Copra Moisture Tester   HX-120

Kett

Operating Manual

Copra Moisture Tester Safety Precautions

If the safety precautions for the copra moisture tester are not observed, injuries or damage to property may result. While the safety of the product has been given considerable attention, please read the precautions in the operating manual and use the instrument properly.

• Please observe the safety precautions.

Please read the precautions noted in the operating manual.

• Do not use if broken.

If the tester breaks or malfunctions, please consult our repair service.

• Meaning of warning symbols.

In order to prevent damage resulting from erroneously operating the equipment, the following symbols are indicated in the operating manual and on the product. The following are their meanings.

| ⚠ **Caution**	This symbol for caution indicates something that should be strictly observed in order to use the product safely.

CONTENTS

1. Features

• Measure moisture content by simply piercing with electrodes
  You can measure moisture content simply by piercing the sample with the electrodes.

• Handheld device with large built-in display
  The portable handheld device features a large 76mm x 52mm display that's very easy to read.

• Automatic temperature compensation
  Compensation for the temperature of the copra is automatically performed by means of a built-in
  temperature sensor.

• Bias adjustment
  The moisture value can be corrected corresponding to each calibration in the range from
  –9.9% to +9.9%.

• Auto power off
  When inactive, the unit will automatically turn itself off after approximately 5 minutes to avoid draining
  the battery.

• Alarm setting
  Set any moisture value, and an alarm will sound if the measured moisture value is higher than the
 set moisture value.

2. Specifications

Measurement Principle	:	Electrical resistance
Applications	:	Copra
Standard method	:	ISO 665
Measurement Range	:	3 to 20% (dry base)
Measurement Precision	:	Standard error 0.4% (moisture values of 10% or lower)
Display	:	Digital (LCD)
Resolution	:	0.1%
Operating Temperature Range	:	0 to 40˚C
Functions	:	Moisture value bias adjustment (–9.9 to +9.9%), average value, Upper limit alarm, Automatic temperature compensation, Auto power off (automatically turns off after approximately 5 minutes)
Power Supply	:	1.5 V batteries (AA alkaline) (6)
Power Consumption	:	approximately 0.45 W
Dimensions	:	110 mm (W) x 210 mm (D) x 50 mm (H)
Weight	:	0.5 kg
Accessories	:	Two needle proble, wrench, shoulder strap, 1.5 V battery (AA alkaline) (6), carrying case, operating manual
Options	:	Printer (VZ-330), printer connecting cable (VZC-26)

3. Part Names

<Main body>

Connector

Display
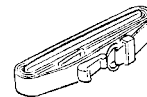
Control Panel

Battery cover (back)

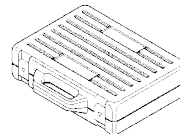## <Accessories>
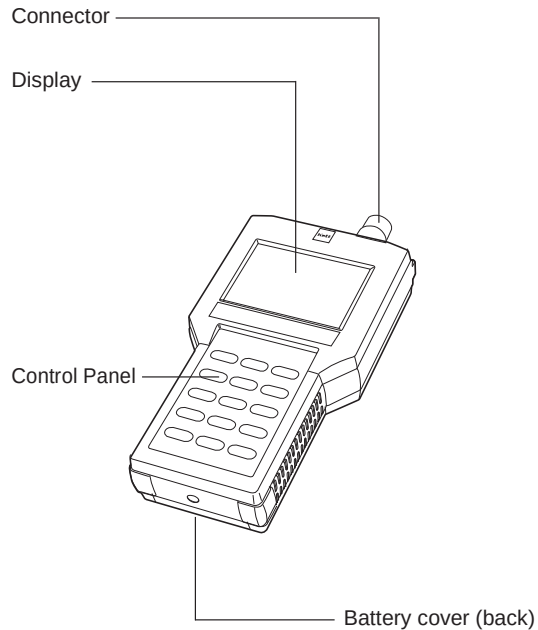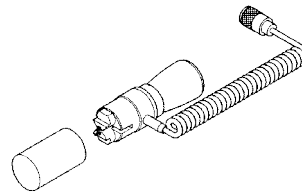
Two needle probe (Cap)
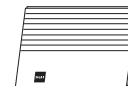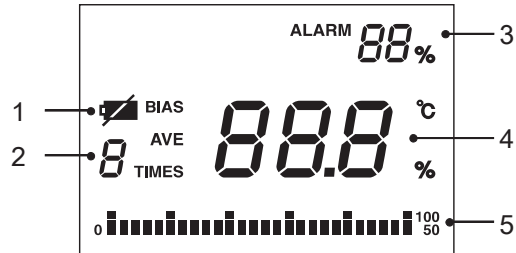
Shoulder strap

1.5 V battery (AA) (6)

Wrench

Carrying case

Operating manual

4. Display

Description of display

Item No.	Name of display area	Description
1	Battery indicator	Comes on when battery is depleted.
2	Number of measurment times	Displays the number of times measured.
3	Alarm set-point value	Displays the set-point value for the alarm for the upper moisture limit that was set.
4	Moisture value	Displays the measured moisture value (%).
5	Bar graph	Displays the measured moisture value by means of a bar graph. Displays up to 50% in 2% increments.

