



TSC SERIES

Touchscreen High
Resolution Balance



TSC 123 / TSC 213 / TSC 313 / TSC 1202



TSC 2102 / TSC 3102 / TSC 6101 / TSC 10001

Operating Manual

Professional Weighing Equipment

NOTE: THIS PRODUCT HAS BEEN FACTORY CALIBRATED. PLEASE
REFER TO THE MANUAL BEFORE RE-CALIBRATING PRODUCT!

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Declaration of Conformity

Declaration of conformity for apparatus with CE mark

We hereby declare that the product to which this declaration refers conforms to the following standards.

Electronic scale: **TSC** - High Resolution Balances (Touchscreen)

Available Models:

TSC 123
TSC 213
TSC 313
TSC 1202
TSC 2102
TSC 3102
TSC 6101
TSC10001

Mark Applied	EU Directive	Standards
	2004/108/EC	EN 61326-1: 2006

Signature:



Boon Lim, R & D Manager

Date: 14. 11. 2018

LW Measurements, LLC, 620 Carlson Court, Rohnert Park, CA 94928

Customer Service

USA

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Scan to Contact Us

Introduction

What you should know about this Operation Manual:

Tree® Professional Weighing Equipment products are simple to operate. Nevertheless, you should read through these operating instructions in their entirety, so that you can make optimum use of the full potential of the weighing scale in your daily work activities.

These operating instructions contain guidance in the form of pictograms and keyboard diagrams, which should help in finding the required information:

For the labeling of potential hazards, please refer to the safety proportion of this operation manual.

Safety

Representations & Symbols

Note: Important instructions which involve safety are highlighted with the appropriate mark:



Safety Recommendations

When using the weighing equipment in surroundings with increased safety requirements, the corresponding regulations must be observed.

The weighing scale may only be used with the power adapter supplied.

Before connecting the power adapter to the scale, the user must ensure that the operating voltage stated on the power adapter is compliant with the mains voltage. If not, please contact Customer Service at the address above.

If the power adapter or its cable is damaged, the weighing scale must immediately be disconnected from the electricity supply (unplug the power adapter).

If there should be any reason to believe that it is no longer safe to operate the scale, it should be immediately unplugged from the electricity supply (unplug power adapter) and secured against inadvertent operation.

During maintenance work, it is essential to follow the recommendations set out in maintenance and servicing.

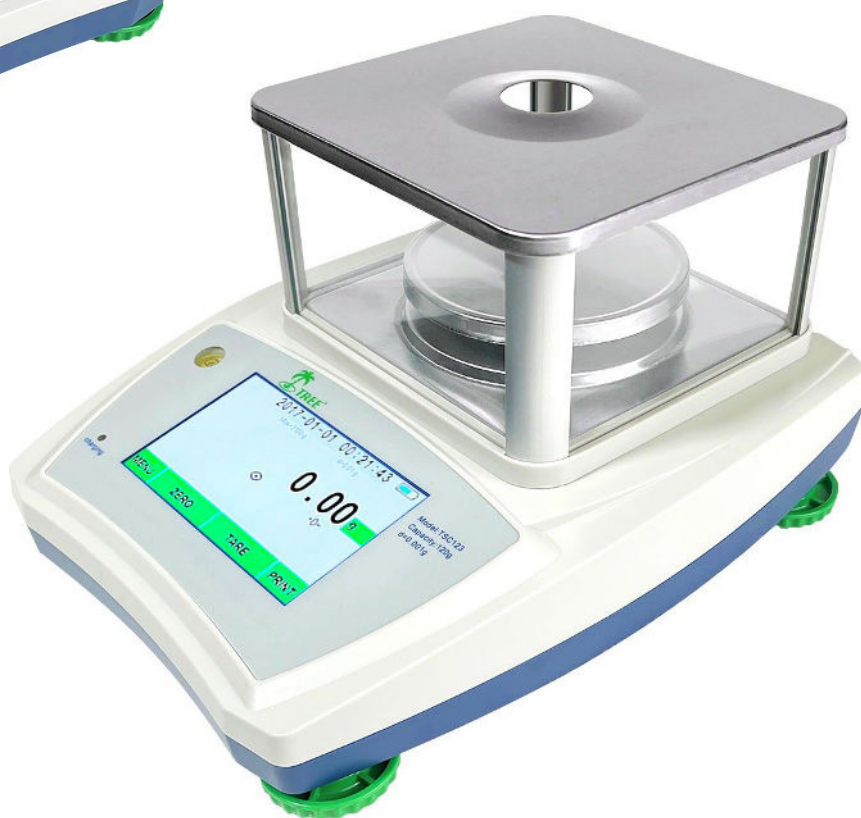
The weighing scale must not be operated in an area subject to explosion risks.

Care must be taken when weighing liquids to ensure that no liquid is spilled inside the scale, into connections on the rear of the equipment, or the power adapter. If liquid is spilled on the scale, it must immediately be unplugged from the main electricity supply (unplug power adapter).

The weighing scale may be operated after it has first been inspected by a service technician.

These operating instructions must be read by each user and should always be easily accessible at the workplace.

Weight Scale



Functions

The TSC Series are high-quality electronic precision weighing machines with the following specifications.

