

HV/HW/CEP Series

INSTRUCTION MANUAL

Digital Platform Scale

HV-15KCEP
HV-60KCEP
HV-200KCEP
HW-10KCEP
HW-60KCEP
HW-100KCEP
HW-200KCEP



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1. Compliance



1.1. 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 this equipment is operated in a commercial environment. If this unit is operated in a residential area it might 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.)



2. Outline and Features

- ❑ The HV-CEP/HW-CEP series are intrinsically safe electronic scales complying with international standards such as IECEx and ATEX or FM requirements.
- ❑ The HV-CEP/HW-CEP series can be used in areas where explosive atmospheres are present. (For details on the explosion-proof structure, refer to “6. CONFORMING STANDARDS.”)
- ❑ The HV-CEP series are platform scales with 1/3000 resolution, and have the triple weighing range function to select the weighing range. The scale automatically switches to small scale interval when a light sample is weighed or large scale interval when a **heavy** sample is weighed, depending on the sample weight (multi-interval).
- ❑ The HW-CEP series are platform scales with 1/10000 resolution.
- ❑ The HV-CEP/HW-CEP series use batteries. As a power source, only the four “D”, “LR20” or “AM1” alkaline 1.5 V batteries listed below can be used. DURACELL MN1300, ENERGIZER E95, Panasonic LR20(XJ)
- ❑ The scales use a back lit liquid crystal display to enable viewing in dim light.
- ❑ The counting mode converts the total mass value (total weight) of articles to be counted, to a count, when each article has the same mass value.
- ❑ The comparator function compares the displayed weight value with the upper limit value (HI) and the lower limit value (LO) and displays the result.
- ❑ The scale has an accumulation function with a maximum of 6 digits, which has a maximum accumulations of 999 times. (The number of times weighed and the total mass of that can be stored in the scale.)
- ❑ The following parameters are stored in the scale even if the power is removed.

Display mode (unit)
Unit mass of counting mode
Total count and total mass of accumulation function
Upper limit value and lower limit value of upper / lower comparator function
Calibration data
Parameters of the function table

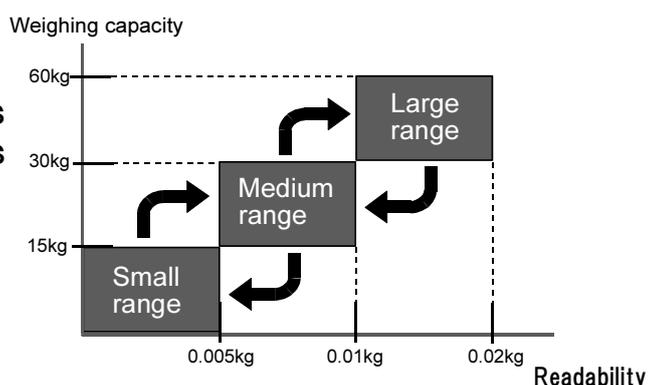
- ❑ **Multi-interval:** This is what the readability is automatically switched to depending on the sample weight.

Example) With the HV-60KCEP, weighing capacity is 60kg and readability is 0.005kg, 0.01kg or 0.02kg.

Multi-interval: When exceeding the range for small, medium or large, the readability is automatically switched.

Point: When a light sample is weighed, the readability is small.

When a heavy sample is weighed, the readability is large.





3. Safety Instructions and Precautions



3.1. Safety Instructions on Intrinsically safe Structure

DANGER

- Do not disassemble or modify the scale.
- When determining the installation site, take the following into consideration. Will explosive gases be generated? How often will they be generated? Refer to “6. CONFORMING STANDARDS.”
- A portion of the enclosure is non-conducting and, under certain extreme conditions, may generate an ignition-capable level of electrostatic charges. The user shall ensure that the equipment is not installed in a location where it may be subjected to external conditions (such as high-pressure steam) which might cause a build-up of electrostatic charges on non-conducting surfaces. Additionally, cleaning of the equipment should be done only with a damp cloth.
- Replace the batteries in non-hazardous areas.
- As a power source, only the four “D”, “LR20” or “AM1” alkaline 1.5 V batteries listed below can be used.
DURACELL MN1300, ENERGIZER E95, Panasonic LR20(XJ)
- All 4 cells in single platform scale must be by the same manufacturer.
- When replacing the batteries, be sure to prevent foreign materials from entering the battery compartment.
- The enclosure contains aluminum and is considered a potential risk of ignition by impact or friction. Care must be taken during installation to prevent impact or friction.



3.2. Precautions on Installing the Scale

Consider the following conditions to get the most from your scale.

- Install the scale where the temperature and relative humidity is stable, there is no draft and a stable power source is available.
- Install the scale on a solid and level surface.
- Do not install the scale in direct sunlight.
- Do not install the scale near heaters or air conditioners.
- Do not install the scale where there is corrosive gas present.
- Do not install the scale near equipment which produces magnetic fields.
- Do not install the scale where there is apt to be static electricity, in a place where the relative humidity is lower than 45% RH. Plastic and isolators are apt to be charged with static electricity.
- The display unit is not water resistant. Use the display unit cover to avoid damage.
- Do not use an unstable power source.
- Remove the protective film from the weighing pan before use.





3.3. Precautions on operating the Scale

- Periodically ensure that the weight value is correct.
- Calibrate the scale before using and after moving it to another location.
- Do not place anything on the pan which exceeds the weighing capacity.
- Do not drop anything upon the pan.
- Do not use a sharp instrument such as a pencil to press the keys. Press the keys gently using your finger.
- Pressing the **ZERO** key before each weighing is recommended to prevent possible error.
- Replace the used batteries with four new ones when the “ L_b ” mark is displayed.
As a Battery , only the four “D”, “LR20” or “AM1” alkaline 1.5 V batteries listed below can be used.
DURACELL MN1300, ENERGIZER E95, Panasonic LR20(XJ)



3.4. Precautions on storing the Scale

- Do not disassemble the scale.
- Do not use solvents to clean the scale. Wipe it with a dry lint free cloth or a lint free cloth which is moistened with warm water and a mild detergent.
- The base unit can be cleaned with gentle running tap water. Do not scratch the base unit with a brush. Allow the unit to dry before using.
- Protect the display unit from dust and water.
- Remove the batteries from the display unit when the scale is not to be used for a long time. If you leave the batteries installed, they may leak and damage the scale.



4. Installing the Scale



4.1. Setting up the Scale

This procedure includes all of the steps for installing the scale. Therefore, there may be some unnecessary steps for some models.

Step 1 Take the base unit and pole out, taking care not to pull on the load cell cable.

Step 2 Place the pan on the base unit. Remove the protective film from the pan before use.

Step 3 Attach the pole to the bracket of the base unit, while using care not to damage the load cell cable.

Insert the remainder of the load cell cable into the pole.

Affix the pole to the bracket using two hex screws.

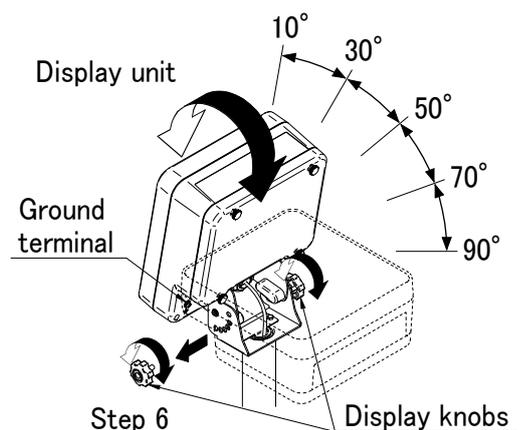
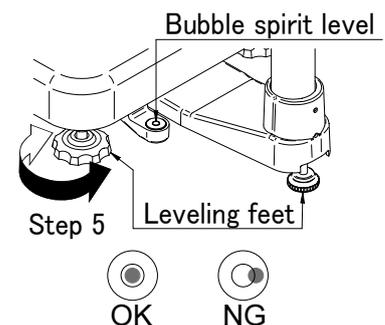
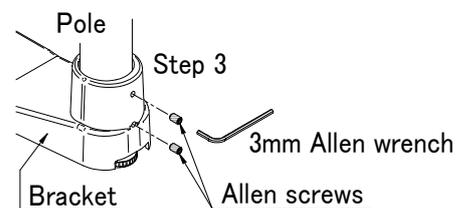
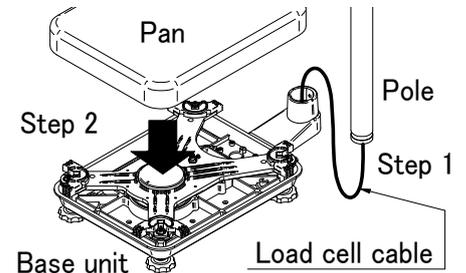
* With the HW-10KCEP and HV-15KCEP, this procedure is not required because the pole and bracket is a combined unit.

Step 4 Select a place for installing the scale. Refer to "3.2. Precaution on Installing the Scale".

Step 5 Adjust the level of the base unit using the bubble spirit level and the leveling feet.

Step 6 Adjust the angle of the display unit and fix by display knobs.

Step 7 Check the weighing accuracy. If the scale needs calibration, refer to "13. Calibration".

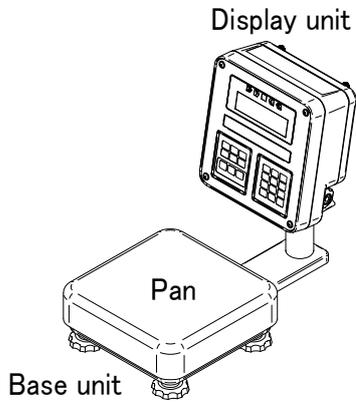


The display unit can be adjusted in five steps in the up-and-down direction. Setting the display sideways is also possible. (Make sure that the pole is secured at the lower part of the pole using the hex screws. Do not turn the display unit at a joint for the pole.)

