Grain & Seed Moisture Tester PM-600

Kett

Operating Manual

CONTENTS

1. Specifications

Measuring principle	:	Dielectric constant (50MHz)
Applications	:	Grain seeds and other agricultural products(See PM-600 PRODUCT LIST)
Measuring range	:	1.0 ～ 40.0% (depends on products)
Accuracy	:	S.E.C 0.2 ～ 0.5% (for less than 20% moisture content) S.E.C : Standard Error of Calibration
Capacity	:	Sample volume : 240mL
Compensations for	:	Weight : with built-in load cell Temperature : with built-in thermistor Bias : － 9.9 ～＋ 9.9%
Functions	:	Weight / liter Memory-back-up Auto power off Average
Display	:	LCD
Power supply	:	Alkaline batteries (1.5V "LR6"x4)
Power consumption	:	240mW
Output	:	RS-232C Interface
Dimensions	:	130(W) × 185(D) × 210(H)mm
Weight		1.5kg
Accessories	:	Funnel, Sample cup, Brush, Alkaline batteries (1.5V "LR6" × 4), Product list, Operating manual
Option	:	Printer VZ-330 (with printer cable VZC-22), RS-232C cable (VZC-57)

2. Names of Parts

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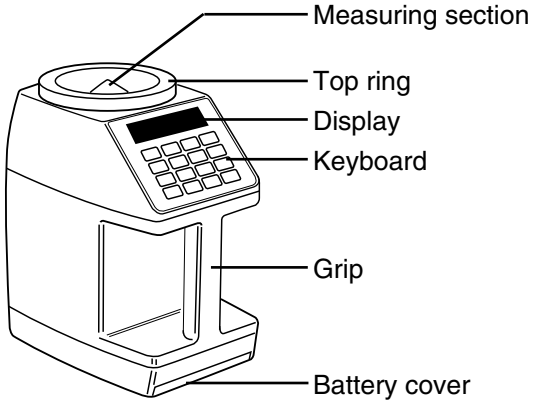
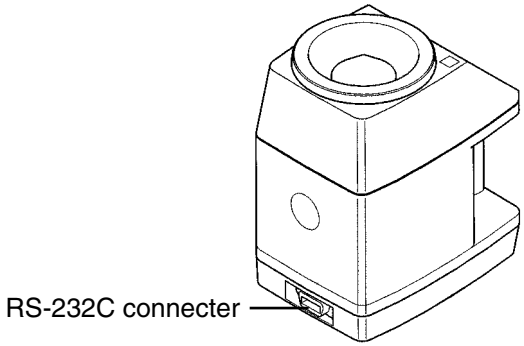
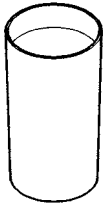


