U.S. SOLID

Instruction Manual

USS-DBS49 Analytical Balance

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1. Introduction

Thank you for choosing the U.S. Solid USS-DBS49 Electronic Analytical Balance.

The U.S. Solid USS-DBS49 Electronic Analytical Balance is precise and reliable. It provides a high level of operating convenience and response sensitivity to facilitate determination of the weight of your samples. U.S. Solid's dedicated customer service staff are available to answer any inquiries regarding applications and accessories.

Please read the manual completely and follow the usage instructions before installation and operation as this will help you to make full use of the functions and performance of the USS-DBS49 Analytical Balance.

1.1 Safety Precautions

The U.S. Solid USS-DBS49 Analytical Balance qualifies as state-of-the-art technology and complies with all recognized safety rules. Improper use or handling, however, can result in damage and/or injury. Please follow the precautions below to ensure safe and trouble-free operation of your balance.

- The balance has a 3-pin power socket equipped with a ground terminal. To prevent electric shock and to maintain

stability in operation of the balance, be sure to ground the balance.

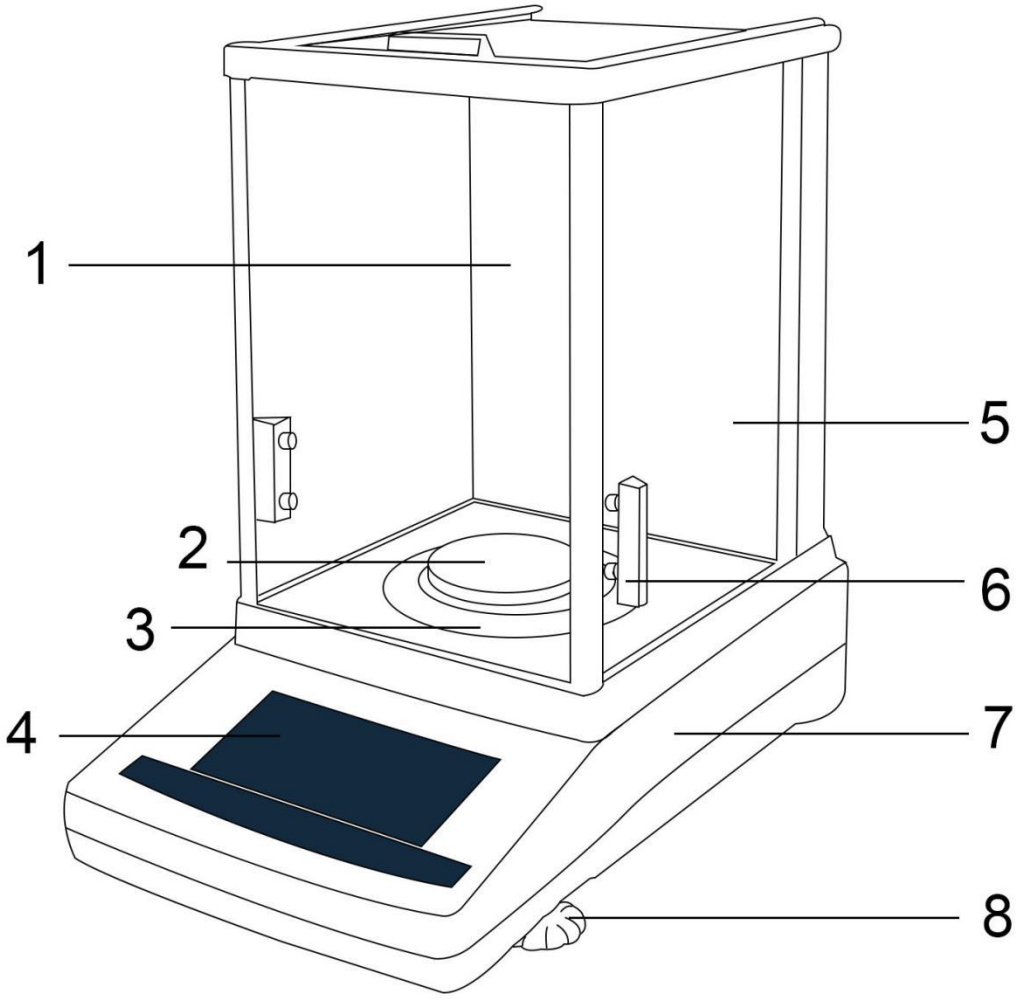
- Avoid getting the balance wet as it is not water resistant. Any leakage of liquid into the balance may damage the balance or cause an electric shock to the user.

- Use a power source (voltage, frequency, outlet type) adapted to the specification of the balance. If excessive voltage is used, the balance may overheat and be damaged or cause a fire.

- Operate the balance on a stable, rigid and flat table.
- Handle the balance carefully. It is a precision device, subjecting it to impact may result in a malfunction.
- If the device is not be used for a long period of time, the power should be turned off and disconnect the power cable.
- Do not disassemble, remodel or repair this product or accessories.

2. Design and Function

2.1 Components



1: Weighing chamber

2: Weighing pan

3: Anti-draft ring

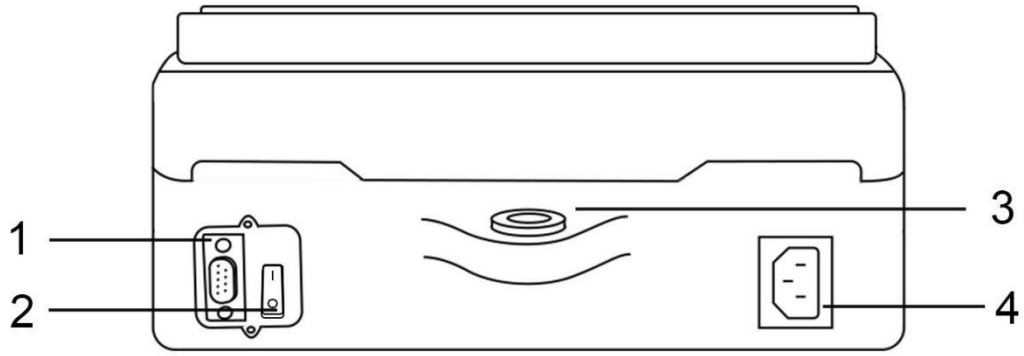
4: Display panel

5: Glass door

6: Handle of glass door

7: Balance main body

8: Leveling foot



1: RS-232 connector

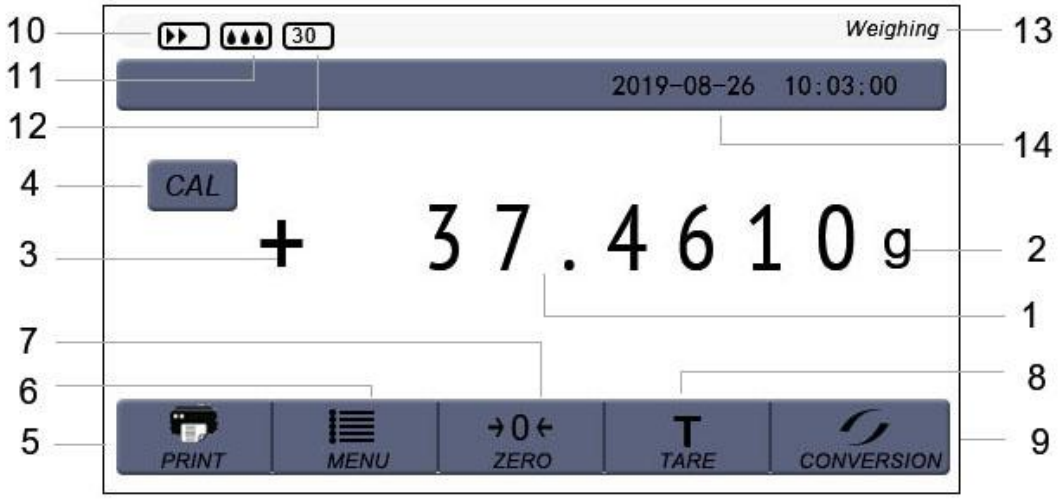
2: Switch button

3: Level bubble

4: Power inlet

2.2 Display panel

2.2.1 Home page



No.	Description
Measuring result area	
1	Weight value
2	Weight unit
3	Indicates positive or negative values
Operating buttons area	
4	Execute internal calibration
5	Print measuring result
6	Enter the menu page
7	Zero the value when in the no-load state
8	Tare the balance

