Service Manual for ECB counting scale

Ⅰ. Phenomena of trouble

1) Trouble of part

The trouble phenomena are as following:

a) Buzzer-----buzzer doesn't make sound, or sometimes make sound and sometimes doesn't make sound.

b) LCD-----The display is faultily.

c) Backlight-----The backlight doesn't lighten, or sometimes it lighten and sometimes doesn't lighten:

d) Key -----The key don't work.

2) Trouble of load cell

The trouble phenomena are as following:

a) The display data is drifting.

b) The display data doesn't change, or the internal resolution value is not in the natural range.

c) The internal resolution data drift badly.

d) The initial resolution is drifting.

3) Trouble of power supply

The phenomenon is as following:

The scale doesn't work or the "low voltage" symbol comes out after turning on.

4) Trouble of the PCB

The phenomena are as following:

Trouble of main board

- There is nothing in the display when turn on the scale.
- The scale can not be powered on.
- The weighing is unstable.
- The internal resolution is out of the normal range.
- The display is abnormal, or shows nothing.
- The scale doesn't transmit any data.

Ⅱ. **To solve the trouble**

1．The scale can not be powered on

```
┌──────────────┐     ┌──────────────┐ Y  ┌──────────────┐ Y  ┌──────────────┐ N  ┌──────────────┐ N  ┌──────────────┐
│ The    scale │ ──▶ │ The AC power │──▶ │ The voltage  │──▶ │ The   output │──▶ │ The audion T1│──▶ │ Replace the  │
│ can not be   │     │ indicator    │    │ of T1C is    │    │ voltage of   │    │ is damaged.  │    │ diode.       │
│ powered      │     │ light is     │    │ about 10.5v  │    │ T1B is about │    │ Replace it   │    └──────────────┘
└──────────────┘     │ lighten.     │    └──────────────┘    │ 8v.          │    └──────────────┘
                     └──────────────┘                        └──────────────┘
```

- The scale can not be powered → The AC power indicator light is lighten.
- The AC power indicator light is lighten. — Y → The voltage of T1C is about 10.5v
- The AC power indicator light is lighten. — N ↓

- The switch is damaged. ◀—Y— Short the on/off switch to check if the scale can work well.

- The voltage of T1C is about 10.5v — Y → The output voltage of T1B is about 8v.
- The voltage of T1C is about 10.5v — N ↓ Check the output voltage of adapter is about 17V.

- The output voltage of T1B is about 8v. — N → The audion T1 is damaged. Replace it
- The audion T1 is damaged. Replace it — N → Replace the diode.
- The output voltage of T1B is about 8v. — Y ↓ Short the audion T3(8550) to check if the scale can work well.

- Short the on/off switch to check if the scale can work well. — N → The adapter is damaged.

- Check the output voltage of adapter is about 17V. — N → The adapter is damaged.
- Check the output voltage of adapter is about 17V. — Y ↓ The AC jack (for adapter) is damaged, replace it.

- Short the audion T3(8550) to check if the scale can work well. — Y → The audion 8550is damaged.
- Short the audion T3(8550) to check if the scale can work well. — N ↓ The voltage balance between the pins of the Crystal Oscillator (CR1) is around 0.20v.

- The voltage balance between the pins of the Crystal Oscillator (CR1) is around 0.20v. — N → The Crystal Oscillator is damaged.
- The voltage balance between the pins of the Crystal Oscillator (CR1) is around 0.20v. — Y ↓ Replace the CPU to check if the trouble can be solved.

- Replace the CPU to check if the trouble can be solved. — N → Replace the main board.

