

# Compact Precision Scale

111120

## INSTRUCTION MANUAL

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**AND**  
A&D Company, Limited



1WMPD4002673

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# SAFETY PRECAUTIONS

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All safety messages are identified by the following, "**WARNING**" or "**CAUTION**", of ANSI Z535.4 (American National Standard Institute: Product Safety Signs and Labels). The meanings are as follows:

 <b>WARNING</b>	A potentially hazardous situation which, if not avoided, could result in death or serious injury.
 <b>CAUTION</b>	A potentially hazardous situation which, if not avoided, may result in minor or moderate injury.

- This manual is subject to change without notice at any time to improve the product.
- Product specifications are subject to change without any obligation on the part of the manufacture.
- When using the scale, the following safety precautions should always be followed.

## **WARNING**

### Repairs

Do not disassemble the scale. Contact your local A&D dealer if your balance needs service or repair.

### Troubleshooting

If a problem has occurred and you cannot clear it, stop using the scale, place a notice on the scale and request service from the store where you purchased the balance or from your local A&D dealer.

## **CAUTION**

### Conditions for use and Ambient Temperature

- The scale is a precision instrument. Avoid installing the scale in direct sunlight, excessive dust, high humidity, high temperature, large temperature fluctuations or magnetic fields, which may cause problems or malfunctions.
- Drafts and vibration may cause excessive weighing errors.
- Use the scale range of the  $-10^{\circ}\text{C}$  to  $40^{\circ}\text{C}$ , with less than 85% R.H.

### Operation

- Avoid using the weighing pan to move the scale, as that could cause damage to the scale.
- Avoid overloading that could cause damage to the scale.
- The scale is not waterproof type. Water invading into the scale may cause damage.
- If the scale is not to be used for a long period of time, remove all batteries from the battery compartment to avoid battery leakage.
- Do not mix batteries made by different manufactures, or mix old and new batteries. Replace all of the batteries at one time.
- Use only the specified AC adapter for the scale (AC adapter is optional).

## Compliance with FCC rules

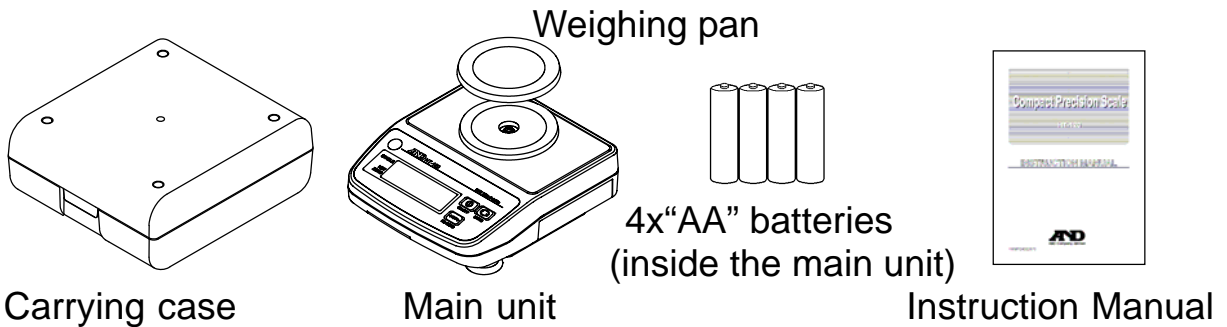
Please note that this equipment generates, uses and can radiate radio frequency energy. This equipment has been tested and has been found to comply with the limits of a Class A computing device pursuant to Subpart J of Part 15 of FCC rules. These rules are designed to provide reasonable protection against interference when the equipment is operated in a commercial environment. If this unit is operated in a residential area it may cause some interference and under these circumstances the user would be required to take, at his own expense, whatever measures are necessary to eliminate the interference. (FCC = Federal Communications Commission in the U.S.A.)

