# MWP SERIES

## High Precision Balance

**OWNER'S** MANUAL

CAS

## 1. INTRODUCTION

The scale is very simple to use and are applicable for general weighing.The user can also use the parts counting and percent weighing functions for special applications. Special functions are available for weighing in up to 8 different units of weight.

For safe and dependable operation of this scale, please comply with the following **safety precautions:**

● Verify that the input voltage printed on the AC Adapter and the plug type matches the local AC power supply.
● Make sure that the power cord does not pose a potential obstacle or tripping hazard.
● Disconnect the scale from the power supply when cleaning the scale.
● Do not operate the scale in hazardous or unstable environments.
● Do not immerse the scale in water or other liquids.
● Do not drop loads on the platform.
● Use only approved accessories and peripherals, as available.
● Operate the scale only under ambient conditions specified in these instructions.
● Service should be performed by authorized personnel only.
● It must not be bump against other items or overloaded with excessively heavy weights (The load must not exceed the maximum capacity of the balance).

## 2. INSTALLATION

## 2.1 Unpacking

Unpack and verify that the following components have been included:

● Scale
● Steel pan
● Instruction Manual
● AC Adapter
● CD-ROM (for the scale with USB interface only)
● USB Cable (for the scale with USB interface only)
● Five pieces of wind shield

Save the packaging material. This packaging ensures the best possible protection for the storage or transport of the product.

## 2.2 ILLUSTRATION OF THE INSTALLATION FOR PLASTIC SHIELD
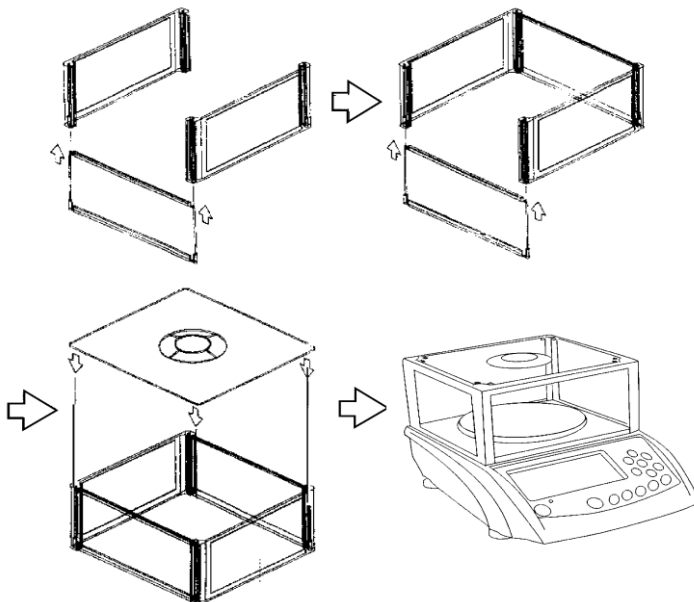
## 2.3 Selecting the Location

Operate the scale on a firm, level surface. Avoid locations with rapid temperature changes, excessive dust, moisture, air currents, vibrations, electromagnetic fields, heat or direct sunlight.

## 2.4 Leveling the scale

Adjust the leveling feet until the bubble is centered in the circle of the level indicator(located on the front panel).

**NOTE:** Ensure that the scale is level each time its location is changed.

## 2.5 Connecting Power

### 2.5.1 AC Power

Verify that the intended AC power source matches the AC adapter rating. Connect the supplied AC adapter to the power input receptacle at the back of the scale. Plug the AC adapter into a properly grounded power outlet.

### 2.5.2 Battery Power

The battery will begin charging with the AC adapter connected accordingly. An LED indicator below and to the left of the scale shows the status of battery charging:

● Green-battery is fully charged
● Yellow-battery is partially charged and charging
● Red   -battery is nearly discharged

When AC power is not available, the scale will operate on the internal rechargeable battery. The scale will automatically switch to battery operation if there is a power failure or the power cord is removed. Low battery charge is indicated by the ⬚ annunciator.

Before using the scale for the first time, the internal rechargeable battery should be fully charged for up to 12 hours. A fully charged battery can operate the scale for approximately 80 hours independent of AC power. The battery is protected against overcharging and the scale can remain connected to the AC power line.

## NOTE:
● The battery must be recharged every 3 months if the scale is not used for a long time.
● Dispose of the lead acid battery according to local laws and regulations.
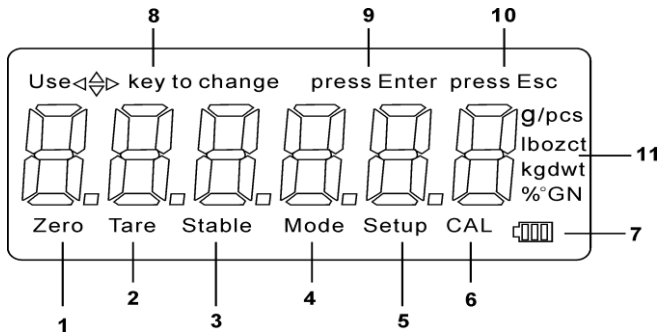
### 2.6 Initial Calibration

When the scale is operated for the first time, a Span Calibration is recommended to ensure accurate weighing results. Before performing the calibration, be sure to have the appropriate calibration weights.