9	Switch the weight unit
Settings display area	
10	Display speed currently selected
11	Stability currently selected
12	Automatic internal calibration mode currently selected
13	Indicates the current test mode
Other area	
14	Time and date

2.2.2 Menu

No.	Display	Name	Description
1		Speed	Adjust the display speed of the balance
2		Stability	Adjust the stability of the balance
3		Printer	Printer Settings
4		Calibration	Weight calibration, including automatic internal calibration and external calibration
5		System Setting	Set time and date, perform touch calibration and restore factory defaults
6		Mode	Test mode selection, including weighing, counting and percent weighing
7		System Information	View the basic parameters of the analytical balance
8		Back	Return to the home page

3. Installation

3.1 Unpacking and delivery inspection

The USS-DBS49 Analytical Balance is a precision instrument. Unpack the balance carefully and check the delivered items for completeness.

The following accessories are part of the standard equipment for your new USS-DBS49 Analytical Balance:

- 1 Balance Main Body
- 1 Weighing Pan
- 1 Draft Shield
- 1 Power Cable
- 1 200g Calibration Weight
- 1 Glove
- 1 Instruction Manual
- 1 Quality Certification

Check the instrument for damage in transit. Immediately inform the U.S. Solid customer service if you have any complaints or parts are missing.

3.2 Selecting the location

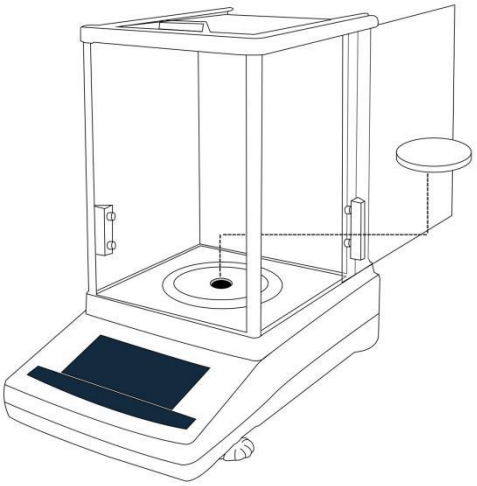
Measurement performance of your balance depends largely on the surrounding environments.

Please follow these guidelines to make sure the proper environmental conditions are met:

- Select a firm, horizontal location that is free from vibrations.
- Make sure that the ambient temperature is between 5°C and 30°C, the relative humidity is around 50% and that non-condensing conditions are met.
- Avoid direct sunlight and ensure that there are not any excessive temperature fluctuations.
- Ensure the balance is places a sufficient distance from heat-sensitive materials in the vicinity of the instrument.
- Avoid the effects of air currents from air conditioners, ventilators, open doors, or windows.
- Keep away from objects or equipment that are magnetic or capable of generating magnetic fields.
- Surroundings should be as free from dust as possible.

3.3 Installing components

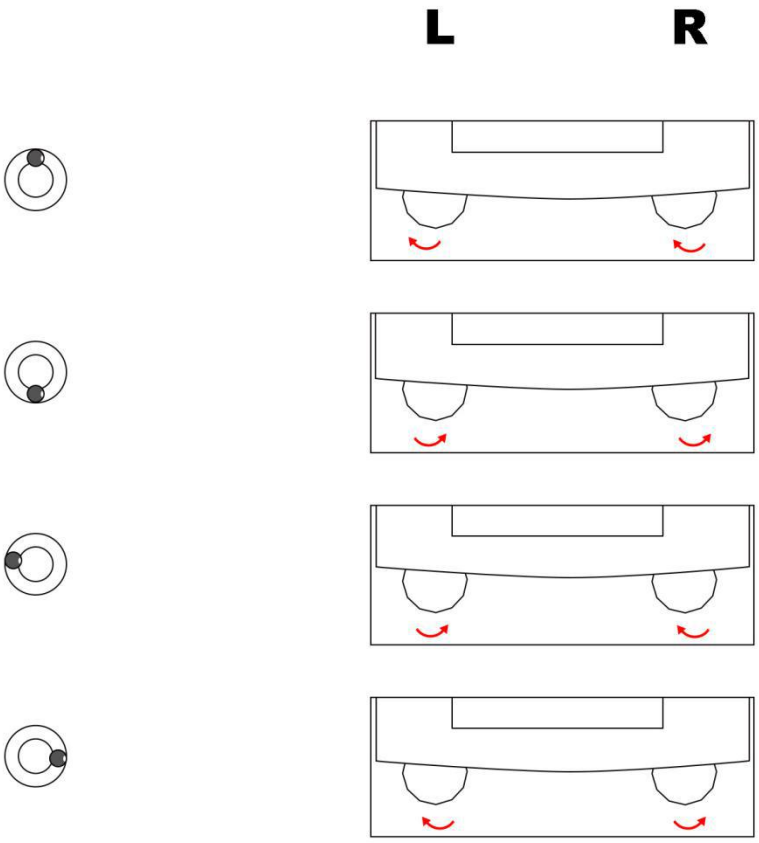
1. Place the balance main body on the installing location.
2. Push the side glass door open.
3. Gently attach the pan on the center axis of the weighing chamber.
4. Push the side glass door close.



3.4 Leveling the balance

Accurate horizontal positioning necessary for repeatable measurements and exact results. To compensate for small irregularities or tilts at this location, the instrument needs to be leveled.

Adjust the leveling feet of the analytical balance until the air bubble in the indicator is centered. The level indicator is located under the cover towards the rear of the analytical balance.



Position of air bubble	Adjustment method
up	Turn both feet clockwise
down	Turn both feet counterclockwise
Left	Turn left foot counterclockwise, right foot clockwise
Right	Turn left foot clockwise, right foot counterclockwise

3.5 Connecting the power

Warning:

- To prevent electric shock, be sure to use the 3-pin power cord with equipment grounding connector.
- Check to make sure the voltage indicated on the analytical balance data label matches the local line voltage. Do not connect the balance to the power source if it does not match.

Connecting a power cable:

a. Insert the female end of the power cord into the power inlet located at the rear of the main unit.

b. Plug the male end of the power cord into the outlet.

Note:

To obtain accurate results, the analytical balance must be warmed up for at least one hour each time it is connected to an AC power source or after a power outage of more than 30 minutes.

Only after this length of time will the balance reach the required operating temperature.

