TREE®

LW MEASUREMENTS, LLC

Professional Weighing Equipment

Intelligent Weighing Machine

MCT PLUS SERIES

WITH CHECK-WEIGHING FUNCTION

Operating Manual

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: MCT Plus Mid Counting Scales

Imperial version	Metric version
MCT PLUS 3	MCT PLUS 1500
MCT PLUS 7	MCT PLUS 3000
MCT PLUS 16	MCT PLUS 7500
MCT PLUS 33	MCT PLUS 15000
MCT PLUS 66	MCT PLUS 30000

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

Date: 14. 11. 2012 Signature:

Boon

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R & D Manager

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Refer to our website for information about local customer service centers and details of their addresses.

Introduction

What you should know about these Operating Instructions:

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 and the diverse possibilities of the weighing machine in your daily work.

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

For the labeling of potential hazards and advice, please see Safety below.

Contents

1 Safety

1.1 Representations and symbols

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

1.2 Safety recommendations

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

The weighing machine may only be used with the power adapter supplied exclusively for use with the weighing machine.

Before inserting the power adapter, the user must ensure that the operating voltage stated on the power adapter agrees 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 machine must immediately be disconnected from the electricity supply (pull out the power adapter).

The weighing machine may only be operated from mains electricity supply with a power adapter which is in perfect condition.

If there should be any reason to believe that it is no longer possible to operate the weighing machine without danger, the weighing machine is to be immediately unplugged from the electricity supply (pull out power adapter) and secured against inadvertent operation.

In carrying out maintenance work, it is essential to follow the recommendations in Chapter 6 Maintenance and Service.

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

Keep this weighing machine away from water – this machine is NOT water resistant. Shock, injury and electrical damage can occur if used in a wet location.

Care must be taken when weighing liquids to ensure that no liquid is spilled into the inside of the weighing machine or into connections on the rear of the equipment or the power adapter. If liquid is spilled on the weighing machine, it must immediately be unplugged from the mains electricity supply (pull out power adapter). The weighing machine may only be operated again after it has first been re-checked by a service technician.

These operating instructions must be read by each operator of the equipment and must be available at the workplace at all times.

2 Your weighing machine

2.1 Construction and functions

2.1.1 Construction of the weighing machine

The weighing machine consists of the weighing machine body (1), the platter (2), the weighing machine (3) the adapter, (4) this operating manual.

Figure 2.1 Your weighing machine

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2.1.2 Functions of the weighing machine

The MCT Plus Series are high-quality electronic precision weighing machines designed to function as counting scales and check-weighers with the following specifications:

1. Imperial weight unit version

Model number	Capacity	Division	Weighing pan Size
MCT PLUS 3	3 lb	0.0001 lb	7.6 x 10 in
MCT PLUS 7	7 lb	0.0002 lb	7.6 x 10 in
MCT PLUS 16	16 lb	0.0005 lb	7.6 x 10 in
MCT PLUS 33	33 lb	0.001 lb	7.6 x 10 in
MCT PLUS 66	66 lb	0.002 lb	7.6 x 10 in
Package Standard Carton	13.8 X 12.2 X 6.5(in^3)		
Package Master Carton	4 Units in one box: 25.4.×15 × 14.2(in^3)		
Operating Temperature	32-104°F		
Power source	Rechargeable batteries or AC/DC Adapter 10V / 500 mA		

2. Metric weight unit version

Model number	Capacity	Division	Weighing pan Size
MCT PLUS 1500	1500 g	0.05 g	193 X 254mm
MCT PLUS 3000	3000 g	0.1 g	193 X 254mm
MCT PLUS 7500	7500 g	0.2 g	193 X 254mm
MCT PLUS 15000	15 kg	0.0005 kg	193 X 254mm
MCT PLUS 30000	30 kg	0.001 kg	193 X 254mm
Package (Standard carton)	35 X 31 X 16.5(cm^3)		
Package (Master carton)	4 Units in one box: 64.5×38×36(cm^3)		
Operating Temperature	0-40C^o		
Power Source	Rechargeable batteries or AC/DC Adapter 10V/500mA		