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# UNPACKING

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Check whether all of the following items are included:

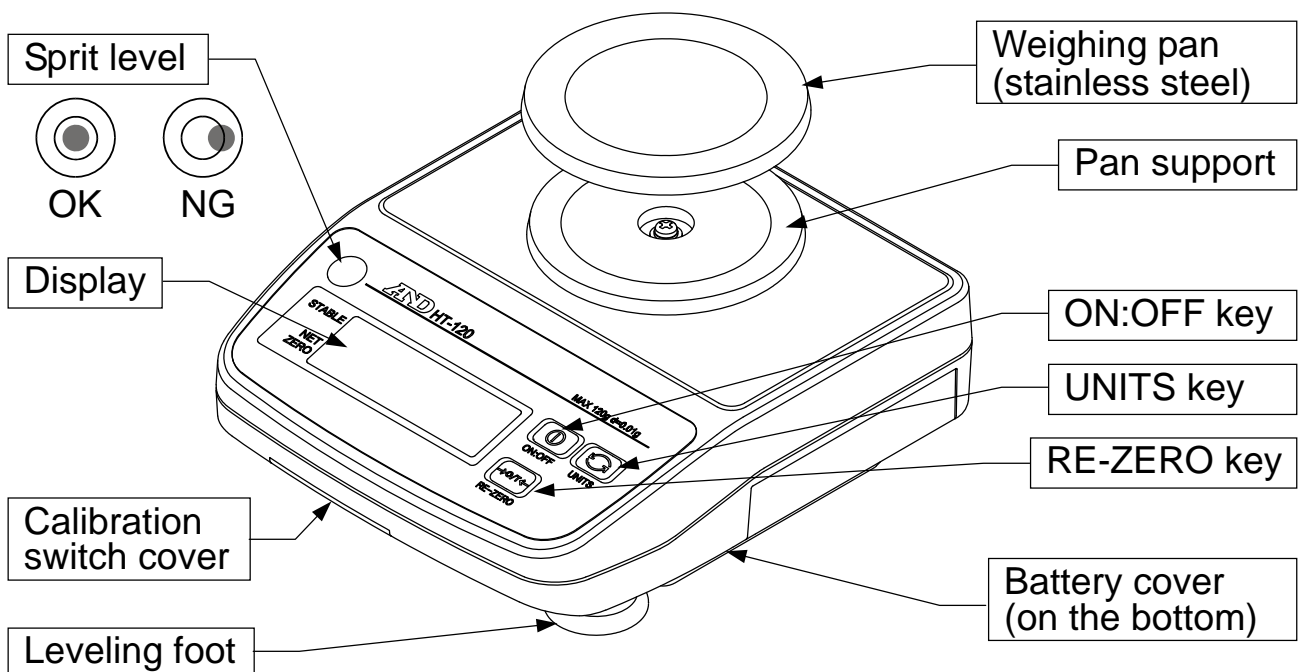


The bubble should be in the center of the circle.

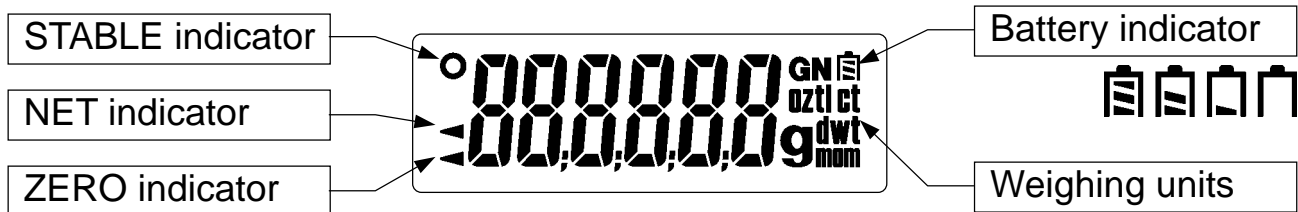
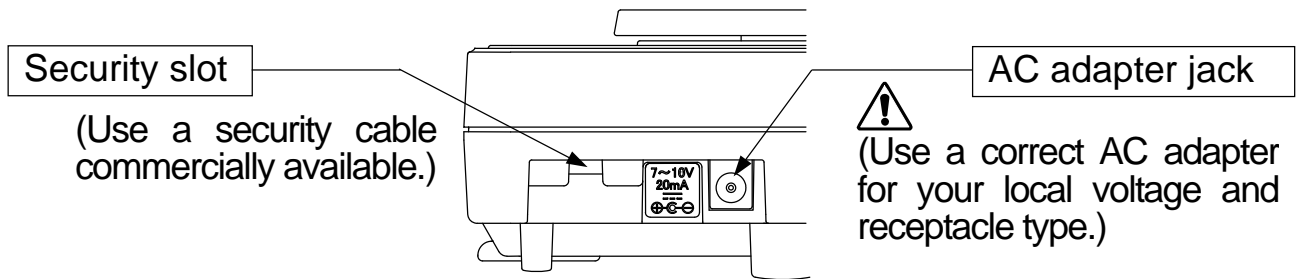
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# PARTS DESCRIPTION