4. Settings and Calibration

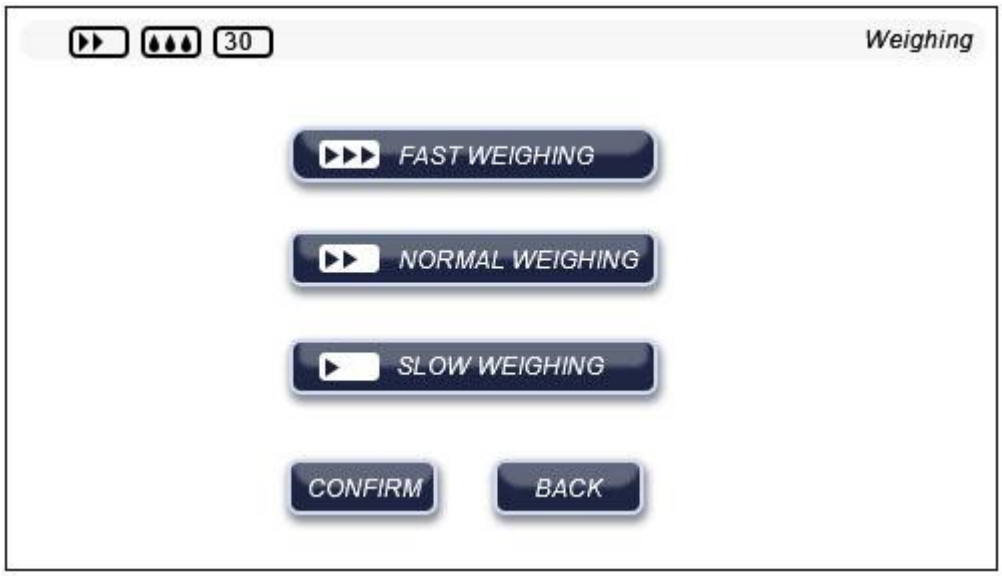
4.1 Display speed

If the operating environment meets the requirements, the display speed of the balance can be adjusted to reduce the time required for the balance to stabilize, thereby improving work efficiency.

Icons	Description
	Slow
	Normal
	Fast

Depending on the environment in which the instrument is used, carefully select the display speed to avoid instability that might be caused by excessive speed.

1. Tap the “SPEED” icon on the menu page to enter the selection of display speed.



2. Select required speed and confirm by tapping “CONFIRM”.

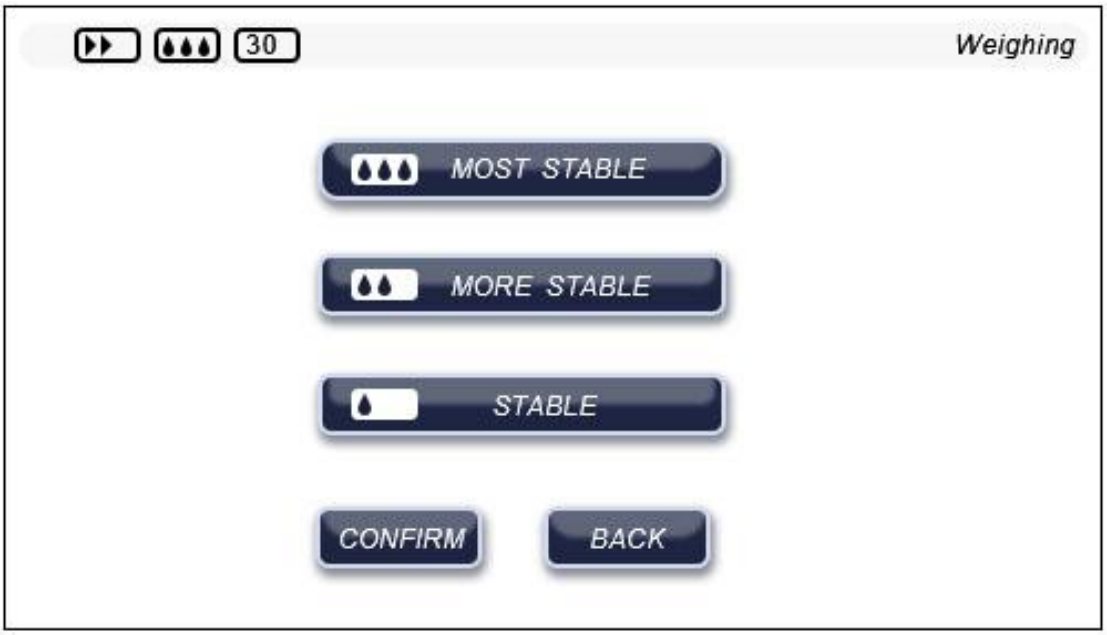
4.2 Stability

According to different operating environments, the balance is kept in a relatively stable state by adjusting its stability.

It is recommended that the balance be adjusted appropriately in an environment that guarantees its normal operation.

Icons	Description
	Stable
	More Stable
	Most Stable

1. Tap the “STABILITY” icon on the menu page to enter the selection of stability.



2. Select required stability and confirm by tapping “CONFIRM”.

4.3 Calibration

Calibration is a necessary step to assure the analytical balance will accurately weigh the sample.

Perform calibration operations in the following situations:

- Changes in the location of use (including moving in the same room).
- Changes in ambient conditions.
- Prior to each use.

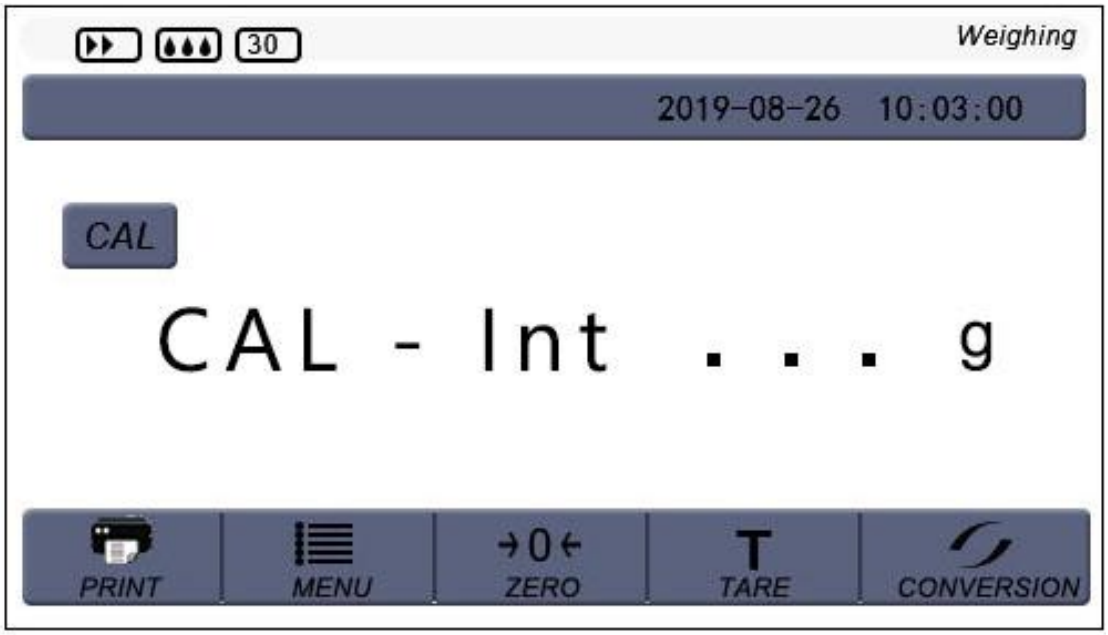
The USS-DBS49 Analytical Balance offers three calibration methods.