2. **No display after turn on:**

```
┌──────────────────┐       ┌──────────────────┐   Y   ┌──────────────────┐   N   ┌──────────────────┐
│ No display after │──────▶│ Check        the │──────▶│ Check  the display│──────▶│ Re-solder it to check if│
│ turn on.         │       │ voltage of 8ᵗʰ pin│      │ driver  is  soldered│      │ the  trouble  can  be│
│                  │       │ of U2 is 5v      │       │ well.            │       │ solved           │
└──────────────────┘       └──────────────────┘       └──────────────────┘       └──────────────────┘
                                    │ N                         │ Y
                                    ▼                           ▼
┌──────────────────┐   N   ┌──────────────────┐       ┌──────────────────┐
│ Clean it and fit it│◀────│ Check    if   the│       │ Replace    the display│
│ well.            │       │ CPU is fit well. │       │ driver and solder it well.│
└──────────────────┘       └──────────────────┘       └──────────────────┘
         │ N                         │ Y                         │ N
         ▼                           ▼                           ▼
┌──────────────────┐       ┌──────────────────┐       ┌──────────────────┐
│ The trouble is in│       │ The voltage balance│     │ Replace the main board.│
│ CPU     (89C52), │       │ between the pins of│      └──────────────────┘
│ replace it.      │       │ the Crystal Oscillator│
└──────────────────┘       │ (CR1)   is   around│
                           │ 0.20v.           │
                           └──────────────────┘
                                    │
                                    ▼
                           ┌──────────────────┐
                           │ The Crystal Oscillator│
                           │ (CR1)   is  damaged.│
                           │ Replace it.      │
                           └──────────────────┘
```

3．RS232 don't transmit any data

```
┌──────────────┐     ┌──────────────────┐        ┌──────────────────┐        ┌──────────────────┐
│ RS232  don't │     │ Check if the     │   Y    │ Check the voltage│   N    │ Check the voltage│
│ transmit any │ ──► │ setting of       │ ─────► │ of the 7 pins of │ ─────► │ of the input pin │
│ data.        │     │ transmit method  │        │ the RS232 socket │        │ of the IC        │
└──────────────┘     │ or baud rate is  │        │ is around 10V.   │        │ U1ADM202EA (U1)  │
                     │ matching with    │        └──────────────────┘        │ is 5V.           │
                     │ the printer or PC│                                     └──────────────────┘
                     └──────────────────┘
```

- Check if the setting of transmit method or baud rate is matching with the printer or PC. — **N** → Correct the setting.
- Check the voltage of the 7 pins of the RS232 socket is around 10V. — **Y** → The socket is damaged, replace it.
- Check the voltage of the 7 pins of the RS232 socket is around 10V. — **N** (from previous) → Re-solder the U10. The trouble can be solved.
- Check the voltage of the input pin of the IC U1ADM202EA (U1) is 5V. — **N** → Re-solder the U10. The trouble can be solved.
- Check the voltage of the input pin of the IC U1ADM202EA (U1) is 5V. — **Y** → Check the 3-cores cable is living.

Re-solder the U10. The trouble can be solved. — **N** → Replace the AD202EA.

Re-solder the U10. The trouble can be solved. — **Y** → The voltage balance between the pins of the Crystal Oscillator (CR2) is around 0.20v.

Check the 3-cores cable is living. — **Y** → The voltage balance between the pins of the Crystal Oscillator (CR2) is around 0.20v.

Check the 3-cores cable is living. — **N** → Replace the 3-cores cable.

The voltage balance between the pins of the Crystal Oscillator (CR2) is around 0.20v. — **Y** → Replace the CPU (89C2052), and the trouble can be solved.

The voltage balance between the pins of the Crystal Oscillator (CR2) is around 0.20v. — **N** → The Crystal Oscillator is damaged. Replace it.

4．**Weighing is inaccurate or instable:**

| Weighing is inaccurate or instable. | → | The AC power supply is normally. | **N** → | The AC power supply should be stable. |

Y ↓

| The voltage of the battery is less than 5.40v. | **Y** → | Recharge the battery or change the battery. |

N ↓

| There is something touches the upper support or there is something on the pan. Take it away, then the trouble can be solved. | **Y** → | Move it away. |

N ↓

| Recalibrate the scale. The trouble can be solved. |

N ↓

| Replace the load cell, and re-calibrate. The trouble can be solved | **Y** → | The load cell was damaged. |

N ↓

| Re-solder the U7 (AD5530). | **Y** → | Clean it and solder it well. Then recalibrate the scale. |

N ↓

| Replace the A/D module. |

5．The keys don't work

The keys don't work.	Short the key by using a forceps, the trouble can be solved.	→Y→ The key is damaged, replace it.

N↓

Check the resistance value of resistor "RP1" is right	→Y→ Replace the Resistor Array 9P.

N↓

Replace the CPU (89C52) to check if the trouble can be solved.	→Y→ The CPU is damaged, replace it.

N↓

Replace the 40-cores socket to check if the trouble can be solved.	→Y→ The socket is damaged, replace it.

N↓

The resistor "RX2" is damaged, replace it.

