**Industrial Crane Scale
Instruction Manual Model:
BA15S – BA150S
BA15SR – BA150SR**

TORBAL

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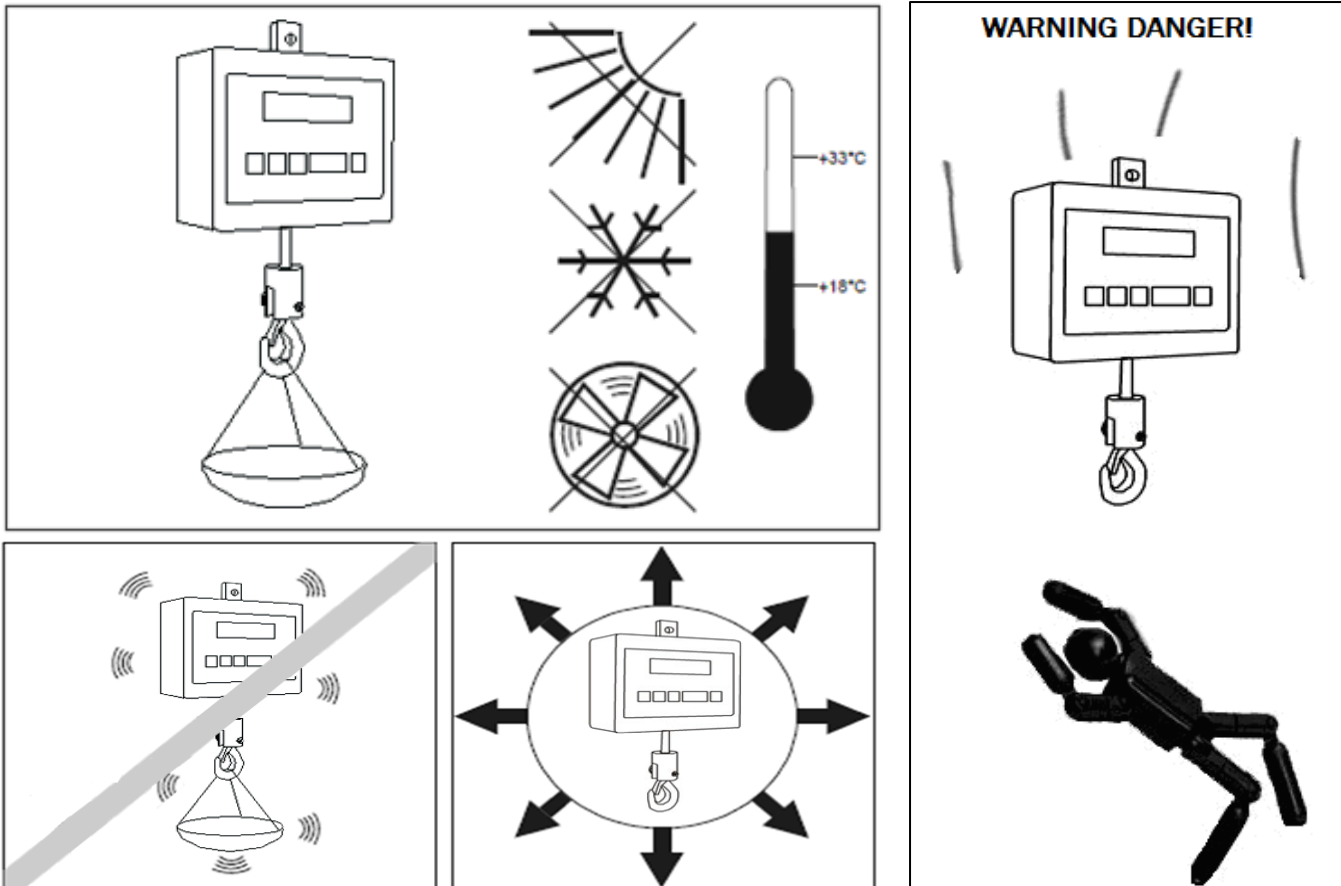# Chapter 1: Cautionary Notes

Remember choose a proper location for you scale. Always handle the unit with care.

The correct location and proper environment make an important contribution to the accuracy of the weighing results of TORBAL industrial scales.

The optimum location and installation for your scale:
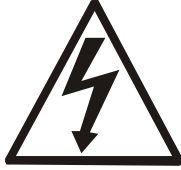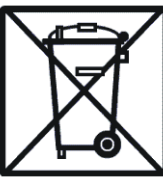
- Stable, vibration-free mounting installation.
- Away from direct sunlight
- Not exposed to high temperature variations
- Away from direct drafts
- **When mounting take extra caution and make sure that your mounting method will support a load which is equal to twice the weight of the scale's maximum weighing capacity. Improper mounting of the crane scale can result in having the unit fall from its mounted height and can cause serious injury or death.**

CAUTION:	• The scale is designed for indoor use only. • Do not operate the scale in hazardous areas or conditions. • Do not use the scale in locations subject to high humidity. • Do not connect cables in ways other than those mentioned in this manual. • Be sure to set the scale on a firm, stable, horizontal surface. • Never stand on or lean upon this product. Equipment may fall or collapse, causing breakage and possible injury. • Before moving the product, unplug it and unplug all cables connected to it. • When storing, transporting or returning the scale for service, always use the original packaging.
WARNING:	• Never attempt to repair, disassemble or modify the scale yourself. Tampering with the scale may result in injury and cause more damage to the equipment. • Be sure to use the specified power source. • Do not allow foreign matter to fall into the scale. • If water or other liquid spills into the scale, do not continue to use it. Unplug the power cord immediately and contact technical support.

1.1. Important handling Cautions and Warnings

	Follow all safety guidelines in order to avoid electrical shock, or damage to connected peripheral devices.

- All necessary repairs or internal adjustments should be made by authorized personnel only.

- To avoid the risk of fire use an outlet of the proper type that provides the specified voltage. The required voltage for the power supply is 115vAC @ 60Hz and requires a minimum of 1.2 amperes of current.

- Do not use the scale when the cover is open.

- Do not use the scale in explosive atmospheres.

- Do not use the scale in very high humidity.

- If the scale does not operate properly, unplug the power supply and do not use it until checked by authorized personnel.

	Disposal of electronic equipment in waste containers is forbidden by law.

- Please dispose of electronic equipment in appropriate recycling centers or by returning to the original point of purchase.

⚠ Always handle your scale with care. Damage caused by improper handling is not covered under the scale's warranty. Improper installation can cause a safety hazard.

When mounting take extra caution and make sure that your mounting method will support a load which is equal to twice the weight of the scale's maximum weighing capacity. Improper mounting of the crane scale can result in having the unit fall from its mounted height and can cause serious injury or death.

DO NOT let the scale fall or drop from its tabletop surface!
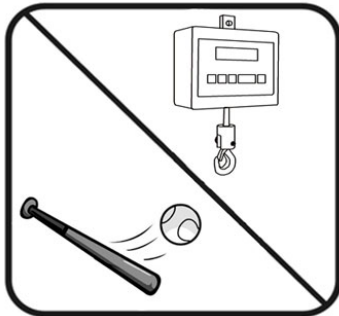
Never drop or throw articles at the scale or any other parts of the unit!
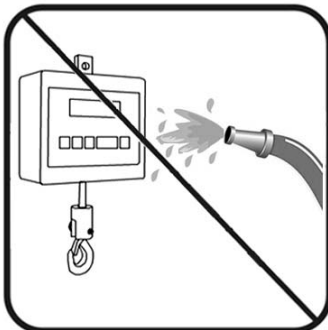
DO NOT spray water or any other liquids at the scale to avoid liquid damage!

Chapter 2: Specifications

2.1 Scale Specifications

| TORBAL	Model							
	BA15S	**BA15SR**	**BA30S**	**BA30SR**	**BA60S**	**BA60SR**	**BA150S**	**BA150SR**
Capacity	15 kg / 30 lbs		30 kg / 60 lbs		60 kg / 150 lbs		150 kg / 300 lbs	
Readability (d)	5 g / 0.01 lbs		10 g / 0.02 lbs		20 g / 0.05 lbs		50 g / 0.1 lbs	
Temporary (BP) Increased Resolution	0.5 g / 0.001 lbs		1 g / 0.002 lbs		2 g / 0.005 lbs		5 g / 0.01 lbs	
Stabilization time (typical)	< 3s							
Tare Range	-15 kg		-30 kg		-60 kg		-150 kg	
Indicator Dimensions	195x165x100 mm (7.7x6.5x3.9 in)							
Overall Height	500 mm (19.7 in)							
Scale Weight	3.3 kg (7.3 lb)							
Internal Battery	Lead Acid							
Working Time w/Battery	> 8 hours							
Charging Time	< 3 hours							
External Power Supply	12 VDC@160ma							
Operating Temperature	-10C to +40C							
RS232 Female Opto-Isolator	Bidirectional							
RS232 Male Opto-Isolator	Bidirectional							
Class	III							
Warranty	One Year							

2.2 Remote Control Specifications

TORBAL	**Remote Control**
Operating Range	656 ft (200m)
Frequency	915 Mhz, 868 Mhz
Channels	16
Power	4 x 1.5V AAA Batteries
Battery Operating Time (no backlight)	60 hours
Battery Operating Time (with backlight)	20 hours
Power Consumption (no backlight)	20 mA
Power Consumption (no backlight)	50 mA
LCD Dimensions	47 x 33 mm (1.9 x 1.3 in)
Remote Control Dimensions	80 x 185 x 35 mm (3.1 x 7.3 x 1.4 in)
Operating Temperature	-10C to +40C

Chapter 3: Keys, Display Indicators and Abbreviations
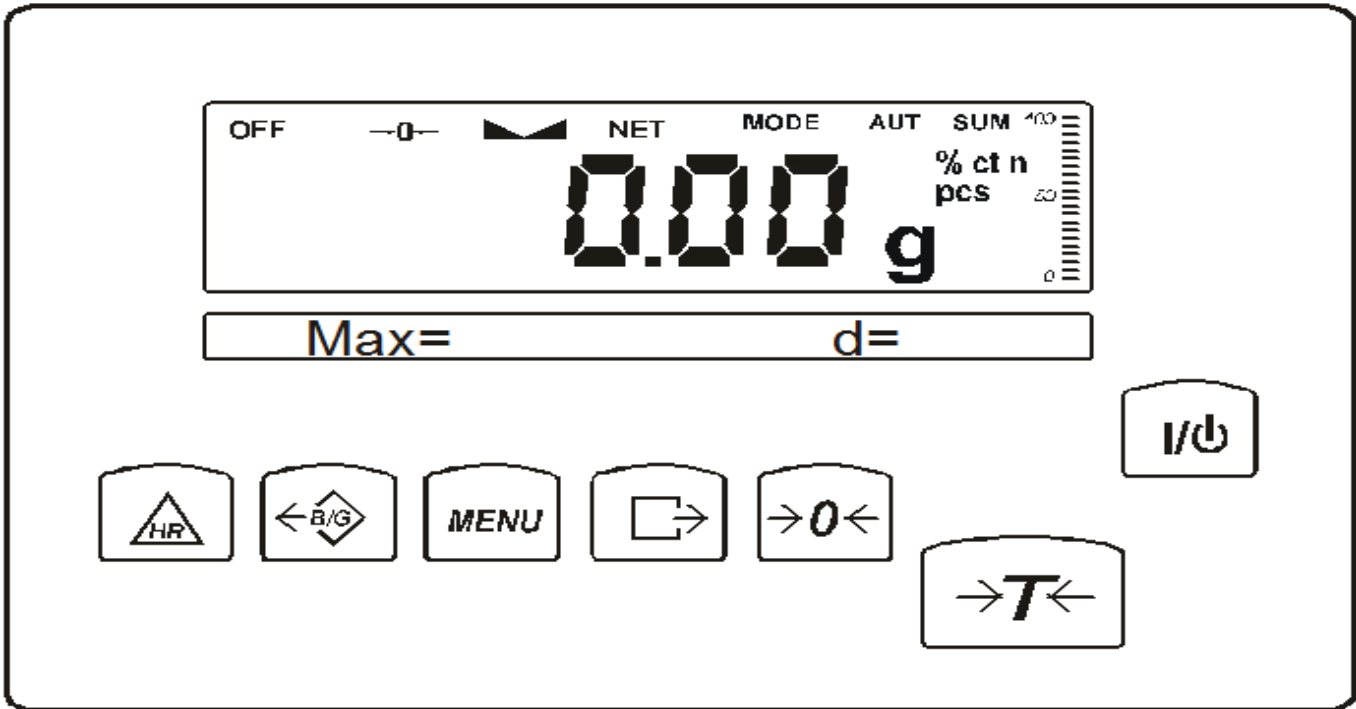
Key	Primary Function
I/⏻	Power On and Power Off
→T←	Tare – used to tare the weighing pan
→0←	Zero – used to zero the scale (Legal for Trade models only)
MENU	Menu – used to access the main menu
⟼	Data Transfer – used to print data or transfer data to a PC via the RS232 communication port
B/G	Gross Weight – used to change display from Net Weight to Gross Weight
HR	High Resolution – temporarily (5 sec) increases the display resolution
Display Indicator	**Description**
◥◣	Stability Indicator - The weighing result has stabilized and an accurate reading may be taken.
→0←	Zero - The scale is maintaining a "center of zero" condition. (Legal for Trade models only)
AUT	AZSM (Automatic Zero Setting Mechanism) is enabled. Always enabled in Legal for Trade models.
NET	Net Weight – indicates that the container weight has been removed by tare

Fulcrum Inc.

Chapter 4: Parts Description

Front View

Front View w/Remote Control

Side View

Rear View

Remote Control

RS232 Port and Opto-Isolator Output

Chapter 5: Unpacking the Balance and Getting Started

1. Carefully remove the crane scale, ac adapter, as well as the remote control and antenna (optional) out of the packaging.

2. After removing all of the components, place the crane scale on a table top surface.

3. Using scissors cut the plastic tie straps which secures the hook during shipping.

4. If an optional remote control is purchased, mount the remote antenna onto the crane scale by firmly screwing it into the antenna port located on the left side.

5. After assembling the unit, plug in the AC adapter to the AC adapter socket located on the right side the scale. Leave the adapter plugged in for minimum of 3 hours in order to charge the scale's internal battery.

6. Once the battery has been charged the scale maybe installed.
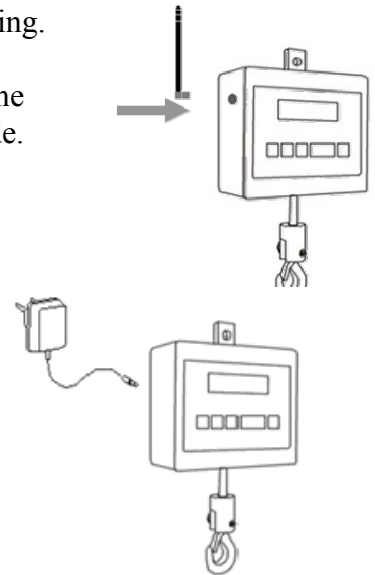
   ⚠️ **Before installing the scale make sure that the scale's hook is in place, and firmly secured with two locking retaining rings located on both sides of the hook shaft.**
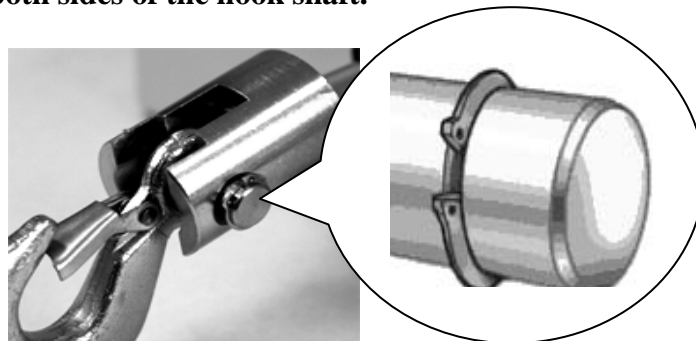
7. When mounting take extra caution and make sure that your mounting method will support a load which is equal to twice the weight of the scale's maximum weighing capacity.

