HV-C/CP series
HW-C/CP series

INSTRUCTION MANUAL

Digital Platform Scale

Global models

HV–15KC	HV–15KCP
HV–60KC	HV–60KCP
HV–200KC	HV–200KCP
HW–10KC	HW–10KCP
HW–60KC	HW–60KCP
HW–100KC	HW–100KCP
HW–200KC	HW–200KCP

Region - limited models

HV–300KC	HV–300KCP
HV–600KC	HV–600KCP
HW–300KC	HW–300KCP
HW–600KC	HW–600KCP

A&D Company, Ltd.

1WMPD4003471C

The contents of this manual and the specifications of the instrument covered by this manual are subject to change for improvement without notice.

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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

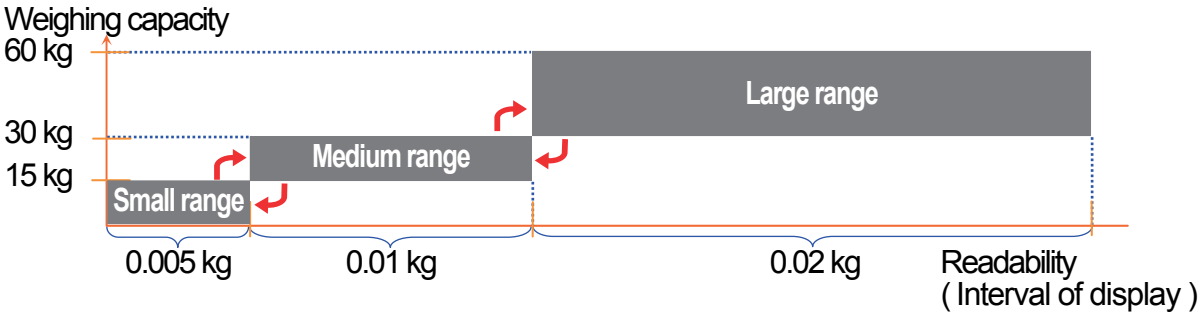
- The HV-C/CP series are platform scales with 1/3000 resolution.
  These scales have the triple weighing range function to select the weighing range. The scale automatically switches to small interval when a light sample is weighed or large interval when a heavy sample is weighed, depending on the sample weight (multi-interval).
- The HW-300KC, HW-300KCP, HW-600KCP and HW-600KC are platform scales with 1/6000 resolution. Other HW models are platform scales with 1/10000 resolution.
- Type CP scales are equipped with a built-in printer.
- Type C scales use batteries or an AC adapter as a power source.
- The scales use a backlit liquid crystal display to enable viewing in dim light.
- Using the optional RS-232C serial interface or USB interface, data can be output to a printer. Also, the weighing value can be output, the scale can be controlled or the setting value can be set by a command from a personal computer.
- The counting mode converts the total mass value (total weight) of objects to a count when each object has the same mass value.
- The scale has an accumulation function with a maximum of 6 digits, which can accumulate up to 999 times. (The number of times weighed and the total mass value can be stored in the scale.)
- The comparator function compares the displayed weighing value against preset limit values and displays the result. The result can be output by a buzzer if optional HVW-04C is installed.
- An optional RS-232C serial interface, USB interface or comparator relay output can be installed up to three units into the scale.

- The following parameters are stored in the scale even if the AC adapter or batteries are removed or the display is turned off (standby mode).
  - Display mode (weighing unit)
  - Unit mass of counting mode
  - Total count and total mass value of accumulation function
  - Preset limit values of comparator function
  - Calibration data
  - Parameters of the function table

- Multi-interval:
  The Readability is automatically switched depending on the sample weight. When exceeding the small, medium or large ranges, the interval of display is automatically switched.

  Example of an HV-60KC where weighing capacity is 60kg:
  The Readability is 0.005 kg, 0.01 kg or 0.02 kg.

  Principal performance of this function:
  When a light sample is weighed, the interval of display is small.
  When a heavy sample is weighed, the interval of display is large.



3. Precautions

3.1. Installing the Scale

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

- Install the scale where the temperature and relative humidity are 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 flammable or corrosive gas present.
- Do not install the scale near equipment that produces strong magnetic fields.
- Do not install the scale where there may be static electricity. When the relative humidity is lower than 45%R.H., 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.
- 30 minutes before the scale is used, connect the power (the AC adapter or batteries) and press the [ON/OFF] key to turn the display on.
- The scale is designed for indoor use. If the scale is used outdoors, it may receive electrical shock of thunder surge and suffer malfunction and damage.

3.2. Operating the Scale

- Calibrate the scale before using and after moving it to another location.
- Do not place anything on the weighing pan that exceeds the weighing capacity.
- Do not drop anything on the weighing 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 in order to prevent possible error.
- Periodically confirm that the weighing value is correct.
- Replace used batteries with four new ones when the [Lb] mark is displayed. Batteries are type D, Mono, R20P, R20PU or LR20.

3.3. 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 moistened with 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.

Caution

The base units of the following models are not waterproof.
HV-300KC, HV-300KCP, HV-600KC, HV-600KCP,
HW-300KC, HW-300KCP, HW-600KC, HW-600KCP

- 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. Setting up and Installing the Scale

There are two ways of assembling (setting up) the HV-C/CP and HW-C/CP series. Assemble the scale according to the method-A procedure or method-B procedure.

Models					Reference
S-model:	HV-15KC,	HV-15KCP,	HW-10KC,	HW-10KCP	**Method-A procedure** to assemble the scale
M-model:	HV-60KC,	HV-60KCP,	HW-60KC,	HW-60KCP	
L-model:	HV-200KC,	HV-200KCP, HW-100KC,	HW-100KCP,	HW-200KC, HW-200KCP	**Method-B procedure** to assemble the scale
L2-model:	HV-300KC, HW-300KC,	HV-300KCP, HW-300KCP,	HV-600KC, HW-600KC,	HV-600KCP, HW-600KCP	

4.1.1. Model-A Procedure to Assemble the Scale

HV-15KC, HV-15KCP, HV-60KC, HV-60KCP, HV-200KC, HV-200KCP, HW-10KC, HW-10KCP, HW-60KC, HW-60KCP, HW-100KC, HW-100KCP, HW-200KC, HW-200KCP

This procedure is used to set up the above models and includes steps that may not be necessary for some models.

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

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

Step 3 Assemble the pole. Attach the pole to the bracket of the base unit, taking 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.

Note With S-models, this procedure is not required because the pole and bracket are a combined unit.

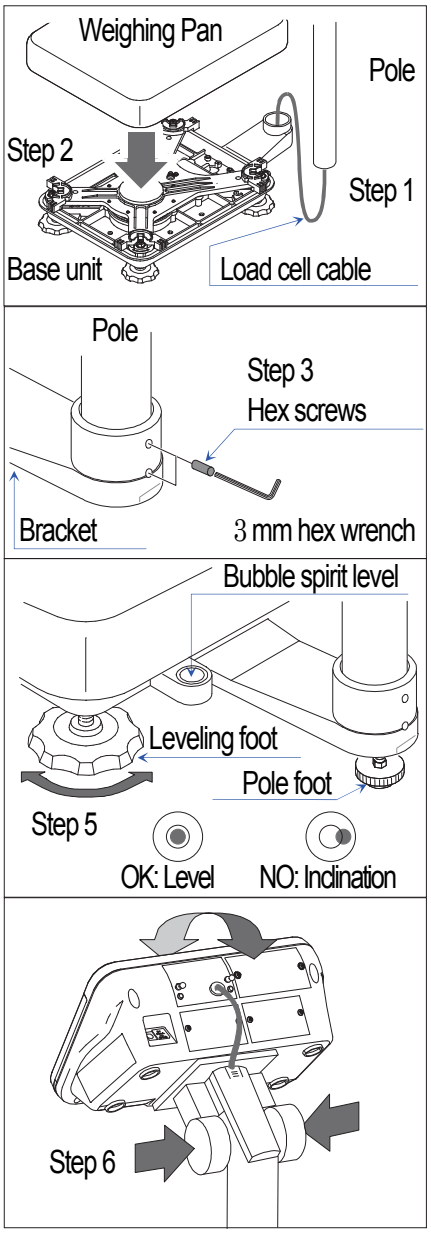
Step 4 Select a place to install the scale.
Refer to "**3.1. Installing the Scale**" .

Step 5 Adjust the level using the bubble spirit and four leveling feet of the base unit. Place the pole on the floor using the pole foot.

Step 6 Arrange the angle of the display unit. Press the caps at the pole top from both sides and adjust the angle of the display unit.

Step 7 Check the weighing accuracy. If the scale needs calibration, refer to "**14. Calibration**".

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



4.1.2. Method-B Procedure to Assemble the Scale

(HV-300KC, HV-300KCP, HV-600KC, HV-600KCP,
HW-300KC, HW-300KCP, HW-600KC, HW-600KCP)

This procedure is used to set up the above models.

Note Display unit, pole and base unit are connected by cable. Take care not to pull on the load cell cable.

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

Step 2 Remove the weighing pan.

Step 3 Assemble the pole and display unit.
Affix the pole and display unit using four 4 mm screws. Use the Phillips screwdriver included. Bundle the AC adapter cable and communication cable using two cable clamps that affix to the pole.

Step 4 Arrange the angle of the display unit.
Press the caps at the pole top from both sides and adjust the angle of the display unit.

Step 5 Connecting the load cell cable.
Connect the load cell cable to the display unit. Close the cable cover, hook the cable in hooks and adjust cable length. Close the bracket cover.

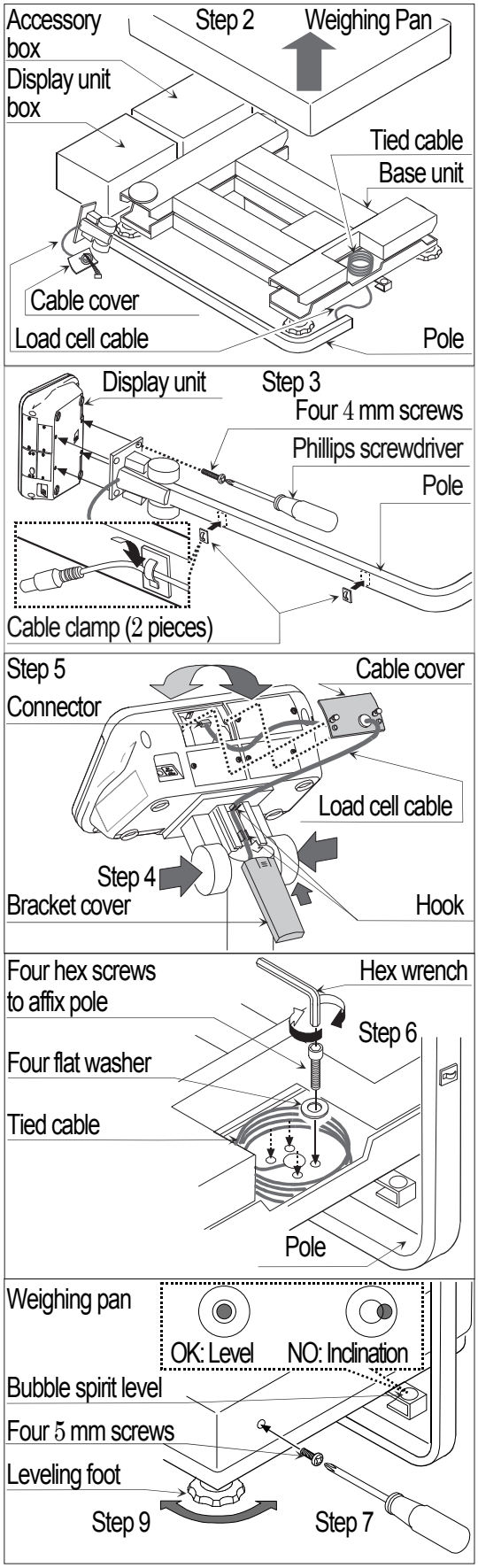
Step 6 Assemble the base unit and pole.
Affix the pole and base unit using four hex screws (and flat washers) so as not to damage the load cell cable. Use the hex wrench included. Bundle the remainder of the load cell cable using the included cable ties.

Step 7 Place the weighing pan on the base unit.
Affix the weighing pan using four 5 mm screws. Use the Phillips screwdriver included. Peel the protective film from the weighing pan.

Step 8 Select a place for installing the scale.
Refer to "**3.1. Installing the Scale**" .

Step 9 Adjust the bubble spirit level.
Adjust the level of the base unit using the bubble spirit level and the leveling feet.

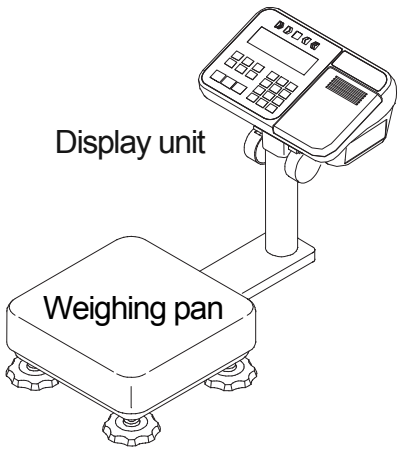
Step 10 Check the weighing accuracy. If the scale needs calibration, refer to "**14. Calibration**".



5. Package Contents

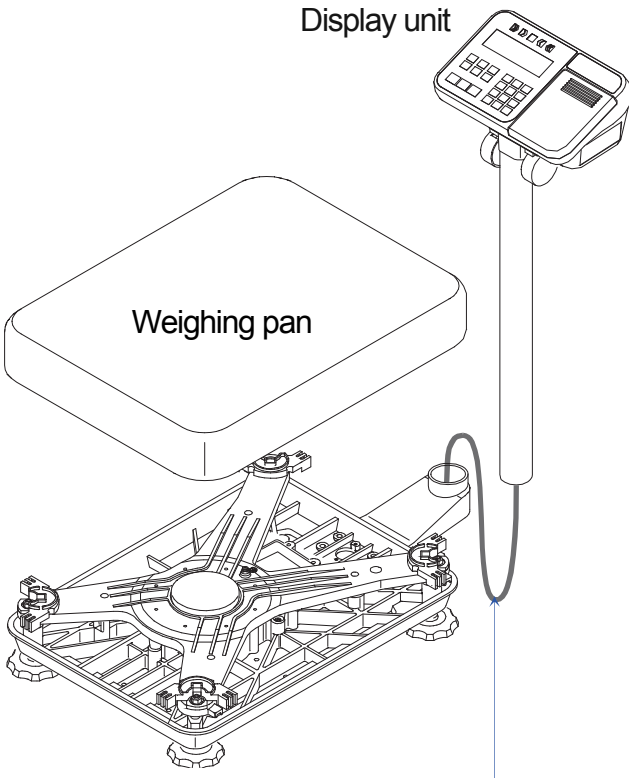
S-models

HV-15KC
HV-15KCP
HW-10KC
HW-10KCP



L-models

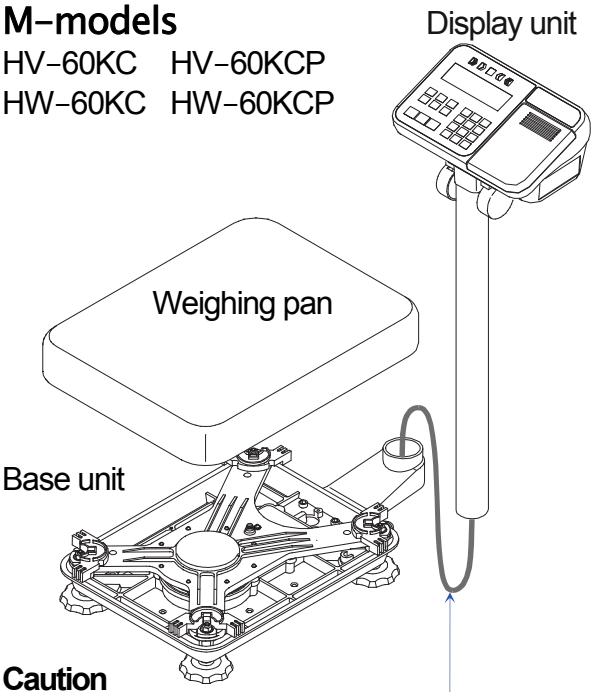
HV-200KC HV-200KCP
HW-100KC HW-100KCP
HW-200KC HW-200KCP



Caution
Do not pull the load cell cable.

M-models

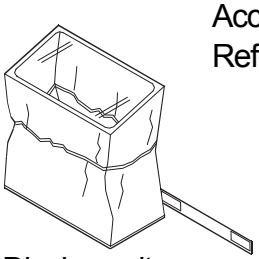
HV-60KC HV-60KCP
HW-60KC HW-60KCP



Caution
Do not pull the load cell cable.

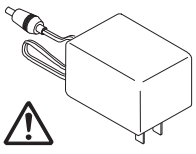
Accessories

Accessories supplied depend on the scale.
Refer to "**5.1. Accessories and Options List**".



Display unit cover
AXP-3003217D

Hex wrench

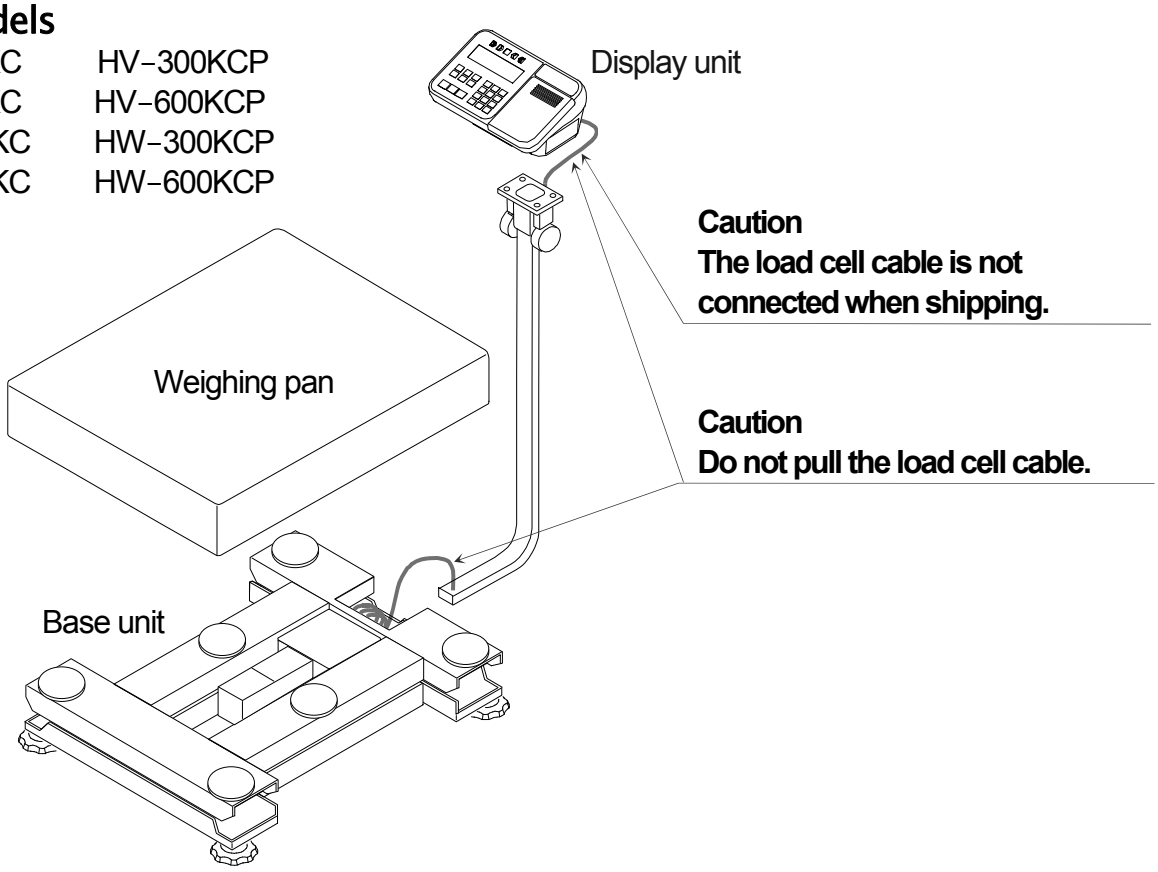


AC adapter

Please confirm that the AC adapter type is correct for your local voltage and receptacle type. The AC adapter may not be provided for some areas.

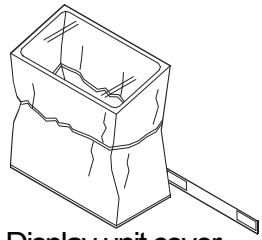
L2-models

HV-300KC HV-300KCP
HV-600KC HV-600KCP
HW-300KC HW-300KCP
HW-600KC HW-600KCP

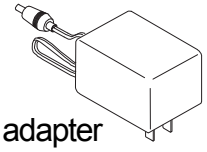


Accessories

Accessories supplied depend on the scale.
Refer to "**5.1. Accessories and Options List**".

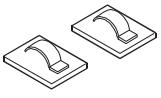


Display unit cover
AXP-3003217D



AC adapter

⚠ **Please confirm that the AC adapter type is correct for your local voltage and receptacle type. The AC adapter may not be provided for some areas.**

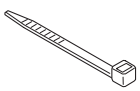


Tow
Cable clamp

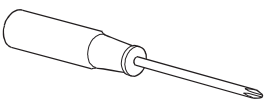
Set of hex screws for pole with hex wrench.

Four
4 mm screws for display unit.

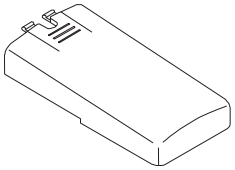
Four
5 mm screws for weighing pan



Cable tie



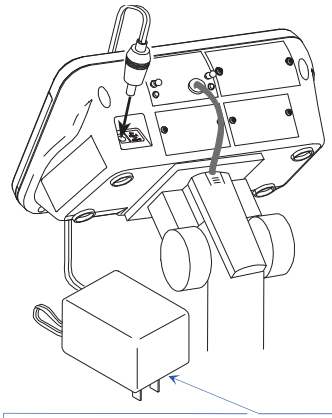
Phillips screwdriver



Bracket cover

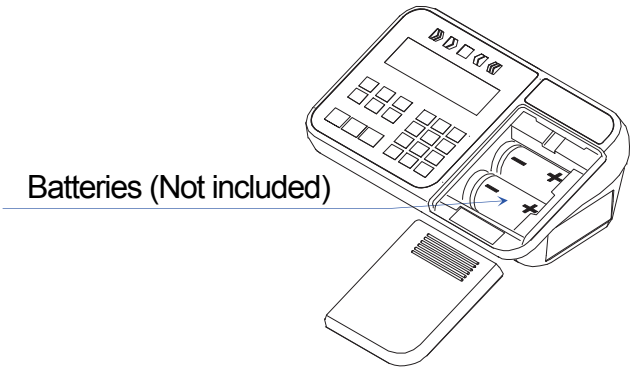
Type C and CP

Scale with "C" or "CP" at the end of model name.



Type C

Scale with "C" at the end of model name.



AC adapter

⚠ **Please confirm that the AC adapter type is correct for your local voltage and receptacle type. The AC adapter may not be provided for some areas.**

5.1. Accessories and Options List

5.1.1. Accessories List

Type	Models	Accessories (Quantity)
Type C (Able to use battery)	HV-15KC HW-10KC	Display unit cover (AXP-3003217D) Instruction manual ⚠ AC adapter (1)
	HV-60KC HV-200KC HW-60KC HW-100KC HW-200KC	Display unit cover (AXP-3003217D) Hex wrench (1) Instruction manual ⚠ AC adapter (1)
	HV-300KC HV-600KC HW-300KC HW-600KC	Display unit cover (AXP-3003217D) Cable clamp (2) Set of hex screws for pole with hex wrench. Bracket cover (1) 4 mm screws for display unit (4) Cable tie (1) 5 mm screws for weighing pan (4) Phillips screwdriver (1) Instruction manual ⚠ AC adapter (1)
Type CP (Built-in printer)	HV-15KCP HW-10KCP	Display unit cover (AXP-3003217D) Roll paper (1 roll) Instruction manual ⚠ AC adapter (1)
	HV-60KCP HV-200KCP HW-60KCP HW-100KCP HW-200KCP	Display unit cover (AXP-3003217D) Hex wrench (1) Roll paper (1 pc) Instruction manual ⚠ AC adapter (1)
	HV-300KCP HV-600KCP HW-300KCP HW-600KCP	Display unit cover (AXP-3003217D) Cable clamp (2) Set of hex screws for pole with hex wrench. Bracket cover (1) 4 mm screws for display unit (4) Cable tie (1) 5 mm screws for weighing pan (4) Phillips screwdriver (1) Roll paper (1 roll) Instruction manual ⚠ AC adapter (1)

5.1.2. Options List

Order code	Option name	Models
HVW-02	Extension load cell cable for L2-models, 5 m	HV-300KC, HV-300KCP, HV-600KC, HV-600KCP, HW-300KC, HW-300KCP, HW-600KC, HW-600KCP
HVW-02CB	USB interface	All models
HVW-03C	RS-232C interface	
HVW-04C	Comparator relay output / Buzzer / Contact input	
HVW-08C	Extension load cell cable for models except L2-models, 5 m	HV-15KC, HV-15KCP, HV-60KC, HV-60KCP, HV-200KC, HV-200KCP, HW-10KC, HW-10KCP, HW-60KC, HW-60KCP, HW-100KC, HW-100KCP, HW-200KC, HW-200KCP
HVW-11C	Wall mounting kit	All models
HVW-12C	Printer mounting kit (for AD-8127)	
FW-15	Stand for the display unit (The display is not included)	HV-300KC, HV-300KCP, HV-600KC, HV-600KCP, HW-300KC, HW-300KCP, HW-600KC, HW-600KCP
FW-16-4	Wheel	
AX-KO2466-200	RS-232C cable, D-sub 25 pin, 2 m.	All models
AX-KO2466-500	RS-232C cable, D-sub 25 pin, 5 m.	
AX-KO2466-1000	RS-232C cable, D-sub 25 pin, 10 m. *	

Note

- Refer to the relevant option manual for use of the following options.
  HVW-02, HVW-08C, HVW-11C, HVW-12C, FW-15 and FW-16.
- Calibrate the scale with a calibration weight when extension cable HVW-02 or HVW-08C is used, if necessary.

