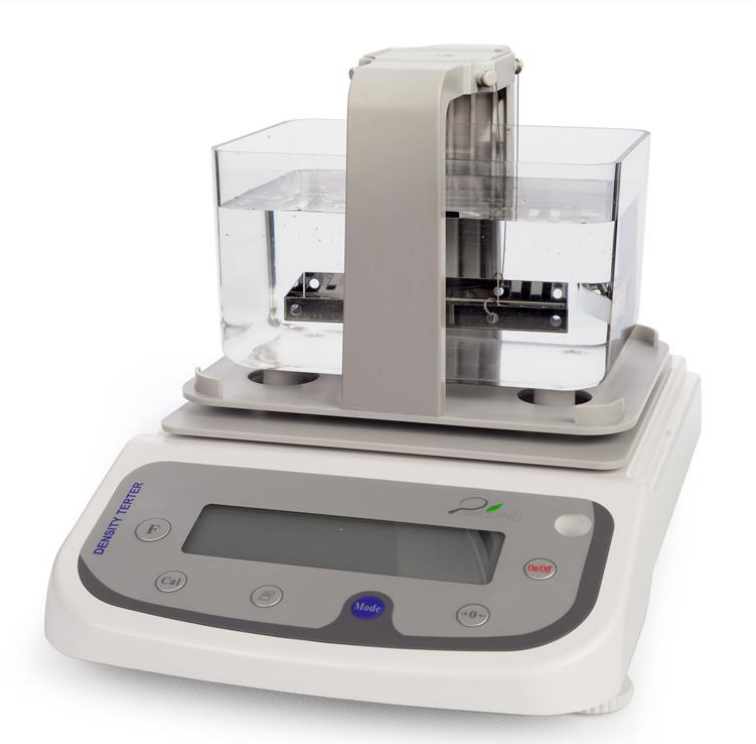
DENSITY BALANCE MANUAL



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I、Introduction

Principle:

Density balance uses Archimedes' water displacement method to measure the density of products. The instrument is based on the density of water at 4 ℃, 1.000 g/㎤.

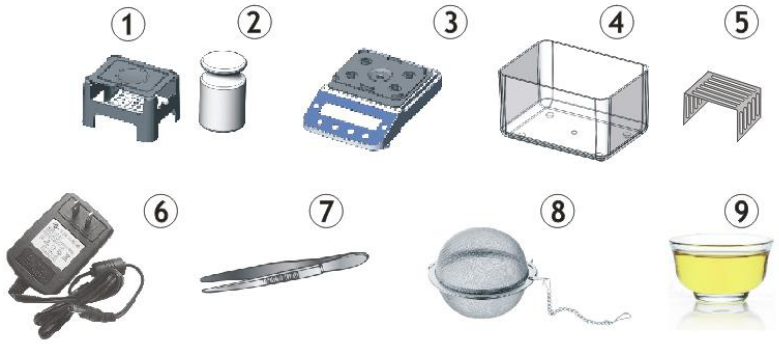
Application:

Density balance is mainly used in rubber, plastic, wire and cable, food, composite materials, cosmetics, shoe materials, glass, precious metal hardware recycling and other industries. The instrument can directly read the weight of the sample in air, the weight in water and the density value.

II、Instrument Description

Model	DX-120X
Weighing Range	0.001g - 120g
Density Analysis	0.0001g/cm ^{3}

Components



①Bracket ②Weight ③Host ④Sink ⑤Anti floating frame ⑥Power Supply
⑦Forceps ⑧Stainless steel cage ⑨cup

Panel Description

1. →0←: A. Weight reset function
   B. Number reduction function when setting parameters
   C. Setting switch function
2. On/Off: On/off display;
3. Cal: A. Calibration key;
   B. Density measurement exit key;