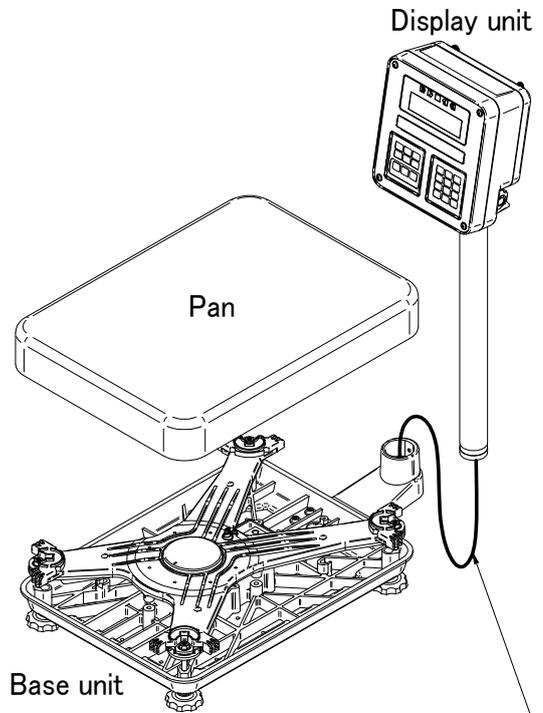


5. Unpacking

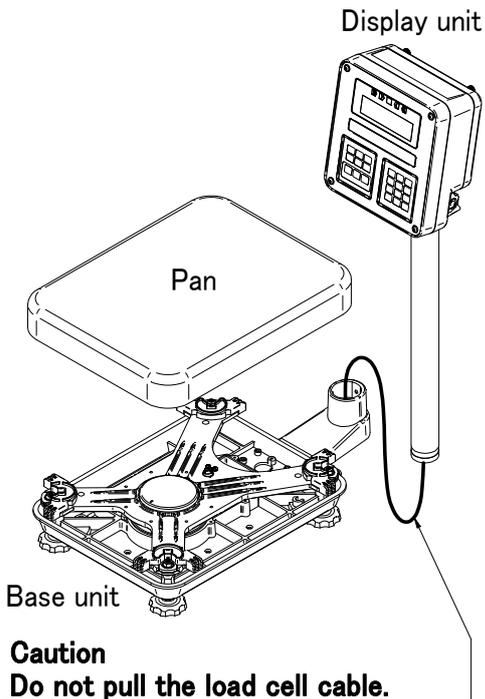
HV-15KCEP
HW-10KCEP



HV-200KCEP
HW-100KCEP
HW-200KCEP



HV-60KCEP
HW-60KCEP



Caution
Do not pull the load cell cable.





5.1. Accessories and Options List

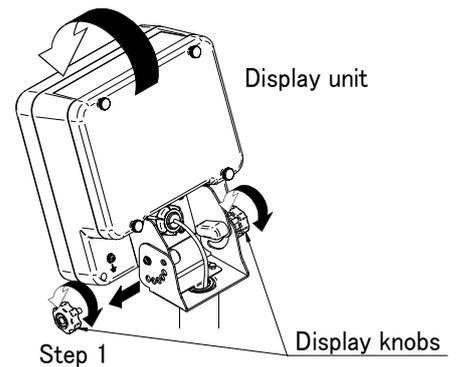
Accessories List

Models	Accessories (Quantity)
HV-15KCEP HW-10KCEP	- 2.5mm hex wrench (1) - Instruction manual (1)
HV-60KCEP HV-200KCEP HW-60KCEP HW-100KCEP HW-200KCEP	- 2.5mm hex wrench (1) - 3mm hex wrench (1) - Instruction manual (1)



5.2. Installing the Batteries

- Step 1 Turn off the display.
Remove the right side display knob.
Tilt the Display unit to the front.

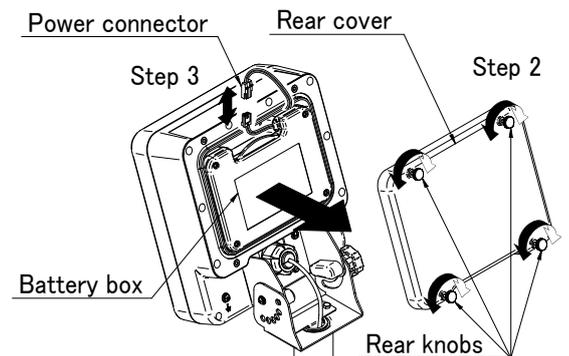


- Step 2 Open the rear cover.

- Step 3 Disconnect the power connector.

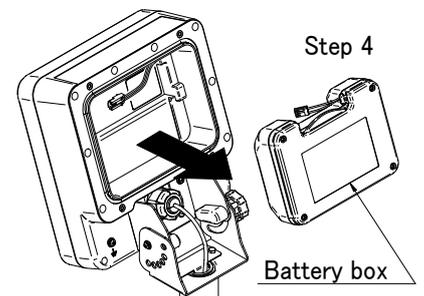
- Step 4 Carry the battery box to non-hazardous areas.

- Step 5 Using the hex wrench provided, remove the battery box securing screws.



- Step 6 Insert four new batteries with proper polarity (+,-). Batteries are only the four "D", "LR20" or "AM1" alkaline 1.5 V batteries listed below can be used.

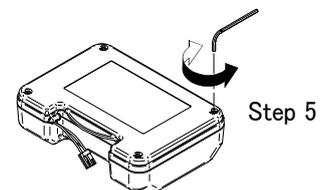
DURACELL MN1300, ENERGIZER E95,
Panasonic LR20(XJ)



- Step 7 Attach the battery cover and secure it using the battery box securing screws.

- Step 8 Close the covers in reverse order of step 3 to step 1.

2.5mm Allen wrench



Caution

- Replace used batteries with four new ones, when "Lb" is displayed.
- All 4 cells in single platform scale must be by the same manufacturer.
- Do not mix used and new batteries. It may cause damage to the batteries or the scale, if used.

Check the battery direction. If the batteries are installed in the wrong direction, it may cause battery leakage. If the direction of a single battery is wrong, the scale may work only temporarily.

- The battery life depends on the ambient temperature.
- Remove the batteries from the display unit, when the scale is not to be used for a long time. They may leak and cause damage.
- Damage which is due to battery leakage is not covered under warranty.

5.3. Grounding the scale

When using where there may be static electricity, ground the scale.

The grounding procedure depends on the scale model. Refer to the table below.

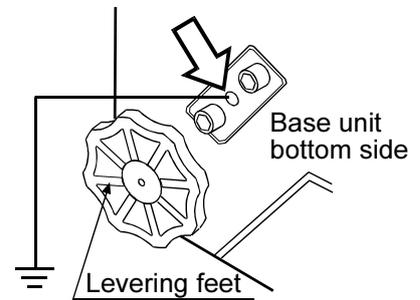
These procedures are only for grounding part of the scale.

Models	Refer to
HV-15KCEP/HW-10KCEP	Procedure A
HV-60KCEP/HV-200KCEP HW-60KCEP/HW-100KCEP/HW-200KCEP	Procedure B

Procedure A

(HV-15KCEP/HW-10KCEP)

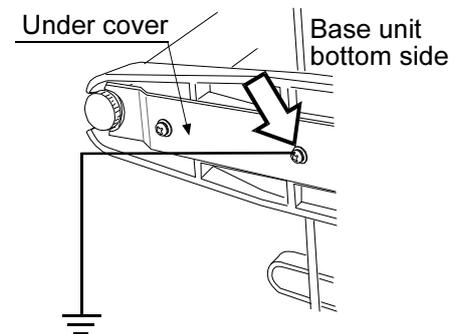
Secure the grounding cable using a M4 screw in the screw hole between the two hexagon bolts on the base unit bottom side. (Part of “⇨”)



Procedure B

(HV-60KCEP/HV-200KCEP
HW-60KCEP/HW-100KCEP/HW-200KCEP)

Secure the grounding cable using the screw that secures the under cover. (Part of “⇨”)





6. CONFORMING STANDARDS



6.1. IECEx

Ex ia IIB T4 Ga Tamb -25°C to +40°C (IECEX FMG 17.0018X)

Ex: Ex Component
ia: Type of Protection
IIB: Gas Classification
T4: Temperature Class
Ga: Equipment Protection Level



6.2. ATEX

II 1G Ex ia IIB T4 Ga Tamb -25°C to +40°C (FM17ATEX0038X)

Ex: Ex Component
ia: Type of Protection
IIB: Gas Classification
T4: Temperature Class
Ga: Equipment Protection Level



6.3. FM,FMc (Zone)

Class I, Zone 0, AEx / Ex ia IIB T4 Tamb -25°C to +40°C
(FM17US0171X/FM17CA0089X)

Class: Permitted Class
Zone: Permitted Zone
Ex: Ex Component
(AEx: American National Standard)
ia: Type of Protection
IIB: Gas Classification
T4: Temperature Class



6.4. FM,FMc (Division)

Intrinsically Safe for Class I, Division 1, Groups C, D T4
Tamb -25°C to +40°C (FM17US0171X/FM17CA0089X)

Intrinsically Safe: Type of Protection
Class: Permitted Class
Division: Permitted Division
Groups: Permitted Groups
T4: Temperature Class

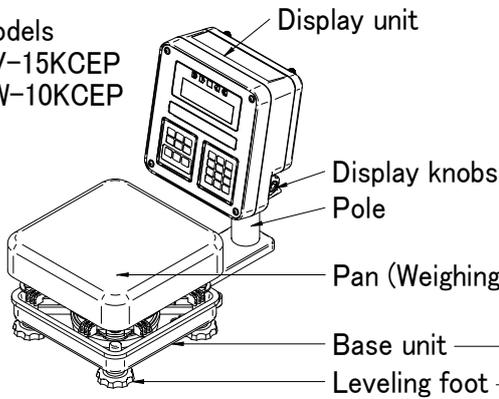
	II 1G Ex ia II B T4 Ga	(FM17ATEX0038X)
	Ex ia II B T4 Ga	(IECEx FMG 17.0018X)
	Class I , Zone 0 , AEx / Ex ia II B T4	(FM17US0171X)
2809	IS / I / 1 / C,D / T4	(FM17CA0089X)
	Tamb -25°C to +40°C	
	Refer to the instruction manual (1WMPD4003607A)	
A&D Company, Limited 1-243 Asahi, Kitamoto-shi, Saitama, Japan		