<Rear Panel>

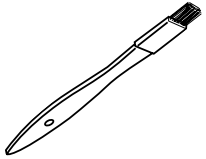


<ACCESSORIES>

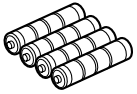
Funnel



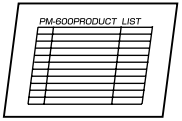
Sample cup



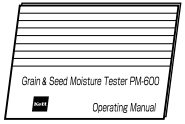
Brush



Batteries



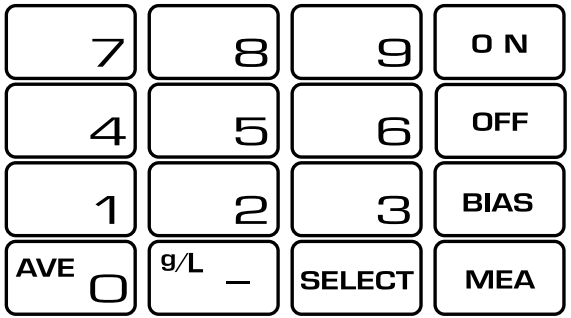
Product list



Operating manual

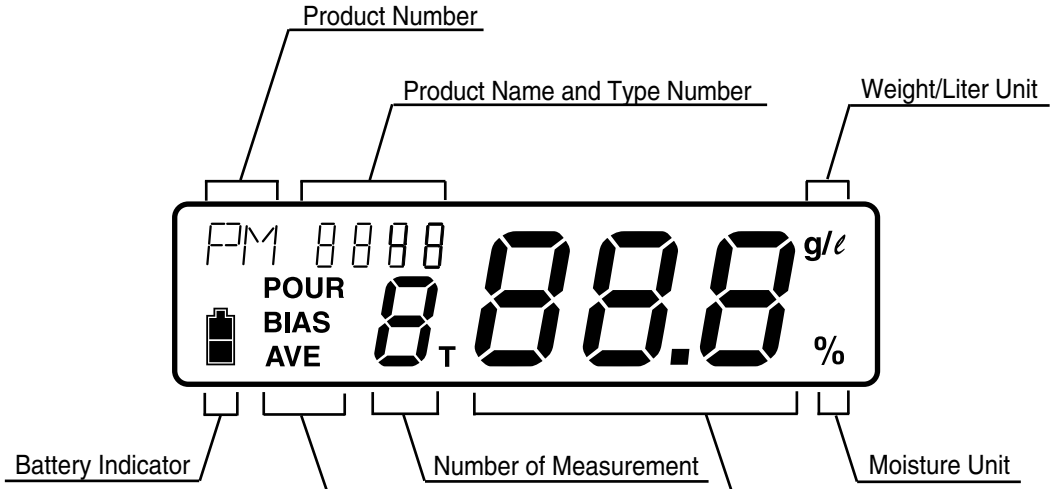
3. Keyboard

<KeyBoard>



Key	Fanction
ON	Power is turned on.
OFF	Power is turned off.
BIAS	Bias adjustment can be entered.
MEA	For measuring moisture.
SELECT	For selecting product number.
g/L –	(1) In MEA(measurement) mode, weight/liter is displayed. (2) In BIAS mode, "-" sigh can be entered.
AVE 0	(1) In MEA mode, average value is displayed. (2) In BIAS and SELECT mode, "0" can be entered.

4. Display



Indicators of Function

(1) Pour When the PM-600 becomes ready for measurement, "Pour" blinks.

(2) Bias Bias adjustment

(3) Ave Average

Indication of

(1)Moisture

(2)Weight/Liter

(3)Bias adjustment value

＊ **"g/ℓ" in displayed on PM-600 is same meaning as "g/L" of the regular expression.**

5. Before Measurement

(1) **Remove the funnel and sample cup from the unit.**

(2) **Load the batteries.**
The unit is powered by four LR6 batteries.
Place the batteries in the compartment correctly.

(3) **The PM-600 features an integrated balance. For best accuracy, place the unit on a horizontal surface, in a location that is not subject to wind or vibration.**
Attempting measurement while holding the unit in your hand or in a location where wind or vibration is present reduce precision or make accurate measurement impossible.

(4) **Prepare the sample to be measured before measurement. Allow it to equilibrate to the ambient temperature of the PM-600.**

6. Measurement Operation

6-1. Turn on the PM-600

(1) Press [ON] key.

(Buzzer sounds for 2 seconds.)

All indicators will be displayed. (Figure1)

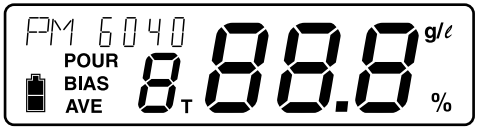


Figure 1

(2) After 4 seconds, the product number (01~99) and the product name (4 characters), "T" and "%" indicators will be displayed. (Figure2)

Figure 2

*** "g/ℓ" in displayed on PM-600 is same meaning as "g/L" of the regular expression.**

6-2. Select the Product.

Example : Product No. 41 to
Product No. 43

(1) Press [SELECT] key.
Be sure that Product No. "41" is blinking. (Figure 3)

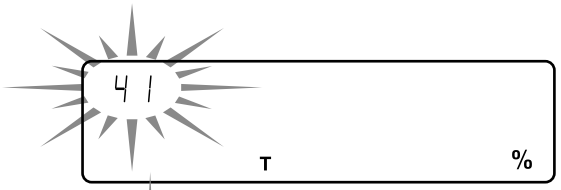


Figure 3

(2) Press [4] key.
"1" is blinking. (Figure 4)

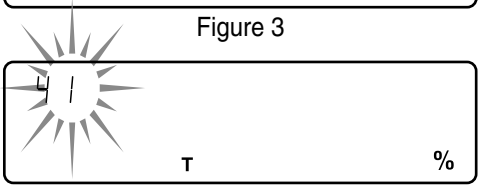


Figure 4

(3) Press [3] key. (Figure 5)

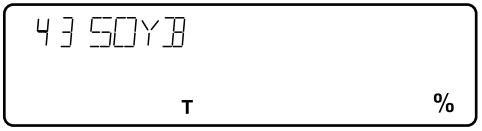


Figure 5

Note : The product number is retained in the non-volatile memory when the PM-600 power is off.