6. **The display is incomplete or exceptional.**

```
┌──────────────────────┐     ┌──────────────────────┐   Y   ┌──────────────────────┐
│ The display is       │     │ Replace the 6-cores  │──────▶│ The cable was        │
│ incomplete or        │─────│ cable. Then the      │       │ damaged.             │
│ exceptional.         │     │ trouble is solved.   │       │                      │
└──────────────────────┘     └──────────────────────┘       └──────────────────────┘
                                       │ N
                                       ▼
                             ┌──────────────────────┐   Y   ┌──────────────────────┐
                             │ Replace the display  │──────▶│ The pins of LCD were │
                             │ board. And the       │       │ soldered faultily. Or│
                             │ trouble can be solved.│       │ the IC 8576 was      │
                             └──────────────────────┘       │ soldered faultily.   │
                                       │ N                  └──────────────────────┘
                                       ▼                       N            Y
                             ┌──────────────────────┐
                             │ The main board was   │
                             │ damaged. Replace it. │
                             └──────────────────────┘

      ┌──────────────────────────────────────────┐        ┌──────────────────────┐
      │ Replace the LCD. Then the trouble can be  │        │ Re-solder them.      │
      │ solved.                                   │        └──────────────────────┘
      └──────────────────────────────────────────┘
           N │              Y                              ┌──────────────────────┐
             ▼                                             │ The LCD was damaged. │
      ┌──────────────────────────────────────────┐───────▶│ Replace it.          │
      │ The IC 8576 was damaged. Replace it.      │        └──────────────────────┘
      └──────────────────────────────────────────┘
```

Note: Since this series of balance is with high precision, it is very easy to be affected by clime and temperature. Sometimes the scale has the following phenomena:

1) Weighing is inaccurate.

   The problem can be solved by re-calibration.

2) After self-check, the display shows error messages.

   E1: Re-calibrate the scale to solve it.

   E3: Re-calibrate the scale or replace the load cell to solve it.

3) If any one of main board and load cell is changed, the scale must be recalibrated.

III. Calibration procedure

1) Switch on, Press "83419" to enter into Calibration mode during self-checking. .

   The windows show as follows:

WEIGHT	UNIT WEIGHT	COUNT
000000	₹ 00 ₹	245678
kg	g	PCS
⊿ →0← NET	⛰ 🔋	→⟩ ▮▯
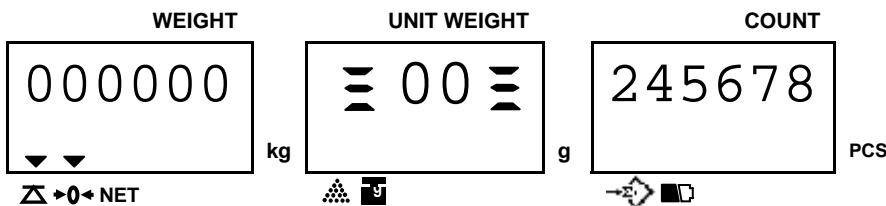
Internal resolution

   Touch the pan by hand lightly to do the calibration if there is no need to change the weight units, accuracy and capacity.

2) Change and choose the weight units, accuracy and capacity by using the "**ENTER**" and the "**MOVE"** key. The steps are as below:

   Choose weight units:

   a) After the scale finish self- checking, press the "**ENTER**" key to enter into selecting weight units setting, and the display shows:

WEIGHT	UNIT WEIGHT	COUNT
103 g	Unit	245678
kg	g	PCS
⊿ →0← NET	⛰ 🔋	→⟩ ▮▯
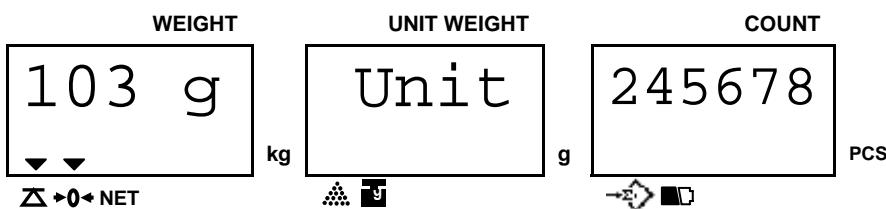
Weighing unit   Internal resolution

   b) Press the "MOVE" key to change the value : lb, 103g(=kg)

   c) Press the "ENTER" key to confirm and enter into next step (Choose accuracy value).