* The requirement for the RS-232C communication includes the limitation of cable length and the limitation due to tolerance against electrical noise from environment. Therefore, it cannot guarantee all of the RS-232C communication.

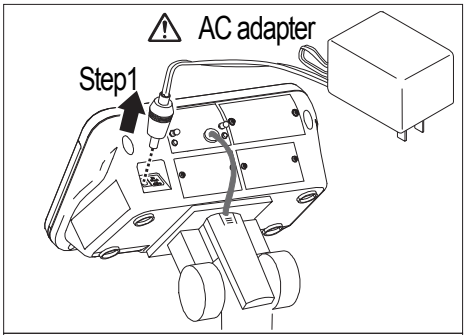
Consumables

AX-PP147-S	Special roll paper for the built-in printer (set of 5 rolls)

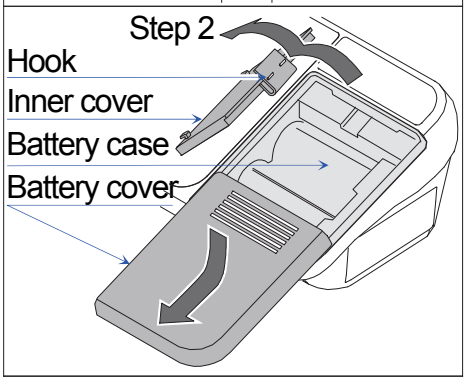
5.2. Installing the Batteries for Type C

Step 1 Turn off the display.
Remove the AC adapter.

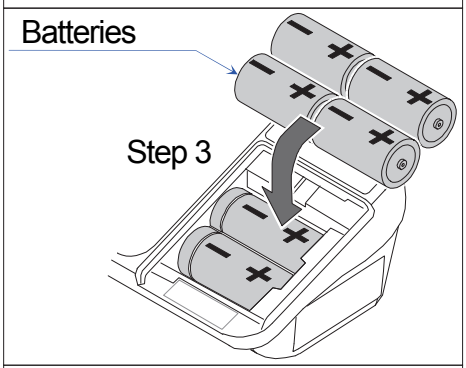
⚠ AC adapter
Please confirm that the AC adapter type is correct for your local voltage and receptacle type. The AC adapter may not be provided for some areas.



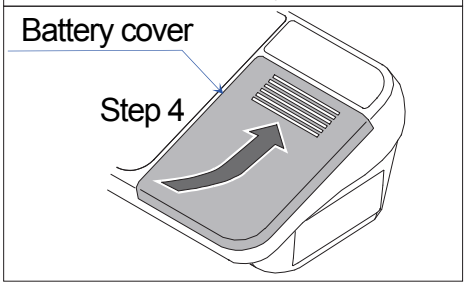
Step 2 Open the battery cover and inner cover in that order.
Push the battery cover and slide it.
Push the hook of the inner cover to the left and lift it.



Step 3 Insert four new batteries with proper polarity (+, −).
Batteries are type D, Mono, R20P , R20PU or LR20.



Step 4 Close the covers in the reverse of the order of step 2.



Caution

- **When batteries are consumed mostly, the battery mark is displayed.**
- **Replace batteries with four new ones, when Lb 0 is displayed.**
- **Do not mix used and new batteries. Do not use batteries of different type and manufacturer. Doing so may cause damage to the batteries and the scale.**
- **Check the battery direction. If the batteries are installed in the wrong direction, it may cause battery leakage. If the direction of just one battery is wrong, the scale may work temporarily.**
- **The battery life depends on the ambient temperature. It becomes shorter in low temperatures such as in winter.**
- **Remove the batteries from the display unit, when the scale is not to be used for a long time. Leaving them installed may result in leakage and cause damage.**
- **Damage due to battery leakage is not covered under warranty.**

5.3. Removing the Pole

Caution

- **Remove the AC adapter and batteries before removing the pole.**
- **When removing the load cell cable, do not pull on the load cell cable connector forcibly and do not pull on the wires of the cable. Do not pull the load cell cable. Do not bend the cable forcibly.**
- **Take care that the load cell cable does not touch the weighing pan inside the base unit.**
- **Avoid dust, static electricity and high humidity (or condensation) because the inside of the display unit is sensitive to those.**

The procedure to remove the pole depends on the model. Refer to the list below and select a proper procedure.

Models					Reference
S-model:	HV-15KC,	HV-15KCP,	HW-10KC,	HW-10KCP	**Method-A procedure** to remove the pole
M-model:	HV-60KC,	HV-60KCP,	HW-60KC,	HW-60KCP	
L-model:	HV-200KC, HW-100KC,	HV-200KCP, HW-100KCP,	HW-200KC,	HW-200KCP	
L2-model:	HV-300KC, HW-300KC,	HV-300KCP, HW-300KCP,	HV-600KC, HW-600KC,	HV-600KCP, HW-600KCP	**Method-B procedure** to remove the pole

5.3.1. Method-A Procedure to Remove the Pole

HV-15KC, HV-15KCP, HV-60KC, HV-60KCP, HV-200KC, HV-200KCP, HW-10KC, HW-10KCP, HW-60KC, HW-60KCP, HW-100KC, HW-100KCP, HW-200KC, HW-200KCP

Step 1 Turn the scale off.
Remove the AC adapter and batteries.

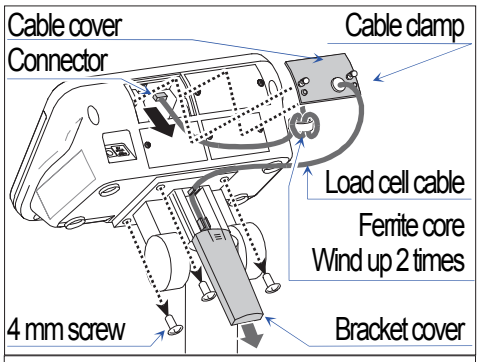
Step 2 Open the rear cover of the display unit.
Gently disconnect the load cell cable connector vertically. (Do not pull toward you).

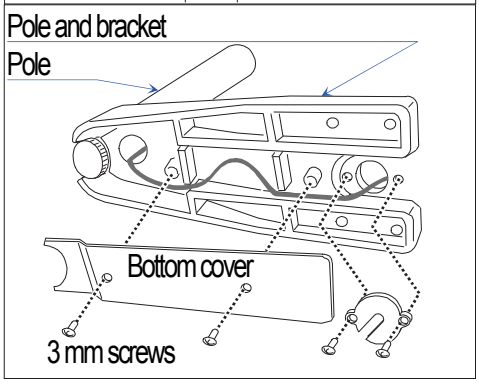
Step 3 Using a Phillips screwdriver, remove four 4 mm screws used to attach the display unit to the pole.

Step 4 Remove the ferrite core and the cable clamp from the load cell cable.

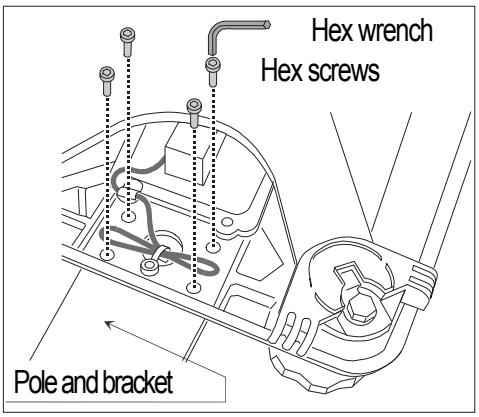
Step 5 Using a Phillips screwdriver; remove 3 mm screws and the bottom cover of the bracket of M-models and L-models.

Step 6 Carefully remove the load cell cable from the pole and the bracket. Particularly with S-models, take care not to pull on the connector forcibly.





Step 7 Arrange the cable so it does not touch the weighing pan in the base unit.
If the cable is untied, the straight length of S-models is approximately 1.5 m, and the straight length of M-models and L-models is approximately 2.5 m.
The length of the optional extension load cell cable (HVW-08C) is approximately 5 m.



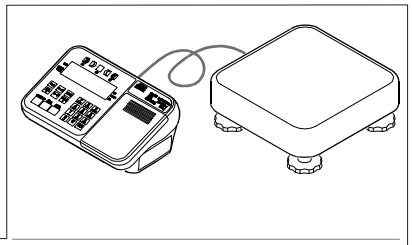
Step 8 Remove the pole and bracket from the base unit using a hex wrench.

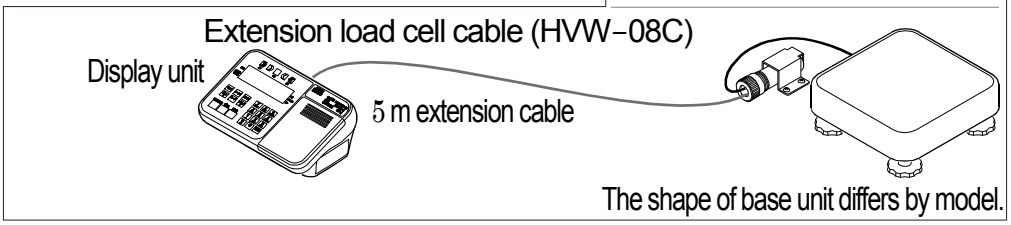
Hex wrench 5 mm	HV-15KC, HW-10KC,	HV-15KCP, HW-10KCP,	HV-60KC, HW-60KC,	HV-60KCP, HW-60KCP
Hex wrench 6 mm	HV-200KC, HW-200KC,	HV-200KCP, HW-200KCP	HW-100KC,	HW-100KCP,

Step 9 Wind the cable through the ferrite core two times.
Affix the cable to the rear cover using the cable clamp.

Step 10 Connect the cable to the connector.
Close the rear cover.

Step 11 Check the weighing accuracy.





5.3.2. Method-B Procedure to Remove the Pole

HV-300KC, HV-300KCP, HV-600KC, HV-600KCP,
HW-300KC, HW-300KCP, HW-600KC, HW-600KCP

Step 1 Turn the scale off.
Remove the AC adapter and batteries. .

Step 2 Open the rear cover of the display unit.
Gently disconnect the load cell cable connector vertically. (Do not pull toward you).

Step 3 Using a Phillips screwdriver, remove four 4 mm screws used to attach the display unit to the pole.

Step 4 Remove the ferrite core and the cable clamp from the load cell cable.

Step 5 Carefully remove the load cell cable from the pole.
Take care not to pull on the connector forcibly.

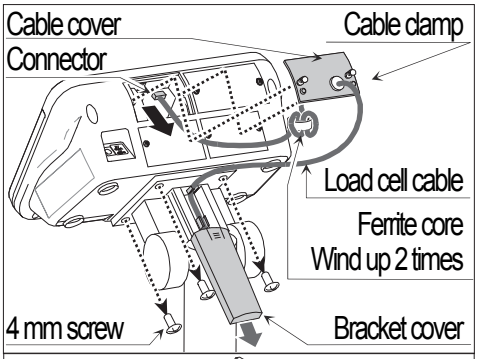
Step 6 Arrange the cable so it does not touch the weighing pan in the base unit.
If the cable is untied, the straight length of L2-models is approximately 4.5 m. The length of the optional extension load cell cable (HVW-02) is approximately 5 m.

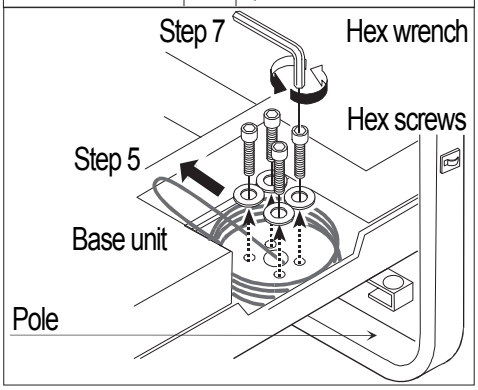
Step 7 Remove the pole and four hex screws from the base unit using a hex wrench.

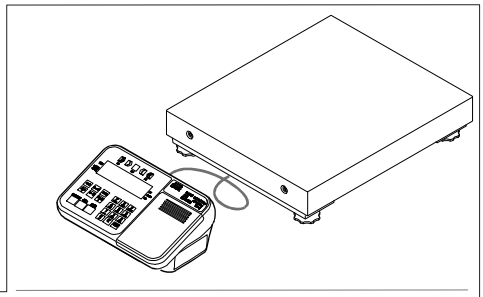
Step 8 Wind the cable through the ferrite core two times.
Affix the cable to the rear cover using the cable clamp.

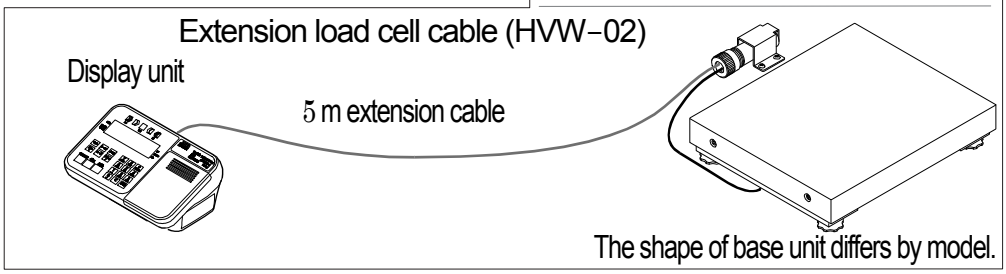
Step 9 Connect the cable to the connector.
Close the rear cover.

Step 10 Check the weighing accuracy









5.4. Grounding the Scale

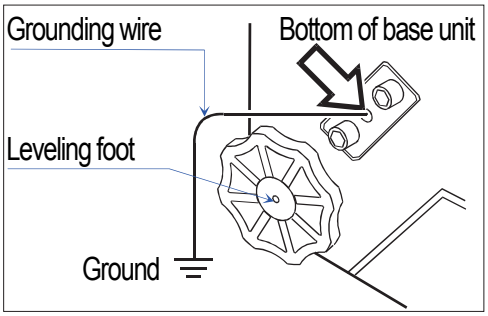
When using where there may be static electricity, ground the scale.
The grounding method depends on the model. Refer to the list below and ground the scale properly. These procedures are only for the grounding part of the scale.

Models					Reference
S-model:	HV-15KC,	HV-15KCP,	HW-10KC,	HW-10KCP	**Method-A procedure** to ground the scale
M-model:	HV-60KC,	HV-60KCP,	HW-60KC,	HW-60KCP	**Method-B procedure** to ground the scale
L-model:	HV-200KC, HW-100KC,	HV-200KCP, HW-100KCP,	HW-200KC,	HW-200KCP	
L2-model:	HV-300KC, HW-300KC,	HV-300KCP, HW-300KCP,	HV-600KC, HW-600KC,	HV-600KCP, HW-600KCP	**Method-C procedure** to ground the scale

5.4.1. Method-A Procedure to Ground the Scale

(HV-15KC, HV-15KCP, HW-10KC, HW-10KCP)

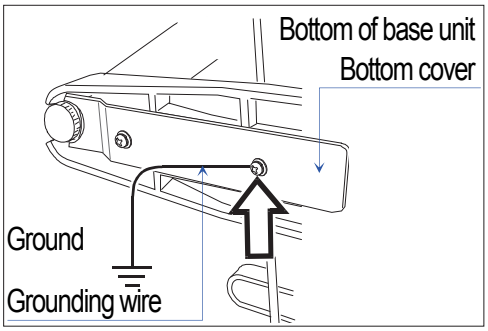
Secure the grounding wire using an M4 screw in the screw hole between the two hexagon bolts on the base unit bottom side. (⇨ Part)



5.4.2. Method-B Procedure to Ground the Scale

(HV-60KC, HV-60KCP, HV-200KC, HV-200KCP,
HW-60KC, HW-60KCP, HW-100KC, HW-100KCP,
HW-200KC, HW-200KCP)

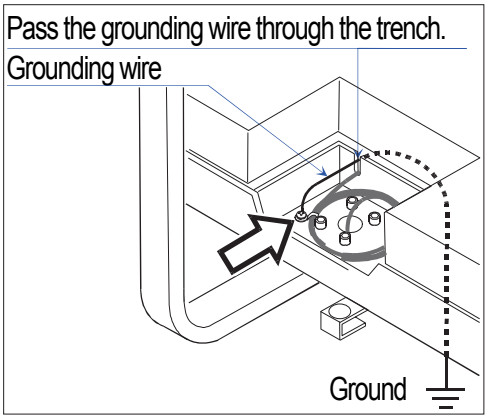
Secure the grounding wire using the screw that secures the bottom cover. (⇨ Part)



5.4.3. Method-C Procedure to Ground the Scale

(HV-300KC, HV-300KCP, HV-600KC, HV-600KCP,
HW-300KC, HW-300KCP, HW-600KC, HW-600KCP)

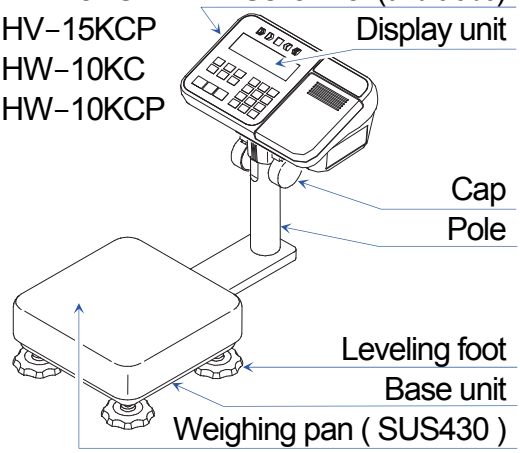
Remove the weighing pan. Secure the grounding wire using the screw that secures the band of the load cell cable bundle. (⇨ Part) Pass the grounding wire through the trench the same as the load cell cable. Arrange the grounding wire so it does not touch the weighing pan.



6. Description of Each Part

S-models

HV-15KC
HV-15KCP
HW-10KC
HW-10KCP

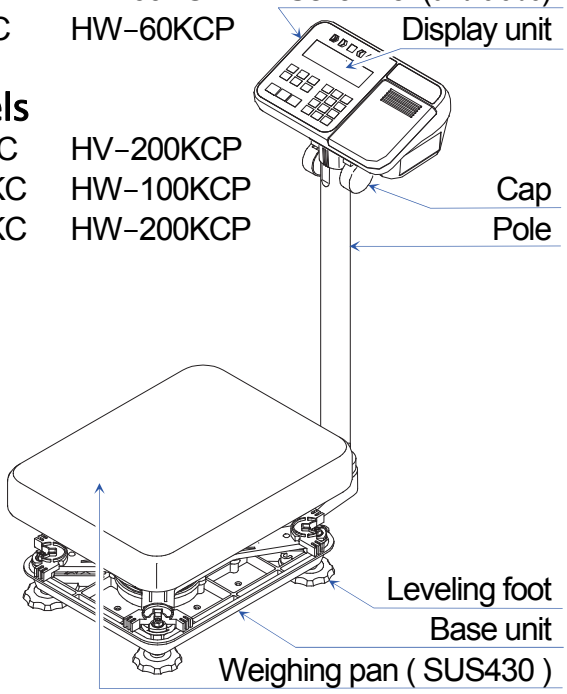


M-models

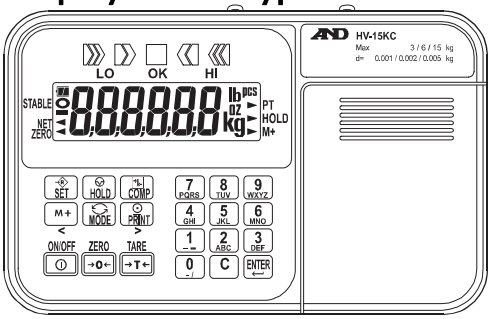
HV-60KC HV-60KCP
HW-60KC HW-60KCP

L-models

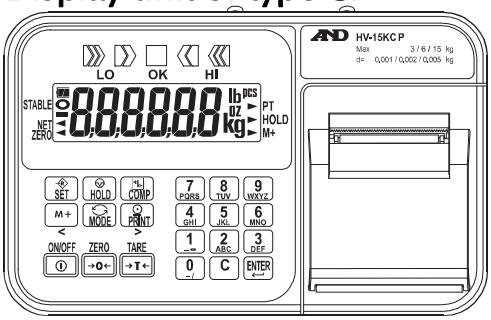
HV-200KC HV-200KCP
HW-100KC HW-100KCP
HW-200KC HW-200KCP

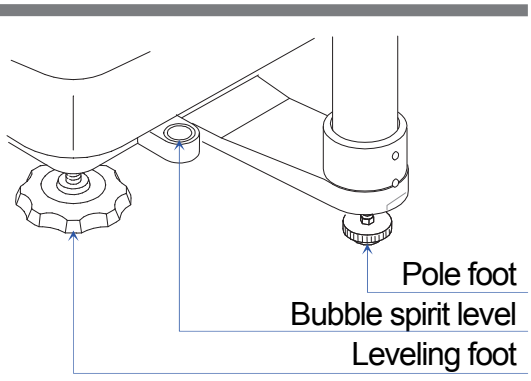


Display unit of type C



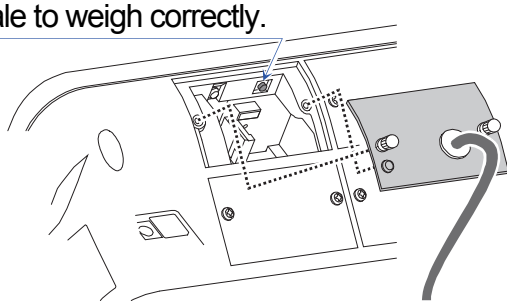
Display unit of type CP



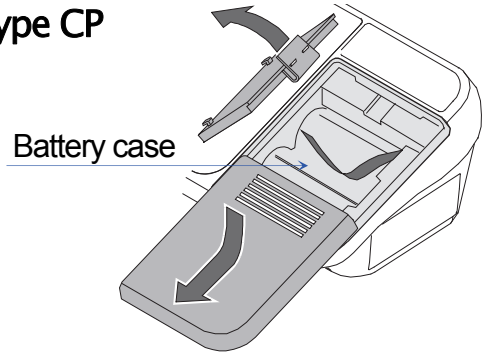


CAL switch

Calibrate the scale to weigh correctly.



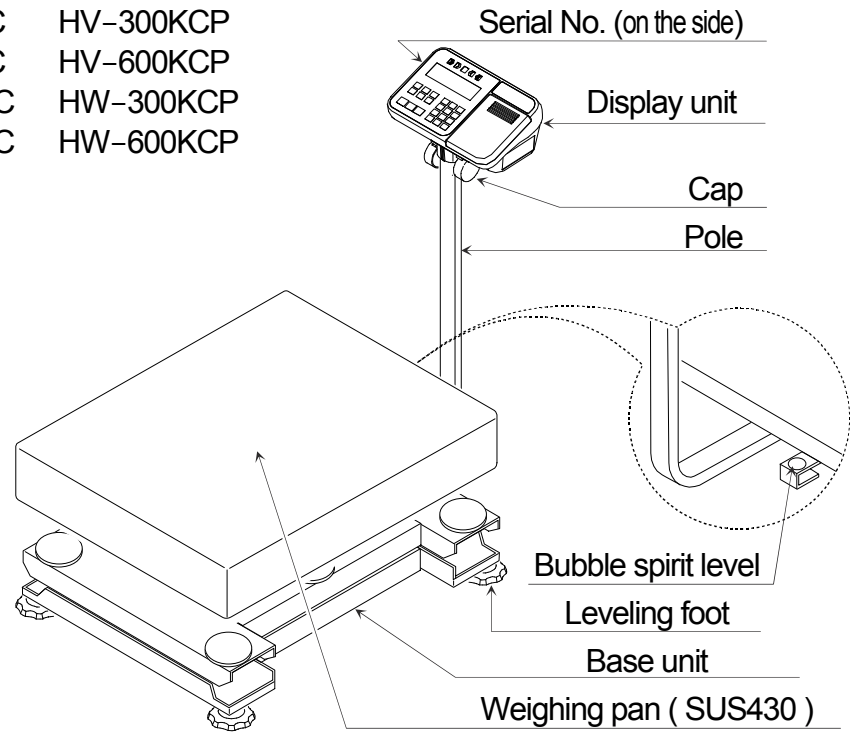
Type CP



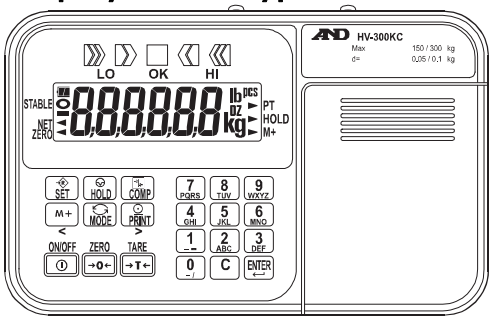
Caution To use the scale, it is necessary to use a weight with a certified mass value.