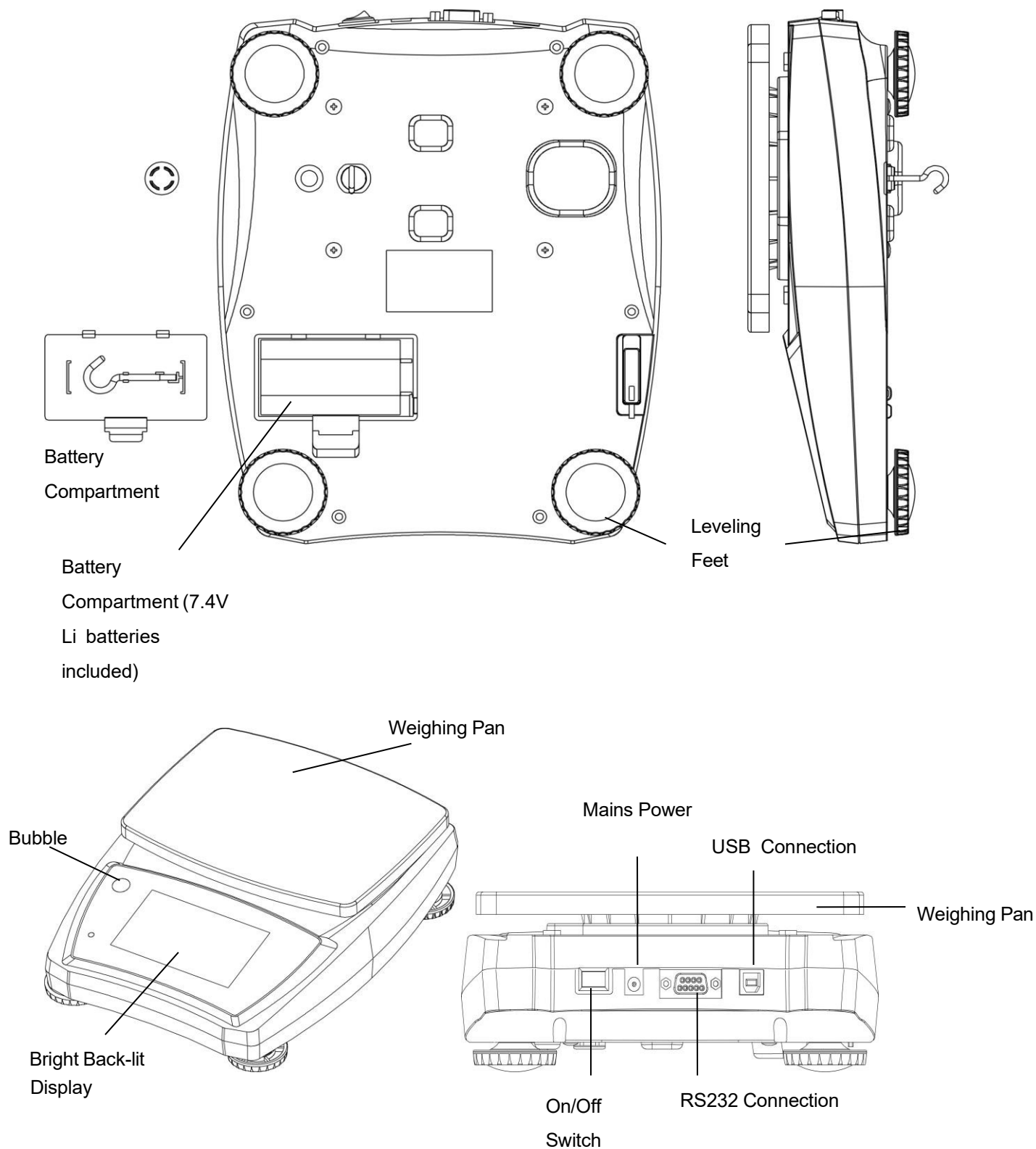
Specifications:

Model Number	Capacity	Graduation	Weighing Pan Size
TSC 123	120g	0.001g	Φ98mm
TSC 213	210g	0.001g	Φ98mm
TSC 313	310g	0.001g	Φ98mm
TSC 1202	1200g	0.01g	Φ115mm
TSC 2102	2100g	0.01g	195mm x 150mm
TSC 3102	3100g	0.01g	195mm x 150mm
TSC 6101	6100g	0.1g	195mm x 150mm
TSC 10001	10000g	0.1g	195mm x 150mm
Net/Gross Weight	TSC-123 / 213 / 313 / 1202: 2.kg / 2.9kg TSC 2102 / TSC 3102: 1.6.kg / 2.4kg TSC- 3101 / 6101 / 10001: 1.6kg / 2.4kg		
Package (Standard Carton)	TSC- 123 / 213 / 313: 33 × 26 ×20(cm ³) TSC1202: 33 × 26 ×20 (cm ³) TSC-2102/ 3102 / 6101 / 10001: 33.5 × 25.5 ×12.5 (cm ³)		
Package (Master Carton)	TSC- 123 / 213 / 313 / 1202: 4 units in one box: 55×35×43 (cm ³) TSC- 3102 / 3101 / 6101 / 10001: 6 units in one box: 55×35×43 (cm ³)		
Operating Temp.	0-40°C (32-104°F)		
Power Source	Rechargeable batteries or AC/DC Adapter 12V/1000mA		

FEATURES

- 1.** Show date and time
- 2.** Auto zero tracking
- 3.** Capacity indicator bar
- 4.** Low battery indication
- 5.** Selectable beeper
- 6.** Color capacitive touch screen.
- 7.** Unit switching g, oz, lb, dwt, ozt, ct, tl. T, tl. H, tl. J, GN, dr, MM, tola, gsm, T/A/R, T/M/R.
- 8.** Large stainless-steel pan
- 9.** 1.3 million internal resolutions
- 10.** Stability indication
- 11.** 200,000 display resolution
- 12.** Auto calibration
- 13.** 24-bit A/D processor
- 14.** Back light displays brightness (adjustable)
- 15.** Highest quality sensor used
- 16.** Less than 1s display setting time
- 17.** Counting functions
- 18.** Percentage functions
- 19.** Density functions

Figure 2.2 Details of your weighing scale



Application & Conformity

The following are instructions on how to correctly use the weight scale:

The weighing scale may only be used for the weighing of solid materials and of liquids contained in secure containers.