   ⚠️ **Improper mounting of the crane scale can result in having the unit fall from its mounted height and can cause serious injury or death.**

8. After installing the scale, the unit can be turned on by pressing the power ON key (I/⏻).

$\lceil - 1$	►0◄ ◣◢ AUT 100 **0.00** Lb 50 0
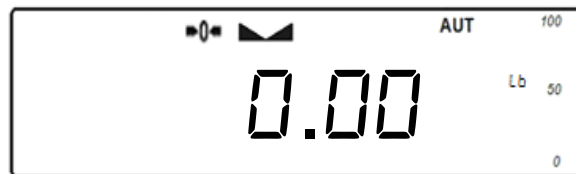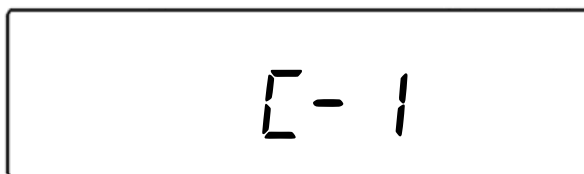
9. To turn the scale OFF press the Power "OFF" button (I/⏻).

Chapter 6: Battery Operation

The BAS Crane Scale is equipped with six Ni-MH 1.2V or two 3.7V internal rechargeable batteries. The battery pack is built in as an integrated part of the scale's back cover. The battery has been designed to handle up to 1,000 charging cycles, which should allow the battery to last anywhere from two to three years. The battery pack should be replaced when after fully charged its operating time is reduced to 20% of its nominal value (fewer than 4 hours). In order to replace the battery pack, please contact Torbal Technical Support. Never attempt to replace the battery on your own. By doing so you may cause scale damage and void the manufacture's warranty.

Useful Tips for Operating the Scale with a Battery

- In order to increase the battery's operating life, it is recommended to set the scale's back light mode to ("back light battery" – B_LBAT). Refer to Chapter 29 (LCD back light).

- The scale's internal battery's are always in the charging mode when the scale is plugged into a power outlet. Do not allow the battery's to completely discharge as this may damage the battery or reduce its life.

- When operating the unit on batteries it is recommended to enable the scale's "Auto-Off" function by setting it to AUT BAT. This will turn the scale off automatically after 5 minutes of inactivity. Refer to Chapter 30 (Auto Off).

Chapter 7: Remote Control (Optional)

The wireless remote control allows controlling the scale and receiving the weighing result on the remote's LCD display in real time.

Key	Primary Function
MENU	Allows accessing the remote control main menu.
↑,↓,→,←	Allows navigating remote's main menu.
ENTER →T←	Tares the scale or accepts selected options in the main menu.
→0←	Zeros the scale.
B/G	Indicates the gross weight
PRINT	Initializes the scale to print or perform data transfer through RS232
ON/OFF	Disables and enables the remote control
HR	Indicates weighing result with higher resolution
BACKLIGHT	Enables remote LCD backlight
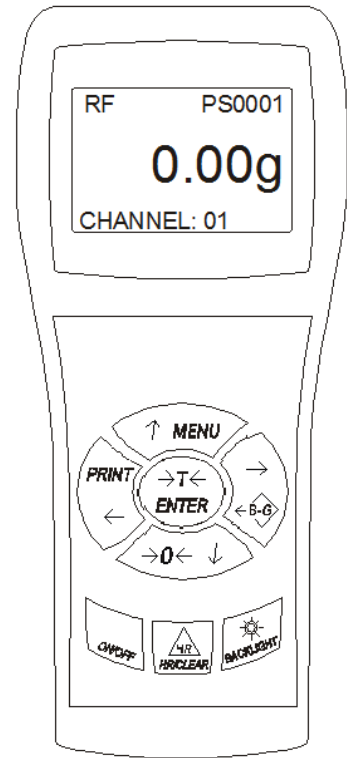
1. After unpacking the remote control install four AAA batteries. To do so unlock the remote's access cover by moving the securities switch to the right (**1**). After moving the security switch, open the battery cover by lifting it on its left side (**2**). When installing the batteries be sure to use correct polarity (+/-) (**3**).

   To begin using the remote control press the On/Off key. By default the remote control is set to receive and send data to the unit using RF Channel 1. The BAS Crane Scale is set to the same RF channel therefore; the remote control will communicate with the unit automatically as soon as it turned on.

2. To change the remote's RF Channel, RS232, or LCD settings, press the MENU key and configure the remote with the appropriate settings.
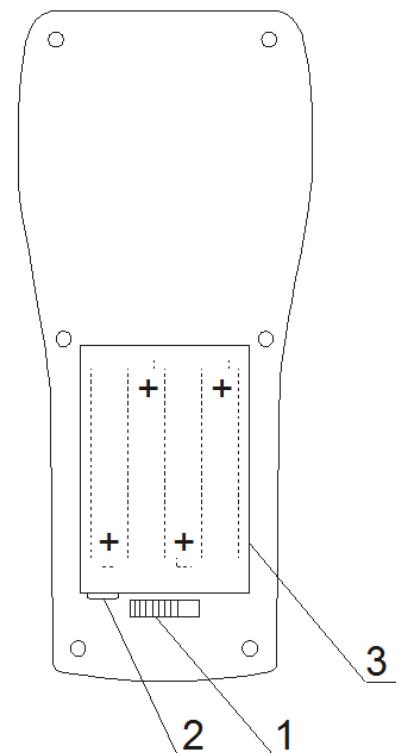
Chapter 8: Basic Principles of Weighing

1. The scale should be properly zeroed before weighing. Proper zeroing is indicated by the Zero Indicator ($\rightarrow 0 \leftarrow$) on the display. If the display signals an out of zero condition (----), press the ($\rightarrow 0 \leftarrow$) key to Zero an empty pan.

2. Weighing allows taring over the entire weight range. This is accomplished by pressing the Tare key, ($\rightarrow T \leftarrow$). Care should be exercised when tare is in use to be sure that the scale's maximum capacity is not overloaded.

3. An accurate weighing result should not be taken until the stability indicator, (◣ ◢) , indicates that the result is stable, and the hanging load is stable from swiveling.

4. For best results place the unknown weight in the center of the pan.

5. Always protect the scale from dirt, dust, and corrosive liquids. When Cleaning use of a clean cloth with soap and water, and then dry with a clean wiper.

6. Use the "Active" function to customize the scale's main menu and disable functions that are not used. This makes use the main menu fast and easy.

7. Always secure the weighing load on the hook with extra caution to make sure it will not fall off.

⚠ ***Never overload the scale in excess of 20% of the scale's rated maximum capacity.***

## Chapter 9: Functions, Descriptions and Definitions

- **Parts Counting** is used to count parts based on their established average piece weight.

- **Percent weighing** is used to establish the relative weight of an unknown, compared to that of a stored reference weight and expressed as a percent.

- **Recipe Making** is used for weighing and summing individual ingredients such as powers or liquids during recipe making or mixing compounds.

- **Check weighing** is used to check whether a weight of an object falls within specified threshold limits.

- **Animal and dynamic weighing** is used to weigh animals or objects which are in motion while on the pan.

- **Tare Storing** is used to store the values of various containers used for weighing.

- **Filtering** is used to minimize or eliminate the effects of vibrations in the weighing surface.

- **Min / Max Indication** is used in conjunction with Check Weighing to control external indication or sorting equipment.

- **Totalizing** is used for summation of sequential weighing results of items or articles.

Chapter 10: Weighing

1. To begin weighing, press the power button (I/⏻) to turn the scale ON. The scale will go through its initialization procedure and automatically enter *"Weighing Mode"*. The scale is ready to begin weighing as soon as the stabilization (◣◢) and zero (→0←) indicators appears on the display.
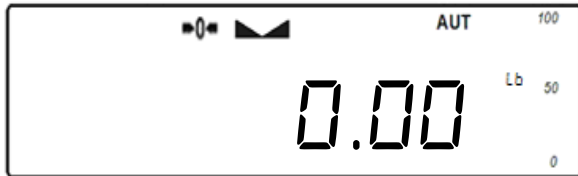

2. When weighing, always hang each load on the scale's hook with caution and make sure it is safety secured. The weighed result may be taken when the stabilization indicator appears on the display.
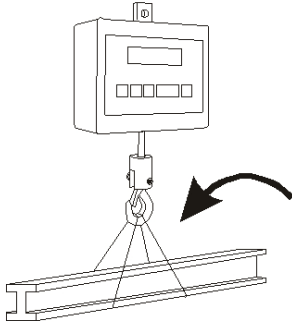

10.1 Taring

1. If a hanging pan is used for weighing, it may be tared. In taring the pan, the scale subtracts the weight of the pan from the gross weight to obtain the net weight.

2. To tare the hanging pan, hang it on the hook. The pan's weight will be shown on the display.
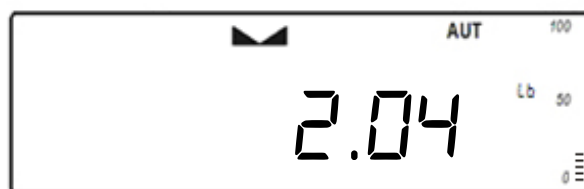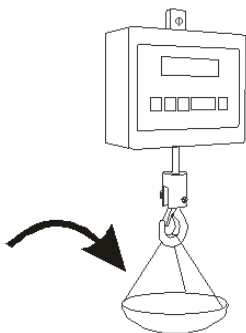
3. Once the stabilization indicator appears on the display, the pan is ready to be tared. To tare the pan, press the "T" button. The display will show a dotted line which indicates the scale has begun the taring process.
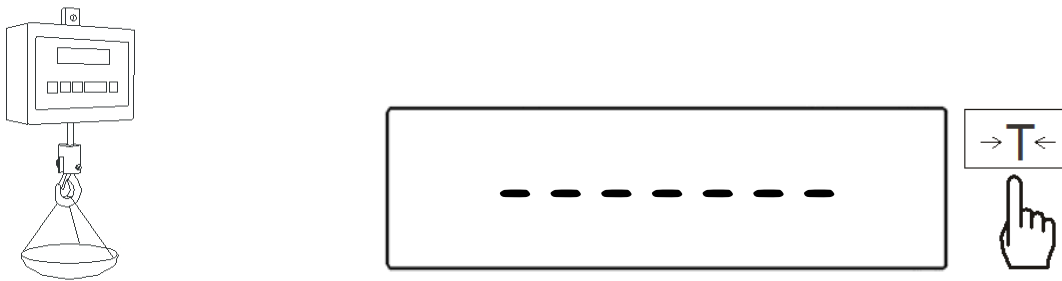
4. When finished taring, the balance will return to weighing and the NET indicator will be lit. The display will indicate 0.00g.
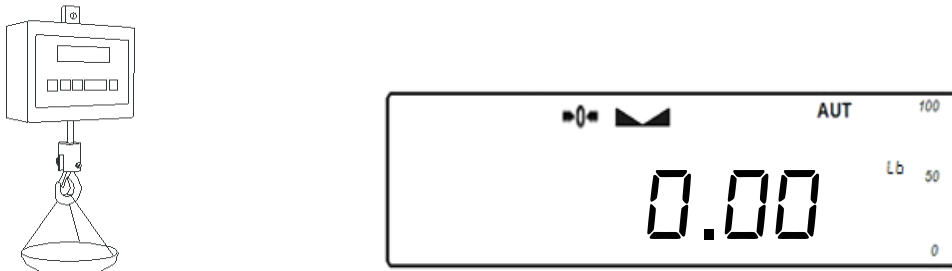
5. Place the unknown weight in the tared hanging pan. The NET weight will be displayed.

6. To obtain the gross weight (Tared pan + unknown weight) press the B/G key.

10.2 Extending the resolution

1. The resolution of the scale can be temporarily increased by pressing the HR key. This temporary increase in resolution can be very useful in scales where d=e. The display resolution is increased for 5 seconds and then reverts automatically.
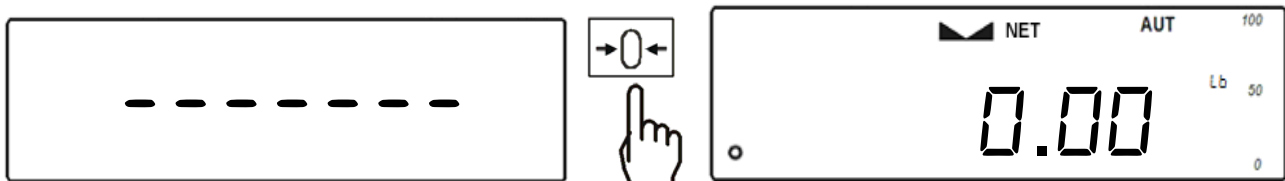

Note: These results are not legal for trade and cannot be sent to a printer or an external computer.

10.3 Zeroing the scale

If the display signals are out of zero condition "—", the scale must be zeroed before weighing.
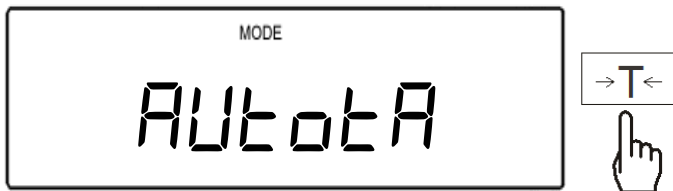

1. To zero the scales press the →0← key.

Chapter 11: Auto-zero (AUtotA)

All BA Scales are equipped with AZSM, the "Auto Zero Setting Mechanism." AZSM automatically maintains a center of zero and 5.0d.

1. Enter the main Menu by pressing the MENU key

2. Select "AutotA" by pressing the T key.

3. To enable Auto-zero press the T key when "Aut on" is displayed, to disable press the T key when "AutoFF" is displayed or select "out" to exit.

Chapter 12: Parts Counting (PC5)

Functions Options:

PCS Off	(PC5oFF)	Disables Parts Counting
PCS On	(Pc5 on)	Enables Parts Counting
PCS ..	(PC5 ..)	Recalls the last Average Pieces Weigh used in for counting
PC Set	(PC 5Et)	Setting a custom sample size
PC UM	(PC Unm)	Setting a custom known Individual Piece Weight
PCS RS	(PC5 r5)	obtaining the average piece weight from secondary higher accuracy scale via RS232

12.1. Using a default sample size setting

1. Hang a container or a hanging pan on the hook while in the weighing and press the T key to tare.
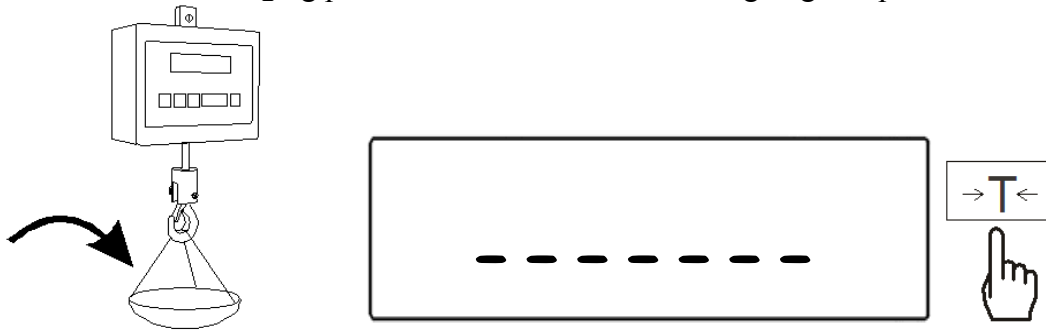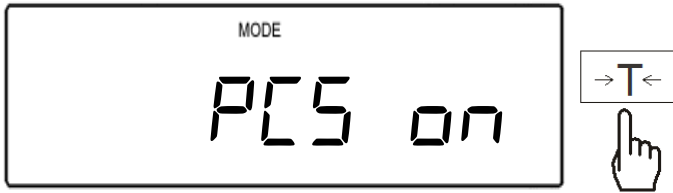
2. Place a sample in the pan. The sample size must equal to one of the pre-set options: 5,10,20,50,100, 200,500, and press the MENU key
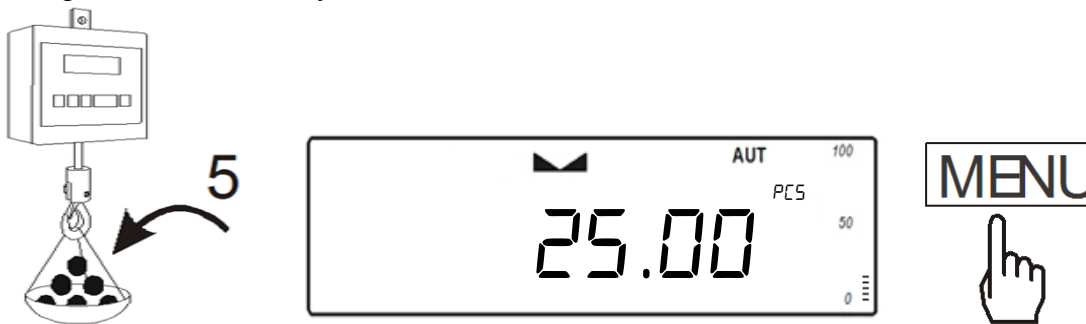
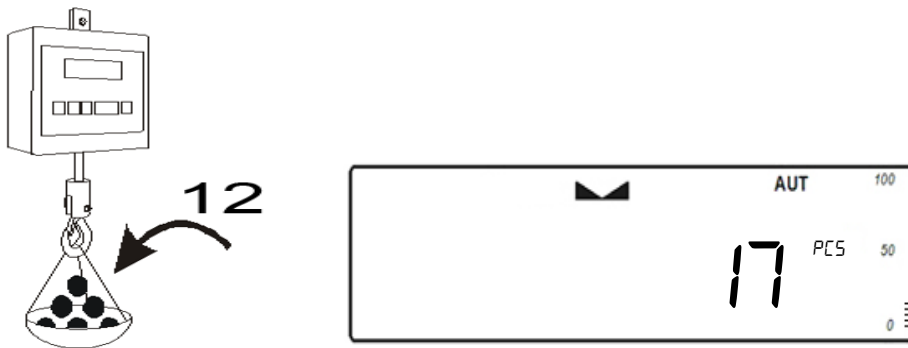3. Wait for PCS to appear on the display and press the T key