4.3.1 Internal calibration

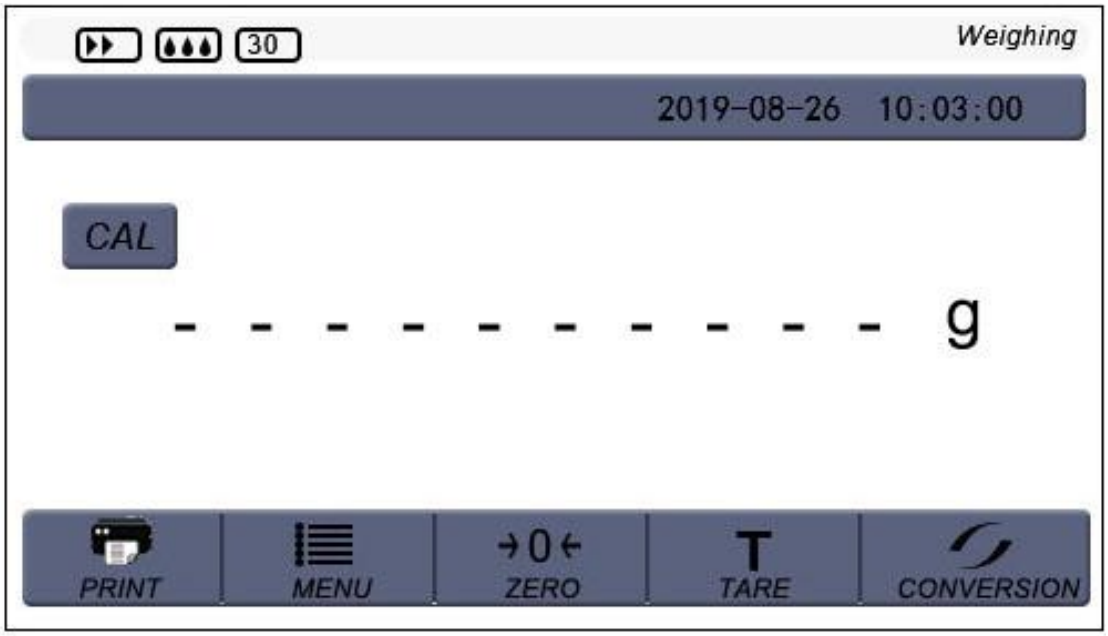
Install the balance as instructed and ensure it is sufficiently warmed-up.

When the balance is in the no-load state：

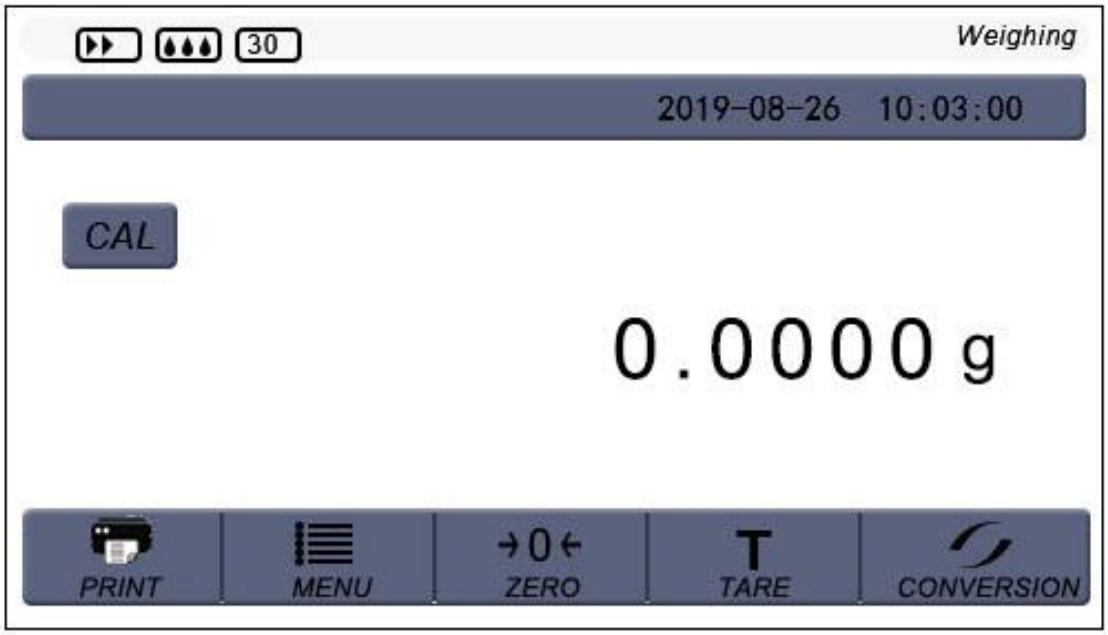
1. Tap “CAL” on the home page, “CAL-Int” will be flashing displayed.



2. Then “------” will be displayed and the balance starts automatic internal calibration.



3. After the calibration is completed, the instrument returns to the weighing state and displays “0.0000g”.



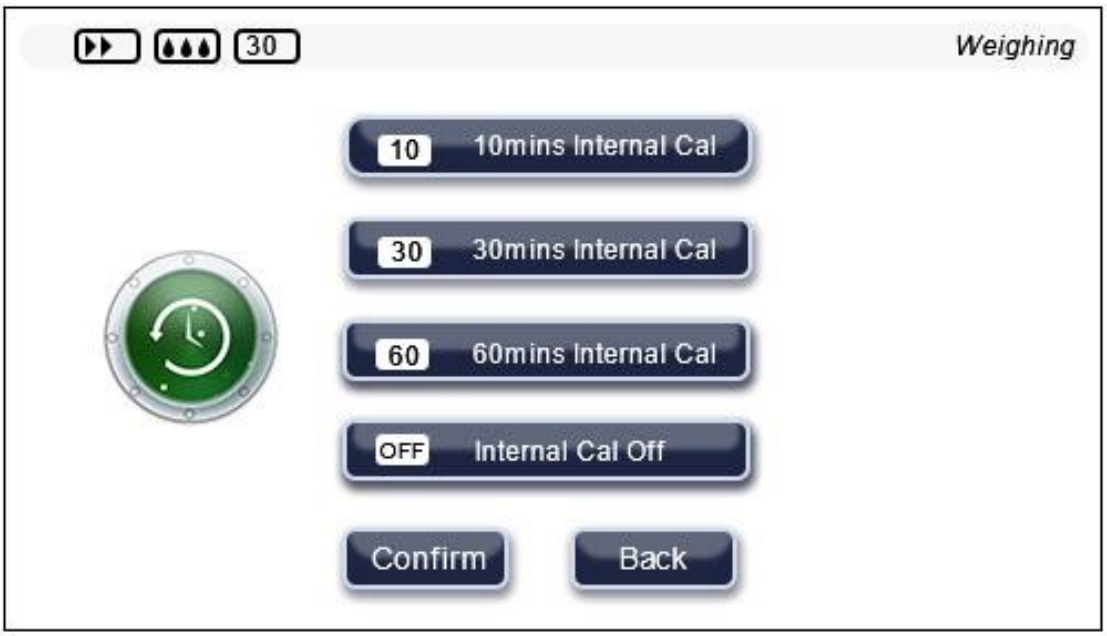
4.3.2 Automatic internal calibration

The USS-DBS49 Analytical Balance offers four kinds of automatic internal calibration time mode to choose from: “10mins Internal Cal” “30mins Internal Cal” “60mins Internal Cal” and “Internal Cal Off”. Respectively, these modes indicates that that the balance is automatically calibrated either every 10 minutes, every 30 minutes, every 60 minutes or the automatic calibration is off.

Icons	Description
10	10 minutes
30	30 minutes
60	60 minutes
OFF	OFF

Procedure:

1. Zero the balance in the weighing state by tapping “ZERO”.
2. Tap “MENU” to enter the menu page.
3. Tap the “CALIBRATION” icon to enter the calibration mode selection.
4. Tap “Internal Calibration” to enter the time mode selection.



5. Tap the desired time mode and confirm by tapping “CONFIRM”.

4.3.3 External calibration

The balance must be fully warmed up for one hour to stabilize the weighing before calibration.

Procedure:

1. Zero the balance in the weighing state by tapping “ZERO”.
2. Tap “MENU” to enter the menu page.
3. Tap “CALIBRATION” icon to enter the calibration mode selection.
4. Tap “Single Point Calibration” to enter the external calibration.
5. “Please put on the weight” will be displayed, and “200.0000g” flashes.

6. Put the calibration weight on the weighing pan, “Wait for a moment” will be displayed. The balance is performing calibration.

7. Then “Please take away the weight” will be displayed and return to the home page. External calibration is completed.

5. Weighing and Applications

5.1 Weighing

Note: Please warm up for at least one hour and calibrate before using.