L2-models

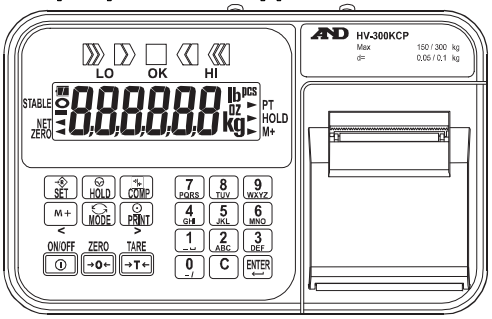
HV-300KC HV-300KCP
HV-600KC HV-600KCP
HW-300KC HW-300KCP
HW-600KC HW-600KCP



Display unit of type C

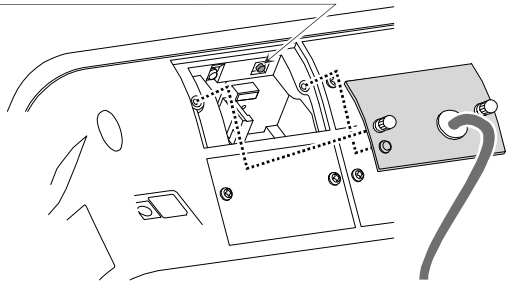


Display unit of type CP

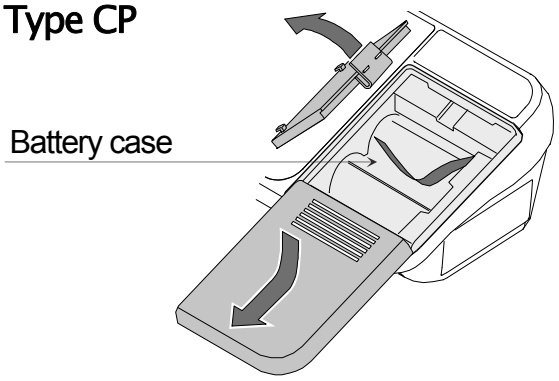


CAL switch

Calibrate the scale to weigh correctly.

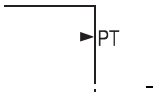
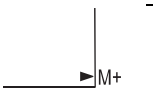
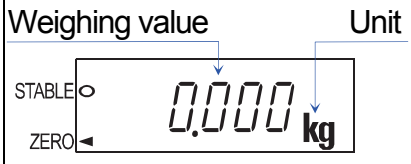
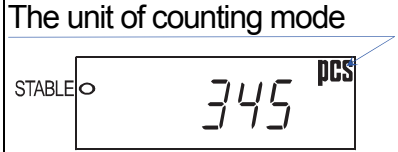
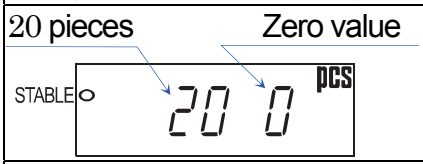
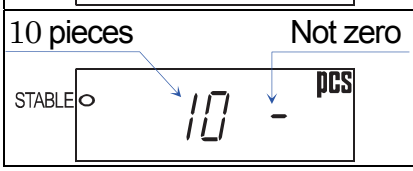


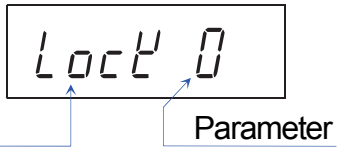
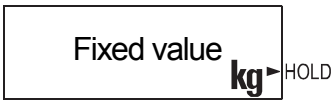
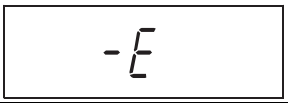
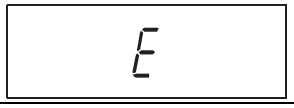
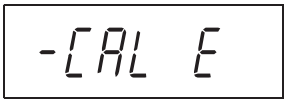
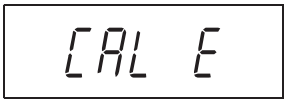
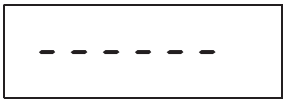
Type CP



Caution To use the scale, it is necessary to use a weight with a certified mass value.

6.1. Display and Symbols

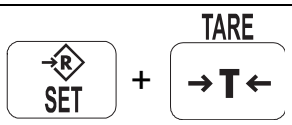
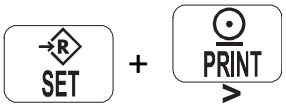
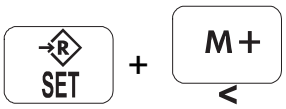
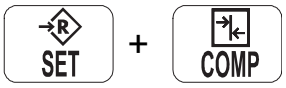
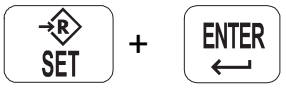
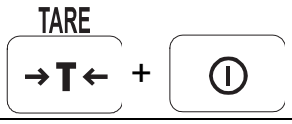
Display and Symbols	Description
	**Stability mark** When the current weighing value is stable, this mark is displayed. It means the scale is in the proper condition for reading weighing value.
	**Zero point mark** The **zero point** is the reference point for weighing. When the [ZERO] key is pressed with nothing on the weighing pan, this mark and a zero value are displayed.
	**Net mark** When a tare weight (example: container) is placed on the weighing pan and the [TARE] key is pressed, this mark and a zero value are displayed. The **net value** is a value the tare value is subtracted from the gross value.
	**Preset tare mark** This mark blinks while a digitally input tare is displayed.
	**Hold mark** This mark is displayed while the display is held.
	**Accumulation mark** This mark is displayed while the accumulation function is used.
	**Low battery mark for type C** This mark is displayed when the battery is close to being depleted (voltage is low). Replace with four new batteries.
	**Comparator indicator** While the comparator function is being used, the weighing value is compared using the preset threshold values and the indicator displays the result.
	**Zero point** (Example) When the [ZERO] key is pressed with nothing on the weighing pan, the zero value, **zero point mark** and **stability mark** are displayed.
	**Counting mode** (Example) This mode counts the number of objects on the weighing pan using the preset unit mass. The unit is pcs.
	**Storing the unit mass for the counting mode** (Example) The unit mass is stored using 20 samples. The zero value means that no objects are on the weighing pan.
	**Storing the unit mass for the counting mode** (Example) The unit mass is stored using 10 samples. Sign "−" means that something is placed on the weighing pan.

Display and Symbols	Description
	**While setting a preset tare** (Example) Input a tare value using the numerical keys. Store the new tare value using the ENTER key.
	**Function settings** (Example) Select the item using the MODE key and enter the item using the ENTER key. Input a parameter using the numerical keys. Store the parameter using the ENTER key.
	**Hold display** (Example) Activate the hold mode in the Hold item of "**15.2. Parameter list**", if you will hold the display of the weighing value. When the weighing value is "**near zero**" (within the "**zero band**") or changes more than (25 % of the hold display + 30 **digits**), the hold display is canceled.
	**Weighing error** Check the base unit and the weighing pan.
	**Overload display** Remove anything that is on the weighing pan.
	**Calibration error** The calibration weight is too light. Check the base unit and the weighing pan.
	**Calibration error** The calibration weight is too heavy. Check the base unit and the weighing pan.
Fixed display 	**An error where the zero value cannot be displayed because the weighing value is unstable when the scale turns on.** Remove anything that is on the weighing pan. Perform zero point calibration. Avoid a breeze or vibration that will affect measurement. Check around the weighing pan.
Blinking M+	Accumulated data count
Blinking M+ and lighting up **kg**	Total mass value of the accumulated data
Example of model label: **Max** 3 / 6 / 15 kg **d** = 0.001 / 0.002 / 0.005 kg	The weighing range and measurable Readability. **Example:** The weighing value is displayed up to 15 kg with interval 0.005 kg. The weighing value is displayed up to 6 kg with interval 0.002 kg. The weighing value is displayed up to 3 kg with interval 0.001 kg.

- "**digit**" is a unit of display and is equivalent to the minimum measurable weighing value.
- "**Max**" means the weighing range.
- "**d =**" means "**digit**" and is equivalent to minimum weighing value in the unit of kg.
- "**near zero**" or "**zero band**" is within ±4 digits (four times the minimum weighing value that can be weighed) from zero point in the weighing unit "kg".

6.2. Keys

Display and Symbols	Description
ON/OFF ⏻	**ON/OFF** key to show or hide the display alternately. ❑ When the scale is turned on, the electric power is supplied to the electric circuit inside the scale. ❑ When the scale is turned off, the scale is in standby status. At this time, only minimum power consumption of the waiting mode and power consumption of AC adapter connected to the AC socket are consumed.
ZERO →0←	**ZERO** key. ❑ When the scale is turned on and zero point is weighed with nothing on the weighing pan, the scale assumes zero point as the reference value of weighing. ❑ When the [ZERO] key is pressed within 2% of the capacity and the weighing value is stable, the scale displays **zero point mark** and zero value. At this time, if tare function and accumulation mode have been used, that data are deleted.
TARE →T←	**TARE** key. ❑ When the weighing value is a positive stable value and the [TARE] key is pressed, the scale displays a zero value as net value, **net mark** and **zero point mark**. The **net value** is a value obtained by subtracting the value of tare weight from gross value. **Tare weight** (container) is placed on the weighing pan and is not included in the net value. (In tare mode) **Note** **The weighing range is reduced according to value of the tare weight.**
M+ <	Adds to the accumulated data.
SET	**SET** key. In the comparator mode, this key selects + and − for limit values.
MODE	**MODE** key ❑ The key switches the mode (weighing unit) to be displayed between weighing value and count. The mode (weighing unit) is maintained in non-volatile memory, so the scale displays using the most recently used mode (weighing unit) when turning on the power next time. ❑ The key is used to select the items at each setting.
HOLD	**HOLD** key The display of the weighing value is held. Refer to the function settings for details.
PRINT >	**PRINT** key The key is used to print out the value displayed or outputs it as data. Those operations differ depending on the function settings.

Display and Symbols	Description
	Press and hold the **SET** key and press the **TARE** key. Use these keys to enter preset tare setting mode.
	Press and hold the **SET** key and press the **PRINT** key. Use these keys to perform paper feed at the built-in printer. (**Type CP**)
	Press and hold the **SET** key and press the **M+** key. Use these keys to display the accumulated results.
	Press and hold the **SET** key and press the **COMP** key. Use these keys to set limit values for the comparator.
	Press and hold the **SET** key and press the **ENTER** key. Use these keys to proceed to unit mass storing when using counting mode.
	Press and hold the **TARE** key and press the **ON/OFF** key. Use these keys to enter the function table.

7. Basic Operation

7.1. Turning the Scale On/Off and Weighing

7.1.1. When Using the AC Adapter

Step 1 Ground the scale.

Step 2 Confirm that nothing is placed on the weighing pan.

Step 3 Confirm that local voltage and receptacle type are correct.

Step 4 The scale is turned on or off using the [ON/OFF] key.

Step 5 Check the accuracy of weighing. Allow a 30-minute warm up period before calibration.

Step 6 With nothing on the weighing pan, press the [ZERO] key to display the zero value.

Step 7 Gently place an object to be weighed on the weighing pan.

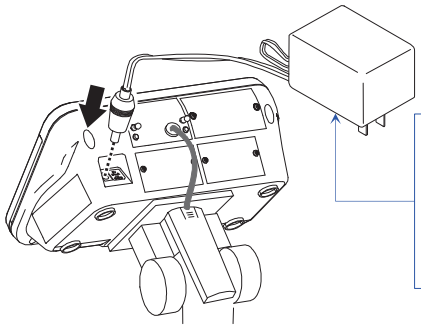
Step 8 Wait for the stability mark to be displayed. Read the weighing value.

Step 9 Gently remove the object from the weighing pan.

Step 10 Turn the scale off using the [ON/OFF] key.

Memo

- When the scale is turned off using the [ON/OFF] key, the scale is in standby status. At this time, minimum power consumption of the waiting mode and power consumption of the AC adapter connected to the AC socket are consumed. If you want to shut off the power consumption completely, disconnect the AC adapter.



AC adapter

⚠ **Please confirm that the AC adapter type is correct for your local voltage and receptacle type. The AC adapter may not be provided for some areas.**

7.1.2. When Using the Batteries for Type C

Step 1 Install four new batteries. Refer to "**5.2. Installing the Batteries for Type C**".

Step 2 Confirm that nothing is placed on the weighing pan.

Step 3 The scale is turned on or off using the [ON/OFF] key.

Step 4 Check the accuracy of weighing. Allow a 30-minute warm up period before calibration.

Step 5 With nothing on the weighing pan, press the [ZERO] key to display zero value.

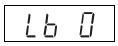
Step 6 Gently place an object to be weighed on the weighing pan.

Step 7 Wait for the stability mark to be displayed. Read the weighing value.

Step 8 Gently remove the object from the weighing pan.

Step 9 Turn the scale off using the [ON/OFF] key.

Caution

- When  is displayed, it means that the batteries will run out soon.
- Replace used batteries with four new ones when  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. Leaving them installed may result in leakage and cause a malfunction and damage to the scale.

7.1.3. Power on Zero Function and Power on Tare Function

Power on Zero Function :

When nothing is placed on the weighing pan and the scale is turned on using the [ON/OFF] key, the weighing value is assumed as the reference value of weighing. The zero value as gross value and **zero point mark** are displayed. The **power on zero** function can be used when the weighing value is within the threshold value * from the zero point at calibration.

Power on Tare Function :

When a tare weight (container) is placed on the weighing pan and the scale is turned on using the [ON/OFF] key, the tare function is performed and a zero value is displayed as net value. **Zero point mark** and **net mark** are displayed. The **power on tare** function can be used when the current zero point is more than the threshold value * from the zero point of calibration.

Active function	* Threshold value	
	Principal standard models	**Approved models**
Power on zero function	±50 % of capacity	±10 % of capacity
Power on tare function	+50 % of capacity	+10 % of capacity

Tare Function to Display Net Value

The **tare function** is used to cancel the mass value of a tare weight and to display the **net value**, when a container (tare weight) to hold the object to be weighed is placed on the weighing pan.

Caution

- The weighing range is reduced according to the value of the tare weight.
- The current net value is reset to zero value when the [ZERO] key is pressed or the display is turned off.
- For the HV-C and HV-CP series, the storable preset tare value must be within the minimum weighing range.

7.2.1. Inputting Tare Value by Weighing

How to weigh a tare weight (container) and display the net value.

Step 1 Place the container on the weighing pan.
Wait for the stability mark to be displayed.
Press the [TARE] key.
The display becomes zero and the net mark is displayed.

Step 2 Place an object to be weighed in the container.
Wait for the stability mark to be displayed and read the net display.

Step 3 Remove all of the objects and the container from the weighing pan.

7.2.2. Digital Input of Tare Value (Preset Tare)

How to input value of a tare weight using numerical keys and to display the net value.

Step 1 While pressing and holding the [SET] key, press the [TARE] key.
The scale displays a blank display or the stored tare value. A blank display means that the tare value is zero (reset value). The ►PT mark blinks.

Step 2 Input the preset tare value using the numerical keys.

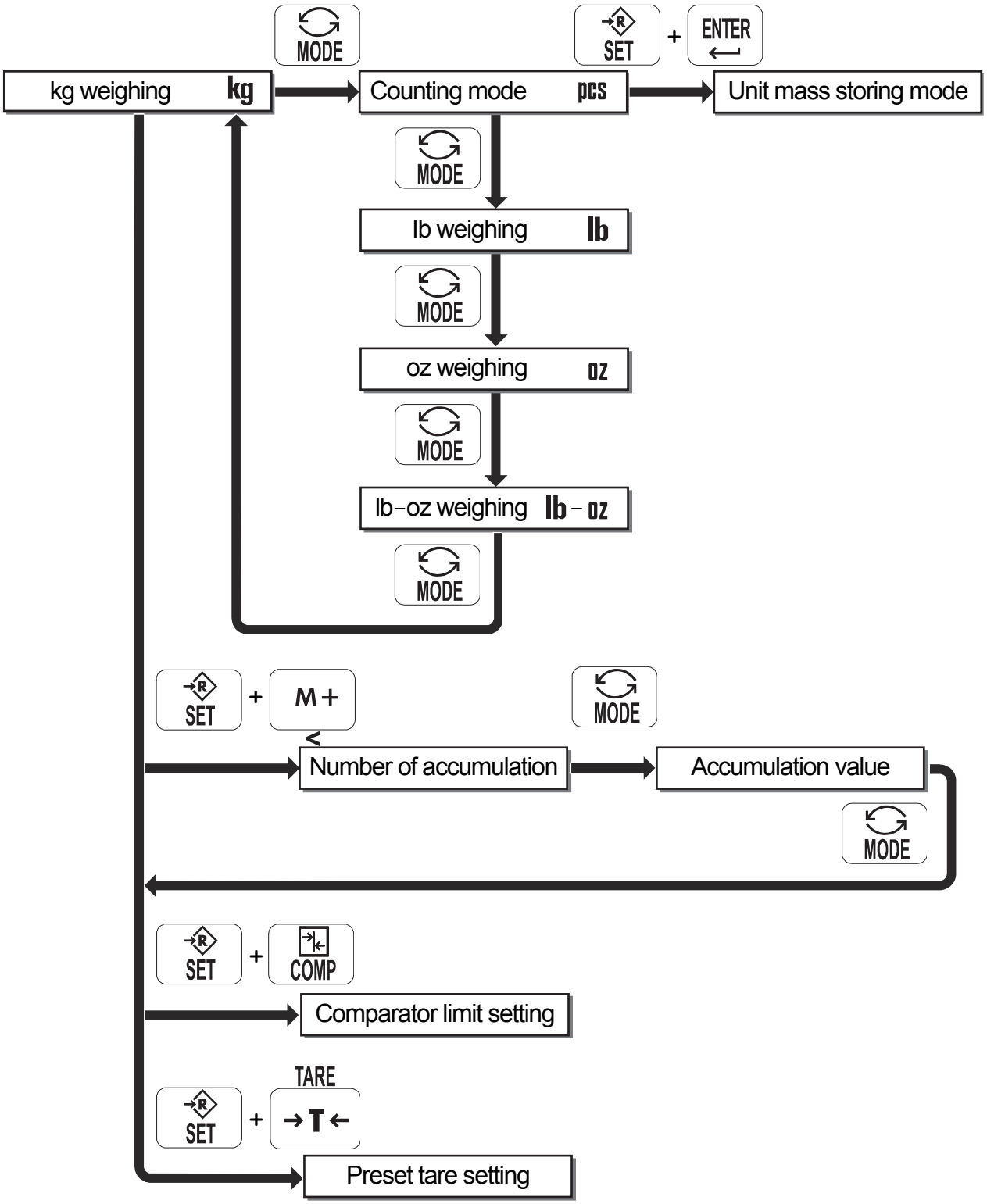
Step 3 Press the [ENTER] key to store the new preset tare value.
The scale displays the net value as preset tare value subtracted from gross value.

Step 4 Place an object to be weighed in the container.
Wait for the stability mark to be displayed and read the net display.

Step 5 Remove all of objects and the container from the weighing pan.

7.3. Switching the Mode

- When accumulation data is stored in the scale, the number of accumulations and an accumulation value can be displayed.
- The weighing unit used when turned on is the last weighing unit used before turning off.
- lb–oz display is available only with HV–15KC, HV–15KCP, HW–10KC and HW–10KCP.



8. Counting Mode

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

8.1. Storing a Unit Mass

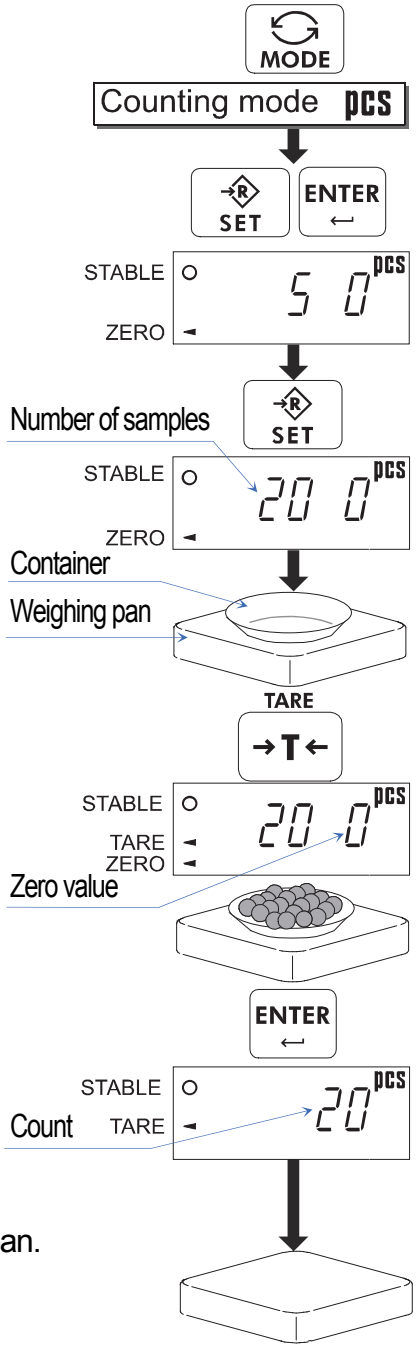
Step 1 Press the [MODE] key to display the unit pcs.

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

Step 3 Select the number of samples using the [SET] key.
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 weighing 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. The total sample mass are required more than 10 times of Readability in kg.
- When the unit mass is too small 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 will display the next unit.

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

Note The shape of the base unit differs depending on the model.

8.2. Counting the Number of Objects

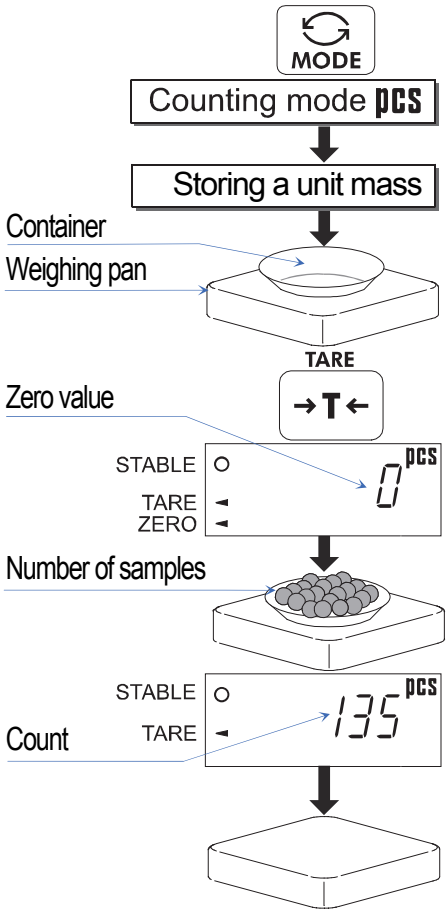
Step 1 Press the [MODE] key to display the unit pcs.

Step 2 Store the unit mass of the object.
Refer to "**8.1. Storing a Unit Mass**".

Step 3 Place the container on the weighing pan.
Press the [TARE] key.

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

Step 5 Remove the objects and the container from the weighing pan.



9. Accumulation Function

- The accumulation function can display the accumulation count and accumulation mass value of objects to be weighed. Maximum accumulation count is 999 times.
- The accumulation function is displayed with up to 6 digits and cannot display the leading digits of 7 or more.
  Example: If a 60 kg sample is weighed 17 times, the total is 1020.000 kg.
  (60.000 x 17 = 1020.000) The scale displays [020.000].
- To use this function, set the parameters of the "**Accumulation function** ([SuM])" in the function table in advance.
- To use the built-in printer of type C, set the parameters of the "**Built-in printer output mode** ([PrtP 9])" in the function table in advance.
- The total count and total mass value are stored in the scale even if the AC adapter or batteries are removed or the display is turned off (standby mode).

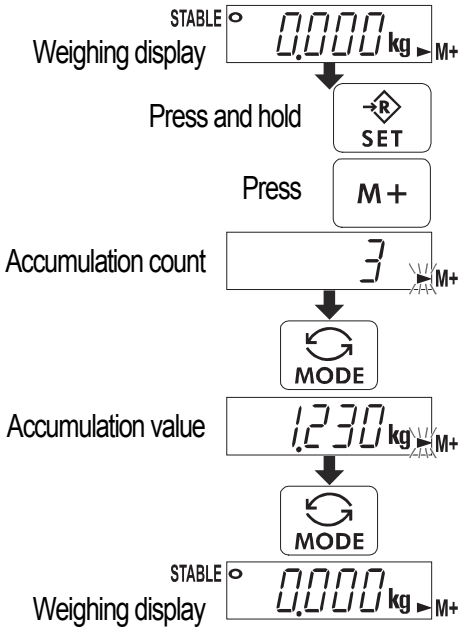
Display and Key Operations of Accumulation Function

- The display of the accumulation count has a blinking ▶ M+ without a weighing unit.
- The display of the accumulation mass value has a weighing unit and a blinking ▶ M+.