The maximum capacity load of the weighing scale must never be exceeded, otherwise the weighing scale may be damaged.

In using the weighing scale in combination with other devices including those produced by other manufacturers, the appropriate regulations for the safe use of the relevant attachments and their application in accordance with instructions must be observed.

The weighing scale has been manufactured and tested in accordance with the standards and recommendations set out in the declaration of conformity.

The power adapter supplied for the weighing scale complies with the appropriate electrical protection class.

The following applies to all TSC series weighing scales.

Power supply:

Input: 110V AC 50Hz to 60Hz

Output: 12v DC 1000mAh

Allowable ambient conditions:

Temperature: 32°F - 104°F / 5°C. 40°C

Relative humidity:

25% - 85%, non-condensing

*****NOTE: If you have any questions on the technical data or require detailed technical information on your balance, please contact your technical representative.*****

Getting Started

The scale is packaged in an environmentally friendly carton, which provides optimum protection for the balance during transportation.

We suggest that you keep the original packaging to avoid damage if you are shipping or transporting the scale to a different location. It is also the best way to keep it in the best condition if it will not be used for an extended period.

To avoid damage, please follow the instructions provided below, when unpacking the scale:

1. Unpack the scale carefully.
2. When outside temperatures are very low, the scale should be stored for a couple hours in its box in a dry room at normal temperature. This prevents condensation from settling on the unit when opening the box.
3. Check the scale immediately after unpacking for any external visual damage. If there is any damage on the scale, contact customer service immediately.
4. If the scale is not to be used immediately after purchase, it should be stored in a dry place where fluctuations in temperature are low. (reference pg.21).
5. Read through these operating instructions before you work with the unit and pay attention to the safety recommendations (reference Safety pg. 5).

Delivery

Inspect delivery for completeness immediately upon unpacking all components.

Checklist for complete delivery

Component	Present (Yes / No)
Weighing unit body	
Weighing pan	
Power adapter	
Operating manual	

Assembly & Installation

The weighing scale is delivered in a partly dismantled condition. Assemble the individual components in the following sequence:

- Place your machine on a level, clean, and dry surface to obtain accurate readings.
- Place the stainless-steel platter on top of the plastic platter with the flat side facing up.

Connecting the AC Adapter

The following safety recommendations must be observed when connecting the balance:



The scale should only be connected to the mains voltage socket with the power adapter supplied. Before connecting the power adapter to the mains socket, check to see that the operating voltage stated on the power adapter complies with the local mains voltage.

If the operating voltage is not the same as the mains voltage, the power adapter must not be connected to the mains socket and contact customer service.

Placement of Scale

The location in which the scale is placed is very important for the scale to work to its full potential. Certain conditions can affect the capabilities of the scale, such as presence of air flow, variations in temperature, and direct sunlight. Please follow the recommendations given below when choosing a location to place your scale.

- Place the scale on a solid, firm, and preferably vibration-proof, horizontal base.
- Make sure that the weighing machine cannot be shaken or knocked over.
- Protect from direct solar radiation.
- Avoid drafts and excessive temperature fluctuations.
- Avoid placing the scale near or on any magnetic surfaces.

The balance is fitted with one bubble level, and adjustable feet for level-control that allow for small height differences or any unevenness in the surface on which the balance is placed.

The screw feet must be adjusted so that the air bubble is precisely in the center of the sight glass of the bubble level (see Fig. 1)

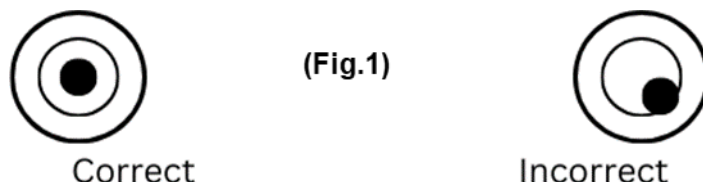


Fig. 1 Correct leveling with the aid of the bubble level and adjusting feet.

Place the scale horizontally and keep the bubble inside the bubble level aligned with the circle (see Fig. 1). To get exact measurements, the balance must be carefully leveled after each re-location.

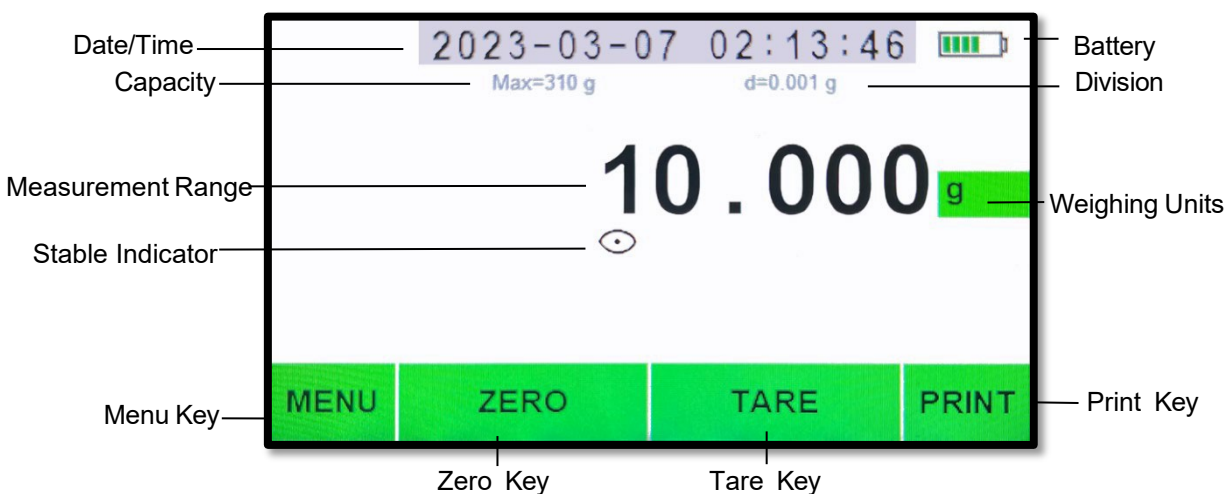
Display Messages

- **Weight Display** - indicates the gross or net weight on the weighing pan.
- **Weighing Units** - indicates the units of measure that have been selected.
- **Stable Indicator** - stable indication.
- **Zero Indicator** - turns on when the scale is zeroed.
- **Tare Indicator** - turns on when this function is used.
- **Low Battery Indicator** - low battery voltage, please charge battery.