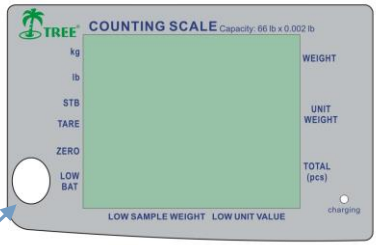
The built-in versatile weighing programs allow you to use the MCT PLUS Series weighing machines not only for accurate weighing but also for components counting.

FEATURES

- Auto zero tracking
- Intelligent applications: weight unit conversion, parts counting
- Low battery indication
- Large bright backlit LCD
- Large heavy gauge stainless steel square pan
- Stability indication
- Auto calibration
- Selectable auto backlight
- Selectable auto shut-off
- Unit switching: kg, lb
- Variable kg or lb reference weight calibration software
- Pieces counting
- 1.3 million internal resolution
- 30,000 display resolution
- 24 bit A/D processor
- Highest quality sensor used
- Die-cast aluminum sub-support, bottom sensor support and steel thread footing

Figure 2.2 Details of your weighing machine

Fig 2.2.1 Display



Leveling bubble

Fig 2.2.2 Numeric Keypad

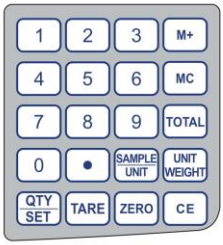


Fig 2.2.3 Back of unit

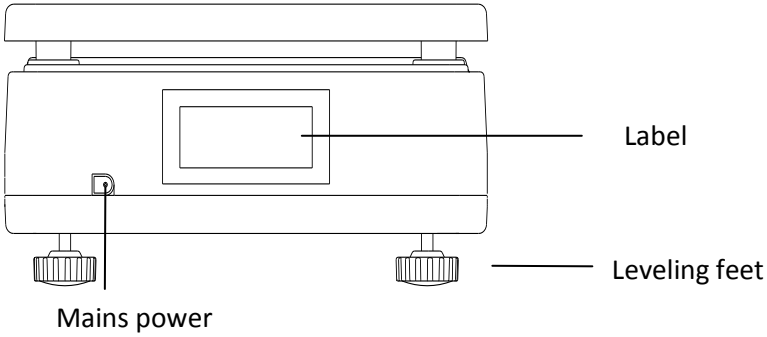
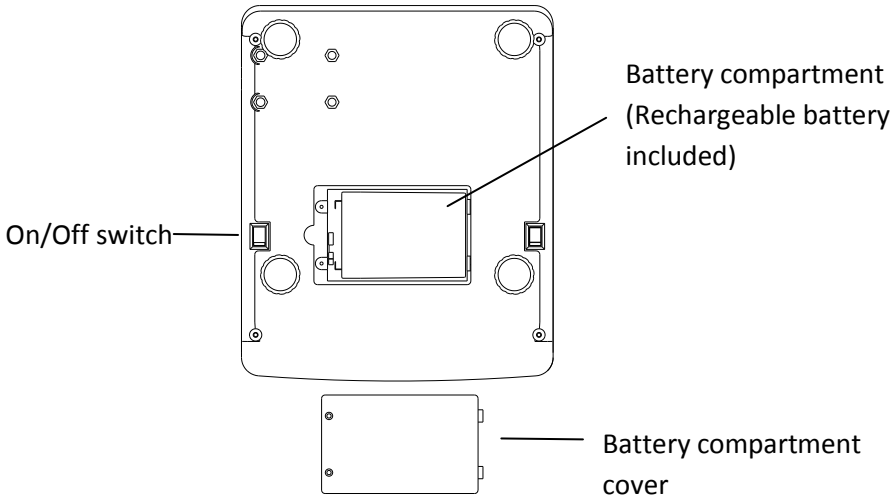


Fig 2.2.4 Underside of unit



2.2 Application, conformity

2.2.1 Correct use of the weighing machine

The weighing machine may only be used for the weighing of solid-materials and liquids filled into secure containers.