4.　Select "PCS on" by pressing the T key.

```
        MODE
      PCS on          →T←
```

5.　Available sample size options will alternate on the display. Press the T key to select a size value equal to the number of the sample placed in the pan.

```
        MODE
      PCS  5           →T←
```

6.　After the sample size has been selected, the scale will display the count of the sample. At any time you can proceed with the count.

```
                        ▼              AUT      100
         12
                            17   PCS    50
                                         0
```
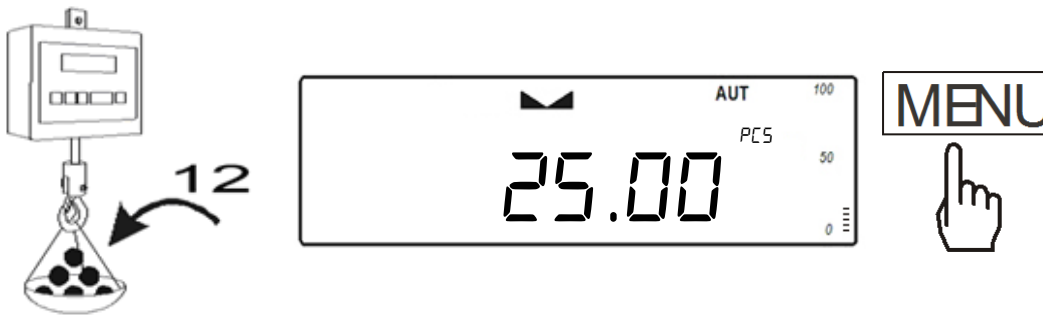
7.　To turn parts counting off, select PCS from the main menu and press the T key when "PCSoFF" is displayed.

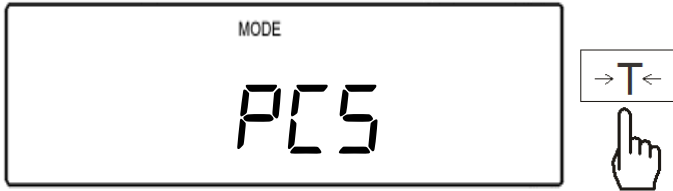## 12.2. Using a custom sample size

1. Hang a container or a hanging pan on the hook while in the weighing mode and press the T key to tare.
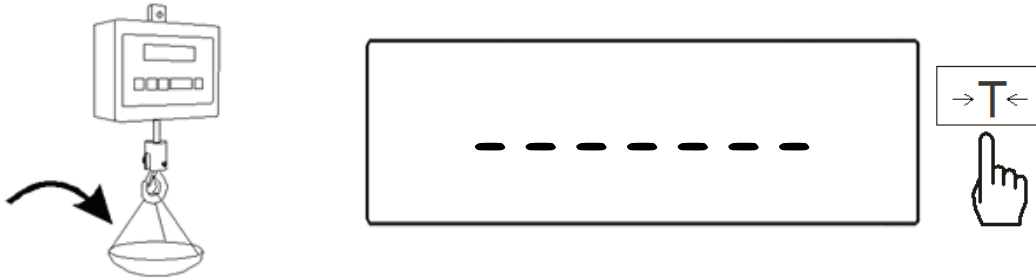
2. Place a desired sample size in the pan and press the MENU key. (i.e. 12 as illustrated).
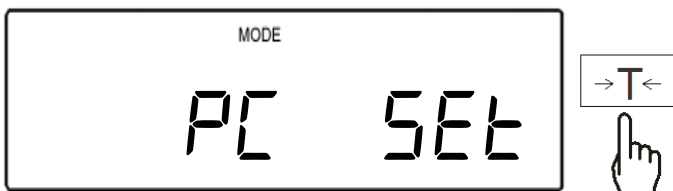

3. Wait for PCS to appear on the display and press the T key


4. Select "PCS on" by pressing the T key.

5. Available sample size options will alternate on the display. Press the T key when "PC Set" is displayed.

6. A dashed line will be displayed indicating to manually enter the value for your sample size in the container. To do so, use the following keys: the →0← key to increment a digit, the T key to accept and go to the next digit, and MENU to accept the entire setting.
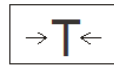
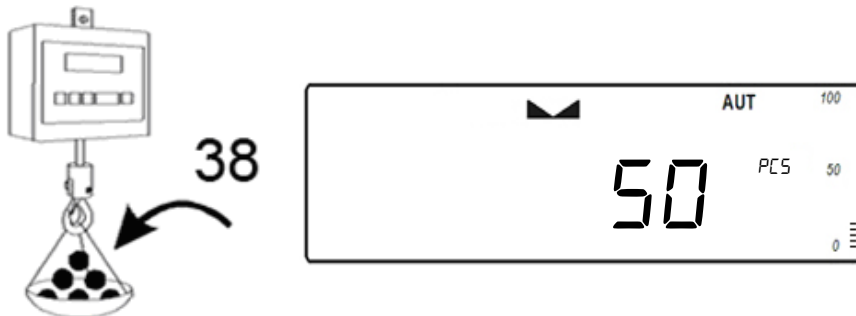| →0←	→T←	MENU
To increment a digit	To accept and go to next digit	To accept entered value

7. Once your custom sample size value has been entered and the MENU key pressed, the scale will display the count of the sample. At any time you can proceed with the count.

8. Once an accurate count has been taken, the contents may be removed from the scale. To turn parts counting off, select PCS from the main menu and press the T key when PCSoFF is displayed.

12.3. Counting based on a known Individual Piece Weight (No Sample Size Required)

1. Hang a container or a hanging pan on the hook and press the T key to tare.
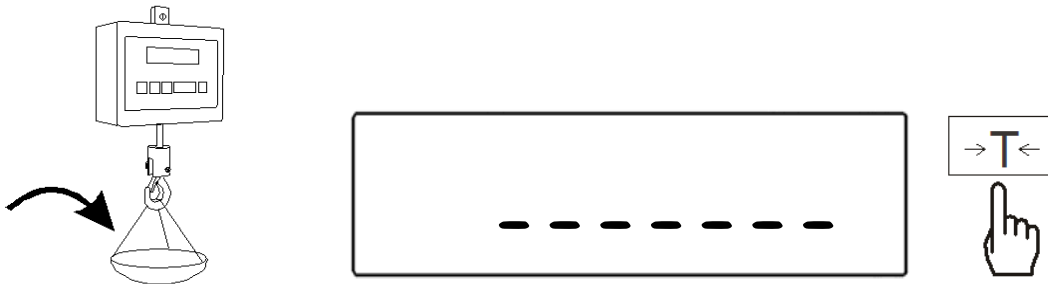
2. Press the MENU key to enter the main menu.

3. Wait for "PCS" to appear on the display and press the T key

4. Select "PCS on" by pressing the T key.

5. Available sample size options will alternate on the display. Press the T key when "PC uM" is displayed.

6. A dashed line will be displayed indicating to manually enter the exact individual piece weight of the counted parts. To manually enter the individual piece weight, use the following keys: the C key to increment a digit, the T key to accept and go to the next digit, the ⮕ key to insert a decimal, and the MENU key to accept the entire setting.

→0←	→T←	⮕	MENU
To increment a digit	To accept and go to next digit	To insert a decimal	To accept entered value
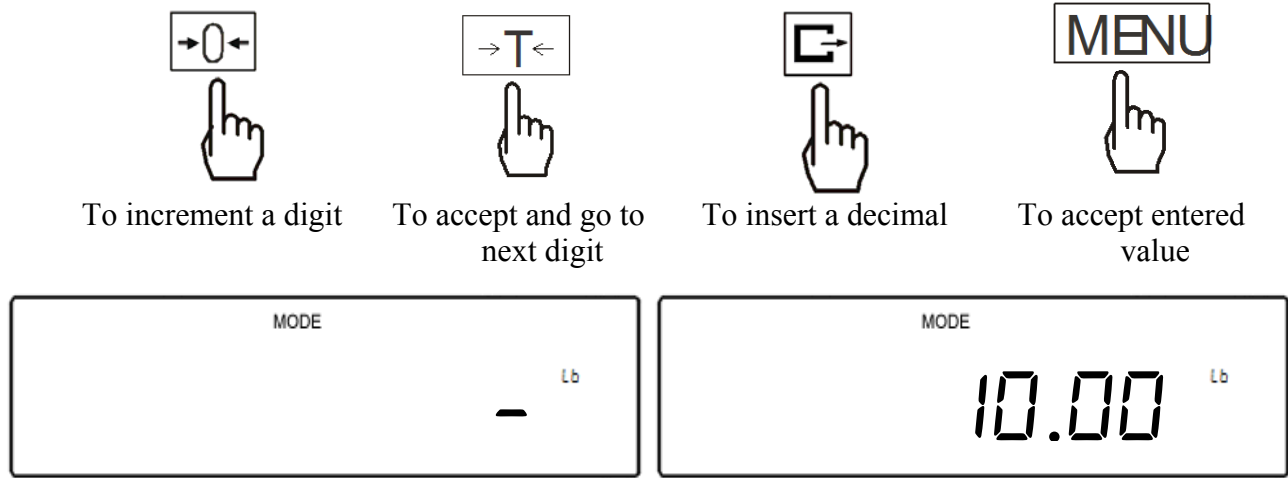
7. Once the individual piece weight is entered and the MENU key pressed, the scale will display "0pcs". At any time proceed with the count.
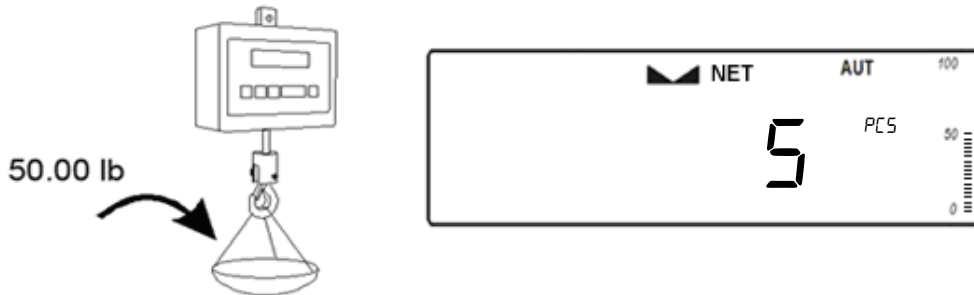
8. Once an accurate count has been taken, the contents may be removed from the scale. To exit parts counting and return to basic weighing, select "PCS OFF" from the parts counting menu.
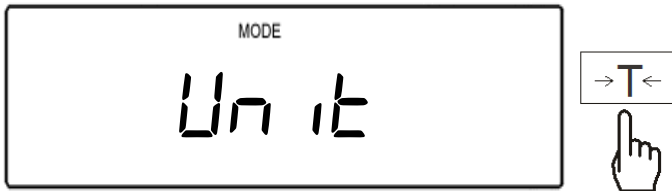
Chapter 13: Units of measure (Unit)

The BA Scales can operate in nine different units of measure: Grams (g), Kilograms (kg), Carats (ct), Pounds (lb), Newton, Grains, Ounces, Ounces Troy, Pennyweight. By factory default, the scale is set to weigh in grams (lb). To select a different unit of measure, follow the steps below.

1. Enter the main menu by pressing the MENU key.   MENU

2. When command "UNITS" is displayed, press the T key.

   MODE
   Unit   →T←

3. The scale will display available units of measure sequentially.

   MODE   MODE
   CArAt   PEnnY

4. When the desired unit is displayed, press the T key to make the selection.   →T←

5. Once the selection is made, the scale will automatically return to the weighing mode.

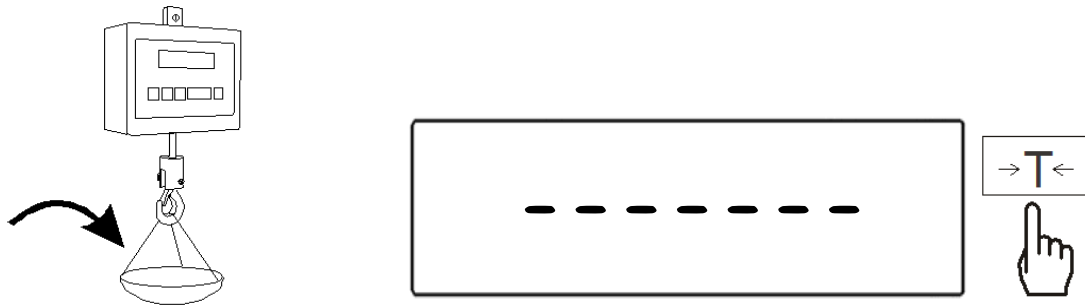# Chapter 14: Percent Weighing (PErC)

Function Options:
PER Off   (PEroFF)   Disables Percent Weighing
PER On   (PEr on)   Enables Percent Weighing

Percent weighing is used to express the weight of an object as a percentage of a stored sample weight.
To use percent weighing, follow these steps:

1. Hang a container or a hanging pan on the hook and press the T key to tare.

2. Once the scale has been tared, place the sample reference weight on the pan.
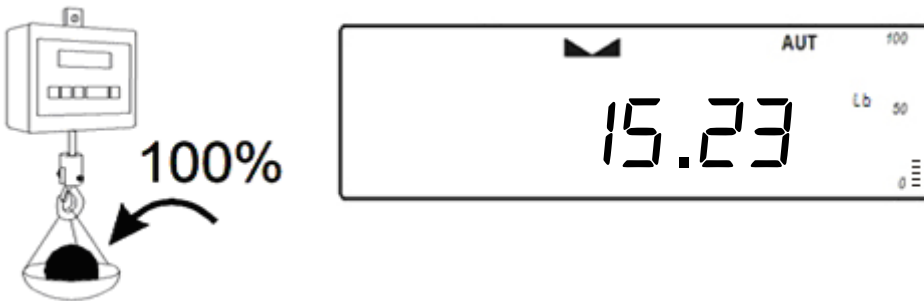
3. The weight of the sample will be displayed as it is placed on the pan. Once the weight of the sample stabilizes and the stability indicator appears on the display, press the MENU key to enter the main menu.

4. When "PERCENT" is displayed, press the T key.
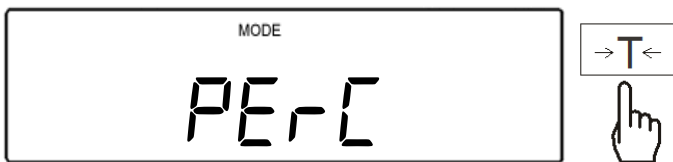
5. Commands "PER OFF" and "PER ON" will be displayed sequentially. To proceed with percent weighing and set the reference sample weight, press the T key when command "PER ON" is displayed.

