GRAM

SERIES

AHV

AH-300V / AH-600V / AH-1200V
AH-1500V / AH-3000V

EN

CE

OPERATION MANUAL

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ENGLISH
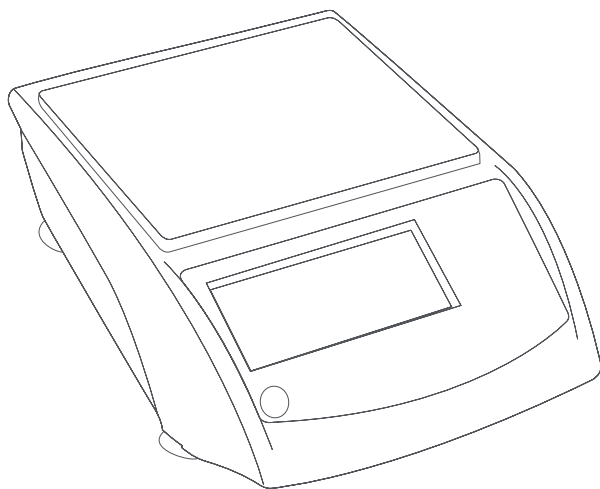
PRECAUTIONS BEFORE USING THE BALANCE

For safe and dependable operation of this balance, 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 bumped against by other items or overloaded with excessively heavy weights (The load must not exceed the maximum capacity of the balance).

- Give a warm-up for 30 mins before using the scale.

NAME AND TYPE OF THE INSTRUMENT

The **AH-V** model weighing balance is a self-indicating weighing scale of Class II with single weighing range, an external AC mains adapter, and an internal rechargeable battery.

The balance consists of analogue to digital conversion, microprocessor control, power supply, keyboard, and a weight display contained within a single enclosure.

KEYS AND DISPLAY DESCRIPTION

The balance is equipped with 13 keys membrane keypad to control the functions and also the **ON/OFF** of the balance.
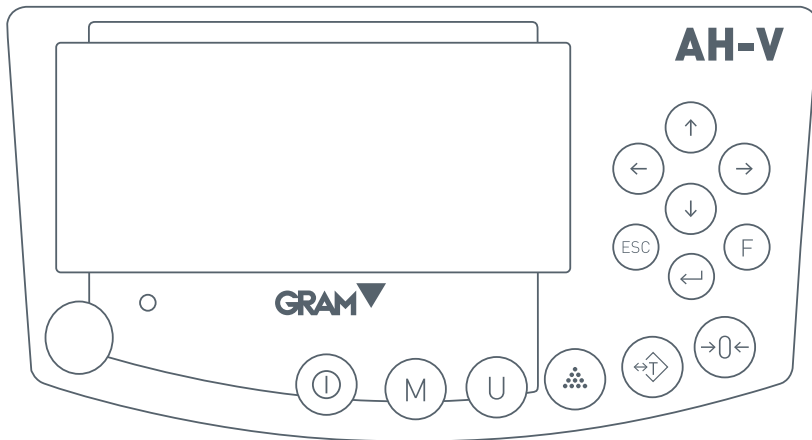
Keys function

ON/OFF switch.

Function key to choose weighing, parts counting and percentage weighing.

Units selection (8 units are available).

To take samples in parts counting mode or percentage weighing mode.

To subtract the container's weight.

To return the display to **"0"**.

Confirmation key and print key.

To enter into setup mode (User Programming Setting).

To return to last menu or exit Setup Mode; extend one more digit for the current display for 5 seconds.

Move to left.

Move to right.

Page up (Increase value).

Page down (Decrease value).

Display
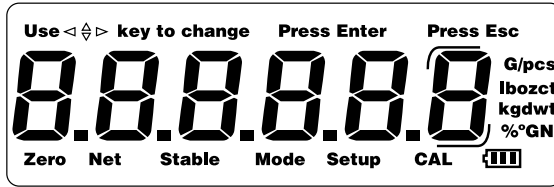
When the Capacity of the balance is 600.0g, the last digit will be the auxiliary display digit (a symbol indicating the digit):

When the Capacity of the balance is 150.00g, 300.00, 1500.0 and 3000.0g, the last digit will be blank in normal weighing mode only if the (ESC) key is pressed to extend the display.

FUNCTION

The balance can be available for operation from mains at 110~240V (50/60Hz) with an external AC/DC adapter with 12V output voltage and an optional internal 6V rechargeable battery.