6-3. Pour the sample into the sample cup.

(1) Place the funnel on top of the sample cup.
Pour the sample to be tested into the cup until it overflows. (Figure 6)

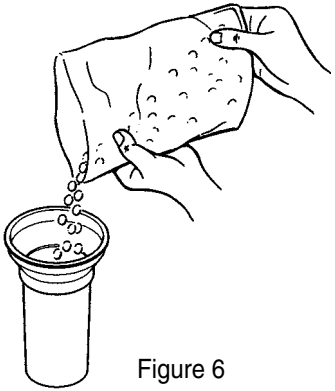


Figure 6

(2) It shoud take about 4~5 seconds.

(3) Remove the funnel and level the cup by pulling the funnel accross the top edge. (Figure 7)

Figure 7

Caution : Never use the sample cup to take a sample directly as shown in Figure 8.
Always use the funnel.

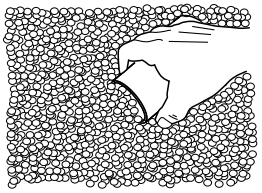


Figure 8

6-4. Pour the sample into the measuring section.

(1) Press [MEA] key.

The decimal point blinks. (Figure 9)

The PM-600 is performing zero-adjustment of the built-in scale while the decimal point is blinking.

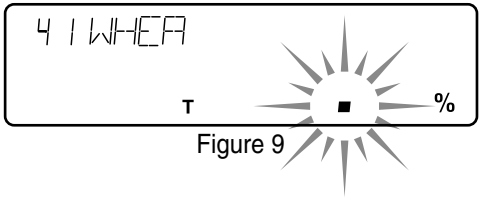


Figure 9

Caution : Be sure not to touch the unit at this moment.

(2) Pour the sample into the unit when the "POUR" indicator begins blinking. (Figure 10)

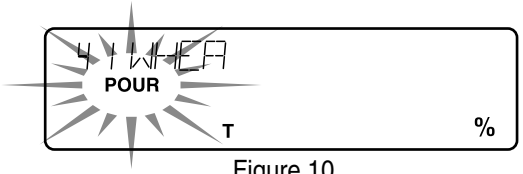


Figure 10

Caution : Pour the sample into the center of the measuring section at a speed at which the entire sample is poured in about 5 ~ 6 seconds.
Pour the sample in to be even. (Figure 11)

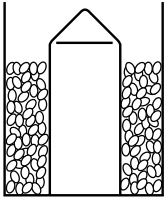


Figure 11

Note 1 : For tea sample which is not so smooth as grain, pour the sample, a little <u>shaking</u> the sample cup and aiming at the center point of the unit.

Note 2 : **When the sample such as "corn cane" or "flattened barley" or "tapioca flour" is powder state, the sample is sometimes put on the top of testing chamber as per Figure 12. In that case, drop the sample from the top into the testing chamber while a decimal point is blinking.**

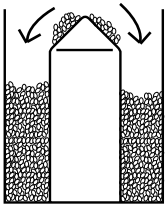


Figure 12

Note 3 : **When the sample which is contained solid such as "tapioca chips" or "tapioca pellets" is measured, the sample may be put between testing chamber as per Figure 13. In that case, the sample which can not be put into testing chamber should be either removed or cut fine into small pieces and put them into the testing chamber prior to measurement.**

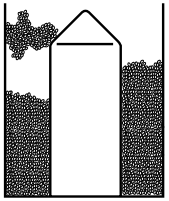


Figure 13

(3) After the "POUR" indicator goes out, the decimal point blinks 10 seconds.

The moisture content and the number of measurement are displayed. (Figure 14)

The unit measures weight of the sample while the decimal point is blinking after the "POUR" indicator goes out.

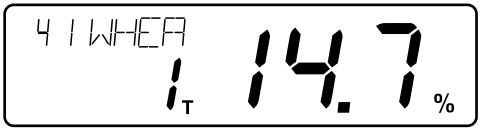


Figure 14

Caution : Do not pour more sample in during this period or the measurement precision will be greatly downgraded. Do not put more sample into the measuring section even if some spills out.

Note 1 : When moisture underflows the lowest limit of the measuring range, " AAA " is displayed. (Figure 15)

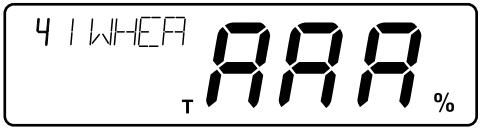


Figure 15

Note 2 : When moisture overflows the range, " FFF " is displayed. (Figure 16)

Figure 16

Note 3 : See error display (P. 22), when error displayed on PM-600.