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5. Description of Keypad

- Of the numeric keys of 0 to 9, some combine numerical input and other functions.

<Control panel>
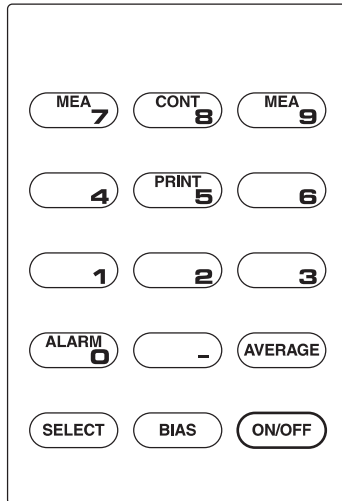
| Key	Function
ON/OFF	Power On and Off
BIAS	Bias correction
SELECT	Not used for this device.
AVERAGE	Average value
−	Entering a minus input
ALARM 0	Setting of upper alarm limit
PRINT 5	Setting printer output
MEA 7 MEA 9	Use for measuring. You can use either the left or right side key.
CONT 8	Continuous measurement

6. Directions

6-1.Before Measurement

1.The unit is powered by six 1.5 V batteries (AA, alkaline). Remove the rear battery cover, place the batteries into the compartment taking care to correctly orient the positive (⊕) and negative (⊖) terminals. Then attach the battery cover.

• ⊟ is displayed when the batteries are depleted. Replace all six with new batteries.

2.Plug the probe connector into the socket on the main unit, and fasten and secure the lock ring.

2 Tighten the lock ring

1 Securely plug the connector in

3.Prepare the copra sample to be measured. Allow the sample to equilibrate to the same temperature as the main unit.

• Errors may occur when there is a large difference in the temperature of the copra and the temperature of the unit. To make more accurate measurements, allow the temperature of the copra to equilibrate with the temperature of the unit.
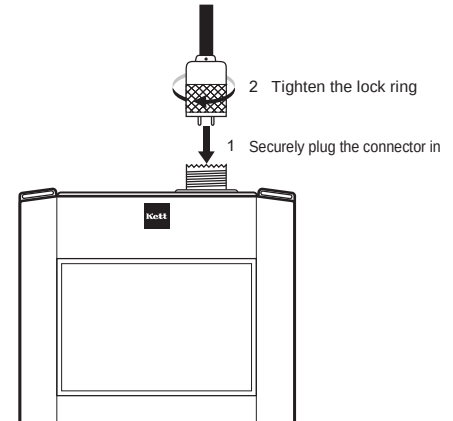
6-2.Measurement Method

1.Press the (ON/OFF) key to turn on the power. All elements of the
   LCD will be displayed for approximately three seconds.
   Subsequently, the "TIMES", and "%" will be displayed.

• If the display shows something other than that described above, there
   may be a problem with the unit. Refer to p. 17 "7. Error Display".
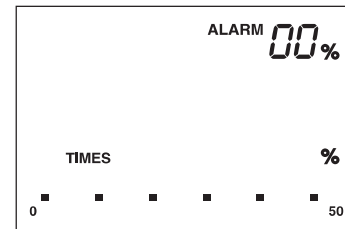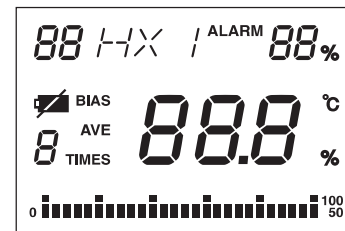
2.Hold the two needle probe firmly, and insert the sensor needles
   completely into the copra.