POWER-UP

When power up the balance, the display will first show the software version (Ver. 1.01) for 2 seconds and then perform a self display test. Then it will show the Calibration counting times for about 1 second. After that it will automatically establish the current weight as a new zero reference point.

WEIGHING MODE

Display range

The display can show weight from −Max (Tare weight) to Max+9e (Gross weight).

Zero-Setting

Zero-setting range: ±2% of Max

Zero-setting is only available when the load receptor is not in motion (The display is stable).

Semi-automatic zero-setting

When there is a minor weight displayed (without load on the pan), press $(→0←)$ key to return to the display to zero, then the **Zero** symbol appears which indicates that the display now is at the zero point.

Zero-tracking

The instrument is equipped with a zero-tracking feature which operates at a

speed of ±0.25e/s and only when the indicator is at gross zero and there is no motion in the weight display.

Initial zero-setting

Initial zero-setting range: ±10% of Max

When the initial zero-setting range is below -10% of Max, the display shows **"-------"** and the buzzer sounds. To return the display to normal mode, please adding more weights until the initial zero-setting range is between ±10% of Max.

When the initial zero-setting range is beyond +10% of Max, the display shows **"-------"** and the buzzer sounds. To return the display to normal mode, please take off weights until the initial zero-setting range is between ±10% of Max.

Tare

The instrument is provided with a semi-automatic subtractive tare.

Semi-automatic tare

Press (↔⬇) key to subtract the current displayed weight value as the tare weight value (Consecutive tare operations are permitted). The **NET** symbol appears and the display will show a net weight of the object to be weighted.

To clear the tare value, please remove the container on the pan, then the display will show a minus tare weight value and press (⟷↧) key again.

Note:

1. When performing the tare operation(s), make sure the instrument is in **stable**.

2. If consecutive tare operations have been performed, to clear the tare value, please remove all the containers on the pan first and then press (⟷↧) key.

3. Tare range is the full capacity of balance for all models.

Units selection

Press the (U) 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.

Overload alarm

When the weight on the pan exceeds the Max. capacity, the display will show **"--OL--"** at the same time the buzzer sound. Please take off the weight at once. Otherwise the load cell will be easy to be damaged.

Counting mode

In normal weighing mode, press the (M) key to enter into parts counting mode. The display shows as below:

```
 C      10        G
  Net   Stable   Mode
```
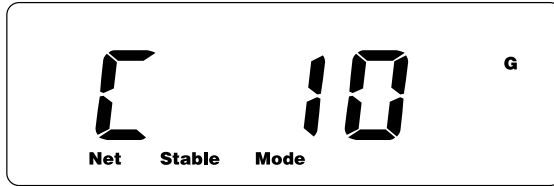
Press (U) key or (↑)(↓) key to choose the sample size (10, 20, 50 and 100 pcs).

After a desired sample size has been chosen, put the samples as the chosen sample size on the pan and press the (⚬) key. Then the **"Mode"** symbol starts flashing and the **"C"** disappears.

```
        50        G
      Stable   Mode
```
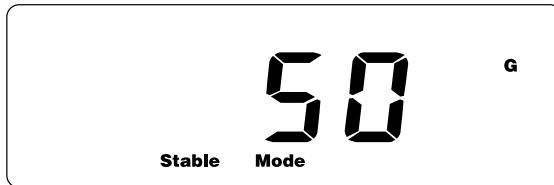
Then the sampling procedure is finished. And the balance can be used for parts counting.

Note: If the unit weight is two small (less than 0.2 scale division), the display will show **"- -or- -pcs"**.

Percentage weighing mode

In normal weighing mode, press (M) key twice to enter into percentage weighing mode.

```
 P     100        %
      Stable   Mode   ▯▯▯
```
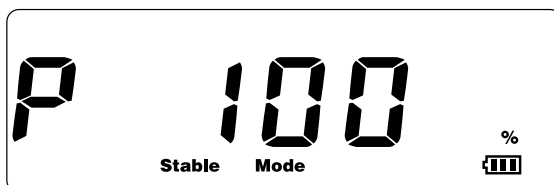
Press $\left(\text{U}\right)$ key or $\left(\uparrow\right)\left(\downarrow\right)$ key to switch between 100.0% or 100.00%.