The label on the scale

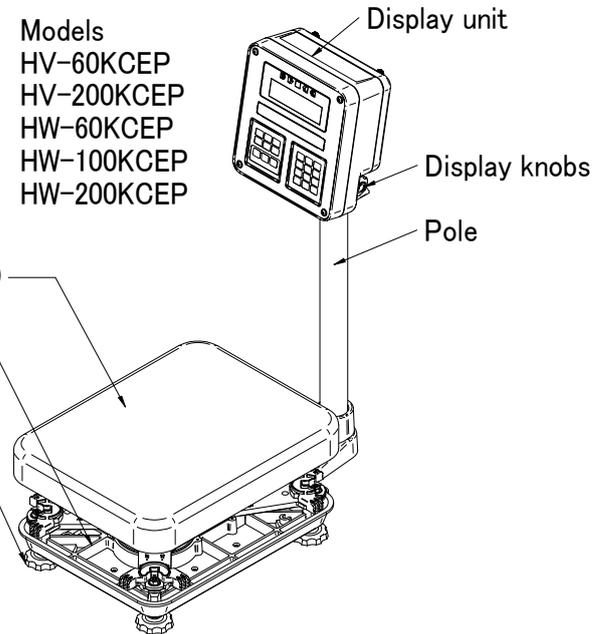


7. Description of Each Part

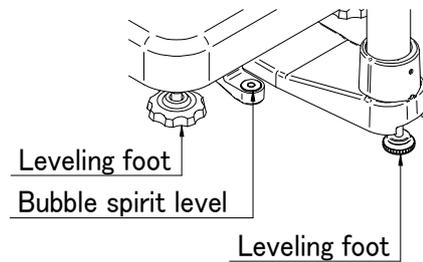
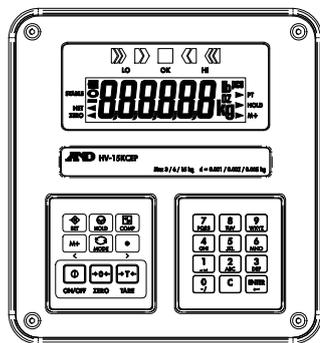
Models
HV-15KCEP
HW-10KCEP



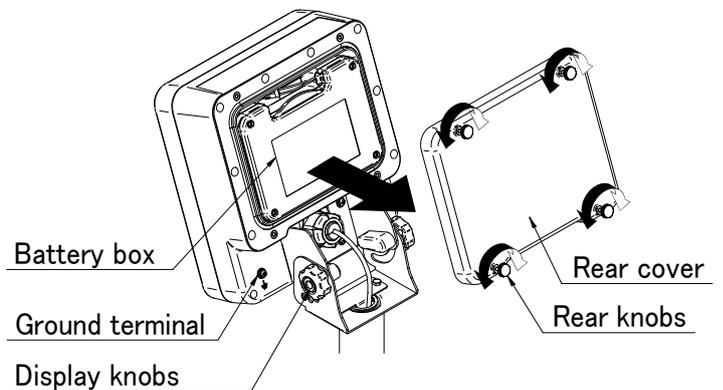
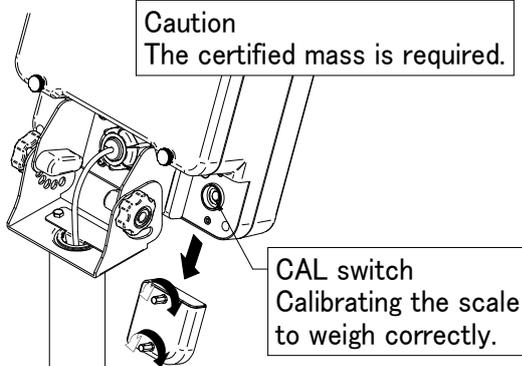
Models
HV-60KCEP
HV-200KCEP
HW-60KCEP
HW-100KCEP
HW-200KCEP



Display



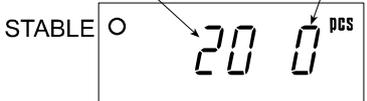
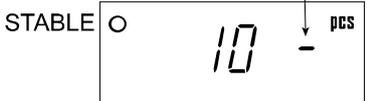
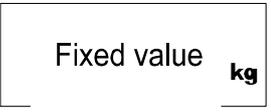
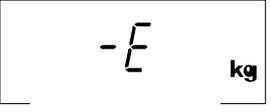
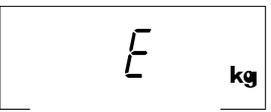
Caution
The certified mass is required.



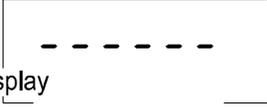


7.1. Display and Symbols

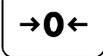
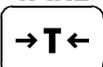
Display and Symbols	Description
	<p>Stability mark When the current weight value is stable, this mark is displayed. It means a proper condition that this value is readable.</p>
	<p>Zero point mark When the [ZERO] key is pressed with nothing on the pan, this mark is displayed. The zero point is the fundamental starting point to weigh anything.</p>
	<p>Net mark When the [TARE] key is pressed, this mark is displayed. Used to indicate that the mass of the container placed on the pan has been subtracted from the gross value.</p>
	<p>Preset tare mark While a tare with digital input is displayed, this mark blinks.</p>
	<p>Hold mark While the display is held, this mark is displayed.</p>
	<p>Accumulation mark While the accumulation function is used, this mark is displayed.</p>
	<p>Low battery mark When the battery is depleted (becoming low voltage), this mark is displayed. Replace with four new batteries.</p>
	<p>Comparator indicator When using the comparator function, the result is indicated after the weight value is compared with the upper and lower limits.</p>
<p>Weighed mass value unit</p>	<p>Zero point (Example) When the [ZERO] key is pressed with nothing on the pan, the zero point mark and the stability mark are displayed.</p>

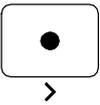
Display and Symbols	Description
<p>Unit of counting mode</p> 	<p>Counting mode (Example)</p> <p>This mode uses the stored unit mass and counts the number of articles on the pan. The unit is PCS.</p>
<p>20 pieces Zero value</p> 	<p>Storing the unit mass for the counting mode (Example)</p> <p>The unit mass is stored, using 20 pieces of samples. The zero value means that no articles are on the pan.</p>
<p>No zero value</p> 	<p>Storing the unit mass for the counting mode (Example)</p> <p>The unit mass is stored, using 10 pieces of samples. Sign "-" means that something is placed on the pan.</p>
	<p>Function settings (Example)</p> <ul style="list-style-type: none"> - Press the MODE key to select the item, and then press the ENTER key to finalize the selection. - Enter a parameter using the numerical keypad. - Press the ENTER key to store the new parameters.
<p>Example</p> 	<p>While preset tare setting (Example)</p> <ul style="list-style-type: none"> - Enter a setting value using the numerical keypad. - Press the ENTER key to store the new tare.
	<p>Hold display (Example)</p> <p>The hold display is set using <i>HoLd</i> of the function table. When the weight value is "Near zero" (within the zero band) or changes more than 25% +30 digits, the hold is canceled.</p>
	<p>Weighing error</p> <p>Check the base unit and the weighing pan.</p>
	<p>Overload display</p> <p>Remove anything that is on the pan.</p>
	<p>Calibration error</p> <p>The calibration mass is too light. Check the base unit and the weighing pan.</p>

The "digit" is a unit of display, and is equivalent to the minimum measurable mass. The "Near zero" or zero band is within ± 4 digits from zero point in the unit of kg.

Display and Symbols	Description
	Calibration error The calibration mass is too heavy. Check the base unit and the weighing pan.
 Fixed display	Does not display zero when the scale is turned on. Remove anything that is on the weighing pan. Perform zero point calibration. Or The weight value is unstable due to drift or vibration when the scale is turned on. A breeze or vibration may be affecting the measurement. Check around the weighing pan.
Blinking  M+	Accumulated data count
Blinking  M+ and lighting up kg	Total mass value of the accumulated data
e.g. CAP. MAX. 3/6/15kg d=1/2/5g	The weighing range and measurable minimum mass. Example: Displays the weight value by 5 g up to 15 kg. Displays the weight value by 2 g up to 6 kg. Displays the weight value by 1 g up to 3 kg.

7.2. Keys

Display and Symbols	Description
ON/OFF 	ON/OFF key The scale is in standby status when power is connected using the AC adapter.
ZERO 	ZERO key The ZERO key will zero the scale if the weight value is within $\pm 2\%$ of the weighing capacity (kg) around the power-on zero point. The zero point indicator turns on (Zero operation). If the scale is in tare in this time, the tare value is cleared. When accumulation is displayed, the accumulation is cleared.
TARE 	TARE key The TARE key will tare the scale and subtract the weight to zero as a tare (container) weight when the weight is a plus stable value. In this case the zero point indicator and net indicator turn on. (TARE operation) When the tare is removed while the tare operation is in progress and the scale returns to the zero point, the zero point indicator and net indicator turn on. In this case the displayed tare value will be negative. Note The tare reduces the weighing range.
	Adds to the accumulated data.

Display and Symbols	Description
	<p>SET key When setting the upper/lower limit, switch between + and -.</p>
<p>Press and hold  and press </p>	<p>Enters preset tare setting mode</p>
<p>Press and hold  and press </p>	<p>Displays the accumulated results</p>
<p>Press and hold  and press </p>	<p>Sets upper/lower limit values for comparator</p>
<p>Press and hold  and press </p>	<p>Proceeds to unit mass storing when using counting mode</p>
	<p>MODE key</p> <ul style="list-style-type: none"> - Switches the mode (unit) to be displayed - The mode (unit) is maintained in non-volatile memory, so the scale displays using the most recently used mode (unit) when turning on the power next time - Used as key to select the items at each setting.
	<p>HOLD key Holds the display. Refer to function settings for details.</p>
	<p>Not used in the HV/HW-CEP series</p>
<p>Display off</p> <p>↓</p> <p>Press and hold  and press </p>	<p>Enters function settings</p>



8. Basic Operation



8.1. Turning the Scale on/off and Weighing

8.1.1. When Using Batteries

- Step 1 Install four new batteries. Refer to "5.2. Installing the Batteries".
- Step 2 Confirm that nothing is placed on the pan.
- Step 3 The scale turns on/off using the **ON/OFF** key alternately.
- Step 4 Check the accuracy of weighing. Allow 30-minute warm up before calibration.
- Step 5 With nothing on the pan, press the **ZERO** key to display zero.
- Step 6 Place an article to be weighed on the pan gently.
- Step 7 Wait for the stability mark to be displayed. Read the weight value.
- Step 8 Remove the article from the pan.
- Step 9 Turn the scale off using the **ON/OFF** key.

Caution

- **When \square is displayed, this means the batteries will run out soon.**
- **Replace used batteries with four new ones when “Lb” is displayed.**
- **Battery life depends on the ambient temperature.**
- **Remove the batteries from the display unit when the scale is not to be used for a long time. The batteries may leak and cause damage.**



8.2. Tare (And Net Display)

The "tare" is used to cancel the mass of a container, which is placed on the pan to contain the article to be weighed.