Refer to Section 5.1 for Span Calibration procedures and Section 6 for AUTO CALIBRATION.

# 3. OVERVIEW OF DISPLAY INDICATORS AND KEYBOARD FUNCTIONS

## 3.1 Display Symbols



| 1 | **Zero-** Is displayed when the "Zero" key is pressed. |
|---|---|
| 2 | **Tare**-Is displayed when the "Tare" key is pressed. |
| 3 | **Stable**-Stable indication, scale is in stable condition. |
| 4 | **Mode**-Is displayed when the "Mode" key is pressed. |
| 5 | **Setup**-Is displayed when the "Setup" key is pressed. |
| 6 | **CAL**-Is displayed when the scale in Calibration Mode. |
| 7 | ▢▢▢▢ - Power indication. |
| 8 | **Use ⬦ key to change**-Used to prompt the user while navigating through the menu system. |
| 9 | **Press Enter** –Used as a prompt to the user to press the Enter key. The menu item displayed is selected. |
| 10 | **Press Esc**- Used as a prompt to the user to press the Esc key to return to last menu or exit Setup Mode. |
| | **Symbols for weighing units and modes, include:** |
| 11 | ct -Carats<br>lb -Pounds<br>oz -Ounces<br>GN -Grain<br>ozt -Ounces troy<br>dwt -Pennyweight<br>t1.T -Tael<br>pcs -Parts counting<br>% -Percent weighing<br>℃ -Temperature |

## 3.2 Keyboard Functions

⏻ : ON/OFF switch

Mode : Function key to choose weighing, counting, percentage

Units :"Unit" selection, 8 units are available

Pcs : Sample key to set the unit weight of sample

↔T : Tare key to deduct the container weight

→0← : Zero key, press this key, the weight will become "0"

Enter : Confirmation key and print key

Setup : Selects various menus

Esc : Return to last menu or exit Setup Mode

◄ : Travels to the left through menus

► : Travels to the right through menus

▲ : Travels up through menus

▼ : Travels down through menus

## *4.OPERATIONS*

Press the ⏻ key for power on ,the scale will be on the weighing mode using the initial units of weight selected.

## 4.1   WEIGHING MODE

### 4.1.1 Units selection

Press the [Units] key to choose the weighing units and the display will be changed to the new value with the units shown.There are up to 8 units of weight that can be enabled.

### 4.1. 2 Zero Function

If the zero shifts during operation, press the →0← key to set it to zero. The Zero function is only active over ±2% of full capacity.

### 4.1. 3 Tare Function

Tare weight is the weight of a container and can be subtracted by placing an empty container on the scale. When the display is stable, press the ↔ key. The display will become zero and the display will have a tare indication.

Cancel the tare function by pressing the ↔ key with no weight on the scale.
Tare range is the full capacity of the scale.

## 4.1. 4 Over load alarm

When the weight on the scale is more than Max. capacity, the display shows"-----OL------" at the same time the buzzer sounds. Please take off the weight at once. Otherwise the scale will be easily damaged.

## 4.2 COUNTING MODE

The scale will count parts by weighing a preset number of samples and setting the display to show the number. Then, as more samples are added, the display will increase. If necessary, place a container on the scale and press [→T←] key before beginning.

After selecting parts counting with the [Mode] key, press the [Units] or [▲] , [▼] key to select the sample size (10,20,50,100 pcs).

Put the sample number （same as selected） on the scale and press [Pcs] key. When the symbol" C" disappears the sampling procedure is finished and you can start to use the counting function.

If the unit weight is too small(less than 0.2 of a scale division), the display will show:"----or----pcs." It would be best to use larger parts or to use ten times as many parts as required and reduce the displayed values to 1/10th.

## 4.3 Percentage (%) mode

After selection % Weighing with the $\boxed{\text{Mode}}$ key press the $\boxed{\text{Units}}$ or $\boxed{\blacktriangle}$ , $\boxed{\blacktriangledown}$ key to choose either 100.0%, 100.00%.

Put the item to be considered 100% onto the pan and press the $\boxed{\text{Pcs}}$ key to sample, at the same time the symbol "Mode" flash, after several seconds the symbol" Mode" disappears and the buzzer sounds the sampling procedure is finished and you can start to use the percentage function.

When the value of the sample is smaller than 0.2d, the display will show"----or----". It means that the sample is too small, larger parts should be put on.

