User Guide
EE-KU GRAINS MOISTURE TESTER.

MODEL.
EE-KU 60th Years Anniversary

Feature

      The portable tester is 116mm wide, 120 mm long and 150mm high. On the top if an opening for putting the grain in, inside the opening is designed as electric capacitor with grain temperature sensor.

      The front side is inclined, for easily operated by user, display with 3 digits LCD screen. Under the screen, there are 5 buttoms. The system is operated by microcontrollers, EEPROM and RAM are two types of memory in the system.

      The testor requires a 9-volts battery located on the bottom of the tester .It measure 7 typesof grain, compensate effect of temperature drift automatically , dosplays moisture percentage ,average moisture and number of testing , measures grain temperature,and also low battery warning ,abnormal operation or wrong use.

Special Feature
1) This grain moisture tester is designed to be calibrated by users.
2) The tester has been already calibrated to measure 4 grain types (Standard model i.e. corn, paddy, soybean, millet.) To measure other types, Users have to notify as option. With extra charge.

Equipments.
1) Grain Moisture tester model EE-KU.
2) Balance EE-KU (50-100 grams).
3) Cone.
4) Case and bag.
5) User's guide.

Specification.
1) Principle : Capacitance.
2) Measure temperature :Thermal couple type-K fast response.
3) Moisture : Display percentage 00.0%-99.9% (depending on calibration).
4) Error : Less than 0.5% (depending on calibration).
5) Repeatability : less than 0.2% (range 0%-20% depending on calibration).
6) Grain temperature :00.0-80.0 ˚C ±0.2 ˚C.
7) Moisture compensation due to temperature drift.
8) Grain type : Maximum 7 types.
9) Sample : 50 g./100g. (depending on grain type).
10) Memory : Ram and EEPROM.
11) Display average moisture percentage : 1-99 samples.
12) Number of testing : maximum 99 times.
13) Count numbers of testing and calculate average readings automatically.
14) Delete average and number of testing.
15) Calibration : user are able to calibrate for accuracy or other grain types.
16) Check system operation automatically : notify user when battery is low or any mistakes
17) Operating temperature 10-50 ˚C.
18) Power source : 9 V battery. And DC Adapter as option
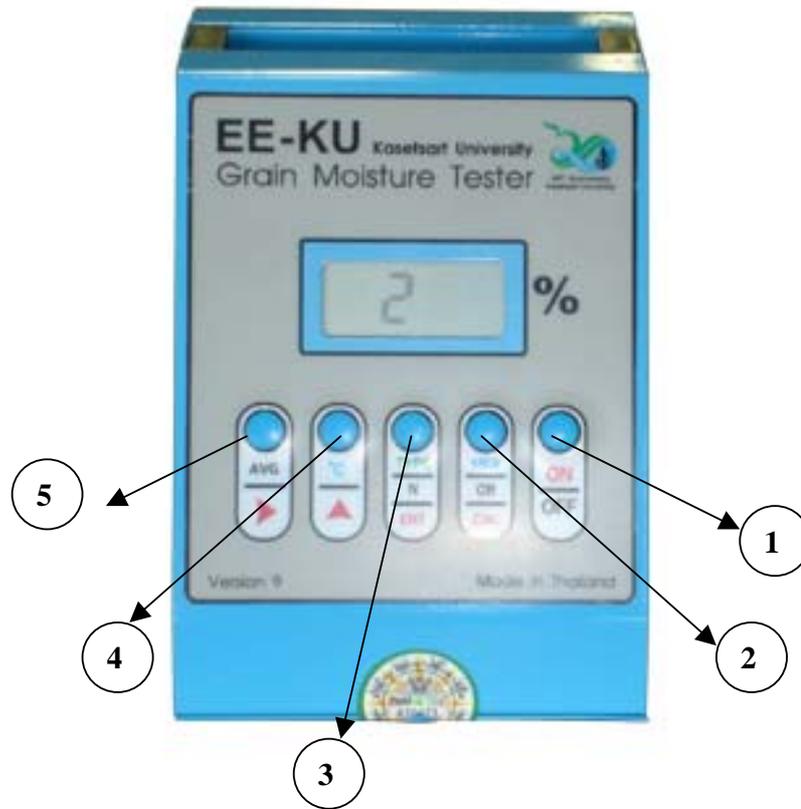
This tester can measure and display many parameter .