• Please make sure to stick the probe in from outside the shell.
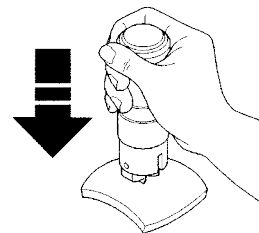
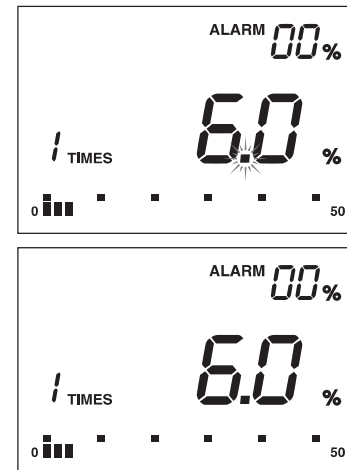• The ☀ symbol denotes a blinking display.

3.Press the (**MEA** 7) key. The decimal point will blink. After about 3 seconds a "beep" will sound and the "Number of measurement times", "Moisture value", and "Bar graph" will be displayed.

- The (**MEA** 7) key on the left and the (**MEA** 9) key on the right both have the same function so it doesn't matter which one you press. Please use the one that's easier to press.
- The bar graph displays a 50% full scale in 2% increments.
- If the moisture value is outside of the measuring range, "HI" will be displayed if the value higher than the measuring range, and "LO" will be displayed if it is lower.

4.Remove the two needle probe from the copra. At this time, the moisture value will remain on display. To continue to make further measurements, start the procedure from Step "2. Hold the two needle probe firmly...".

When finished making measurements, press the (ON/OFF) key to turn off the power.

•With its auto power off function, the unit will automatically turn itself off when inactive after approximately 5 minutes.

• The ☀ symbol denotes a blinking display.

6-3.Setting the Measurement Mode

There are two measurement modes: "Normal measurement mode" and "Continuous measurement mode".

Immediately after pressing the (ON/OFF) key and turning on the power, the unit will be set to "Normal measurement mode". If the unit is set to "Continuous measurement mode", measurements can be made without pressing the (MEA 7) key for each measurement.
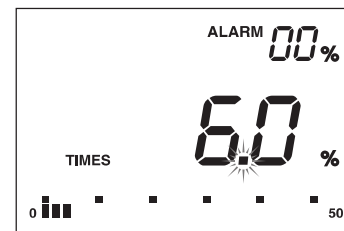
1.Continuous measurement mode setting
  In step "6-2. Measurement Method 3. Press the...", press the (CONT 8) key. The decimal point will blink, and the moisture value and bar graph will be displayed.
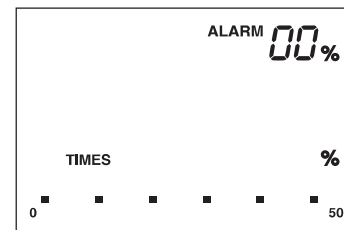• If the measured value is outside of the measuring range, either "HI" or "LO" will be displayed, and the decimal point will blink.

2.Canceling the continuous measurement mode
  Press the (CONT 8) continuously for at least 2 seconds until a "beep" sounds. The display will momentarily go blank. When you take your finger off the key, the unit will return to normal measurement mode.

• Pressing the (ON/OFF) key turns off the power and automatically cancels this mode.

• Note that the battery life is shorter in continuous measurement mode.

ALARM 00%

TIMES 6.0 %

0 ▮▮▮ ▪ ▪ ▪ ▪ 50

ALARM 00%

TIMES   %

0 ▪ ▪ ▪ ▪ ▪ 50

• The ☀ symbol denotes a blinking display.

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6-4.Displaying the Average Value

When the number of measurements is from 2 to 9, and you press

(AVERAGE), the "AVE", "average value", and "number of measurement

times" will be displayed. At this time, the "AVE", "average value", and "number of measurement times" remain displayed, but if you proceed to make a measurement, the "number of measurement times" resets to "1".

- If the number of measurement times exceeds 9, the measured value up to that point resets and measurement starts from measurement number 1.
- The average value cannot be determined when making measurements in continuous measurement mode.
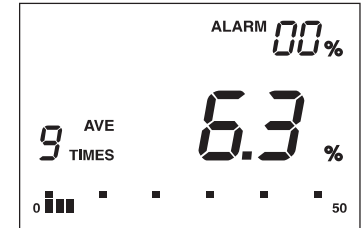
6-5.How to make Bias Adjustment

The calibration (scale) for this unit was prepared by determining the relationship between the moisture of copra resulting from a drying method and the electrical resistance of the copra, and then statistically processing these results. However, depending on various conditions, there are cases where the standard measurement method and the moisture value do not agree. In these cases, a moisture value bias adjustment can be made (–9.9% to 9.9%) by the following method.

1.Press the (BIAS) key. The "BIAS" indicator will blink, and the previously entered bias value will be displayed. The bias is initially set to "0.0%".