Caution

- **The tare reduces the weighing range.**
- **The current tare value is reset by pressing the **ZERO** key or turning the scale off. (Reset value is zero.)**
- **The storable preset tare value must be within the minimum weighing range.**

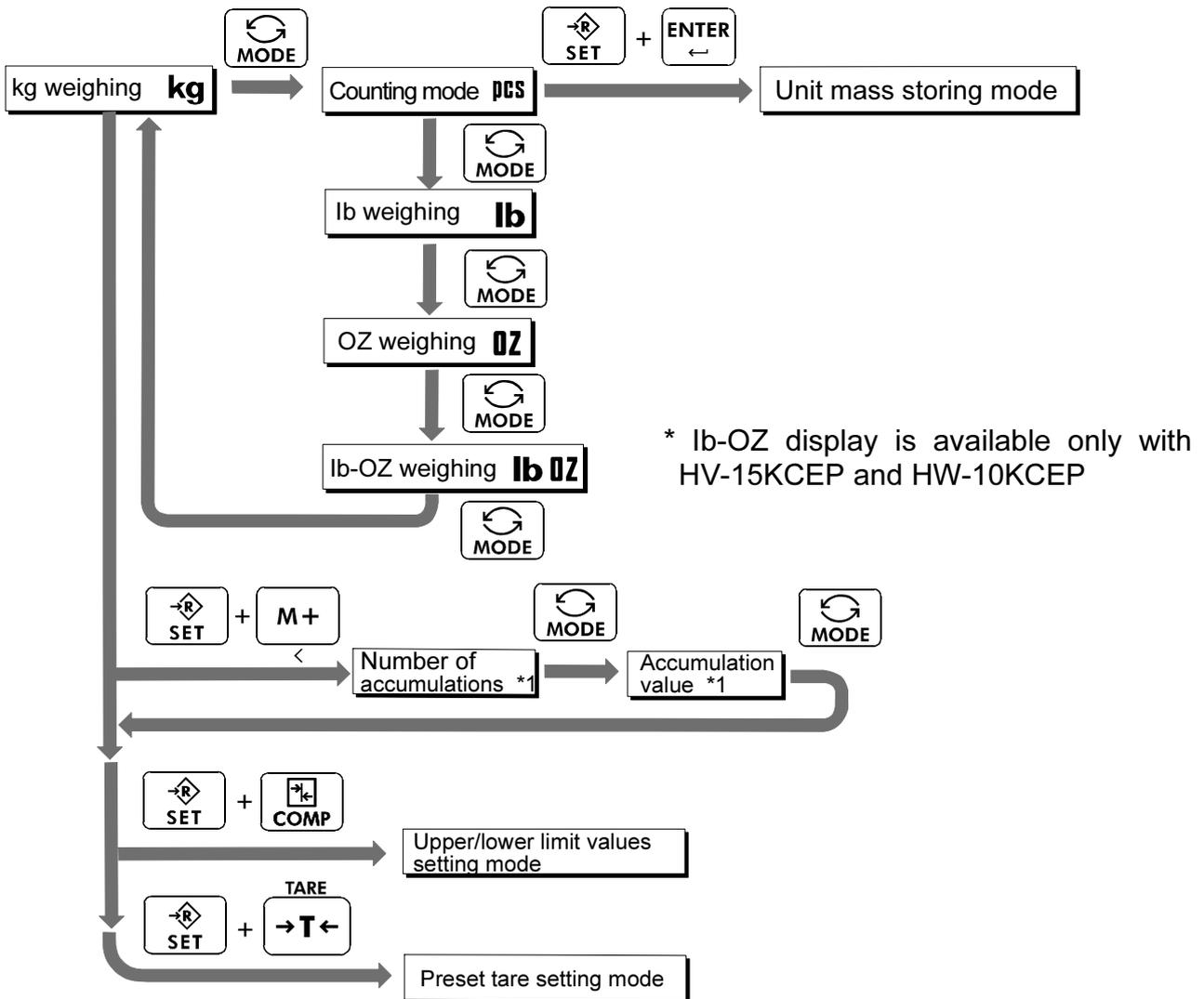
8.2.1. Tare Input by Weighing

- Step 1 Place the container on the pan.
- Step 2 Wait for the stability mark to be displayed. Press the **TARE** key. The display becomes zero and the net mark is displayed.
- Step 3 Place an article to be weighed into the container. Wait for the stability mark to be displayed and read its net display.
- Step 4 Remove the article and the container from the pan.

8.2.2. Digital Input (Preset Tare)

- Step 1 Press and hold the **SET** key and press the **TARE** key.
Then the blank or stored tare value is displayed. The blank display means that the tare value is zero (reset value). And ►PT blinks.
- Step 2 Enter the preset tare value using the numerical keypad.
- Step 3 Press the **ENTER** key to store the new preset tare value.
Then the scale displays the net value (the gross weight value minus the tare value).
- Step 4 Place an article to be weighed into the container. Wait for the stability mark to be displayed and read its net display.
- Step 5 Remove the article and the container from the pan.

8.3. Switching the mode



* The scale displays the number of accumulations and an accumulation value only when accumulation data exists.



9. Counting Mode

- The counting mode is the function to convert the total mass value (total weight) of articles to a count, when each article has the same mass value.
- To use this function, store a unit mass in advance.
- Even if the batteries are removed, the unit mass is maintained in non-volatile memory.



9.1. Storing a Unit Mass

Step 1 Press the **MODE** key to display the unit **PCS**.

Step 2 Press the **SET** and **ENTER** key to enter the mode that stores a unit mass.

Step 3 Press the **SET** key to select the number of samples.
The greater the quantity of samples, the greater the accuracy of the count.
5 pieces, 10 pieces, 20 pieces, 50 pieces,
100 pieces

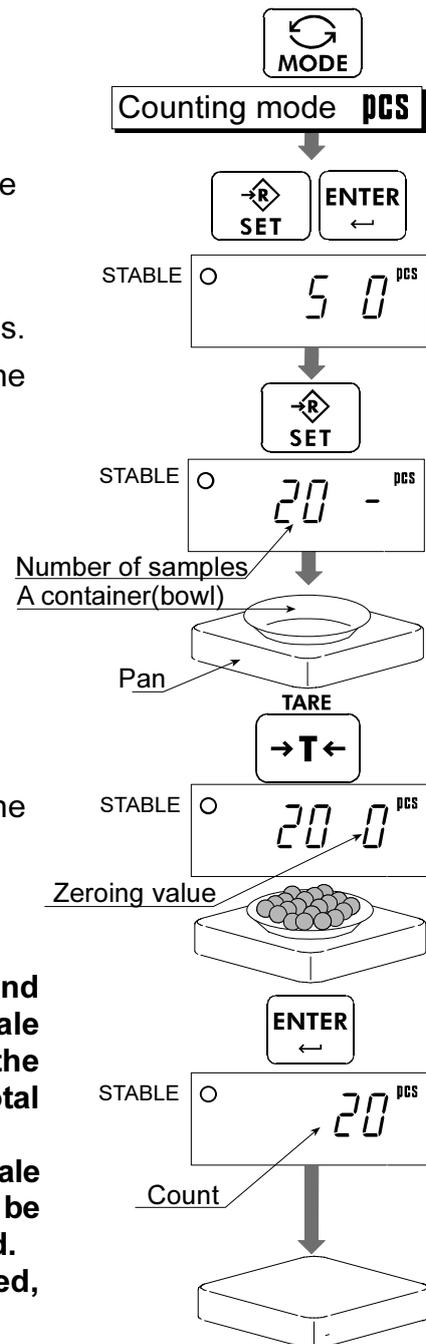
Step 4 Place the container on the pan.
Press the **TARE** key.

Step 5 Place the number of samples selected at step 3.
Wait for the stability mark to be displayed. Press the **ENTER** key to store. The count is displayed.

Caution

- When the sample total mass value is too small and it is not possible to calculate a unit mass, the scale displays **Lo ut** and returns to step 3. Increase the number of samples. More than 10 digits of the total sample mass, in the unit of kg, are required.
- When the unit mass is too light to store, the scale displays **Lo ut**. In this case, the unit mass will not be stored even if the number of samples is increased.
- Pressing the **MODE** key, after **Lo ut** is displayed, displays the next unit.

Step 6 Remove the samples and the container from the pan.



Note
The pan shape depends on the scale model.



9.2. Counting the Number of Articles

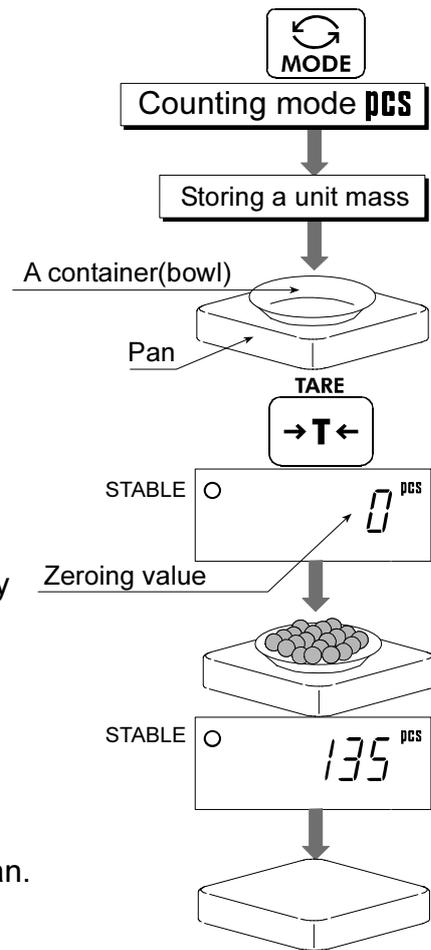
Step 1 Press the **MODE** key to display the unit **pcs**.

Step 2 Store the unit mass of the article.
Refer to "9.1. Storing a Unit Mass"

Step 3 Place the container on the pan.
Press the **TARE** key.

Step 4 Place articles in the container. Wait for the stability mark to be displayed and read the count.

Step 5 Remove the articles and the container from the pan.



Note
The pan shape depends on the scale model.