    1) Percentage of moisture contain of current sample.
    2) Over all percentage of moisture contain.
    3) Number of testing.
    4) Temperature of current sample.
    5) Delete average percentage and number of testing.
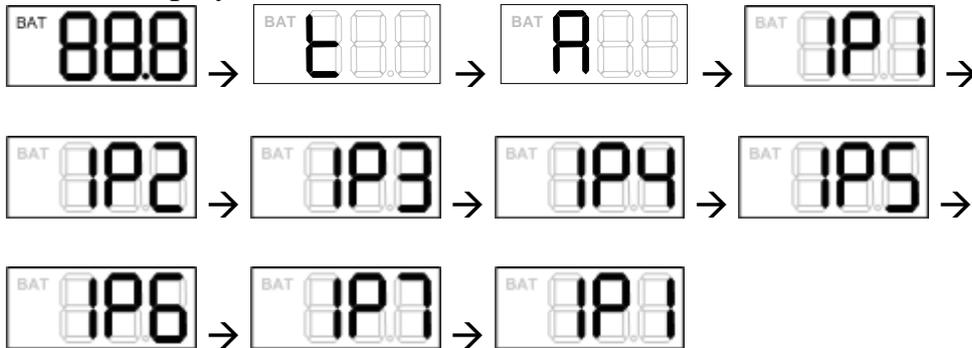   6) Percentage compensation due to temperature drift.

Measuring Percentage of Moisture content.

  1.1 Preparation

   Place the tester on smooth horizontal surface, eg. Table.

  1.2 Press Power button to turn on the tester(button 1) [ON/OFF] then Screen will display

[BAT 88.8] → [BAT t88] → [BAT A88] → [BAT 1P1] →

[BAT 1P2] → [BAT 1P3] → [BAT 1P4] → [BAT 1P5] →

[BAT 1P6] → [BAT 1P7] → [BAT 1P1]

   t-1 number1 indicates that it will measure first grain type,and it displays t-1 repeatedly (it may not be t-1, it depend on last used The tester can recognize last type of grain to be used)
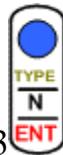
  1.3 Select grain type

   To measure first type ,when screen display t-1(moving)

   [BAT 1P1] , it is ready to be used

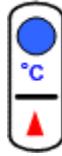   To measure other type (maximum 7) ,eg. Type 3, follow the instruction below

   1.3.1 Press button 3 [TYPE/N/ENT] and hold for 5 second, screen will

    display [BAT t4P] and blink, and then press
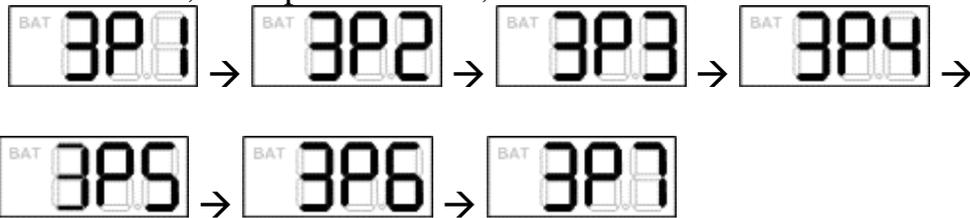
    button3 [TYPE/N/ENT] again, screen will show [BAT t-1]

1.3.2 Press button4 to select type (screen display t-2, t-3, t-4, …, t-7 and t-1 again as round robin),for example ,we

press button until t-3 displays ,then press button3 ,when press button3, the screen shows

$$3P.1 \rightarrow 3P2 \rightarrow 3P3 \rightarrow 3P4 \rightarrow$$

$$3P5 \rightarrow 3P6 \rightarrow 3P7$$

meaning it is ready for measuring.

1.4 Weighing sample

Pour grains half of the cup, then place a balance on the top of the tester. Gradually add some grains in to the cup until the balance is balanced horizontally. That is the right weight of the sample (100g. or50g.)

1.5 Pouring the grain into opening

Put the grain on top of the opening. Press button2 pour the grain from the cup, let them slide down along one side of the opening

