Paper Moisture Tester HK-300-1/300-2/300-3

Kett

Operating Manual

Paper Moisture Tester Safety Precautions

If the safety precautions for the wood 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.

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1. Features

- **Supports 3 types of sensors**

  Supports a light-weight hand-held grip sensor (HK-300-1) that has little measurement variation from person toperson. In addition, calibration curves for use with a conventional rubber sensor (HK-300-2) and pressure sensor (HK-300-3) are also built in.

- **Able to compensate for moisture values**

  Able to compensate for moisture values in the range from -9.9 to +9.9% with respect to each calibration curve.

- **Can record a maximum of 10 user calibration curves (scaled)**

  Users can record their own calibration curves to support various types of paper.

- **Auto power off**

  If no measurement is made or key is operated for approximately 5 minutes, the power is automatically shut off and avoids wasting the batteries.

- **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	:	All paper
Calibration Curves*1	:	See "Table 1"on the right
Measurement Range	:	See "Table 1" on the right
Measurement Precision	:	Standard error 0.4% (moisture values of 15% or lower)
Standard Method	:	JIS P8127 (copying paper, cardboard)
Display	:	Digital (LCD)
Resolution	:	0.1%
Operating Temperature Range	:	0 to 40˚C
Functions	:	User calibration curves (10 types),Data storage (250 data), Moisture value bias adjustment (-9.9 to +9.9%), Average value display, Upper limit alarm setting, Auto power off (automatically goes off in about 5 minutes)
Power Supply, Power Consumption	:	1.5 V batteries (AA alkaline) (6), approximately 0.45 W
Dimensions and Weight	:	110 mm (W) x 210 mm (D) x 50 mm (H), 0.5 kg
Included sensors	:	HK-300-1: grip sensor (cord included) HK-300-2: rubber sensor (underlay, conducting rubber (2), wrench included) HK-300-3: pressure sensor
Accessories	:	Shoulder strap, 1.5 V batteries (AA alkaline) (6), carrying case, operating manual, calibration curve list (Japanese and English) (1 each)
Options	:	Printer (VZ-330), printer connecting cable (VZC26)

<Table 1>

Sensor	Calibration curve	Measuring range
Grip	Copying paper	4 ~ 15
	Cardboard	6 ~ 20
Rubber	Copying paper	4 ~ 25
	Liner	6 ~ 23
	Kraft	5 ~ 24
Pressure	Copying paper	2 ~ 10
	Liner	5 ~ 15
	Kraft	2 ~ 10

Copying paper*2 (for use with each sensor)

* Paper that is generally used in copiers, printers, fax machines, etc.

Cardboard*2 (for use with the grip sensor)

* Base paper that makes up corrugated cardboard (without decorative paper).

Liner, kraft*3 (for use with the rubber sensor and pressure sensor)

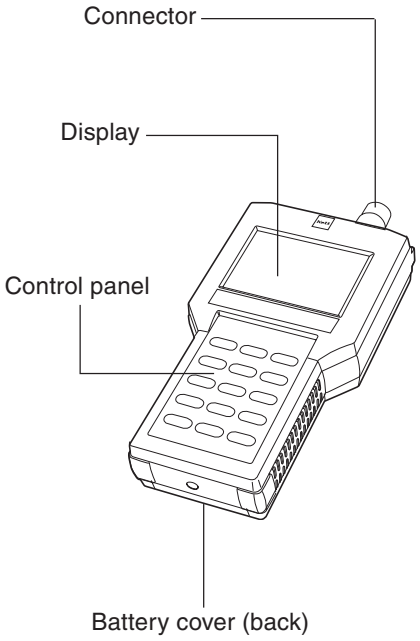
*1 Because this calibration curve is prepared at a 20˚C condition, correct moisture values may not be displayed when temperature conditions are different. In this case, please use the moisture bias compensation function (see p. 19, "6-5. How to Make a Moisture Value Bias Adjustment").

*2 Because calibration curves may differ greatly depending on conditions such as the type and thickness of paper, the correct moisture value may not be displayed depending on the paper. In this case, please use the moisture value bias compensation function (see p.19, "6-5. How to Make a Moisture Value Bias Adjustment,") and a user calibration curve (see p. 26, "7. Preparing a Calibration Curve").

*3 Uses the same calibration curve as our "K-100/200" paper moisture meter (production discontinued).

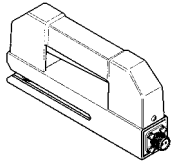
3. Part Names

Main unit



Accessories

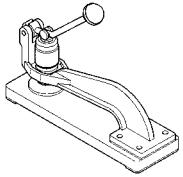
HK-300-1



Grip sensor

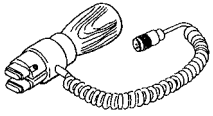
Cord

HK-300-3



Pressure sensor

HK-300-2

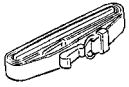


Rubber sensor

Underlay

Conducting rubber (2)

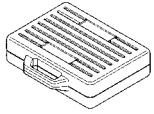
Wrench



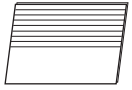
Shoulder strap

Calibration curve list (Japanese and English) (1 each)

