



MOISTURE ANALYZER **DS**  
User Manual



v.201811



**HiWEIGH**  
Weighing system & solution

An ISO9001 registered company  
@No.335 Haishen, Xingxin Road, Huinan Town, Pudong District, Shanghai 201301, China  
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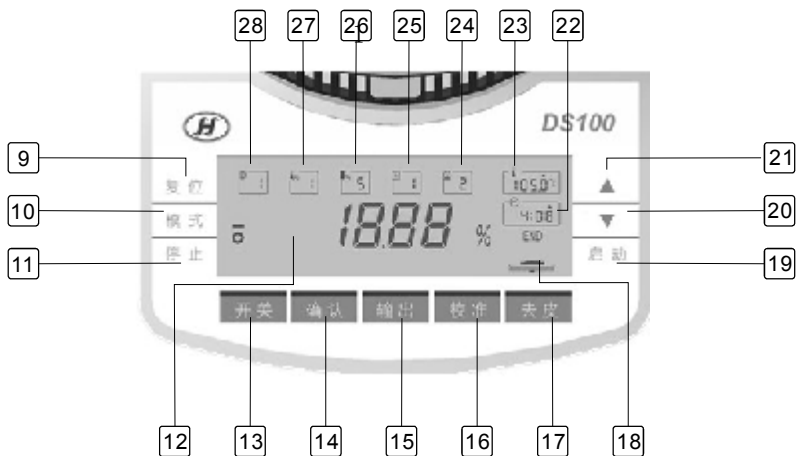
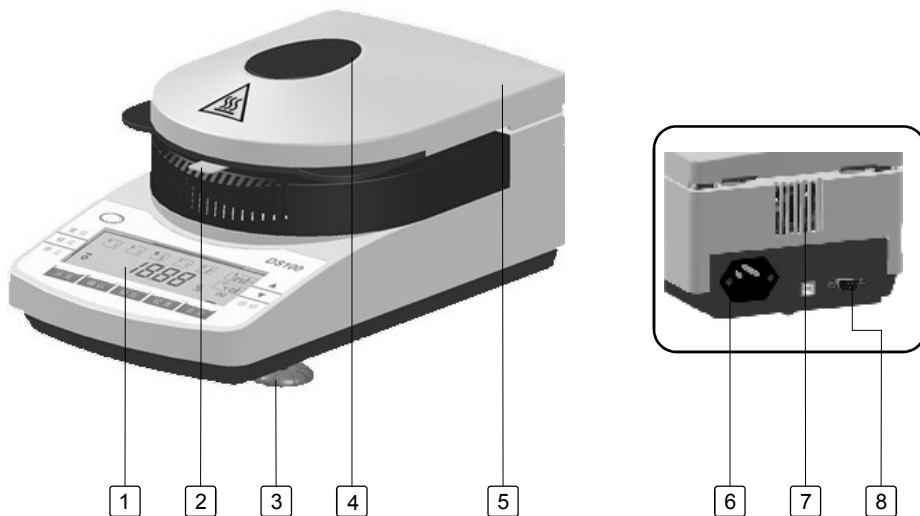
Value Each Gram

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# 1. You are familiar with the equipment

## 1.1 Outline of equipment



## 1.2 Signs that the equipment

SN	Explain
1	Show window
2	Sample plate frame
3	Level foot
4	Vent
5	Heating unit
6	Power input
7	Air vents
8	Rs232 output
9	Reset key
10	Mode key
11	Stop key
12	Data zone
13	On/off
14	Confirmation

SN	Explain
15	Output key
16	Cal key
17	Tare key
18	The heating mark
19	Start key
20	<↑> up key
21	<↓> down key
22	Time display
23	Temperature display
24	Output mode
25	Display mode
26	Shutdown mode
27	Drying heating method
28	Process ID number

## 2. About Moisture Analyzer

First of all, thank you very much to buy DS Series Halogen Moisture Analyzer. This instrument technology innovation, rapid and reliable measurements. Simple operation and a variety of practical functions, so that the measurement of water has become very simple, greatly increase your efficiency.

This section details on the DS Series Moisture Analyzer reasonable and safe use information, please read carefully before use.