C. Function confirmation key;

4. Mode: A. Density measurement key;

B. Number increase function when setting parameters;

5. F : Function keys

6. : Print

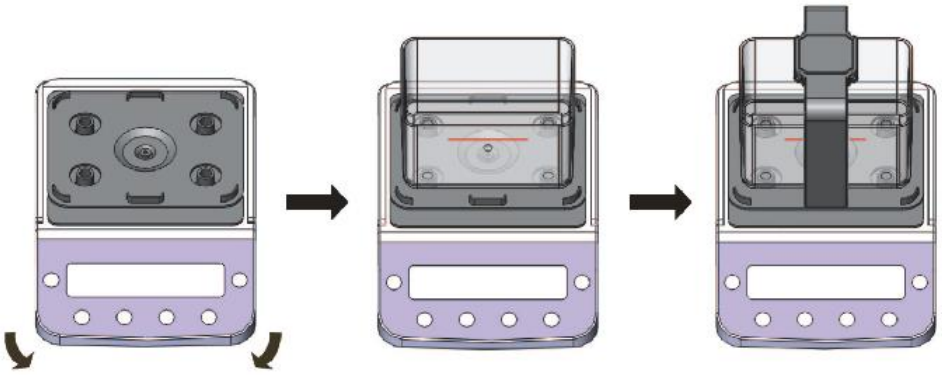
III、Installation

1. The place where the density balance is placed must avoid vibration, direct sunlight, electromagnetic waves, humidity and overheating.

2. Adjust the two legs to make the density balance reach a horizontal position. Make sure that the sensor platform and the water tank support seat are not in contact.

3. Add water to the water tank to the water level line. Then place the water tank on the water tank support seat.
Note: The water level should be able to cover the product.

4. Place the measuring table on the sensor platform. Pay attention to whether there are bubbles attached to the hanging rail, and use tweezers or burette to remove the bubbles.



Installation Diagram

Warm up:
Voltage: AC 220V, 50Hz or 110V, 60Hz;
In order to keep the circuit of the density balance stable, it is recommended to leave the density balance in the power-on state for 10 minutes when using it for the first time.

IV、Calibration Instructions

Density measurement is based on weight calculation. The accuracy of density measurement depends on the accurate measurement of weight. To ensure the measurement results, the density balance needs to be calibrated regularly using calibration weights.

Situations where the density balance needs to be calibrated:

■When used for the first time

■When moved to another location
■Regular calibration

Calibration Method
Use 100g weight for calibration.
1. Plug in the power supply and warm up for 30 minutes (for colder areas);
2. Press the →0← key to reset the value displayed on the screen to zero. Then press the CAL key, and the screen will display 100;
3. Place a 100g weight on the instrument and press the MODE key. The screen will display ACAL (indicating calibration). When the screen displays 100.000, it means that the calibration is complete and the weight can be removed. At this time, the density balance has automatically returned to the test mode.
※ Note:
If the density balance is moved, it needs to be recalibrated.

V、Function Settings

1、Water temperature compensation setting

Press the F key, the screen displays CEn719; press the Mode key, the screen will display a value. The value displayed at this time is the currently set solution temperature value. Press the Mode key to increase the value; press the →0← key to decrease the value. After setting, press the Cal key, the value will flash, and then press the Mode key to confirm.

2、Solution compensation setting

The density balance uses water as the solution by default, and the density of water is 1g/cm ^{3}by default. If you do not use water for measurement, please enter the density of the solution used into the density balance.

The specific operation is as follows:

Press the F key to display CEn719; repeatedly press the →0← key until COEFF is displayed; press the Mode key to display COEFF1; press the Mode key to display the current medium. If no setting is required, press CAL to exit. Press the Mode key, and SET dp will appear. Press the →0← key to adjust the decimal point after T, and SET. dp will be displayed; press the Mode key, and the value will appear on the screen (the value is the density of the liquid medium). Press the Mode key to increase the value; press the →0← key to decrease the value. After the setting is completed, press the Cal key, the value will flash, and then press Mode to confirm.

3、Restore factory settings

Press the F key to display CEn719; press the →0← key repeatedly until 1n171A is displayed, and press Mode to confirm.

4、Baud rate setting

Press the F key to display CEn719. Press the →0← key repeatedly until bAUd is displayed. Press the Mode key to display 300. Press the →0← key repeatedly to select the baud rate to be adjusted. After selecting the baud rate, press the Mode key three times to confirm.

