

HT-GL Series Compact Scale

HT-300GL / HT-3000GL / HT-500GL / HT-5000GL

INSTRUCTION MANUAL

AND

A&D Company, Limited

1WMPD4003328

SAFETY PRECAUTIONS

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:

 WARNING	A potentially hazardous situation which, if not avoided, could result in death or serious injury.
 CAUTION	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°C to 40°C , with less than 85% R.H.

Operation

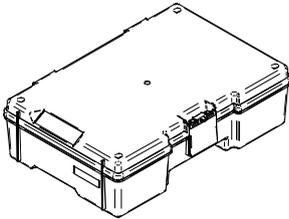
- Avoid mechanical shock to the scale, especially to the weighing pan. That could cause damage.
- Avoid overloading that could cause damage to the scale.
- The scale is not waterproof type. Water invading into the scale may cause damage.
- If the scale is not to be used for a long period of time, remove 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.)

UNPACKING

Check whether all of the following items are included:



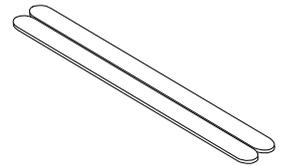
Carrying case



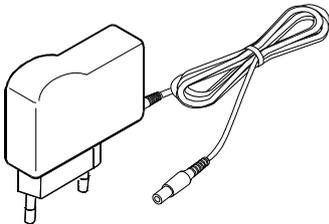
Main unit



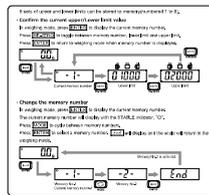
Name plate



Color bar



AC adapter



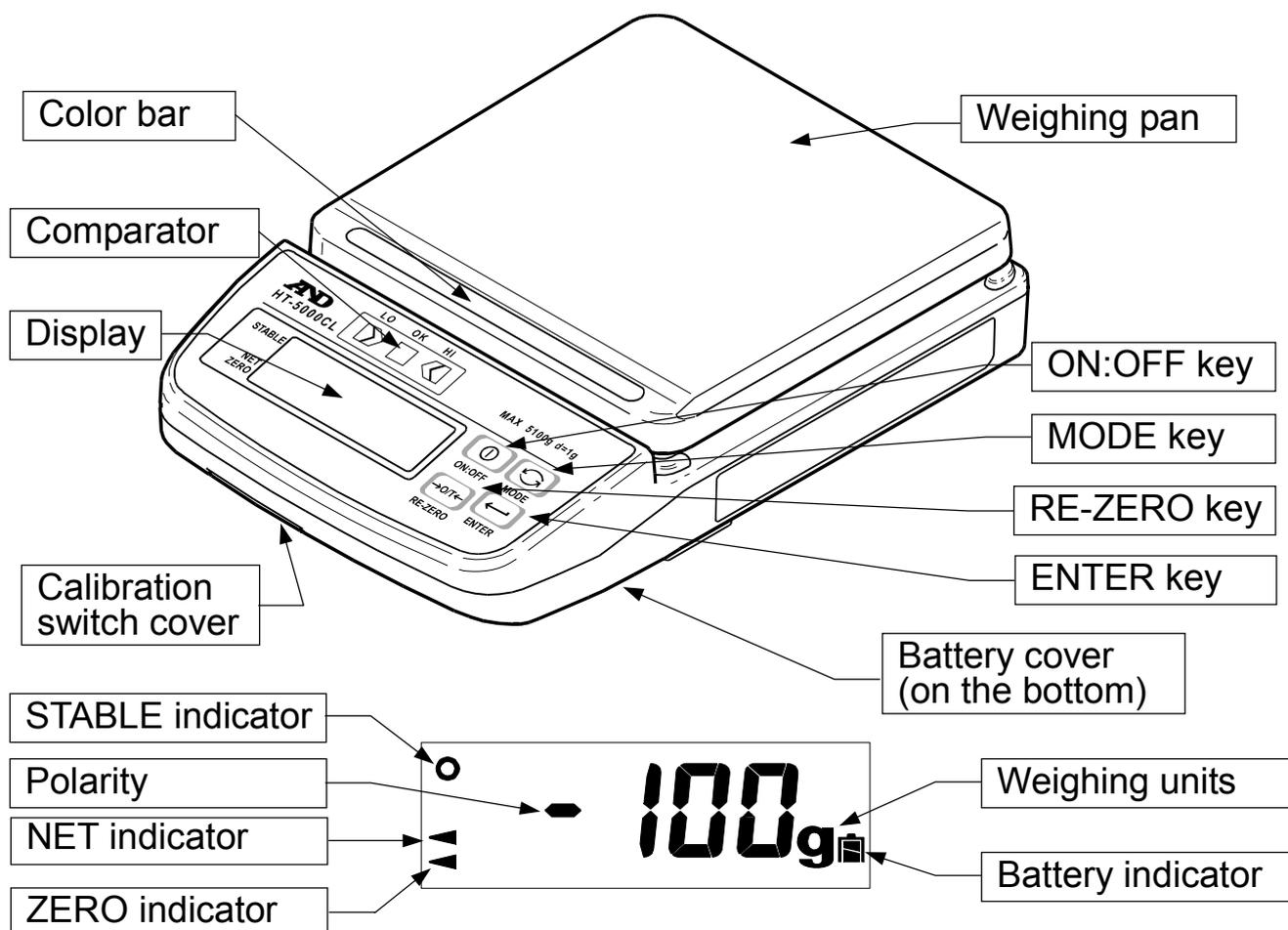
Operating instructions sticker



Instruction manual

Please confirm that the AC adapter is correct for your local voltage and receptacle type.

PARTS DESCRIPTION



ON:OFF key	Turns the scale power on/off.
RE-ZERO 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.
MODE key	Changes the weighing units.