1.5 V batteries (AA alkaline) (6)

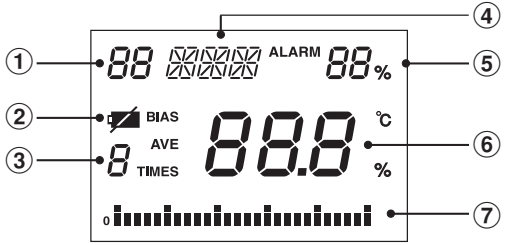


Carrying case



Operating manual

4. Display



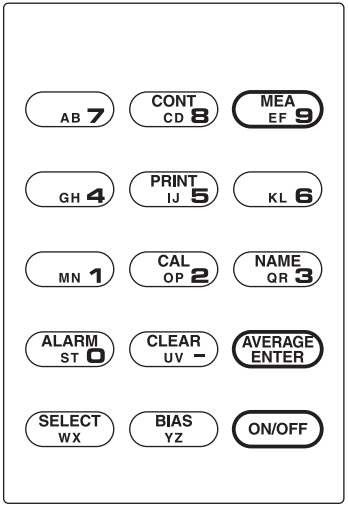
Description of display

Item No.	Name of display area	Description
①	Calibration curve number display	Displays the number of the calibration curve being used.
②	Battery indicator	Comes on when battery is depleted.
③	Measuring times	Displays the number of times measured.
④	Name of calibration curve	Displays the calibration curve display name or the set calibration curve name.
⑤	Alarm set-point value	Displays the set-point value for the alarm for the upper moisture limit that was set.
⑥	Moisture value	Displays the measured moisture value (%).
⑦	Bar graph	Displays the measured moisture value by means of a bar graph. Displays up to 25% in 1% increments.

5. Description of Keypad

* The AB to YZ keys are used for inputting alphabetical characters (name of calibration curve).
* Of the numeric keys of 0 to 9, some combine numerical input and other functions.

<Control panel>



Key	Function
ON/OFF	Used to turn power On and Off.
BIAS YZ	Used for moisture value bias compensation.
SELECT WX	Used to select a calibration curve.
AVERAGE ENTER	Used when determining the average value and to confirm the numerical value input.
CLEAR UV –	Used when there is an input error and to input a minus sign.
ALARM ST 0	Used to set the measurement upper limit value.
PRINT IJ 5	Used to set the printer output.
NAME QR 3	Used to input the name of the calibration curve.
CAL OP 2	Used to input the calibration curve.
MEA EF 9	Used to make a measurement.
CONT CD 8	Used to switch the measurement values from a constant display to a continuous display.
AB 7	Used for block functions.

6. Directions

6-1. Before Measuring

(1) The unit is powered by six 1.5 V batteries (AA, alkaline). Remove the rear battery cover, and 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 near depletion. Replace all six with new batteries.

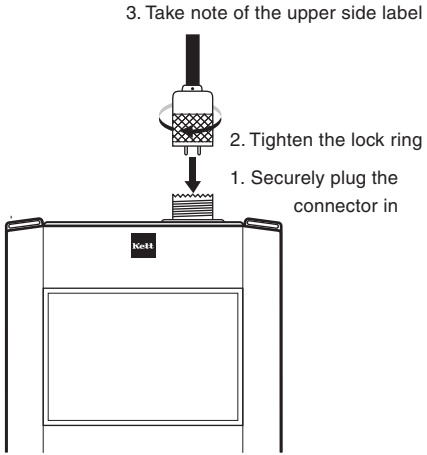
(2) Connect the sensor to the main unit. Plug the sensor connector into the socket on the main unit, and fasten and secure the lock ring.

* When using the grip sensor, please plug the cord (for use with the grip sensor) into both the main unit and the sensor.

* When plugging in the grip sensor or pressure sensor connector, plug it in with the "upper side" label facing up.

(3) Prepare the paper to be measured, and adapt it to equilibrate to the same temperature as the main unit.

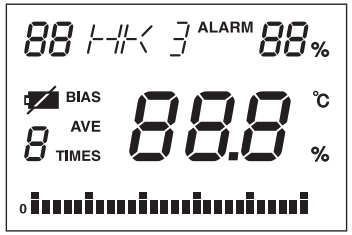
* Errors may result when there is a large difference in the temperature of the paper and the temperature of the unit. To make more accurate measurements, adapt the temperature of the paper to equilibrate to the temperature of the unit.



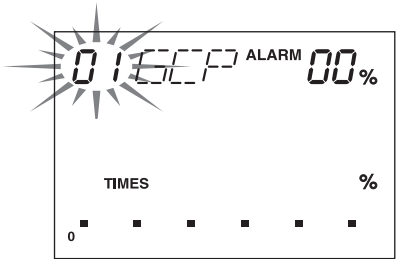
6-2. Measurement Method

(1) Press the (ON/OFF) key to turn on the power. All elements of the LCD will be displayed for about 3 seconds. Subsequently, the "calibration curve number," "TIMES," and "%" will be displayed.

* At this time, if the display shows something other than that described above, there may be a problem with the unit. Refer to p. 38, "8. Error Display".

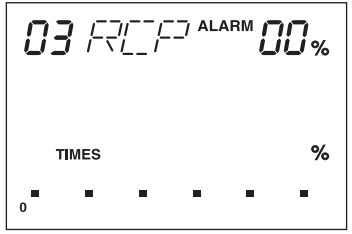


(2) Select a calibration curve from the included "calibration curve list." Press the (SELECT WX) key, and the calibration curve number will start blinking. Enter a 2-digit calibration curve number.