10. Accumulation Function

- This function counts the number of times articles are weighed, calculates the total mass value and can display the number (accumulation count) and accumulated mass value.
- The accumulation function is displayed with up to 6 digits. The balance can not display 7 or more digits, therefore the leading digits are not displayed.
Example: With 60K type, when importing the data of 17 accumulations of up to 60kg (60.000 X 17=1020.000), the balance displays this as "020000".
- To use this function, set the parameters of the "Accumulation function (\overline{Sum})" in the function table in advance.
- The accumulation count and accumulated mass value are stored in the scale even if the power is removed.

Operation and Keys

- The display of the accumulation count has a blinking $\overline{M+}$ without a unit.
- The display of the accumulated mass value has a unit and a blinking $\overline{M+}$.
- Press the \overline{SET} and $\overline{M+}$ key to display the accumulation count and accumulated mass value.
- Press the \overline{ZERO} key in the accumulation function (with a blinking $\overline{M+}$) to reset the current function (The count and accumulated mass value become zero.)

Caution

The accumulation function is available only when weighing is performed in the same unit.

Parameter List and Word Definition

- The "Near zero" is within ± 4 digits from the zero point in the unit of kg.
- The "digit" is a unit of display, and is equivalent to the minimum measurable mass.
- The "zero point" is the fundamental starting point to weigh anything.

Function table	Description
$\overline{Sum} 0$	Accumulation function not used.
$\overline{Sum} 1$	The scale accumulates the data, if the $\overline{M+}$ key is pressed, when the display is a positive stable value and not near zero. The next accumulation can be performed after the display becomes near zero or a negative value.
$\overline{Sum} 2$	The scale accumulates the data, if the $\overline{M+}$ key is pressed, when the display is a stable value and not near zero. The next accumulation can be performed after the display becomes near zero.
Function table	Description
$\overline{Sum} 3$	When the display is a positive stable value and not near zero, the scale accumulates the data automatically. The next accumulation can be performed after the display becomes near zero or a negative value.

5.00 4	<p>When the display is a stable value and not near zero, the scale accumulates the data automatically. The next accumulation can be performed after the display becomes near zero.</p> <p>Use Recording the number and mass of articles removed from the pan. (Place the articles on the pan. Press the TARE key at each removal.)</p>
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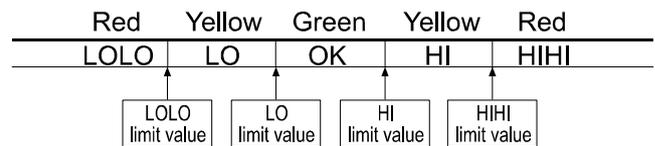
11. Comparator

Five-level, three-level and seven-level (portion weighing mode) comparators are available.

Each comparator mode compares the weight value against the preset limit values and displays the results using LEDs (yellow / green / red).

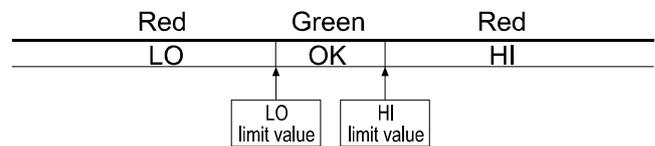
- Five-level comparator mode:

Uses four comparator values to compare the weight value and displays results in five levels of LOLO, LO, OK, HI and HIHI.



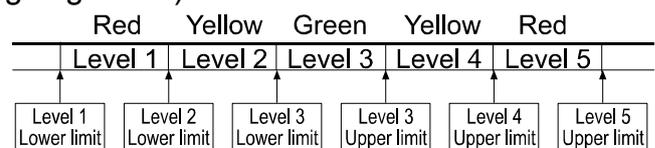
- Three-level comparator mode:

Uses two comparator values (upper and lower limit values) to compare the weight value and displays results in three levels of LO, OK and HI.



- Seven-level comparator mode (portion weighing mode):

Uses six comparator values to compare the weight value and displays results in seven levels of over in the negative value, level 1 (LOLO), level 2 (LO), Level 3 (OK), level 4 (HI), level 5 (HIHI) and over in the positive value.



To use the comparator modes, the function settings “[P-L]” and “[P]” must be specified and the comparator values must be set.

Using the function setting “[P-L]”, select a comparator mode.

0: five-level comparator mode

1: three-level comparator mode

2: Seven-level comparator mode (portion weighing mode)

Using the function setting “[P]”, select comparison conditions.

0: No comparison (comparator mode disabled).

1: To compare all data.

2: To compare all stable data.

3: To compare all data which are more than or equal to +5d, or less than or equal to -5d.

4: To compare stable data which are more than or equal to +5d, or less than or equal to -5d.

5: To compare all data which are more than or equal to +5d.

6: To compare stable data which are more than or equal to +5d.

d = readability in kg (Refer to “15. Specifications”.)

Also in the counting mode, “d” is equal to the readability of kg mode.



11.1. The formula to compare

Comparison is performed using the formula listed below and the results are displayed.

Five-level comparator mode

Results	Comparison formula	LED display
LOLO	Displayed value < LOLO limit value (Or over in the negative value)	■□□□□ (Red LED on)
LO	Displayed value < LO limit value	□■□□□ (Yellow LED on)
OK	LO limit value ≤ Displayed value ≤ HI limit value	□□■□□ (Green LED on))
HI	HI limit value < Displayed value	□□□■□ (Yellow LED on)
HIHI	HIHI limit value < Displayed value (Or over in the positive value)	□□□□■ (Red LED on)

Three-level comparator mode

Results	Comparison formula	LED display
LO	Displayed value < LO limit value (Or over in the negative value)	■□□□□ (Red LED on)
OK	LO limit value ≤ Displayed value ≤ HI limit value	□□■□□ (Green LED on))
HI	HI limit value < Displayed value (Or over in the positive value)	□□□□■ (Red LED on)

Seven-level comparator mode (portion weighing mode)

Results	Comparison formula	LED display
None	Displayed value < Level 1 lower limit value (Or over in the negative value)	□□□□□ (No LEDs on)
LOLO (Level 1)	Displayed value < Level 2 lower limit value	■□□□□ (Red LED on)
LO (Level 2)	Displayed value < Level 3 lower limit value	□■□□□ (Yellow LED on)
OK (Level 3)	Level 3 lower limit value ≤ Displayed value ≤ Level 3 upper limit value	□□■□□ (Green LED on))
HI (Level 4)	Level 3 upper limit value < Displayed value	□□□■□ (Yellow LED on)
HIHI (Level 5)	Level 4 upper limit value < Displayed value	□□□□■ (Red LED on)
None	Level 5 upper limit value < Displayed value (Or over in the positive value)	□□□□□ (No LEDs on)

- The comparator values are common to the weighing and counting mode.
- Ignore the decimal point when setting the comparator values.
- The comparator values are maintained even if the power is turned OFF.
- Judgment order of comparison is from the top row to the bottom in the comparator mode tables
- The entered comparator values are not judged. Even if the upper limit value is less than the lower limit value, no error will be display.



11.2. Entering the comparator values

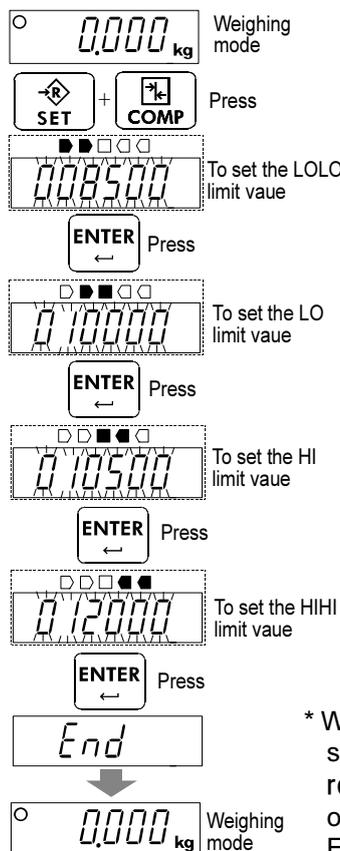
1. In the weighing mode, press and hold the **SET** key and press the **COMP** key to enter the comparator value setting mode.
2. Enter the comparator values using the following keys.
 - 0** to **9** To enter numerical value
 - C** To cancel settings
 - SET** To switch between + and -
 - ENTER** To store setting values

* Each time the **SET** key is pressed, “-” switches between being lit and off at the first digit. “-” being lit means a minus setting.
3. When the setting is complete, “End” is displayed and the scale returns to the weighing mode. (At this time, power-on-zero is not performed.)

Example of five-level comparator mode

With the HW-60KCEP, set as follows.

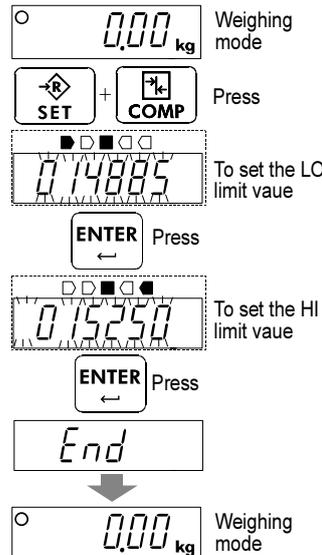
LOLO 8.500 kg
 LO 10.000 kg
 HI 10.500 kg
 HIHI 12.000 kg



Example of three-level comparator mode (upper/lower limit mode)

With the HV-200KCEP, set as follows.

LO 148.85 kg
 HI 152.5 kg

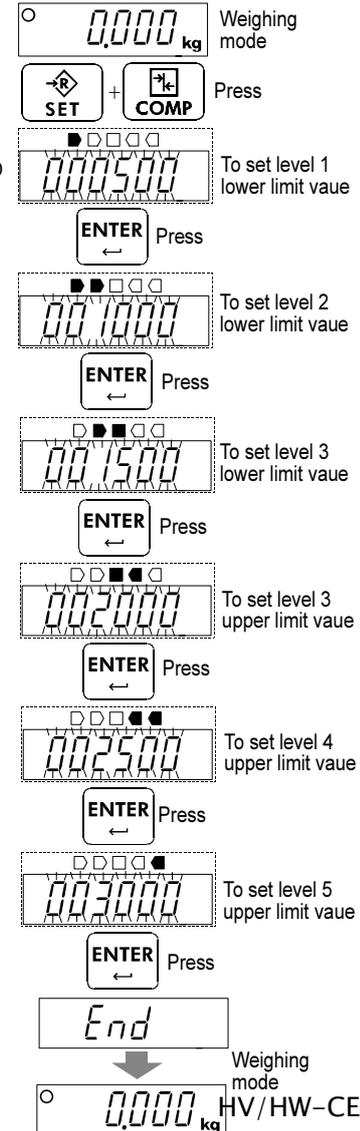


* With the HV-C models, the scale changes the readability digit depending on the display range. Enter 0 for the final digit.