ENTER key	Used for setting the upper and lower limit value for the comparator.
Comparator	Shows results using LO, OK or HI (red, green and yellow) after comparing the weighing value to the upper and lower limit value.
STABLE indicator	Turns on when the weight reading is stable.
Polarity	Shows the polarity of the weighing value.
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 3 steps when operated by batteries.

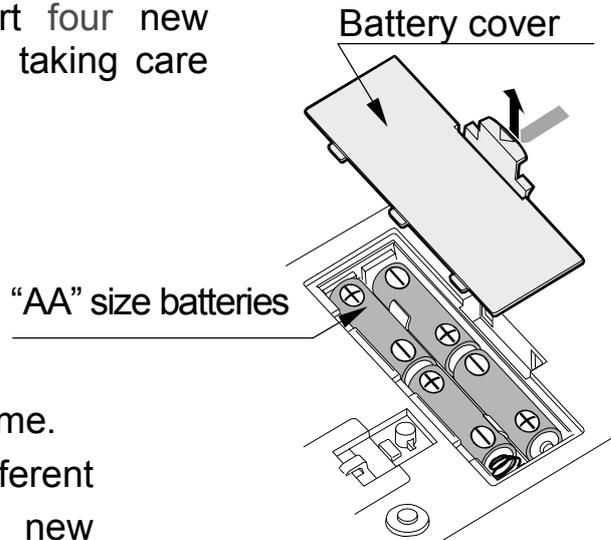
PREPARATION

Installing or Replacing Batteries

Remove the battery cover and insert four new batteries into the battery compartment, taking care of the polarities.

⚠ CAUTION

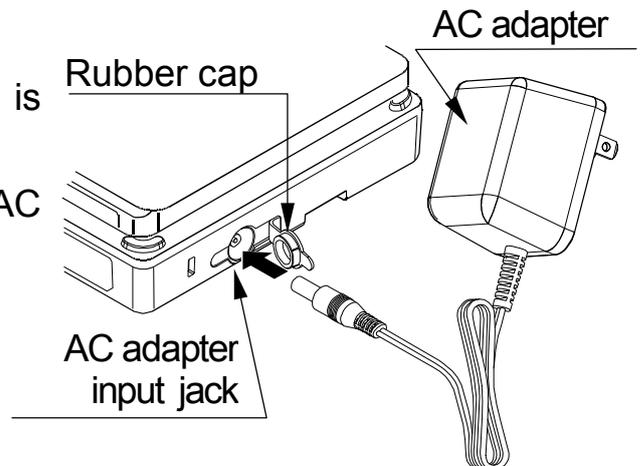
- ❑ Insert four batteries into the battery compartment, taking extreme care to that the polarities plus and minus are observed.
- ❑ Replace all of the batteries at one time.
- ❑ Do not mix batteries made by different manufactures, or mix old and new batteries.
- ❑ Turning the scale over to replace the batteries may result in excessive force being applied to the load cell and could damage the scale. Take care not to apply too much force to the weighing pan.
- ❑ Be sure to lock the battery cover again after installing the batteries.
- ❑ The battery life differs depending on the ambient temperature.
- ❑ Remove all of the batteries from the battery compartment when the device will not be used for a long period of time or is only operated using the AC adapter.