MODE

PEr   on

→T←
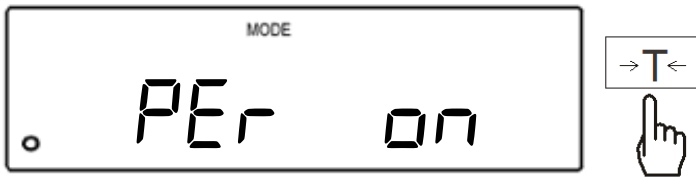
6. Once the reference sample weight is set, the scale will express the weight as a percentage.

NET   AUT   100

100 %

50

0

7. Remove the sample and place an object in the pan. The scale will express the weight of that object as a percentage of the stored sample.

50%

NET   AUT   100

50 %

50

0
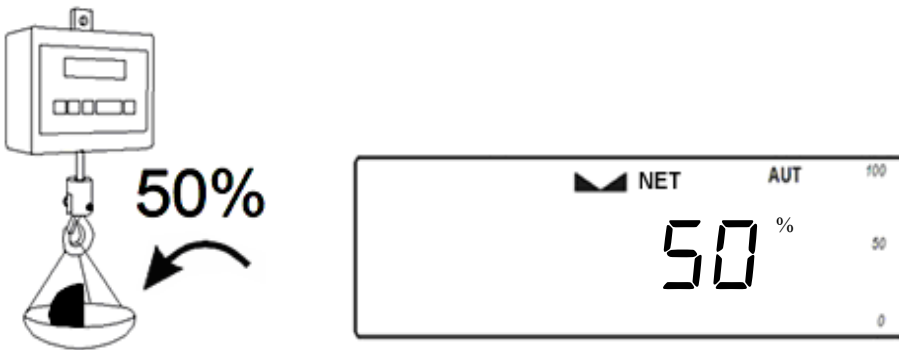
8. To exit percent weighing and return to basic weighing, select "PER OFF" from the percent menu.

Chapter 15: Recipe Weighing (ʳELIPE)

Function Options:

Rec Off   (ʳELoFF)   Disables Recipe Weighing
Rec On   (ʳEL on)   Enables Recipe Weighing
Rec Con   (ʳELLon)   allows to continue recipe making after obtaining a total
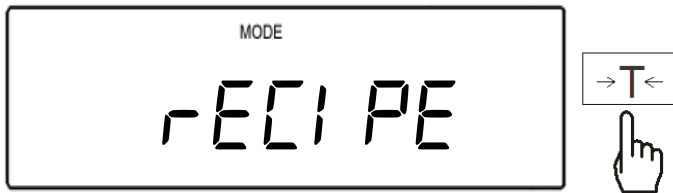
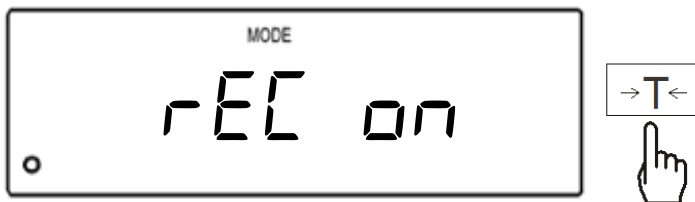1. Hang a container or a hanging pan and press the T key to tare.
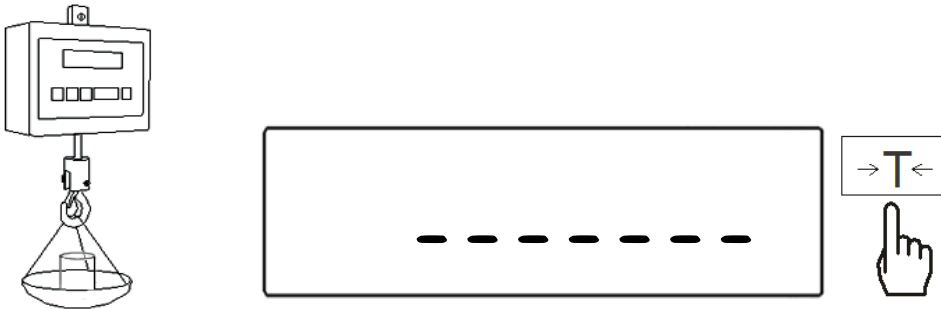
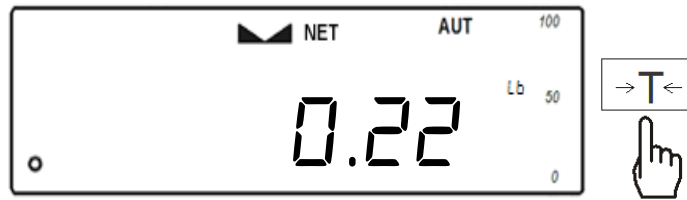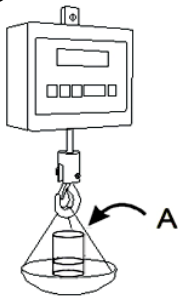2. Press the MENU key to enter the main menu.

3. Wait for "RECIPE" to appear on the display and press the T key


4. Select "Rec on" by pressing the T key.

5. The display will read 0 indicating that you may place the first ingredient into the pan. Once the Weight of the ingredient stabilized press the T key to accept the ingredient weight.

6. Once the weight has been accepted place the second ingredient into the pan. Once the weight of the second ingredient stabilizes press the T key to accept the ingredient weight.
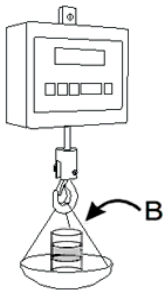
7. Steps 1 and 2 can be repeated until all ingredients are in the pan. Before obtaining a Total make sure that the last ingredient weight was accepted and the display reads 0.
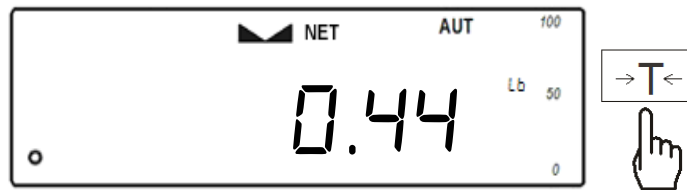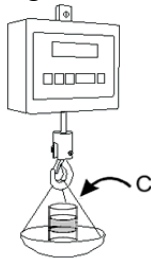
8. To obtain the Total for the recipe press the MENU key, select the "Recipe" function, and then select "Rec Off"
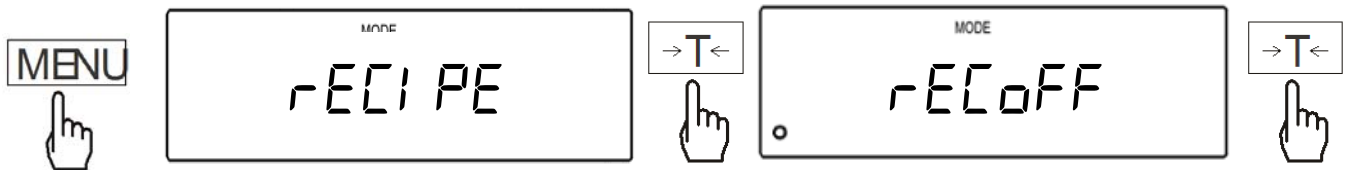
9. The total of all ingredients will be displayed.

NET   AUT   100

A+ B+ C

1.04 Lb   50

0
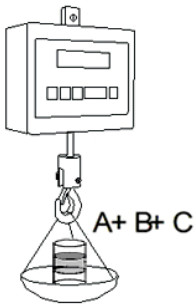
10. To continue Recipe making press the MENU select the "Recipe" function, and then select "Rec Con"

MENU   MODE   rECI PE   →T←   MODE   rECCon   →T←
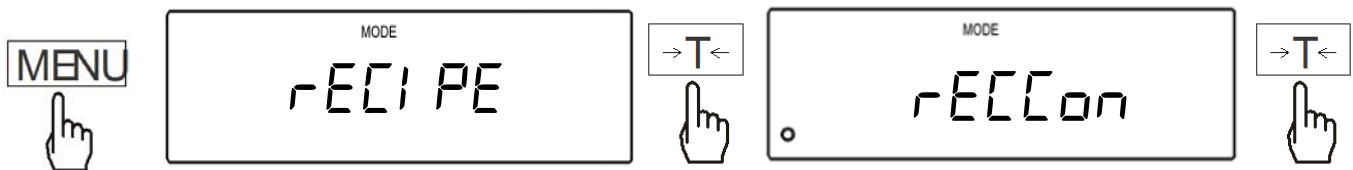
11. Press the T key to accept the current Total and repeat steps 5 through 7 to add more ingredients.

12. To clear and start a new recipe, remove all ingredients from the pan and press the zero key →0←. Once the result is cleared, repeat steps 1 through 9.

Chapter 16: Calibration (ᴄᴀᴌⁱ ᵇ)

Function Options:

CAL On   (ᴄᴀᴌ ᵒⁿ)   Starts Quick Calibration. Recommended when calibrating with a single calibration weight.

CAL Stp   (ᴄᴀᴌ ˢᵗᴾ)   Starts Stepped Calibration. Recommended when calibrating with multiple calibration weights.
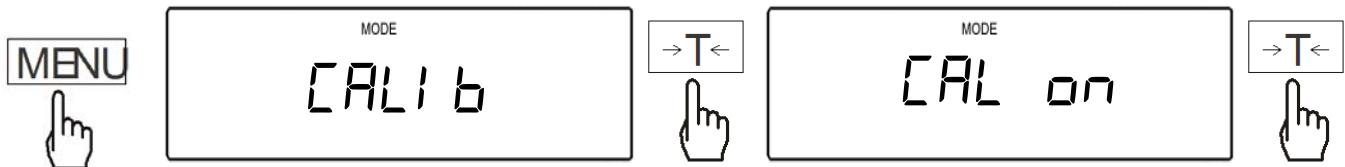
Other   (ᵒᵗʰᴇᵣ)   Calibration with calibration mass not equal to the scale' capacity.
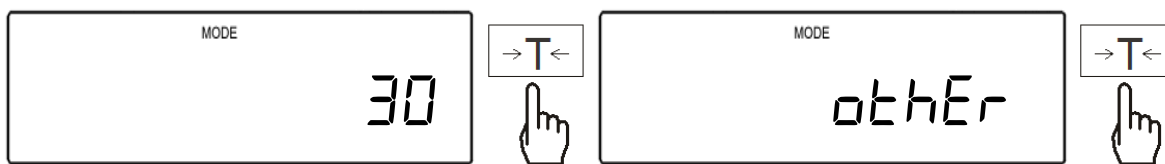
Calibration with an external Calibration Weight should be performed if the scale exhibits erroneous readings or periodically to assure accuracy of all weighing results. The scale should be calibrated with a high accuracy weight equal to its maximum capacity. Before starting calibration, have the appropriate calibration weight available.

16.1 Quick Calibration (calibrating with a single calibration weight).
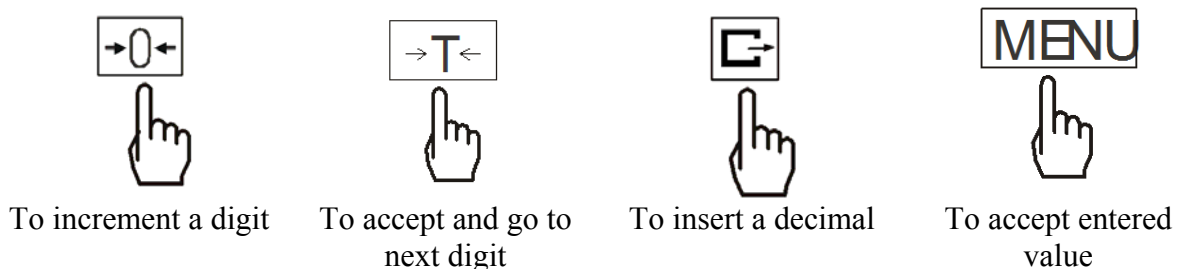
1. Press the MENU key, when the option "Calib" is displayed press the T key, and then select the option "CAL On" by press the T key once again.

2. The scale will display a full a calibration mass equal to the scales capacity i.e."30", and an option to select a different calibration mass"other". To calibrate the scale with a mass value equal to the scales capacity press the T key when the calibration mass value is displayed (proceed to step 4). To calibrate the scale with a mass lower than the scale's maximum capacity, press the T when "other" is displayed (proceed to step 3).

3. If option "other" has been selected a dashed line will be displayed indicating to manually enter the exact value of the calibration mass used to calibrate the scale. To manually enter the calibration value, use the following keys: the C key to increment a digit, the T key to accept and go to the next digit, the ⇨ key to insert a decimal, and the MENU key to accept the entire setting.

| To increment a digit | To accept and go to next digit | To insert a decimal | To accept entered value |

4. The scale will perform a tare and the message "LOAD" will be displayed.

CAL	CAL	CAL
-CAL-	------	LOAd

5. When the message "LOAD" is displayed, place the calibration weight on the scale's hanging pan. Calibration will begin automatically and "WAIT" will be displayed indicating that calibration is in progress.

CAL
WAIt
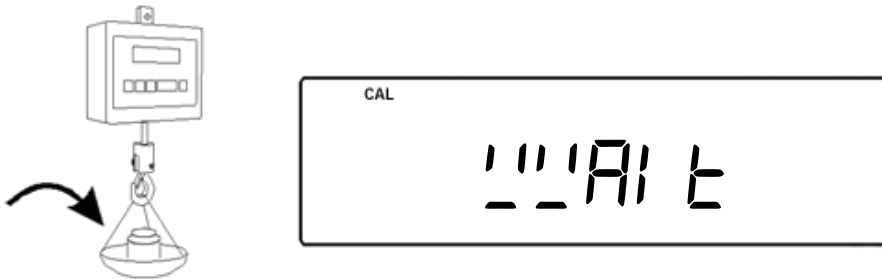
6. When finished the scale will automatically return to the weighing mode, and the calibration weight can be removed from the pan.

NET   AUT   100

30.00   Lb   50

                        0
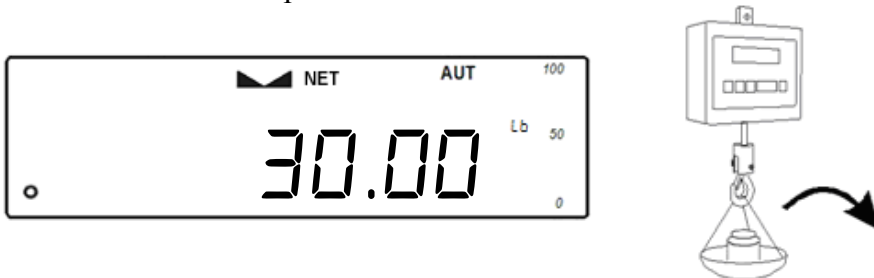
16.2 Stepped Calibration (calibrating with multiple calibration weights.)

1. Press the MENU key, when the option "Calib" is displayed press the T key, and then select the option "CAL Stp" by press the T key once again.
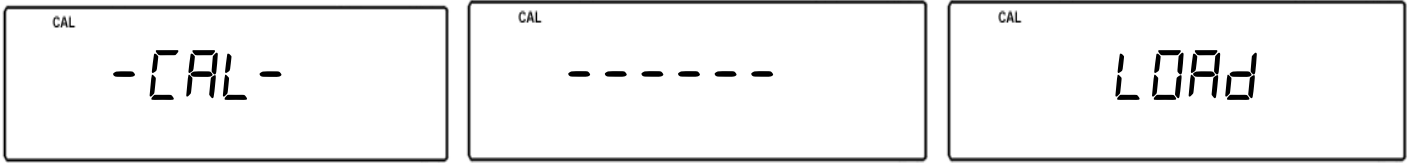

2. The scale will display a full a calibration mass equal to the scales capacity i.e."30", and an option to select a different calibration mass"other". To calibrate the scale with a mass value equal to the scales capacity press the T key when the calibration mass value is displayed (proceed to step 4). To calibrate the scale with a mass lower than the scale's maximum capacity, press the T when "other" is displayed (proceed to step 3).