### 2.1 Halogen Moisture Analyzer uses

This Halogen Moisture Analyzer can be used to measure the moisture content of the material. Instruments based on the weight of pyrolysis principle: the beginning of measurement, the instruments measured (moisture) sample weight, and then, apparatus built-in halogen heating device to start drying, heating and drying the tested samples were dealt with. In the drying process, the apparatus for determination of the weight of the samples and to show that the loss of water. Measuring the end of the apparatus or the content of water samples show that drying material content as the final results.

In practice, the most important factor is the speed of heating and drying. Conventional oven or infrared heating method, the use of halogen heating in the maximum heating power required for a shorter period of time. At the same time, this may also be used in high-temperature apparatus, which reduce the drying time is another important factor. As a result, can greatly improve the measurement of the efficiency of the water.

In addition to the measurement of all parameters (such as: heating and drying time, heating temperature, etc.) can be set in advance, this equipment can also be used to sample some of the parameters stored in the device, easy to use again after the equipment directly from the program out . Each boot, automatic apparatus to retain the most recent set of the state.

DS Series Moisture Analyzer full-featured, easy to operate. State apparatus will show signs of the current state of setting and measurement process, allowing users to clear and easy to understand the work of the state apparatus.

In addition to a variety of user-friendly operating procedures, the accuracy of the measurements are also important. The present configuration of the high-precision equipment with low drift of the weighing system to ensure the accuracy of the measurement instruments.

DS-Series Moisture Analyzer with the relevant water standard of measurement and testing methods.

## 2.2 Security requirements

DS Series Moisture Analyzer, a leading technology and equipment in line with the safety requirements misoperation but still dangerous and harmful. In order to ensure safe and reliable operation, follow these steps: - this is the instrument used to measure the moisture content of samples, do not use it for any other application would probably have resulted in personal injury and damage to equipment.



- Please use this product specification requirements of the environmental conditions, not inconsistent with the requirements of the operating environment to use the equipment.



- The only familiar with the equipment nature of the samples and the use of trained professionals.
- Equipment for the power cord with 3-pin socket ground to prohibit the off-line or the use of ground equipment without a good grounding of power.

Moisture Analyzer with the operation of heat-related



- Around the instruments to ensure that there is sufficient space to avoid overheating and the accumulation of heat (the top of the instrument should leave room for 1m)
- As a result of heating equipment units around the region will become hot, do not put in the equipment around flammable liquids
- In samples taken Should be interpreted carefully. Sample itself, the heating unit and other containers at this time will still be very hot
- In the process of heating and drying, heating elements ring protective glass and its temperature to reach 400 °C. Do not touch or open the heating unit. For more information, please disconnect the power to open and wait until the complete cooling.

Some of the samples need to be particularly careful:

Some samples may be through the course of the following people on the harm or damage to equipment:

Fire or explosion:



- Combustible or flammable liquids :
- Solvents containing substrate
- Heat produced explosive or flammable gases

In the determination of this sample matrix, so that the operation of the heating temperature should be low enough to prevent the formation of fire or explosives, and good wear protective equipment such as goggles. If the sample is not very understanding of the flammability, the amount of test samples should be minimal. In this case, the instrument should have custody of hand, just in case, you do risk analysis of the test.

Toxic and corrosive :



- Toxic elements in the matrix, the matrix can only be good ventilation of heating and drying conditions.
- Heating and drying corrosive steam when the matrix (such as: acid) measured in this sample matrix, as a result of steam condensation in the cooler will be part of the case arising from corrosion, the proposed amount of samples as little as possible

Users should follow the requirements of the operating manual to standardize the operation to ensure that the equipment failure for a long time without work.



### 3. Installation and commissioning

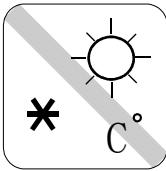
#### 3.1 The standard configuration of the equipment out of the box and check

Open the package, removed equipment and accessories, check whether the integrity of the configuration.

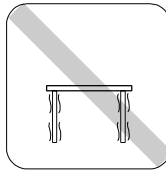
- whole apparatus 1 set
- power cord 1 pcs
- sample set 25pcs
- sample disk stent 1 pcs

Open the package of instruments to check whether there are transport equipment damage, If you have any questions in a timely manner with the supplier. Please contact 0086-21-62042173。 Please save all packaging, transport equipment needed when the original packaging is the most Good protection.

