SELECT (Low)] key.



After the contrast adjustment, press the [Contrast] key again. "Contrast" disappears, and the regular measurement mode resumes. The adjusted contrast is saved even after the power is turned off.

<Average moisture value>

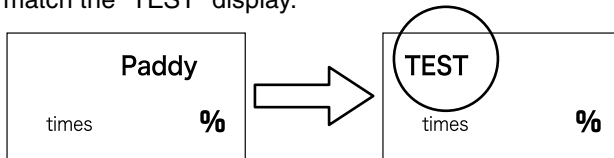
Press the [AVERAGE] key in order to obtain the average moisture value after making measurements several times. A point will appear at the lower right of the TIMES display to indicate that the average value is being displayed.



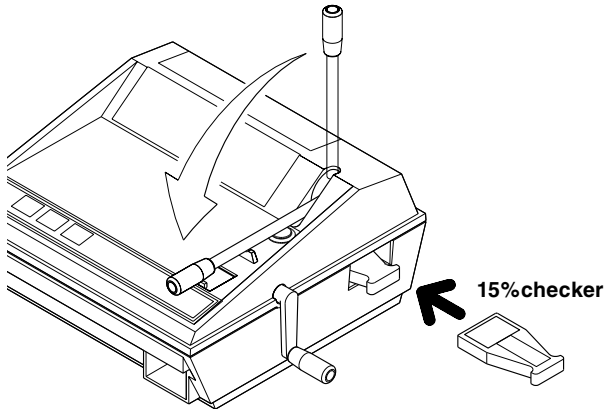
When the [AVERAGE] key is pressed again the TIMES display for the next measurement will return to "1". The maximum number of measurement times (repetitions) is 9. The TIMES display will return to "1" when measurements are performed 10 times.

<Testing>

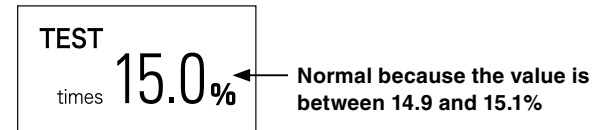
Use the supplied checker to check to make sure that the PB-3103's electrical circuits are functioning normally. Press several times the [SELECT] key, I will match the "TEST" display.



Insert the checker into the measurement section and lower the measurement lever.



The electrical circuitry is functioning normally if a numeric value of 14.9~15.1% is displayed at this time.




Raise the measurement lever and press the "TEST" key again, "TEST" disappears, and the regular measurement mode resumes.

[Note]

In most cases, failure to display a normal value is due to the presence of dirt in the testing section. Perform the test once again after thoroughly cleaning the testing section if the normal values are not displayed.

<Battery level icon>

When the battery is low, the battery level icon () appears on the display. When the icon appears, replace the battery with new ones reference "When using batteries as the power supply" on page 7.

[Note]

The moisture content may not be properly measured when the battery level icon displayed.

<Printer Output>

Connecting the printer, VZ-330 (option), to the connector on the rear panel of the main unit with the cable supplied with the printer allows users to automatically print the measured results after measurement.

[Note]

Refer to the operating manual for the printer for how to set up the printer.

<Printout example>

```
TEST 15.0%  
TEST 15.0%  
  
N=1 13.3%  
N=2 13.2%  
N=3 13.3%  
AV3 13.3%
```

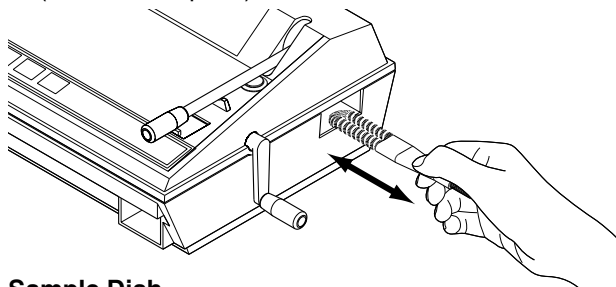
| RS-232 Interface Specifications | |
|---------------------------------|---|
| Transmission Format | Start-stop (asynchronous) transmission, transmission only |
| Signal Format | Baud Rate : 9600bps Data Bit Length : 8 Parity : None Stop Bit : 1 bit Code : ASCII |

7. Maintenance

<Cleaning>

Measurement Section

It is very easy for spilled samples to accumulate in the section where the sample dish is inserted, so the supplied brushes should occasionally be used to clean this section. It is particularly easy for errors to arise if measurements are made when there is sample material adhering to the electrode plate (round metal plate).



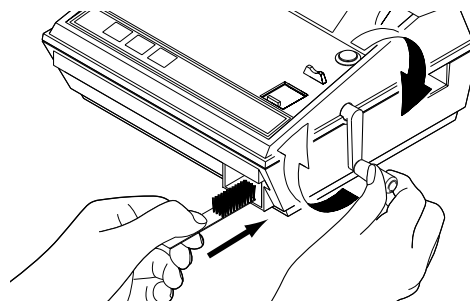
Sample Dish

When using the sample dish continuously, use the brush to remove any sample material adhering to the inside and back of the dish.



Crushing Section

If a new sample is crushed when there are still traces of old samples adhering to the crushing rollers, the new sample will be contaminated with the old sample material and accurate measurements will be impossible. It is therefore necessary to clean the rollers with the supplied brushes while turning them.



<Storage>

After using the PB-3103, clean it well as described above and then store it in a dry place where it will not be exposed to direct sunlight. Be sure to remove the batteries if storing the unit for an extended period of time.

The Kett logo consists of the word "Kett" in a white, sans-serif font, centered within a dark gray square background.

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- The contents of this manual are subject to change without notice.
- The appearances, screens, etc. of the product and accessories displayed on this manual may differ from the actual ones, however, operations and functions are not affected.
- All efforts have been made to ensure the contents of this manual are accurate. However, if you notice any part to be unclear, incorrect, omitted, or the like in this manual, please contact us.
- Be aware that we are not liable for the effects resulting from operations according to this manual regardless of the items above.