Working with the application menu using the Intelligent Keypad

2.1 Display Messages and Key Functions

2.1.1 Display Messages:

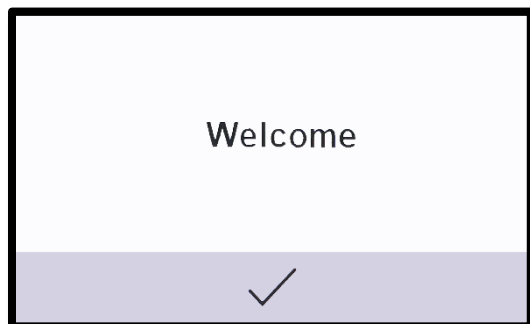


2.1.2 Key Functions:

1. The **On/Off key** is to turn the balance on or off (Note: It is a hard switch on/off on the right rear)
2. The **ZERO key** allows the subtraction of multiple container values through the weighing range and is used to set or re-adjust the weighing machine in correct zero position.
3. The **Print key** is to send data to external device through RS232 to USB connector.
4. The **Weighing Units key** touch to toggle between different weighing units.
5. The **TARE** allows the user to subtract the container value and returns the display to zero.

Program Options

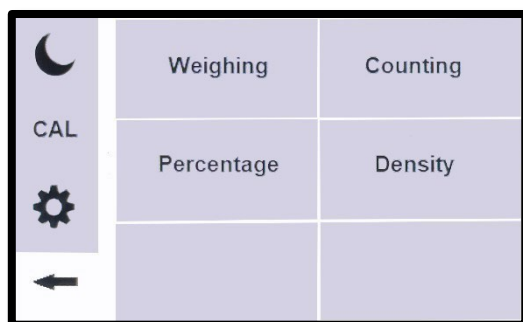
1. Press [ON/OFF] switch to turn on the scale, when instrument displays.



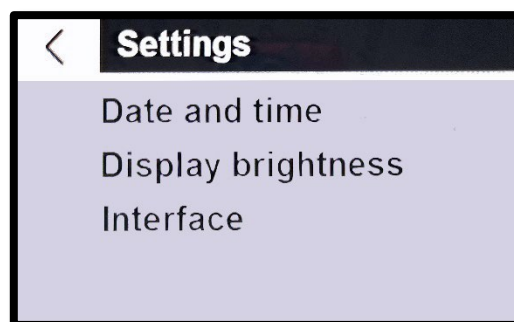
2. Click ✓, the display will show mode and other self-checking information.



3. Click **MENU**, the display will show the following menu interface.

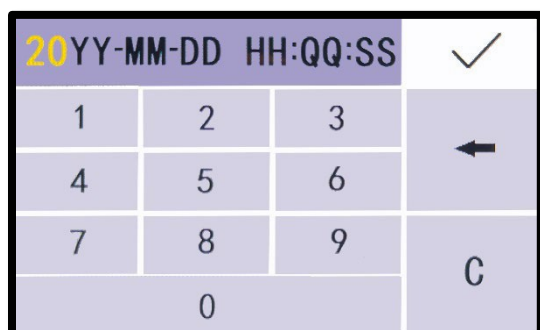


4. Click , the display will show



Date and Time Settings

Click **Date and time**, the display will show



Display Brightness Settings

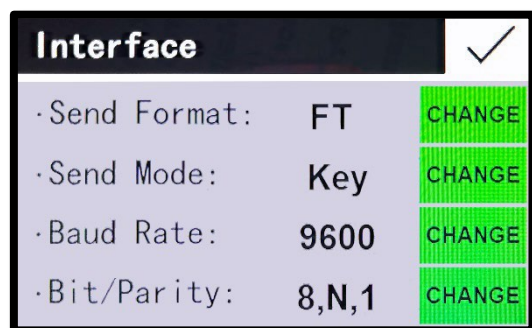


Click **Display brightness**, the display will show

Click **CHANGE** to select: Medium/Slight/Bright, Click ✓.

Interface Settings

Click **Interface**, the display will show



Click **CHANGE** to select:

Send Format: PM / FT, default setting is PM

Send Mode: Key/Stb / Con /OFF, default setting is Key

- a) OFF stands for serial data output disabled
- b) Key stands for manual mode by pressing [PRINT]
- c) STB stands for automatic print when scale is stable
- d) CON stands for continuous print

Baud Rate: 1200/2400/4800/9600, default setting is 9600

Bit/parity: 8,N,1/7,O,1/7,E,1, default setting is 8,N,1.

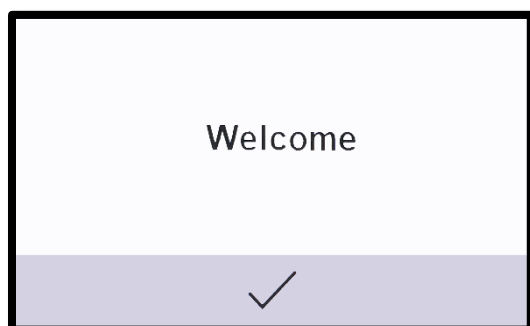
(7,O,1 stands for 7 data bits with odd parity, 7,E,1 stands for 7 data bits with even parity, 8,N,1 stands for 8 data bit without parity)

Press ✓, again, to return to Setting mode.