**NOTE:**

● When you finish the procedures of selecting the sample size in the counting mode or percentage(%) mode, press the $\boxed{\text{Mode}}$ key to change back to the weighing mode.
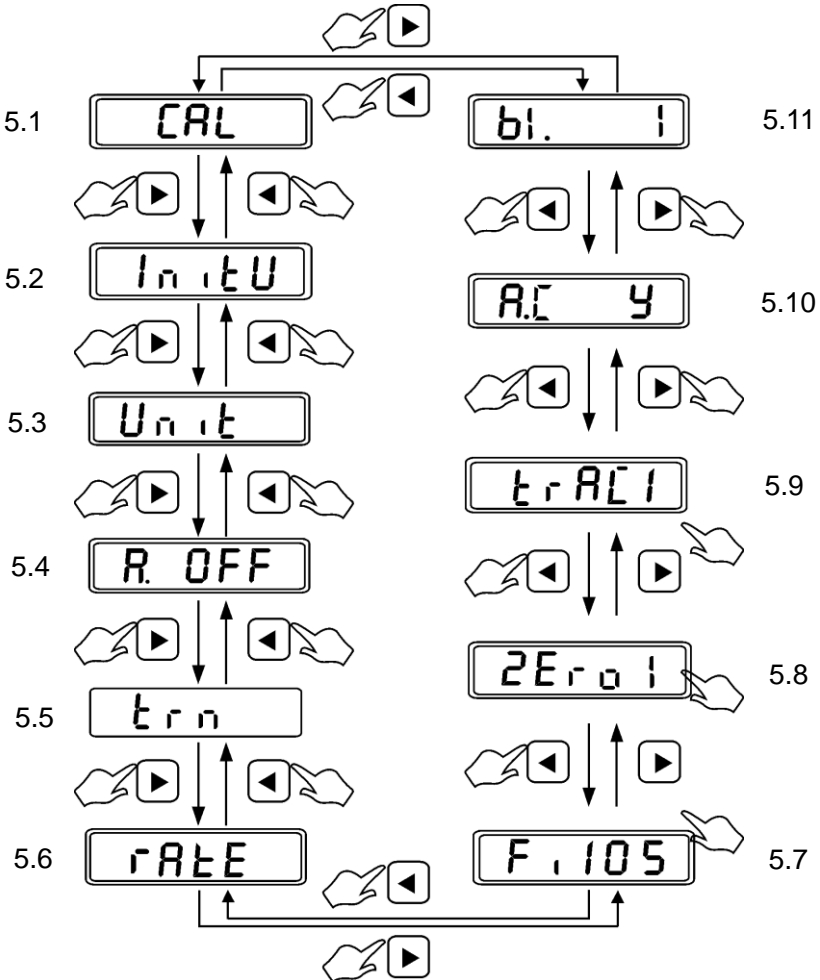
Press the $\boxed{\text{Pcs}}$ key to return to counting or percentage mode.

The scale will memorize the previous data automatically so that you can continue to count parts or weigh in percentage.

● The memory of sampling size data will be cleared automatically when the two modes of counting and percentage switch reciprocally.
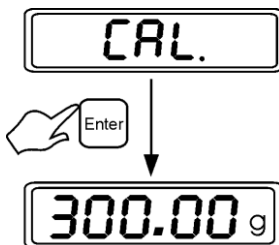
## 5. PARAMETER SET-UP

Press [Setup] key to enter SETUP PARAMETER mode during in weighing mode, and the display shows "CAL". The functions will change by pressing [◄] , [►] key. The functions are:



5.1 CAL
5.2 InitU
5.3 Unit
5.4 A. OFF
5.5 trn
5.6 rAtE
5.7 Fi105
5.8 2Erol
5.9 trACI
5.10 A.C  y
5.11 bi.  I

## 5.1 Span Calibration

When the display shows "CAL", press the Enter key to enter Auto calibration.



Please use ▲ , ▼ and ◄ , ► key to key in the mass values which you are going to calibrate, then press Enter key to confirm the value. When the display is flashing and showing the weight values, put the mass on scale. While scale is stable, the scale will return back to weighing mode. The calibration procedure is finished.

**NOTE:** ● **Mass Value:** Any over (full calibration×10%)weight of key in value is acceptable to calibrate.

● **Suggestion:** Generally. If the calibrated weight is over half load capacity or full load capacity, it will be good for getting the precise accuracy.

Another method for auto calibration, please see the section 6 "AUTO CALIBRATION".

● During in calibration procedure, you can press the Esc key to exit calibration function.