1. Zero the balance in the no-load state.
2. Open the glass door of the weighing chamber and place the weighing sample on the weighing pan, then close the glass door.
3. Wait for the display to stabilize. The appearance of the stability mark indicates a stable state.
4. Read the value displayed.

To weigh a sample that requires a container:

1. Open the glass door of the weighing chamber and place the weighing container on the weighing pan, then close the glass door again.
2. Wait for the display to stabilize. The appearance of the stability mark indicates a stable state. Then tap the “TARE” icon to tare, and the displayed value will return to zero.
3. Open the glass door and place the sample(s) to be weighed in the weighing container, then close the glass door.
4. After the display stabilizes, read the value displayed.

5.1.1 Unit of weight

The USS-DBS49 Analytical Balance has multiple sets of weight units. The unit selection function can be used to meet the unit requirements in various usage situations.

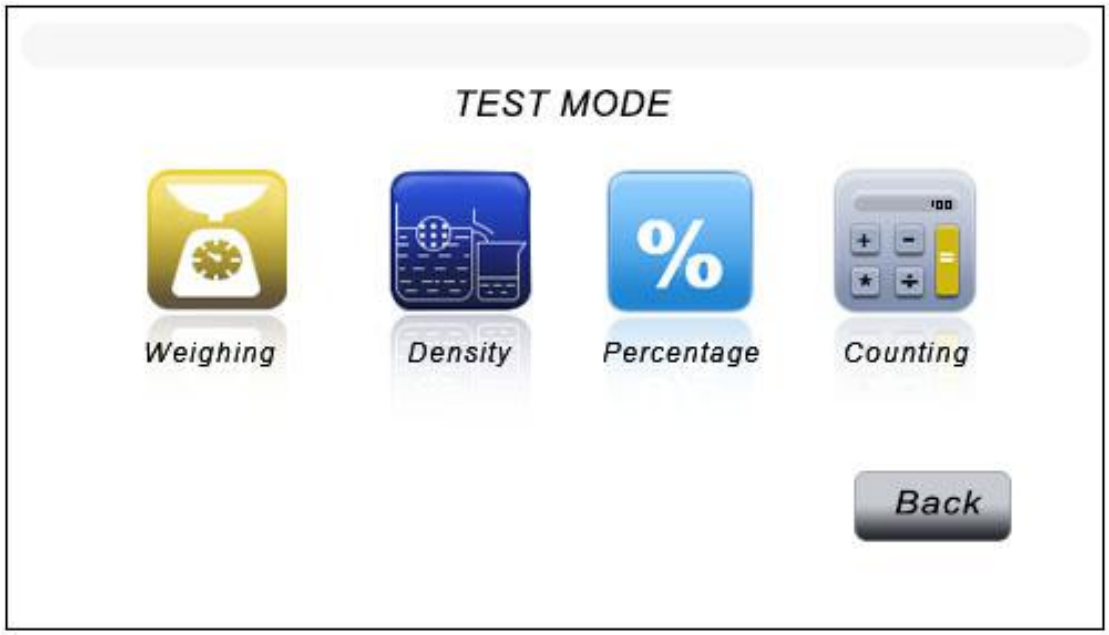
Tap “CONVERSION” on the home page to perform unit conversion:
The balance includes four weighing units, including grams, milligrams, carat and ounces (g, mg, ct, and oz). Tap “CONVERSION” continuously to select desired units.

Note: To avoid the deviation of the weighing record caused by unit misreading, please ensure that the selected unit is the one required.

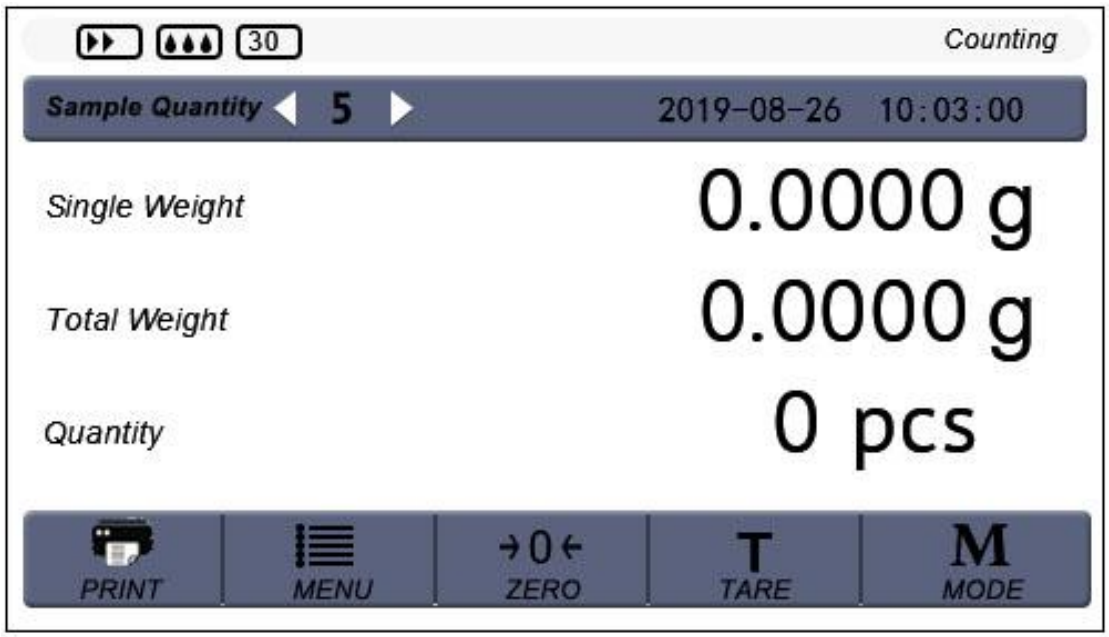
5.2 Counting function

The U.S. Solid USS-DBS49 Analytical Balance has a built-in counting function that meets various industrial counting requirements, especially the counting function for small components.
To ensure the accuracy of the counting function for small components, it is necessary to ensure that the weight of all samples is consistent, and that the weight of a single object is ≥0.5mg.

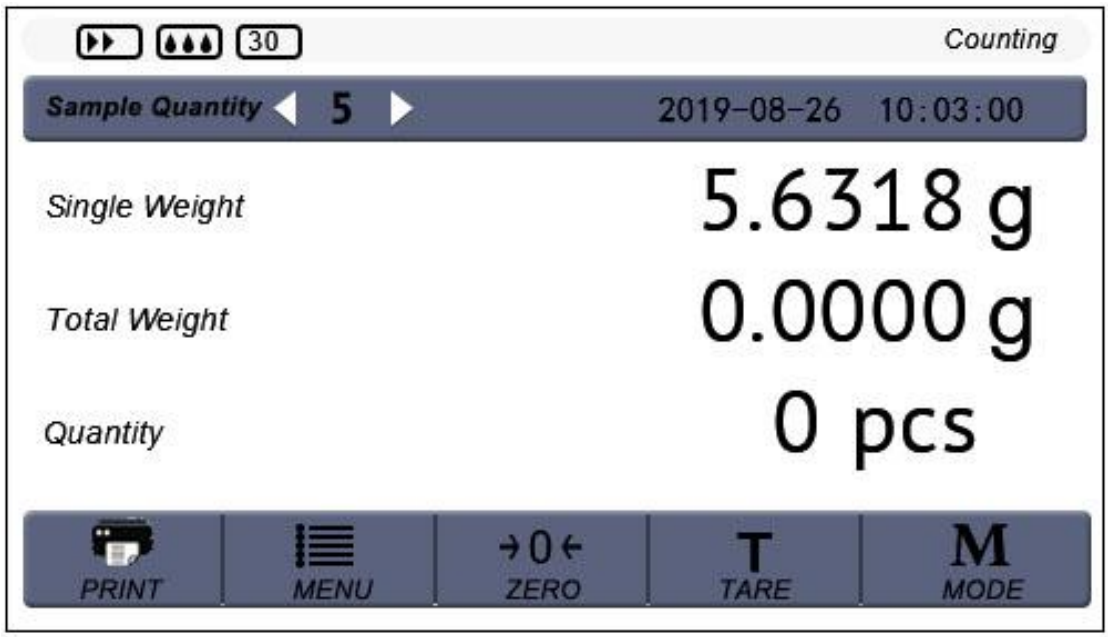
1. Tap the “Counting” icon on the “MODE” submenu page.