(4) Press [g/L –] key, weight/liter is displayed. (Figure 17)

Figure 17

(5) Dispose of the sample. (Figure 18)

The moisture content or weight/liter is displayed during this time. If you wish to continue with further measurement, resume the procedure from step 6-3 "Pour the sample into the sample cup".

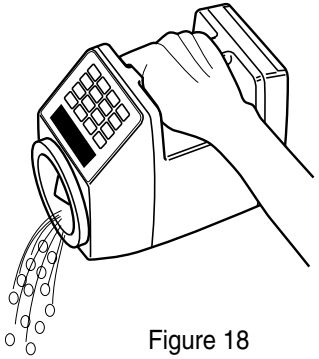


Figure 18

7. Displaying the Average Value

Press [AVE ▢] key to display the average of the measured values.

When the number of measurement is between 2 and 9, "AVE", the number of measurements and the average moisture are displayed. (Figure 19)

Next press [g/L –] key, the number of measurements and the average weight/liter are displayed. (Figure 20)

Figure 19

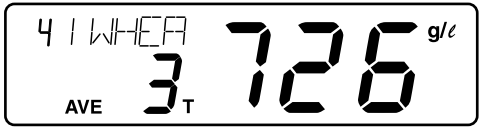


Figure 20

Note : Once [AVE ▢] key is pressed the number of measurements goes back to "1".

8. Performing Moisture Content Bias Adjustment

Moisture content bias adjustment can be made from -9.9~ +9.9% for each product.

Input a bias value if the moisture content has any discrepancy against the official standard.

The bias value is not cleared, when the power is off.

Example : Product No. 41
BIAS value shoud be decreased by 0.4.

(1) **Set the unit to the bias adjustment mode.**

Confirm if the power is turned off.

Press [ON] key.

(2) **Select the product.**

Press [SELECT] key, [4] key and [1] key.

(Figure 21, Figure 22, Figure 23)

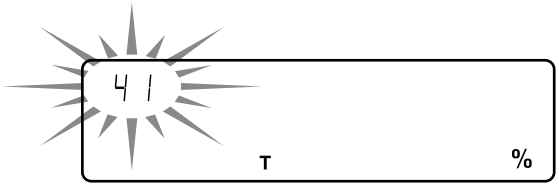


Figure 21

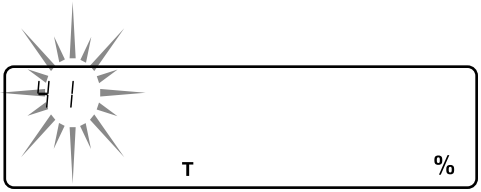


Figure 22

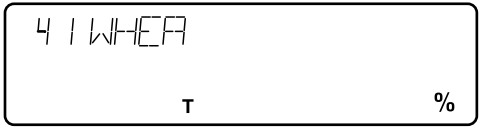


Figure 23

(3) Input the bias.

Press [BIAS] key.

The "BIAS" sign blinks. (Figure 24)

Press [g/L –] key, [AVE 0] key and [4] key. (Figure 25, Figure 26)

The "BIAS" sign stops blinking. (Figure 27)

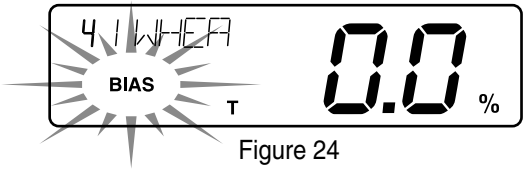


Figure 24

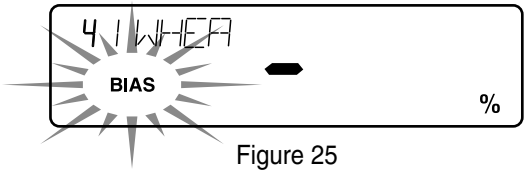


Figure 25

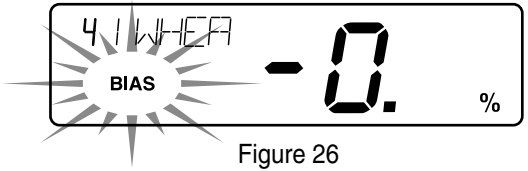


Figure 26

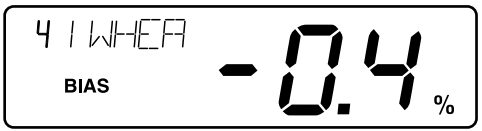


Figure 27

9. Data Output

9-1. Printer Output

(1) Keep pressing [5] key, and press [ON] key.
"FF" will be displayed. (Figure 28)

Figure 28

(2) Press [5] key. "1" or "0" will be displayed. (Figure 29)
Printer output on "1"
Printer output off "0" (default)

Figure 29

(3) Press [5] key until the number that wants to be set is displayed.