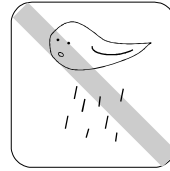
#### 3.2 Instruments placed location



Stable temperature

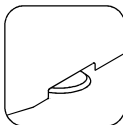


Solid desktop

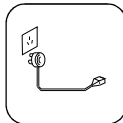


Moisture, air-free

#### 3.3 The level of conditioning and power connections

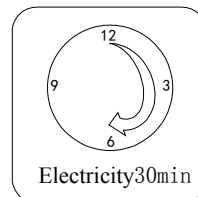


- Will be selected on the apparatus, adjust the level of the foot so that the level of equipment in a central location indicator



- Connected to the power supply (Note: there should be a good grounding power)
- Samples placed disk stent

- Instruments used to be a half-hour warm-up



### 3.4 For the first time measurement

Now you have the equipment ready for the first time measured the water. After this step will enable you to understand this and are familiar with the process of measuring devices and display status.



Instruments with this new state of directional signs, this section will allow you to understand and familiar with the state of directional signs, the signs will tell you the current state apparatus, and you are prompted to the next step of the operation.

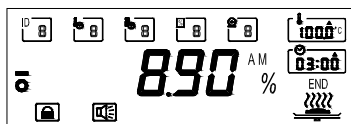
- Have been key so that the water meter indication of the balance back to zero
- To open heating element, test samples placed on the scales, a few drops of water so that it contains water, close the heating unit.
- Start button to start measuring instruments sample water

On the screen can be seen rolling in the heat drying flashing signs, said heating and drying process in progress. At the same time on the screen shows the current position of the heating temperature, and has been heating and drying time. In addition, the moisture content of the samples showed that the value of the ever-changing.



- Measurement of water after the device will automatically turn off the heating element, buzzer noise, suggesting that the operator has completed the measurement of moisture。

Now you can read on the screen measuring the moisture of the relevant information.



- Sample the water content (indication locked)
- experienced heating and drying time
- current Cang heating temperature
- measuring water when setting the parameters

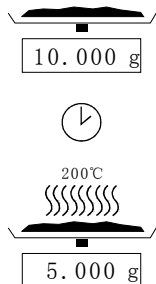
Be careful, now the sample or samples of hot plate and should be allowed to cool down before they can take out.



- Reset button, the screen on the Elimination of the water measurements, the return of weighing instruments (standby), the next step to prepare the survey.

## 4. How to achieve the best results of the water

### 4.1 Moisture Analyzer working principle:



This equipment is based on the principle of thermal analysis to carry the weight of water measurement. That is, in the heat drying process, in order to sample to determine the moisture content of weight loss, the apparatus basically 2 parts: a precision balance, a heating and drying devices and other heat method (oven, infrared, microwave ), Halogen-Moisture is the only halogen used for heating and drying equipment. Will be faster measurement speed, measured in the process of measuring the accuracy of the results also depend on the sample preparation and measurement of the following parameters of the right to choose

- The size of the sample
- The drying temperature settings
- The choice of drying time

In fact, not only the quality of the measurements are important, and sometimes the process of measuring the speed is very important, DS series of halogen-Moisture Analyzer can help you achieve the perfect combination between the two.

The best drying temperature and drying time and sample size, nature and preparation of the required accuracy of the measurements related. These parameters can only be determined through experiments, the main equipment parameters set by the user, (see parameter settings), once a sample of measurements to determine the parameters, these parameters can be used as a measuring instrument in the preservation process, After measuring the same sample, the procedure can be Measurement Instruments in the address out into the original process, direct measurement of water, again without the need to set up a variety of measurement parameters.

## 4.2 With regard to the scale and Heating drying device calibration

Moisture Analyzer heating and drying equipment at the factory from the factory calibration, the user will no longer need to carry out calibration, the balance can be calibrated. For the measurement of moisture, the calibration of the balance is not absolutely necessary, because the water is measured relative, that is, the scale measuring the weight of the samples before and after drying, the moisture is based on the wet weight and dry weight ratio calculated. Weighing in general, the balance calibration is necessary.