3. If option "other" has been selected a dashed line will be displayed indicating to manually enter the exact value of the calibration mass used to calibrate the scale. To manually enter the calibration value, use the following keys: the C key to increment a digit, the T key to accept and go to the next digit, the ⮕ key to insert a decimal, and the MENU key to accept the entire setting.
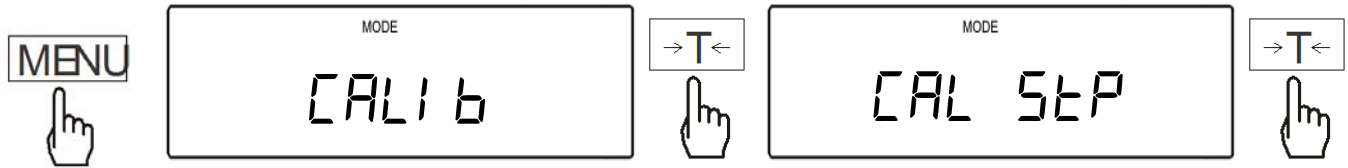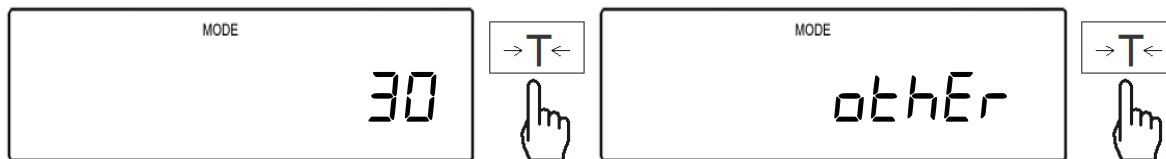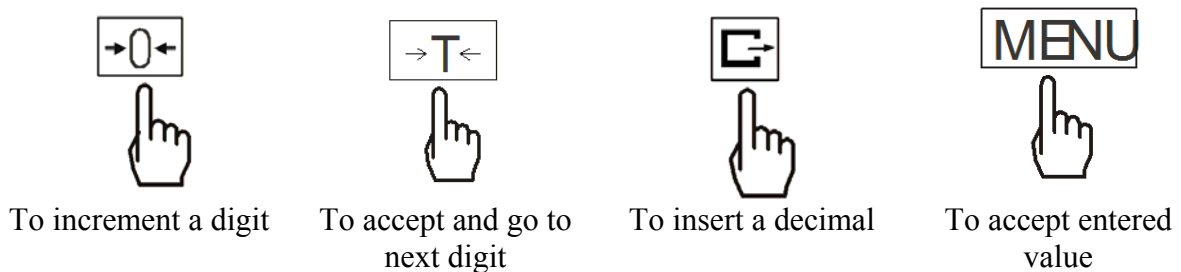

To increment a digit	To accept and go to next digit	To insert a decimal	To accept entered value

4. The scale will display the message "Press Menu". When you are ready to tare the scale press the MENU key.
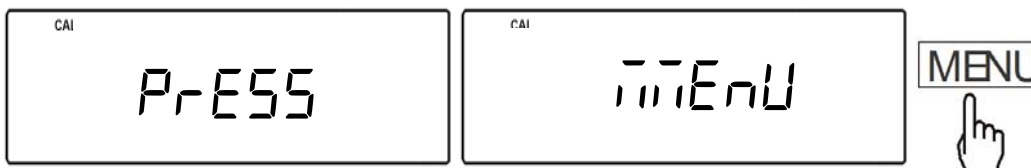
5. The scale will perform a tare and the message "LOAD" will be displayed indicating to place all calibration weights on the pan. After placing all weights on the pan, press the MENU key to initiate the calibrations process.

Caution: Do not press MENU until all calibration weights are on the scale's pan

CAL

‒ ‒ ‒ ‒ ‒ ‒

CAL

LOAd

CAl

PrESS

CAl

MENU

MENU
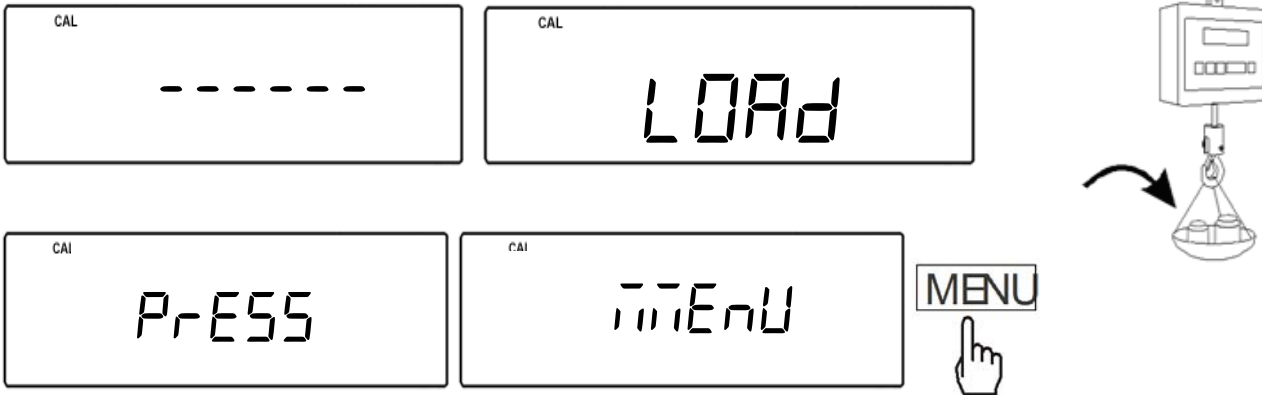
6. Message "CCCCCC" will be displayed indicating that calibration is in progress. When finished the scale will automatically return to the weighing mode and the calibration weights can be removed from the pan.

CAL

CCCCCC

NET   AUT   100

30.00   Lb   50

o   0

Chapter 17: Port 1-RS232 Communication Port Configuration (⌐5⌐ *1*)

After a weighing transaction is completed, a result data receipt can be printed. To initiate printing, press the data transfer key. Data may be sent to a printer or a PC via the Torbal Communication Software.

### 17.1 Data Transmission and Exchange Protocol

Data Transmission (LONG):
Transmission Parameters: 8 bits, 1 stop bit, no parity, baud rate 4800bps,

Exchange data:

- Transmit the weight (equivalent to the Print Key, ⤷, in weighing:

  Computer→Scale: **S I** CR LF (53h 49h 0Dh 0Ah) – initiating signal,
  Scale→Computer: scale sends 16 Bytes of data as follows:

Byte	1	- The charater '-' or space
Byte	2	- space
Bytes	3,4	- digit or space
Bytes	5-9	- digit, comma, or space
Byte	10	- digit
Byte	11	- space
Byte	12	- k, l, c, p or space (for kg,lb,ct,pc, or%)
Byte	13	- g, b, t, c or %
Byte	14	- space
Byte	15	- CR
Byte	16	- LF

- 'Tare the weight' (corresponds to the →T← key in weighing):
  Computer→Scale: **S T** CR LF (53h 54h 0Dh 0Ah),
  Scale→Computer: no response.

- 'Zero the scale' (corresponds to the key →0← in weighing):
  Computer→Scale: **S Z** CR LF (53h 5Ah 0Dh 0Ah),
  Scale→Computer: no reponse.

- 'Turn On / Off the Scale (corresponds to the key I/⏻ in weighing):
  Computer→Scale: **S S** CR LF (53h 53h 0Dh 0Ah),
  Scale→Computer: no response.

- 'Display the MENU' (corresponds to the key *MENU* in weighing):
  Computer→Scale: **S F** CR LF (53h 46h 0Dh 0Ah),
  Scale→Computer: no response.

- Setting the threshold 1 (optional):
  Computer→Scale: **S L** *D1...DN* CR LF (53h 4Ch *D1...DN* 0Dh 0Ah)
  where: *D1...DN* – Threshold value, up to 8 characters,
  Scale→Computer: no response,
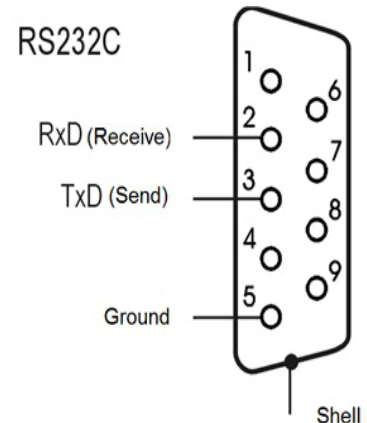
- Example:
  To set 1000g in weight B1.5 (d=0.5g) type:
  S L 1 0 0 0 . 0 CR LF (53h 4Ch 31h 30h 30h 30h 2Eh 30h 0Dh 0Ah).
  To set 100kg in weight B150 (d=50g) type:
  S L 1 0 0 . 0 0 CR LF (53h 4Ch 31h 30h 30h 2Eh 30h 30h 0Dh 0Ah),

- Setting the threshold 2 (optional):
  Computer→Scale: **S H** *D1...DN* CR LF (53h 48h *D1...DN* 0Dh 0Ah),
  where: *D1...DN* – threshold value, up to 8 characters,
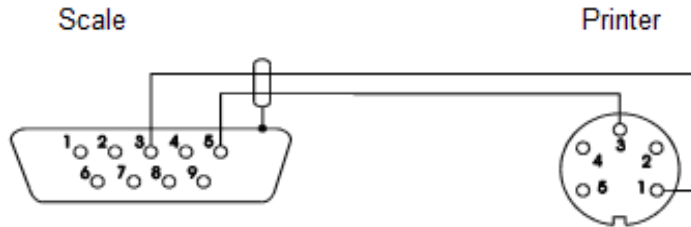 Scale→Computer: no response

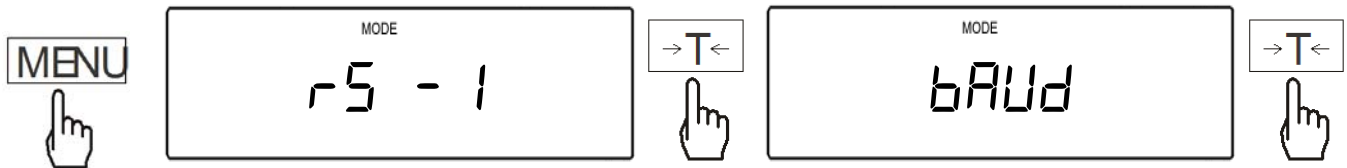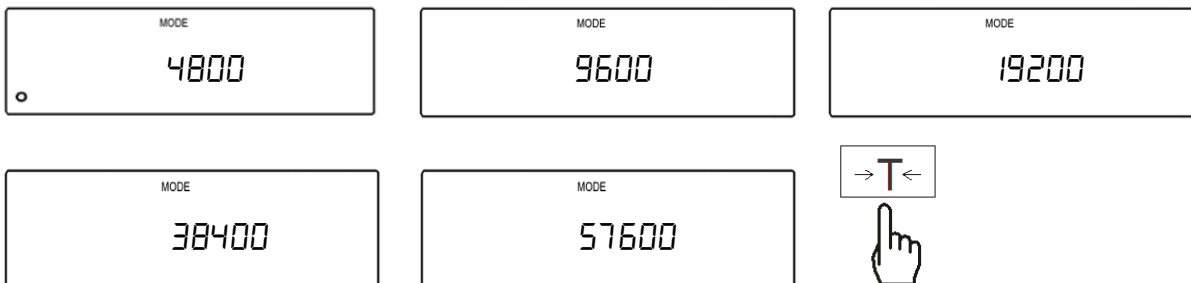*Cable WK-1 Configuration*
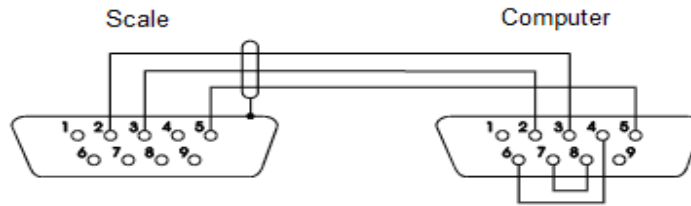
Cable WD-1 Configuration

17.2 Baud Rate

1. Press the MENU key, when the option "Port - 1" is displayed press the T key, and then select the option "Baud" by press the T key once again.

2. The scale will begin to display available baud rates: "4800", "9600", "19200", "38400", and "57600". To make a selection, press the T key when the desired setting is displayed.

17.3 Bites

1. Press the MENU key, when the option "Port - 1" is displayed press the T key, and then select the option "Bites" by press the T key once again.
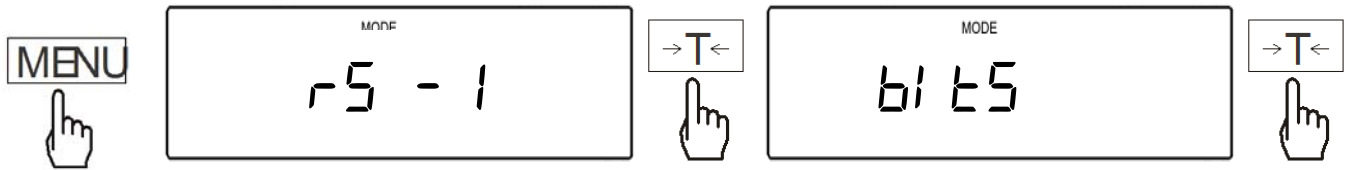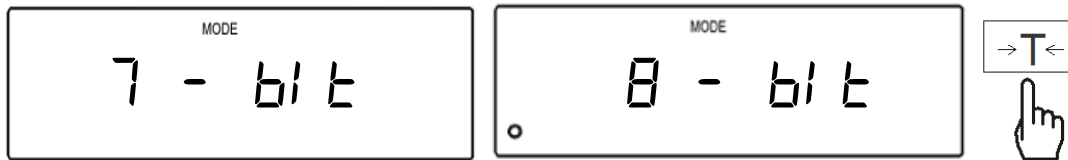
| MENU | MODE
r5 - 1 | →T← | MODE
bI t5 | →T← |

2. The scale will display available Bits settings: "7-bit","8-bit". To make a selection press the T key when the desired setting is displayed.

| MODE
7 - bI t | MODE
8 - bI t | →T← |

17.4 Parity

1. Press the MENU key, when the option "Port - 1" is displayed press the T key, and then select the option "Parity" by press the T key once again.

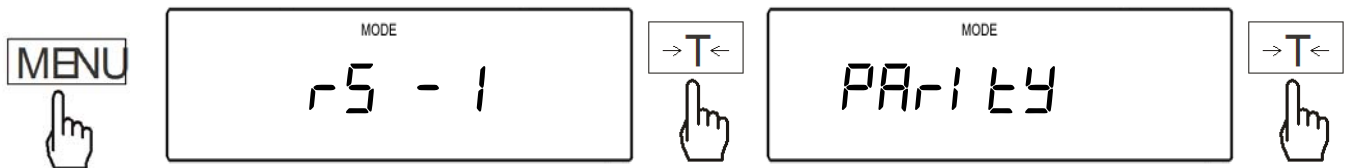| MENU | MODE
r5 - 1 | →T← | MODE
PArI tY | →T← |

2. The scale will display available Parity settings: "none","odd", "even". To make a selection press the T key when the desired setting is displayed.