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(Adjust the leveling feet as the bubble is in the middle of the circle.)



<b>ON:OFF</b> key	Turns the scale power on/off.
<b>RE-ZERO</b> key	Sets the display to zero. When the weight is within $\pm 2\%$ of the weighing capacity to the zero point at the power-on, the key will zero the scale. When the weight exceeds $+2\%$ , it will be subtracted as tare weight.
<b>MODE</b> key	Changes the weighing units.
STABLE indicator	Turns on when the weight reading is stable.
NET indicator	Turns on when the net weight is displayed.
ZERO indicator	Turns on at the center of zero point. At the net weight zero point, both the ZERO and NET turn on.
Battery indicator	Shows the remaining battery level in 4 steps when operated by batteries.

## PREPARATION

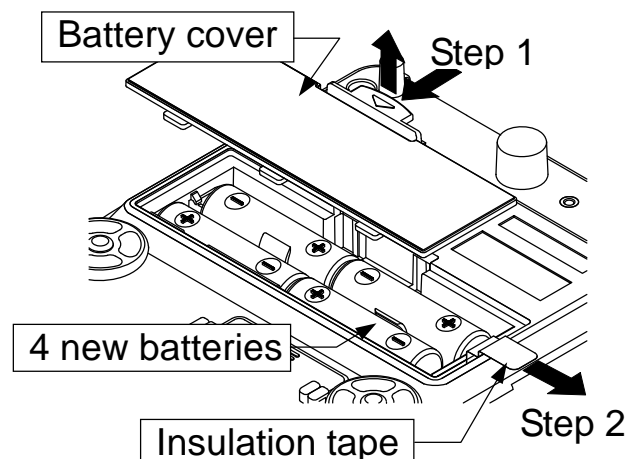
### Installing Batteries

Step 1 Remove the battery cover.

Step 2 Before use, remove the insulation tape from the battery compartment.

Step 3 Insert 4 new batteries into the battery compartment, taking care of the polarities.

Step 4 Replace the battery cover.

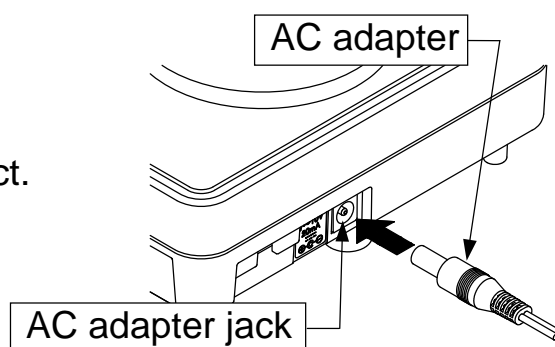


Note The batteries provided with the scale are for testing the performance of the scale and may have a limited life.

## When Using the AC adapter

Step 1 Verify that the AC adapter is correct.

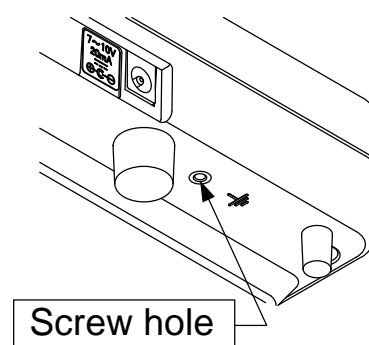
Step 2 Plug the AC adapter into the AC adapter jack.



## Possibility of Electrostatic Influence

When the ambient humidity gets low, plastics and insulators will be easily charged. That may make the reading unstable and cause some errors. To reduce the electrostatic influence, ground the scale using a threaded screw hole on the bottom. A ground wire and a screw are not included.