<Example> Entering the value 03

Press the (ALARM ST O) key. The 1-digit will start blinking.
Then, press the (NAME QR 3) key again. "03" will be displayed.



* Please make use of the calibration curve list by affixing it to the battery cover.

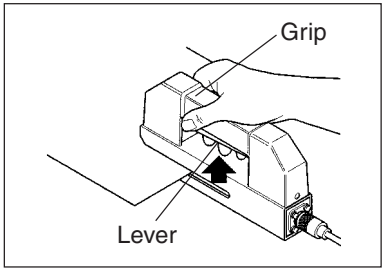
* Once the calibration curve is set, unless otherwise changed, it will be maintained in memory even when the unit's power is turned off.

*The ✳ symbol denotes a blinking display.

(3) Hold the paper against the sensor electrode in accordance with the usage method for each sensor. Keep the paper in position until the measurement is complete.

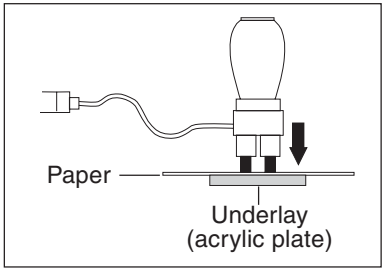
<Grip sensor>

1. Hold onto the grip, and pull the lever up.
   * When pulling the lever up, there may be a creaking noise, but this is not unusual.
2. Insert paper in between the electrodes.
3. Loosen your grasp on the grip, and clamp the paper in by lowering the lever.



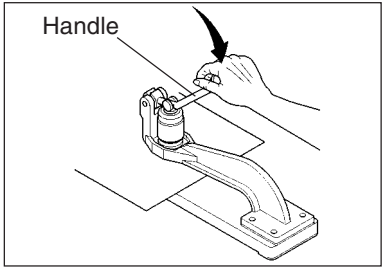
<Rubber sensor>

1. Place the paper on top of the underlay (acrylic plate).
2. Hold the sensor against the paper.



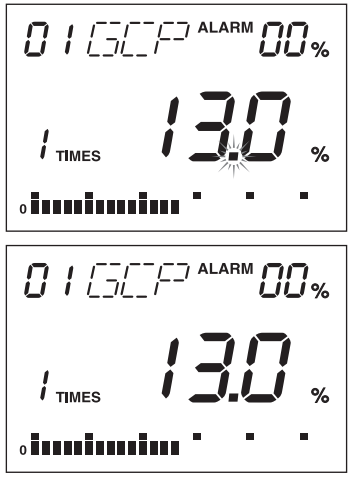
<Pressure sensor>

1. Insert paper in between the electrodes of the pressure sensor.
2. Clamp the paper in by pushing down on the handle until it stops.



* When using the grip sensor or pressure sensor, be careful not to nip your fingers.

(4) Press the MEA/EF 9 key, and the decimal point will start to blink. After approximately 3 seconds, the buzzer will sound with a "beep", and the "number of measurement times," the "moisture value," and the "bar graph" will be displayed.



* The bar graph will display up to 25% full scale in 1% increments.

* When the moisture value is outside of the measuring range, "HI" will be displayed if the value is higher than the measuring range, and "LO" will be displayed if the value is lower than the measuring range.

(5) Remove the paper from the sensor.
At this time, the moisture value will remain displayed, but if measurements will continue to be made, please start from "(3) Hold the paper against the sensor electrodes in accordance with the usage method for each sensor." When making measurements is completed, press the ON/OFF key, and turn off the power.

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

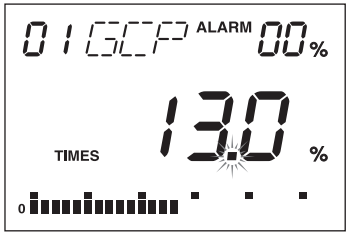
*The ✳ symbol denotes a blinking display.

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 EF 9 key for each measurement.

(1) Setting the continuous measurement mode
In step "6-2. Measurement Method (4)," press the CONT CD 8 key. The decimal point will blink, and the moisture value and bar graph will be displayed.

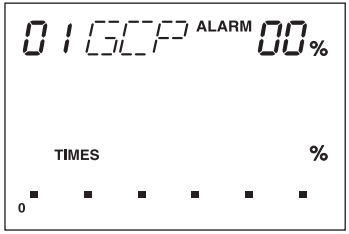
* If the paper is not held against the sensor electrodes, and if the measured value is outside of the measuring range, either "HI" or "LO" will be displayed, and the decimal point will blink.



(2) Canceling the continuous measurement mode
Press the CONT CD 8 key, and a "beep" will sound. The display will momentarily go blank, and the unit will return to normal measurement mode.

* Pressing the ON/OFF key turns off the power and automatically cancels this mode.

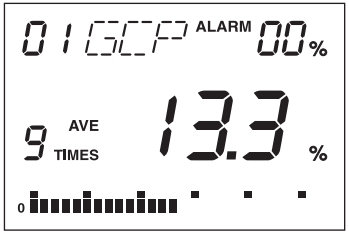
* Note that the battery life is shorter in continuous measurement mode.



*The ✳ symbol denotes a blinking display.

6-4. Displaying the Average Value

When the number of measurements is from 2 to 9, and you press (AVERAGE ENTER), the “AVE”, “average value”, and “measurement number” will be displayed. At this time, the “AVE”, “average value”, and “measurement number” remain displayed, but if you proceed to make a measurement, the “measurement number” resets to “1”.