Connecting the AC Adapter

⚠ CAUTION

- ❑ Verify that the correct AC adapter is used.
- Open the rubber cap and plug the AC adapter into the AC adapter jack.



WEIGHING

Basic Operation

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.
2. Press the **MODE** key to select an appropriate weighing unit.
 - When the key lock functions are activated, these operations cannot be made.
 - The scale will power up with the same weighing unit as the one in use when turned off last time.
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.
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.
-----	The scale is out of zero range or unstable when powered on.
Lb	Low battery. Replace batteries with four new ones immediately.
CALE	Calibration error. Incorrect calibration weight.
Err #	Internal errors (# shows an error number). Request service.

COMPARATOR

The comparator is a function used to display comparison results using LO, OK or HI (red, green and yellow) after comparing the weighing value to the upper and lower limit values specified beforehand. The relationship between the LO, OK and HI is as follows.

$$LO < \text{lower limit value} \leq OK \leq \text{upper limit value} < HI$$

- Comparison conditions (Refer to “ $[P]$ ” in “FUNCTIONS”)
 - Not compared (Comparator functions disabled)
 - Compares all data
 - Compares all stable data
 - Compares plus data, excluding near zero
 - Compares stable plus data, excluding near zero
 - Compares all data, excluding near zero
 - Compares all stable data, excluding near zero
- “Near zero” means a range within ± 4 digits (quadruple the minimum display) from the zero point in grams.
- Nine upper and lower values respectively can be stored. (Memory number is 1 to 9.)
- Numerical values of the upper and lower limit value are common for each weighing unit, and the decimal point is ignored.

HT-300CL / HT-500CL

Upper limit value “02000”:	“200.0 g”	“200.0 ct”	“20.00 N”
Lower limit value “-01000”:	“-100.0 g”	“-100.0 ct”	“-10.00 N”

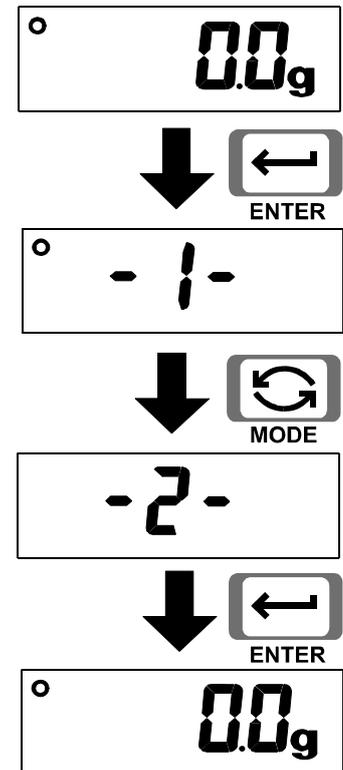
HT-3000CL / HT-5000CL

Upper limit value “02000”:	“2000 g”	“2000 ct”	“20.00 N”
Lower limit value “-01000”:	“-1000 g”	“-1000 ct”	“-10.00 N”

- The scale does not make a judgment on whether the upper or the lower limit value is larger. The scale does not result in an error even if the lower limit value is larger than the upper limit value.
- When both the upper and lower limit value are set to zero, the comparator function does not operate.
- When the weighing unit is lb, oz or catty, tael, the comparator cannot be used.

How to Operate

1. Press the **ON:OFF** key to put the device in the weighing mode.
2. Press the **ENTER** key to display the currently selected memory number.
3. Each time the **MODE** key is pressed, the memory number display will be switched.
The currently selected memory number is indicated by the “O” mark being lit.



Start comparing using the second memory.