Prepare the screw M3 x @ ~ M3 x # (mm).



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# WEIGHING

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Step 1 Press the **ON:OFF** key to turn the scale on. The scale displays all segments for a few seconds and shows zero. Press the **ON:OFF** key again to turn the scale off.

Step 2 Press the **UNITS** key to select an appropriate weighing unit. The scale will power up with the same weighing unit as the one in use when turned off last time.

Step 3 Verify that the reading is zero. If not, press the **RE-ZERO** key to zero the display. When you use a container for weighing, place an empty container on the weighing pan and press the **RE-ZERO** key to zero the display.

Step 4 Place objects to be weighed on the weighing pan or in the container. Wait for the STABLE O to be displayed and read the value.

## Errors

E	Overload. Remove object from the weighing pan.
-----	Out of range or unstable error. There is a load beyond the zero range at the power-on. When pressed the <b>RE-ZERO</b> key or powered on, unstable weighing shows this display either.
Lb	Low battery. Replace batteries with four new ones immediately.
CAL E	Calibration error. Unstable weighing or incorrect calibration weight.
Err #	Internal errors (# will be 1, 2, 3, 4, 5 or 6). Request service.

# FUNCTIONS

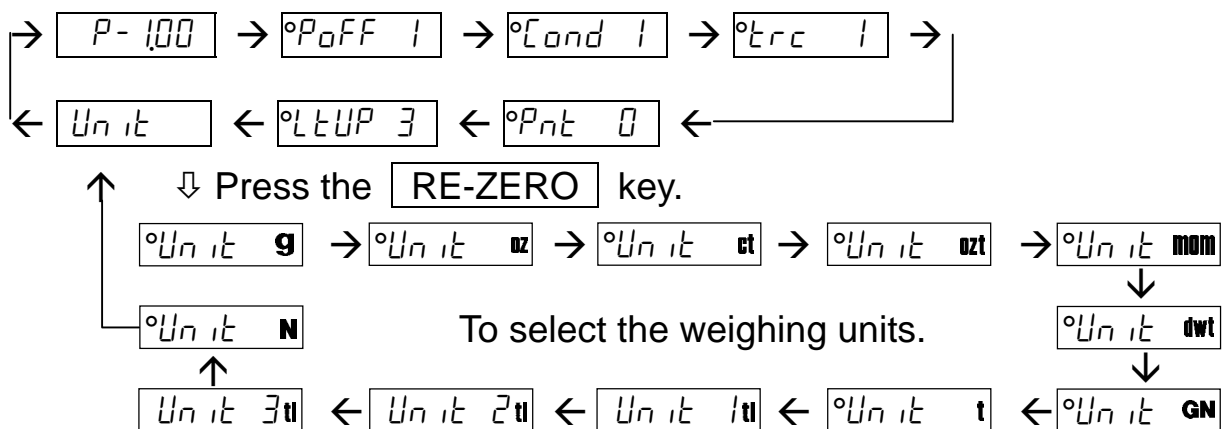
## Entering the Function Settings

Turn the scale turned off and press the **ON:OFF** key while pressing the **RE-ZERO** key. Then, the display will show the software version **P-1.00** ("1.00" is an example and may be a different number.) This is the starting point of the function settings.

## Key Operation

- UNITS** key To select a function item.
- RE-ZERO** key To change the parameter of each item.
- ON:OFF** key To finish the operation and turns off the scale.

Starting at the software version display, each function item appears cyclically by pressing the **UNITS** key.



“→”, “←”, “↓” and “↑” show the movement by the **UNITS** key. While the display shows function item, press the **RE-ZERO** key to change the setting. To finish the settings, press the **ON:OFF** key to turn off the scale.

## Automatic Power Off Function

If the scale is left ON and the STABLE O is displayed, the automatic power-off function turns power off after approximately 5 minutes.

`PoFF 0`

Automatic power off function is disabled.

`PoFF 1`

Automatic power off function is enabled. (factory default)

## Setting the Response/Stability Condition

This function is to specify the response speed and to stabilize the weight value reducing the influence of ambient environment like vibration. But note that the setting is a trade-off between response and stability.