Note: If only the unit should be changed, then keeping press the "ENTER" key until the display shows as below, and press "CLEAR" key to exit calibration model.

WEIGHT	UNIT WEIGHT	COUNT
000000	₹ 00 ₹	245678
kg	g	PCS
⊿ →0← NET	⛰ 🔋	→⟩ ▮▯
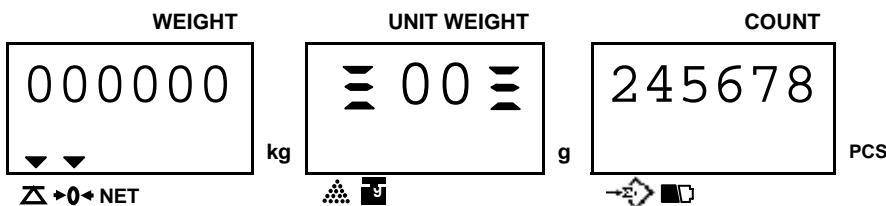
Choose accuracy value:

a) The display shows:

WEIGHT	UNIT WEIGHT	COUNT
1	≡n≡	245678
kg		PCS
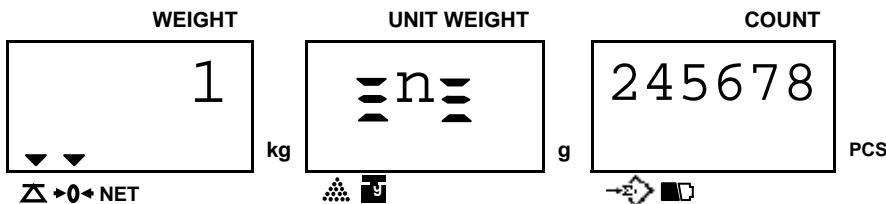
b) Press the "MOVE" key to change the value. There are three system-preset (1, 2, 5) can be chosen.

c) Press the "ENTER" key to confirm and enter into next step (Choose capacity).

Choose capacity:

a) The display shows:

WEIGHT	UNIT WEIGHT	COUNT
150.00	≡CAP≡	245678
kg		PCS
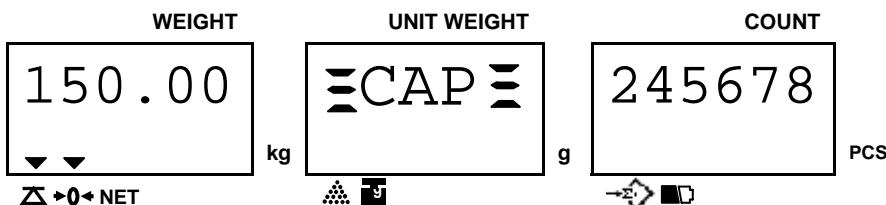
b) Use the 0-9 numerical keys to key in the capacity. The weighing unit is kg.

C) Press the "ENTER" key to confirm, at the same time enters into "Set the zero calibration value" mode, and the display shows:

WEIGHT	UNIT WEIGHT	COUNT
0	≡CAP0≡	245678
kg		PCS
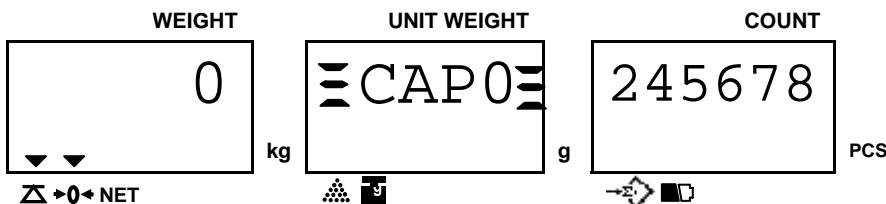
d) Use the numerical keys to key in the zero calibration value (0). Then Press the "ENTER" key to confirm and enter into "Set the first calibration value" mode, the display shows as below:

WEIGHT	UNIT WEIGHT	COUNT
50	≡CAP1≡	245678
kg		PCS
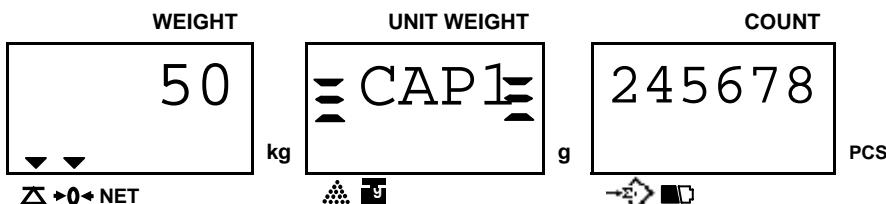
e) Use the numerical keys to key in the first calibration value. Then Press the "ENTER" key to confirm and enter into "Set the second calibration value" mode, the display shows as below:

WEIGHT	UNIT WEIGHT	COUNT
100	≡CAP2≡	245678
kg		PCS
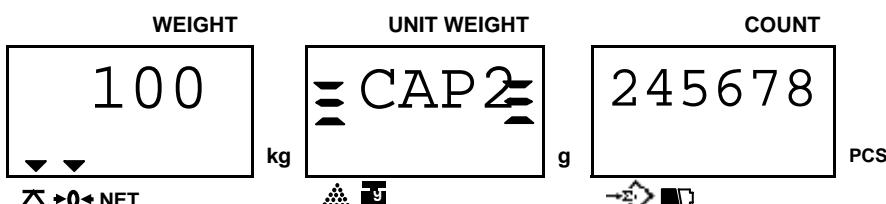
f) Use the numerical keys to key in the first calibration value. Then Press the "ENTER" key to confirm and enter into "Set the third calibration value" mode, the display shows as below:

WEIGHT	UNIT WEIGHT	COUNT
150	☰CAP3☰	245678
kg	g	PCS
▼ ▼		
⚖ →0← NET	⚠ 🔁	→⚡ ▢▢
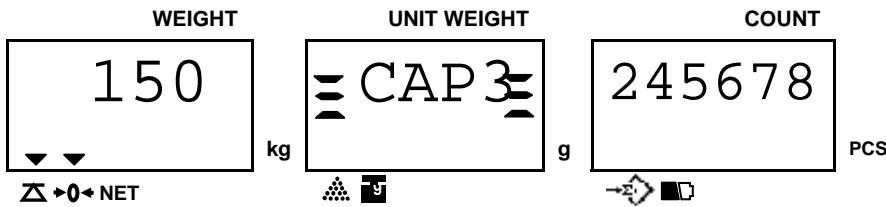
g) Use the numerical keys to key in the first calibration value. Then Press the "ENTER" key to confirm and enter into the first step calibration mode. The display shows as below:

WEIGHT	UNIT WEIGHT	COUNT
0	☰00☰	245678
kg	g	PCS
▼ ▼		
⚖ →0← NET	⚠ 🔁	→⚡ ▢▢
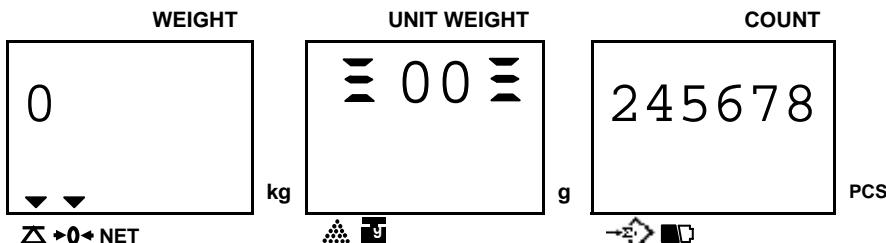
Calibration Mode:

- Touch the pan by hand lightly, several seconds later, the unit weight window shows " 01 ",and the weight window shows the first calibration weight value which should be put on for the first time. Put on the weight refer to the display.

- Several seconds later, the unit weight window shows "02", and the weight window shows the second calibration weight value which should be put on for the second time. Put on the weight refer to the display.

- Several seconds later, the unit weight window shows "03", and the weight window shows the third calibration weight value which should be put on for the third time. Put on the weight refer to the display.

- Several seconds later, the scale returns to counting mode. Then the calibration procedure is finished.

- Switch off, and take off all the weight, then switch on, the scale can be used.

Note; 1.There are four calibration weight values, CAP0-CAP3. You are supposed to set at least two calibration weight values.

2. If the number of calibration weight value is less than four, press SET key after set the last weight value and enter into the next calibration value setting mode. Then weight display window show "END", press ENTER key to move to calibration mode.

3. The other way to enter into calibration mode is press CAL switch on the back of the indicator during the self-checking. Buy using this method, there is no need to change the unit, capacity and calibration weight.