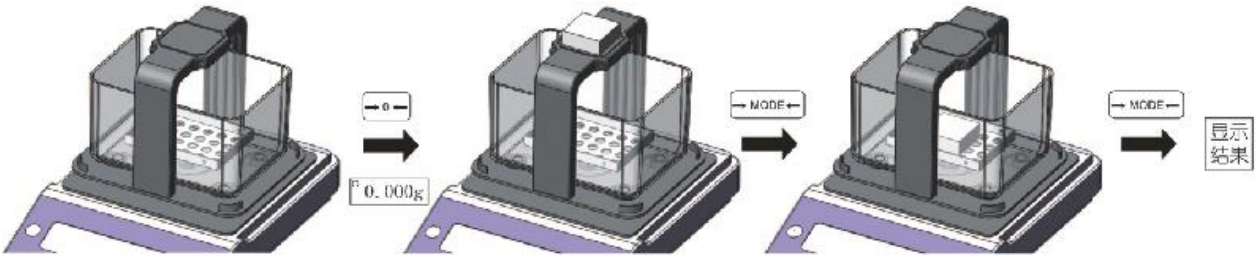
VI、Test Steps

According to Archimedes' principle, in order to avoid large test errors, the higher the density of the product, the heavier the weight required. Please refer to the following table:

Density(g/cm³)	0.200	0.400	0.600	0.800	1.000	1.200	1.400	1.600	1.800	2.000	2.200	2.400
Weight(g)	0.16	0.62	1.41	2.56	3.93	5.65	7.7	10.1	12.7	15.7	19.0	22.7
Density(g/cm³)	2.600	2.800	3.000	3.500	4.000	4.500	5.000	5.500	6.000	6.500	7.000	/
Weight(g)	26.6	30.9	35.4	48.2	62.9	79.6	98.3	118	141.6	169.9	200	/

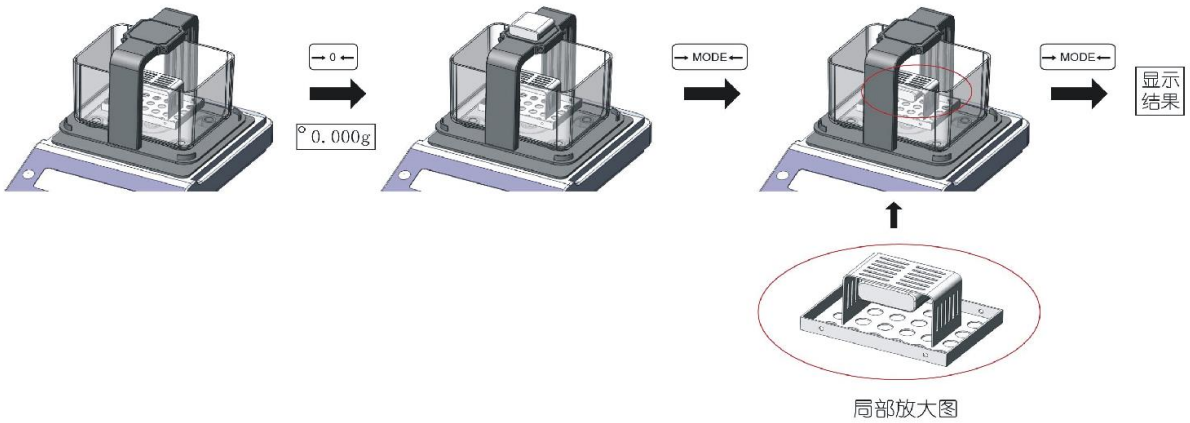
A、Test steps for solid products with a density greater than 1

1. Turn on the machine;
2. The display shows 0.000g. If it does not show 0.000g, press the →0← key to reset it to zero.
3. Place the sample on the measuring table, press the Mode key after the value stabilizes, and the upper left corner of the balance will display "HIGH", indicating that the weight of the product in the air has been recorded.
4. Place the sample on the hanging railing in the water. If there are bubbles attached to the surface of the product, use a burette to remove them. After the value stabilizes, press the Mode key, and the density balance will directly display the density value. Press the →0← key to switch to display the volume value.
5. Press the CAL key to exit and continue to measure other products. If 120 is displayed after exiting, press the →0← key repeatedly until UnSPAn is displayed, and then press the Cal key.



B、Measurement method of floating products

1. Place the anti-floating frame on the hanging rail in the water (as shown in Figure 1 below), and press the →0← key to reset the value to zero.
2. Place the product on the measuring table, press the Mode key after the value stabilizes, and the upper left corner of the balance will display "HIGH", indicating that the weight of the product in the air has been recorded.
3. Use tweezers to place the product under the anti-floating frame. After the value stabilizes, press the Mode key, and the density balance will directly display the density value. Press the →0← key to switch to display the volume value.
4. Press the CAL key to exit and continue to measure other products. If 120 is displayed after exiting, press the →0← key repeatedly until UnSPAn is displayed, and then press the Cal key.