`Cond 0`

Fast response / Sensitive to the vibration

`Cond 1`

Normal condition for both response and stability (factory default)

`Cond 2`

Slow response / Insensitive to the vibration

## Setting the Zero Tracking Function

This function is to automatically track small zero drift caused by changes in the ambient environment.

`trc 0`

Zero tracking function is disabled.

`trc 1`

Zero tracking function is enabled. (factory default)

## Selecting the Decimal Point

This function is to select the decimal separator.

`Pnt 0`

“.” (period) (factory default)

`Pnt 1`

“,” (comma)

## Setting the LCD Backlight Operation

This function is to control how the LCD backlight turns off. When the weight data becomes and stays stable for some seconds, the backlight will automatically turn off. The weight change or the key operation will turn the backlight on (except the settings “always on” and “always off”).

`LEUP 0`

Backlight is always off.

`LEUP 1`

Backlight turns off 5 seconds after STABLE turning on.

`LEUP 2`

Backlight turns off 10 seconds after STABLE turning on.

`LEUP 3`

Backlight turns off 30 seconds after STABLE turning on. (factory default)

`LEUP 4`

Backlight turns off 60 seconds after STABLE turning on.

`LEUP 5`

Backlight is always on.

## Setting the Weighing Units to Use

- ❑ The scale has the weighing units listed in the table below and the units to be used only can be selected. Set the weighing units enabled or disabled as appropriate.
- ❑ There are three types of tael, HK general/Singapore tael, HK jewelry tael and Taiwan tael. But one of them can be selected.
- ❑ The order of units to be displayed is as in the table and it cannot be changed.

**UNITS** key To select the unit to be set.

**RE-ZERO** key To set the displayed unit enabled or disabled.

The **STABLE** **O** indicates the displayed unit enabled.

ex. **Unit g** shows “g” enabled. **Unit g** shows “g” disabled.

Unit	Unit name	Conversion to gram	At setting mode
g	Gram	1 g	<b>Unit g</b>
oz	Ounce (avoir)	28.349523125 g	<b>Unit oz</b>
ct	Metric carat	0.2 g	<b>Unit ct</b>
ozt	Troy ounce	31.1034768 g	<b>Unit ozt</b>
mom	momme	3.75 g	<b>Unit mom</b>
dwt	Pennyweight	1.55517384 g	<b>Unit dwt</b>
GN	Grain (UK)	0.06479891 g	<b>Unit GN</b>
t	Tola (India)	11.6638038 g	<b>Unit t</b>
tl	Tael (HK general)	37.7994 g	<b>Unit 1 tl</b>
	Tael (HK jewelry)	37.4290 g	<b>Unit 2 tl</b>
	Tael (Taiwan)	37.5 g	<b>Unit 3 tl</b>
N	Newton	See below.	<b>Unit N</b>

- ❑ HK = Hong Kong. HK tael (general) is equal to Singapore tael.
- ❑ Newton is a value calculated as follows:  

$$\text{Newton} = (\text{weight in gram}) \times (9.80665 \text{ m/s}^2) / 1000.$$



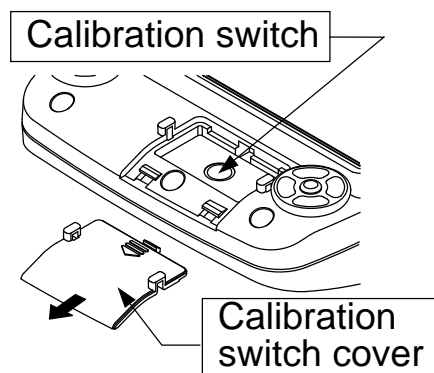
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# CALIBRATION

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## When is Calibration Required?

Calibration may be required when the scale was initially installed or has been moved to another location.



## Calibration Using a Calibration Weight

Step 1 Press the Calibration switch while the scale is in the weighing mode. Then, CAL will be displayed.

Step 2 Press the RE-ZERO key and CAL 0g will be displayed. With nothing on the weighing pan, press the RE-ZERO key.

Step 3 The display shows CAL blinking while waiting for the weighing value to be stable. When becoming stable, the scale perform zero calibration and will show CAL 100g (factory default) with tens place digit blinking).

Select the next step as follows:

- Proceed to the span calibration of Step 4.
- Press the ON:OFF key to finish the procedure without performing the span calibration.