Note 1 : The display changes " 0 " and " 1 " alternately whenever [5] key is pressed.

Note 2 : The measurement processing becomes early with "printer output off".

(4) Press [OFF] key, when the number that wants to be set is displayed.

Note : The display when the power supply is turned off is memorized to PM-600.

(5) Connect to printer VZ-330 (optional) with the printer cable. (Figure 30)

Note : see the manual of the printer about the setting of the printer.

(6) After measuring, the measurement result is printed by the automatic operation.

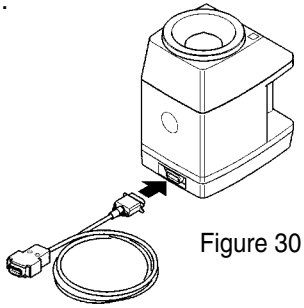
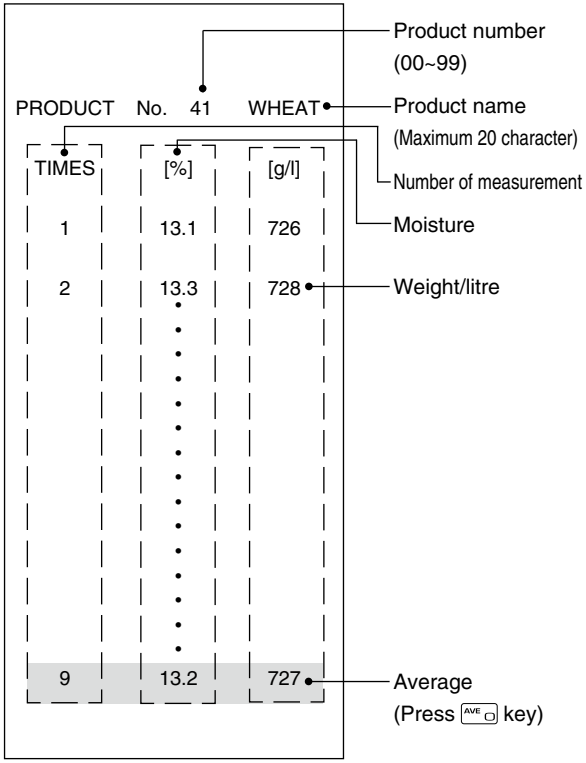


Figure 30

<Printer Output>



9-2. RS-232C Output

(1) RS-232C Interface Specifications (Figure 31)

- Transmission Format: Asynchronous
- Signal Format : Baud Rate : 2400bps
  : Data Bit Length : 8bits
  : Parity : None
  : Stop Bit :1bits
  : Code : ASCII

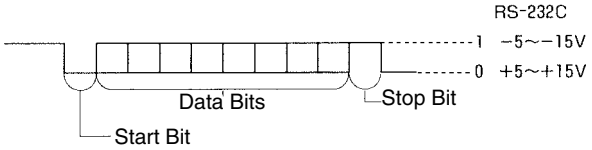
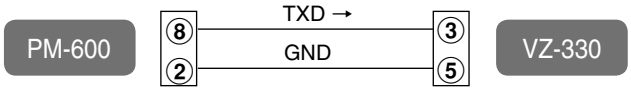


Figure 31

The content of the output is a content of the print example published in the printer output page.

(2) PM-600 and RS-232C Cable Wiring

- PM-600 — VZ-330 Printer (VZC-22 recommend)



- PM-600 — Personal Computer (VZC-57 recommend)

10. Replacing the Batteries

The battery indicator ( ) is displayed when the batteries are exhausted. (Figure 32) Replace all four with new batteries.

Figure 32

11. Auto Power Off

When inactive, the unit will automatically power off
in approximately five minutes.

12. 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. Please, contact your vender.

Display	Operation
	Temperature measurement circuit error.
 	Moisture measurement circuit error.
	Weight measurement circuit error.

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