* If the number of measurements 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 a Moisture Value Bias Adjustment

The calibration curves (scale) for this unit were prepared by determining the relationship between the moisture of paper resulting from a drying method and the electrical resistance of the paper, and then statistically processing these results. However, the standard measurement method and the moisture value may not agree as a result of various conditions such as the type and thickness of the paper. In these cases, a moisture content bias adjustment can be made (-9.9 to +9.9% with respect to each calibration curve) by the following method.

(1) Press the SELECT WX key and select the calibration curve.

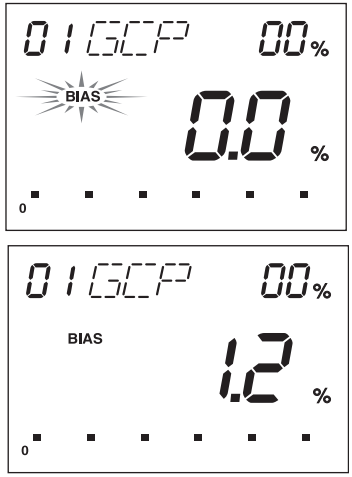
(2) Press the BIAS YZ key. The "BIAS" will blink, and the previously entered bias value will be displayed. The bias is initially set to 0.0%.

(3) Enter a bias value.
To enter the 2-digit number "1.2%," press the MN 1 → CAL OP 2 keys in succession. For a negative value, press the CLEAR UV – key prior to pressing the numerical keys.

(4) Press the MEA EF 9 key to make measurements.

* If a bias adjustment value has been entered, "BIAS" will be displayed when making measurements.

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

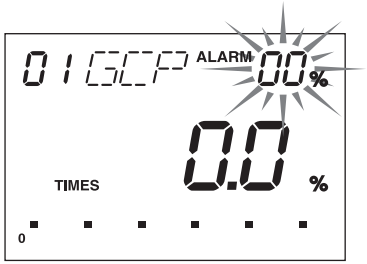


*The ✳ symbol denotes a blinking display.

6-6. Setting the Alarm

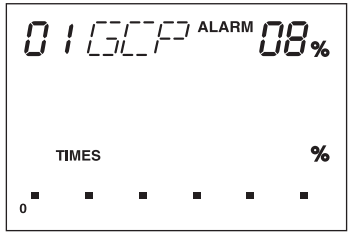
An upper limit moisture alarm can be set. When paper having higher moisture than the set value is measured, the alarm will sound with a beeping tone.

(1) Press the ALARM ST 0 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 ST 0 → CONT CD 8 keys in succession.

(3) A value set for the alarm of "08%" will be displayed. Press the MEA EF 9 key to make measurements.



* To cancel the value set for the alarm, enter "00%."

*The ✳ symbol denotes a blinking display.

6-7. Printer Output

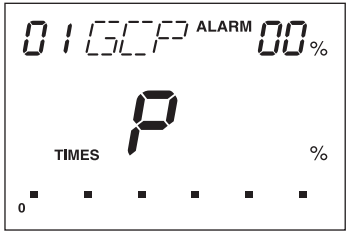
Measured values can be printed out by using the optional printer (VZ-330). The output content is "calibration curve number," "number of measurement times," "moisture value," and "average moisture value."

<Printout example>

HK-300	CALIBRATION No.01
TIMES	[%]
1	5.8
2	5.9
3	5.7
4	6.0
5	5.9
6	5.8
AVERAGE	5.9

(1) Set up

Press the PRINT IJ 5 key in normal measurement mode. "P" will be displayed to the right of "TIMES". The set up is complete.

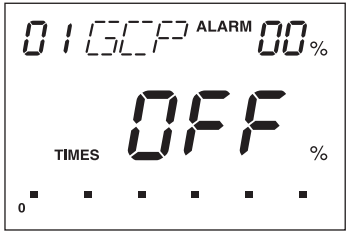


* The timing for output is just after a measurement or just after the display of an average value. However, there is no output if the measured value is outside the measuring range.

* After setting up the printer (VZ-330, option), connect the printer cable (VZC26, option). Please refer to the operating manual for the printer for how to set up the printer.

(2) How to cancel the setting

Press the PRINT IJ 5 key in normal measurement mode. "OFF" will be displayed to the right of "TIMES". The setting is cancelled.



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

6-8. Data Storage

Up to 250 measurement values are stored automatically.The contents of the data are “data number”, “year/month/day”, “time”, “calibration curve number”, and “moisture value”.

* If the number of stored data items exceeds 250, the oldest data item is deleted and the new data item is added.

(1) Batch output of stored data

Press the keys in the order of GH 4 ➡ MN 1 ➡ AVERAGE ENTER to output the data.

* After setting up the printer (VZ-330, option), connect the printer cable (VZC26, option).

* Refer to the printer’s operating manual for how to set up the printer.

(2) Block function

For cases such as different measurement samples, pressing the AB 7 key between measurements is recognized as a separator signal, and a line feed is inserted when printing out.