Example of seven-level comparator mode (portion weighing mode)

With the HV-15KCEP, set as follows.

Level 1 (LOLO) 0.500 kg or more
 Level 2 (LO) 1.000 kg or more
 Level 3 (OK) 1.500 kg to 2.000 kg
 Level 4 (HI) up to 2.500 kg
 Level 5 (HIHI) up to 3.000 kg





12. Auto-tare

The HV/HW-CEP series has an auto-tare function to be used with the comparator mode enabled. Using this function in check weighing, the scale automatically tares, then displays “OK” for a certain amount of sample and repeats this process for the next weighing.

Start with display zero after tare operation. Place or take away objects until the comparison result will show OK. When the stable display is maintained for the duration specified in the function setting “ $Rt - t$ ”, the scale will automatically tare the weight, show zero and be ready for next weighing.

❑ In some countries or areas, the auto-tare function can not be used on the Legal for Trade models and the selection in the function settings “ Rt ”, “ $Rt - t$ ” and “ $Rt - F$ ” is not available.

❑ To use the auto-tare function, set the function settings below.

$[P] 1$: Compare all weighing data (other settings may be used depending on the application).

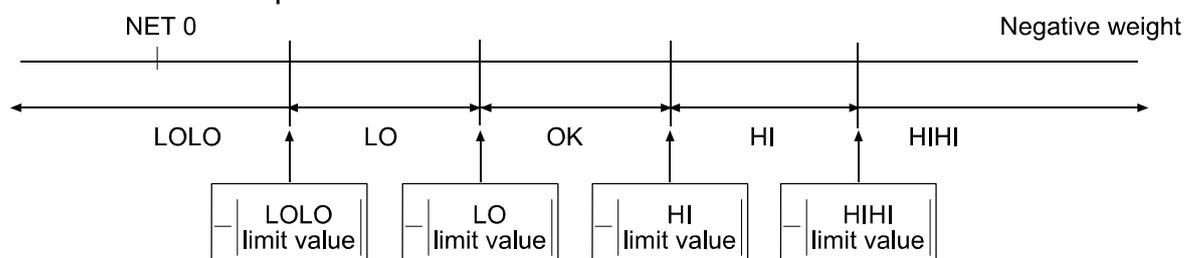
$Rt 1$: Auto-tare function enabled.

$Rt - t 0 \sim 9$: Select the timing to tare automatically to avoid the wrong tare operation, for example; too early to tare, to take a longer time to go to the next weighing.

❑ Take-away check weighing “ $[P - P] 1$ ” (Example with “ $[P - L] 0$ ” setting)

Take-away check weighing (negative comparison) is the way to compare the negative weight while taking away objects from a container. Set the function “ $[P - P] 1$ ” together with the auto-tare function enabled “ $Rt 1$ ”. In this operation mode, the scale operates as “take-away the objects” → “OK and stable” → “auto-tare” → “take-away the objects” → …….

In this setting, the polarity of LOLO, LO, HI, and HIHI limit values are ignored and the scale shows the comparator results as below.



Note: To start the take-away check weighing, be sure to use the **[TARE]** key to tare the weight of the container filled with objects. The **[ZERO]** key may zero the display, and the scale goes below the zero point by taking out the objects. Then, the auto-tare function or **[TARE]** key does not work.

❑ When the function “ $Rt - F 1$ Tares the initial (container) weight.” is selected:

To start the auto-tare function, usually the container (filled with objects) will be placed on the weighing pan and its weight must be tared using the **[TARE]** key. When the function “ $Rt - F 1$ ” is selected, the scale will tare the initial (container) weight automatically.

When all load on the weighing pan is removed, the scale will return to the zero point and the tare weight will be automatically cleared. If the scale does not return to the zero point, press the **[ZERO]** key to clear the tare weight.



13. Calibration

- The scale is an instrument which weighs the "weight" and displays its "mass". Calibration is the adjustment function so that the scale can weigh correctly.

- Three steps of calibration are available

Gravity Acceleration Correction ... The function to correct the scale's local gravity acceleration, so that the scale functions correctly when the calibrated scale has been moved to a distant place.

Refer to the "Gravity Acceleration Table" on the next page.

Calibration of the Zero Point The function to adjust the zero point, so that the zero point mark is displayed when there is nothing on the pan.

Comment The zero point is the fundamental starting point to weigh anything and influences the performance of scale.

Span Calibration..... The function to adjust the span with a calibrated mass, so that the scale can accurately weigh anything within the weighing capacity.

Comment Span means the range of weighing capacity. Use a calibration mass heavier than two thirds of the weighing capacity.

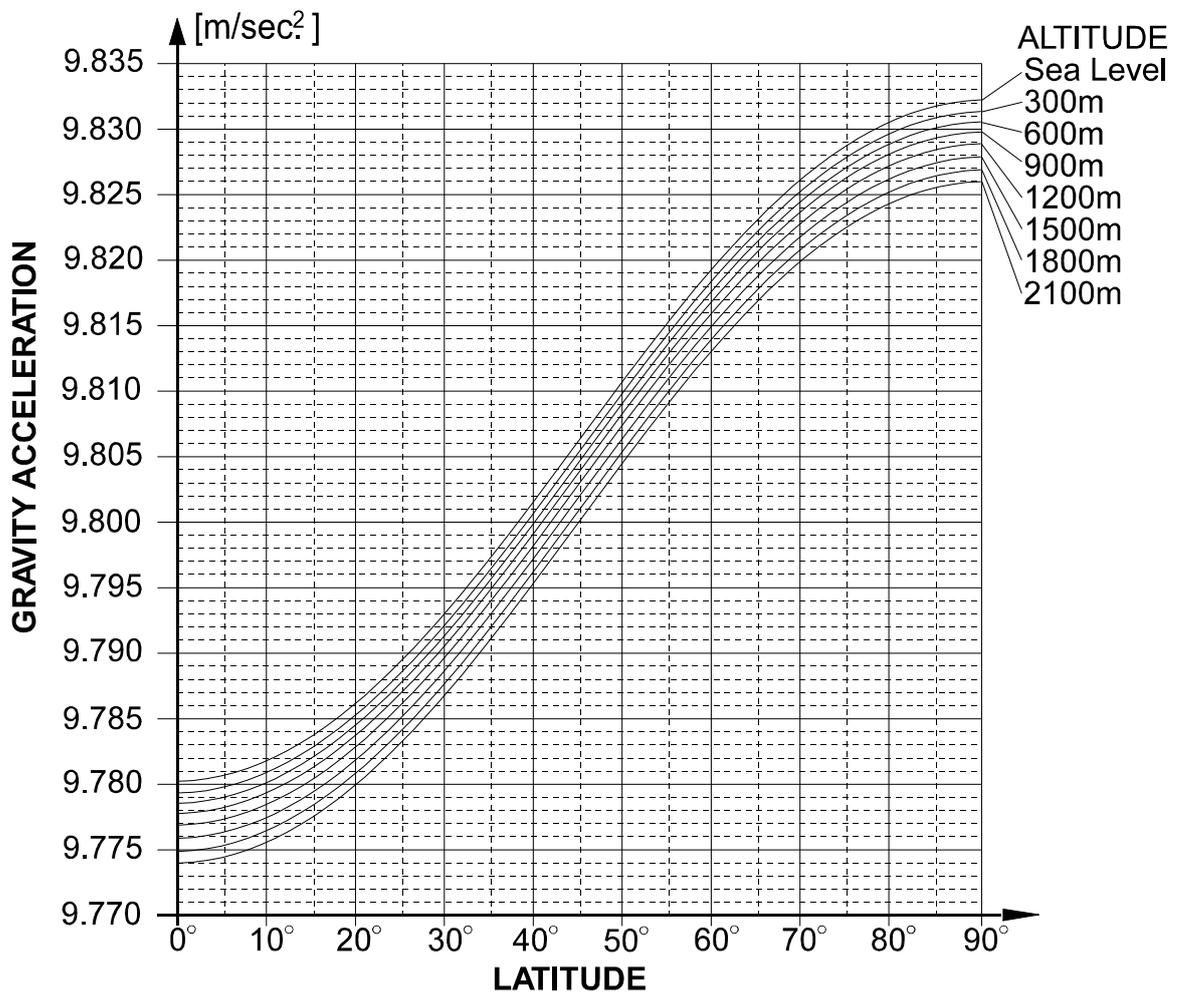
Caution

- **Check the accuracy of weighing periodically. Calibrate the scale, if it has been moved to another location or the environment has changed.**
- **Gravity acceleration correction is not required, when the scale is calibrated with the calibration mass at the place where the scale is used.**



13.1. Gravity Acceleration Table

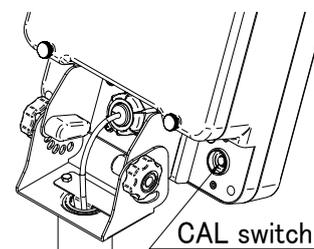
Amsterdam	9.813 m/s ²	Manila	9.784 m/s ²
Athens	9.800 m/s ²	Melbourne	9.800 m/s ²
Auckland, NZ	9.799 m/s ²	Mexico	9.779 m/s ²
Bangkok	9.783 m/s ²	Milan	9.806 m/s ²
Birmingham	9.813 m/s ²	New York	9.802 m/s ²
Brussels	9.811 m/s ²	Oslo	9.819 m/s ²
Buenos Aires	9.797 m/s ²	Ottawa	9.806 m/s ²
Calcutta	9.788 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
Glasgow	9.816 m/s ²	Sydney	9.797 m/s ²
Havana	9.788 m/s ²	Tainan	9.788 m/s ²
Helsinki	9.819 m/s ²	Taipei	9.790 m/s ²
Kuwait	9.793 m/s ²	Tokyo	9.798 m/s ²
Lisbon	9.801 m/s ²	Vancouver, BC	9.809 m/s ²
London (Greenwich)	9.812 m/s ²	Washington, DC	9.801 m/s ²
Los Angeles	9.796 m/s ²	Wellington, NZ	9.803 m/s ²
Madrid	9.800 m/s ²	Zurich	9.807 m/s ²



13.2. Complete Calibration Procedure

13.2.1. Gravity Acceleration Correction

- Step 1 Turn on the display.
Open the rear cover of the display unit. Locate the **CAL** switch inside.
Press the **CAL** switch to enter the calibration mode.
Then **CAL** is displayed.