## 4.3 Sample the best configuration

Sample preparation determines the measurement of the speed and accuracy of the measurements Please note that the sample preparation of the following basic principles:

- the choice of samples to meet the accuracy of the premise of the small sample should be too, need more drying time So that the slow speed of measurement; if the amount is too small sample, the results may not be representative. Therefore, to be followed by the following principles: the more non-uniform sampling, the greater the amount of samples, so that with repeated measurements.
- Samples should be uniformly distributed in the samples on site in the sample should be evenly distributed set of samples, so sampling can increase the surface area for heat absorption. For liquids, oils and fats, soluble and highly reflective samples should first be heated to hot dry state had put samples of quartz sand tray, and then the sample will be evenly distributed in the sand, this approach also applies to heating in Surface of the shell samples. Quartz sand to ensure uniform heat distribution quickly to prevent the formation of impervious surface in the sample were the case.

## 5. Moisture Analyzer's operation

### 5.1 Address procedure code (ID) settings

(ID) The address is used to store a certain type of measurement procedures, This measurement procedures set has a set of relevant measurement parameters (such as heating temperature, shutdown mode, and so on) through (ID) of the address set could be deposited in the original sample some of the procedures for measuring out, and it can A new set of measurements into the process.



- Weighing in the state, press (mode) key, measuring instruments into the water to set the parameters, at this time (ID) address marks the beginning of flashing
- Press (UP) key, (ID) number to the address plus one, press (DOWN) key, (ID) number to the address by one, (ID) number to address the scope of 0 ~ F, of which 1 ~ F for the user area, 0 for factory Set
- In the (ID) is located at 0, press the (confirmation) button factory equipment used to set the parameters and settings from the state, weighing return (standby) state.
- When (ID) number for the address of 1 ~ F, press the (confirmation) Key, (ID) to set parameters, the next parameter (heating) set up the state.
- When (ID) number for the address of 1 ~ F, press (Tare) bond, will present a set of relevant parameters, as a sample into the measurement process (ID) address, at this time if the ID = 1, then keep 1 into the address, set up to complete and return to weigh (standby) state.
- When (ID) for the 1 ~ F, press (start) button, the instrument will address the ID of the process out, as water measurement parameters at this time if the ID = 2, will be on the 2nd address Out process, the program will be based on the equipment in the water measurement parameters to work..

## 5.2 And the setting up of heating methods

Heating and drying equipment in this way 3



- Standard drying: The program is the factory setting for most of the samples, the samples were heated to a temperature drying (determined by the temperature settings) and has been kept at the temperature, until The end of the measurement.



- Rapid drying: The program applies to the main water content of 3% to 15% of the samples, to start after the temperature rose rapidly, so that the water fast drying.



- Slow drying: the procedure applicable to the drying time will be formed on the surface of the shell samples (such as sugar, etc.), making it the temperature in a row after a slow rise evenly to set the heating temperature drying. "Huansheng time" refers to the drying process from the beginning of the final set to reach the required temperature, the time is optional (for DS103).

### Heating and drying parameters set



Heating and drying parameters set when the heat drying indicator flashing signs, press ? key parameters plus one, press ? key parameters by one, when the required parameters, press (confirmation) key parameters set to complete drying, into the The next parameter (shutdown mode) set

### 5.3 Shutdown mode and setting method

This equipment is divided into automatic shutdown mode model, semi-automatic mode and manual mode



SN	Application of the sample
1	Fastest
2	Fast
3	Normal
4	Slow
5	Slowest



- Automatic mode (No. 1 to 5): The model is based on the weight loss per unit time, as long as the required period of time the average weight loss of less than default, that the water measurement equipment, and automatic termination of the measurement process. The process of measuring the data displayed on the screen. The model starts at 15 seconds after the performance.
- Manual mode (No. 6): Using the model, the measurement process is continuous, by up to (stop) button to stop the measure, at this time measurements and other relevant measurement parameters will be retained and displayed on the screen . (Stop) key in the other mode is invalid.
- Semi-automatic mode (No. 7): This mode is also called the shutdown mode from time to time, measured on a continuous basis, until the arrival set off before the end of the measurement. Time indicators show that measuring time in a row.