The maximum allowable load of the weighing machine must never be exceeded; otherwise the weighing machine may be damaged.

In using the weighing machine in combination with other appliances as well as with appliances 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.

2.2.2 Conformity

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

The power adapter produced for the operation of the weighing machine and intended exclusively for this application complies with the appropriate electrical protection class.

2.3 Data and parameters

2.3.1 Technical data

The following applies to all MCT PLUS series weighing machines:

Power supply:

- Input: 110 or 230V AC (+/-15-20%); 50 to 60Hz
- Output: 10v DC 500mA

Allowable ambient conditions:

- Temperature: 0°C - 40°C / 32 - 104ºF
- Relative humidity: 25% - 85%, non-condensing

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

3 Getting started with your weighing machine

3.1 Unpacking the equipment

The machine is delivered in an environmentally-friendly carton, specifically developed for this precision instrument, which provides optimum protection for the unit during transportation.

We suggest that you retain the original packaging in order to avoid transportation damage if re-shipping or transporting the balance, and to allow the unit to be stored in the best conditions if it is out of operation for an extended period.
In order to avoid damage, attention must be given to the following points when unpacking the balance:

Unpack the weighing machine carefully. It is a precision instrument.

When outside temperatures are very low, the balance should first be stored for some hours in the unopened transport package in a dry room at normal temperature, so that no condensation settles on the unit when unpacking.

Check the weighing machine immediately after unpacking for externally visible damage. If you should find transport damage, please inform your service representative immediately.

If the unit is not to be used immediately after purchase but rather at a later time, it should be stored in a dry place where fluctuations in temperature are as minimal as possible. (See Chapter 7 Transport, storage).

Read through these operating instructions; even if you already have prior experience with weighing equipment, before you work with the unit and pay attention to the Safety recommendations (see Chapter 1 .Safety).

3.2 Scope of delivery

Inspect delivery for completeness immediately upon unpacking all components.

Checklist for complete delivery

	Component delivered present yes / no
Weighing unit body	
Weighing platter	
Power adapter	
Operating manual	

3.3 Assembling your weighing machine

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

- Place the base unit in position and add the weighing platter.
- Insert the power adapter cable plug into the socket at the rear of the balance.

3.4 Choice of a suitable location

The environment in which your weighing machine is used is very important. Air movement, temperature changes, vibrations, direct sunlight, etc. all influence the performance of high precision weighing machines. Therefore, place your weighing machine on a solid, sturdy surface that is free of air currents,

vibration and not in direct sunlight. The surface should not be magnetic and should be located away from doors, windows, heaters, air conditioners and fans.

To summarize:

- Put the weighing machine 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

3.5 Checking the mains voltage

The following Safety recommendations must be observed when connecting the balance to the mains:

⚠ DANGER

The balance may only be operated with the power adapter supplied.

Check before connecting the power adapter to the mains supply, that the operating voltage stated on the power adapter agrees with the local mains voltage.

If the operating voltage is not the same as the mains voltage, the power adapter must on no account be connected to the mains supply. Contact customer service.

3.6 Leveling the weighing machine

To function properly, the weighing machine must be precisely horizontal. The machine is fitted with one bubble level and four (4) adjustable feet for level-control, with the aid of which it is possible to compensate for small height differences and/or any unevenness in the surface on which the machine is positioned.