- Step 2 Press the **MODE** key to enter the gravity acceleration correction mode. Press the **ENTER** key to make the numerical value blink and proceed to input mode.

CAL



9.7985

- Step 3 Set your local gravity acceleration using the numerical keypad.

Enter using numerical keypad

9.8065

- Step 4 Press the **ENTER** key to store the new value.
The display returns to gravity acceleration display after displaying **End**.



End

- Step 5 Press the **CAL** switch again to finish gravity acceleration correction.

9.8065

CAL switch

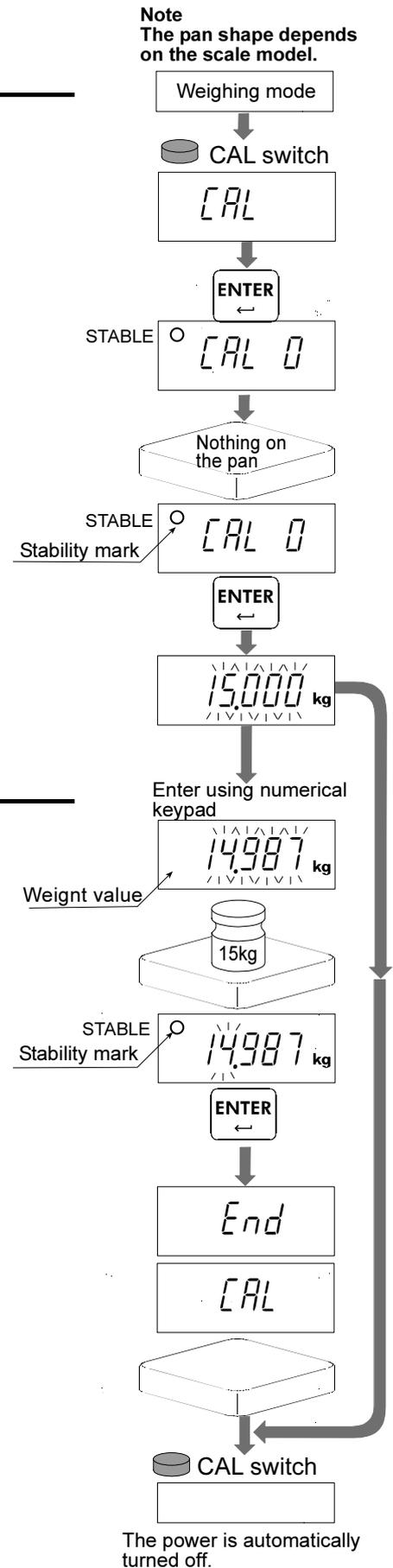
The power is automatically turned off.

13.2.2. Preparation

- Step 6 Confirm the environmental conditions as follows:
Maintain a constant temperature and stable power.
Install the scale on a solid floor where there is no draft, vibration, strong magnetic fields or direct sunlight.
Refer to "3.2. Precaution on Installing the Scale".
- Step 7 Keep the display turned on for at least 30 minutes to warm up the scale.

13.2.3. Calibration of the Zero Point

- Step 8 After 30-minute warm up, press the **CAL** switch to display **CAL**.
Press the **ENTER** switch to display **CAL 0**.
- Step 9 Confirm that nothing is placed on the pan. Wait for the stability mark to be displayed. Press the **ENTER** key. The scale stores the current condition as the zero point.
- Step 10 Calibration of the zero point is finished. To exit the calibration mode, proceed to step 14.



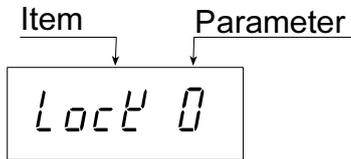
13.2.4. Span Calibration

- Step 11 Set the value of the calibration mass using the numerical keypad. (The initial value depends on the scale model.)
- Step 12 Place the mass on the pan which was set at step 11. Wait for the stability mark to be displayed. Press the **ENTER** key. The scale then calculates the span and stores it.
- Step 13 The scale displays **CAL** after displaying **End** to finish setting. Remove the mass from the pan.
- Step 14 Press the **CAL** switch to finish calibration.



14. Function Table

- ❑ The function table is used to store and refer items that determine the performance of the scale. Each item has a parameter.
- ❑ The parameters are stored in the scale even if the power is removed.



14.1. Parameter Setting Procedure

Step 1 Turn off the display.

Press and hold the **TARE** key and press the **ON/OFF** key to display software version **P-XXX**.

Press the **MODE** key to enter function setting mode.

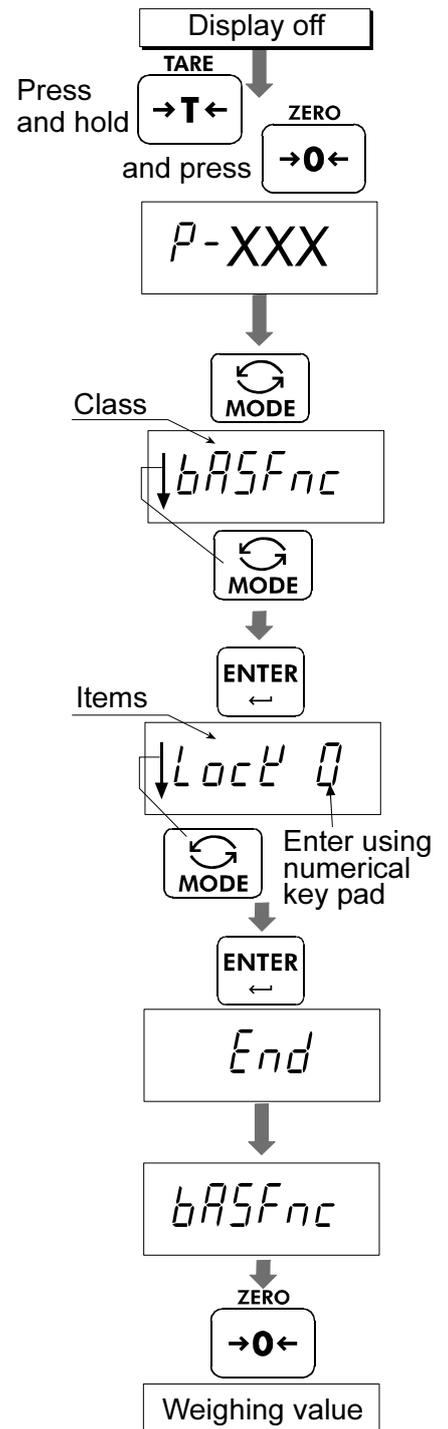
Class **bASFnC**.

Step 2 Press the **MODE** key to select the desired class, and then press the **ENTER** key.

Step 3 The first item of class is displayed. Press the **MODE** key to select the desired item, and then enter a value using numerical keypad.

Step 4 Press the **ENTER** key to store. The display returns to class after displaying **End**.

Step 5 Press the **ZERO** key to return to normal weighing mode.





14.2. Parameter List

Class	Items	Parameter	Details and usage
bPSFnc	Key lock <i>Lock</i>	0 ■	Functions with all the keys
		1	Functions with the ON/OFF, ZERO, TARE, HOLD and M+ key
		2	Functions with the ON/OFF, ZERO, TARE key
	Automatic power off <i>PoFF</i>	0 ■	OFF
		1	After 5 minutes
		2	After 10 minutes
		3	After 15 minutes
		4	After 30 minutes
		5	After 60 minutes
	Automatic power on <i>P-on</i>	0 ■	OFF
		1	ON
	Zero tracking <i>trc</i>	0	OFF
		1 ■	ON
	Stability band width <i>St-b</i>	0 ■	±0.5 digit
		1	±1 digit
		2	±2 digits
	Stability band time <i>St-t</i>	0	0.5 second
		1 ■	1.0 second
		2	1.5 seconds
	Weighing stabilization level <i>cond</i>	0	Fast
		1	
		2 ■	
		3	
		4	
	Backlight control <i>L-it</i>	0	Always turned off
		1	Always lit
		2 ■	Turns off 5 seconds after stabilizing
		3	Turns off 10 seconds after stabilizing
		4	Turns off 15 seconds after stabilizing
		5	Turns off 30 seconds after stabilizing
Decimal point <i>Pnt</i>	0 ■	Dot (.)	
	1	Comma (,)	
Automatic tare <i>Rt</i>	0 ■	OFF	
	1	ON	

■ : factory settings

"Near zero" is within ± 4 digits (four times the minimum mass that can be weighed) from zero point in the unit kg.

Class	Items	Parameter	Details and usage
bRSFnC	Interval until making automatic tare <i>Rt-t</i>	0	0 second
		1	0.5 second
		2 ■	1.0 second
		3	1.5 seconds
		4	2.0 seconds
		5	2.5 seconds
		6	3.0 seconds
		7	4.0 seconds
		8	5.0 seconds
		9	10 seconds
	Tare on initial load <i>Rt-F</i>	0 ■	OFF
		1	ON
	Accumulation mode <i>Sum</i>	0	OFF
		1 ■	Accumulates by [M+] key when the value is +, excluding near zero
		2	Accumulates by [M+] key when the value is + or -, excluding near zero
		3	Accumulates automatically when the value is +, excluding near zero
	Hold condition <i>Hold</i>	0 ■	OFF
		1	Holds or releases by the [HOLD] key
		2	Automatically holds when detecting a stabilization

■ : factory settings

"Near zero" is within ± 4 digits (four times the minimum mass that can be weighed) from zero point in the unit kg.