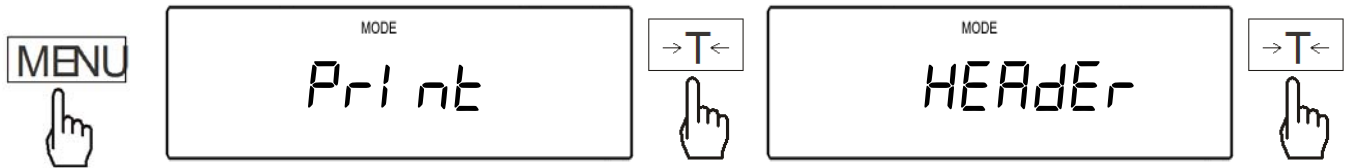| MODE
nonE | MODE
odd | MODE
EuEn | →T← |

Chapter 18: Receipt Printout (*Print*)

A detailed transaction receipt can be printed after weighing has been completed. The receipt can be customized to include the following information:

	MODE HEAdEr	**Header** – includes unit information such as: Mode number, Max Capacity, resolution and Unit Serial number.
	MODE idOPEr	**Operator Id** – shows the ID number of the user which performed the weighing transaction
	MODE dAtE	**Date** – Date of the performed transaction
	MODE tImE	**Time** – Time at which the transaction was performed
	MODE Prn no	**Printout number** – Number of the receipt prenticed in a given day
	MODE Id Prod	**Product Id** – ID number of the product or item weighed
	MODE CoUnt	**Count** – Result obtained in Parts Counting
	MODE APW	**APW** – Average Piece weight of the counted parts in the Parts Counting Functions
	MODE nEtto	**Net** – Net result of the weighing transaction
	MODE tArE	**Tare** – tared weight in the weighing transaction
	MODE brUtto	**Gross** – gross weight of the weighing transaction
	MODE totAL	**Total** – grand total obtained in the totalizing function

18.1 Enabling and Disabling Receipt Fields

1. Press the MENU key, when the option "Print" is displayed press the T key, and then select a desired field by press the T key once again when the name is displayed.

```
MENU        MODE          →T←        MODE         →T←
            Print                    HEAdEr
```

2. The scale will display options "ON" and" Off". To enable the field press the T key when "On" displayed, to disable the field press the T key when "Off" is displayed.

```
   MODE          →T←   ▲      MODE
▲  On                          OFF
                           ○
```
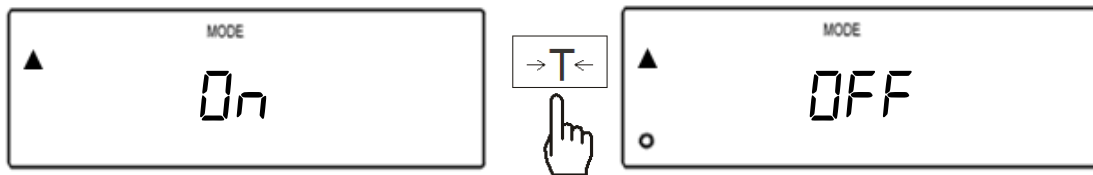
18.2 Assigning Operator and Product ID numbers.

1. From the weighing mode press and hold the MENU key for 3 seconds or until the scales displays "IDPROD" and "IOPER". Select the desired option by pressing the T key.

```
   MODE         MENU        MODE          →T←
   0.00                     IdProd
```
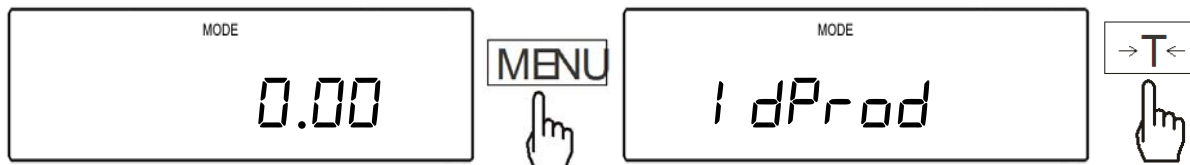
2. A dashed line will be displayed indicating to manually enter ID number. To manually enter the ID number, use the following keys: the C key to increment a digit, the T key to accept and go to the next digit, the ⮕ key to insert a decimal, and the MENU key to accept the entire setting.

```
   →0←          →T←          ⮕          MENU

To increment a digit    To accept and go to    To insert a decimal    To accept entered
                           next digit                                     value
```
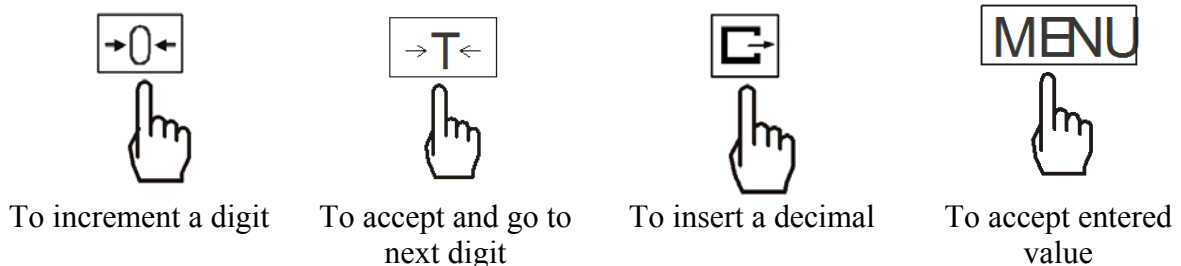
Chapter 19: Dynamic and Animal Weighing (LOC)

Function Options:

LOC Off	(LOC oFF)	Disables the LOC Dynamic Weighing Function
LOC On	(LOC on)	Enables and Starts the LOC Dynamic Weighing Function (Weight integration initiates automatically)
LOC Prn	(LOC Prn)	- Enables and Starts the LOC Dynamic Weighing Function (Weight integration is initiated manually with the press of the Data Transfer Key ⮕)

1. Hang a container or a hanging pan and press the T key to tare.
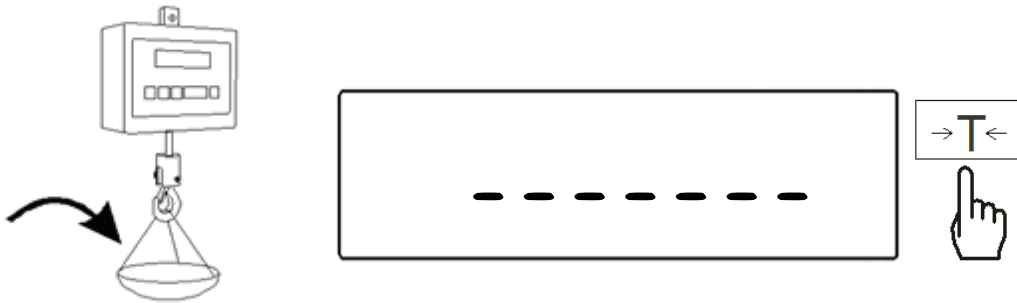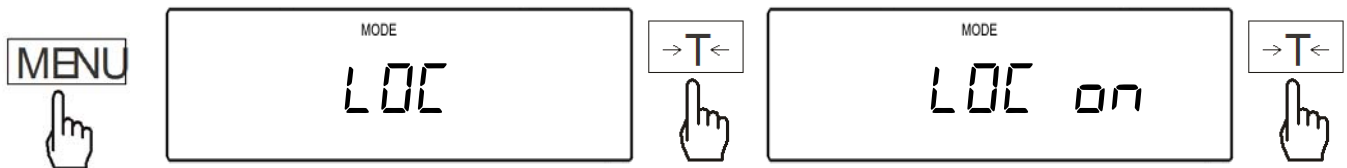

2. Press the MENU key, when the option "LOC" is displayed press the T key, and then select the option "LOC On" or "LOC Prn" by press the T key once again.

3. Place the animal or the moving object on the pan. Weight integration will begin automatically. If "LOC Prn" was selected press the data transfer key to initiate weight integration manually ⮕. While the scale is integrating the weighing result the display flashes.

4. Final result will be automatically sent to a printer or a PC via the RS232 port. During data transmission the word print will be displayed. The final result remains displayed for 30 seconds. To perform the next weighing remove the animal, wait for the scale to display 0 and place the next animal on the pan.

Fulerum Inc.

Chapter 20: Storing Tare Values

20.1 Storing a Tare Value Manually

1. Press the MENU key, when the option "Tare" is displayed press the T key, and then select the option "Tar Set " by press the T key once again.
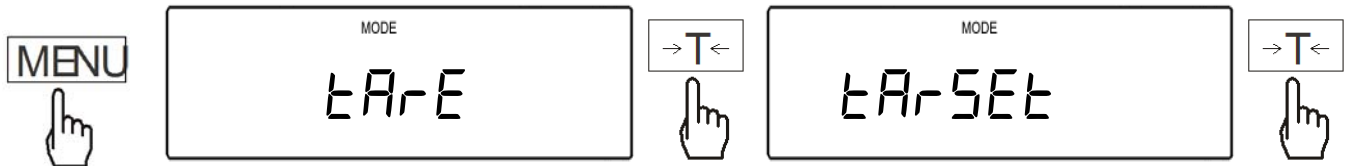
2. The scale will begin to Display tare locations. Locations marked with a dot in the upper left corner of the LED have a stored tare value assigned. To select a tare location or overwrite a current location press the T key when a desired location is displayed, and then select the option "Manual " by press the T key once again.

3. A dashed line will be displayed indicating to manually enter the Tare value. To manually enter tare value, use the following keys: the C key to increment a digit, the T key to accept and go to the next digit, the ⊏→ key to insert a decimal, and the MENU key to accept the entire setting.

| To increment a digit | To accept and go to next digit | To insert a decimal | To accept entered value |

4. Once a tare value has been assigned, the scale will automatically store the value in the selected memory location and return to the weighing mode with the tare value in use.
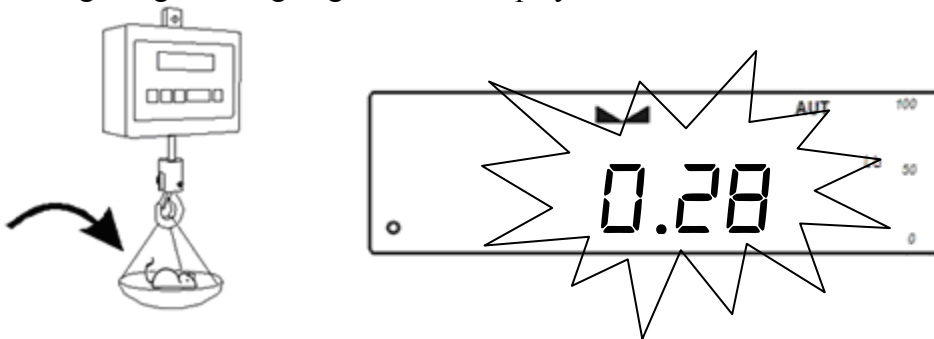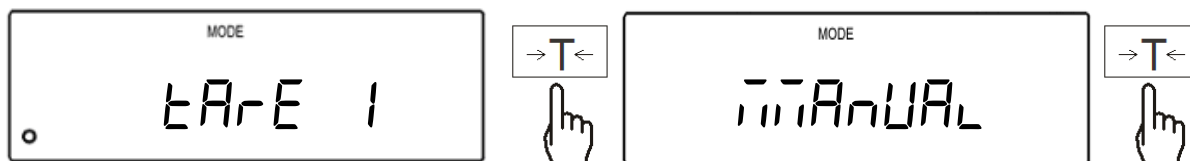
20.2 Storing a Tare Value Automatically

1. Hang a container or a hanging pan and press the MENU key to enter the main menu.

2. When the option "Tare" is displayed press the T key, and then select the option "Tar Set " by pressing the T key once again.
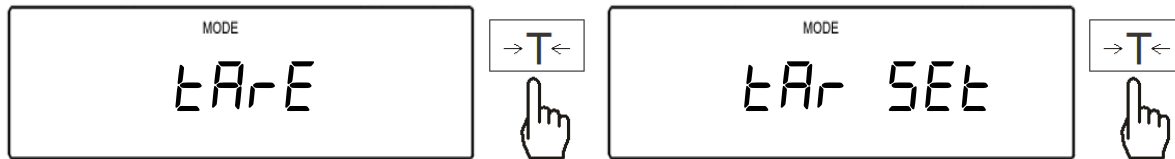
3. The scale will begin to Display tare locations. Locations marked with a dot in the upper left corner of the LED have a stored tare value assigned. To select a tare location or overwrite a current location press the T key when a desired location is displayed, and then select the option "Pan " by press the T key once again.
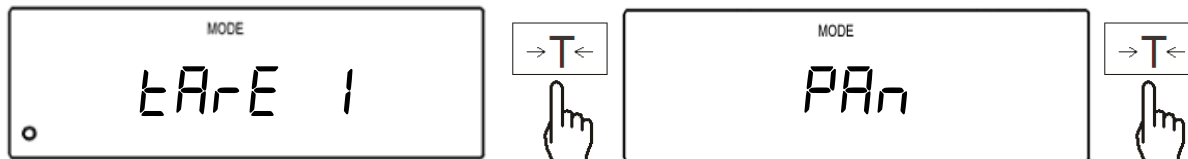
4. The scale will automatically store the value of the pan on the in the selected memory location and return to the weighing mode with the tare value in use.

20.3 Recalling a previously stored tare value.

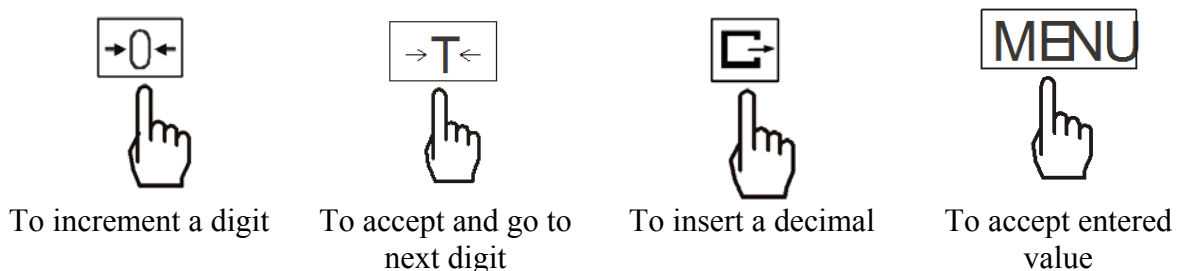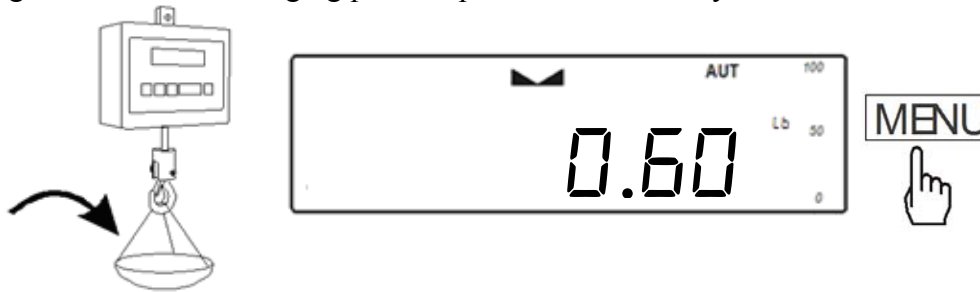1. Press the MENU key, when the option "Tare" is displayed press the T key, and then select the option "Tar On " by press the T key once again.

```
         MODE                          MODE
MENU    ╋╋╋╋╋      →T←              ╋╋╋╋╋      →T←
        tArE      🖑      ∘        tAr on     🖑
🖑
```

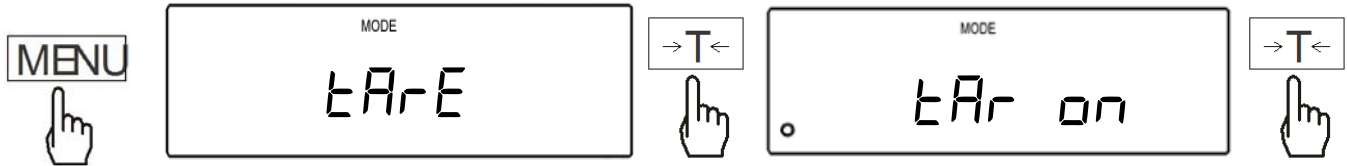2. The scale will begin to Display tare locations. Locations marked with a dot in the upper left corner of the LED have a stored tare value assigned. To select a tare location press the T key when a desired location is displayed.

```
              MODE
            ╋╋╋╋╋          →T←
∘           tArE 1         🖑
```
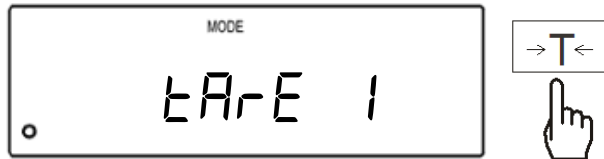
3. The scale will return to the weighing mode with the selected tare value in use.

Chapter 21: Min – Max Weighing (*UP*)

This function allows you to find the maximum (highest) or minimum (lowest) weight in a series of weights.