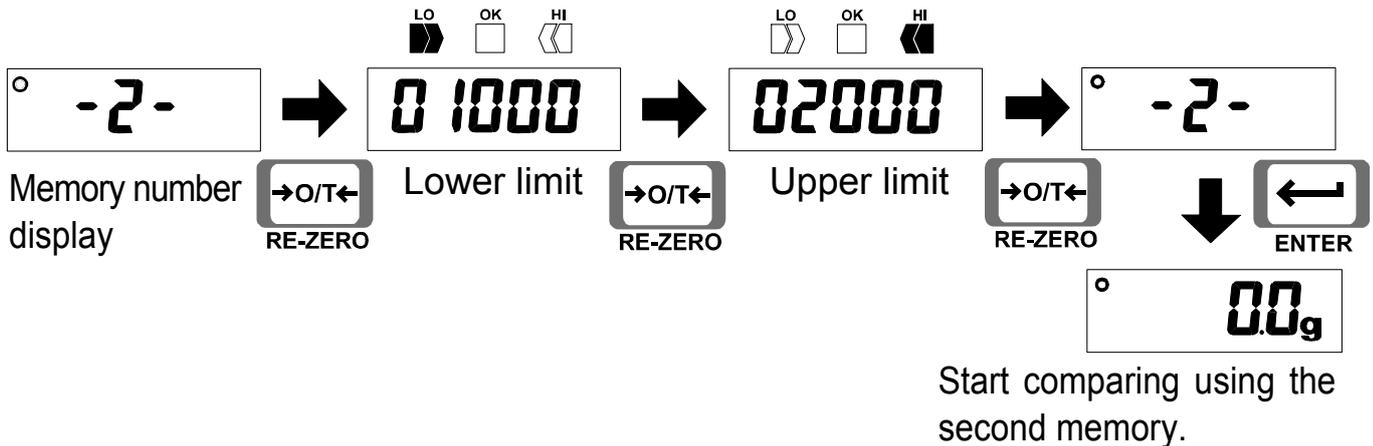
Selecting the Memory Number

4. Press the **MODE** key to display the memory number to be changed.
5. Press the **ENTER** key to change the memory number. After displaying **End**, the device returns to weighing mode.
6. Start comparing using the memory number changed to.

Confirming the Upper and Lower Limit Value

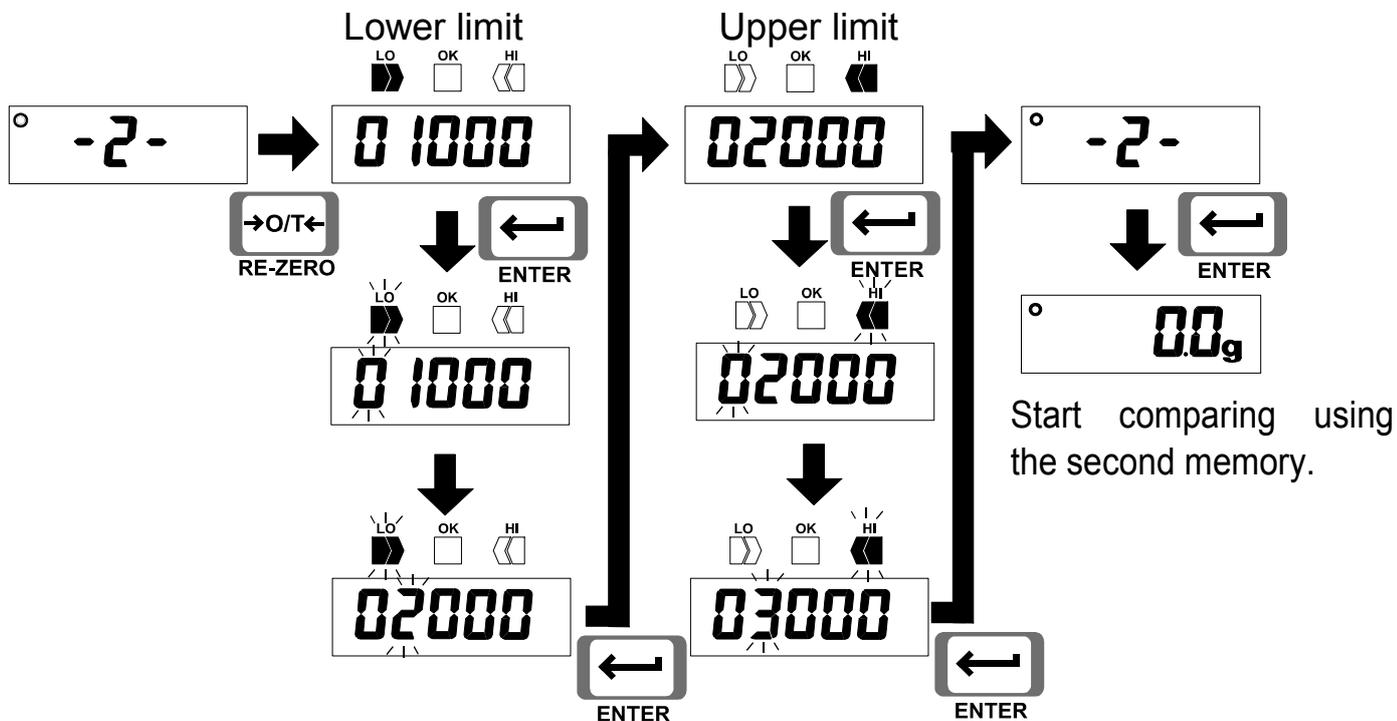
4. Press the **MODE** key to display the memory number to be confirmed.
5. By pressing the **RE-ZERO** key, LO is lit and the lower limit value of the memory number selected is displayed.
6. By pressing the **RE-ZERO** key, HI is lit and the upper limit value of the memory number selected is displayed.
7. To return to the memory number display, press the **RE-ZERO** key
8. To return to the weighing mode, press the **ENTER** key. (Start comparing using the memory number displayed at this time.)