3) Check the internal resolution

   a) Press "83419" or "CAL" switch during self-checking to enter into the calibration mode. The display shows as below;

WEIGHT	UNIT WEIGHT	COUNT
0.000	≡00≡	245678
kg	g	PCS
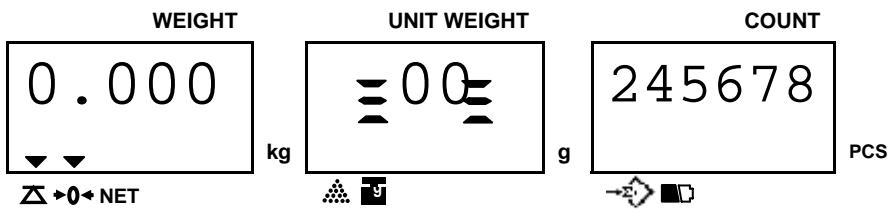
   b) Press SET key to check the internal resolution. The display shows as below;

WEIGHT	UNIT WEIGHT	COUNT
0	CAL	245678
kg	g	PCS
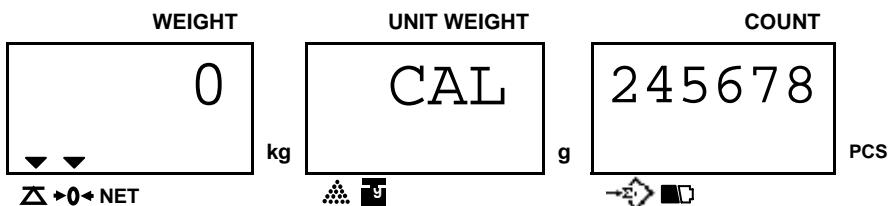
Current internal resolution

   c) Put on some weight. The weight display window shows the increased internal resolution, and the count window shows the total internal resolution which is equal to the original one and the increased internal resolution. The display shows as below;

WEIGHT	UNIT WEIGHT	COUNT
120045	CAL	365723
kg	g	PCS
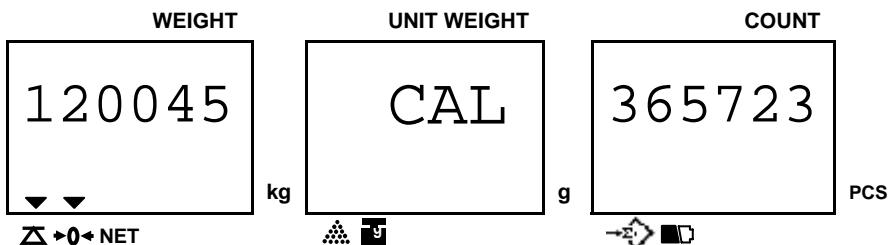
Increased internal resolution   Current total internal resolution

   d) Press the SET key again, the display shows;

WEIGHT	UNIT WEIGHT	COUNT
0.000	≡00≡	365723
kg	g	PCS
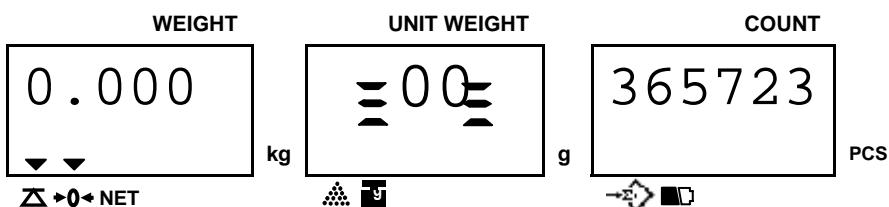
   e) Take away the load, the scale is back to calibration mode. The display shows;

WEIGHT	UNIT WEIGHT	COUNT
0.000	≡00≡	245678
kg	g	PCS
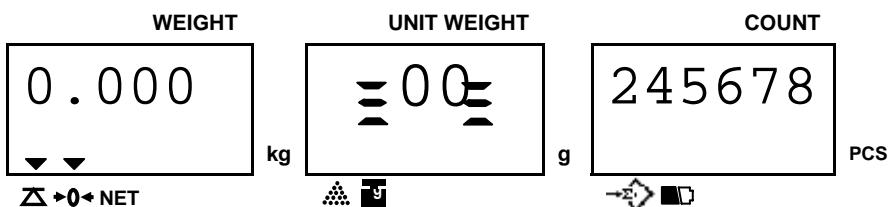
After a while, you will hear a beeper. The display shows;