Press < , Press ← again to return to Weighing mode

Application Options

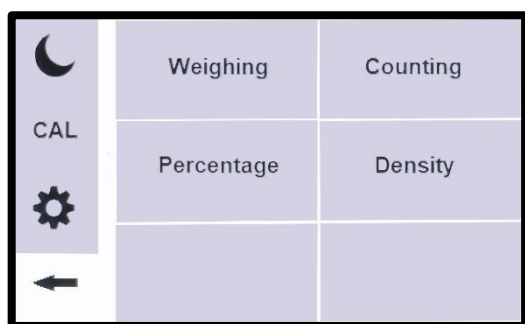
1. Press [ON/OFF] switch to turn on the scale, when instrument displays.



2. Click ✓, the display will show mode and other self-checking information.



3. Click **MENU**, the display will show

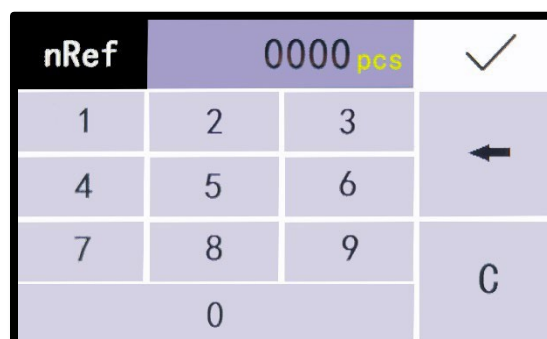


Counting Functions

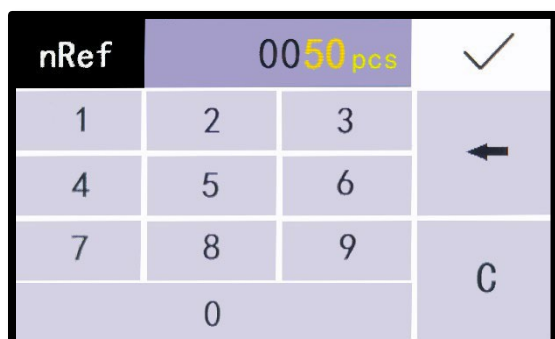
1. Click **Counting**, the display will show



2. Place the container on the balance then click **TARE** to tare. Click **Reference pcs**, the display will show



3. Input sample reference number and click . (Example 50pcs).



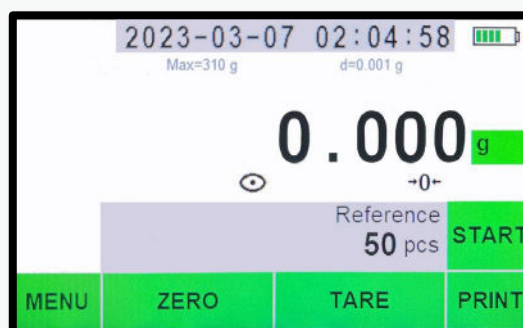
5. Place full amount of samples in the container, the display will show



4. Place the sample into the container, then click **START**, the display will show



6. Remove the sample, then click **END** to exit the counting function, and it will display

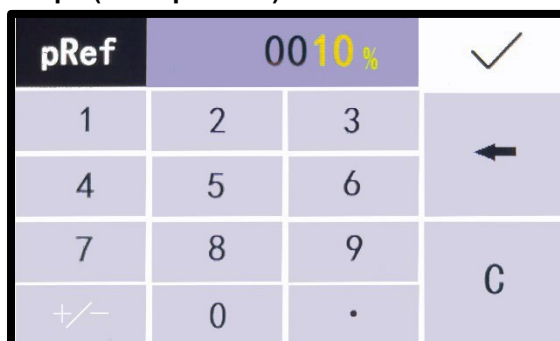


2.1.3 Percentage Functions

1. Click on the **Percentage** option in the main menu and the display will show



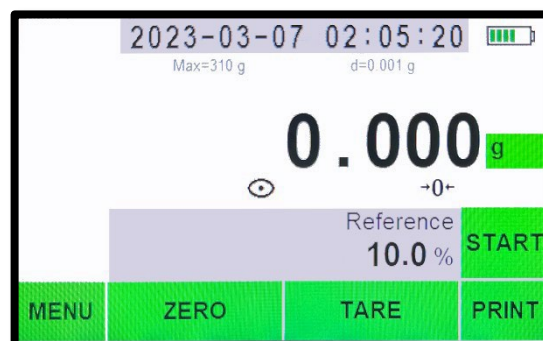
3. Input the percentage of reference sample (Example 10%).



2. Click **Reference %**, the display will show



4. Click then the display will show



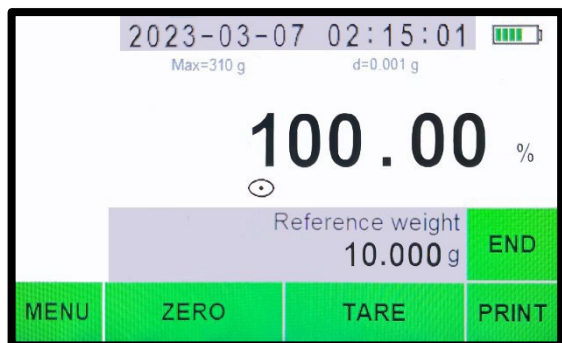
5. Place the sample on the container.