Confirming the second upper and lower limit value



Setting the Upper and Lower Limit Value

- When the key lock function active, these operations cannot be used.
- 4. Press the **MODE** key to display the memory number to be set.
- 5. Press the **RE-ZERO** key to display the lower limit value.
- 6. Press the **ENTER** key at the lower limit value display to make LO and a digit of the value blink.
- 7. Set the lower limit value by using the following keys.
 - MODE** : To change which digit is blinking.
 - RE-ZERO** : To increase by +1 the value of the blinking digit.
 - RE-ZERO** (Press and hold) : To toggle between plus and minus.
- 8. Press the **ENTER** key to store the lower limit value. The scale then displays the upper limit value after displaying **End** .
- 9. Press the **ENTER** key at upper limit value display to make HI and a digit of the value blink.
- 10. Set the upper limit value by using the following keys.
 - MODE** : To change which digit is blinking.
 - RE-ZERO** : To increase by +1 the value of the blinking digit.
 - RE-ZERO** (Press and hold) : To toggle between plus and minus.
- 11. Press the **ENTER** key to store the upper limit value. The scale then returns to the memory number display.
- 12. To return to weighing mode, press the **ENTER** key. (Start comparing using memory number displayed at this time.)



FUNCTIONS

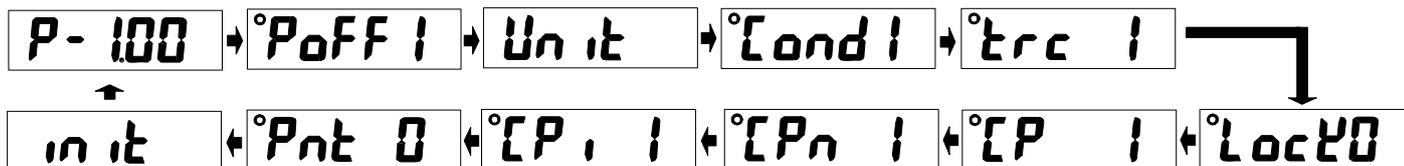
Entering the Function Settings

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

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

Start from the version display. By pressing the **MODE** key, function setting items switch in the order shown in the figure below.



Items that include a “○” mark are currently set values.

If the **RE-ZERO** key is pressed when a function settings item is being displayed, the setting values can be changed.

To store setting value changes (at a setting display with the “○” mark turned off), press the **MODE** key. After **End** is displayed, the next item will be displayed.

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 taels, 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.

• Display **Unit**.

• Press the **RE-ZERO** key to proceed to weighing unit selection settings.

MODE : To select weighing units to be set.

RE-ZERO : To enable or disable the units displayed.

Units that include a “○” mark are units to be used.

Example) **Unit g** "g" is available.

Unit g "g" is unavailable.

- By repeatedly pressing the **MODE** key, the device stores weighing units to be used after displaying **End**, and then it returns to a function setting item.

Unit	Unit name	Conversion to gram	At setting mode
g	Gram	1 g	° 1n it g
t	Tola (India)	11.6638038 g	° 1n it t
oz	Ounce (avoir)	28.349523125 g	° 1n it oz
ozt	Troy ounce	31.1034768 g	° 1n it ozt
lb, oz	Pound ounce	See below.	° 1n _{lb} it oz
tl	Tael (HK general)	37.7994 g	° 1n it 1tl
	Tael (HK jewelry)	37.4290 g	1n it 2tl
	Tael (Taiwan)	37.5 g	1n it 3tl
dwt	Pennyweight	1.55517384 g	° 1n it dwt
ct	Metric carat	0.2 g	° 1n it ct
N	Newton	See below.	° 1n it N

A pound contains 16 ounces.

lb and oz are not available for use with HT-300CL.