11

## 5.2　To choose the initial unit while turning on

Please press [Units] or [▲] , [▼] key to select the unit, then press [Enter] key to confirm. Press [Esc] key to return to last menu or exit. (**Factory setting**: "g")
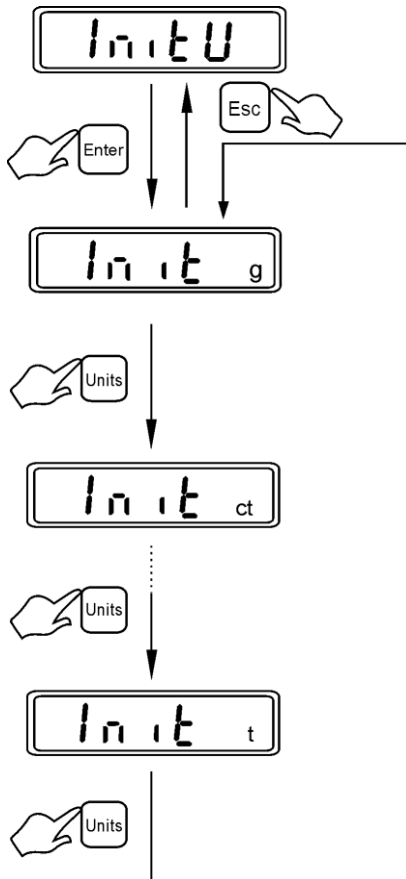
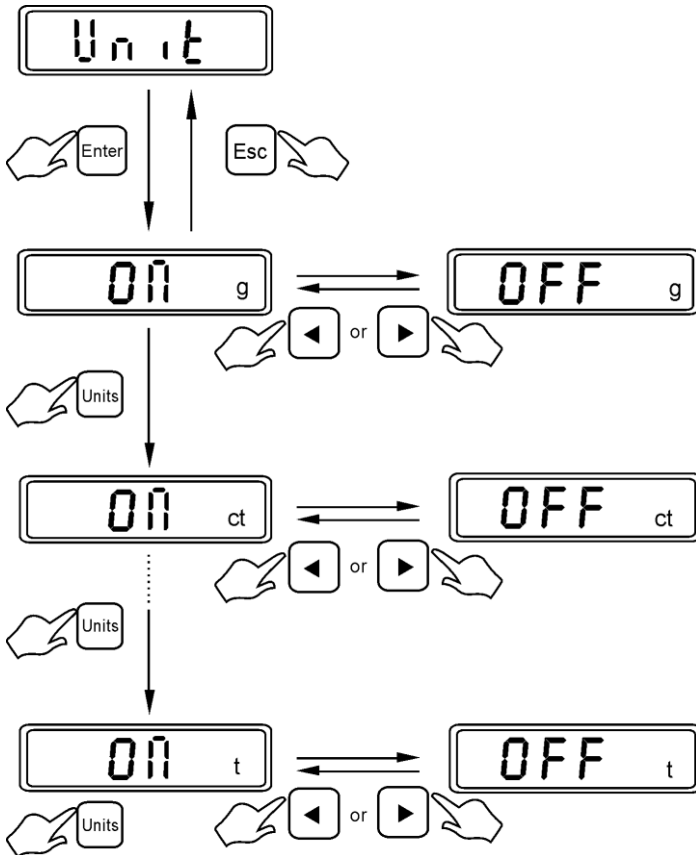## 5.3   To choose the "UNIT" you need (Total 8 units, you can choose some of them you need to use )

Press [Units] or [▲] , [▼] key to move the units, press [◄] , [►] key to choose "ON" or "OFF" and press [Enter] key   to confirm . Press [Esc] key to return to last menu or exit.
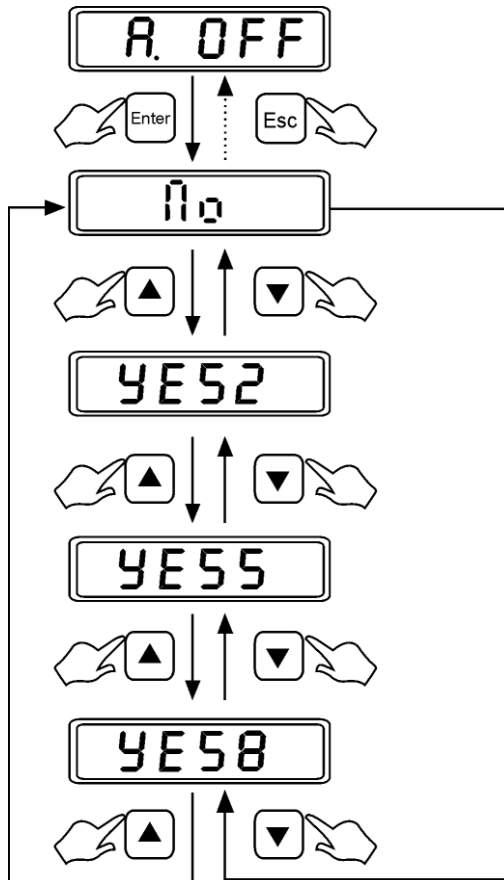(**Factory setting**: total 8 units are on)

## 5.4 To choose the time of AUTO OFF

Press $\boxed{\blacktriangle}$ , $\boxed{\blacktriangledown}$ key to select the time of auto off .i.e.no,2,5 or 8 minutes,then press $\boxed{\text{Enter}}$ key to confirm. Press $\boxed{\text{Esc}}$ key to return to last menu or exit.