2. Tap on “Sample Quantity” in the top left corner to select the quantity of reference pieces.

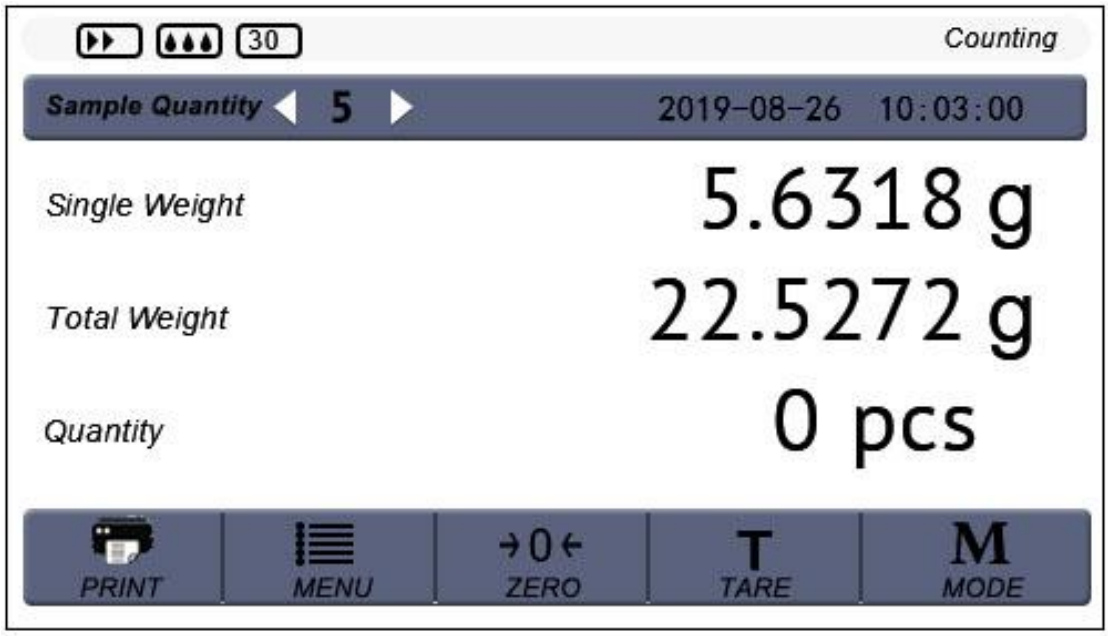


3. Tap on “0.0000g” on the right of “Single weight”, then put the reference pieces of the corresponding quantities on the weighing pan.



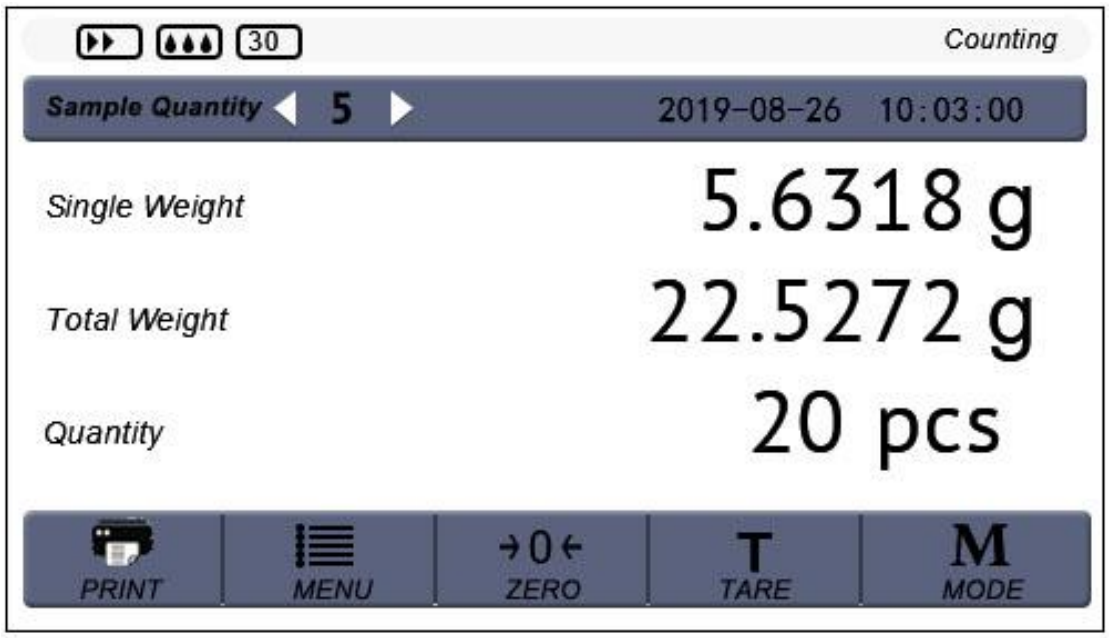
4. After the value is displayed stably, tap on it again to save the result.

5. Tap on “0.0000g” on the right of “Total weight”, and place the pieces to be counted on the weighing pan.



6. Tap on the value again after it is displayed stably to save the result.

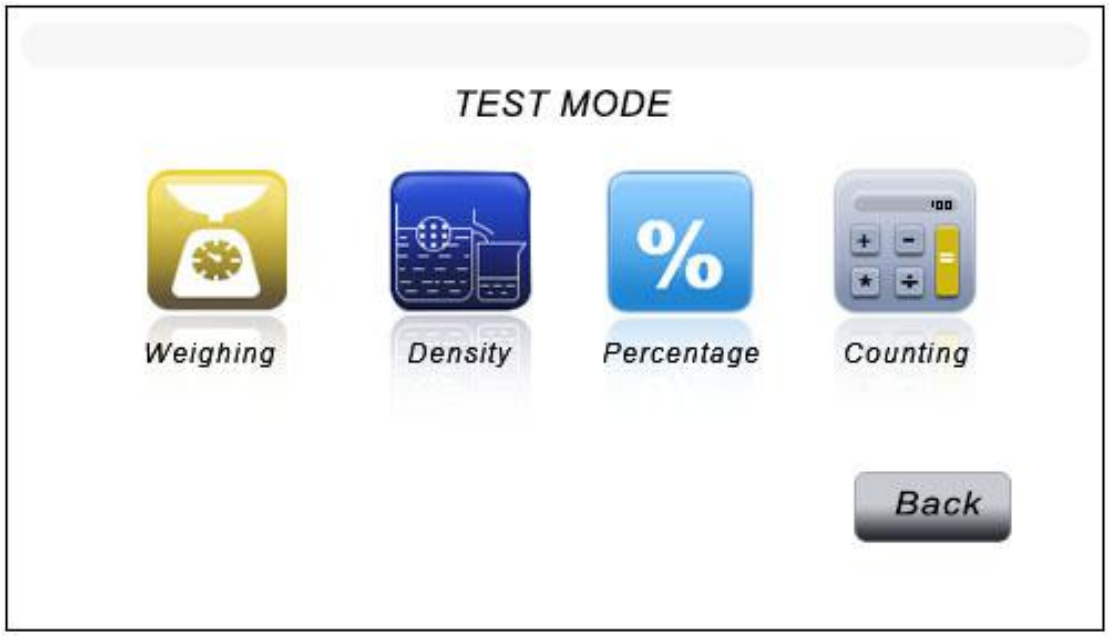
7. Tap “0pcs” on the right of “Quantity” and the result will be displayed.