The leveling 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)

Place the weighing machine horizontally and keep the bubble inside the bubble level aligned with the red circle (See Fig.1). In order to get exact

measurements, the machine *must again be carefully leveled after each relocation.*

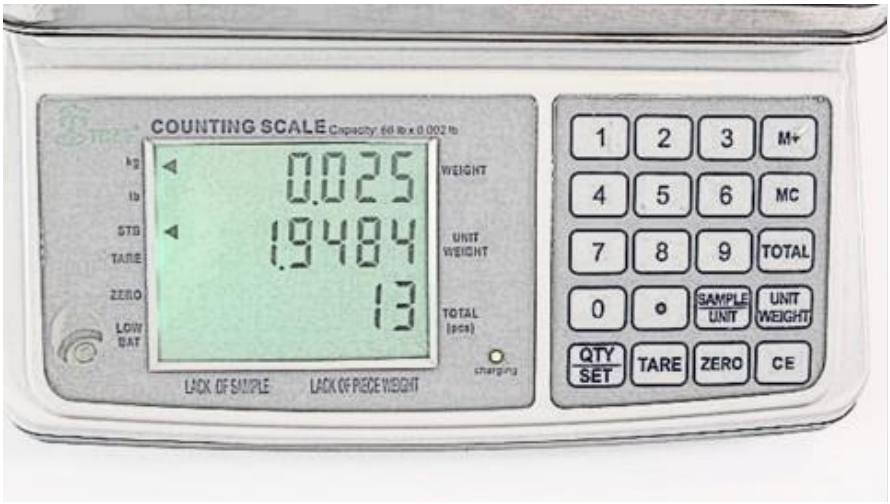
Fig. 1 Correct leveling with the aid of the bubble level and adjusting feet.

3.7 Calibration of the weighing machine

Since the Earth's gravity is not the same everywhere, each weighing machine must be adjusted to compensate for the gravity differences at each location in accordance with the underlying physical weighing principles. This adjustment process, known as calibration and must be carried out on initial installation and after each subsequent relocation.

In order to ensure exact measurements, it is recommended that the balance should be calibrated regularly using a known external calibration weight (see Section 5 below).

4 Working with the application menu using the Numeric Key-Pad



4.1 Display messages and key functions

4.1.1 Display messages

1. The STABLE icon indicates when the readings are stable.
2. The ZERO icon indicates when the weights are tared to zero.
3. The LO-BAT icon indicates when the battery is running out of power.
4. The PCS icon indicates when the pieces counting function is applied.

4.1.2 Display & Key Functions

1. WEIGHT DISPLAY indicates the Gross or Net weight on the platter (when the tare function is activated).
2. UNIT WEIGHT DISPLAY indicates the average or set unit piece weight.

3. TOTAL DISPLAY is the accumulated total pieces on the scale.

4. The ZERO INDICATOR turns on when the weighing machine is in Zero position.

5. The TARE INDICATOR turns on when this function is used.

6. LOW SAMPLE WEIGHT turns on when the sample number is not large enough for accurate counting.

7. LOW UNIT VALUE turns on when sample unit weight is not heavy enough for accurate counting.

8. NUMERIC (0-9) KEYS are used for setting numeric data for sample number, sample weight or to limit the HI / LO settings.

9. DECIMAL POINT (.) key is used to set the decimal position of sample weight.

10. Press the ZERO key to set or re-adjust the scale to the correct zero position.

11. Pressing the TARE key eliminates the gross weight on the platter (box or container, etc) as the tare weight.

12. Press the SAMPLE/UNIT (kg/lb) to select the desired weighing unit. The SAMPLE/UNIT key is also used when setting the counted sample numbers on the platter into the machine's memory.

13. The UNIT/WEIGHT key is used when setting the known unit weight data into the weighing machine during normal operation.

14. The CE key is used for cancelling the numeric setting data or to cancel the previous unit weight data.

15. QTY/SET key is used for the alternating between normal counting and quantity check operations.

16. Press the MEMORY (M+) key to save the counted data; data can be saved up to 99 times.

17. Press the MC key to clear or cancel the data in the memory.

18. Press the TOTAL key to switch between normal counting and recalling memory data.

4.1.3 Function setting

- Turn off the weighing machine using the hard switch located on the bottom of the weighing machine.