Put the sample considered to be 100% on the pan, and then press the $\left(\text{⁂}\right)$ key to perform sampling process. Then the **"Mode"** symbol starts flashing and several seconds later, the **"Mode"** symbol and **"P"** disappears.
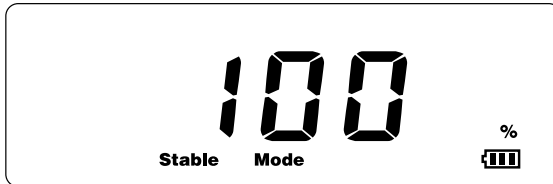
Then the sampling procedure is finished. Take away the sample and put other objects on, the display will show a percentage (the objects' weight to the 100% sample weight).

- The sample weight considered to be 100% should be larger than 0.2d, or the display will show **"- -or- -%"**, which indicates that larger sample weight should be put on.

Note:

1. Press the $\left(\text{M}\right)$ key after the sampling procedure (parts counting or percentage weighing) is finished, it will return to normal weighing mode. Then press the $\left(\text{⁂}\right)$ key, the balance will return to parts counting or percentage weighing mode again; and the sampling data can also be used.

2. The sampling data will be cleared automatically when after switching between counting mode and percentage weighing mode.

CALIBRATION PROCEDURE

IMPORTANT: This action involves breaking the seal of the verification certificate.

Turn on the balance and press calibration button under the balance to enter calibration mode (break verification seal). When the salf-test procedure finished, the display will show as below:

Use ◁⇕▷ key to change   Press Enter   Press Esc

$$CAL$$

Setup
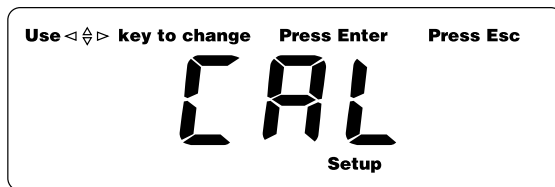
Press (←) (→) key to move to "SET"for parameters setting or "CAL.R" for ratio span calibration, or "CAL.W" for weight span calibration. Then press (↵) to enter.

Use ◁⇕▷ key to change   Press Enter   Press Esc

$$SEt-$$

Setup
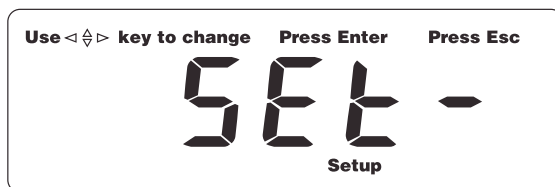
Or justa press (↵) key to enter into Weights loading procedure when it displays "CAL".

Parameters setting

1. Unit selection

The display will show as below:

Use ◁⇕▷ key to change   Press Enter   Press Esc

$$Unit\ 1$$

Setup
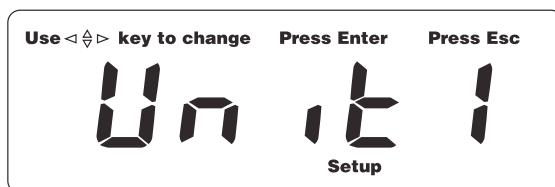
Use (↑) (↓) keys to choose the available units:

1: g, ct

2: g, ct, GN

3: g, ct, ozt, oz, dwt, GN, t (Default)

4: Press ⏎ key to choose the units manually from g, ct, ozt, oz, dwt, GN and t.

```
Use ◁ ⇕ ▷ key to change                    Press Esc
                                                    G

    On

                        Setup
```
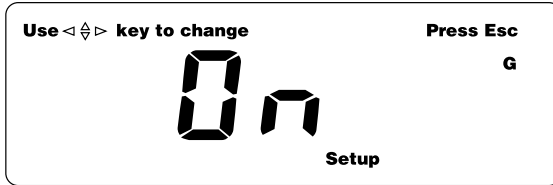
Use ↑ ↓ keys to choose the unit, use ← → key to set the unit to be on or off.

Press ⏎ key to confirm the choice or press ESC key to exit.

Note: The unit g and ct is default to be on (can not set to be off).

2. LFT mode (Legal for trade)

The display will show as below:

```
Use ◁ ⇕ ▷ key to change    Press Enter    Press Esc

    LF    OFF

                        Setup
```
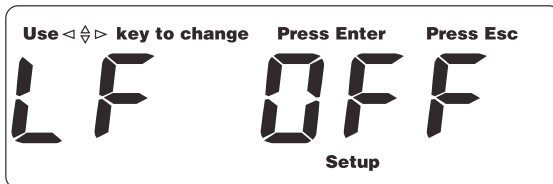
Use ↑ ↓ keys to set the LFT mode to be on or off.