(**Factory setting**: "no")

```
     ┌──────────┐
     │  A. OFF  │
     └──────────┘
   Enter    Esc
     ┌──────────┐
     │   No     │
     └──────────┘
    ▲       ▼
     ┌──────────┐
     │  YES2    │
     └──────────┘
    ▲       ▼
     ┌──────────┐
     │  YES5    │
     └──────────┘
    ▲       ▼
     ┌──────────┐
     │  YES8    │
     └──────────┘
    ▲       ▼
```

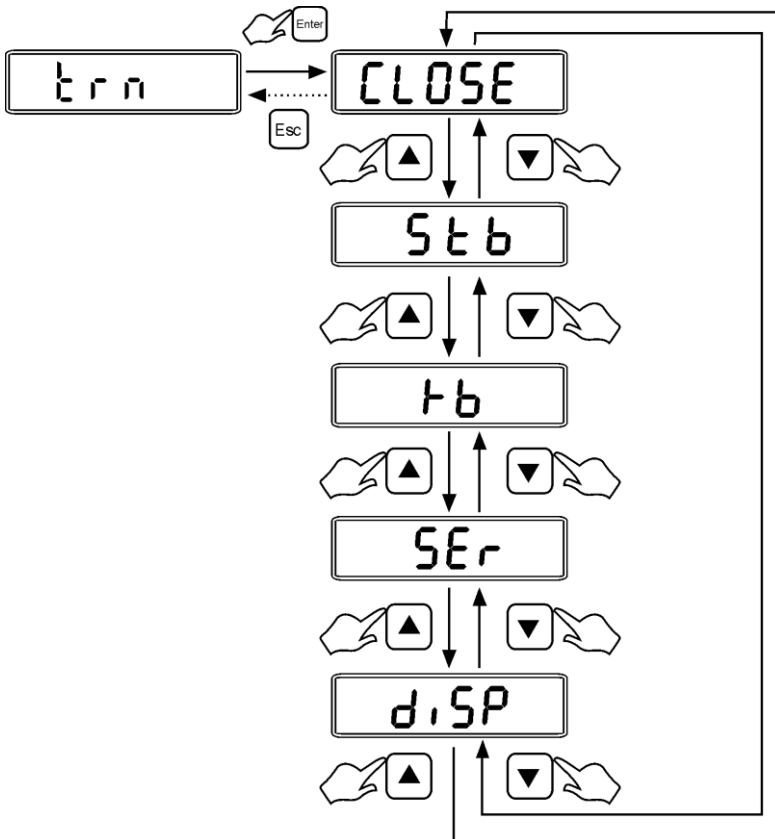## 5.5 To choose output transmission method

Press ▲ , ▼ key to select "stable transmit", press Enter key to confirm. Press Esc key to return to last menu or exit.
(**Factory setting**: "close")



"CLOSE"=output disabled        "stb"= Stable transmit

"tb"= Transmit by pressing Enter key      "ser"= Series transmit

"disp"= Transmit the display data

## 5.6 Baud rate setting for RS232 interface

Use ▲ , ▼ key to select the baud rate you need 1200,2400,4800, 9600,Press Enter key to confirm. Press Esc key to return to last menu or exit.

(**Factory setting**:2400)
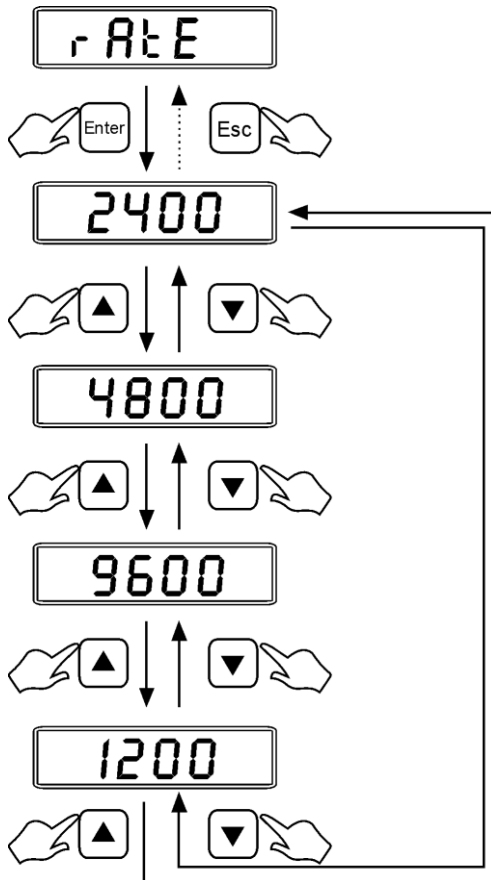
## 5.7 To choose the range of stability

Press ▲ , ▼ key to select the range of stability from 1 to 15.Then press Enter key to confirm. Press Esc key to return to last menu or exit.