6. Click **START**, the display will show the percentage of reference sample.



7. Place full amount of sample on the container, display shows the percentage of sample.



8. Remove the sample, then click **END** to exit the Percentage function, and it will display.

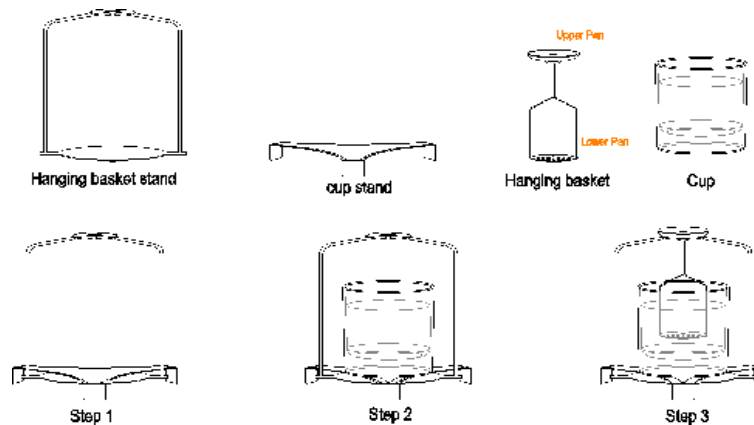


Density Functions

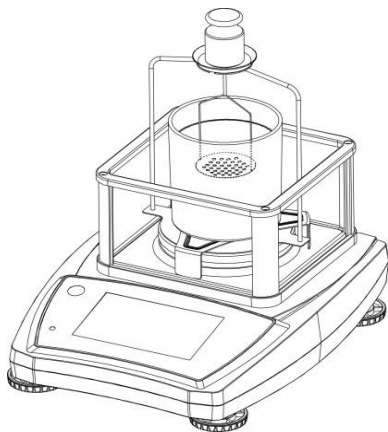
Specifications:

- 1) Use Density Measurement Tool (Optional parts) to measure the density by steeping in liquid.
- 2) Read density directly to avoid cumbersome calculations.
- 3) Measure density of solids and liquids.

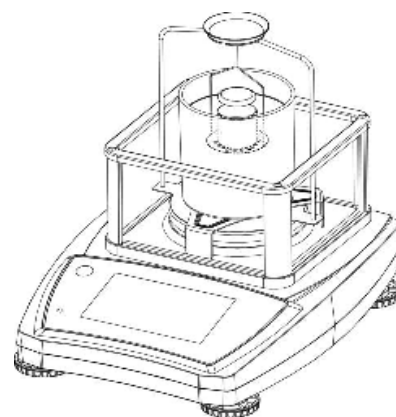
Density measurement device installation steps:



When weighing in air, place the sample on the upper pan of the hanging basket.

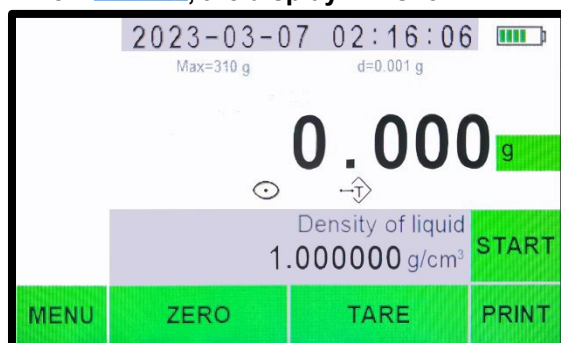


When weighing in medium, place the sample on the lower pan.



Full set of density measure is necessary to realize this function.

1. Click **Density**, the display will show



2. Click **Density of liquid g/cm³**, the display will show



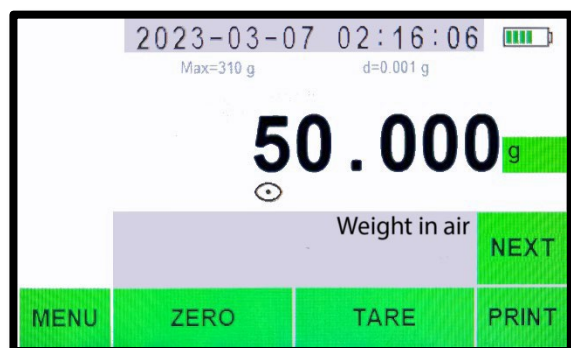
3. Input medium liquid density then click ✓.(Example 1.000000g/cc³³)



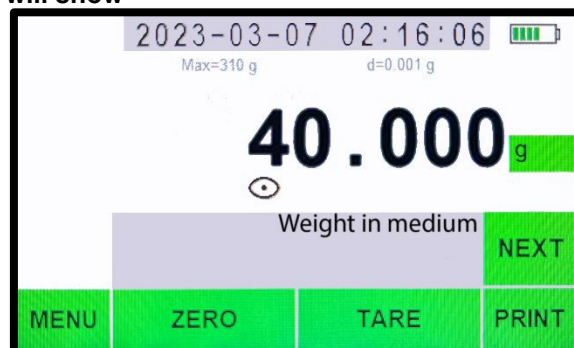
4. Remove the tare weight of the scale in the next display and make the scale return to zero, then click **START**



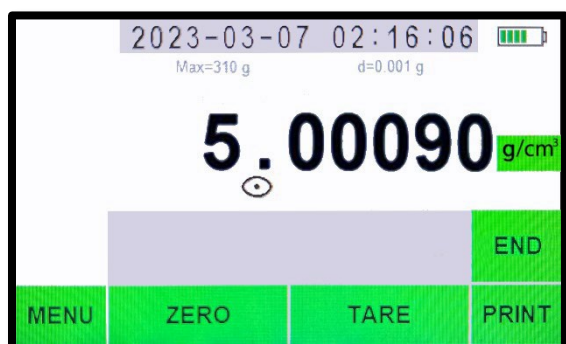
5. Place sample on the upper square platform of density measure.