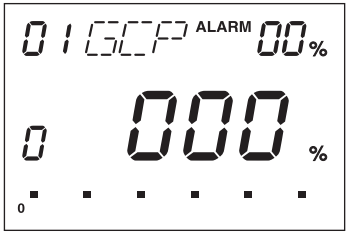
<Printout example>

001	2008/01/23	13:17	#01	5.9%
002	2008/01/23	13:17	#01	8.4%
003	2008/01/23	13:17	#01	10.4%
004	2008/01/23	13:17	#01	10.3%
005	2008/01/23	13:17	#01	10.4%
006	2008/01/23	13:17	#01	10.2%
007	2008/01/23	13:18	#01	10.2%
008	2008/01/23	13:18	#03	17.7%

(3) Batch erasure of stored data

Press the keys in the order of GH 4 ➡ CLEAR UV − ➡ AVERAGE ENTER.

A tone sounds and “0” will be displayed for the measurement number. Next, the display for moisture changes from 0➡ 00➡ 000. The original display will return after approximately 15 seconds.



6-9. Date and Time Display

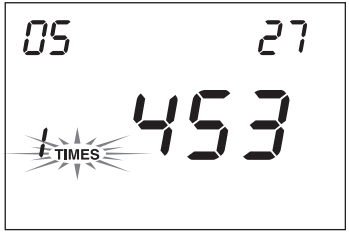
Press the keys in the order of KL 6 ➡ MN 1 ➡ AVERAGE ENTER.

The date and time (24-hour system) are displayed. “TIMES” will blink.

An display example is shown as 27 May, 14:53.

After displaying, press the ON/OFF to turn off the power.

<Display example>



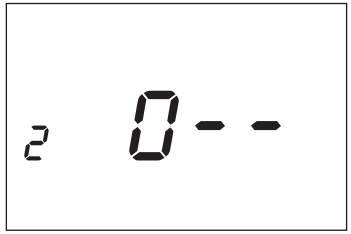
* If the clock is slow or the display is abnormal, the clock battery has been depleted. If the is blinking when performing the above operation, the clock battery has likewise become depleted. Servicing is required to use the clock function.

*The symbol denotes a blinking display.

The following procedure sets the western calendar date and time.

<Example> 23 January 2008, 4:56

*In the operation below, to confirm the input number, press the AVERAGE ENTER key. If you make a mistake when pressing an input number key, press the CLEAR UV – key.



(1) Entering the western calendar date (in this case, 2008)
When the date and time are displayed, press the KL 6 key. The screen on the upper right will be displayed. Next, enter the last 2-digits of the western calendar year. Press keys in the order of ALARM ST 0 → CONT CD 8 → AVERAGE ENTER.

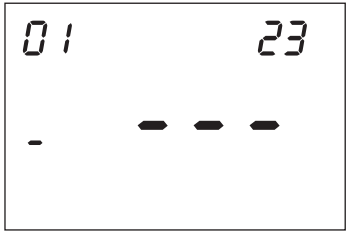
(2) Entering the month and day (in this case, January 23)
First, enter the month of January by pressing keys in the order of ALARM ST 0 → MN 1 → AVERAGE ENTER. Next, enter the 23rd by pressing keys in the order of CAL OP 2 → NAME QR 3 → AVERAGE ENTER .

* When the month and date are 1-digit numbers, enter a leading "0".

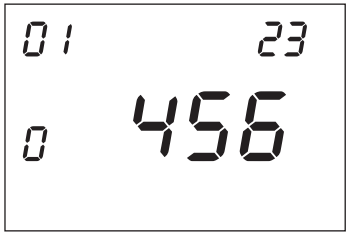
(3) Entering the time (in this case, 4:56)

After the input of Step (2) is completed, the screen at the right will be displayed. First, enter 4 for the hour by pressing keys in the order of ALARM ST 0 ➡ GH 4 ➡ AVERAGE ENTER.

Next, enter 56 for the minutes by pressing keys in the order of PRINT IJ 5 ➡ KL 6 ➡ AVERAGE ENTER.



* When the hour and the minutes are 1-digit numbers, enter a leading "0".



(4) Set up complete

When the input of Step (3) is completed, "TIMES" will blink as in the screen on the right. Set up is complete at this point. Press the ON/OFF key to turn off the power.

*The ✳ symbol denotes a blinking display.

7. Preparing a Calibration Curve

7-1. What is a Calibration Curve?

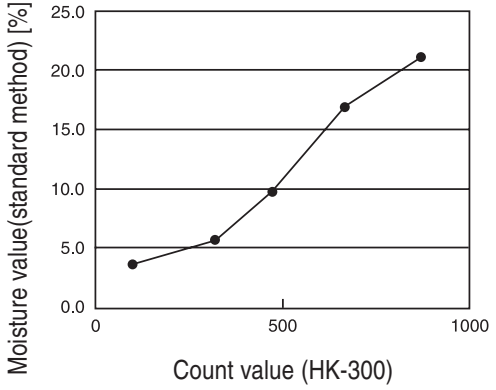
In general, calibration curves for an electrical resistance type moisture meter indicate the relationship between the electrical resistance value for each sample and the moisture previously determined by a standard method.

These may be expressed as an equation, a graph, a table, or some other form. Calibration curves for the HK-300 (for copying paper and cardboard) show the relationship between the electrical resistance value for paper measured using a grip sensor, rubber sensor, or pressure sensor and the moisture value determined by a standard method.

Depending on various conditions such as the type and thickness of paper and other factors, the relationship between the electrical resistance value and the moisture can differ greatly. Accordingly, depending on the paper, the correct moisture value may not be able to be measured by the calibration curves of this unit.