LFT on: The auxiliary display function or extended display function are

unavailable.

LFT off: The mode with auxiliary display function or extended display function. (Default).

Press ⏎ key to confirm the choice and move to next setting; or press ᴱˢᶜ key to exit.

2. Capacity

The display will show as below:
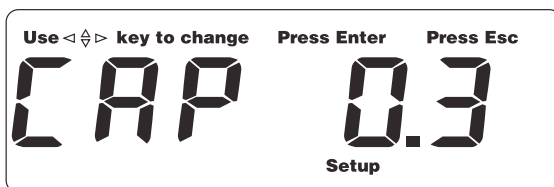
Use ↑ ↓ keys to choose the capacity from Cap 0.3 (300g), Cap 0.6 (600g), Cap 1.2 (1200g), Cap 1.5 (1500g), Cap 3.0 (3000g) or Cap 6.0 (6000g).

Press ⏎ key to confirm the capacity and enter into Weights loading procedure.

Ratio span calibration

When the display shows "CAL", press →0← key to move to "CAL.R" for ratio span calibration.

When the display shows "CAL.R", press ⏎ key to enter into the ratio span calibration and the display show as below:

Use ◁ ⬦ ▷ key to change   Press Enter   Press Esc

CAL.r

Press (↵) key to display the ratio inputting status.

Use ◁ ⬦ ▷ key to change   Press Enter   Press Esc

0.00000

Use (←)(→) key to move the digit; use (↑)(↓) keys to change the figure for the current digit.

The ratio can only be a value between 0.80000 ~ 1.20000 (= Mass weight value/Actual display weight value).

Press (↵) key to confirm and exit to normal weighing mode.

Weight span calibration

Press (←)(→) keys to move to "CAL.W" when ti display "CAL.R".

When the display shows "CAL.W", press (↵) key to enter into the weight span calibration and the display show as below:

Use ◁ ⬦ ▷ key to change   Press Enter   Press Esc

CAL.ω

Press (↵) key to display capacity value.

Use ◁ ⬦ ▷ key to change   Press Enter   Press Esc

60.0.00

Use (←)(→) key to move the digit; use (↑)(↓) keys to change the figure for the current digit.

Put the Weights which is exactly equal to the displayed value and press (↵) key to confirm.

The value flickers and the exit to normal weighing mode when it finishes.

Weight loading

The display show as below:

Use ◁ ⬦ ▷ key to change   Press Enter   Press Esc

0.000

Stable   CAL

Touch the pan lightly, the displaying value flickers; when the display is stable, the Zero point is confirmed. And the display will show a value which flicker, when it is stable, the display will show a value which should be put on for the second time.

Use ◁ ⬦ ▷ key to change   Press Enter   Press Esc

100.000

Stable   CAL
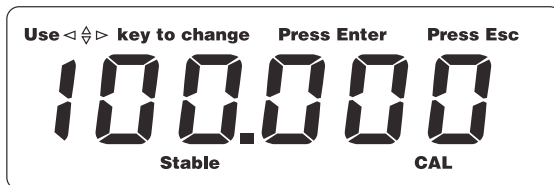
Put on the Weights which equals the value displayed, and the value will

flicker, when it is stable, the display wil show a value which should be put on for the second time.
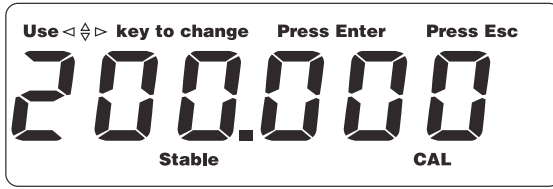
Put on the Weights which equals the value displayed, and the value will flicker, when it is stable, the display will show a value which should be put on for the third time.
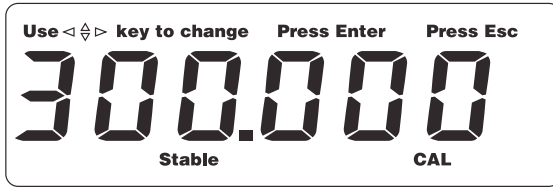
Put on the Weights which equals the value displayed, and the value will flicker, when it is stable, the loading procedure is finished. Take off the Weights, and the scale can be used.