6.To check its weight in the air, click **NEXT**. Immerse your sample on the structure in the liquid beaker, the display will show



7. Click **NEXT**, Display shows the density of solid sample.



8. Remove the weight then click **END** to exit the Percentage function, and it will display



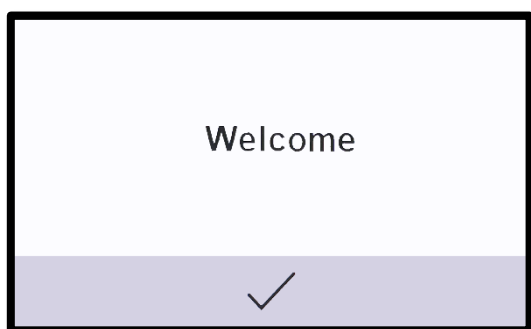
Calibration Using an External Calibration Weight

Since the effect of the Earth's gravity is not the same everywhere, every balance must be adjusted to compensate for the gravity differences at each location in accordance with the underlying physical weighing principles which apply to accurate weighing machines. This adjustment process is known as calibration and must be carried out on initial installation, regularly in accordance with internal quality systems and after each subsequent relocation.

To ensure best measurement results it is recommended that the balance should be calibrated regularly and often using a known external calibration weight.

Calibration is required when the weighing machine is initially installed or if the balance is moved to a substantial distance from the original location or if ambient conditions change considerably. 30 minutes' warm-up of the balance is always needed before weighing and calibration

1. Press [ON/OFF] switch to turn on the scale, when instrument displays.

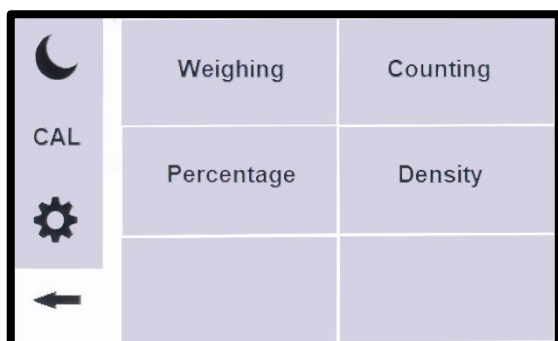


- Click ✓, the display will show mode and others self-checking information.



3. Click **MENU**, the display will show the following menu interface.

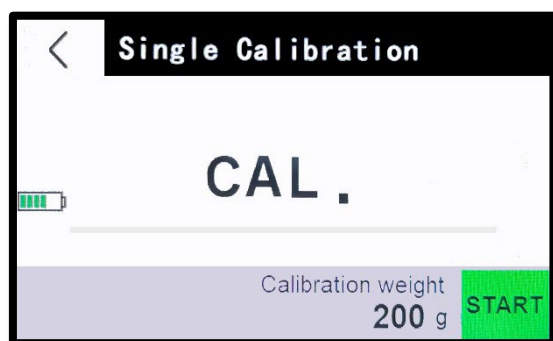
2.



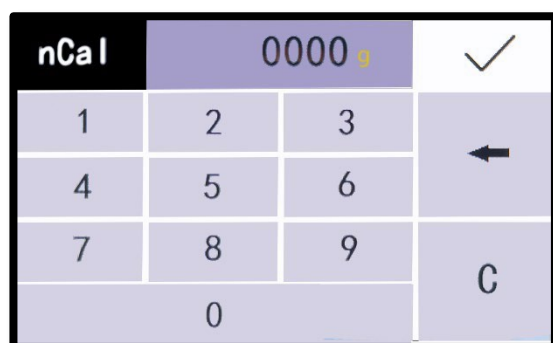
4. Click **CAL**, the display will show



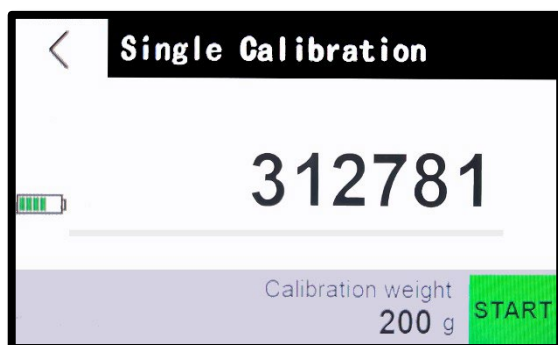
5. Click **CAL-Single**, the display will show



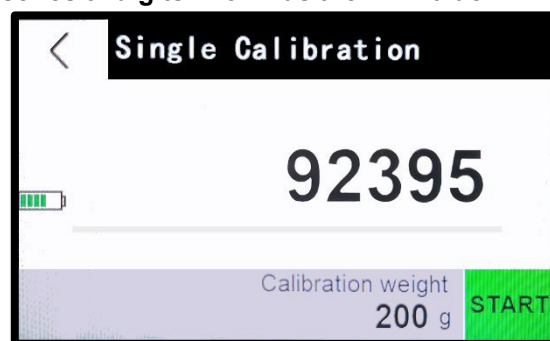
7. Click **Calibration weight**, the display will show



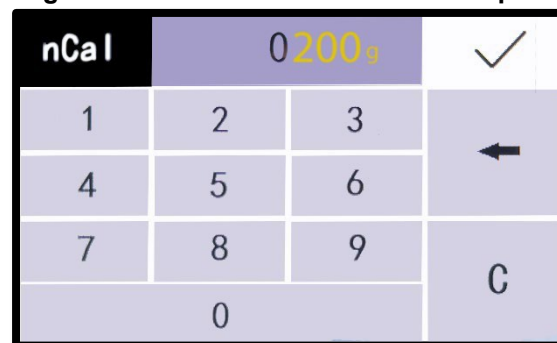
9. Click **✓**, the display will show



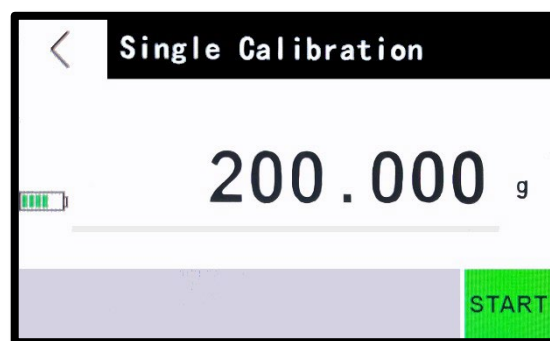
6. After 2 seconds, the display will show a series of digits known as the A/D value.