- Press and hold UNIT WEIGHT key and then turn on the weighing machine. The display will show
"------" and then "b = XX" (beeper), on the first line, A-XX (auto off) on the second line and "L = XX (backlight) on the third line.

- Press the QTY/SET key to toggle between activating the beeper on or off.

- Press the TARE key to select auto off time.

- Press the ZERO key to toggle between activating the backlight On, Off, or Auto(AU). To save your settings, and begin weighing, turn the machine off and then back on again.

- When there is no weight on the platter, press the SAMPLE/UNIT key to select the weighing unit (kg or lb).

4.1.4 Clearing the total weight

- Press the TOTAL key to show the total pieces on the third line of the display.

- Press the MC key to show the unit that will be cleared.

- Press the CE key to confirm clear.

5 Operation

5.1 Tare

5.1.1 Clearing the tare weight

- Place the empty container on the platter. Press the TARE key. The display will show 0.00000.

- When the container is removed from the platter, the WEIGHT display will show a minus (-) weight value which is the weight of the container.

5.1.2 Clearing the previous tare weight

- Remove weight from the platter and then press the TARE key. The Tare indicator will turn off and the WEIGHT display will return to Zero.

5.2 Sample setting

5.2.1 Number setting (for counting any unknown weight)

- Place the pre-counted X number of sample pieces on the platter. The total weight will be displayed. Set the X number of pieces using the numeric keys and then press the SAMPLE/UNIT key.

- UNIT WEIGHT on the display shows the average piece weight of the samples.

- TOTAL (pcs) on the display shows the number of sample pieces on the scale. Add in more units and it will show the total number of pieces.

5.2.2 Unit weight setting (when unit weight is known)

- Place samples on the scale. Using the numeric keypad, key in the average piece weight. Press UNIT WEIGHT on the keypad to save the specified piece weight.

- The total number of pieces will be shown on the TOTAL (pcs). Add in more units to be counted. Press the CE key to clear previous setting.

Press the CE key again to cancel the previous unit weight and sample setting.

5.3 Alarm function

- To avoid counting errors, this scale has a useful alarm function to inform the operator of a counting error in the event of low sample size or low sample weight.

- The Low Sample Weight cursor on the display will turn on if the total weight of the sample is below the limit value. The scale will start counting but the error may be high.

- Press the CE key. Then use a larger sized sample (more weight) and key in the new sample size using the numeric keypad, and then press SAMPLE/UNIT.

5.4 Unit Weight Enhancement

- The weighing machine will automatically adjust and calculate a new average unit weight when more samples are slowly placed on the scale. This ensures higher accuracy as samples are now based on a larger population size.

5.5 Lack of Piece Weight

- LOW UNIT VALUE indicator will turn on if the averaged unit weight of set unit weight is not enough for accurate counting operation. Operator may still use the weighing machine if this indicator is on, but counting error might occur.

5.6 Hi / LO check-weighing with counting

- The MCT Plus series has a useful check function to inform the operator if the total pieces counted has reached the desired lower limit and the upper limit. This function is designed for packaging applications.

EXAMPLE: If the operator wishes to count 1,000 pieces for every package, he/she can set the lower limit and the upper limit as 1,000 pieces by:

- Press the QTY/SET key to enter the quantity alarm menu.

- Press the ZERO key to turn on the check weighing. Display will show CH=ON. Press the ZERO key again and the display will show CH-OFF which means the quantity alarm function has been turned off.

- To set the lower and upper count limit, press the TARE key to select the hi/lo limits. For example,
"L = 990," press 990 on the numeric keypad, then TARE to switch over to: H = 1010," press 1010 on the numeric keypad.

- Press the QTY/SET key to confirm and return to counting mode.

- Put 10 pieces of your sample on the platter and press "10" on the numeric keypad. Then press the SAMPLE / UNIT key to store and confirm the sample weight.