In this case, use the moisture value bias correction function (p. 19, "6-5"), or prepare a calibration curve for the sample from the relationship of the count value in the count mode and the moisture value according to a standard method.

<Example of preparation of a calibration curve>



7-2. Precautions when Preparing a Calibration Curve

* Prepare the calibration curve with the same sensor as when measuring the sample. If the sensor is different, accurate measurements cannot be made.
* Prepare the calibration curve in the same environment as when measuring the sample. Errors will become particularly large if the temperature changes.
* In cases where the temperature at the time of measurement differs with the seasons or other factors, prepare and enter multiple calibrations curves for each temperature.

<Example>

Temperature at the time of measurement	Temperature at the time of calibration curve preparation	Entered calibration curve number
15 ~ 20˚C	17˚C	11
20 ~ 25˚C	22˚C	12

7-3. How to Prepare a Calibration Curve

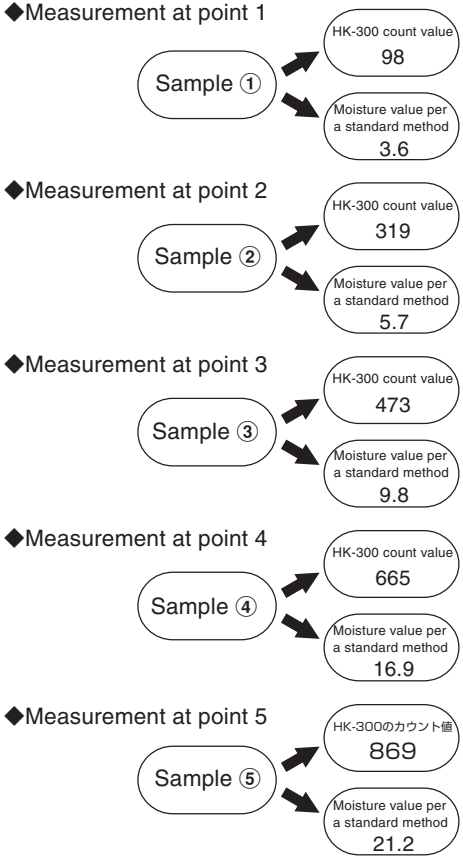
(1) Preparing samples. Prepare 2 to 5 samples having different moisture levels. At this time, prepare samples including the upper and lower bounds of the moisture values you actually want to measure. For example, if you wish to measure moisture from 5-15%, be sure to include samples at 5% or lower and 15% or higher.

(2) Measure the samples prepared in count mode (calibration curve number 10). At the same time, measure each sample by a standard method.

* For the detailed sample measurement method, see p. 14, "6-2. Measurement Method".

* In cases such as where there is a large amount of scatter in the count values from the samples, a more stable count value can be obtained by making measurements in continuous measurement mode (see p. 17, "6-3. Setting the Measurement Mode") or by determining an average value with normal measurements.

<When measuring 5 sample points>



(3) Record the measurement results in count mode (calibration curve number 10) as in Table 1. (Please copy and use the "Calibration Curve Preparation Table" on p. 37.)

* When preparing the table, put the count values from the HK-300 in the ascending order.

◆ Calibration curve number:
◆ Calibration curve name :
◆ Sample name :
◆ Sensor name :
◆ Measurement temperature:

	HK-300 count value (calibration curve number 10)	Moisture value per a standard method
Sample ①	98	3.6%
Sample ②	319	5.7%
Sample ③	473	9.8%
Sample ④	665	16.9%
Sample ⑤	869	21.2%

<Table 1>

7-4. Inputting a Calibration Curve (when measuring 5 sample points)

10 user calibration curves (calibration curve numbers 11 to 20) can be input into this unit. Here, we describe an example of entering and storing measurement results (content of "Table 1") in count mode (calibration curve number 10) into calibration curve number "12" of the HK-300.

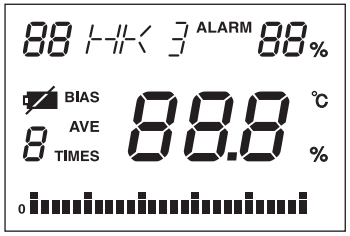
* Enter numerical input with the numeric keys. When the count value to input is a 2-digit integer, or when the moisture value is a 1-digit, enter a leading "0".

<Example> To input 9.9%

Press keys in the order of (ALARM ST 0) → (MEA EF 9) → (MEA EF 9)

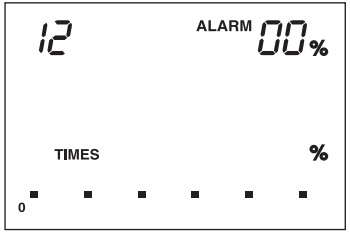
* If you make a mistake in the numerical value to be input, press the (CLEAR UV −) key, and then enter the correct numerical value.

(1) Press the (ON/OFF) key to turn on the power. All elements of the LCD will be displayed for about 3 seconds. Subsequently, the "calibration curve number," "TIMES," and "%" will be displayed.



(2) Select the calibration curve number

Press the (SELECT WX) key, and the calibration curve number will start blinking. Enter a 2-digit calibration curve number, in this case "12". Press keys in the order of (MN 1) ➡ (CAL OP 2) .