WEIGHT	UNIT WEIGHT	COUNT
50.000	≚01≚	245678

WEIGHT

50.000

▼ ▼
⚖ →0← NET kg

UNIT WEIGHT

≚01≚

g

COUNT

245678

PCS
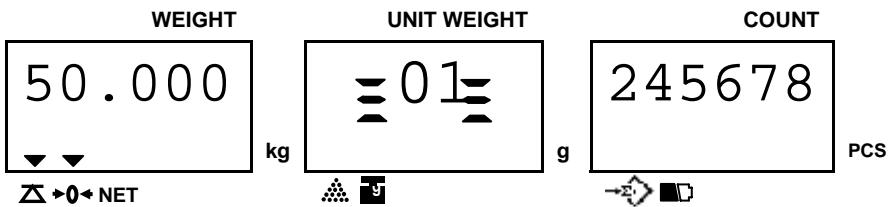
Simple calibration without weight

1. Turn on the scale, and key in "000419" during counting down (self-check) to zero to enter into Simple Calibration mode.

   The displays will indicate as below eventually. (Take 150kg scale for instance)

WEIGHT

0.000

▼ ▼
⚖ →0← NET   kg

UNIT WEIGHT

150.000

g

COUNT

CAL

PCS
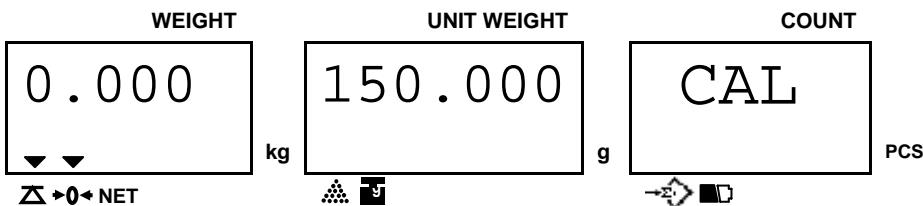
Required weight (150 kg) for calibration

2. Keying in an error coefficient "R" (R= A/B, A=the correct value, B=the error value), then press the **ENTER** key, then the scale will be calibrated and return to normal counting mode.

   ★ Press **CLEAR** key to escape from calibration mode at any time.

   ★ The error coefficient is shown in "UNIT WEIGHT" window, and the decimal dot is fixed after the first digit, and it is hidden. So it is no need to key in the decimal dot.

   For example:

   a) If the error coefficient is "0.89737", then the display will be as:

WEIGHT

0.000

▼ ▼
⚖ →0← NET   kg

UNIT WEIGHT

89737

g

COUNT

CAL

PCS
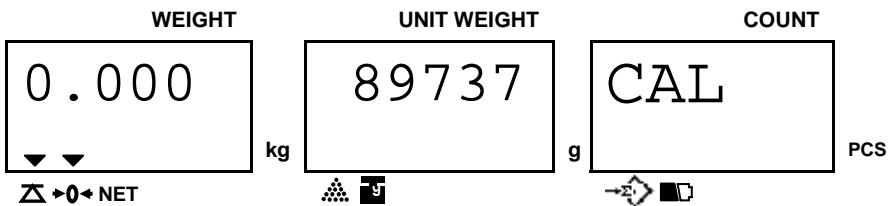
   b) If the error coefficient is "1.23456", then the display will be as:

WEIGHT

0.000

▼ ▼
⚖ →0← NET   kg

UNIT WEIGHT

123456

g

COUNT

CAL

PCS
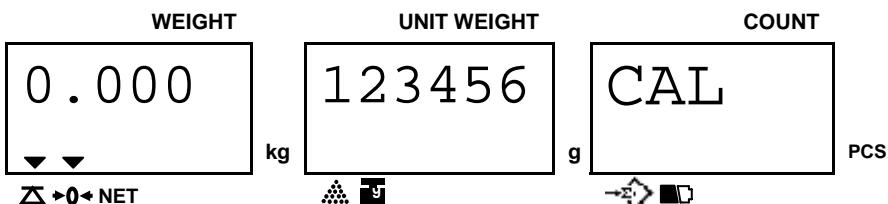
Note: When the scale was calibrated in Country A, and it is used in Country B, the error coefficient (R) should be:

   R=gravity value in Country A / gravity value in Country B