Press → | PuE | → Pour → | --- | → | Sho |
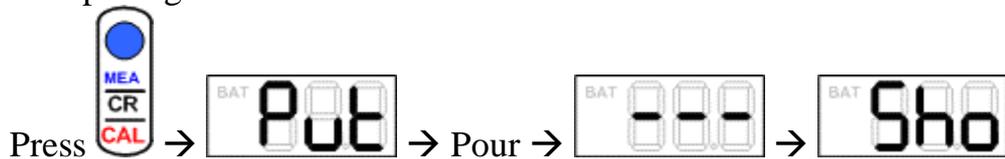
Note : pouring grains in to the opening slowly and gradually will give more accurate and less error of the measurement . But pouring the grains to fast will give little error with less percentage than the reality.
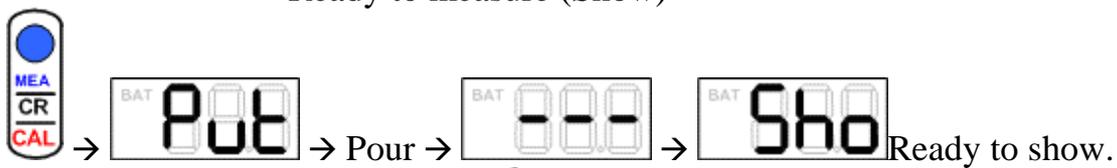
1.6 Reading

The tester will display :

1) moisture percentage
2) average moisture percentage (if test many times or many samples)
3) Member of testing
4) Sample temperature (°C)

1.6.1 Moisture percentage
Ready to measure (Show)

[MEA/CR/CAL] → **Put** → Pour → **---** → **Sho** Ready to show.

Press button2 [MEA/CR/CAL] it will display _ _ _% of moisture content (the tester also summing and memorize the number of testing)

Sho → Press [MEA/CR/CAL] → **12.5** %
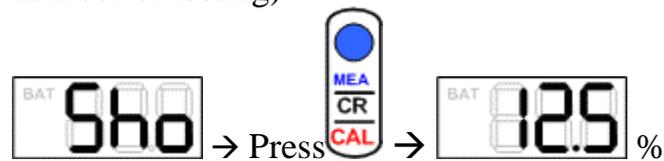
1.6.2 Average percentage of moisture content

Press button5 [AVG ►]

12.5 Will blink, that means the average is 12.5%

Note : For instance , measure 3 samples

1st sample 10.0%
2nd sample 15.0%
3rd sample 17.0%

when press button5 it will display

button5 [AVG ▶] → [BAT **14.0**] $= \dfrac{(30+15+17)}{3} = 14.0$

1.6.3 Number of testing

Press button5 [AVG ▶] and button3 [TYPE N ENT] together.

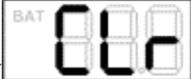[BAT **n01**] measure 1 times

[BAT **n03**] measure 3 times

1.6.4 Samples Temperature.

Press button4 [°C ▲]
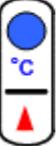
[BAT **25.3**] Means the samples Temperature is 25.3 °C

1.7 Deleting number of testing and the average

Press button5 [AVG ▶] and button2 [MEA CR CAL] together

Screen will display [BAT **CLr**] and blink.

1.8 Taking the sample out

When the sample is already taken out, the number of testing and average are still memorized.
To delete them
:- Clear as 1.7 or
:- switch off the tester or
:- change the grain type as 1.3

1.9 In case of non-calibrated type (eg.if type 7 has not been calibrated yet) when select type as 1.3

When press, button3 screen displays

And blink 3 time (No-data),then back to as previous.
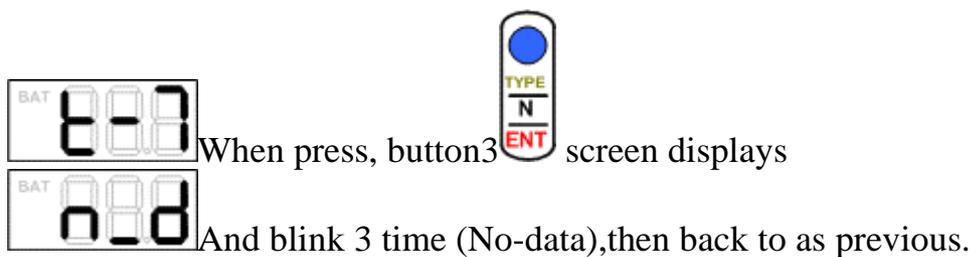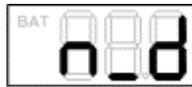
1.10 Error displaying

E06 , **E02** →Internal Voltage offset is too low ,Maybe Operating temperature is too low (should be 10-50 °C)

E07 →When switch the tester on . Internal Voltage offset is too high. Maybe The grain are still inside.Make sure the grain is taken out.
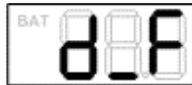
d_F → Display Over flow, Maybe the grain moisture contain to large.

n_d →No data in this type, This type has not been calibrated. It must not to be used with this type.