1. Press the MENU key, when the option "Up" is displayed press the T key, and then select the option "High" or "Low" by press the T key once again.
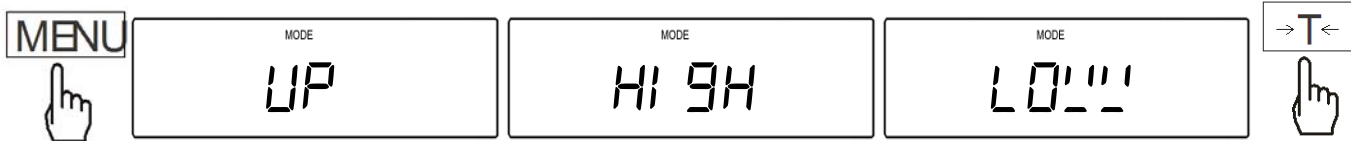
2. The scale will return to weighing and it will begin to hold on the display the highest or the lowest weight. When seeking the highest weight in a series make sure to remove the previous weight from the pan before adding the new weight. When seeking the lowest value weight be sure to add the new weight before removing the previous weight.

Note: Add and remove weights with care in order not to increase the weight unintentionally.
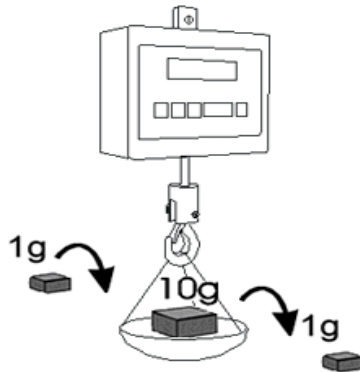
Note: Stability indicator and Auto-Zero is disabled during Min/Max weighing.

Chapter 22: Newton – Force Measurement (nEl'''tO)

This function changes the unit of weight to Newton (N) - 1N ≈0.101971 kg

1. Press the MENU key, when the option "Newton" is displayed press the T key.
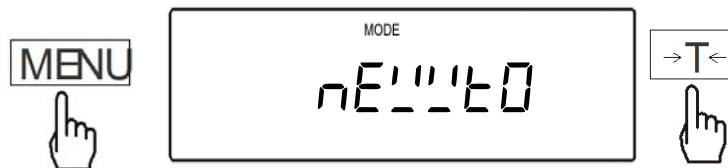
2. The scale will display options "ON" and" Off". To enable Newton force measuring press the T key when "New On" displayed, to disable Newton force measuring press the T key when "New Off" is displayed.

Chapter 23: Filtering (FI LtEr)

This function is used when vibration is encountered during weighing. This may be the result of ground vibration, or a vibrating live load on the pan. Increasing the filter setting will increase the time required for a measurement. The integration time of the measurement is increased thereby eliminating higher frequency vibration.

1. Press the MENU key, when the option "Filter" is displayed press the T key.
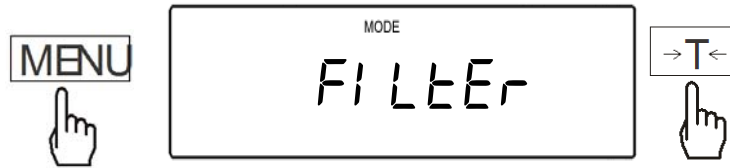
2. The scale will display options "Off" and available filter sensitivity levels "Fil 10, Fil 20, Fil 30 and Fil 40". To select and enable Filtering press the T key when a desired filter level is displayed.

Filter	Sensitivity
Fil 10	Low
Fil 20	Medium
Fil 30	High
Fil 40	Severe

3. To disable filtering select "Fil Off" from the filter menu.

Chapter 24: Date and Time (*dAtE*)

Function Options:

Dat On　　(*dAt on*)　　Enables date and time printing with every weighing result.
Dat Off　　(*dAtoFF*)　　Disables date and time printing.
Dat Set　　(*dAtSEt*)　　Date configuration" allows to set the current date and time.
Dat Pin　　(*dAtPln*)　　Enables PIN access to the Date Configuration.
Dat For　　(*dAtFor*)　　Format selection (United States / Europe).

24.1 Enabling and Disabling Date and Time stamping

1. Press the MENU key, when the option "Date" is displayed press the T key.

2. The scale will display options "Dat On, Dat Off, Dat Set, Dat Pin, Dat For" . To enable Date stamping press the T key when "Dat On" is displayed, to disable press the T key when "Dat Off" is displayed.
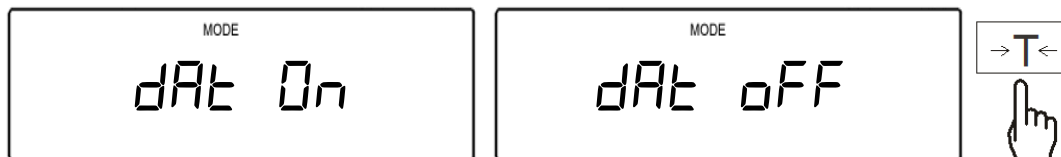
24.2 Setting the current date and time

1. Press the MENU key, when the option "Date" is displayed press the T key, and then select the option "Dat Set " by press the T key once again.
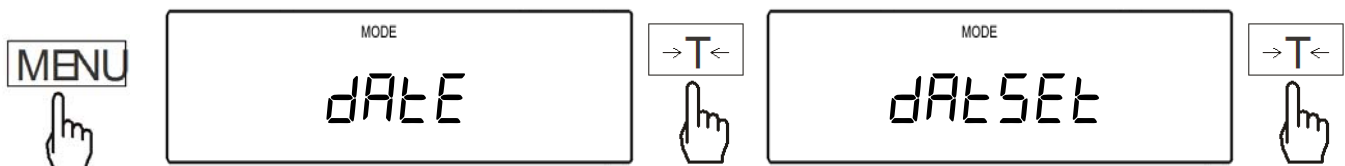
2. The current time will be displayed. To change or to set a new time press the T key
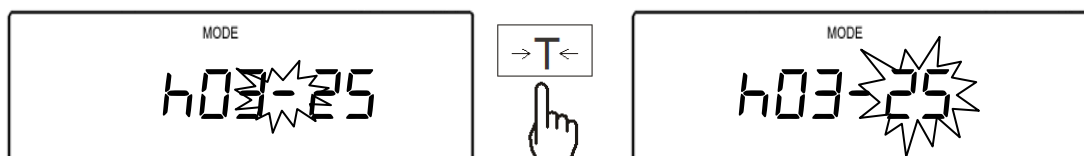
3. Use the following keys to change the current time

To increment a digit   To accept and go to
next digit
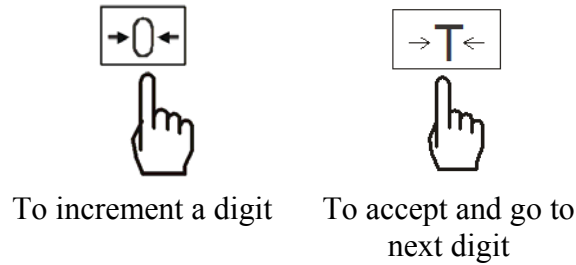
4. Once the time has been set the scale will display "PM" or "AM". Press the T key when the desired setting is displayed.

5. Once the Time has been set, the scale will display the current date. To change or to set a new date press the T key

6. Use the following keys to change the date

To increment a digit   To accept and go to
next digit
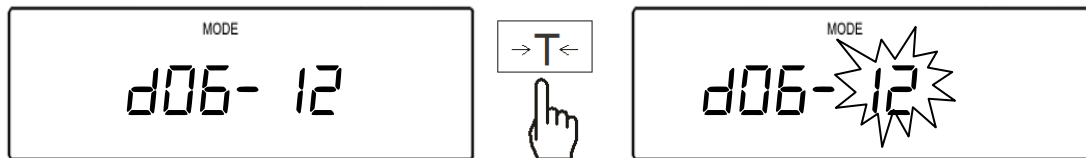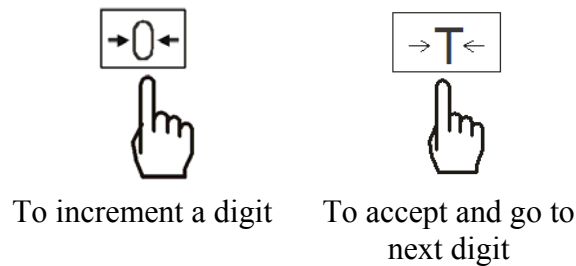
7. Once the time has been set the scale will display the current year. To change the years press the T key.

24.3 Enabling PIN access to the Date Configuration Function.

Configuration of the current date and time can be protected with a PIN. Once set the user is prompted to enter a pin number before time and date change is allowed.

1. To Set PIN for date configuration press the MENU key. When the option "Date" is displayed press the T key, and then select the option "Dat PIN " by press the T key once again.

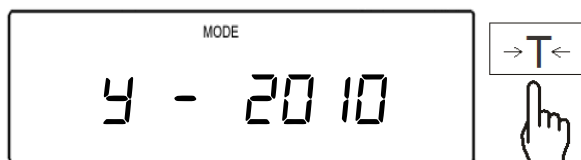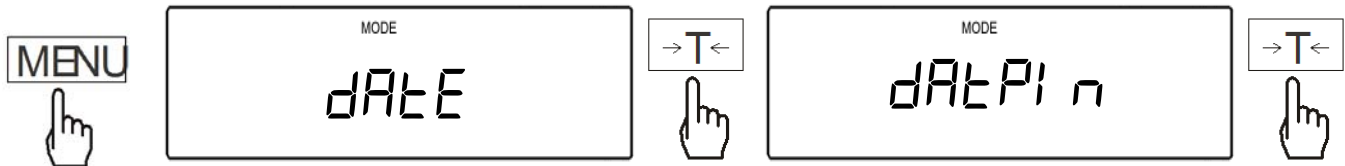2. The scale will display a dashed line indicating to enter a desired PIN. To enter the PIN, use the following keys: the C key to increment a digit, the T key to accept and go to the next digit, the ⇨ key to insert a decimal, and the MENU key to accept the entire setting.

| To increment a digit | To accept and go to next digit | To insert a decimal | To accept entered PIN |
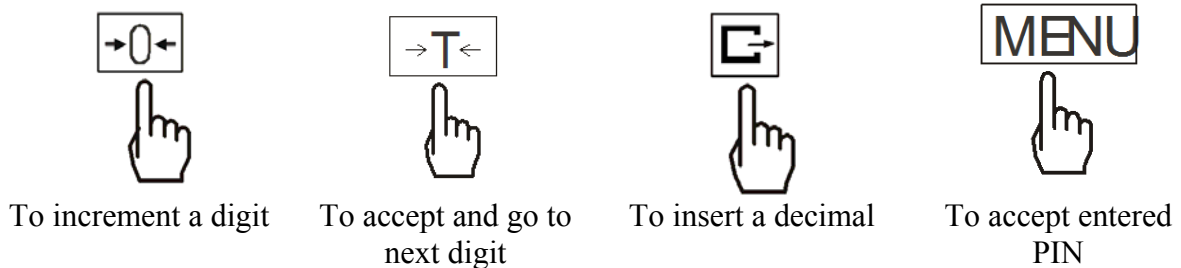
3. After setting the PIN, you will be asked to key in the pin in order to access the "Date and Time" feature. To remove or disable PIN access, enter the "Date" function and key-in the current PIN. After accessing the "Date" menu, select option "DatPin" and do not enter a new PIN number. Simply press the MENU key with the dashed line displayed.

Chapter 25: Threshold Check Weighing (thr)

Threshold check weighing is used to check whether a weight of an object falls within specified threshold limits.

Function Options:

Thr Off   (throFF)   Disables threshold and check weighing.
Thr On   (thr on)   Enables threshold weighing and sets function parameters.
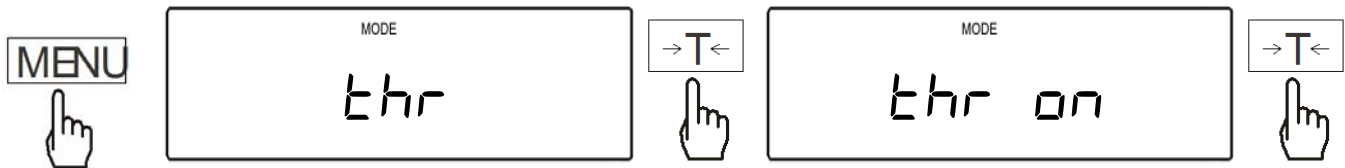Thr Prn   (thrPrn)   Prints currently set parameters.
Dat Cfg   (thrCFG)   Sets output mode for the opto-isolator (Pulse Mode / Level Mode).

25.1 Enabling check weighing and setting threshold limits.

1. Press the MENU key, when the option "thr" is displayed press the T key, and then select the option "thr On" by press the T key once again.

2. The scale will begin to display threshold limits. To set the Lower Limit waits for "Set-1" to display and press the T key. To set the Upper Limit waits for "Set-2" to display and press the T key. To set the minimum weight value that should be used in check weighing select "Set-3".

3. The scale will display a dashed line indicating to enter the limit value. To enter the value, use the following keys: the C key to increment a digit, the T key to accept and go to the next digit, the ⮕ key to insert a decimal, and the MENU key to accept the entire setting.

To increment a digit   To accept and go to next digit   To insert a decimal   To accept entered value

4. After setting all limit sets, select "Set-0" in order to return to weighing with the limits enabled.

MODE

SEt - 0

→T←

5. To perform check weighing places the weigh on the Pan. The result is indicated by a dashed line located on the left side of the display.

LOW	OK	HIGH
MODE _ 0.50	MODE = 1.10	MODE ≡ 3.20

6. To disable check weighing enter the "thr" menu and select "thr Off"

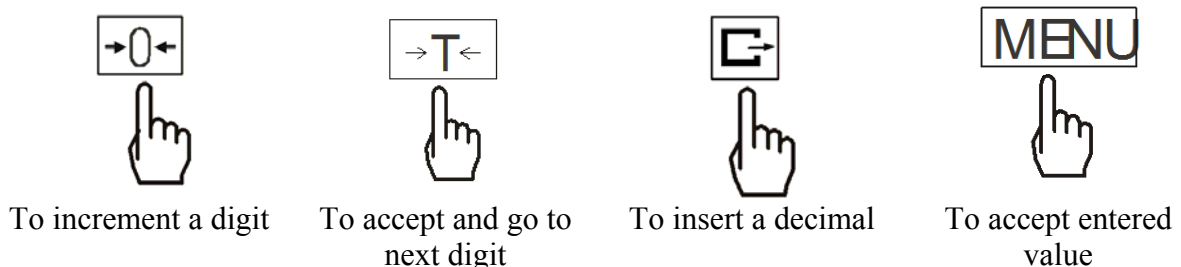7. To view the threshold limits Press the MENU key, when the option "thr" is displayed press the T key, and then select the option "thrPrn " by press the T key once again.
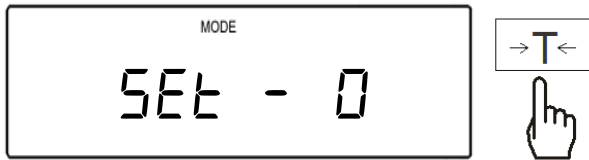
MENU

MODE

thr

→T←

MODE

thrPrn

→T←
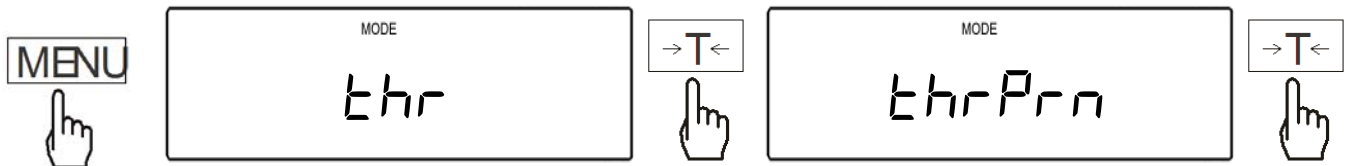
8. Current limit sets will be displayed and transmitted via the RS-232 port. To view all limits use the T key.