PARAMETERS SET-UP

In normal weighing mode, press $\left(\text{F}\right)$ key to enter into parameters set-up mode. The **"Setup"** message appears.

Auto-shut off time
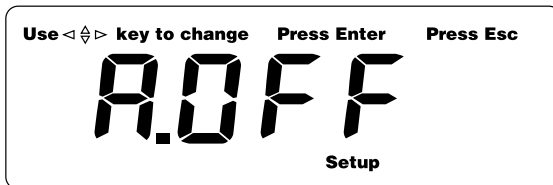
Press ⊙ key to move to parameter **"Unit"** (To choose available units) or press ⊙ key to move to parameter **"A.OFF"** (To choose auto-shut off time).

Press ⊙ key to enter into the parameter.

```
Use ◁ ⇕ ▷  key to change                    Press Esc


                    ⊓ o

                             Setup
```
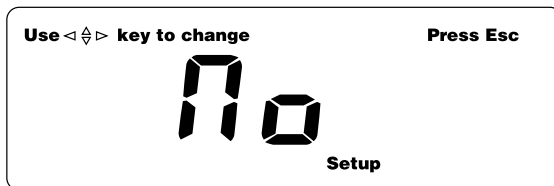
Press ⊙, ⊙ keys to choose from 2m, 5m, 8m or No (auto. shut off is unavailable). (Default: **No**).

Press ⊙ key to confirm your choice and press ⊙ key to return to parameters menu. To move to next setting press the ⊙ key. To return to normal weighing mode press the ⊙ key.

Transmitting mode

```
Use ◁ ⇕ ▷  key to change    Press Enter    Press Esc


                    t r n

                             Setup
```
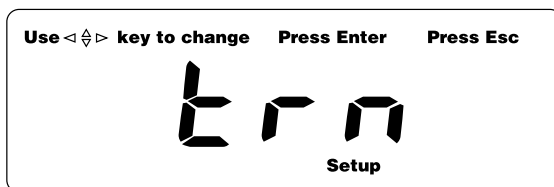
Press ⊙ key to move to parameter **"A.OFF"** (auto-shut off time) or press the ⊙ key to move to parameter **"trn"** (transmitting mode).

Press the ⊙ key to enter into the parameter.

```
Use ◁ ⇕ ▷  key to change                    Press Esc


              CLOSE

                             Setup
```
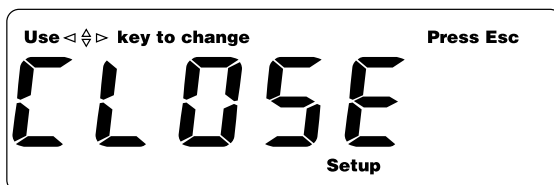
Press (↑), (↓) keys to choose the transmitting mode from tr.M.LP, tr.disp, tr.SEr, tr.A.PC, tr.M.PC, tr.A.dt, tr.M.dt, tr.A.LP . (Default: **tr.M.LP**).

tr.M.LP: When the display is stable, the data can be printed by pressing a key (For LP-50 printer).

tr.disp: Only the displaying data will be transmitted (for Extra Display).

tr.SEr: The data will be transmitted continuously.

tr.A.PC: When the display is stable, it will be transmitted to PC automatically.

tr.M.PC: When the display is stable, it can be transmitted to PC by pressing a key.

tr.A.dt: When the display is stable, the data can be printed automatically. (For DT printer).

tr.M.dt: When the display is stable, the data can be printed by pressing a key. (For DT printer).

tr.A.LP: When the display is stable, the data will be printed automatically. (For PR printer).

Press (↵) key to confirm your choice and press (ESC) key to return to parameters menu. Press the (→) key to move to next setting. To return to normal weighing mode press the (ESC) key.

Note: For some balance, they can be connected with PR Printer. So two more choices will be added here:

KBl: The data will be transmitted ony by pressing the key (For PR only).

Stbl: The data will be transmitted when the display is stable (For PR only).