Step 4 At the display CAL 100g, place the calibration weight 100 g ( $\pm 2$  mg) on the center of the weighing pan and press the RE-ZERO key.

- To use the other calibration weight (50 g or more recommended), press the UNITS key to change by 10 g and place the weight equal to the displayed value.

Step 5 The display shows CAL blinking while waiting for the weighing value to be stable. When becoming stable, the scale perform span calibration and will show End. Remove the calibration weight and press the ON:OFF key to finish the procedure.

## Gravity Acceleration Compensation

The scale is calibrated with the gravity acceleration value  $9.7985 \text{ m/s}^2$  at the factory. When the gravity acceleration at your location is different value, you should calibrate the scale using a calibration weight. But if the calibration weight cannot be prepared, change the

gravity acceleration of your scale to the value of the area where the scale is used. See “The Value of Gravity Acceleration at Various Locations” of this manual.

- Step 1 Start from  display at the Step 1 of “Calibration Using a Calibration Weight”, and press the  key and the current acceleration value will be displayed. ex.
- Step 2 Press the  and the digit that can be changed starts to blink. Change the value with following keys.
- key To increment the blinking digit.  
 key To move the blinking digit.
- Step 3 After setting the new value, press the  key while pressing the  key. Then, the display will show  for a second and stop blinking the value. Press the  key to finish the procedure.

## Restoring the Calibration Data

The zero calibration, span calibration and gravity acceleration values can be restored to the factory default values.

Ex. The scale was calibrated with wrong weight, but there is no correct weight. The values above can be reset to the factory default.

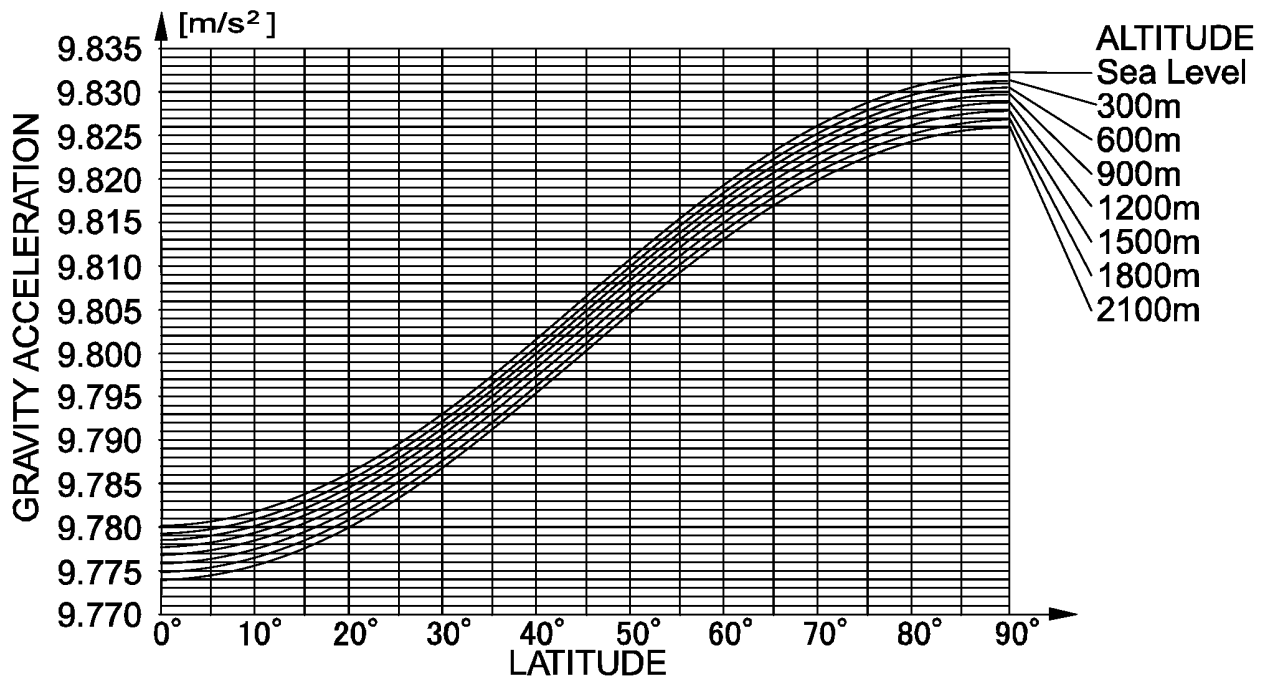
- Step 1 Start from  display at the Step 1 of “Calibration Using a Calibration Weight”, and press the  key twice to display .
- Step 2 Press the  key, then the display will show .  
Press the  key again to display  to restore.
- Step 3 At the display , press the  key while pressing the  key. Then, the display will show  for a second and automatically return to .
- Press the  key to finish the procedure.
- If perform the step 3. to the display , the display will return to  without showing .