LOW	HIGH	Min
MODE _ 1.00	MODE ≡ 3.00	MODE 0.20

Chapter 26: Totalizing (totAL)

Function Options:
Tot Prn   (totPrn)   Displays and prints transaction total. (Does not reset the sum value)
Tot Off   (totoFF)   Displays and disables the transaction total. (Resets the sum Value)
Tot o   (tot o)   Prints measurement weigh before adding.
Tot -   (tot -)   Adds measurement weigh to the total without printing

1. Hang a container or a hanging pan and press the T key to tare.
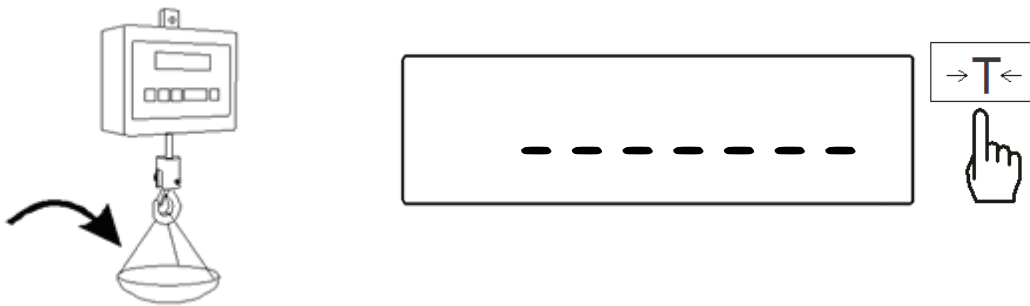
2. Press the MENU key, when the option "Total" is displayed press the T key, and then select the option "Tot o " or "Tot –" by press the T key once again.
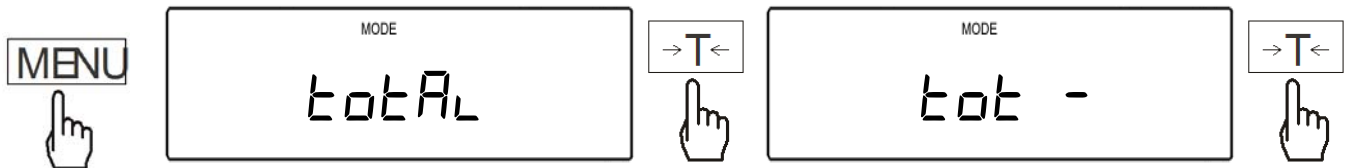
3. The display will read 0 indicating that you may place the first object into the container. Once the weight of the object stabilized press the data transfer key ⇨ to accept and add the object weight to the total.
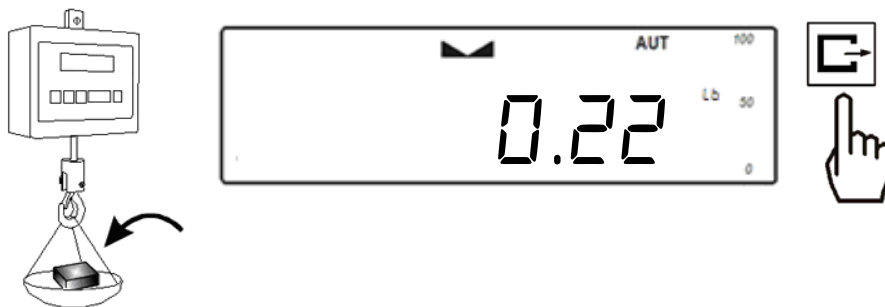
4. Once the weight has been added, remove the object from the weighing pan.
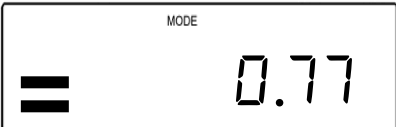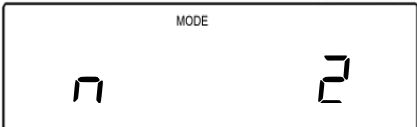
5. Wait for the scale to return to 0 and place the second object on the pan. . Once the weight of the object stabilized press the data transfer key ⇨ to accept and add the second object weight to the total.

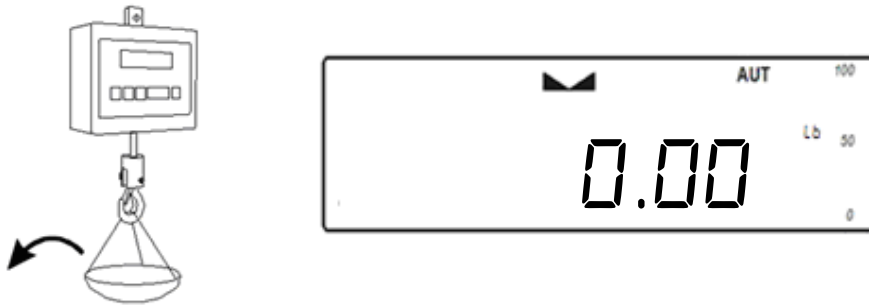6. Follow steps 3 through 6 until all object have been added. To view the total of the transaction press the MENU key, when the option "Total" is displayed press the T key, and then select the option "Tot Prn" by press the T key once again.

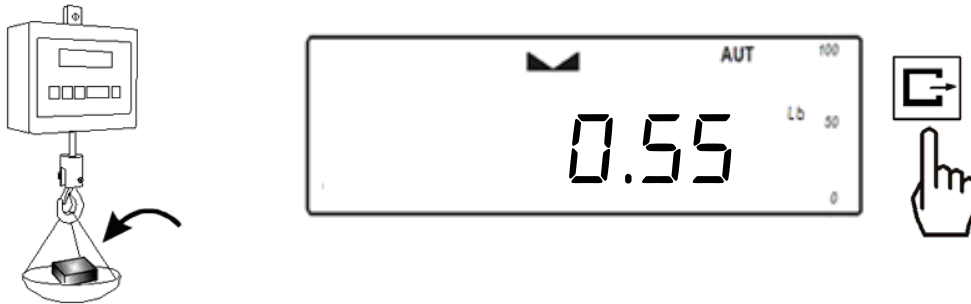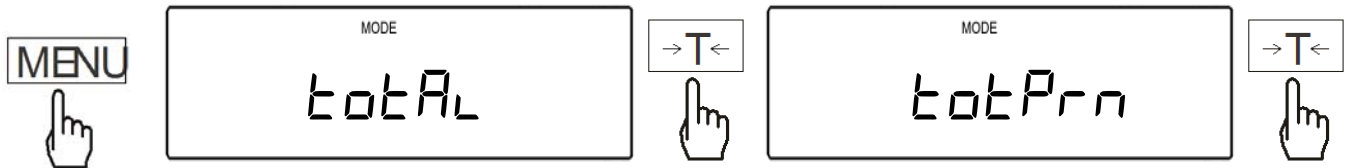7. The total will be displayed. To view the number of measurements added and the average press the MENU key.

Total	Number of measurements	Transaction Average
MODE ☰ 0.77	MODE n 2	MODE ☰ 0.39

Chapter 27: RF Channel Setup for Remote Control (rF chAn)

In order to use the Crane Scale with the remote control, both the BAS Crane Scale as well as the remote control must be set to the same RF Channel. To set or change an RF Channel follow the steps below:

1. Press the MENU key, when the option "RF Chan" is displayed press the T Key.
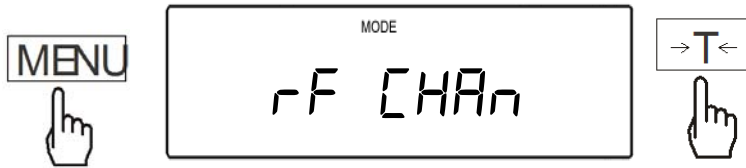
2. The scale will display available channels. To set a desired channel presses the T Key.
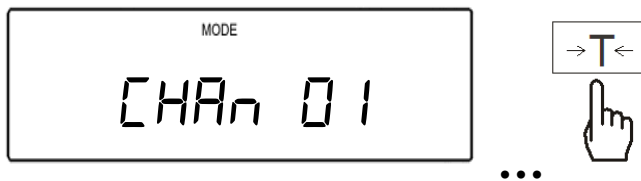
Chapter 28: LCD Back Light (b_LI9Ht)

Function Options:

B_L OFF	(b_L OFF)	Disables LCD back light.
B_L On	(b_L On)	Enables LCD back light.
B_L ECO	(b_L ECO)	Disables the LCD back light after 30 second inactivity "no weight applied to the pan or the pressed keys."
B_L BAT	(b_L bAt)	Disables back light after 30 second inactivity when operating the unit on batteries "no weight applied to the pan or the pressed keys."

To configure or disable the LCD back light follow the steps below:

1. Press the MENU key, when the option "B_Light" is displayed, press the T Key.
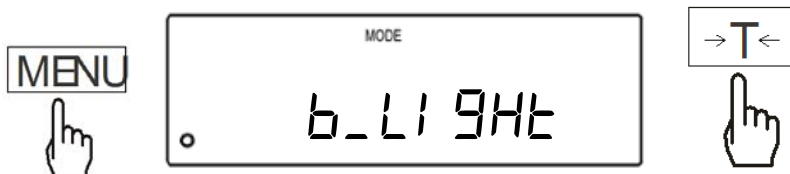
2. The scale will display available back light settings: "B_L On", B_L Off, "B_L ECO" and "B_L BAT".

3. To make a selection press the T key when desired back light setting is displayed.

Chapter 29: Auto OFF (*AUtoOFF*)

Function Options:

AUT OFF	(*AOF oFF*)	Disables the Auto OFF Function. Scale is always on.
AUT On	(*AOF on*)	Enables the Auto Off Function. Scale automatically turns OFF after 5min. inactivity (no weight applied or keys depressed).
AUT BAT	(*AOF bAt*)	Enables the Auto Off Function. Scale automatically turns OFF after 5min. inactivity (no weight applied or keys depressed).

To configure or disable the LCD back light follow the steps below:

1. Press the MENU key, when the option "Aut Off" is displayed, press the T Key.
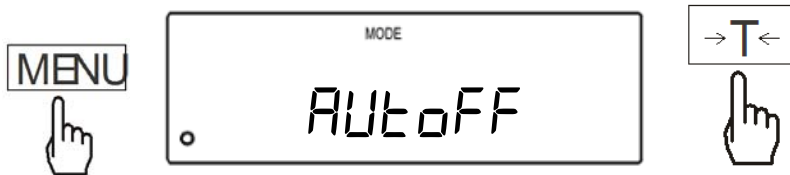
2. The scale will display available back light settings: "AOF Off", AOF On, and "AOF BAT".

3. To make a selection press the T key when desired Auto Off setting is displayed.

Chapter 30: Changing to Grams (g) or Pounds (lbs) (Lb_bAL)

The function "lb bal" is used to configure the unit to weigh in grams (g) or pounds (lb). "Lb Bal" optimize the scale's accuracy and resolution disabling or enabling ponds (lb) as a default unit of measure.

1. To disable lb (pounds) as default unit of measure and set the scale weigh in grams (g) .Press the MENU key, when the option "lb_bal" is displayed press the T key.
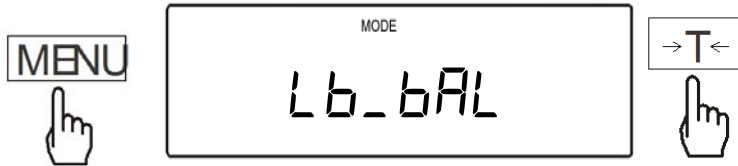
2. The scale will display options "Lb Off" and" Lb On". To select disables pounds and select grams as the default unit of measure press the T key when "Lb Off" is displayed, to disables grams and select pounds and the default unit of measure press the T key when "Lb Ob" is displayed.

Chapter 31: Menu Customization (ACtI U)

The Active function is used to customize the scale's Main Menu. This feature should be used to deactivate functions or features that are not used. Deactivated functions will not appear in the Main Menu which will simplify its use. To activate or deactivate features or function follow the steps below.

1. Press the MENU key, when the option "Active" is displayed press the T key, and then select a desired function or feature by press the T key once again when the name is displayed.

```
MENU        MODE              →T←        MODE              →T←
            ACtI U                       AutotA
```

2. The scale will display options "ON" and" Off". To disable a function from appearing in the Main Menu press the T key when "Off" is displayed, to enable a function to have it appear in the Main Menu press the T key when "On" is displayed.
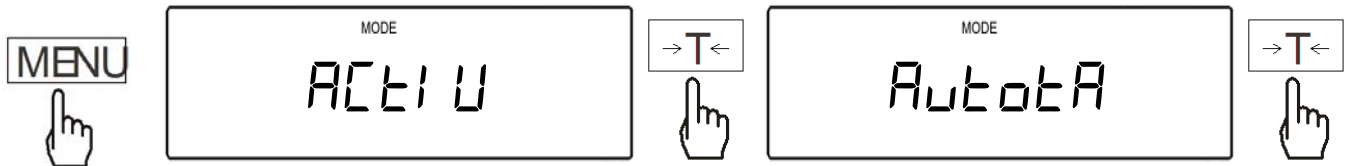
```
     MODE              MODE              →T←
     On                OFF
```

Chapter 32: Restoring Default Settings (dEFAUL)

To restore the scale's factory settings follow the steps below

1. Press the MENU key, when the option "Default" is displayed press the T key.

```
MENU        MODE              →T←
            dEFAUL
```

2. The scale will display options "Yes" and" No". To restore the scale's factory setting press the T key when "Yes" is displayed. To cancel press the T key when "No" is displayed.

```
     MODE              MODE              →T←
     YES               nO
```

Chapter 33: Common Errors and Troubleshooting

Error or Indicator	Cause	Explanation / Solution
- - - -	Below zero	Re-zero the scale by pressing the →0← key.
- -	Taring is not allowed	Place a weight on the pan before taking a tare.
- -	Re-zeroing is not allowed	Remove weight from pan and clear stored tare values.
L	Pan error	Make sure that pan is properly seated on the pan support.
H	Exceeded capacity	The scale has exceeded its weighing capacity. Reduce the weight.
Err - b	Pan not cleared on power-up	The pan was not empty while the scale was initiating at startup. Clear the pan and restart the scale.
Sapl LO (Parts Counting)	Average piece weight is too low	The average piece weight is lower than 3e. Be sure that individual piece weight is greater than 3e.
Sapl LO (Percent Weighing)	Sample reference weight is too low	The sample reference weight is lower than 100d. Increase the sample weight.
The scale will not turn on	Possible power failure	Check the power AC adapter connection.
Weighing results are not accurate	Inaccurate calibration	Calibrate the scale.
Weighing result will not stabilize	Irregular environment	Eliminate drafts or vibrations.

Chapter 34: Maintenance

Cleaning and maintaining your Scale:

- Before cleaning the scale always unplug the A/C adapter from the electrical outlet.
- Use a soft, slightly damp cloth to clean the exterior housing of your scale,.
- Wipe the scale gently. Do not allow any liquid to enter into the scale.
- Do not apply extensive pressure to the LCD or the LED display.
- Do not use chemicals or benzene when cleaning the surface. Corrosive chemicals may damage the finish.
- Alcohol may be used only to clean the scale's stainless steel pan or the draft ring.

Fulcrum Inc.

Chapter 35: Limited Warranty

PURCHASER'S 12-MONTH WARRANTY

Warranty is valid only if the attached warranty registration card is completed and returned within 30 days.

This product is a precision device made to exacting standards of scientific accuracy. It is guaranteed to have been adjusted and inspected for proper workmanship and performance, and certified for its currently advertised specifications before shipment.

Fulcrum Products are warranted against defects in material and workmanship under normal use and service. This warranty is extended only to the first purchaser. This limited warranty will not apply if, upon inspection, it is found that the product was tampered with, misused, overloaded, or abused, mishandled, placed in an improper environment, improperly installed or adjusted, used for a purpose other than that for which it was designed, or repaired by unauthorized personnel.

Fulcrum's liability under this warranty is limited to furnishing labor and parts necessary to remedy the defect covered by this warranty and restore the product to normal operating condition. Purchasers may be charged a minimum repair fee for in-warranty products returned for repair if those products are determined to be problem-free.

To make a claim under this limited warranty, obtain an RMA number from Fulcrum and return the product, carefully packed in its original packaging, shipping prepaid, with the RMA number written on the return package.

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