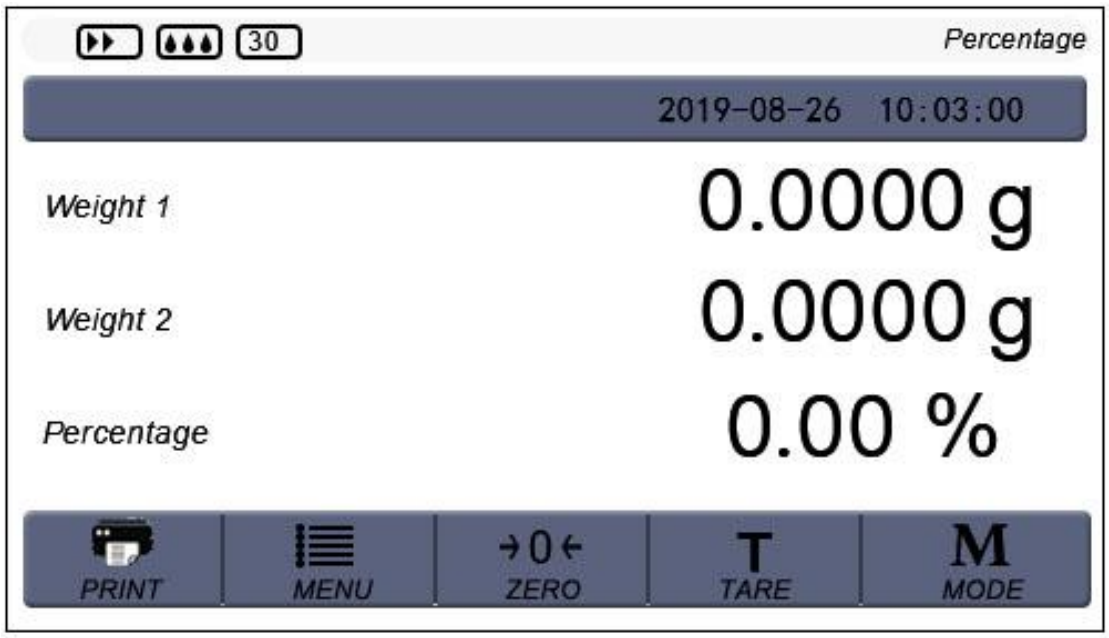


5.3 Percent weighing

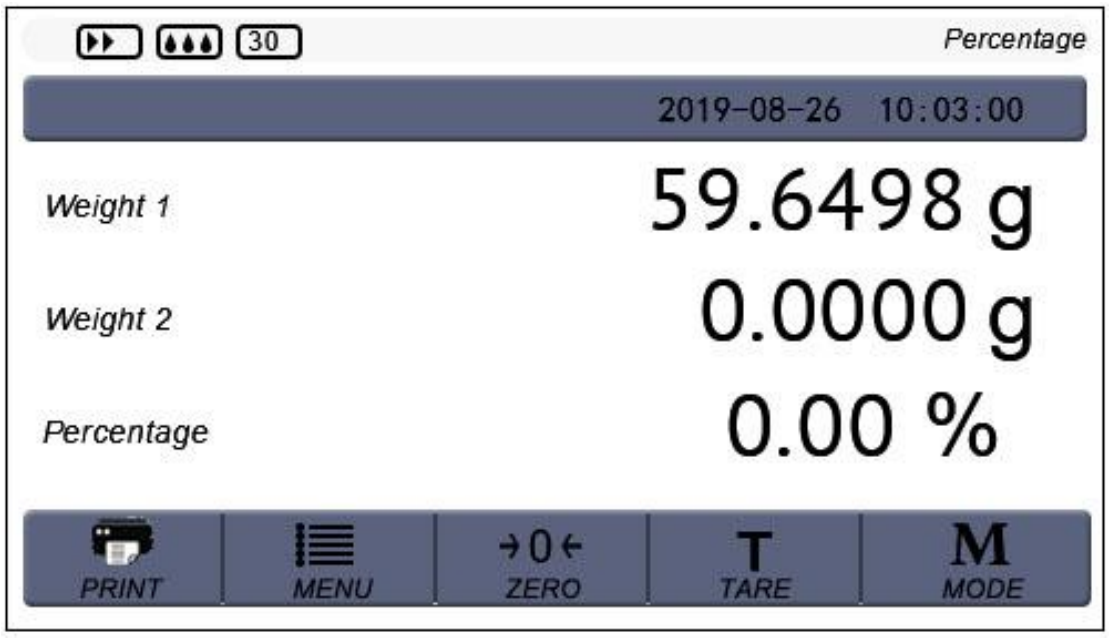
The USS-DBS49 Analytical Balance has a percent weighing function.