The bigger the figures you choose, the quicker the stability of display will be got.

(**Factory setting**:"05")
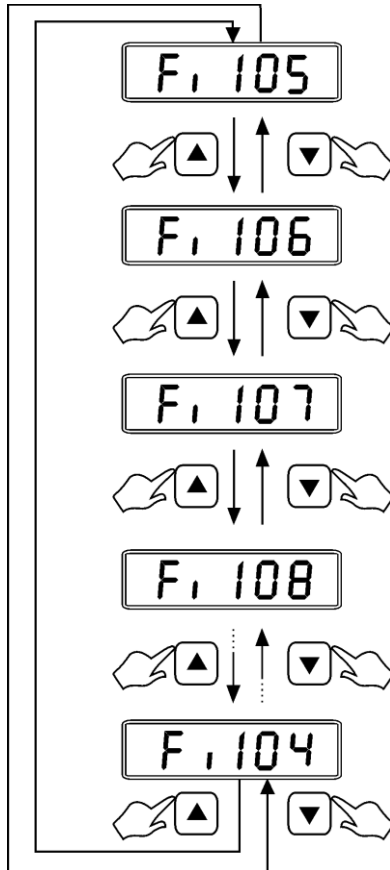
## 5.8 To choose the Zero display range

Press [▲] , [▼] key to select the zero display range from 0 to 3 Divisions, then press [Enter] key to confirm. Press [Esc] key to return to last menu or exit.

(**Factory setting**:"1")
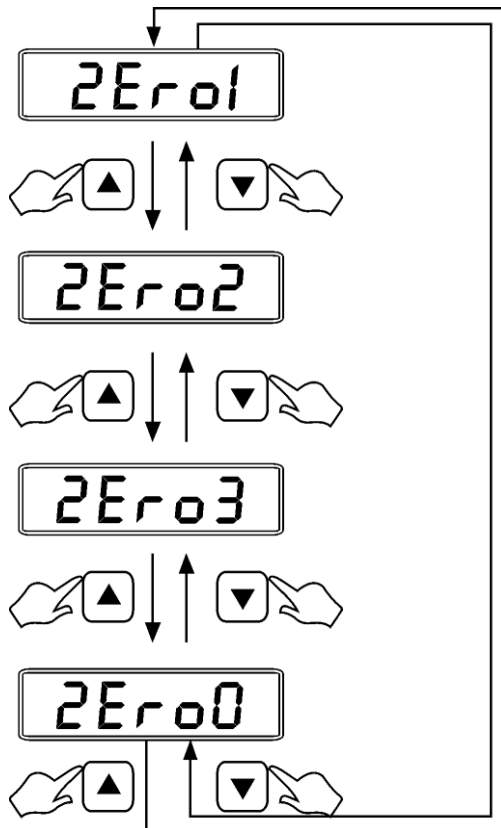
## 5.9  To choose the Zero Recovery display range

Press $\boxed{\blacktriangle}$ , $\boxed{\blacktriangledown}$ key to select the display range of zero recovery from 0 to 3 divisions, press $\boxed{\text{Enter}}$ key to confirm. Press $\boxed{\text{Esc}}$ key to return to last menu or exit.
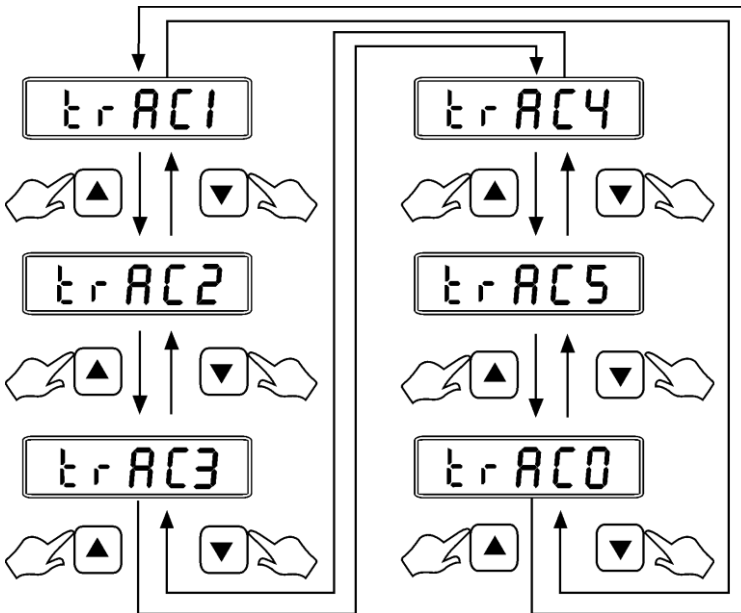
(**Factory setting**:"2")

## 5.10 To choose the auto-average in sampling on counting mode

Please ⌈ ▲ ⌉ , ⌈ ▼ ⌉ key to select the auto-average (Yes or No).Then press ⌈Enter⌉ Key to confirm. Press ⌈Esc⌉ key to return to last menu or exit.