# SPECIFICATIONS

MODEL	HT-120
Weighing capacity	120 g
Resolution	0.01 g
Non-linearity	± 0.02 g
Repeatability	0.01 g (Std. deviation)
Span drift	50 ppm/°C (5°C to 35°C / 41°F to 95°F)
Operating temp.	-10°C to 40°C / 14°F to 104°F, Less than 85%RH
Display	15 mm / 0.59 inches, 7segment LCD with backlight
Display update	Approximately 10 times per second
Power supply	4 x "AA" batteries (R6P / LR6) or AC adapter (option)
Battery life	Approx. 500 hours with alkaline cells at 20°C / 68°F (backlight off)
Pan size	φ 70 mm / φ 2.76 inches
Dimensions	136 (W) x 150 (D) x 57.5 (H) mm 5.35 (W) x 5.91 (D) x 2.26 (H) inches
Net weight	Approximately 500 g / 1.1 lb
Max. Tare weight	120 g
Calibration weight	100 g (factory default)
Accessories	This manual, 4x"AA" batteries (for operation check)
Option	AC adapter (contact your dealer)

## The Value of Gravity Acceleration at Various Locations

Amsterdam	9.813 m/s <sup>2</sup>	Madrid	9.800 m/s <sup>2</sup>
Athens	9.807 m/s <sup>2</sup>	Manila	9.784 m/s <sup>2</sup>
Auckland NZ	9.799 m/s <sup>2</sup>	Mexico City	9.779 m/s <sup>2</sup>
Bangkok	9.783 m/s <sup>2</sup>	Milan	9.806 m/s <sup>2</sup>
Brussels	9.811 m/s <sup>2</sup>	New York	9.802 m/s <sup>2</sup>
Buenos Aires	9.797 m/s <sup>2</sup>	Oslo	9.819 m/s <sup>2</sup>
Calcutta	9.788 m/s <sup>2</sup>	Ottawa	9.806 m/s <sup>2</sup>
Cape Town	9.796 m/s <sup>2</sup>	Paris	9.809 m/s <sup>2</sup>
Chicago	9.803 m/s <sup>2</sup>	Rio de Janeiro	9.788 m/s <sup>2</sup>
Copenhagen	9.815 m/s <sup>2</sup>	Rome	9.803 m/s <sup>2</sup>
Cyprus	9.797 m/s <sup>2</sup>	San Francisco	9.800 m/s <sup>2</sup>
Djakarta	9.781 m/s <sup>2</sup>	Singapore	9.781 m/s <sup>2</sup>
Frankfurt	9.810 m/s <sup>2</sup>	Stockholm	9.818 m/s <sup>2</sup>
Istanbul	9.808 m/s <sup>2</sup>	Sydney	9.797 m/s <sup>2</sup>
Havana	9.788 m/s <sup>2</sup>	Taipei	9.790 m/s <sup>2</sup>
Helsinki	9.819 m/s <sup>2</sup>	Tokyo	9.798 m/s <sup>2</sup>
Kuwait	9.793 m/s <sup>2</sup>	Vancouver, BC	9.809 m/s <sup>2</sup>
Lisbon	9.801 m/s <sup>2</sup>	Washington DC	9.801 m/s <sup>2</sup>
London (Greenwich)	9.812 m/s <sup>2</sup>	Wellington NZ	9.803 m/s <sup>2</sup>
Los Angeles	9.796 m/s <sup>2</sup>	Zurich	9.807 m/s <sup>2</sup>



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