HK = Hong Kong. HK tael (general) is equal to Singapore tael.

A catty contains 16 taels.

Newton is a value calculated as follows:

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

Initializing

When initializing the scale, the function settings are reset to factory settings, and the upper and lower limit value (for all of the memories) of the comparator are cleared to zero.

- Display 1n it.
- Press the RE-ZERO key to light up the “O” mark.
- Press the MODE key while the “O” mark is lit to display End. The settings are then reset to factory settings.

Function List

Items list	Descriptions	
Automatic power off "P _{OFF} "	If the scale is left on and the STABLE indicator is lit, the automatic power off function turns power off after approximately 5 minutes.	
	0	Disables automatic power off function.
◆1	Enables automatic power off function.	
	Weighing unit selection "Unit"	
Filter conditions "Cond"	Weighing stabilization levels/Response speed selections	
	0	Fast response/Susceptible to vibration and drafts
	◆1	Medium response and effect level against environment
2	Slow response/Strong resistance to vibration and drafts	
	Zero tracking "Trc"	
This function automatically track small zero drift caused by changes in the ambient environment.		
0	Disables zero trucking function.	
◆1	Enables zero trucking function.	
Key lock "Lock"	Misoperation prevention function	
	◆0	Disables key lock (Upper and lower limit value settings and unit switching are available)
1	Enables key lock (Upper and lower limit value settings and unit switching are unavailable)	
Comparison conditions "CP"	Operating conditions of the comparator	
	0	Does not compare (Comparator disabled)
	◆1	Compares all data.
	2	Compares all stable data.
	3	Compares plus data, excluding near zero.
	4	Compares stable plus data, excluding near zero.
	5	Compares all data, excluding near zero.
6	Compares all stable data, excluding near zero.	
Memory number selections "CPn"	Selects a memory number for comparison to be used when turning the power on.	
	0	Does not compare (Comparator disabled).
	◆1	Compares using the first memory.
	2	Compares using the second memory.
3	}	
9	Compares using the ninth memory.	

◆ Factory settings

□ "Near zero" means a range within ± 4 digits from zero point in grams.

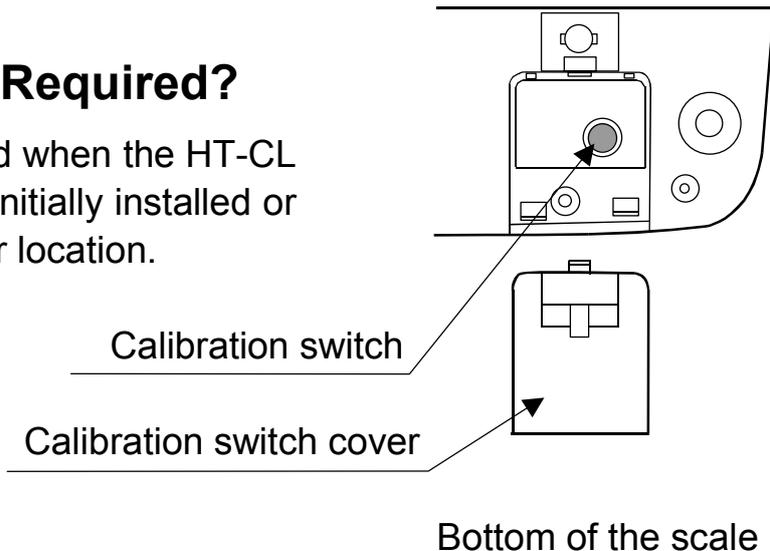
Items list	Descriptions
Comparison display LED brightness “ <i>LED</i> ”	Adjusts LED brightness for the comparator display. 0 Dark ◆1 ↑↓ 2 Bright
Decimal point “ <i>Dot</i> ”	Selects the symbol used for the decimal point. ◆0 Dot (.) 1 Comma (,)
Initialization “ <i>Init</i> ”	Resets settings to factory settings.

◆ Factory settings

CALIBRATION

When is Calibration Required?

Calibration may be required when the HT-CL series compact scale was initially installed or has been moved to another location.