8. Click numbers key input digit (Example 200g). The calibration weight can be set according to users' requirements; we recommend a minimum weight of at least 50% of the Balance capacity.



10. Click **START** key, the display will show the flashing calibration weight.



- Place the corresponding test weight at the center of the pan
- Wait for the stable indicator to appear; the display will then return to weighing mode
- Calibration is now complete.
- Place a known weight on the platform to verify accuracy.

If the weight displayed does not correspond with the value of the calibration weight, please repeat the above steps.

Maintenance & Service



- For maintenance-work, the balance must be disconnected from the power supply (remove power adapter plug from socket). Also ensure that the balance cannot be connected to the power supply during the work by a third party.
- Make sure that no liquid spills into the scale while performing maintenance work. If liquid is spilled on the scale, it must be inspected by a service technician.
- **Regularly** perform maintenance to the weighing pan and the weighing pan holder by removing any dirt or dust from under the weighing pan and on the weighing scale housing. Use a soft brush or a soft, lint-free cloth, moistened with a mild soap solution.
- **Never** use solvents, acids, alkalis, paint thinners, scouring powders or other aggressive or corrosive chemicals for cleaning; these substances can cause damage to the surfaces of the scale housing.

Transportation & Storage

Your weighing machine is a precision instrument, treat it carefully. Avoid shaking, severe impacts and vibration during transportation. Make sure that there are no marked temperature fluctuations during the transportation and that the weighing machine does not become damp (condensation).

If you would like to take the weighing machine out of service for an extended period, disconnect it from the electricity supply, clean it thoroughly (refer to Maintenance & Service) and store it in a place which meets the following conditions:

- No violent shaking, no vibrations
- Minimum temperature fluctuations
- No direct solar radiation
- Minimum moisture

3 TSC Series Conversions Of Various International Weight Units

Model UNIT Resolution	123	213	313	1202	2102 3102	6101 10001
g	0.001g	0.001g	0.001g	0.01g	0.01	0.1g
oz	0.00005	0.00005	0.00005	0.0005	0.0005	0.005
lb	0.000002	0.000002	0.000002	0.00002	0.00002	0.0002
dwt	0.001	0.001	0.001	0.01	0.01	0.1
ozt	0.00005	0.00005	0.00005	0.0005	0.0005	0.005
ct	0.005	0.005	0.005	0.05	0.05	0.5
tiT	0.00005	0.00005	0.00005	0.0005	0.0005	0.005
tiH	0.00005	0.00005	0.00005	0.0005	0.0005	0.005
tiJ	0.00005	0.00005	0.00005	0.0005	0.0005	0.005
gn	0.02	0.02	0.02	0.2	0.2	2
dr	0.001	0.001	0.001	0.01	0.01	0.1
MM	0.0005	0.0005	0.0005	0.005	0.005	0.05
tola	0.0001	0.0001	0.0001	0.001	0.001	0.01
gsm	0.1	0.1	0.1	1	1	10
T/A/R	0.01	0.01	0.01	0.1	0.1	1
T/M/R	0.01	0.01	0.01	0.1	0.1	1

Troubleshooting

Error Code	Issue	Troubleshoot	Solution
ERR-O/0	Overload error	Turn scale off, then back on, and try weighing using weight under max capacity to verify the loadcell still functions.	If scale still registers accurate weight refrain from continued over loading. If error continues loadcell may be damaged.
ERR-Z/2	Exceeded zero tracing range when powered on.	Turn scale off and clear weighing platform. Turn scale back on and attempt recalibration.	If the scale was recalibrated successfully then the error is resolved. If error persists, scale may need a linearity calibration or has a damaged loadcell.
ERR-S/5	Scale not stable when powered on.	Make sure scale is stable when powered on. Do not touch, shift, or place anything on the weighing platform until after the countdown.	If error persists, scale may need recalibration. If error continues after recalibration, then loadcell may be damaged.
ERR-C	Calibration weight was not entered during calibration	Enter calibration weight during calibration process.	If error persists, call support.
ERR-P	Counting set error	Place sample before entering counting settings.	If error persists, call support.
ERR-L	Calibration weight was not placed during calibration.	Be sure to place weight when recalibrating.	If error persists, call support.
ERR-E	Software issue	If error persists, call support.	If error persists, call support.
ERR-B/6	Low battery error	Attempt to charge battery.	If error persists, battery will need to be replaced. Make sure to not leave scale with rechargeable battery plugged in constantly.
For any error that is not shown on this list or that persists after troubleshooting you will need to contact support.			



We are genuinely grateful for your recent purchase. Your decision to choose TREE by LW Measurements means a lot to us.

Your support enables us to continue creating and providing high-quality products and services. We hope you enjoy your new scale and that it brings you as much satisfaction as it brings us to serve customers like you.

We would love to know what you think of our TREE products and your experience with us. If you have a chance, please visit www.lwmeasurements.com and leave a review.

Thank you for being a part of the LW Measurements family. We look forward to serving you again in the future.

**All TREE products are designed in the
U.S.**

**Scan to Contact Us
OR
Call:707-542-2185**