Step 1 Press the [SET] and [M+] key to display the accumulation count and accumulation mass value.

Step 2 Press the [MODE] key to display the accumulation count and accumulation mass value.

Step 3 Press the [MODE] key to return to weighing display.



- When the [ZERO] key is pressed in the accumulation mode, the current data is reset to zero.
- When the [PRINT] key is pressed in the accumulation mode for type CP, the data is output to the built-in printer.
- Refer to "**Time and date adding** [StdP]" of the function table to print the date and time.
  Refer to "**12. Built-in printer Type CP**" for print sample.

Caution

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

Parameters of Function Table and Word Definition

- "**near zero**" is within ±4 digits (four times the minimum weighing value that can be weighed) from zero point in the weighing unit "kg".

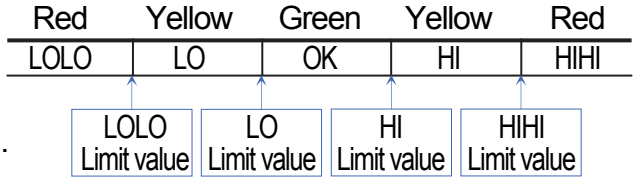
Item and Parameter	Description
Sun 0	Accumulation function not used.
Sun 1	▫ When the weighing value is a positive stable value and not "**near zero**", if the M+ key is pressed, the value is accumulated. ▫ The next accumulation can be performed after the display becomes "**near zero**" or a negative value.
Sun 2	▫ When the weighing value is a positive stable value and not "**near zero**", if the M+ key is pressed, the positive value is added to the accumulation value. ▫ When the weighing value is a negative stable value and not "**near zero**", if the M+ key is pressed, the negative value is subtracted from the accumulation value. ▫ The next accumulation can be performed after the display becomes "**near zero**".
Sun 3	▫ When the weighing value is a positive stable value and not "**near zero**", the value is accumulated automatically. ▫ The next accumulation can be performed after the display becomes "**near zero**" or a negative value. Use: To weigh each object and accumulate the count and total mass value.
Sun 4	▫ When the weighing value is a positive stable value and not "**near zero**", the positive value is added to the accumulation value automatically. ▫ When the weighing value is a negative stable value and not "**near zero**", the negative value is subtracted from the accumulation value automatically. ▫ The next accumulation can be performed after the display becomes "**near zero**".

10. Comparator

- The comparator function can select a mode from "Five-level comparator mode", "Three-level comparator mode (Upper and lower limit mode)" and "Seven-level comparator mode (Ranking mode)".
- Each comparator mode compares the weighing value against the preset threshold values and outputs the results using LEDs (yellow, green and red).
- When the optional comparator relay output (HVW-04C) is installed into the scale, the comparison result can sound the buzzer synchronized to LEDs and output as relay signal.

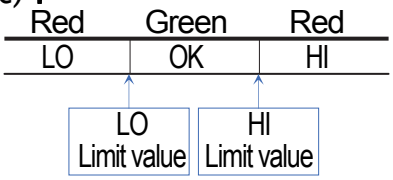
Five-Level Comparator Mode :

This mode compares the weighing value with four threshold values (limit values) and outputs results in five levels of LOLO, LO, OK, HI and HIHI.



Three-Level Comparator Mode (Upper and lower limit mode) :

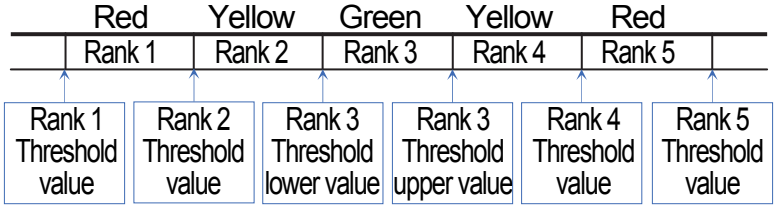
This mode compares the weighing value with two threshold values (upper and lower limit) and outputs results in three levels of LO, OK and HI.



Seven-Level Comparator Mode (Ranking Mode) :

This mode compares the weighing value with five threshold values and outputs results in seven ranks.

Out of range (Negative value),
Rank 1 (LOLO), Rank 2 (LO),
Rank 3 (OK), Rank 4 (HI),
Rank 5 (HIHI),
Out of range (Positive value)



- To use the comparator modes, item [CP-L] and [CP] of the function table must be specified and threshold values (limit values) of the comparator must be set in advance.
- Select a comparator mode at item [CP-L] of the function table.
  - 0 : Five-level comparator mode.
  - 1 : Three-level comparator mode (upper and lower limit mode).
  - 2 : Seven-level comparator mode (ranking mode).
- Select a comparator condition at item [CP] of the function table.
  - 0 : No comparison (comparator function not used).
  - 1 : All data is compared regardless of stability of value.
  - 2 : Stable data is compared (when stability mark lights).
  - 3 : All data is compared regardless of stability of value except "**near zero**".
  - 4 : Stable data is compared except "**near zero**".
  - 5 : All positive data is compared except "**near zero**".
  - 6 : Stable positive data is compared except "**near zero**".

Note

- "**near zero**" is within ±4 digits (four times the minimum weighing value that can be weighed) from zero point in the weighing "kg".

10.1.1. Setting a Mode and Method

Step 1 Turn off the scale using the [ON/OFF] key.

While pressing and holding the [TARE] key, press the [ON/OFF] key to enter the setting mode. Then the software version [P-xxx] is displayed.

Press the [MODE] key to enter the function table and class [bASFnc] is displayed.

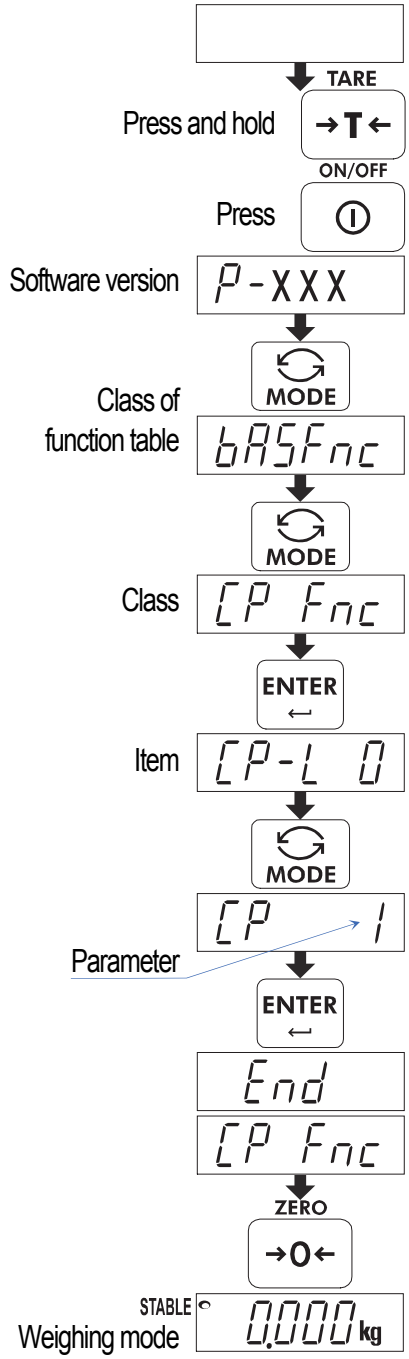
Step 2 Select class [CP Fnc] using the [MODE] key.
Press the [ENTER] key to store it.

Step 3 Item [CP-L] is displayed.
Input a parameter for the mode using the numerical keys.
Press the [MODE] key to proceed to next step.

Step 4 Item [CP] is displayed.
Input a parameter for the comparison method using the numerical keys.
Press the [ENTER] key to store it.
The scale returns to class level after the [End] is displayed

Step 5 When the [ZERO] key is pressed, the scale returns to the weighing mode.

Step 6 Proceed to "**10.1.3. Setting Threshold Values (of Limits and Ranks)**" to use the comparator mode.



10.1.2. Comparison and Formula

Judgment is performed using the formulas below. The result is displayed to the comparator indicator and output to option interface.

Five-Level Comparator Mode

Result	Comparison formula	LED	Relay output
LOLO	Displayed value < LOLO limit value or, Displayed value < Out of range (Negative value)	LOLO Red	LOLO
LO	Displayed value < LO limit value	LO Yellow	LO
OK	LO limit value ≤ Displayed value ≤ HI limit value	OK Green	OK
HI	HI limit value < Displayed value	HI Yellow	HI
HIHI	HIHI limit value < Displayed value or, Out of range (Positive value) < Displayed value	HIHI Red	HIHI

Three-Level Comparator Mode (Upper and lower limit mode)

Result	Comparison formula	LED	Relay output
LO	Displayed value < LO limit value or, Displayed value < Out of range (Negative value)	LOLO Red	LOLO
OK	LO limit value ≤ Displayed value ≤ HI limit value	OK Green	OK
HI	HI limit value < Displayed value or, Out of range (Positive value) < Displayed value	HIHI Red	HIHI

Caution The LO result is output to LOLO LED and LOLO option output.
The HI result is output to HIHI LED and HIHI option output.

Seven-Level Comparator Mode (Ranking Mode)

Result	Comparison formula	LED	Relay output
None	Displayed value < Limit Lower value of Rank 1 or, Displayed value < Out of range (Negative value)	No LED	-
Rank 1 (LOLO)	Displayed value < Limit Lower value of Rank 2	LOLO Red	LOLO
Rank 2 (LO)	Displayed value < Limit Lower value of Rank 3	LO Yellow	LO
Rank 3 (OK)	Limit Lower value of Rank 3 ≤ Displayed value ≤ Limit Upper value of Rank 3	OK Green	OK
Rank 4 (HI)	Limit Upper value of Rank 3 < Displayed value	HI Yellow	HI
Rank 5 (HIHI)	Limit Upper value of Rank 4 < Displayed value	HIHI Red	HIHI
None	Limit Upper value of Rank 5 < Displayed value or, Out of range (Positive value) < Displayed value	No LED	-

- Threshold values of limits and ranks are common to both the weighing and counting mode. These threshold values are maintained even if the power supply is off.
- Ignore the decimal point when setting threshold values of limits and ranks.
- Comparison is performed in order from the top row to the bottom of each table.
- These threshold values are not judged. Even if the threshold values are incorrect, no error will be output.

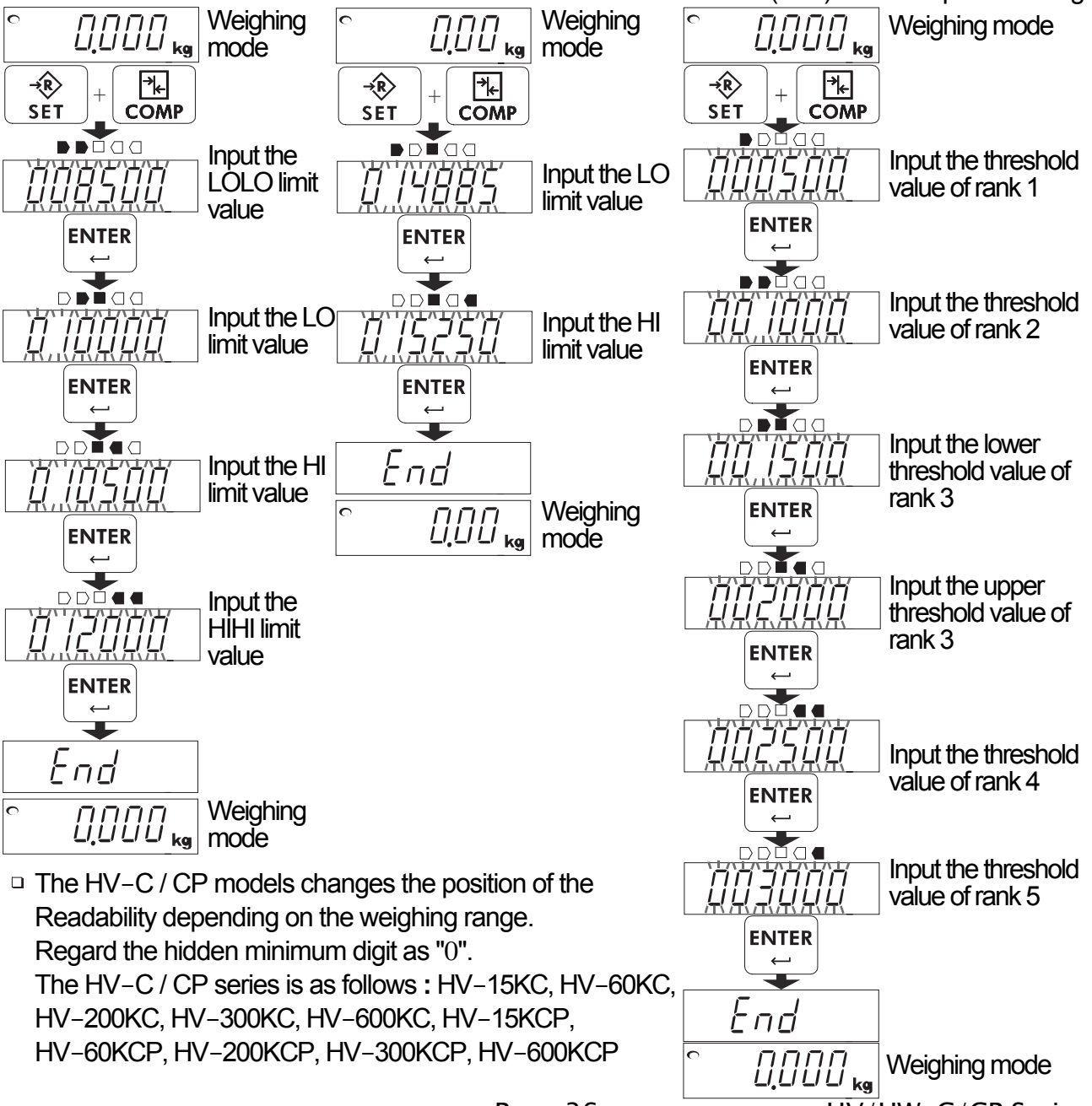
10.1.3. Setting Threshold Values (of Limits and Ranks)

Step 1 While pressing and holding the [SET] key, press the [COMP] key to enter the comparator value setting mode.

Step 2 Input a parameter for the comparison method using the numerical keys of [0] to [9], [ENTER] key to store and proceed, [C] key to cancel and [SET] key to alternate between +/−. However the [SET] key is dependent on models.

Step 3 When settings of threshold values (of limits and ranks) are finished, [End] is displayed. (At this time, power-on-zero is not performed.)

Five-Level Comparator Mode	Three-Level Comparator Mode (Upper and lower limit mode)	Seven-Level Comparator Mode (Ranking Mode)
Example: HW-60KC LOLO 8.500 kg LO 10.000 kg HI 10.500 kg HIHI 12.000 kg	Example: HV-200KC LO 148.85 kg HI 152.50 kg	Example: HV-15KC Rank 1 (LOLO) 0.500 kg or more Rank 2 (LO) 1.000 kg or more Rank 3 (OK) 1.500 kg to 2.000 kg Rank 4 (HI) up to 2.500 kg Rank 5 (HIHI) up to 3.000 kg



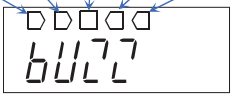
- The HV-C / CP models changes the position of the Readability depending on the weighing range. Regard the hidden minimum digit as "0". The HV-C / CP series is as follows : HV-15KC, HV-60KC, HV-200KC, HV-300KC, HV-600KC, HV-15KCP, HV-60KCP, HV-200KCP, HV-300KCP, HV-600KCP

10.1.4. Buzzer of Comparator Mode

Installing the optional HVW-04C on the scale allows the buzzer to sound in conjunction with LEDs according to the comparison result.
The buzzer can be set by using the [1], [2], [3], [4] and [5] numerical keys when bUZ7 of the function table is displayed.

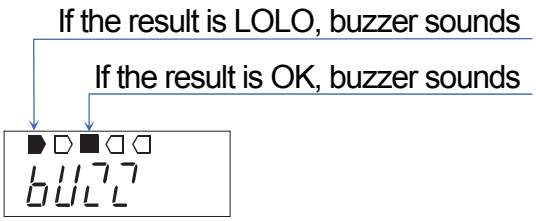
To set the buzzer to sound according to comparison result, select the corresponding numerical key to light up the LED (showing that the buzzer is on) or turn it off (showing that the buzzer is off).
Each LED can be toggled between on and off by pressing the corresponding key.

Corresponding numerical key	[1]	[2]	[3]	[4]	[5]
LED for the comparison result	LOLO	LO	OK	HI	HIHI

Image of display during setup 

Example **:**
When the result is LOLO or OK, the buzzer sounds.

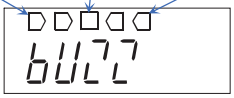
Step 1 Press the [1] key to light up the LED for LOLO.
Step 2 Press the [3] key to light up the LED for OK.
Step 3 Press the [ENTER] key to store the settings.



Caution

When the three-level comparator mode is used, [1] LOLO, [3] OK and [5] HIHI are used for buzzer settings. [2] HI and [4] LO are not used.

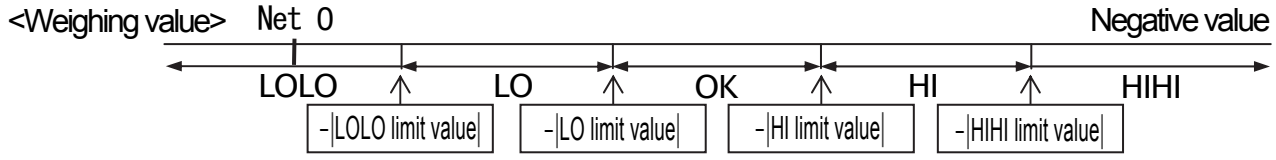
Corresponding numerical key	[1]	[2]	[3]	[4]	[5]
LED for the comparison result	LOLO	LO	OK	HI	HIHI

Image of display during setup 

11. Auto-Tare

The HV/HW-C/CP 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 samples and repeats this process for the next weighing.
Start with display zero value after tare operation. Place or take away objects until the comparison result shows OK. When the stable display is maintained for the duration specified in the function setting [At-t], the scale will automatically tare the weighing value, show zero value and be ready for next weighing.

- In some countries or areas, the auto-tare function cannot be used on the Legal for Trade models and the selection in the function settings [At], [At-t] and [At-F] is not available.
- To use the auto-tare function, set the function settings below.
  [CP 1] : Compare all weighing data (other settings may be used depending on the application).
  [At 1] : Auto-tare function enabled.
  [At-t 0] to [9] : Select the timing to tare automatically to avoid the wrong tare operation, Example **:** Too early to tare, so take longer time to go to the next weighing.
- Take-away check weighing [CP-P 1] (Example with [CP-L 0] setting)
  Take-away check weighing (negative comparison) is the way to compare a negative weighing value while taking away objects from a container.
  Set the function [CP-P 1] together with the auto-tare function enabled [At 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 take-away check weighing, be sure to use the [TARE] key to tare the weighing value of the container filled with objects. The [ZERO] key may zero value the display, but the scale goes below the zero point by taking away objects. Then, the auto-tare function or [TARE] key does not work.

- When the function "Tares the initial weighing value (of container) [At-F 1]" is selected **:**
  To start the auto-tare function, usually the container (filled with objects) will be placed on the weighing pan and its weighing value must be tared using the [TARE] key.
  When [At-F 1] is selected, the scale will tare the initial weighing value (of container) automatically. When the entire load on the weighing pan is removed, the scale will return to the zero point and the value of 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.
- If the scale is equipped with the optional USB interface (HVW-02CB) or optional RS-232C serial interface (HVW-03C), the OK weighing data can be output automatically. Set the function setting [Prt1] or [Prt2] to [7] or [8].

12. Built-in Printer of Type CP

- Specify the parameter of "**Built-in printer output mode** (PrtP)" in the function table to use the printer in advance.
- Specify the parameters of "**Setting the clock** (CL AdJ)" and "**Time and date adding** (StdP)" in the function table to print the date in advance.

Specification

Type	Line thermal dot type
Width of roll paper	58 mm
Accessories	Special roll paper (1 roll)
Characters	32 characters per line (when using double height and width size, 16 characters per line)

Consumables

Special roll paper	AX-PP147-S (set of 5 rolls)

Operation and Print Samples

- While pressing and holding the SET key, press the PRINT key. Paper feed is performed.
- The following example is when the print mode in the function settings is selected.
  Printing example for "**Built-in printer output mode** PrtP 1 - 8 ".

```
        1.181 kg
```
Weighing value

```
          590 PC
```
Count

Printing example for "**Prints the date and time** StdP 3 ".

```
2016/ 8/31
14:56:51
      1.180 kg
```
Date
Time
Weighing value

Printing example for "**Prints the ID** SidP 1 ". ID number = 000123

```
2016/ 8/31
14:56:51
000123
      1.180 kg
```
Date
Time
ID
Weighing value

Printing example where data is accumulated automatically and is printed out at the same time.

```
2016/ 8/31
14:56:51
000123
001     1.181 kg
002     1.180 kg
003     1.180 kg
```

This is used when "**Accumulation mode** Sum 4 " and "**Built-in printer output mode** PrtP 9 " are set.

- Accumulation mode Sum 4
- Built-in printer output mode PrtP 9
- Prints the date and time StdP 3

A sample weight is weighed, accumulated and printed.

* Date, time and ID are only printed at the first time.

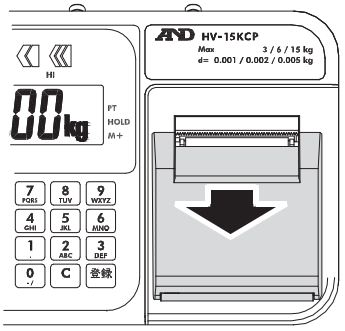
Printing example for accumulation result (accumulated data and count).

```
2016/ 8/31
14:56:51
000123
N          3
Total
        3.541 kg
```

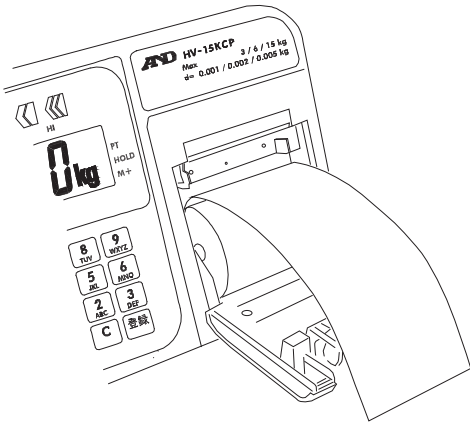
If the [PRINT] key is pressed while the accumulation result (accumulated data and count) is displayed, this result is printed.

12.1.1. Installing the Roll Paper

Step 1 Pull the printer cover toward you to open it.

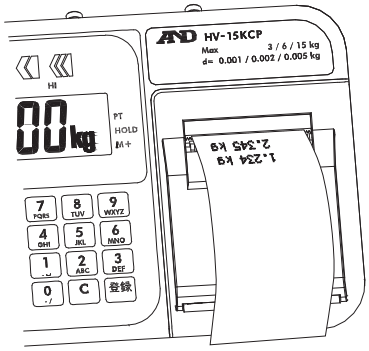


Step 2 Install the roll paper so that the end of the paper is at the top.



Step 3 Close the printer cover.

Step 4 When the roll paper is installed successfully, the built-in printer automatically feeds out the paper.



Caution

Do not pull the roll paper after printing. It may cause printing errors next time.

13. ID Number and GLP

The ID number is used to identify the scale when Good Manufacturing Practice (GMP) or Good Laboratory Practice (GLP) is used. The following GMP data is output to the built-in printer (HV-CP/HW-CP series) or a personal computer using the RS-232C interface.

- Results of calibration ("Calibration report")
- Results of calibration test ("Calibration test report")
- "Start block" and "End block" for GLP data

13.1. Setting the ID Number

Step 1 With the power turned off, while pressing and holding the [TARE] key, press the [ON/OFF] key to turn the power on and enter the function setting mode. [bASFnc] appears.

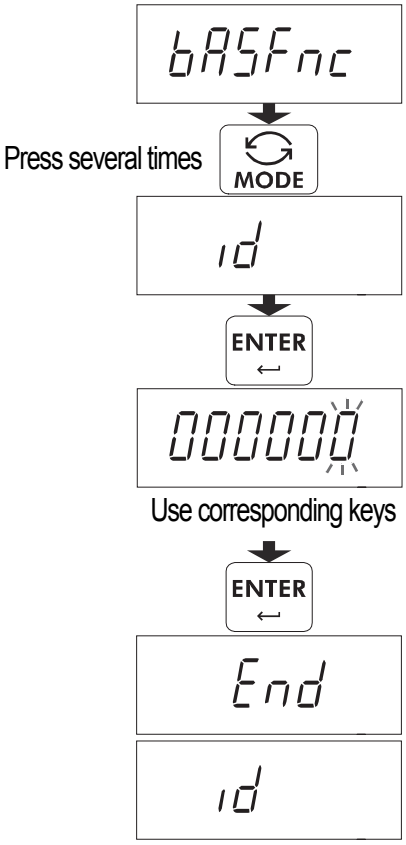
Step 2 Press the [MODE] key several times to display [id].

Step 3 Press the [ENTER] key.
Enter the ID number using the following keys.