Calibration Preparations

Remove the calibration switch cover located on the bottom of the scale.

Press the **ON:OFF** key to turn the scale on.

Press the calibration switch while the scale is in the weighing mode.

CAL will be displayed.

When calibrating using a weight, select a calibration weight from the following. The weight must be purchased separately by the customer.

HT-300CL 300 g ± 0.01 g

HT-3000CL 3000 g ± 0.1 g

HT-500CL 500 g ± 0.01 g

HT-5000CL 5000 g ± 0.1 g

Calibration Using a Calibration Weight

Zero Calibration

1. Press the **RE-ZERO** key while **CAL** is displayed to display **CAL0**.

2. Confirm that the STABLE indicator is lit with nothing on the weighing pan, and then press the **RE-ZERO** key.

Zero point is calibrated and the scale displays **CALF**.

To only complete zero point calibration, press the **MODE** key while **CALF** is displayed.

Calibration ends and the scale automatically enters weighing mode.

Span Calibration

3. Place the calibration weight at the center of the weighing pan and press the **RE-ZERO** key after confirming that the STABLE indicator is lit. Calibration using a weight ends and the scale automatically enters weighing mode after displaying **End**.
4. Remove the weight from the weighing pan and press the **ON:OFF** key to turn the power off and end the calibration.

Setting the Gravity Acceleration

The scale is calibrated with the gravity acceleration value 9.798 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.

1. Press the **MODE** key while **CAL** is displayed to display **9.798**.
2. Press the **RE-ZERO** key to make the digit to be changed blink. Readjust the gravity acceleration value for the scale to be used using the following keys.

MODE : To change which digit is blinking.

RE-ZERO : To increase by +1 the value of the blinking digit.

3. Press the **RE-ZERO** key while pressing and holding the **MODE** key, and release the **MODE** key while keeping the **RE-ZERO** key depressed. The scale automatically enters **CAL** display after displaying **End**.
4. Press the **ON:OFF** key to turn the power off and end the operations.

Restoring the Calibration Data

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

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

1. Press the **MODE** key twice while **CAL** is displayed to display **CLr**.
2. Press the **RE-ZERO** key to display **CLrno**.
To switch to **CLrGo** display, press the **RE-ZERO** key again.
To reset the settings to factory settings, proceed to the next step while **CLrGo** is displayed.
3. Press the **RE-ZERO** key while pressing and holding the **MODE** key, and release the **MODE** key while keeping the **RE-ZERO** key depressed. The calibration value is returned to factory settings, and the scale automatically enters **CAL** display after displaying **End**.
If performing Step 3 while **CLrno** is displayed, the scale will return to **CLr** without returning the calibration value to factory settings.
4. Press the **ON:OFF** key to turn the power off and end the operations.