2.Enter the bias value.
Enter a 2-digit number. To enter "1.2%", press the (1) key and the (2) key in succession. For a negative value, press the (-) key before the numbers.

3.Press the (MEA 7) key to make measurements .

• If a bias adjustment value has been entered, "BIAS" will be displayed during measurements.

•To cancel the bias adjustment value, enter "0.0%".

• The ☀ symbol denotes a blinking display.

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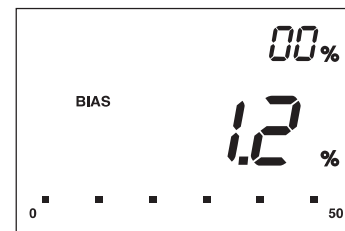
6-6.Setting the Alarm

An upper limit moisture alarm can be set. When copra is measured having moisture higher than the set moisture value, the alarm sounds with a beeping tone.

1.Press the (ALARM) key.
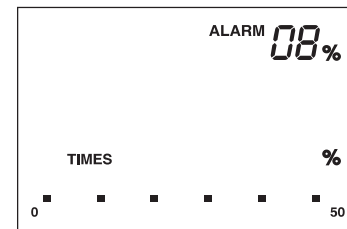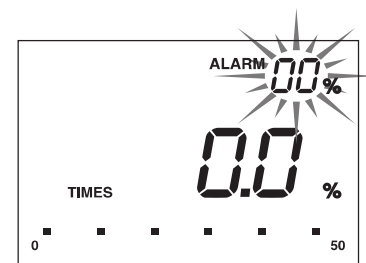
The numbers to the right of "ALARM" will blink.

2.Enter the alarm value.

Enter a 2-digit number. To enter "8%", press the (ALARM) key and

the (CONT 8) in succession.

3.The set value for the alarm is displayed. Then, press the (MEA 7) key to make measurements.

•To cancel the set value for the alarm, enter "0.0%".

• The ☼ symbol denotes a blinking display.

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6-7.Printer Output

Measured values can be printed out by using the optional printer (VZ-330). The output content is "number of measurement times", "moisture value", and "average moisture value".

1.How to set up

Press the (PRINT 5) in normal measurement mode.

"P" will be displayed to the right of "TIMES". Set up is complete.

- The timing of the output is just after the measurement or just after the display of the average value. However, there is no output if the measured value is outside the measuring range.
- After setting up the printer (VZ-330, sold separately), connect the printer cable (VZC-26, sold separately). Refer to the operating manual for the printer for how to set up the printer.
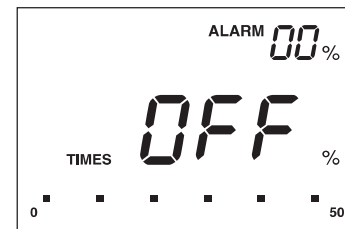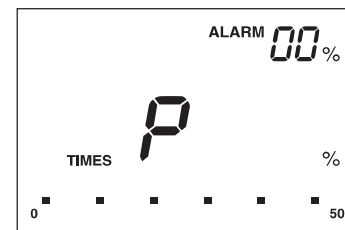
2.How to cancel the settings

Press the (PRINT 5) key in normal measurement mode.

"OFF" will be displayed to the right of "TIMES". The settings have been cancelled.

- The settings in both 1 and 2 will be retained in memory when the power is turned off.

[Printout example]

HX-120	
TIMES	[%]
1	6.8
2	6.9
3	6.7
4	7.0
5	6.9
6	6.8
AVERAGE	6.9

7. Error Display

When there is a problem with the unit or with the measurement conditions, the following errors will be displayed for 4 seconds, and then the power will turn off.

1.There is a problem with the temperature sensor. Servicing is required.

```
001
```

2.When either of the errors on the right are displayed, there is a problem with the electronic circuit used for moisture measurement. Servicing is required.

```
002
```

```
011
```

3.The measurement cannot be made because the temperature of the unit is below –5 °C. Bring the temperature of the unit up to the operating temperature range (0 to 40 °C), and make the measurement again.

- 5 ℃
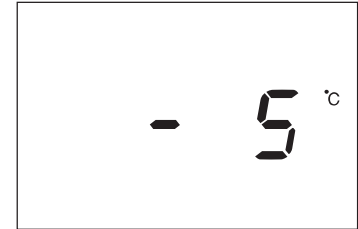
4.The measurement cannot be made because the temperature of the unit is above 50 °C. Bring the temperature of the unit down to the operating temperature range (0 to 40 °C), and make the measurement again.

50 ℃

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