1. Tap the “Percentage” icon on the “MODE” submenu page.



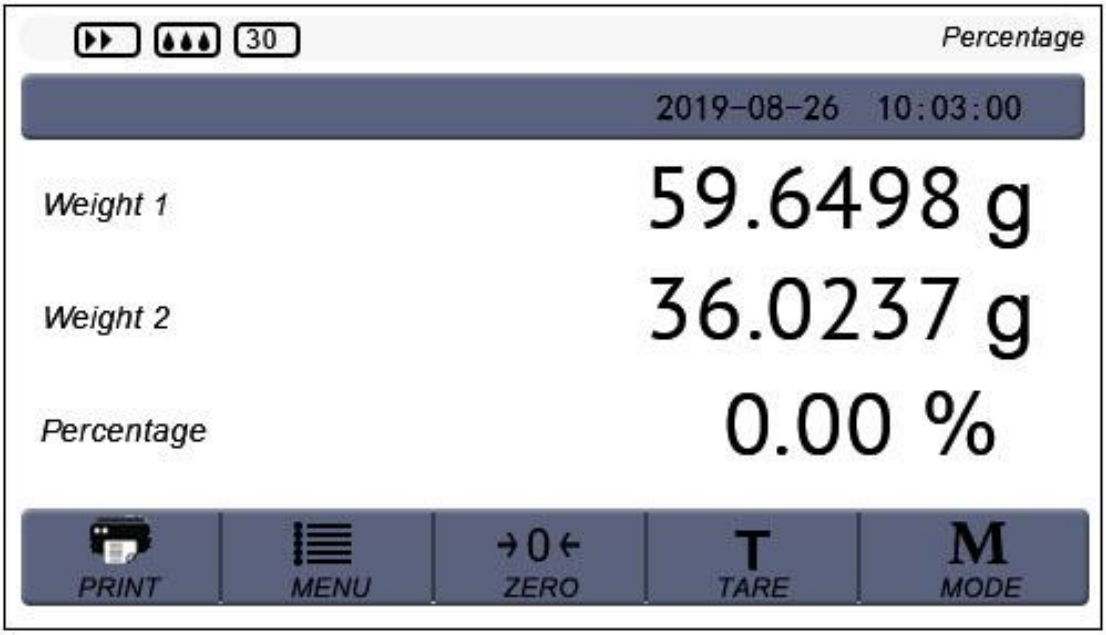


2. Tap on “0.0000g” on the right of “Weight 1”, then put the reference sample on the weighing pan.



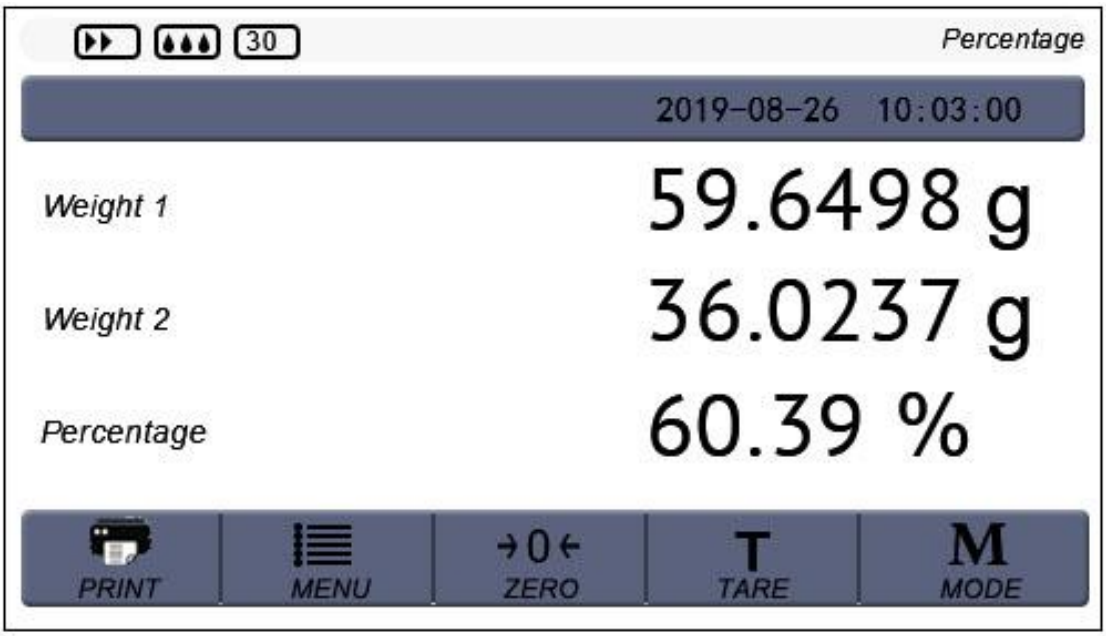
3. After the value is displayed stably, tap on it again to save the result.

4. Tap on “0.0000g” on the right of “Weight 2”, and place the sample on the weighing pan.



5. Tap on the value again after it is displayed stably to save the result.

6. Tap on “0.00%” on the right of “Percentage” and the result will be displayed.

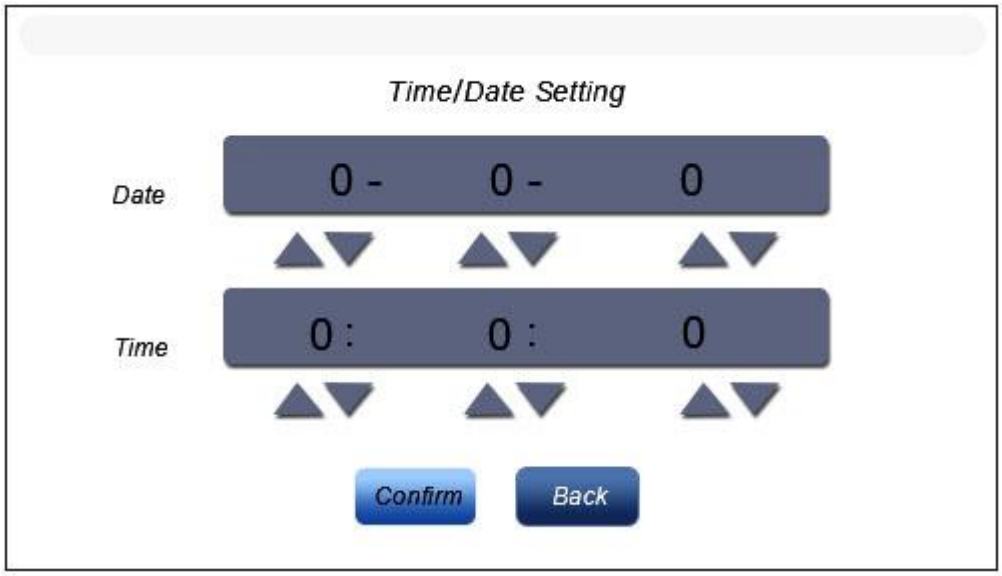


6. System settings

Display the system setting submenu to select each setting.

6.1 Time and Date

1. Tap “Time/Date” in the system setting submenu.



2. Tap on one of the components (year, month, day, hour, minute, second), then use the arrows directly below it to select the desired number. Continue with all six components to set the date and time.

6.2 Touch Calibration

1. Tap “T-Calibration” in the system setting submenu.

2. Follow the prompts to perform the touch calibration.

6.3 Restore factory defaults

If the balance is improperly set or operated, all settings can be restored to factory defaults, which will ensure that the balance is suitable for most operating habits and environments. When the balance is found to be abnormal and unstable, the stability of the balance can also be adjusted by restoring the factory settings.

1. Tap “MENU” to enter the menu page.
2. Tap the “SYSTEM SETTING” icon to enter the system setting page.
3. Tap “Factory Setting” and confirm by tapping “Confirm” to restore factory defaults.

* The setting is only applicable to situations where settings are confusing due to incorrect operation. Factory defaults should NOT be performed frequently.

7. Maintenance

7.1 Precautions

The U.S. Solid USS-DBS49 Analytical Balance is a precision mechatronics intelligent measuring instrument, which must be carefully maintained and treated.

1. Do not use sharp objects (such as pens) to click the button, use only your fingers.
2. To avoid damage to the weighing system, do not let the object fall from the height onto the weighing pan.
3. Do not expose the balance to high humidity or dusty conditions for an extended period of time.
4. When the balance is not to be used for a long time, cover it with to prevent dust from entering.
5. When weighing powder and fine particles should be done with a suitable container to prevent dust and particles from falling into the load cell below the weighing pan.
6. Wear a glove when calibrating with the calibration weight. Do not touch the calibration weight directly with your hand.
7. Keep the balance clean and dry.

7.2 Cleaning

- Turn off the power switch and remove power cord during maintenance.
- Make sure that no dust or liquid enters the balance housing.
- Do not use any aggressive cleaning agents (solvents, abrasive cleaning agents, etc.) or organic solvents to clean the balance.

Clean the balance using a piece of lint-free cloth which has been wet with a mild detergent (soap) only.

Removing the sliding glass doors for cleaning:

1. Remove the pan and anti-draft ring from the weighing chamber.
2. Unscrew and remove the inside knob on the glass door.
3. Slide the glass door out backwards.

7.3 Disposal

Disposal of equipment and packaging must be carried out by the operator in accordance with relevant laws of the country or region in which the equipment is to be used.

8. Troubleshooting

8.1 Troubleshooting

Problem: Display remains off after switching on.

Possible causes:

- Power cord is not connected
- Power line fuse blown
- Power transformer damaged
- Instrument faulty

Problem: Weight display is constantly changing or unstable.

Possible causes:

- The sample pan is in contact with the draft shield or heating chamber
- Glass draft shield is not closed
- Test bench vibration
- Electromagnetic field interference
- Power supply instability

Problem: Displayed value and actual weight are not consistent.

Possible causes:

- Not calibrated before weighing
- Not returned to zero before weighing
- Balance not leveled well

8.2 Error code

Error code display	Description
Err.	Calibration operation error
Err. 1	Counting setting error
Err. 2	The weighing pan is not placed correctly
Err. 3	Sample weight exceeds range

9. Technical Data

Model	USS-DBS49
Capacity	220 g
Readability	0.0001g (0.1mg)
Repeatability	±0.0002g
Linearity deviation	±0.0003g
Stabilization time	Within 3 seconds
Operating temperature	63.5℉- 72.5℉（17.5℃ - 22.5℃）
Display panel type	Touch screen
Pan size	Φ80mm
Interface	RS232
Power	110V 60Hz AC
Dimensions	340×215×350 mm
Net weight	6.5kg
Shipping weight	10.0kg

Contact

Feel free to visit our website: www.ussolid.com

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+1(800) 209-4177