[M+] key	The blinking digit is moved to the left.
[PRINT] key	The blinking digit is moved to the right.
Numerical keys	A value can be input at the blinking digit. Refer to the table below for the "**13.1.1. Display Character Table**".

Step 4 Press the [ENTER] key to store the settings. [id] appears after [End].

Step 5 Press the [ON/OFF] key to turn the display off or press the [ZERO] key.



13.1.1. Display Character Table

0	1	2	3	4	5	6	7	8	9	-	␣	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
0	1	2	3	4	5	6	7	8	9	-	_	A	b	C	d	E	F	G	H	ı	J	K	L	n	n	o	P	q	r	S	t	U	v	W	X	y	Z

␣ : Space, ASCII 20h

13.2. Setting the Clock

The clock can only be set for built-in printer models (Type CP).

Step 1 Turn off the display.
While pressing and holding the [TARE] key, press the [ON/OFF] key to turn the display on and enter function setting mode. [bASFnc] appears.

Step 2 Press the [MODE] key several times to display [CL AdJ].

Step 3 Press the [ENTER] key to enter date confirmation mode.
To set the time without changing the date, press the [MODE] key.

– Date setting mode –

Step 4 Press the [ENTER] key to enter date setting mode.
Set the date using the following keys.

[M+] key	The blinking digit is moved to the left
[PRINT] key	The blinking digit is moved to the right
Numerical keys	A value can be input at the blinking digit
[ZERO] key	To cancel settings and proceed to step 5.

Step 5 Press the [ENTER] key after finishing setting. A setting value is registered, and the scale proceeds to time confirmation mode after displaying [End].
To return to date confirmation mode, press the [MODE] key.

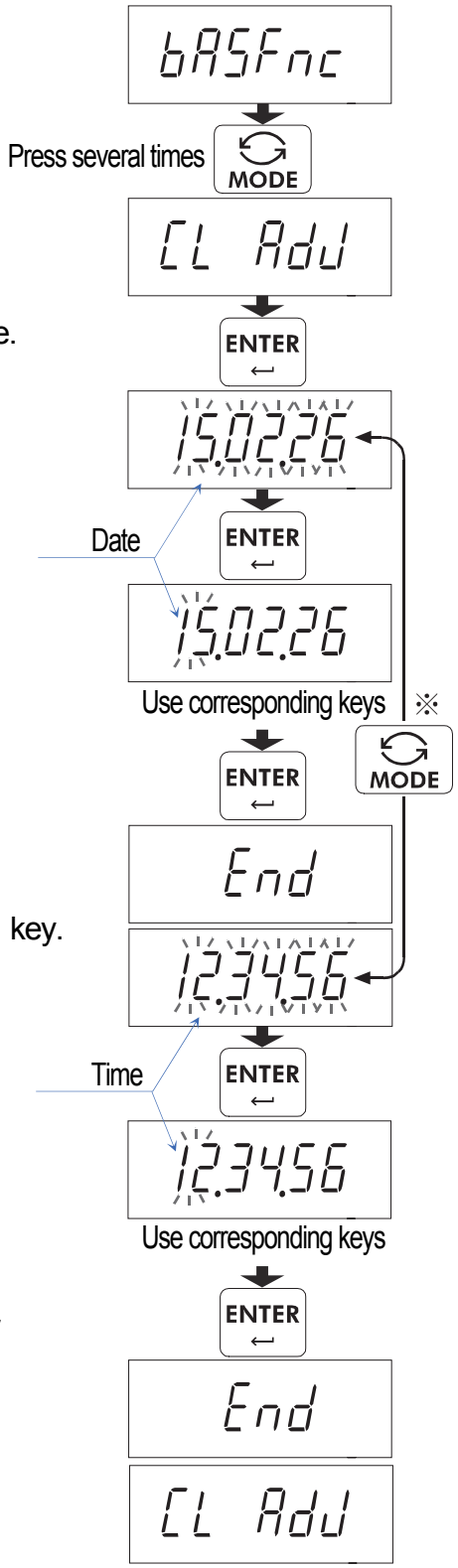
–Time setting mode –

Step 6 Press the [ENTER] key to enter time setting mode.
Set time using the following keys.

[M+] key	The blinking digit is moved to the left
[PRINT] key	The blinking digit is moved to the right
Numerical keys	A value can be input at the blinking digit
[ZERO] key	To cancel settings and proceed to step 7.

Step 7 Press the [ENTER] key after finishing setting to register the set value. The scale displays [CL AdJ] after displaying [End].

Step 8 Press the [ON/OFF] key to turn the display off or press the [ZERO] key.



13.3. GMP Report

- If the GMP report is printed to an AD-8121B printer or AD-8127 printer, use "**Format of AD-8121B or AD-8127**, [inF 1 1] or [inF2 1]" in the function table.
  Use "**MODE 3**" for the AD-8121B. Use "**DUMP print mode**" for the AD-8127.
  - If the GMP report is output to a personal computer, use "the general format, [inF 1 2] or [inF2 2]" in the function table.

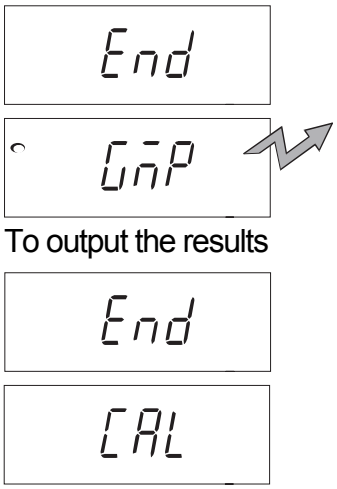
Calibration report

Step 1 Perform calibration according to "**14.2. Complete Calibration Procedure**"

Step 2 [End] appears when calibration is complete.

Step 3 [GAP] appears and the calibration report is output.

Step 4 [CAL] appears again.
Remove the weight.
Press the [ON/OFF] key to turn the display off or press the [CAL] switch.



AD-8127 format [inF 1 1]

```
                A & D
MODEL       HV-15KC
S/N      6A6123456
ID            ABCDEF
DATE    2014/04/01
TIME      16:47:39
CALIBRATED(EXT.)
CAL.WEIGHT
         +15.000 kg
SIGNATURE
```

Manufacture
Model
Serial number
ID number
Date
Time
Calibration executed
Calibration weight
Column for signature

General format [inF 1 2]

```
␣␣␣␣␣␣␣␣␣␣␣A␣&␣
D<CR LF>
MODEL␣␣␣␣␣
HV-15KC<CR LF>
S/N␣␣␣␣␣
6A6123456<CR LF>
ID␣␣␣␣␣␣␣␣␣
ABCDEF<CR LF>
DATE<CR LF>
<CR LF>
TIME<CR LF>
<CR LF>
CALIBRATED(EXT.)<CR LF>
CAL.WEIGHT<CR LF>
␣␣␣␣␣␣␣+15.000␣
kg<CR LF>
SIGNATURE<CR LF>
```

␣ : Space, ASCII 20h
CR : Carriage return, ASCII 0Dh
LF : Line feed, ASCII 0Ah

Calibration test report

The calibration test mode is used to compare a calibration weight with the calibration test data weighed by the scale.

Note

- This test does not perform calibration.

Step 1 In the weighing mode, press and hold the [CAL] switch until [CC] appears, and then release the switch.

- The calibration test mode is not available when the function setting [inF1 0], [inF2 0] or [inFP 0] is selected.

Step 2 Press the [ENTER] key to display [CC 0].

Step 3 If necessary, change the value of the calibration weight as described in "**14.2.4. Span Calibration**" .

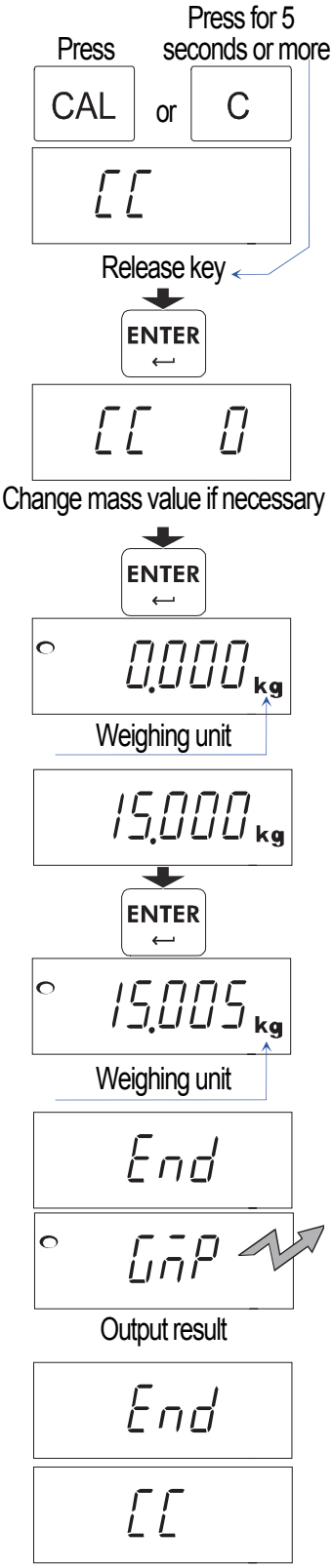
Step 4 With nothing on the weighing pan, press the [ENTER] key. The zero point is measured and the measured value with the unit "kg" is displayed for a few seconds. Then, the value of the calibration weight is displayed.

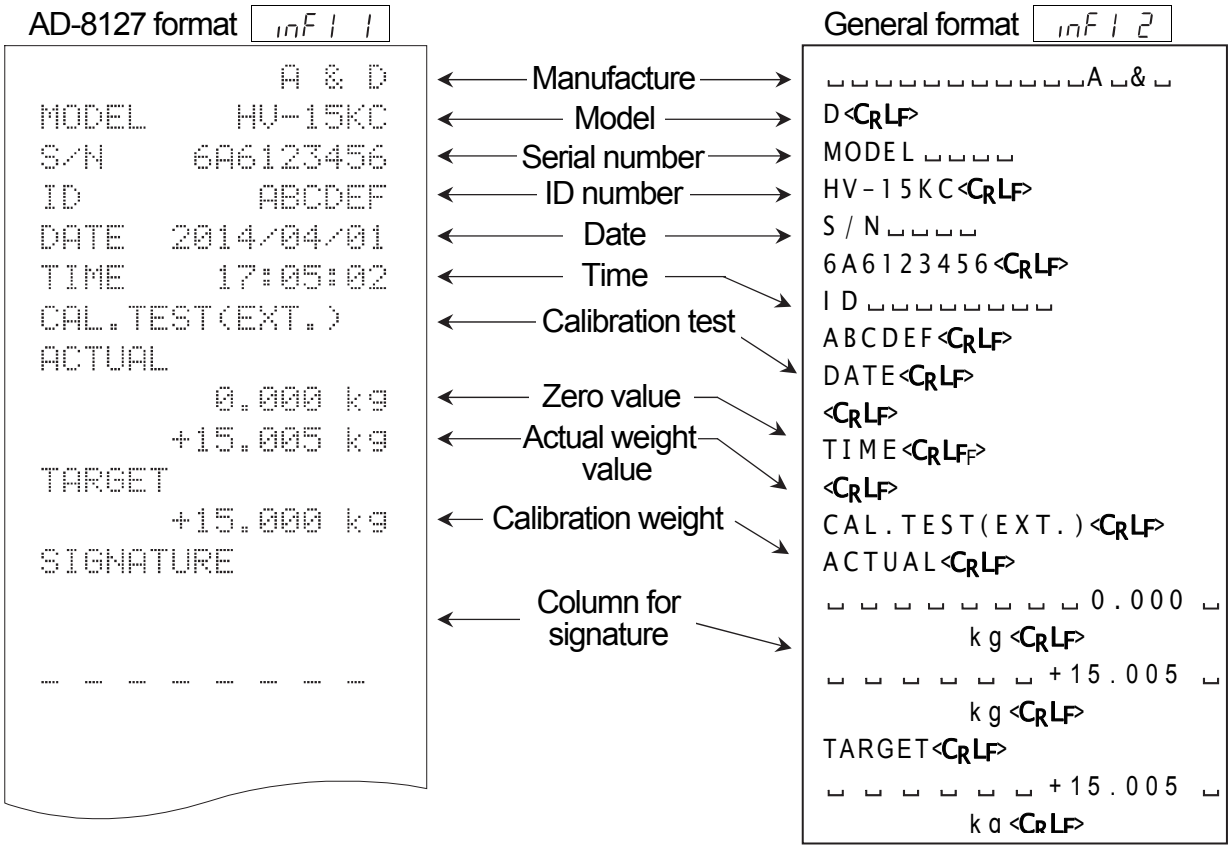
Step 5 Place a weight of the same value as displayed on the weighing pan and press the [ENTER] key to measure it. The measured value with the unit "kg" is displayed for a few seconds.

Step 6 [End] appears.

Step 7 [GnP] appears and the calibration test report is output.

Step 8 [CC] appears again. Remove the weight. Press the [ON/OFF] key to turn the display off or press the [CAL] switch.

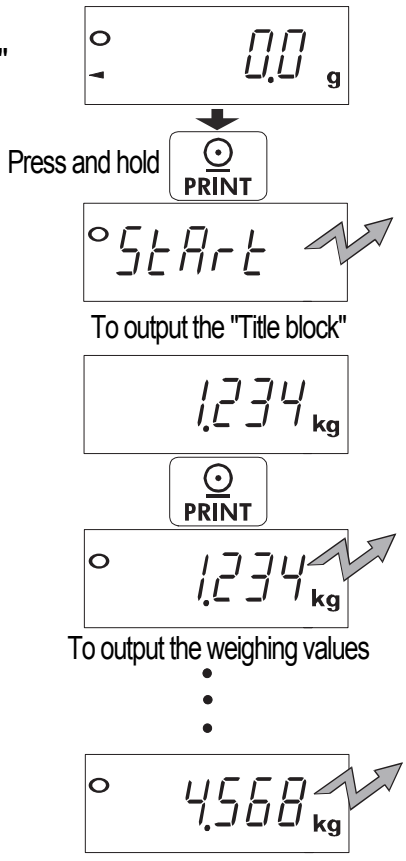




␣ : Space, ASCII 20h
CR : Carriage return, ASCII 0Dh
LF : Line feed, ASCII 0Ah

Output of "Title block" and "End block"

When weighing values are recorded as the GMP report, "**Title block**" and "**End block**" are added at the beginning and at the end of a group of weighing data.



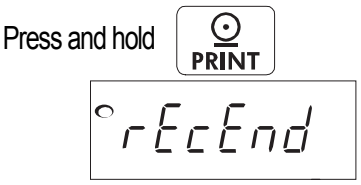
Title block

Step 1 In the weighing mode, press and hold the PRINT key until StArt appears, and release then the key. The scale outputs the "Title block."
The scale automatically returns to the weighing mode.

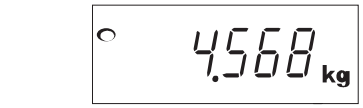
Step 2 Press the PRINT key or select the auto-print mode to output the weighing values.

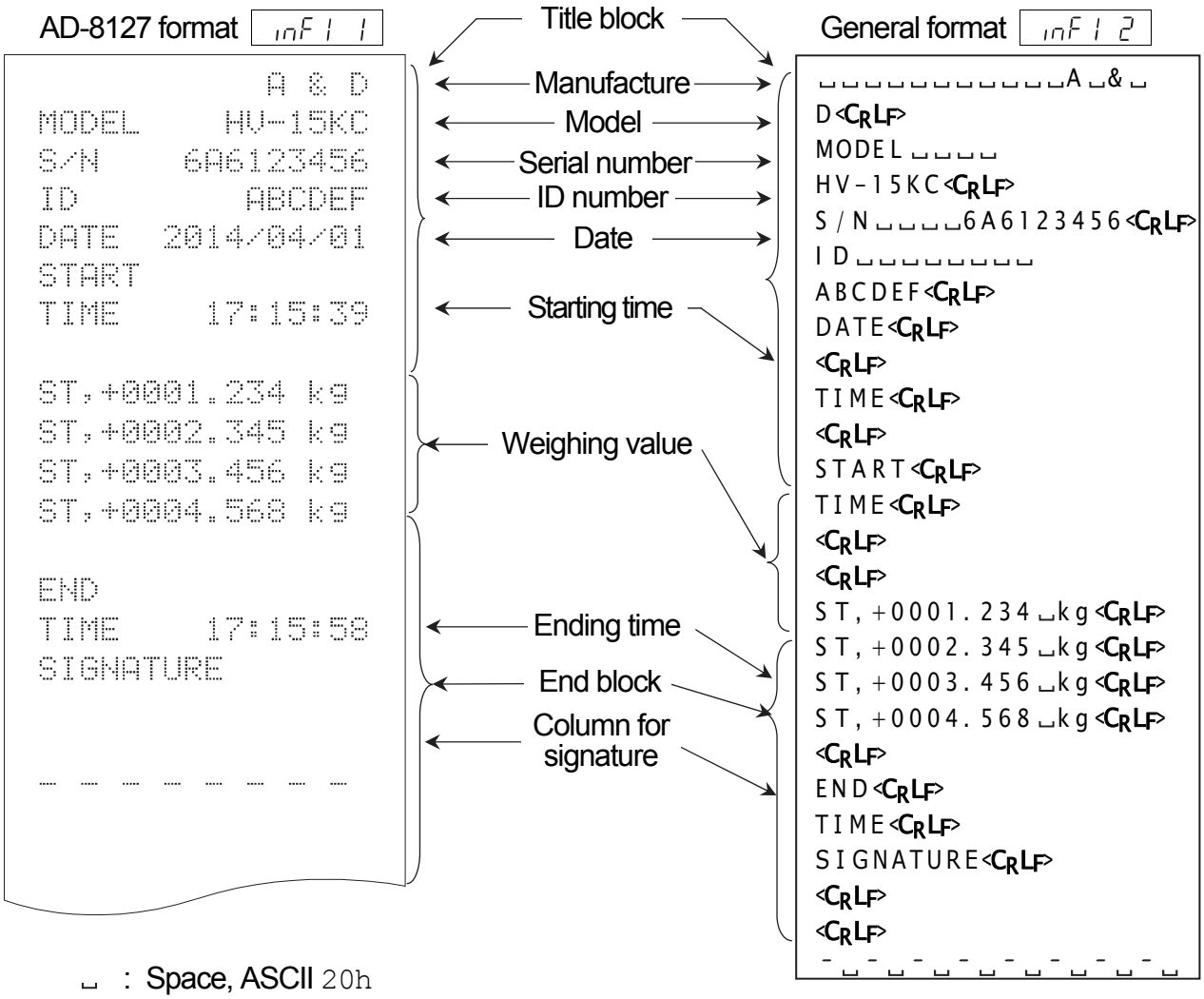
End block

Step 3 Press and hold the [PRINT] key until [rEcEnd] appears, and release then the key.
The scale outputs the "End block."



Step 4 The scale automatically returns to the weighing mode.





␣ : Space, ASCII 20h
CR : Carriage return, ASCII 0Dh
LF : Line feed, ASCII 0Ah

14. Calibration (Adjusting the Scale)

- The scale is an instrument that 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

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.

Comment Refer to the "14.1. Gravity Acceleration Table" on the next page.

Calibration of the Zero Point

Function to adjust the zero point, so that the zero point mark is displayed when there is nothing on the weighing pan.

Comment The zero point is the reference point for weighing and influences the performance of scale.

Span Calibration

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

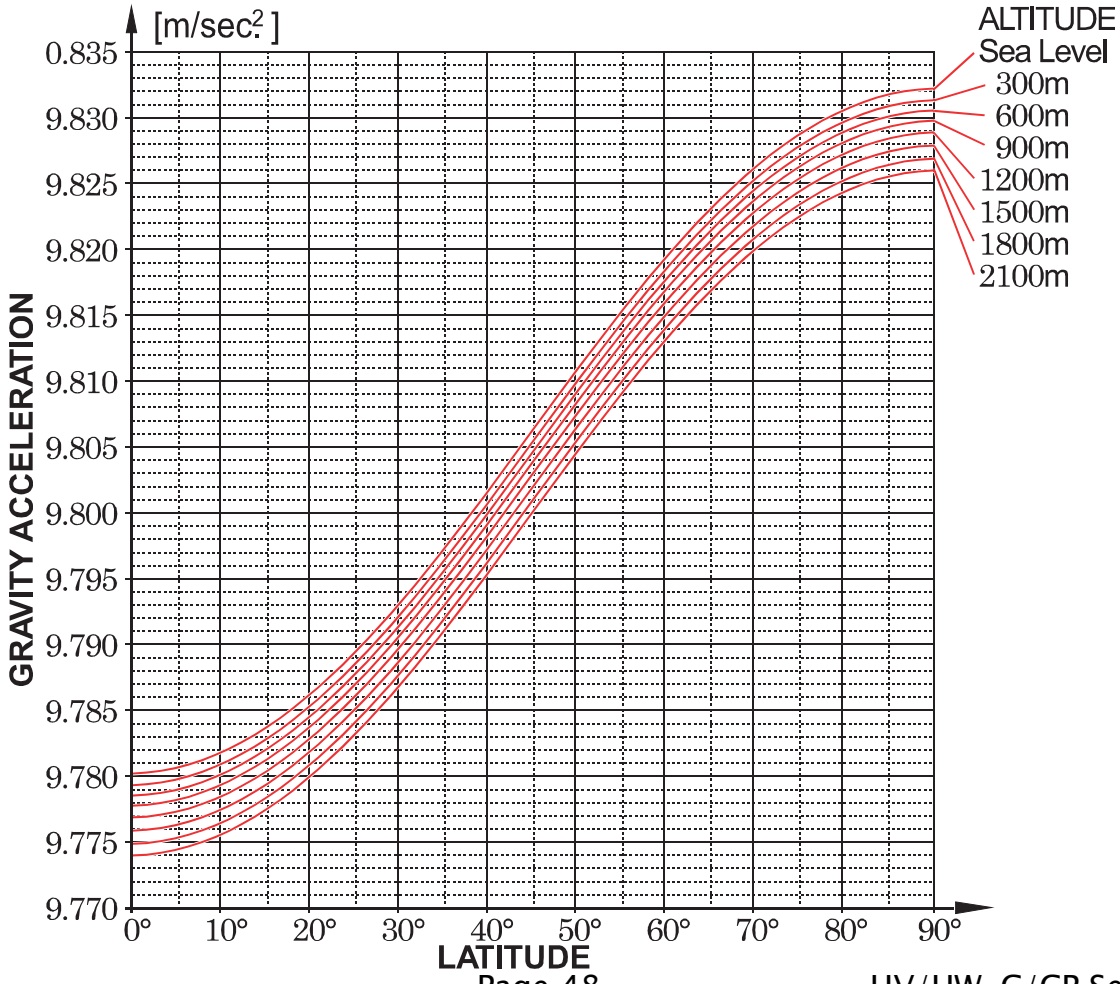
Comment Span means the range of weighing capacity. Use a calibration mass heavier than two thirds of the weighing capacity.

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.**

14.1. 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



14.2. Complete Calibration Procedure

14.2.1. Gravity Acceleration Correction

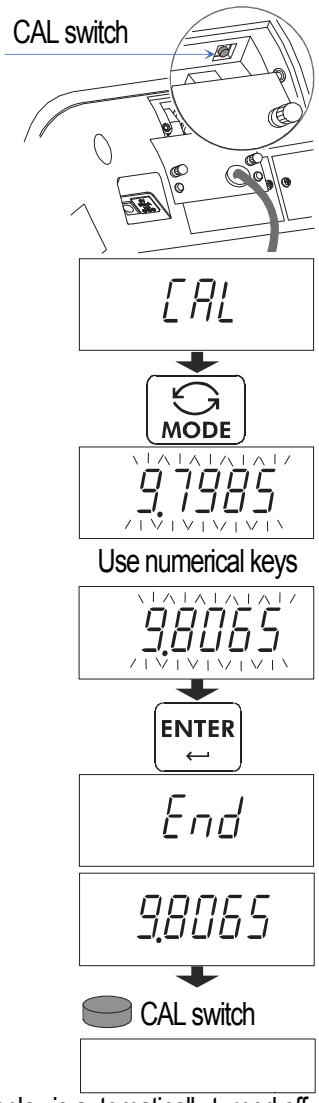
Step 1 Turn on the display.
Open the rear cover of the display unit. Locate the [CAL] switch inside.
Press the [CAL] switch to enter calibration mode.
Then [CAL 0] is displayed.

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

Step 3 Set your local gravity acceleration using the numerical keys.

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

Step 5 Press the [CAL] switch again to finish gravity acceleration correction.



The display is automatically turned off.

14.2.2. Preparation

Step 1 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 "**3.1. Installing the Scale**".

Step 2 Keep the display turned on for at least 30 minutes to warm up the scale.