Class	Items	Parameter	Details and usage
CPFnC	Comparator judgment value <i>[P-L]</i>	0 ■	Five-level comparator
		1	Three-level comparator (upper and lower limits)
		2	Seven-level comparator (portion weighing)
	Comparator judgment condition <i>[P]</i>	0	OFF
		1 ■	Compares all
		2	Compares all the stabilized data
		3	Compares all the data, excluding from -4 digits to +4 digits
		4	Compares the stabilized data, excluding from -4 digits to +4 digits
		5	Compares all the data more than +4 digits
	Comparator reversal <i>[P-P]</i>	0 ■	OFF
		1	ON
	All LEDs upon the power on <i>[P-d]</i>	0 ■	ON
		1	OFF

■ : factory settings



15. Specifications

HV-CEP Series (Weighing capacity of 15 kg to 220 kg)

Models	HV-15KCEP			HV-60KCEP			HV-200KCEP		
Weighing Capacity [kg]	3	6	15	15	30	60	60	150	220
Min. weighing (1 digit) [g]	1	2	5	5	10	20	20	50	100
Weighing Capacity [lb] #	6	15	30	30	60	150	150	300	500
Min. weighing (1 digit) [lb] #	0.002	0.005	0.01	0.01	0.02	0.05	0.05	0.1	0.2
Weighing Capacity [oz] #	96	240	480	480	960	2400	2400	4800	8000
Min. weighing (1 digit) [oz] #	0.05	0.1	0.2	0.2	0.5	1	1	2	5
Weighing Capacity [lb_oz] #	30 lb			---					
Min. weighing (1 digit) [lb_oz] #	0.1 oz			---					
Number of samples in counting mode [pieces]	5 (can be changed to 10, 20, 50, 100)								
Max. count number [pieces]	150,000			120,000			110,000		
Display	7 segment LCD, Character height 25 mm, 3 color 5 level comparator LED, Display refreshment rate: 10 times per second								
Repeatability [g]	±1	±2	±5	±5	±10	±20	±20	±50	±100
Linearity [g]	±1	±2	±5	±5	±10	±20	±20	±50	±100
Span drift	20ppm/°C typ. (5°C to 35°C)								
Power source	Battery TYPE D (LR20) x 4 DURACELL MN1300, ENERGIZER E95, Panasonic LR20(XJ)								
Battery life (Approximately)	1500 hours (LED and Backlight off) 1000 hours (LED and Backlight on)								
Ambient temperature and humidity	-10°C to 40°C, Less than 85%R.H. (Do not allow condensation)								
Weighing pan size [mm]	250 x 250			330 x 424			390 x 530		
Dimensions [mm] Width x Depth x Height	250 x 439 x 397			330 x 585 x 776			390 x 691 x 776		
Weight [kg]	8			12			18		

: If the law in your area permits, you can use these units.

HW-CEP Series (Weighing capacity of 10 kg to 220 kg)

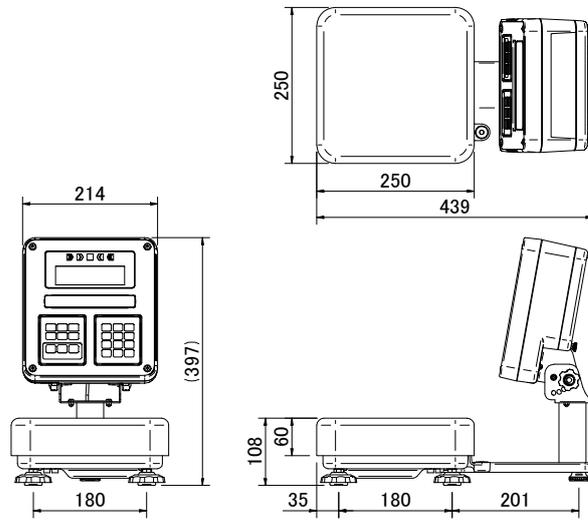
Models	HW-10KCEP	HW-60KCEP	HW-100KCEP	HW-200KCEP
Weighing Capacity [kg]	10	60	100	220
Min. weighing (1 digit) [g]	1	5	10	20
Weighing Capacity [lb] #	20	150	200	500
Min. weighing (1 digit) [lb] #	0.002	0.01	0.02	0.05
Weighing Capacity [oz] #	320	2400	3200	8000
Min. weighing (1 digit) [oz] #	0.05	0.2	0.5	1
Weighing Capacity [lb_oz] #	20 lb	---		
Min. weighing (1 digit) [lb_oz] #	0.1 oz			
Number of samples in counting mode [pieces]	5 (can be changed to 10, 20, 50, 100)			
Max. count number [pieces]	100,000	120,000	100,000	110,000
Display	7 segment LCD, Character height 25 mm, 3 color 5 level comparator LED, Display refreshment rate: 10 times per second			
Repeatability [g]	±2	±10	±20	±40
Linearity [g]	±2	±10	±20	±40
Span drift	20ppm/°C typ. (5°C to 35°C)			
Power source	Battery TYPE D (LR20) x 4 DURACELL MN1300, ENERGIZER E95, Panasonic LR20(XJ)			
Battery life (Approximately)	1500 hours (LED and Backlight off) 1000 hours (LED and Backlight on)			
Ambient temperature and humidity	-10°C to 40°C, Less than 85%R.H. (Do not allow condensation)			
Weighing pan size [mm]	250 x 250	330 x 424	390 x 530	390 x 530
Dimensions [mm] Width x Depth x Height	250 x 439 x 397	330 x 585 x 776	390 x 691 x 776	390 x 691 x 776
Weight [kg]	8	12	18	18

: If the law in your area permits, you can use these units.

Dimensions

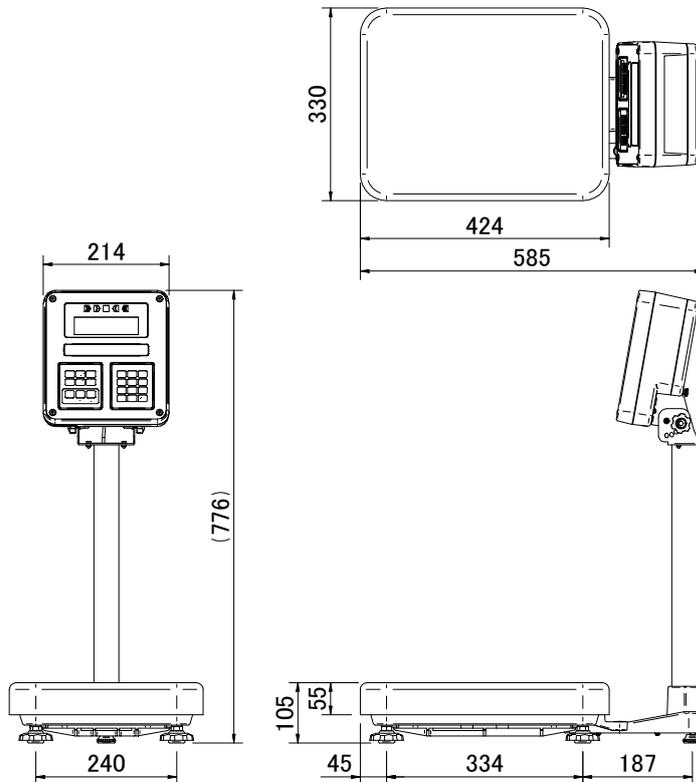
Models

- HV-15KCEP
- HW-10KCEP



Models

- HV-60KCEP
- HW-60KCEP



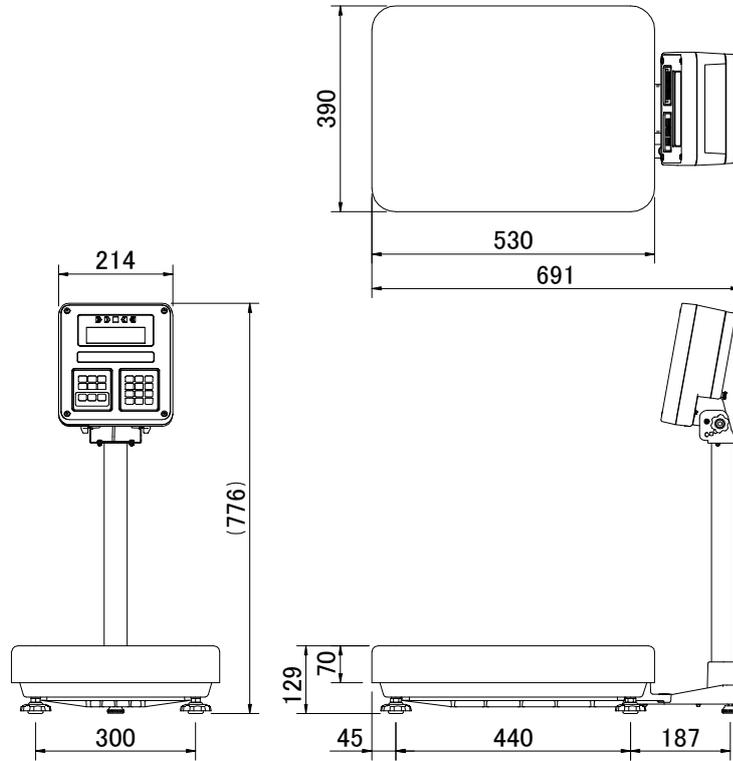
Unit: mm

Models

HV-200KCEP

HW-100KCEP

HW-200KCEP



Unit: mm



16. Maintenance

- Refer to "3. Precautions" for use.
- Refer to "7.1. Display and Symbols " for displayed error code.
- Refer to "13. Calibration (Adjusting the Scale)" for precision weighing.
- Periodically check the accuracy of the weighing. Calibrate the scale, if it has been moved to another location or the environment has changed.



16.1. Check Points Before Calling Maintenance Service

In this situation	Confirm these items
Nothing is displayed. Scale does not turn on.	<ul style="list-style-type: none"> □ Are the batteries dead ? □ Is the battery direction correct ?
The scale does not display zero upon power-on.	<ul style="list-style-type: none"> □ Check around the weighing pan. □ Is there anything on the pan? □ Perform zero point calibration.
----- is displayed and does not proceed.	<ul style="list-style-type: none"> □ The weight value is unstable due to drift, vibration or other. A breeze or vibration may be affecting the measurement. Check around the weighing pan. □ Check the connection of load cell cable. □ No zero display when the display is turned on. Remove anything that is on the pan. □ Perform zero point calibration.
CAL E is displayed	<ul style="list-style-type: none"> □ Calibration error that means "Too heavy".
-CAL E is displayed	<ul style="list-style-type: none"> □ Calibration error that means "Too light".
E is displayed	<ul style="list-style-type: none"> □ Weighing error that means "Overload".
-E is displayed	<ul style="list-style-type: none"> □ Weighing error that means "Underload".
Fixed display	<ul style="list-style-type: none"> □ Do you use the hold function? □ Turn off the scale and turn it on.

16.1.1. Repair

Do not disassemble or assemble the scale without an authorized service engineer. It may cause an electrical shock or damage to the scale. In this case, repair is not covered under warranty. Contact your local A&D dealer if your scale needs service or repair.



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