#### Shutdown Mode Parameters setting

- When the shutdown mode indicator flashing signs, press ? key parameters plus one,press ? key parameters by one, when the required parameters, press (confirmation) key, shutdown mode to set parameters, the next parameter (Display) set.

## 5.4 Display and setting method

Of the measurement instruments in the water when there are four types of display, with numbers from 1 to 4 that - Moisture content



Moisture content of samples to show that the percentage of wet weight, which is the apparatus of the factory settings. M% moisture content with that,  $M = (WW - DW) / WW$ , measurement, the current measurements in a row that percentage.



### - Dry weight

Samples of the dry weight of wet weight in order to show that the percentage of dry weight to D% said,  $D = DW / WW$ , measurement, the current measurements in a row that percentage



### - ATRO Moisture content

Samples of water to dry weight (DW) showed that the percentage, ATRO to AM% moisture content, said,  $AM (0 \sim 100) = (WW - DW) / DW$ , in the process of measuring the current measurements in order to show that the percentage of in a row.



### - ATRO wet weight

Wet weight in order to sample (DW) showed that the percentage of shows that when AD% said,  $AD (100 \sim 1000 \text{ value}) = WW / DW$ , in the process of measuring the current measurements in order to show that the percentage of in a row.

Note: When the show beyond the scope of the measurements, the apparatus will show signs overflow "E1".

Show the way to set the parameters - when the display indicator flashing signs, press ? key parameters plus one, press ? key parameters by one, when the required parameters, press (confirmation) key, shutdown mode to set parameters

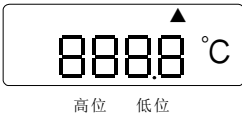


Printout of the way and set up ways (for DS103)

DS100 Series Moisture Analyzer output from the factory setting, the user can not be altered



## 5. 5 Heating temperature and the setting up of methods



- The apparatus of the heating temperature set in the range of 0 ~ 200 °C, when the low temperature heating flashing signs, press ? key parameters plus one, according to the ? key parameters by one, when the required parameters, press (confirmation) key to enter temperature Set high, press ? key parameters plus one, press ? key parameters by one, when the required parameters, press (confirmation) key, heating and drying temperature settings, enter the parameters for the next (time) set up a state.

Note: When measuring instrument to start when the water temperature indicator to show the actual position of the current heating temperature, at the same time in the indicator appeared in "△" signs.

## 5. 6 Set the time and method of measurement



- This time to set the scope of the instrument from 0 to 90 minutes \* time off from time to time set up only for heating and drying methods 3
- the time when the indicator (s) flashing, press ? key parameters plus one, press key parameters ? A reduction in the number of seconds needed to occur, press (confirmation) into the key indicator of time (minutes) set up, p ? key paess rameters plus one by one by ? key parameters in the required number of minutes when, press (confirmation) key set the time to complete. At this point, and the measurement of water-related parameters set all, the return of weighing instruments (standby) state.

When the equipment to start measuring water, the time indicator to show that the time has been measured at the same time the indicator appeared in "△" signs.

Note: in the process of setting parameters, with the exception of calls have been placed ID) in the process, other parameters in the process of setting can not withdraw from the half-way, such as the case may be no need to modify the parameters of (recognition) button until all parameters are set to complete Can be set from the state.

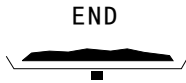
## 5.7 Measurement

Now you are familiar with this Moisture Analyzer all the parameters, you can measure their own samples



- Weighing (standby) mode, open the warehouse heating, the samples will be placed on scales, Guan heating on the warehouse, to be that the value of stability in the balance, press (start) button to start measuring. - At this point, the

screen can be seen not only heating symbolic rolling in the flicker, while heating warehouse to see real-time changes in temperature, heating time and real-time results of the water, and other relevant information



- When the pre-shutdown mode parameters, will automatically stop heating equipment, audible, suggesting that the end of the measurement. At this point in the heat to stop flashing signs, and a "END" sign,

locked-related measurements, waiting to read. By the (reduction) keys can be locked to withdraw and return to weigh (standby) state. At this point the heating unit had been shut down but the temperature is changing over time and temperature display to reflect the actual position of the current heating temperature.

Note: In the measurement process, according to the (reduction) at any time to terminate the key measurements, but reservations will not be displayed. \* Samples have been heated plate and samples are still hot, before cooling to be out samples.