14.2.3. Calibration of the Zero Point

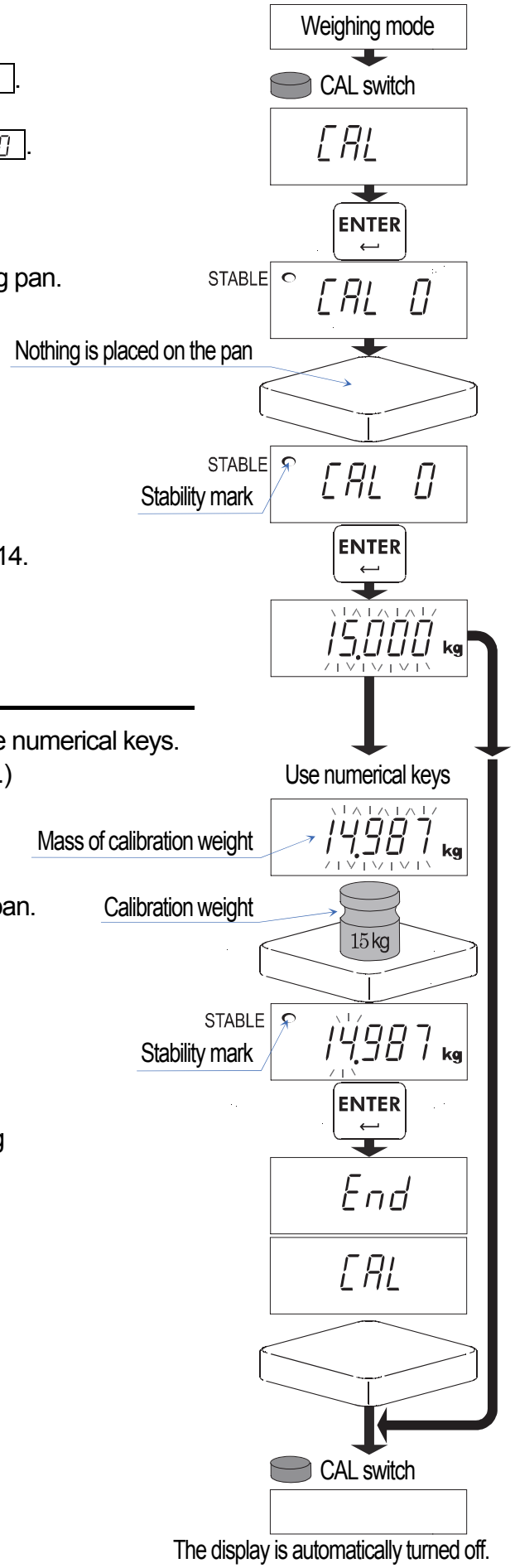
Step 3 After 30-minute warm up,
press the [CAL] switch to display [CAL].

Press the [ENTER] key to display [CAL 0].

Step 4 Confirm that nothing is placed on the weighing pan.
Wait for the stability mark to be displayed.
Press the [ENTER] key to store
the current condition as the zero point.

Note **The shape of base unit differs depending on model.**

Step 5 Calibration of the zero point is finished.
To exit the calibration mode, proceed to step 14.



14.2.4. Span Calibration

Step 6 Set the value of the calibration mass using the numerical keys.
(The initial value depends on the scale model.)

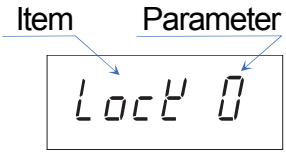
Step 7 Place the calibration weight on the weighing pan.
Wait for the stability mark to be displayed.
Press the [ENTER] key to calculate the span
and store it.

Step 8 The scale displays [CAL] after displaying
[End] to finish setting.
Remove the mass from the weighing pan.

Step 9 Press the [CAL] switch to finish calibration.
The display is automatically turned off.

15. 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 AC adapter or batteries are removed or the display is turned off (standby mode).



15.1. Parameter Setting Procedure

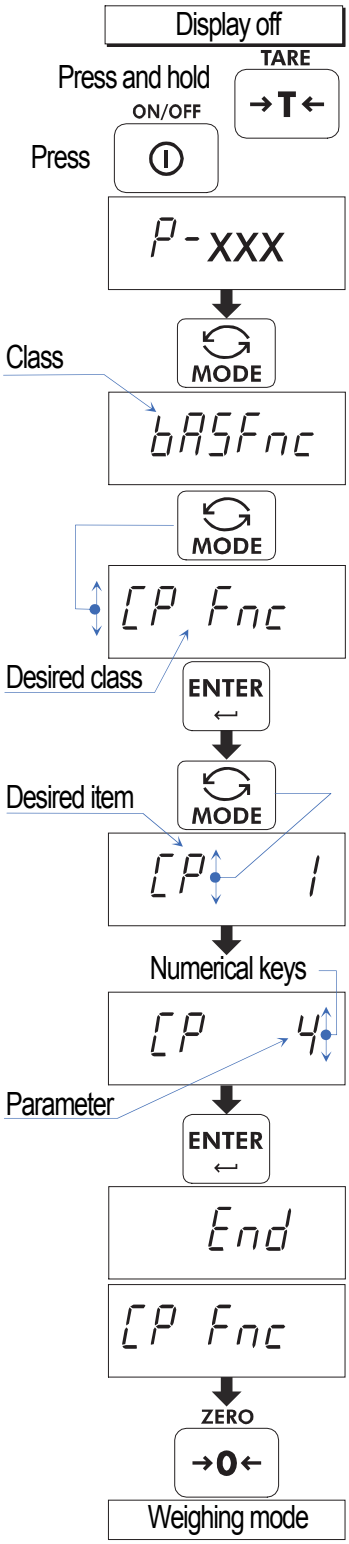
Step 1 Turn off the display.
While pressing and holding the [TARE] key, press the [ON/OFF] key to display software version [P-xxx].
Press the [MODE] key to enter function setting mode.
First class [bASFnc] is displayed.

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 input a value using numerical keys.

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 the weighing mode.



15.2. Parameter List

For the HV-C/CP series NTEP/Measurement Canada version, the shaded items in the below table cannot be changed by the user, so these items are not displayed.

Class	Items	Parameter	Details and usage	
bASFnc	Key lock LocK	0 ■	All the keys function.	
		1	The [ON/OFF], [ZERO], [TARE], [HOLD], [M+] and [PRINT] keys function.	
		2	The [ON/OFF], [ZERO] and [TARE] keys function.	
	Automatic power off PoFF	0 ■	OFF	When a stable weighing value is displayed and no operation is made, the scale is automatically turned off after time of the parameter has past.
		1	After 5 minutes	
		2	After 10 minutes	
		3	After 15 minutes	
		4	After 30 minutes	
		5	After 60 minutes	
	Automatic power on P-on	0 ■	OFF	
		1	ON * The scale automatically turns the power on by connecting to the power using the AC adapter.	
	Zero tracking trc	0	OFF	
		1 ■	ON	
	Stability band width St-b	0 ■	±0.5 digit	Condition for lighting stability mark : Factory settings for stability mark is "within ±0.5 digits" and "within 1.0 second".
		1	±1 digit	
		2	±2 digits	
	Stability band time St-t	0	0.5 seconds	
		1 ■	1.0 second	
		2	1.5 seconds	
	Weighing stabilization level Cond	0	Fast response / sensitive to vibration ↕ Slow response / stable weighing	Weighing at good environment ↕ For stable weighing
		1		
		2 ■		
		3		
		4		
	Back light control L-it	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	
	Back light brightness L-i	0	Dark ↕ Bright	
		1		
		2 ■		
		3		
		4		
	Decimal point Pnt	0 ■	Dot(.)	
		1	Comma(,)	
	Automatic tare At	0 ■	OFF	
		1	ON	

■ : Factory settings

- **"near zero"** is within ±4 digits (four times the minimum weighing value that can be weighed) from zero point in the weighing unit "kg".
- **"digit"** is equivalent to minimum weighing value in the unit "kg".

Class	Items	Parameter	Details and usage
bASFnc	Interval until making automatic tare AT-t	0	0 second
		1	0.5 seconds
		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 AT-F	0 ■	OFF
		1	ON
	Accumulation mode Sum	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**"
		4	Accumulates automatically when the value is + or −, excluding "**near zero**"
	Hold condition HoLd	0 ■	OFF
		1	Holds or releases by the [HOLD] key during stabilization
		2	Automatically holds when detecting stabilization
	Buzzer buZZ	0 ■	Does not sound (All LEDs are turned off.)
			Method for lighting LED * When lighting up the LED registered to be lit, the buzzer sounds. Set it using the numerical keys. On/off can be switched alternately. Refer to "**10.1.4. Buzzer of Comparator Mode**". Setting key: 1 / 2 / 3 / 4 / 5 Result LED: LOLO / LO / OK / HI / HIHI
	External contact input 1 Con1	0 ■	None
		1	[ON/OFF]
		2	[ZERO]
		3	[TARE]
		4	[MODE]
		5	[PRINT]
		6	[M+]
		7	[HOLD]
	External contact input 2 Con2	0 ■	None
		1	[ZERO]
		2	[TARE]
		3	[MODE]
		4	[PRINT]
		5	[M+]
		6	[HOLD]

■ : Factory settings

- "**near zero**" is within ±4 digits (four times the minimum weighing value that can be weighed) from zero point in the weighing unit "kg".
- "**digit**" is equivalent to minimum weighing value in the unit "kg".

Class	Items	Parameter	Details and usage	
CP Fnc	Comparator mode CP-L	0 ■	Five-level comparator mode	
		1	Three-level comparator mode (upper and lower limit mode)	
		2	Seven-level comparator mode (ranking mode)	
	Comparator judgment condition CP	0	No comparison	
		1 ■	All data is compared.	
		2	Stable data is compared.	
		3	All data is compared except "**near zero**".	
		4	Stable data is compared except "**near zero**".	
		5	All positive data is compared except "**near zero**".	
		6	Stable positive data is compared except "**near zero**".	
	Comparator brightness CP-1	0	Dark	
		1		
		2 ■		
		3		
		4	Bright	
	Comparator reversal CP-P *	0 ■	Off	
		1	On	
	Status of LED when turning on display CP-d	0 ■	All LEDs are lit.	(Comparator relays are "Contact".)
		1	All LEDs are off.	(Comparator relays are "No contact".)
SIF	Baud rate 1 bPS1 (OP-ch1)	0 ■	2400 bps	
		1	4800 bps	
		2	9600 bps	
	Bit length, parity 1 btP1 (OP-ch1)	0 ■	7 bit / even	
		1	7 bit / odd	
		2	8 bit / non	
	Communication format 1 SIF1 (OP-ch1)	0 ■	Format 1	
		1	Format 1, existing returned value	
		2	UFC	
	Baud rate 2 bPS2 (OP-ch2)	0 ■	2400	
		1	4800	
		2	9600	
	Bit length, parity 2 btP2 (OP-ch2)	0 ■	7 bit / even	
		1	7 bit / odd	
		2	8 bit / non	
	Communication format 2 SIF2 (OP-ch2)	0 ■	Format 1	
		1	Format 1, existing returned value	
		2	UFC	
	Built-in printer communication format SIFP	0 ■	Format 1	
		1	UFC	
	Tare data output during tare SIFt *	0 ■	Not output	Refer to the item "Example of tare function" in "**Data format**" of "**16.5. Communication Format**".
		1	Tare data is output	

■ : Factory settings

- "**near zero**" is within ±4 digits (four times the minimum weighing value that can be weighed) from zero point in the weighing unit "kg".
- "**digit**" is equivalent to minimum weighing value in the unit "kg".

* This item is only displayed on models compatible with this function, is not displayed on other models.

Class	Items	Parameter	Details and usage	
dout	Output mode 1 (OP-ch1) PrtI	0	Stream mode (commands)	
		1	Output by command from OP-ch1 or OP-ch2.	* Commands to be output are as follows : Q, A, N
		2	Output by command from OP-ch1.	
		3	Output by command from OP-ch2.	
		4 ■	Command is output by the PRINT key.	
		5	Output data at auto-print setting, +5 digits or more and stable (commands)	
		6	Output data at auto-print setting, +5 digits or more, or -5 digits or less and stable (commands)	
		7	Output data at auto-print setting, +5 digits or more and stable when the comparator is OK (commands)	
		8	Output data at auto-print setting, +5 digits or more, or -5 digits or less and stable when the comparator is OK (commands)	
		9	Print an accumulation value when the accumulation operation is made (commands)	
	Time and date adding (OP-ch1) StdI	0 ■	Do not output the date and time	
		1	Output time (ESC T) *2	Parameter available when connecting AD-8121B or AD-8127.
		2	Output date (ESC D) *2	
		3	Output date and time (ESC D, ESC T) *2	
		4	Output time (RTC) *1	Parameter available when built-in printer is used.
		5	Output date (RTC) *1	
		6	Output date and time (RTC) *1	
	ID number adding (OP-ch1) SidI	0 ■	Do not output the ID number.	
		1	Output the ID number.	
	GMP output (OP-ch1) inFI	0 ■	Do not output	
		1	Output (ESC D, ESC T output) *2	Format of AD-8121B or AD-8127
		2	Output (DATE, TIME output)	General format
		3	Output (RTC output) *1	

■ : Factory settings

*1 RTC **:** Built-in clock. Parameter available for type CP.

*2 ESC D, SEC T **:**
The time and date uses the calendar function of the AD-8121B and AD-8127.
Use the "**dump print mode**" of the AD-8121B and AD-8127.

- "**digit**" is equivalent to minimum weighing value in the unit "kg".

Class	Items	Parameter	Details and usage	
dout	Output mode 2 (OP-ch2) PrE2	0	Stream mode (commands)	
		1	Output by command from OP-ch1 or OP-ch2.	* Commands to be output are as follows : Q, A, N
		2	Output by command from OP-ch1.	
		3	Output by command from OP-ch2.	
		4 ■	Command is output by the PRINT key.	
		5	Output data at auto-print setting, +5 digits or more and stabilization (commands)	
		6	Output data at auto-print setting, +5 digits or more, or -5 digits or less and stable (commands)	
		7	Output data at auto-print setting, +5 digits or more and stable when the comparator is OK (commands)	
		8	Output data at auto-print setting, +5 digits or more, or -5 digits or less and stable when the comparator is OK (commands)	
		9	Print an accumulation value when the accumulation operation is made (commands)	
	Time and date adding (OP-ch2) StD2	0 ■	Do not output the date and time	
		1	Output time (ESC T) *2	Parameter available when connecting AD-8121B or AD-8127.
		2	Output date (ESC D) *2	
		3	Output date and time (ESC D,ESC T) *2	
		4	Output time (RTC) *1	Parameter available when built-in printer is used.
		5	Output date (RTC) *1	
		6	Output date and time (RTC) *1	
	ID number adding (OP-ch2) S id2	0 ■	Do not output the ID number.	
		1	Outputs the ID number.	
	GMP output (OP-ch2) inF2	0 ■	Do not output	
		1	Output (ESC D, ESC T output) *2	Format of AD-8121B or AD-8127
		2	Output (DATE,TIME output)	General format
		3	Output (RTC output) *1	

■ : Factory settings

*1 RTC **:** Built-in clock. Parameter available for type CP.

*2 ESC D, SEC T **:**
The time and date uses the calendar function of the AD-8121B and AD-8127.
Use the "**dump print mode**" of the AD-8121B and AD-8127.

- "**digit**" is equivalent to minimum weighing value in the unit "kg".

Class	Items	Parameter	Details and usage	
dout	Built-in printer output mode PrtP	0	Do not print	
		1	Output by command from OP-ch1 or OP-ch2.	* Commands to be output are as follows : Q, A, N
		2	Output by command from OP-ch1.	
		3	Output by command from OP-ch2.	
		4 ■	Print data by the PRINT key.	
		5	Output data at auto-print setting, +5 digits or more and stable.	
		6	Print data at auto-print setting, +5 digits or more, or -5 digits or less and stable.	
		7	Print data at auto-print setting, +5 digits or more and stable when the comparator is OK.	
		8	Print data at auto-print setting, +5 digits or more, or -5 digits or less and stable when the comparator is OK.	
		9	Print an accumulation value when the accumulation function is used.	
	Time and date adding StdP	0 ■	Do not output the date and time	
		1	Output time (RTC)	Parameter available for built-in printer of type CP.
		2	Output date (RTC)	
		3	Output date and time (RTC)	
	ID number adding SidP	0 ■	Do not output the ID number.	
		1	Output the ID number.	
	GMP output inFP	0 ■	Do not print	
		1	Print (RTC output)	
	Double height and width size dScP	0 ■	Standard	
		1	Double height and width size	
	Built-in printer label mode LAbL	0 ■	Thermal paper	
		1	(Not used)	
	Line feed of printer PrLF	0	0 line	
		1	1 line	
		2 ■	2 lines	
		3	3 lines	
		4	4 lines	
		5	5 lines	
		6	6 lines	
		7	7 lines	
		8	8 lines	
		9	9 lines	

■ : Factory settings

RTC **:** Built-in clock. Parameter available for type CP.

- **"digit"** is equivalent to minimum weighing value in the unit "kg".

15.3. Initializing Parameters of the Function Table

The following procedure can reset to the factory settings parameters stored in the function table.

* Parameters of the comparator are reset as well.

Step 1 Turn off the display using the [ON/OFF] key.

Step 2 While pressing and holding the [TARE] key,
press the [ON/OFF] key to display [CLrFnA].

Step 3 Press the [SET] key to display [CLrFCA].

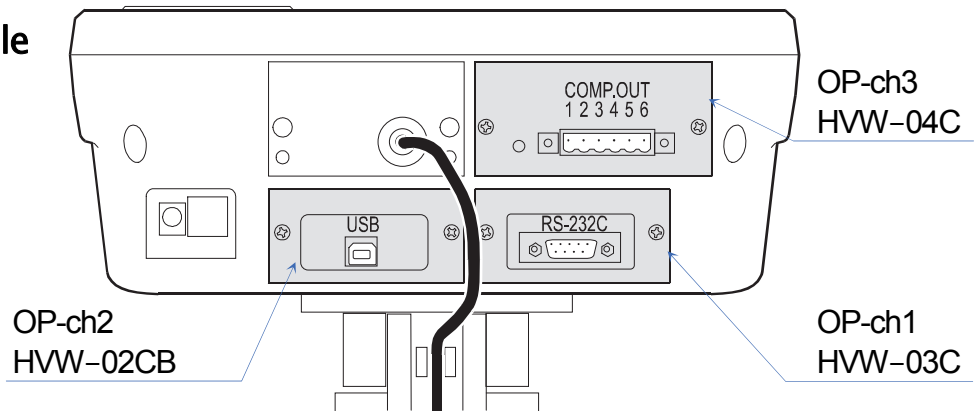
Step 4 When [CLrFCA] is displayed,
press the [ENTER] key to initialize parameters to the factory settings.
The scale displays [End] and enters weighing mode.

16. Options

The scale is equipped with OP-ch1 and OP-ch2 for communication options, and OP-ch3 only for comparator relay output. Those options can be combined freely. Combinations such as HVW-02BC x 2, HVW-02CB + HVW-03C or HVW-03C x 2 are possible.
Only an HVW-04C can be installed to the slot for OP-ch3.

Installation example

OP-ch1: HVW-03C
OP-ch2: HVW-02CB
OP-ch3: HVW-04C

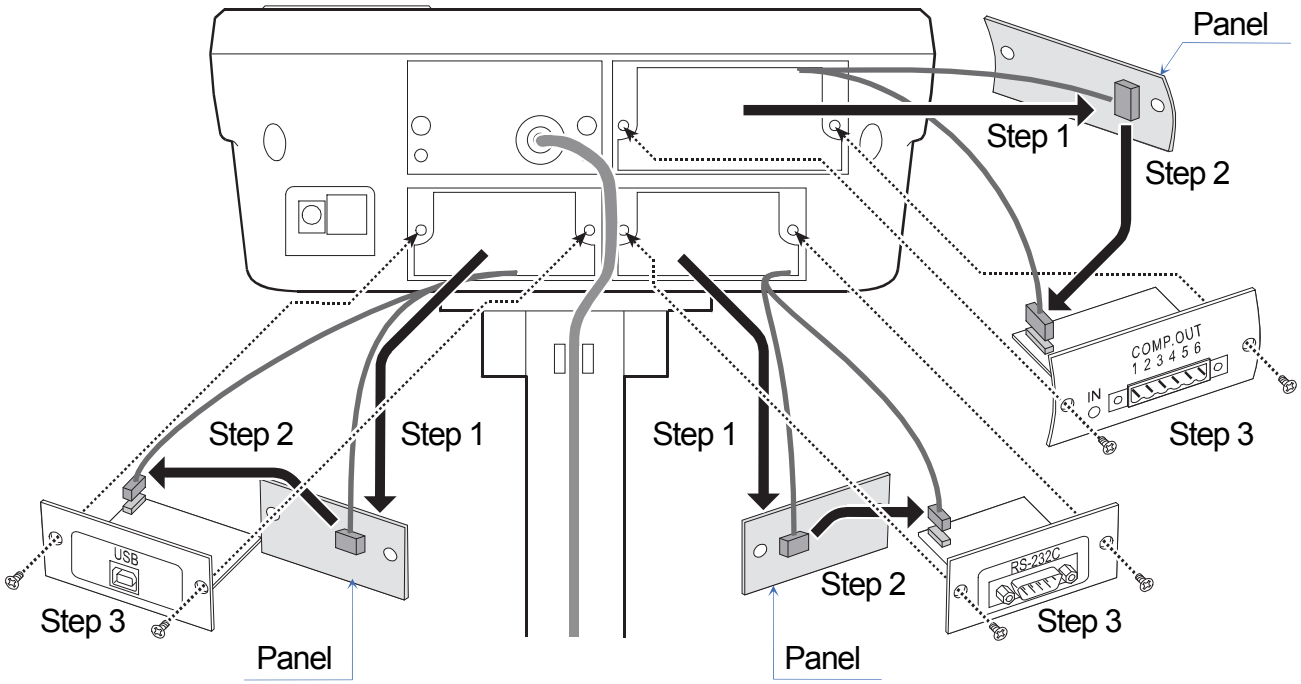


16.1. Installing Options

Step 1 Remove the two M3 screws at both side on the panel, and then remove the panel from the display unit.

Step 2 Connect the cable located inside the display unit to the connector on the option panel.

Step 3 Firmly secure the option to the display unit using the two M3 screws.



16.2. HVW-02CB, USB Interface

- The HVW-02CB enables duplex communication using a USB interface.
  The connector is type B.
  To connect the HVW-02CB to a computer, a commercially "type A male - type B female" cable can be used.
  To communicate between the scale and a computer using the USB interface, it is necessary to install the specified driver software to a computer. Download the driver software from the A&D website.
  The HVW-02CB can only be connected with a computer.
  Do not use a USB terminal as power supply terminal. Do not connect a device other than a computer to the USB terminal. Dosing so may cause failure and malfunctions.

16.2.1. Procedure for Using the USB Interface

Prepare the computer as shown below.

Step 1 Download the USB driver software from the A&D website.

Step 2 Install the USB driver software to the computer that is used as a COM port.

Step 3 Read the COM port number on the computer.

Step 4 Input the number to the data communication software.

Step 5 Connect the scale to the computer using the USB cable.

Step 6 When the PRINT key is pressed, a weighing value can be received by the data communication software.

Example of data communication software **: RsCom** of A&D **WinCT**.

16.2.2. Example of Using the USB Interface

Reading COM port number

(Computer is used as a COM port.)

Step 1 Download the USB driver software from the A&D website.

Open the A&D website at the URL `http://www.aandd.jp/` and
open the "**Support**" and "**Software**" pages in that order.
Download the driver software from "**download**" of "**Driver software for HVW-02CB** (USB interface option for the HV/W-C & HV/W-CP series)".

Note : The location and version of the software may be changed without notice.

Step 2 Expand the file " `hvw-02cbja_driver.zip` " by double-clicking.
The folder " `hvw-02cbja_driver` " is created.

Step 3 Install the file " `CDM21224_setup.exe` " in the folder by double-clicking.

Step 4 Finish the installation by following the displayed instruction.

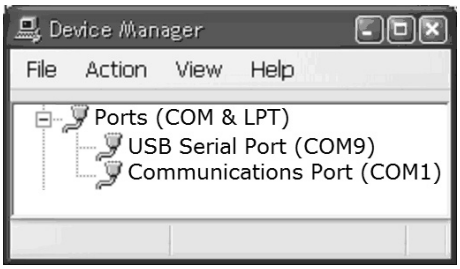
Reading the COM port Number

(Check after software is installed to computer.)

Step 1 Press the START button and open the control panel.

Step 2 Open "**Hardware & Sound**" and "**Device Manager**" in that order.

Step 3 Expand the "**Ports (COM & LPT)**" by double-clicking to display the COM port number. Port number is "9" in the example.



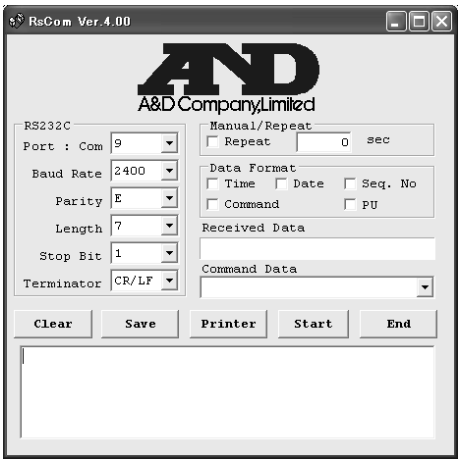
Note : The COM port number may differ depending on the hardware of the computer. Confirm the COM port number in device manager.

Communication Software

Example **:** If the communication software **WinCT** is used, data can be stored in memory.

Step 1 Start **RsCOM** of **WinCT** for example.

Step 2 Prepare parameters of "Port **:** COM". Port number is "9" in the example.