(**Factory setting**: "YES")

$$\boxed{A.C \quad Y} \quad \text{YES}$$

$$\boxed{A.C \quad \Pi} \quad \text{NO}$$
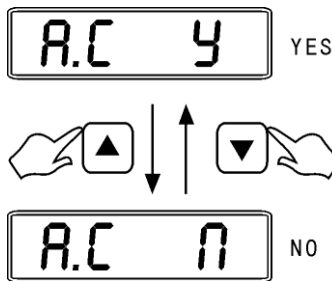
## 5.11 To choose Backlight Mode

Please $\boxed{\blacktriangle}$ , $\boxed{\blacktriangledown}$ key to select the backlight mode (1,2,3 can be chosen). Then press $\boxed{\text{Enter}}$ Key to confirm. Press $\boxed{\text{Esc}}$ key to return to last menu or exit.

(**Factory setting**: bl.l)
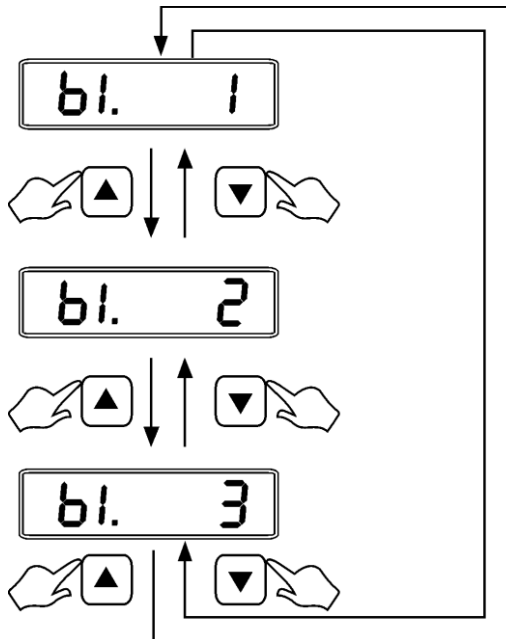


"bI.1"=Auto backlight

"bI.2"=Backlight will always be on

"bI.3"=No backlight

## 6. AUTO CALIBRATION

Press the $\boxed{\text{Enter}}$ key for about 3 seconds. The display will show the "Calibration weight value." Put the same weight on the pan. When the "CAL" symbol disappears, the calibration procedure is finished.

## 7. RECOVERY OF THE DEFAULT VALUES FROM MEMORY

During in weighing mode, hold down the $\boxed{\text{Setup}}$ key for 3 seconds. The scale will come back with a default calibration values.

## 8. ERROR MESSAGES

During self test the scale verifies operation and the load cell.

Error messages are: " E 1 . E 2 . E 5 . O L" messages.

These messages may also be shown if the pan is not installed correctly or the environment is not suitable.

Contact your dealer for assistance.

E1  → EPROM data lost → Re calibrate
E2  → Loaded when scale is turning ON → Unload the load and turn the scale on
Loaded when tray is not in proper position→ Unload the load and turn the scale on

→ Load cell zero value is out of range → Re calibrate

→ Load cell damage → Change load cell

OL → Overload

# 9. SPECIFICATION OF OUTPUT INTERFACE

**Mode:** EIA-RS-232 C's UART signal, or USB signal.

**Format:**

| | |
|---|---|
| Baud rate: | 2400 BPS ,4800 BPS |
| Data bits: | 7 BITS |
| Parity bit: | 1 EVEN |
| Stop bit: | 1 BIT |
| Code: | ASCII |

RS-232 connector is a 9 pin D-subminiature socket.

| | |
|---|---|
| Input Pin | 2 |
| Output Pin | 3 |
| Signal Ground Pin | 5 |

Starting bit    LSB data bit    MSB    Parity bit    Stop bit
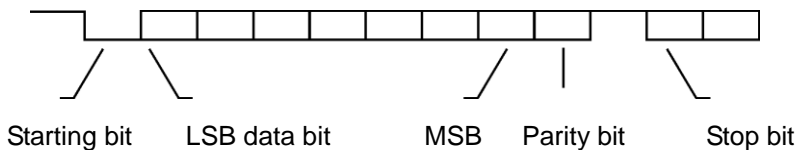
**DATA FORMAT:**

HEAD1 ,    HEAD2 ,        DATA                    UNIT            CR

1 2       3     4 5       6    7 8 9 10 11 12 13 14    15 16 17 18    19 20

HEAD1 (2 BYTES)            HEAD2 (2BYTES)