Label format (For PR Printer)

> **Use ◁⇕▷ key to change   Press Enter   Press Esc**
>
> ## LABEL
>
> Setup
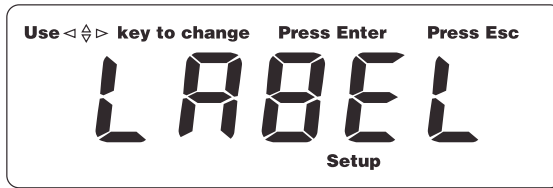
Press ⟵ key to move to "To choose transmitting mode" or press ⟶ key to move to "To choose baud rate".

Press (ESC) key to exit to normal weighing mode; press (⟵) key to enter into choosing label format.

> **Use ◁⇕▷ key to change   Press Enter   Press Esc**
>
> ## For Π0
>
> Setup
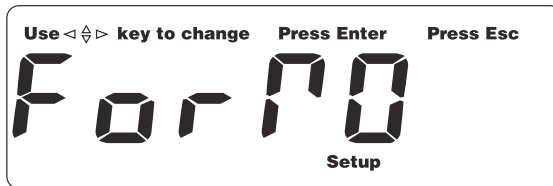
Press (↑), (↓) key to choose the Label format from Form 0 ~ Form 9. (Default: Form 0)

Press (⟵) key to confirm your choice and press (ESC) key to exit; then press (⟶) key to move to next setting.

Baud rate

> **Use ◁⇕▷ key to change   Press Enter   Press Esc**
>
> ## rAtE
>
> Setup
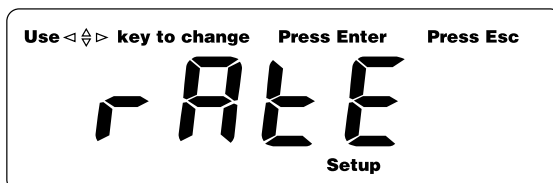
Press (←) key to move to parameter **"trn"** (transmitting mode) or press the (→) key to move to parameter **"rAtE"** (to choose baud rate).

Press (↵) key to enter into the parameter.

> **Use ◁ ⬍ ▷ key to change**   **Press Esc**
>
> # 9600
>
> **Setup**
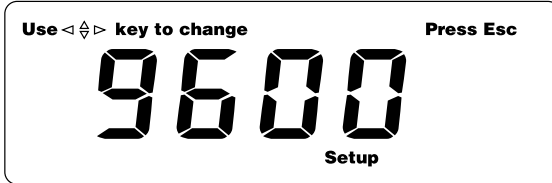
Press (↑), (↓) keys to choose the baud rate from 1200, 2400, 4800 and 9600. (Default: **9600**).

Press (↵) key to confirm your choice and press (ESC) key to return to parameters menu. To move to next setting press the (→) key. To return to normal weighing mode press the (ESC) key.

Data bits

> **Use ◁ ⬍ ▷ key to change**   **Press Enter**   **Press Esc**
>
> # dAtA b
>
> **Setup**

Press (←) key to move to parameter **"rAtE"** (to choose baud rate) or press the (→) to move to parameter **"dAta b"** (To choose data bits).

Press (↵) key to enter into the parameter.

b it.n8

Setup
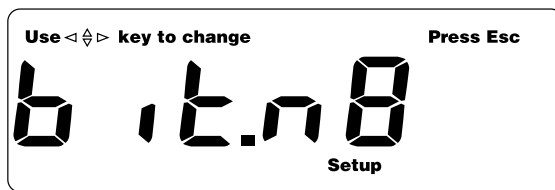
Press (↑), (↓) keys to choose the data bits from bit. N8 or bit. E7. (Default: **bit. N8**).

Press the (↵) key to confirm and then the (ESC) key to return to parameters menu. Press the (→) to move to next setting or press again the (ESC) to back to normal weighing mode.

Unit weight re-computing in counting mode

Use ◁ ⬌ ▷ key to change   Press Esc

A.C   y

Setup
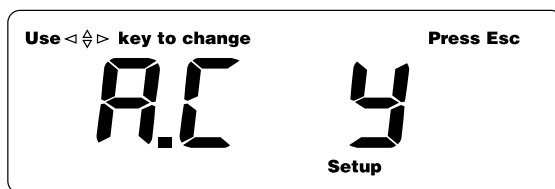
Press (←) key to move to parameter **"Zero1"** (To choose zero display range) or press the (→) to move to **"A.C Y"** (to choose unit weight in counting mode).

Press (↑), (↓) key to choose it from y or n (yes or no). (Default: **y**).

Press (↵) key to confirm your choice and then press (→) key to move to next setting; press (ESC) key to exit.