Note : The communication software **WinCT** can download from the A&D website of URL `http://www.aandd.jp/` .

Starting Data Communication

Step 1 Connect the scale to the computer using the USB cable.

* Use a commercially available "type A male - type B female" cable.

Step 2 Press the Start button of **RsCOM** of **WinCT**. Then, communication is available.

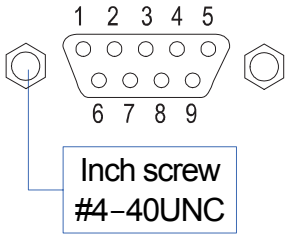
Step 3 When the PRINT key of the scale is pressed and weighing value is output, **RsCOM** can receive it.

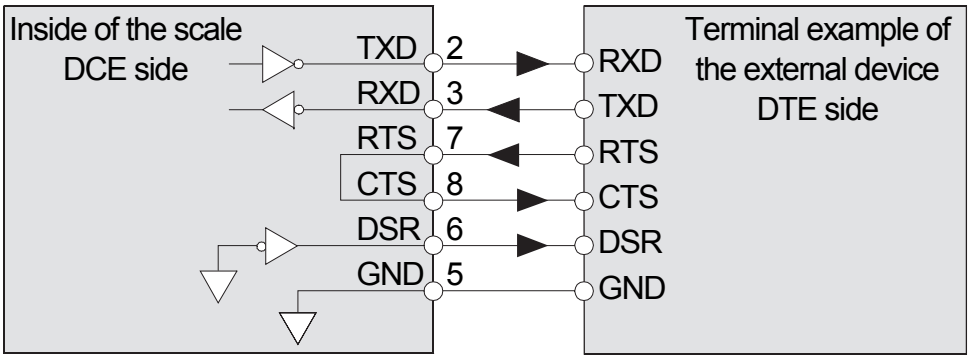
* The weighing value to be output to the interface depends on the parameters of the function table.

16.3. HVW-03C, RS-232C Interface

- The HVW-03C enables duplex communication using the RS-232C interface.
  The DCE (Data Communication Equipment) connector is type DSUB-9P.
  To connect the HVW-03C to an external device, it is necessary to use a commercially available communication cable.
  AX-KO2466-200 (2 m) / AX-KO2466-500 (5 m) / AX-KO2466-1000 (10 m)
- When confirming the communication format, refer to **"16.5. Communication format"**.
- Pin assignment

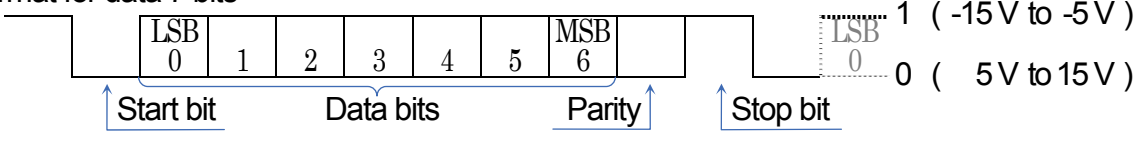
Pin No.	Signal name of DCE side	Direction	Description
1	—	—	No connection
2	TXD	→	Transmit data
3	RXD	←	Receive data
4	—	—	No connection
5	GND	—	Signal ground
6	DSR	→	Data set ready
7	RTS	←	Request to send
8	CTS	→	Clear to send
9	—	—	Used internally



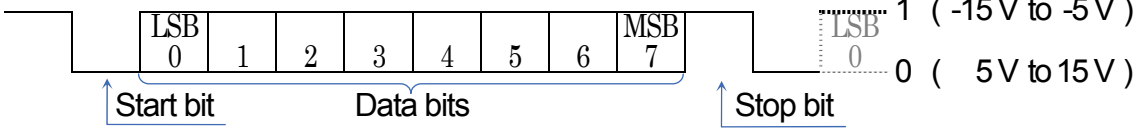


Transmission	EIA RS-232C			
Transmission form	Asynchronous, bi-directional			
Data format	Baud rate :	2400, 4800, 9600 bps		
	Data length :	7 bits or 8 bits		
	Parity :	1 bit	EVEN, ODD	Data length is 7 bits
			NONE (Non-parity)	Data length is 8 bits
	Start bit :	1 bit		
	Stop bit :	1 bit		
	Code :	ASCII		

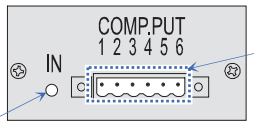
Bit format for data 7 bits



Bit format for data 8 bits



16.4. HVW-04C, Comparator Relay Output / Buzzer / Contact Input



Output terminal of comparator & relay

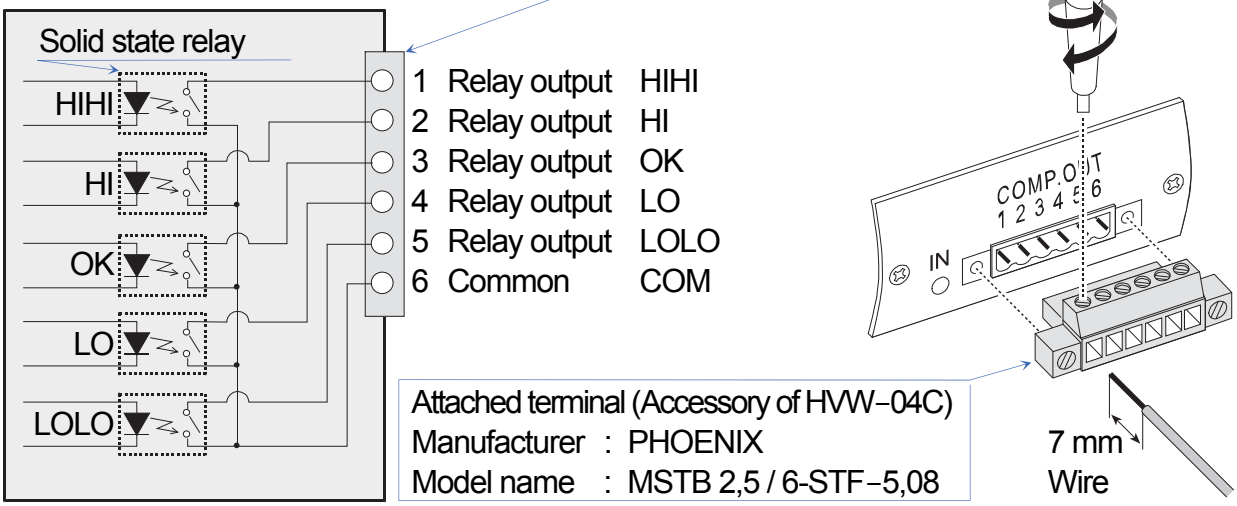
Contact input terminal

* The buzzer is mounted on the board.

- The specifications of the solid state relay are as follows :

Maximum voltage : 50 V DC
Maximum current : 100 mA DC
Maximum ON resistance : 8 Ω

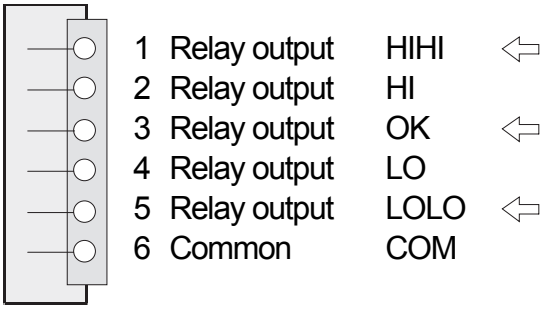
Socket on the board
Maker : PHOENIX
Model : MSTB 2,5 / 6-GF-5,08



Attached terminal (Accessory of HVW-04C)
Manufacturer : PHOENIX
Model name : MSTB 2,5 / 6-STF-5,08

Caution

When the three-level comparator mode is used, the comparator outputs are the HIHI 1pin, OK 3 pin and LOLO 5 pin. HI 2 pin and LO 4 pin are not used.



- ## Buzzer

The buzzer is mounted on the electrical circuit board of the HVW-04C.
When the HVW-04C is installed on the scale, the sound pressure level is approximately 58 dB at a distance of 1 m from the display unit.
The buzzer can sound with LEDs (at upper side of the display) synchronized to a comparator result. The use of the buzzer can specify at bUZ7 of the function table.
Refer to "**10.1.4. Buzzer of Comparator Mode**".

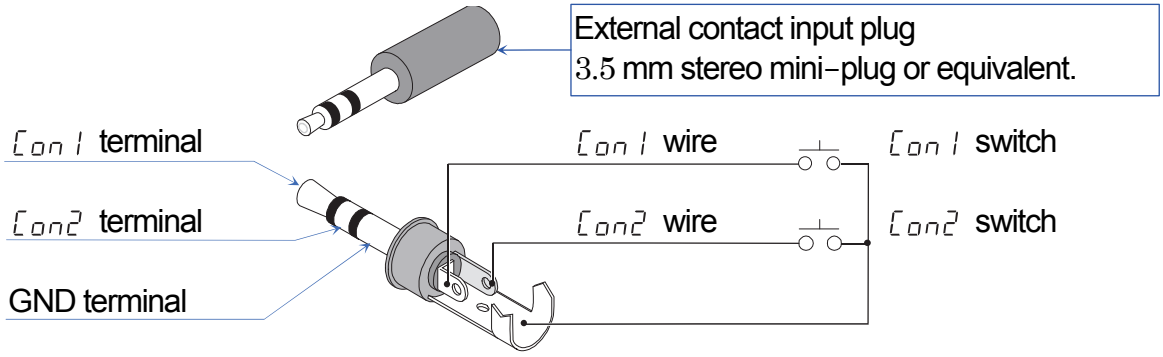
External Contact Input Plug and Wiring Example

An external contact input plug is included.
Solder the plug and electrical wires according to the circuit diagram below.

Con1 : The function of the Con1 switch can be assigned at the external contact input Con1 in the function table.

Con2 : The function of the Con2 switch can be assigned at the external contact input Con2 in the function table.

When the Con1 wire (or Con2 wire) is shorted to GND wire for 100 ms or more, the specified function of the Con1 terminal (or Con2 terminal) is performed.



16.5. Communication Format

Data format

S	T	,	+	0	0	0	0	0	.	0	0	␣	k	g	C_R	L_F

Header — Data — Unit — Terminator

- There are 4 headers for the weighing data.
  - **ST** : Stable weighing data
  - **QT** : Stable counting data
  - **US** : Unstable weighing data
  - **OL** : Out of weighing range
- The data consists of 9 characters including the polarity and decimal point.
- There are 4 units. The character ␣ means "Space (20h)".
  - **␣kg** : Weighing mode "kg"
  - **␣lb** : Weighing mode "lb"
  - **␣oz** : Weighing mode "oz"
  - **␣PC** : Counting mode "pcs"
- As a terminator, **C_R L_F** is always output. **C_R** : 0Dh, **L_F** : 0Ah
- Data example

Weighing data	"kg" (+)	S	T	,	+	0	0	1	2	.	3	4	5	␣	k	g	C_R	L_F
Counting data	"pcs" (+)	Q	T	,	+	0	0	0	1	2	3	4	5	␣	P	C	C_R	L_F
Out of weighing range	"kg" (+)	O	L	,	+	9	9	9	9	.	9	9	9	␣	k	g	C_R	L_F
HV-C / CP model		S	T	,	+	0	0	1	2	.	3	4	␣	␣	k	g	C_R	L_F

When the position of the Readability changes depending on the weighing range, the hidden digit is replaced to ␣.

- Example of tare function
  When "tare data is output (SiFt 1)" is specified in the parameter list, data is output.

Net	"kg" (+)	N	␣	,	+	0	0	1	2	.	3	4	5	␣	k	g	C_R	L_F
Tare data	"kg"	T	␣	,	+	0	0	0	2	.	0	0	0	␣	k	g	C_R	L_F

- Example of preset tare function

Net	"kg" (+)	N	␣	,	+	0	0	1	2	.	3	4	5	␣	k	g	C_R	L_F
Preset tare data	"kg"	P	T	,	+	0	0	0	2	.	0	0	0	␣	k	g	C_R	L_F

Data output mode

- **Command mode**
  The scale is controlled by commands that come from an external device such as a computer. For details, refer to "**16.5.1. Command Mode**".
- **Stream mode** (PrE ∗ 0)
  Specify PrE 1 0 or PrE2 0 in the function table. Data is output continuously. The data update rate is approximately 10 times per second, the same as the display refresh rate. The stream mode does not output data during the setting procedures.

- **Print key mode** (Prt ∗ 4)
  Specify [Prt1 4], [Prt2 4] or [PrtP 4] in the function table. When the weighing value is stable, data is output by pressing the [PRINT] key. At this time, the display flashes once to indicate that the data is output.

- **Auto-print mode + data** (Prt ∗ 5)
  Specify [Prt1 5], [Prt2 5] or [PrtP 5] in the function table. When the weighing value is stable at +5**d** and above, the data is output. The next transmission can occur after the weighing value falls to +4**d** or below.

- **Auto-print mode +/- data** (Prt ∗ 6)
  Specify [Prt1 6], [Prt2 6] or [PrtP 6] in the function table.
  When the weighing value is stable at +5**d** and above or -5**d** and below, the data is output.
  The next transmission can occur after the weighing value falls between -4**d** and +4**d**.

- **Auto-print mode + data and OK** (Prt ∗ 7)
  Specify [Prt1 7], [Prt2 7] or [PrtP 7] in the function table. When the weighing value is stable and OK as a comparison result at +5**d** and above, the data is output. The next transmission can occur after the weighing value falls to +4**d** or below.

- **Auto-print mode +/- data and OK** (Prt ∗ 8)
  Specify [Prt1 8], [Prt2 8] or [PrtP 8] in the function table. When the weighing value is stable and OK as a comparison result at +5**d** and above or -5**d** and below, the data is output. The next transmission can occur after the weighing value falls between -4**d** and +4**d**.

- "**d**" means "**digit**" to be equivalent to minimum weighing value in the unit "kg".

Baud Rate

- Select the proper baud rate according to the device to be connected to the HVW-03C.

  When the **AD-8121B printer** is connected, specify the baud rate to 2400 bps at "Baud rate 1 [bPS1 0]" or "Baud rate 2 [bPS2 0]" in the function table.

  When the **AD-8127 printer** is connected, specify the baud rate to 2400, 4800 or 9600 bps at "Baud rate 1 [bPS1 0], [bPS1 1] or [bPS1 2]" or "Baud rate 2 [bPS2 0], [bPS2 1] or [bPS2 2]" in the function table.

- If using 2400 bps, set [bPS1 0] for the device connected at OP-ch1.
  If using 2400 bps, set [bPS2 0] for the device connected at OP-ch2.

  If using 4800 bps, set [bPS1 1] for the device connected at OP-ch1.
  If using 4800 bps, set [bPS2 1] for the device connected at OP-ch2.

  If using 9600 bps, set [bPS1 2] for the device connected at OP-ch1.
  If using 9600 bps, set [bPS2 2] for the device connected at OP-ch2.

16.5.1. Command Mode

In the command mode, the scale is controlled by commands that come from an external device such as a computer.

Command List

Command	Description		Remarks
Q	Requests data output immediately.		
Z	Zeros the scale when the weighing value is stable.		Same as the [ZERO] key.
T	Tares the scale when the weighing value is stable.		Same as the [TARE] key.
U	Switches the weighing unit.		Same as the [MODE] key.
CT	Clears tare		
PT	Sets preset tare		PT,+000000 C_R L_F
A	Outputs accumulation values		
N	Outputs the number of accumulations		
CA	Clears accumulation		
ID	Sets the ID number		ID:xxxxxx C_R L_F
?ID	Requests the ID number		
?PT	Outputs the preset tare value		
?H3	In five-level comparator mode : In three-level comparator mode : In seven-level comparator mode :	Not used Not used Threshold value of rank 5 is output.	The output of setting values for comparator mode Five-level : CP-L 0 Three-level : CP-L 1 Seven-level : CP-L 2
?H2	In five-level comparator mode : In three-level comparator mode : In seven-level comparator mode :	HIHI limit value is output. HI limit value is output. Threshold value of rank 4 is output.	
?H1	In five-level comparator mode : In three-level comparator mode : In seven-level comparator mode :	HI limit value is output. Not used Upper threshold value of rank 3 is output.	
?L1	In five-level comparator mode : In three-level comparator mode : In seven-level comparator mode :	LO limit value is output. Not used Lower threshold value of rank 3 is output.	
?L2	In five-level comparator mode : In three-level comparator mode : In seven-level comparator mode :	LOLO limit value is output. LO limit value is output. Threshold value of rank 2 is output.	
?L3	In five-level comparator mode : In three-level comparator mode : In seven-level comparator mode :	Not used Not used Threshold value of rank 1 is output.	

Command	Description		Remarks
H3	In five-level comparator mode : In three-level comparator mode : In seven-level comparator mode :	Not used Not used The threshold value of rank 5 is stored.	The input of setting values for comparator mode Input the six-digit value excluding the polarity and decimal point.
H2	In five-level comparator mode : In three-level comparator mode : In seven-level comparator mode :	HIHI limit value is stored. HI limit value is stored. The threshold value of rank 4 is stored.	
H1	In five-level comparator mode : In three-level comparator mode : In seven-level comparator mode :	HI limit value is stored. Not used The upper threshold value of rank 3 is stored.	
L1	In five-level comparator mode : In three-level comparator mode : In seven-level comparator mode :	LO limit value is stored. Not used The lower threshold value of rank 3 is stored.	
L2	In five-level comparator mode : In three-level comparator mode : In seven-level comparator mode :	LOLO limit value is stored. LO limit value is stored. The threshold value of rank 2 is stored.	
L3	In five-level comparator mode : In three-level comparator mode : In seven-level comparator mode :	Not used Not used The threshold value of rank 1 is stored.	

Command Examples

The examples below are for the function setting [SIF 1] (Reply to commands).
The character ␣ means "Space (20h)".

To request data output immediately.

Command	Q CR LF	
Reply	S T , + 0 0 1 2 . 3 4 5 ␣ k g CR LF	Stable positive data
	U S , + 0 0 0 7 . 8 9 0 ␣ k g CR LF	Unstable positive data
	O L , + 9 9 9 9 . 9 9 9 ␣ k g CR LF	[E] display

To zero the weighing value when the weighing value is stable.

Zero point is set when the scale is in a condition where zero operation is possible.

Command	Z CR LF	
Reply	Z CR LF	Zero point has been set. (No reply If [SIF* 0] is set.)

To tare the weighing value when the weighing value is stable.

Net value is displayed when the scale is in a condition where tare operation is possible.

Command	T CR LF	
Reply	T CR LF	Net value has been displayed. (No reply If [SIF* 0] is set.)

To switch the weighing unit.

The weighing unit is switched.

Command	U CR LF	
Reply	U CR LF	No reply If [SIF* 0] is set.

To cancel tare value.

The weighting value becomes the gross and the net mark is turned off. The tare value becomes zero.

Command	C T CR LF	
Reply	C T CR LF	This command has been executed.

To set preset tare.

Tare value is set and the net is displayed. Tare value is a numerical value of 6 digits with a polarity sign and does not contain a decimal point.

Template	P T , [**parameter**]
Command	P T , + 0 0 0 1 2 0 CR LF
Reply	P T , + 0 0 0 1 2 0 CR LF

To output accumulation values.

Command	A CR LF
Reply	A , + 0 0 1 2 . 3 0 0 ␣ k g CR LF

To output the number of accumulations.

Command	N	C_R	L_F												
Reply	N	,	+	0	0	0	0	0	1	4	0	␣	␣	␣	C_R	L_F

To clear accumulation.

Accumulated data and number of accumulations are set to zero.

Command	C	A	C_R	L_F
Reply	C	A	C_R	L_F

To set the ID number.

The ID number is numerical value and alphabet characters of 6 digits and does not contain a decimal point.

Template	I	D	:	[**parameter**]						
Command	I	D	:	A	B	C	1	2	3	C_R	L_F
Reply	I	D	:	A	B	C	1	2	3	C_R	L_F

To request the ID number.

The ID number is output.

Command	?	I	D	C_R	L_F
Reply	I	D	:	A	B	C	1	2	3	C_R	L_F

To output the preset tare value.

The preset tare value is output.

Command	?	P	T	C_R	L_F										
Reply	P	T	,	+	0	0	0	0	,	1	2	0	␣	k	g	C_R	L_F

To output H3 value.

Five-level comparator mode ..... Not used
Three-level comparator mode ..... Not used
Seven-level comparator mode ..... Threshold value of rank 5 is output.

Command	?	H	3	C_R	L_F						
Reply	H	3	,	+	0	0	0	5	0	0	C_R	L_F

To output H2 value.

Five-level comparator mode ..... HIHI limit value is output.
Three-level comparator mode ..... HI limit value is output.
Seven-level comparator mode ..... Threshold value of rank 4 is output.

Command	?	H	2	C_R	L_F						
Reply	H	2	,	+	0	0	0	4	0	0	C_R	L_F

To output H1 value.

Five-level comparator mode ····· HI limit value is output.
Three-level comparator mode ····· Not used
Seven-level comparator mode ····· Upper threshold value of rank 3 is output.

Command	?	H	1	C_R	L_F							
Reply	H	1	,	+	0	0	0	3	0	0	C_R	L_F

To output L1 value.

- Five-level comparator mode ····· LO limit value is output.
  Three-level comparator mode ····· Not used
  Seven-level comparator mode ····· Lower threshold value of rank 3 is output.

Command	?	L	1	C_R	L_F							
Reply	L	1	,	+	0	0	0	2	0	0	C_R	L_F

To output L2 value.

Five-level comparator mode ····· LOLO limit value is output.
Three-level comparator mode ····· LO limit value is output.
Seven-level comparator mode ····· Threshold value of rank 2 is output.

Command	?	L	2	C_R	L_F							
Reply	L	2	,	+	0	0	0	1	0	0	C_R	L_F

To output L3 value.

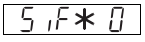
Five-level comparator mode ····· Not used
Three-level comparator mode ····· Not used
Seven-level comparator mode ····· Threshold value of rank 1 is output.

Command	?	L	3	C_R	L_F							
Reply	L	3	,	+	0	0	0	0	0	0	C_R	L_F

To set H3 value.

- Five-level comparator mode ····· Not used
  Three-level comparator mode ····· Not used
  Seven-level comparator mode ····· The threshold value of rank 5 is stored.
  Input the parameter of 6 digits excluding the polarity and decimal point.

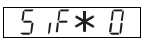
Template	H	3	,	[**parameter**]								
Command	H	3	,	+	0	0	0	5	0	0	C_R	L_F
Reply	H	3	,	+	0	0	0	5	0	0	C_R	L_F

No reply If  is set.

To set H2 value.

Five-level comparator mode ····· HIHI limit value is stored.
Three-level comparator mode ····· HI limit value is stored.
Seven-level comparator mode ····· The threshold value of rank 4 is stored.
Input the parameter of 6 digits excluding the polarity and decimal point.

Template	H	2	,	[parameter]							
Command	H	2	,	+	0	0	0	4	0	0	C_R L_F
Reply	H	2	,	+	0	0	0	4	0	0	C_R L_F

No reply If  is set.

To set H1 value.

Five-level comparator mode ····· HI limit value is stored.
Three-level comparator mode ····· Not used
Seven-level comparator mode ····· The upper threshold value of rank 3 is stored.
Input the parameter of 6 digits excluding the polarity and decimal point.

Template	H	1	,	[parameter]							
Command	H	1	,	+	0	0	0	3	0	0	C_R L_F
Reply	H	1	,	+	0	0	0	3	0	0	C_R L_F

No reply If is set.

To set L1 value.

- Five-level comparator mode ····· LO limit value is stored.
  Three-level comparator mode ····· Not used
  Seven-level comparator mode ····· The lower threshold value of rank 3 is stored.
  Input the parameter of 6 digits excluding the polarity and decimal point.

Template	L	1	,	[parameter]							
Command	L	1	,	+	0	0	0	2	0	0	C_R L_F
Reply	L	1	,	+	0	0	0	2	0	0	C_R L_F

No reply If is set.

To set L2 value.

Five-level comparator mode ····· LOLO limit value is stored.
Three-level comparator mode ····· LO limit value is stored.
Seven-level comparator mode ····· The threshold value of rank 2 is stored.
Input the parameter of 6 digits excluding the polarity and decimal point.

Template	L	2	,	[parameter]							
Command	L	2	,	+	0	0	0	1	0	0	C_R L_F
Reply	L	2	,	+	0	0	0	1	0	0	C_R L_F

No reply If is set.

To set L3 value.

Five-level comparator mode ····· Not used
Three-level comparator mode ····· Not used
Seven-level comparator mode ····· The threshold value of rank 1 is stored.
Input the parameter of 6 digits excluding the polarity and decimal point.

Template	L	3	,	[parameter]							
Command	L	3	,	+	0	0	0	0	0	0	C_R L_F
Reply	L	3	,	+	0	0	0	0	0	0	C_R L_F

No reply If is set.

Response when S1F1 1 or S1F2 1 is specified in the function table

If S1F1 1 or S1F2 1 is used and a command response is active, the following response may be output.

- When the Z command is executed with an unstable weighing value and cannot be finished, the response I is returned.

Command	Z	C_R	LF	
Reply	I	C_R	LF	The scale is not in a condition that zero operation is possible.