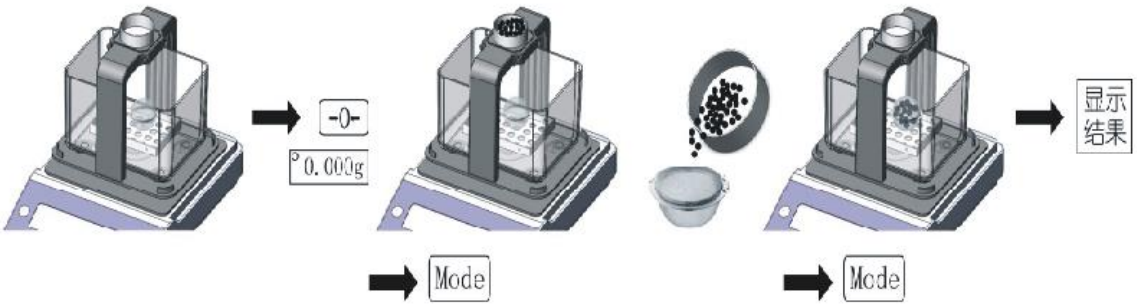
C. Test steps for particles

Preparation:

1. Prepare a cup of industrial alcohol to clean the particles and remove bubbles;
2. Prepare a glass dish and a stainless steel cage (provided with the instrument).

Steps

1. Place the stainless steel cage on the hanging rail in the water (if there are bubbles in the cage, please use a burette to remove them), place the glass dish on the measuring table, press the →0← key to reset the value to zero.
2. Pour the particles into the glass dish, then press the Mode key. The upper left corner of the balance displays "HIGH", indicating that the weight of the product in the air has been recorded.
3. Take out the stainless steel cage and pour the particles in the glass dish into the stainless steel cage. Then put the stainless steel cage in alcohol to clean it.
4. Put the stainless steel cage on the hanging rail in the water, use a burette to remove the bubbles in the stainless steel cage, and then put the glass dish back on the measuring table.
5. The value on the display at this time is the weight of the particles in the water. After the value is stable, press the Mode key, the density balance will record the weight of the particles in the water and calculate the density value. Press the →0← key to switch the display volume value.
6. Press the CAL key to exit and continue to measure other products. If 100 is displayed after exiting, press the Cal key again to exit.



VII、Precautions

1. The instrument is a precision instrument. Please designate a dedicated person to manage and operate it.
2. If water or other liquids spill accidentally, please wipe them off immediately.

3. Check from time to time whether the screen can display 0.000g. If it displays --------, it means that the machine has failed.
4. If liquid enters the densitobalance, please unplug the power supply, turn the density balance upside down, and dry it in the shade.
5. Do not place objects weighing more than 120g on the measuring table.
6. Wipe the surface of the density balance with a dry cloth regularly to prevent dust from accumulating.
7. If it is not used for a long time, the water in the sink needs to be poured out.
8. The density balance should be protected from collision and extrusion. If it is not used for a long time, please unplug the power supply and place it in windshield.

VIII、Troubleshooting

1. Unstable weight

Remove the measuring table and sink. Check if there are any foreign objects or water drops under the support table. If there are any foreign objects or water drops, please remove the foreign objects or wipe the water drops clean.

2. White screen appears on the screen

White screen means that the screen is bright but no value is displayed. This is usually because the voltage is insufficient. Please change the socket. If it still doesn't work, please contact the manufacturer to replace the power plug.

3. If a fault that cannot be eliminated by yourself occurs, please do not open the density balance by yourself. Please contact the manufacturer for repair.

4. If the measured density value is always the same number, or always displays 0.000, please set the temperature compensation to 25 and the solution compensation to 1.

5. If the measured density value has an error:

a. Check whether the solution compensation is set correctly. Please refer to the solution compensation setting in the manual to continue the operation;

b. When measuring the weight of the product in water, the bubbles attached to the surface of the product are not eliminated;

c. The product is hollow and there is air inside.

6. Common Problems

--------	Indicates that the density balance cannot get a stable reading.
HHHHHH	The weight exceeds the weighing range by 5% or more.
LLLLLL	a. The measuring table is not placed. b. There may be debris under the weighing table. Please check whether the weighing table is in contact with the shell.
UnAbLE	The measurement step is wrong. Repeat the operation.