(3) Inputting a calibration curve

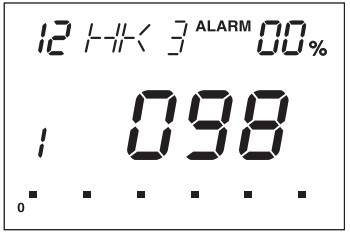
Press the (CAL OP 2) key. The unit will go into calibration curve input mode.

<Procedure 1>

Enter the count value for "Sample ①", in this case "98".

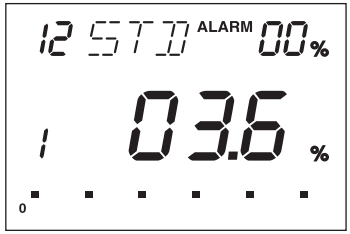
Press keys in the order of (ALARM ST 0) ➡ (MEA EF 9) ➡ (CONT CD 8). When the (AVERAGE ENTER) key is pressed, the display will change from "HK3" to "STD" to confirm the entry.

* Enter the "HK-300 count value" when "HK-3" is displayed, and enter the "standard method moisture value" when "STD" is displayed.

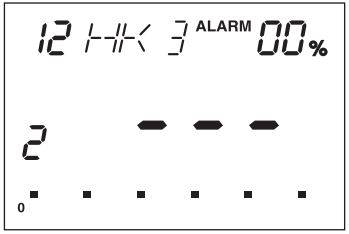


<Procedure 2>

Enter the standard method moisture value, in this case "3.6".
Press keys in the order of (ALARM ST 0) ➡ (NAME QR 3) ➡ (KL 6).



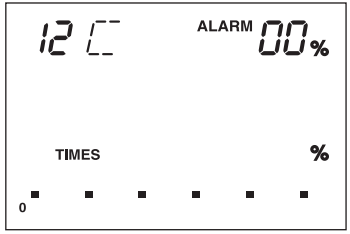
When the (AVERAGE ENTER) key is pressed, the entry of "Sample ①" is confirmed. The display changes from "STD" to "HK3", and the number of measurement times changes from "1" to "2".



Enter the count values and standard method moisture values for "Sample ②" through "Sample ⑤" by repeating Procedure 1 and Procedure 2.

When the input for "Sample ⑤" is complete and the (AVERAGE ENTER) key is pressed, a "beep" will sound. The calibration curve will be entered in "Calibration curve number 12," and the unit will switch to the measurement screen.

If the entry is completed normally, a "C" will be displayed to the right of the calibration curve number.



* To input a calibration curve, the numerical values for points [1] through [5] must be entered. For preparing a 2 to 4 point sample calibration curve, repeatedly enter the upper limit values (count value = 999, moisture value = 99.9). For example, when preparing a 2-point sample calibration curve, enter the upper limit values (HK-300 = 999, standard method = 99.9) for all of the measurement values for [Sample ③] to [Sample ⑤].

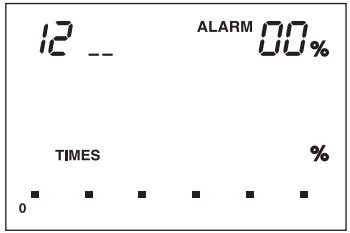
* If newly entering a different calibration curve for a calibration curve number (11-20) that has already been entered, the calibration curve will be overwritten, and the previously entered calibration curve will be modified. Because there may be times when a needed calibration curve is erased by mistake, we recommend that calibration curve data be saved once it has been prepared.

7-5. Inputting a Name for the Calibration Curve

A 3 letter (alphabetical character) calibration curve name can be entered for the unit's user calibration curves.

<Example> Entering the name "ABC" for calibration curve number 12.

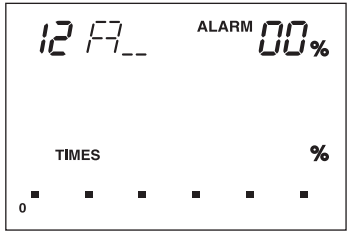
(1) Selecting the calibration curve number
Press the (SELECT WX) key, and the calibration curve number will start blinking. Enter the 2-digit calibration curve number, in this case "12". Press keys in the order of (MN 1) ➡ (CAL OP 2).



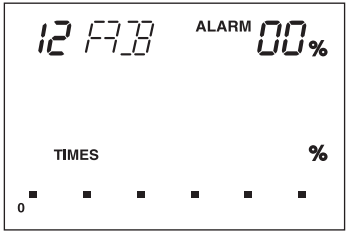
(2) Entering a name

1. Press the (NAME QR 3) key, and an underline field "_ _" will be displayed to the right of the calibration curve number.

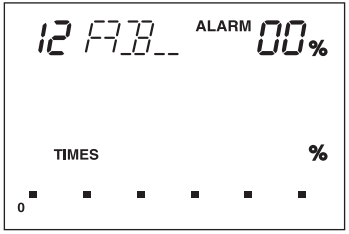
2. Entering "A".
Press the (AB 7) key, and an "A" will be displayed to the right of the calibration curve number. Press the (AVERAGE ENTER) key, and the display will change from "A" to "A_ _".



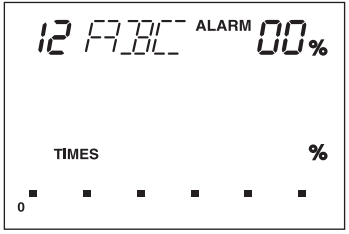
3. Entering "B".
   Press the (AB 7) key, and the display will change from "A_ _" to "AA". Press the (AB 7) key one more time, and the display will change from "AA" to "AB". Press the (AVERAGE ENTER) key, and the display will change from "AB" to "AB_ _".