Of the following circumstances would refuse to measuring instruments and warning

1. If the beginning of measurement, the scales are not in place or the weight of the samples tested showed "0", heating and drying system will not start at the same time buzzer ring, flashing prompt.
2. If the beginning of measurement, the heating did not shut down stores in the heating or heating inthe process of open positions, heating equipmentwill be immediately closed drying system at the same time buzzer ring, flashing prompt.
3. If the beginning of measurement, the heating temperature set <20 °C, while heating and drying system will not start flashing prompt.



## 6 Equipment maintenance and troubleshooting

This chapter describes how to make Moisture Analyzer to maintain a good working condition, as well as introduce several common cause of exclusion and methods

### 6.1 Equipment maintenance

Cleaning: To get accurate results, the proposed Temperature Sensor regular cleaning of heating and warehouses. Clean-up must be pulled out before the power plug, clean-up should be careful to avoid damage to equipment, with no hair (down) with a soft cloth and neutral detergent wash, corrosive must not use solvents and cleaning agents. Cleaner should not be allowed into the in-house equipment.

## 6.2 The following situation may be the cause and solution

### Access to power after the start shows no

- no power supply voltage
- the power cord is not good then
- burning fuse - button panel damage
- equipment failure

Instruments have gained access to the confirmation power, and power supply voltages have to check the fuse equipment, if requested to replace burned. If the equipment can not work, please contact the factory technical service department.

### Instruments showed that L

- did not pan placed
- touch peripheral items

### Instruments showed that H

- scales on samples overweight
- weighing instrument calibration error removed samples re-calibration.

### Indication of instability

- did not pan in place
  - hit the surrounding items
  - surrounded by strong electromagnetic interference
- check pan, turn off the source of strong electromagnetic

### Weighing big indication error

- not peeled, peeled and re- calibration or calibration

### Measurement of time

- not when the shutdown mode
  - over-sample
- check and re-select shutdown mode, adjust the number of samples

After the start heating unit does not work

- with a temperature below the ambient temperature
- not to place the sample
- the burning fuse

Re-set temperature, check on the scales of samples to check the fuse equipment, if requested to replace burned. If the equipment can not work, please contact Factory technical service department.

Results can not be repeated

- non-uniform sampling, that is, the samples have different components. The more heterogeneous sample, the greater the amount of samples required in order to be repeatable
- Selected drying time is too short. Increase the drying time, to choose the appropriate measurement parameters.
- Samples do not entirely (due to the formation of shell). Quartz sand placed in the dry. - Selection of high temperature, the samples have been oxidized, Drying temperature should be lowered.
- Boiling samples, so that spill out to change the weight. Drying temperature should be lowered.
- Heating or heating positions elements polluted by lack of heating, cleaning heating and heating positions elements.
- The setting of instruments of the unstable base Using a stable base.
- Around the very unstable conditions (such as air \ vibration, etc.)

## 7 Other useful information

### 7.1 Measurements and that the weight of a typical sample

The results of the measurement accuracy and samples of the original wet weight and moisture content. Measurements of the relative accuracy with the wet weight of samples (weight) to improve and increase. When the moisture content of samples fixed, regular weight of the samples identified by the user. However, with the weight of the samples, drying process will also be extended. Recommended sample Repeatability up to the required weight to be better. The following table can be used as reference samples to determine the typical amount.

## 7.2 The output interface

The output of the equipment for the way RS232

baud rate: 2400 bit / s

output of characters: ASC II code

output format:

1	2	3	4	5	6	7	8	9	10	11	12	13	14
±	■											LR	LF

Sign space                      area data    unit

Output in the form of: automatic output

Output interface: 9 core RS232 interface

引脚号	2	3	5
含义	RXD	TXD	GND

With computers, printers, etc. MS peripherals

## 7.3 Specifications

Model	DS110
W Range	110g
Precision	1mg
Repeatability	0.1%
Readability	0.01%
Temp range	Room temperature~200℃
Temp accuracy	±1℃
Heating way	Halogen
Results	Dry weight and moisture content %、ARTO DW、ARTO WW
Pan size	Φ 90 mm
Size	310×180×157 mm
Power consumption	AC 220V 50Hz 1W (Heating the maximum power480W)





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