HW-D-C / HW-D-CP

Platform Scale Indicator

INSTRUCTION MANUAL

A&D Company, Ltd.

1WMPD4005548B

Warning Definition

The warnings described in this manual have the following meanings:

⚠**DANGER**	Indicates a hazardous situation which, if not avoided, will result in death or serious injury.
Note	Information or cautions to use the device correctly.
⚠	This is a safety alert symbol.

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1. Compliance

1.1. Compliance with FCC Rules

This device contains transmitter module FCC ID: 2A6NFEC2832
This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions:
(1) This device may not cause harmful interference, and (2) This device must accept any interference received, including interference that may cause undesired operation. (FCC = Federal Communications Commission in the U.S.A.)

FCC CAUTION: Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.
The antenna used for this transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.
This product is certified as type of the portable device with FCC Rules. To maintain compliance with RF Exposure requirement, please use within specification of this product.

2. Introduction

Thank you for purchasing the A&D HW-D-C/CP Platform Scale Indicator.Read this manual before use.
It contains important information for safe and proper operation.

3. Features

The HW-D-C / CP is an electronic indicator that is appropriate for composing a digital platform scale by connecting to a weighing platform (load cell), and it has the following features.

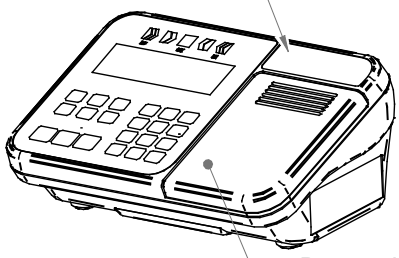
- ❑ Operating up to four 350 Ω load cells is available.
- ❑ Available range selection, for the display resolution, is 1/20 to 1/60,000.
- ❑ Minimum division can be selected from 1 g, 2 g and 5 g.
- ❑ The weighing capacity can be freely set between 100 and 300,000 (within 1/60,000 display resolution).
- ❑ Available weighing units are kg (kilogram), lb (pound), oz (ounce), and pcs (pieces for the counting mode).
- ❑ Functionality is comparable with the display of the HV-C / CP and HW-C / CP series.
- ❑ 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.
- ❑ The comparator memory stores up to 100 sets of threshold values.
- ❑ 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

4. Included Items

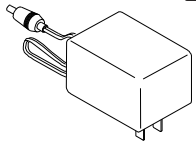
The product includes the following items.

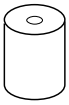
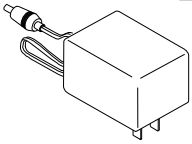
<table>
<tr><th>HW-D-C</th><th>HW-D-CP (for built-in printer models)</th></tr>
<tr><td>●Main Unit
Model label


Affixed here
Write the capacity and section here.

Battery box</td><td>●Main Unit
Model label


Affixed here
Write the capacity and section here.

Printer</td></tr>
<tr><td>●Quick Start Guide

●AC adapter ⚠

(may differ from actual item)</td><td>●Quick Start Guide

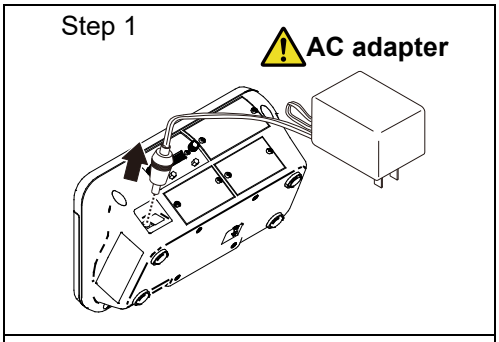
●Dedicated roll paper

●AC adapter ⚠

(may differ from actual item)</td></tr>
</table>

⚠	**AC Adapter** **Confirm that the AC adapter matches the voltage and plug type of your region. An AC adapter is not provided in some regions.**

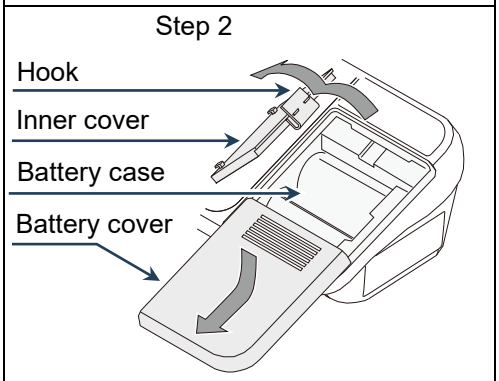
4.1. Installing the Batteries for Type C

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

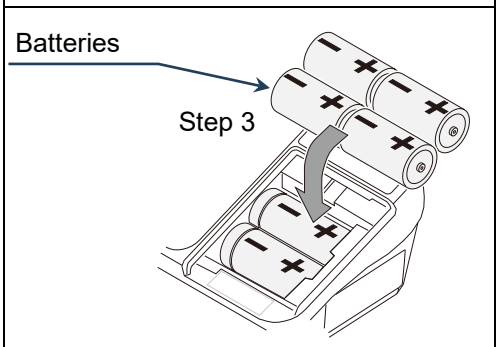
⚠AC adapter
Please confirm that the AC adapter type is correct for your local voltage and receptacle type. The AC adapter may not be provided for some areas.