4. Entering "C".
   Press the (CONT CD 8) key, and the display will change from "AB_ _" to "ABC". Press the (AVERAGE ENTER) key.



(3) Completing inputting the name
   When inputting is completed, a "beep-beep-beep-beep" tone will sound, and the unit will return to its normal state.



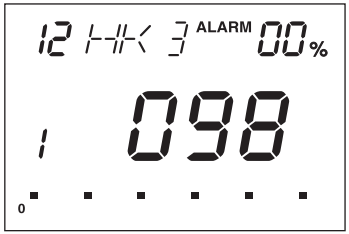
7-6. Display of Input Moisture Values when Preparing a Calibration Curve

(1) First, enter the calibration curve number you want to display by pressing the (SELECT WX) key.

(2) Next, successively press keys in the order of (MN 1) ➡ (GH 4) ➡ (AVERAGE ENTER) .

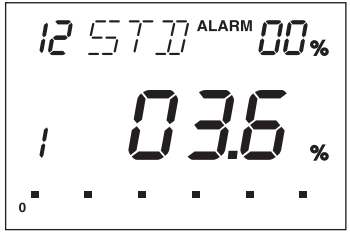
* At this time, if there is an interval greater than 3 seconds between the pressing of each key, the curve number cannot be set.

The HK-300 count value for "Sample ①" is displayed. "HK3" is shown on the display.



Press the (AVERAGE ENTER) key, and the standard method moisture value for "Sample ①" will be displayed. "STD" is shown on the display.

Each time the (AVERAGE ENTER) key is pressed, the count value and the standard method moisture value for "Samples ② through ⑤" will be displayed one after the other.



7-7. Erasing a Calibration Curve

(1) First, enter the calibration curve number you want to erase by pressing the (SELECT / WX) key.

(2) Successively press keys in the order of (MN 1) ➡ (CLEAR / UV −) ➡ (AVERAGE / ENTER). The buzzer will sound, and all the LCD elements will be displayed for approximately 3 seconds. Afterwards, the "Calibration curve number," "TIMES," and "%" will be displayed.

* When a calibration curve is erased, the unit returns to its initial state.

◆ Calibration curve number :
◆ Calibration curve name :
◆ Sample name :
◆ Sensor name :
◆ Measurement temperature :

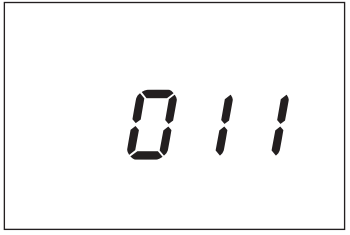
	HK-300 count value (calibration curve number 10)	Moisture value per a standard method
Sample ①		
Sample ②		
Sample ③		
Sample ④		
Sample ⑤		

8. Error Display

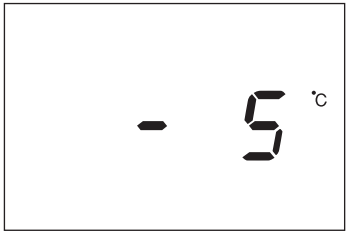
When there is a problem with the unit or with the measurement conditions, the following errors will be displayed for 4 seconds, and then the power will turn off.

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

(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.



(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.



(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.

9. List of Special Operations

Function	Operation
Moisture value display for a user calibration curve, see p. 35 "7-6"	Enter the calibration curve number for the calibration curve you want to display by pressing the SELECT WX key. Then successively press keys in the order of MN 1 ➡ GH 4 ➡ AVERAGE ENTER.
Erasing a user calibration curve, see p. 36 "7-7"	Enter the calibration curve number for the calibration curve you want to erase by pressing the SELECT WX key. Then Successively press keys in the order of MN 1 ➡ CLEAR UV – ➡ AVERAGE ENTER.
Batch output of stored data, see p. 22 "6-8 (1)"	Successively press keys in the order of GH 4 ➡ MN 1 ➡ AVERAGE ENTER.
Batch erasure of stored data, see p. 23 "6-8(3)"	Successively press keys in the order of GH 4 ➡ CLEAR UV – ➡ AVERAGE ENTER.
Inputting a delimiter (block function), see p. 22 "6-8 (2)"	Press the AB 7 key between measurements.
Date and time display, see p. 23 "6-9"	Successively press keys in the order of KL 6 ➡ MN 1 ➡ AVERAGE ENTER.
Setting the date and time, see p. 23 "6-9"	Press the KL 6 key in the state where the date and time are displayed.

10. Calibration Curve List

Number	Sensor	Calibration curve	Display name	Measuring range (%)
01	Grip	Copying paper	GCP	4 ~ 15
02		Cardboard	GCB	6 ~ 20
03	Rubber	Copying paper	RCP	4 ~ 25
04		Liner (K-100 Liner)	RLN	6 ~ 23
05		Kraft (K-100 Kraft)	RKF	5 ~ 24
06	Pressure	Copying paper	PCP	2 ~ 10
07		Liner (K-200 Liner)	PLN	5 ~ 15
08		Kraft (K-200 Kraft)	PKF	2 ~ 10
11 ~ 20	– – –	User calibration curve	– – –	1 ~ 99 (display range)
10		Count mode	HK3	10 ~ 990 (display range)

MEMO