- Keep adding pieces until it reaches the lowest quantity of "990". The alarm will sound when you reach 990.

- Keep adding pieces until it reaches the highest quantity of "1010" or above. The alarm will sound with a different tone.

6 Calibration

Note: Calibration is done in the factory. Don't re-calibrate the machine unless it is not accurate. The weighing machine should be allowed to warm up for 10 minutes before calibration.

Single segment calibration (recommended):

- Press and hold the ZERO key, and then press the ON/OFF key to turn the weighing machine on. The display will show SCALE on the first line, CAL-0 (flashing) on the second line and the AD value on the third line.

- Press the SAMPLE/UNIT key to select the calibration unit to be used as either kg or lb.

- When the AD value is stable, press the ZERO key to calibrate ZERO. After 2-3 seconds, the second line will show 0.

- Set the calibration weight by using the numeric key pad (0-9) and then

place the calibration weight on the platter. Press ZERO to calibrate. Once the stable indicator light is displayed, press the ZERO key again. The second line of display will now show 00000. Calibration is now complete.

NOTE: *The ideal calibration test weight is between 2/3 capacity to full capacity in order to get the most accurate weight after calibration.*

- Turn off the power, then turn it back on again. Place a weight on the platter to ensure weighing is correct. If not, repeat the above steps.

Linearity calibration (for scale technician or factory use):

- Turn on the weighing machine and then turn it off.
- Press and hold the TARE key and then turn on the machine. The display will show LINE on the first row, CAL-0 (flashing) on the second line and AD value on the third line.
- When the AD value is stable, press ZERO to calibrate ZERO. After 2 or 3 seconds, the second line will show 1.0000.
- Place a 1kg weight on the platter and press ZERO when the stable A/D value is displayed. After 2 or 3 seconds, the display will show 2.0000.
- Place a 2kg weight on the platter and press ZERO when the stable A/D value is displayed. After 2 or 3 seconds, the display will show 3.0000.
- Place a 3kg weight on the platter and press ZERO when the stable A/D value is displayed. After 2 or 3 seconds, the display will show 0.0000. Calibration is now complete.
- Turn off the power, and then turn it back on again. Place a weight on the platter to ensure weighing is correct. If not, repeat the above steps.

7 Maintenance and service

The weighing machine must be treated carefully and cleaned regularly. It is a precision instrument.

⚠ DANGER

For maintenance-work, the machine must be separated from the power supply (remove power adapter plug from socket). Also ensure that the weighing machine cannot be reconnected to the power supply during any work by a third party.

Take care during cleaning that no liquid penetrates into the weighing machine. If liquid is spilled on the machine, the latter must immediately be disconnected from the electricity supply. The machine may only be used again after it has first been checked by a service engineer.

The connections on the back of the appliance and the power adapter should not come into contact with liquids.

Regularly dismantle the weighing platter and the weighing platter holder and remove any dirt or dust from under the weighing platter and on the weighing machine housing with a soft brush or a soft, lint-free cloth, moistened with a mild soap solution. The platter and the holder can be cleaned under running water. Ensure that both parts are completely dry before they are re-installed on the scale.

⚠ CAUTION

Never use solvents, acids, alkalis, paint thinners, scouring powders or other aggressive or corrosive chemicals for cleaning, since these substances attack the surfaces of the scale housing and may cause damage

8 Transport and storage

8.1 Transportation and shipping

Your weighing machine is a precision instrument. Treat it carefully. Avoid shaking, severe impacts and vibration during the transportation.

Take care that there are no marked temperature fluctuations during the transportation and that the weighing machine does not become damp (condensation).

8.2 Storage

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 (see Section 6.Maintenance and servicing.) 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

The weighing machine should preferably be dispatched and transported in the original packaging to avoid transportation damage.

The weighing machine should preferably be stored in the original packaging, since this provides optimal protection for the weighing machine.