- When the scale receives a command that it cannot identify or that does not exist, the response ? is returned.

Command	B	C_R	LF	
Reply	?	C_R	LF	The scale received an undefined command.

Response when S1F1 0 or S1F2 0 is specified in the function table

S1F1 0 or S1F2 0 does not use a reply. The undefined command is ignored.

16.6. Using UFC (Universal Flex Coms) Function

- The UFC function allows you to print out using the format enabled for the printer (UFC format). The UFC format data can be output through an RS-232C or USB interface.
- The scale can store the UFC format as text data. The format can use variable parameters as a part of text data. Variable parameters can replace with weighing value, tare value and the like when printed out.
- The maximum number of text data is 400 characters.
- To use the UFC function, it is necessary that the **PF** command be used and the UFC format be stored as text data on the scale in advance.
- When the PRINT key is pressed or auto-print mode is used, the scale prints the stored text data after variable parameters is replaced with weighing value, tare value and the like.
- Specify S1F12, S1F22 or S1FP1 to use the UFC format in the function table.

Store Text Data to the Scale

Command	P	F	,	$	P	C	,	'	T	E	X	T	'	,	#	2	0	,	$	S	P	*	2
	,	&	$	C	R	,	$	L	F	,	$	W	T	,	$	C	R	,	$	L	F	C_R	L_F
Reply	P	F	C_R	L_F																		Terminator	

The text data (the UFC format) can sent using the **PF** command :

- Variable parameters for the scale data and control codes

Parameter	Scale Data & Control Code
$ID	ID number
$PC	Counting number
$WT	Current weighing value
$TR	Current tare value
$PT	Current preset tare value
$TL	Accumulation value
$AN	Accumulation count

Parameter	Scale Data & Control Code		
$CP	Comparator result		
$DT	Date for built-in printer		Type CP
$TM	Time for built-in printer		Type CP
$CM	,	Comma	(2Ch)
$CR	C_R	Carriage Return	(0Dh)
$LF	L_F	Line Feed	(0Ah)
$SP	␣	Space	(20h)

Note

⚠ These parameters must use capital letters.

- ASCII text string
  Text string is described in single quote marks **'**.
  The single quote itself is written as tow single quotes.
  Example of text *Data* : **'***Data***'**
  Example of text *'Data'* : **''***'Data'***''**

- ASCII hexadecimal code
  The ASCII hexadecimal codes are written in the form **#** and two hexadecimal digits.
  This will mainly be used to send control codes that cannot be described as a text string.
  Example of EOT of ASCII code : **#04**

- Data repeated
  When the control codes $SP, $CR and $LF can be used with "* and a number (of two digits maximum)", these codes will be repeated the number of times designated.
  Example where $LF is repeated 9 times : **$LF*9**
  Example where space is repeated 12 times : **$SP*12**

- Link mark **&**
  If you will send more than 2 lines of data, attach **&** to the end of the first line. Then, the scale decides that the data is continued.

- As separators for data, a space (20h) ␣ or comma (2Ch) **,** are used.
  These separators can be omitted, but you cannot omit the comma (2Ch) **,** after the **PF** command. You must start with the **PF,** command.

- Data format for variable parameters (Space (20h) is expressed as ␣ .)

Variable parameters of the scale data are replaced with the following data format :

- Data is a fixed length that includes a sign and a decimal point.
  The leading zeros of data are replaced with spaces (20h) ␣.

$ID of variable parameter
Example of ID number : ABC456
6 digits

A	B	C	4	5	6

$PC of variable parameter
Example of counting number : 123 pcs
9 digit counting number + 3 digit unit

␣	␣	␣	␣	␣	+	1	2	3	␣	P	C

$WT of variable parameter
Example of the current weighing value : 1.234 kg
9 digit weighing value + 3 digit unit

␣	␣	␣	+	1	.	2	3	4	␣	k	g

$TR of variable parameters
Example of the current tare value : 1.234 kg
9 digit tare value + 3 digit unit

␣	␣	␣	+	1	.	2	3	4	␣	k	g

$PT of variable parameter
Example of the current preset tare value : 1.234 kg
9 digit preset tare value + 3 digit unit

␣	␣	␣	+	1	.	2	3	4	␣	k	g

$TL of variable parameter
Example of accumulation value : 1.234 kg
9 digit accumulation value + 3 digit unit

␣	␣	␣	+	1	.	2	3	4	␣	k	g

$AN of variable parameter

Example of accumulation count : 123 counts

9 digit accumulation count

␣	␣	␣	␣	␣	+	1	2	3

$CP of variable parameter

Example of HIHI result

3 digits

H	I	2

Example of HI result

3 digits

H	I	1

Example of OK result

2 digits

O	K

Example of LO result

3 digits

L	O	1

Example of LOLO result

3 digits

L	O	2

Example of "not compared"

2 digits

␣	␣

$DT of variable parameter

Example of date for built-in printer, Type CP : YYYY / MM / DD .

10 digits

2	0	1	8	/	␣	3	/	1	8

$TM of variable parameter

Example of time for built-in printer, Type CP : HH : MM : SS

8 digits

1	2	:	3	4	:	5	6

Printing Example for the PF Command using the AD-8127 Printer

AD-8127 format for

5,F1,2 or 5,F2,2

```
Weight
        +1.234 kg
CHECK
     OK
```

The **PF** Command

Computer → Scale

```
PF,'Weight',$CR,$LF,&
$SP*4,$WT,$CR,$LF,&
'CHECK'$CR,$LF,&
$SP*4,$CP,$CR,$LF,&
$CR,$LF CR LF
```

Terminator code

$CR : Carriage return, ASCII 0Dh

$LF : Line feed, ASCII 0Ah

Note

⚠ The UFC format does not send a terminator code automatically.
Therefore, add the terminator code at the end of text data if necessary.

17. Specifications

HV-C/CP Series (Weighing capacity of 15 kg to 220 kg)

Models			HV-15KC HV-15KCP			HV-60KC HV-60KCP			HV-200KC HV-200KCP		
Weighing capacity	[kg]		3	6	15	15	30	60	60	150	220
Readability	[kg]		0.001	0.002	0.005	0.005	0.01	0.02	0.02	0.05	0.1
Weighing capacity	[lb]	#	6	15	30	30	60	150	150	300	500
Readability	[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
Readability	[oz]	#	0.05	0.1	0.2	0.2	0.5	1	1	2	5
Weighing capacity	[lb_oz]	#	30 lb			---					
Readability	[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 26 mm, 3 color 5 level comparator LED, Refresh rate: 10 times per second								
Repeatability (Standard deviation)	[kg]		0.001	0.002	0.005	0.005	0.01	0.02	0.02	0.05	0.1
Linearity	[kg]		±0.001	±0.002	±0.005	±0.005	±0.01	±0.02	±0.02	±0.05	±0.1
Span drift			±20 ppm/°C typ. (5 °C to 35 °C)								
Power source	HV-C		AC adapter Please confirm that the AC adapter type is correct for your local voltage and receptacle type. The AC adapter may not be provided for some areas. 50Hz/ 60Hz. Battery TYPE D (R20P / R20PU / LR20) x 4								
	HV-CP		AC adapter Please confirm that the AC adapter type is correct for your local voltage and receptacle type. The AC adapter may not be provided for some areas. 50Hz/ 60Hz.								
Battery life (HV-C)			Approximately 1200 hours, when using alkaline battery and setting the display to off.								
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 Width x Depth x Height	[mm]		255 x 494 x 366			330 x 640 x 750			390 x 746 x 750		
Weight [kg]	HV-C		6			11			17		
	HV-CP		7			12			18		

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

HW-C/CP Series (Weighing capacity of 10 kg to 220 kg)

Models			HW-10KC HW-10KCP	HW-60KC HW-60KCP	HW-100KC HW-100KCP	HW-200KC HW-200KCP
Weighing capacity	[kg]		10	60	100	220
Readability	[kg]		0.001	0.005	0.01	0.02
Weighing capacity	[lb]	#	20	150	200	500
Readability	[lb]	#	0.002	0.01	0.02	0.05
Weighing capacity	[oz]	#	320	2400	3200	8000
Readability	[oz]	#	0.05	0.2	0.5	1
Weighing capacity	[lb_oz]	#	20 lb	---		
Readability	[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 26 mm, 3 color 5 level comparator LED, Refresh rate: 10 times per second			
Repeatability (Standard deviation)	[kg]		0.002	0.01	0.02	0.04
Linearity	[kg]		±0.002	±0.01	±0.02	±0.04
Span drift			±20 ppm/°C typ. (5 °C to 35 °C)			
Power source		HW-C	AC adapter Please confirm that the AC adapter type is correct for your local voltage and receptacle type. The AC adapter may not be provided for some areas. 50Hz/ 60Hz. Battery TYPE D (R20P / R20PU / LR20) x 4			
		HW-CP	AC adapter Please confirm that the AC adapter type is correct for your local voltage and receptacle type. The AC adapter may not be provided for some areas. 50Hz/ 60Hz.			
Battery life (HW-C)			Approximately 1200 hours, when using alkaline battery and setting the display to off.			
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 Width x Depth x Height	[mm]		255 x 494 x 366	330 x 640 x 750	390 x 746 x 750	390 x 746 x 750
Weight [kg]		HW-C	6	11	17	17
		HW-CP	7	12	18	18

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

HV-C/CP Series (Weighing capacity of 300 kg to 600 kg)

Models		HV-300KC HV-300KCP		HV-600KC HV-600KCP	
Weighing capacity [kg]		150	300	300	600
Readability [kg]		0.05	0.1	0.1	0.2
Number of samples in counting mode [pieces]		5 (can be changed to 10, 20, 50, 100)			
Max. count number [pieces]		60,000		60,000	
Display		7 segment LCD, Character height 26 mm, 3 color 5 level comparator LED, Refresh rate: 10 times per second			
Repeatability (Standard deviation) [kg]		0.05	0.1	0.1	0.2
Linearity [kg]		±0.05	±0.1	±0.1	±0.2
Span drift		±20 ppm/°C typ. (5 °C to 35 °C)			
Power source	HV-C	AC adapter Please confirm that the AC adapter type is correct for your local voltage and receptacle type. The AC adapter may not be provided for some areas. 50Hz/ 60Hz. Battery TYPE D (R20P / R20PU / LR20) x 4			
	HV-CP	AC adapter Please confirm that the AC adapter type is correct for your local voltage and receptacle type. The AC adapter may not be provided for some areas. 50Hz/ 60Hz.			
Battery life (HV-C)		Approximately 600 hours, when using alkaline battery and setting the display to off.			
Ambient temperature and humidity		-10 °C to 40 °C, Less than 85 %R.H. (Do not allow condensation)			
Weighing pan size [mm]		600 x 700			
Dimensions [mm] Width x Depth x Height		600 x 943 x 942			
Weight [kg]	HV-C	45			
	HV-CP	46			

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

HW-C/CP Series (Weighing capacity of 300 kg to 600 kg)

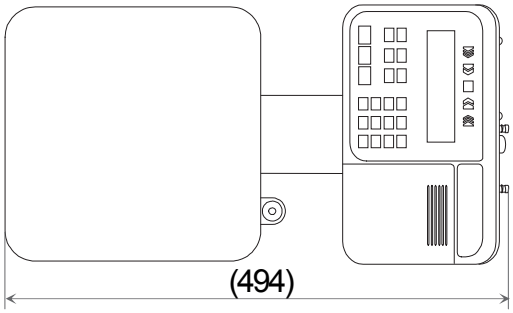
Models		HW-300KC HW-300KCP	HW-600KC HW-600KCP
Weighing capacity [kg]		300	600
Readability [kg]		0.05	0.1
Number of samples in counting mode [pieces]		5 (can be changed to 10, 20, 50, 100)	
Max. count number [pieces]		60,000	60,000
Display		7 segment LCD, Character height 26 mm, 3 color 5 level comparator LED, Refresh rate: 10 times per second	
Repeatability (Standard deviation) [kg]		0.1	0.2
Linearity [kg]		±0.1	±0.2
Span drift		±20 ppm/°C typ. (5 °C to 35 °C)	
Power source	HW-C	AC adapter Please confirm that the AC adapter type is correct for your local voltage and receptacle type. The AC adapter may not be provided for some areas. 50Hz/ 60Hz. Battery TYPE D (R20P / R20PU / LR20) x 4	
	HW-CP	AC adapter Please confirm that the AC adapter type is correct for your local voltage and receptacle type. The AC adapter may not be provided for some areas. 50Hz/ 60Hz.	
Battery life (HW-C)		Approximately 600 hours, when using alkaline battery and setting the display to off.	
Ambient temperature and humidity		-10 °C to 40 °C, Less than 85 %R.H. (Do not allow condensation)	
Weighing pan size [mm]		600 x 700	
Dimensions [mm] Width x Depth x Height		600 x 943 x 942	
Weight [kg]	HW-C	45	
	HW-CP	46	

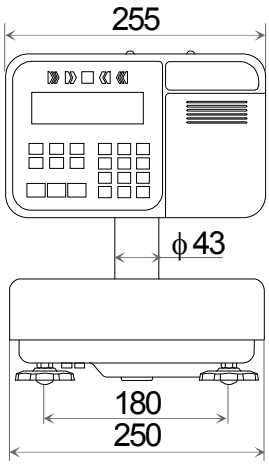
: If the law in your area permits, you can use these units.

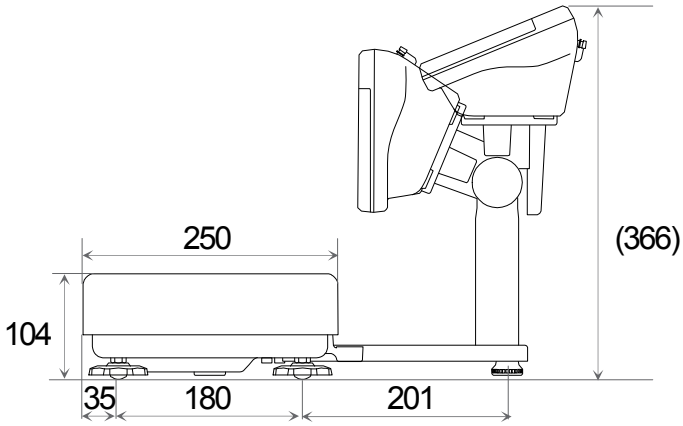
Dimensions

S-models

HV-15KC HV-15KCP
HW-10KC HW-10KCP

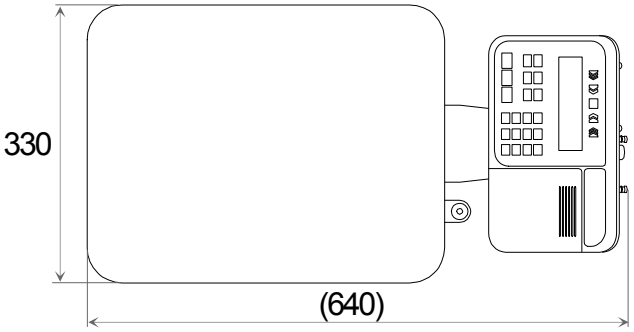


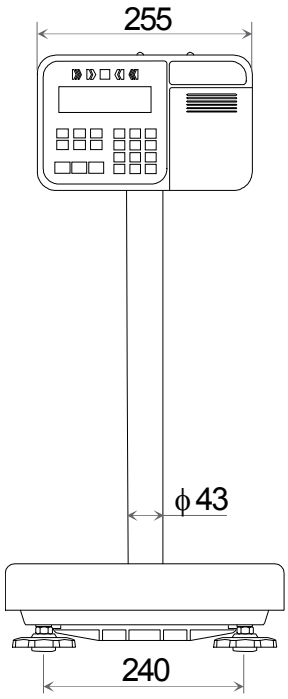


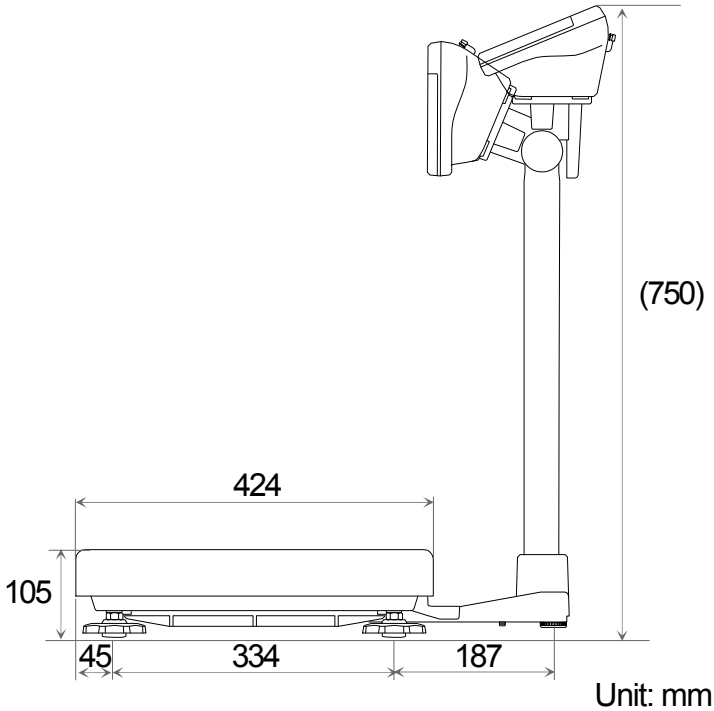


M-models

HV-60KC HV-60KCP
HW-60KC HW-60KCP



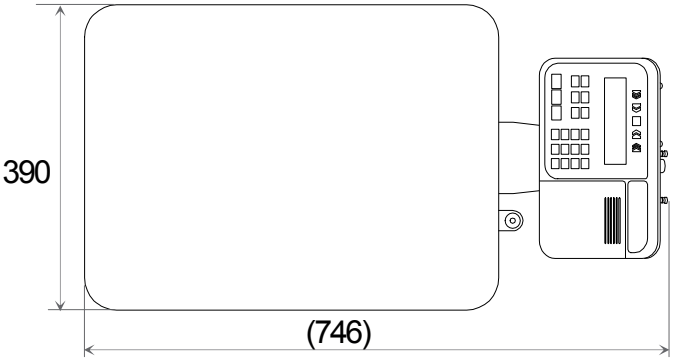


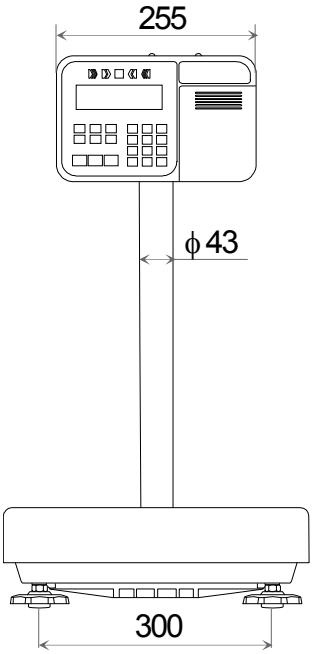


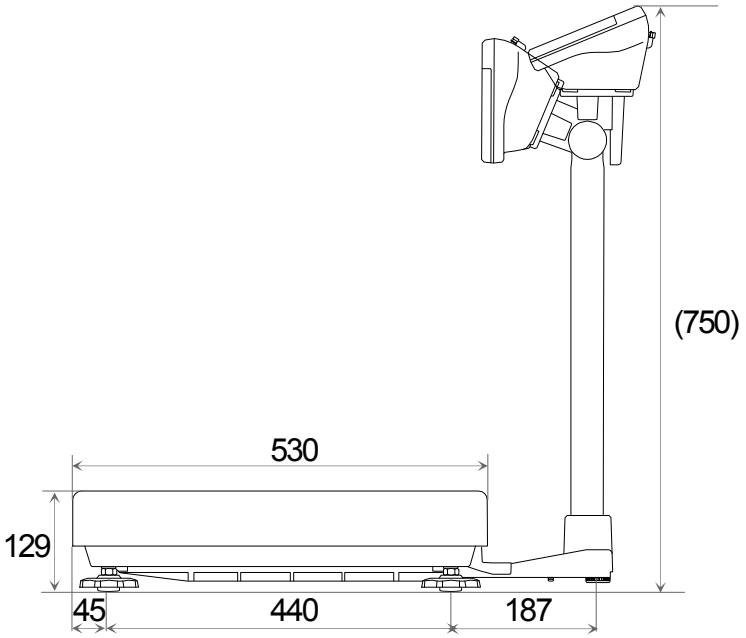
Unit: mm

L-models

HV-200KC HV-200KCP
HW-100KC HW-100KCP
HW-200KC HW-200KCP

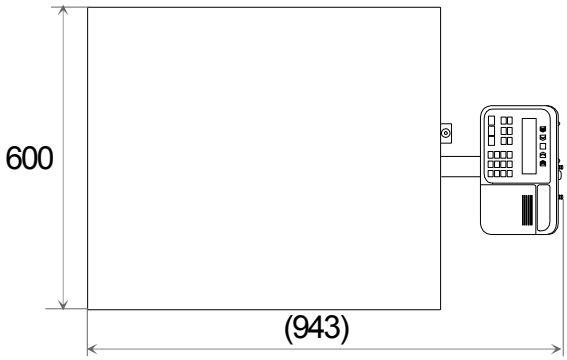


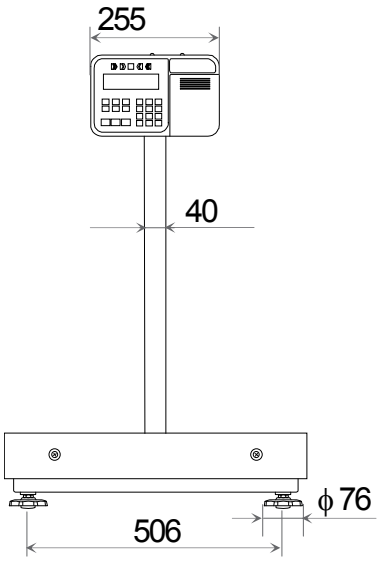


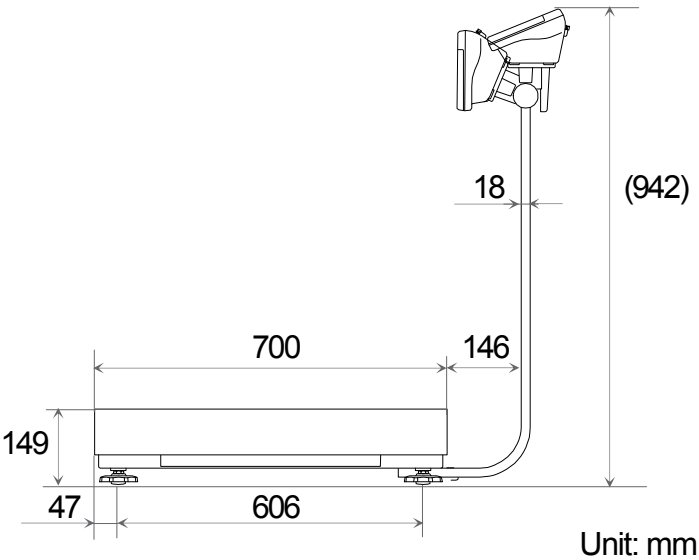


L2-models

HV-300KC HV-300KCP
HV-600KC HV-600KCP
HW-300KC HW-300KCP
HW-600KC HW-600KCP







Unit: mm

18. Maintenance

- Refer to "**3. Precautions**" regarding use.
- Refer to "**14. Calibration (Adjusting the Scale)**" regarding precision weighing.
- Periodically confirm the accuracy of the weighing.
  Calibrate the scale, if it has been moved to another location or the environment has changed.

18.1. Repair

Do not disassemble or assemble the scale without an authorized service engineer. Doing so 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.

18.2. Check Points Before Calling Maintenance Service

In this situation	Confirm these items
Nothing is displayed. Scale does not turn on.	▫ Is the AC adapter properly connected ? ▫ Is the AC adapter of the correct voltage ? ▫ Are the batteries consumed completely ? ▫ Is the battery direction correct ?
Even if the scale turns on, zero cannot be displayed.	▫ Check around the weighing pan. ▫ Is there anything on the weighing pan ? ▫ Perform zero point calibration.
`------` is displayed and does not proceed.	▫ The weighing value is unstable due to drift, vibration or other factors. A breeze or vibration may be affecting the measurement. Check around the weighing pan. ▫ Check the connection of load cell cable. ▫ Zero value is not displayed when the display is turned on. Remove anything that is on the weighing pan. ▫ Perform zero point calibration.
`CAL E` is displayed	▫ Calibration error that means "Too heavy".
`-CAL E` is displayed	▫ Calibration error that means "Too light".
`E` is displayed	▫ Weighing error that means "Overloaded".
`-E` is displayed	▫ Weighing error that means "Underloaded".
Fixed display	▫ Did you use the hold function `HoLd` in the function table ? ▫ Turn off the scale and turn it on again.
`Lb 0` is displayed	▫ Output voltage of batteries is low. Replace with new ones.
`Lb 1` is displayed	▫ Output voltage of the AC adapter is low. Confirm that the type of the AC adapter is correct.

When the following errors are displayed, shutdown the power once and turn the power on again. If you cannot solve those errors, contact your local dealer.

`Err 1` is displayed	▫ Mass sensor is failed.
`Err 2` is displayed	▫ Temperature sensor is failed.
`Err 3` is displayed	▫ Memory (circuit) is failed.

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MEMO

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