OL-Overload,                NT-NET Mode

ST-Display is Stable        GS-Gross Weight

US-Display is Unstable

DATA(8BYTES)

2D (HEX)="-"(MINUS)　　　　　　20(HEX)=" "(SPACE)

2E (HEX)="."(DECIMALPOINT)

UNIT(4BYTE)

g-20　　( HEX ) ; 20 ( HEX ) ; 20 ( HEX ) ; 67 ( HEX )

lb-20　　( HEX ) ; 20 ( HEX ) ; 6c ( HEX ) ; 62 ( HEX )

Tl.T-74 ( HEX ) ; 6C ( HEX ) ; 2E ( HEX ) ; 54 ( HEX )

**Transmit Example:**

EX+0.876g,when it is stable and net value as:

| HEAD, | HEAD, | DATA | UNIT | CR |
|-------|-------|------|------|-----|
| ST , | NT , | + 0.876 | g | 0D 0A |

EX-1.568lb, when it is unstable and net value as:

| HEAD, | HEAD, | DATA | UNIT | CR |
|-------|-------|------|------|-----|
| US , | NT , - | 1.568 | lb | 0D 0A |

EX+15.24tl.T,when it is stable and net value as:

| HEAD, | HEAD, | DATA | UNIT | CR |
|-------|-------|------|------|-----|
| ST, | NT , | +15.24 | tl.T | 0D 0A |

# 10. CONVERSION UNITS TABLE FOR WEIGHTS

1 ct (MET.CARAT)            =0.1999694    g

1 lb(AVOIRDUPOIS POUND)     =453.59237    g

1 oz(AVOIRDUPOIS OUNCE)    =28.349523125g

1 GN(GRAIN)(U.K)            =0.06479891   g

1 ozt (TROY OUNCE)          =31.1034768    g

1 dwt(PENNYWEIGHT)        =1.55517384   g

1 t1.T(TAEL)(TWN)           =37.799375    g

# 11. TABLE LIST FOR FULL CAPACITY

|     | 150g× 0.005g | 300g× 0.01g | 600g× 0.01g | 1500g× 0.05g | 3000g× 0.1g |
| --- | --- | --- | --- | --- | --- |
| g   | 150.045 | 300.09 | 600.18 | 1500.45 | 3000.9 |
| ct  | 750.18 | 1500.45 | 3000.9 | 7501.8 | 15004.5 |
| lb  | 0.33018 | 0.66045 | 1.3009 | 3.3018 | 6.6045 |
| oz  | 5.2018 | 10.5045 | 21.009 | 52.018 | 100.045 |

| GN | 2300.9 | 4601.8 | 9204.5 | 23009 | 46018 |
|------|--------|--------|--------|---------|---------|
| ozt | 4.8018 | 9.6045 | 19.009 | 48.018 | 96.045 |
| dwt | 96.045 | 190.09 | 380.18 | 960.45 | 1900.9 |
| tl.T | 4.0018 | 8.0045 | 16.009 | 40.018 | 80.045 |

## 12. TECHNICAL DATA

| Capacity x Readability | 150X 0.005g | 300X 0.01g | 600X .02g | 1500X 0.05g | 3000X 0.1g | 300X 0.005g | 600X 0.01g | 1200X 0.02g | 3000x 0.05g |
|---|---|---|---|---|---|---|---|---|---|
| Maximum Displayed Resolution | 1:30000 | 1:30000 | 1:30000 | 1:30000 | 1:30000 | 1:60000 | 1:60000 | 1:60000 | 1:60000 |
| Construction | ABS plastic, stainless steel platform | | | | | | | | |
| Tare range | Full capacity | | | | | | | | |
| Zero range | $\leqq$±2% of full capacity | | | | | | | | |
| Weighing Units | G, ct, Ib, oz, GN, oz t, dwt, tl, T | | | | | | | | |
| Application Modes | Weighing, Counting and percentage (%) | | | | | | | | |
| Display | 6 digits LCD (40X95mm) with auto backlight | | | | | | | | |
| Stabilization time | $\leqq$2 seconds | | | | | | | | |
| Operating Temperature | 0 to 40℃/ 32 to 104℉ | | | | | | | | |
| Humidity Range | $\leqq$90% relative humidity, non-condensing | | | | | | | | |
| Power | AC Adapter 12V DC/500mA & Internal rechargeable lead acid battery | | | | | | | | |
| Calibration | Automatic external | | | | | | | | |
| Battery life | 80 hours continuous use with 12 hours recharging time | | | | | | | | |
| Interface | RS-232 or USB output(Option) | | | | | | | | |
| Pan Size | 150g~600g : Ø116mm (round) 1200g ~ 3000g: 124X144mm (square) | | | | | | | | |
| Scale Dimensions (WxHxD) | 200X80X250mm | | | | | | | | |