SPECIFICATIONS

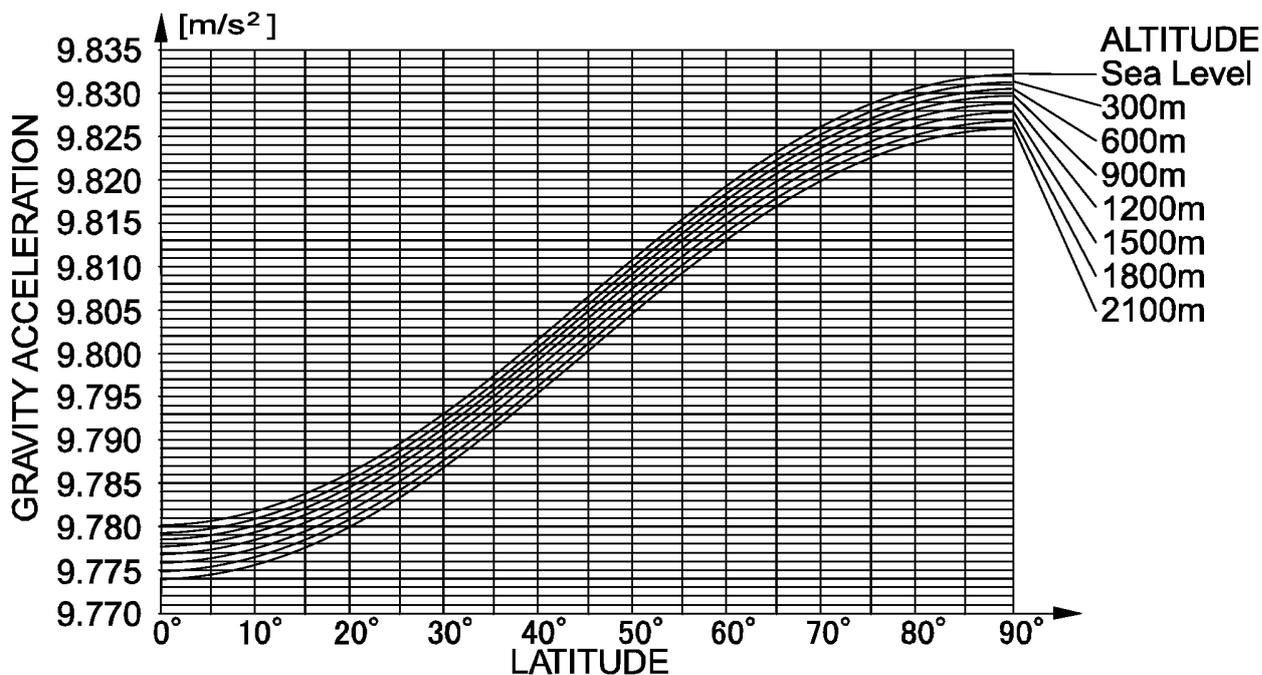
Model	HT-300CL	HT-3000CL	HT-500CL	HT-5000CL
Weighing capacity	310 g	3100 g	510 g	5100 g
Minimum display "d"	0.1 g	1 g	0.1 g	1 g
Non-linearity	±0.2 g	±2 g	±0.2 g	±2 g
Repeatability (Standard deviation)	0.1 g	1 g	0.1 g	1 g
Span drift	±0.015% / °C (5°C to 35°C)			
Operating temperature range / humidity	-10°C to 40°C / 14°F to 104°F, Less than 85% R.H. (Non-condensing)			
Display	7 segment LCD (Character height 13.5 mm)			
Display update	Approximately 10 times per second			
Power supply	4 x "AA" batteries (R6P / LR6) or AC adapter			
Battery life	Approx. 450 hours (When using at 23°C, with comparator disabled and using alkaline batteries) Approx. 220 hours (When using at 23°C, with comparator always enabled (results in red) and using alkaline batteries) * The battery life differs depending on manufacturer, usage and storage conditions.			
Pan size	132(W) x 130(D) mm			
Dimensions	136(W) x 195(D) x 47(H) mm			
Mass	Approx. 470 g (Excluding batteries)			
Calibration weight	300 g±0.01 g	3000 g±0.1 g	500 g±0.01 g	5000 g±0.1 g
Accessories	Carrying case, name plate, color bar (three colors), AC adapter, operating instructions sticker, instruction manual			
Option	Stainless steel pan (HT-10)			

Other weighing units

	Model	HT-300CL	HT-3000CL	HT-500CL	HT-5000CL
t (tola)	Weighing capacity	26.50	265.0	43.70	437.0
	Minimum display	0.01	0.1	0.01	0.1
oz	Weighing capacity	10.90	109.0	17.90	179.0
	Minimum display	0.01	0.1	0.01	0.1
ozt	Weighing capacity	9.90	99.0	16.30	163.0
	Minimum display	0.01	0.1	0.01	0.1
lb,oz	Weighing capacity	–	6.8 lb	1.1 lb	11 lb
	Minimum display	–	0.1 oz	0.01 oz	0.1 oz
tl (tael, HK general)	Weighing capacity	8.20	5.1 catty	13.40	8.4 catty
	Minimum display	0.01	0.1 tael	0.01	0.1 tael
tl (tael, HK jewelry)	Weighing capacity	8.20	5.1 catty	13.60	8.5 catty
	Minimum display	0.01	0.1 tael	0.01	0.1 tael
tl (tael, Taiwan)	Weighing capacity	8.20	5.1 catty	13.60	8.5 catty
	Minimum display	0.01	0.1 tael	0.01	0.1 tael
dwt	Weighing capacity	199.0	1990	327.0	3270
	Minimum display	0.1	1	0.1	1
ct	Weighing capacity	1550.0	15500	2550.0	25500
	Minimum display	0.5	5	0.5	5
N	Weighing capacity	3.00	30.0	5.00	50.0
	Minimum display	0.01	0.01	0.01	0.01

The Value of Gravity Acceleration at Various Locations

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



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