Blacklight type

Use ◁ ⬌ ▷ key to change   Press Esc

b.L   1

Setup
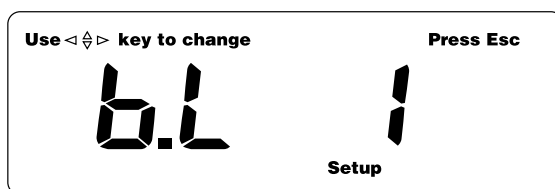
Press $\leftarrow$ key to move to parameter **"A.C Y"** or press the $\rightarrow$ key to move to parameter **"Bl.1"** (to choose backlight type). Press $\uparrow$, $\downarrow$ keys to choose the backlight type from 1, 2 and 3. (Default: **1**)

1. The backlight will be on automatically when a load exceeds 10e on the pan or pressing a key.
2. The backlight will always be on.
3. The backlight will always be off.

Press $\hookleftarrow$ key to confirm your choice and then press $\rightarrow$ key to move to next setting; press ⒠sc key to exit.

Recovery of the default values from memory

In normal weighing mode, hold down the F key for 3 seconds. Then the balance will be recovered with a default calibration values.

SPECIFICATION OF OUTPUT INTERFACE

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

Format:

Baud rate:	1200-9600 BPS
Data bits:	8 bits/ 7 bits
Parity bit:	none/Even
Stop bit:	1 bit
Code:	ASCII

RS232 connector is a 9-pin D-subminiature socket.

Input Pin	2
Output Pin	3
Signal Ground Pin	5

Data Format:

H1	H1	,	H2	H2	,	D	D	D	D	D	D	D	D	U	U	U	U	CR	CR

Head 1   Head 2   Data   Unit   CR LF
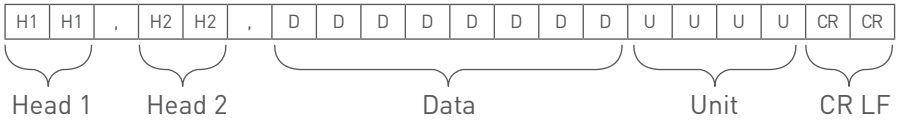
HEAD 1 (2 BYTES)	HEAD 2 (2 BYTES)
OL – Over Load	
ST – Stable	**NT** – Net Weight
US – Unstable	**GS** – Gross Weight

DATA (8 BYTES)
2D (HEX) = "-" (LESS)
20 (HEX) = " " (SPACE)
2E (HEX) = "." (DECIMAL POINT)

UNIT (4 BYTES)
g-20 (HEX) ; 20 (HEX) ; 20 (HEX) ; 67 (HEX)
lb-20 (HEX) ; 20 (HEX) ; 6c (HEX) ; 62 (HEX)
Ti.T-74 (HEX) ; 6C (HEX) ; 2E (HEX) ; 54 (HEX)

GRAM ▼

ERROR MESSAGES

When the balance powered up or during the operation, the display may show some Error messages as below: E1, E2, E5 and OL.

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

TECHNICAL DATA

Model	AHV
Construction	Stainless steel pan, plastic housing
Weighing Units	g, ct
Application Modes	Weighing, Simple Counting and Percent Weighing
Display(s)	20 mm high, 6-digit, 7-segment LCD, blue color LED backlight
Keyboard	13 keys embossed membrane keyboard
Zero Range	4% (± 2%) of Full Scale Capacity
Tare Range	Full Capacity by subtraction
Stabilization Time	≤ 2 seconds
Operating Temp.	5 ºC - 40 ºC
Humidity Range	≤ 90% relative humidity, non-condensing
Power	AC/DC Adapter 12V/1000mA or 6V/1.2Ah Internal rechargeable lead acid battery.
Battery Life	20 hours continuous use with 8 hour recharge time.
Safe Overload Capacity	120 % of capacity
Pan Size	Φ 116 mm (Round) / 124 * 144 mm (Square)
Scale Dimension W*H*D	200 * 76 * 250 mm

GUARANTEE

This balance is guaranteed for one year from the delivery date. The guarantee covers any fabrication defect of the material.

During this period, **GRAM PRECISION, SL,** covers the manpower and the spare parts costs necessary for the reparation of the scale.

This guarantee does not cover the failures caused by an inappropriate use or overload.

The guarantee does not cover the freight cost (transport) necessary to repair the balance.

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