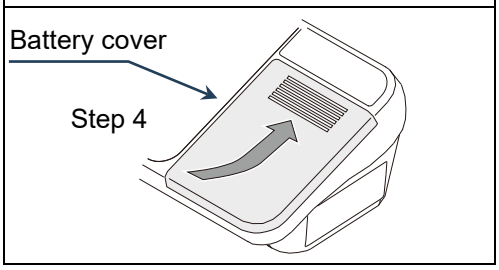
Step 2 Open the battery cover and inner cover in that order.
Push the battery cover and slide it.
Push the hook of the inner cover to the left and lift it.



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. Cautions

5.1. Precautions for Installing the Indicator

⚠DANGER

- ❑ **Do not install the product in a location exposed to corrosive gas or combustible gas.**

Consider the following installation conditions to ensure that the scale can operate properly.

- ❑ The ideal installation environment has a stable temperature and humidity, a robust and flat floor surface, is not exposed to wind or subject to vibration, is an indoor location not exposed to direct sunlight, and has a stable power supply.
- ❑ Do not install the product on a soft floor or a location subject to vibration.
- ❑ Do not install the product in a location exposed to wind or subject to dramatic changes in temperature.
- ❑ Avoid locations exposed to direct sunlight.
- ❑ Do not install the product in a location subject to strong magnetism or strong electromagnetic waves.
- ❑ Do not install the product in a location prone to electrostatic. When the humidity is 45% RH or less, rubbing an insulating material such as plastic will easily build up an electrostatic charge.
- ❑ This product is not waterproof. Use the optional display cover or another item to ensure that the display does not get wet.
- ❑ When using an AC adapter, an unstable AC power supply may cause malfunction.
- ❑ 30 minutes before use, connect the power supply (AC adapter or batteries) and press the ON/OFF key to turn the display on.
- ❑ The scale is for indoor use only. If it is used outside, this product may receive a lightning surge that exceeds its discharge capacity. If that happens, this product may be damaged because it cannot withstand the energy of the lightning.

5.2. Precautions for Operating the Scale

- ❑ 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.

5.3. Precautions for Storing the Scale

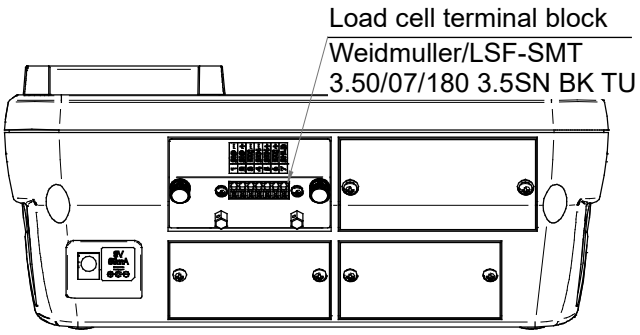
- ❑ Do not disassemble the indicator.
- ❑ Do not use solvents to clean the indicator. Wipe it with a dry lint-free cloth or a lint-free cloth moistened with water and a mild detergent.
- ❑ Protect the indicator from dust and water.
- ❑ Remove the batteries when the indicator is not to be used for a long time.
  If you leave the batteries installed, they may leak and damage the indicator.

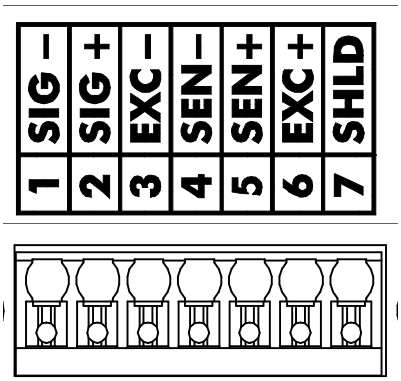
5.4. Load Cell Connection

The load cell can be connected with a 6-wire or 4-wire connection.

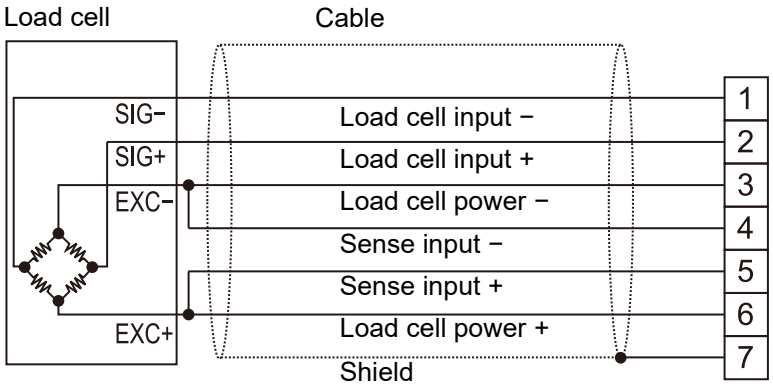
When extending the load cell cable, we recommend using a 6 wire connection to ensure high measurement accuracy and stability.

Please keep the load cell cable length less than 30 m.

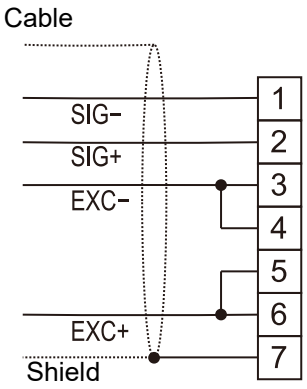




Terminal	Terminal Function	
1	SIG−	Load cell input −
2	SIG+	Load cell input +
3	EXC−	Load cell power −
4	SEN−	Sense input −
5	SEN+	Sense input +
6	EXC+	Load cell power +
7	SHIELD	Shield



(A) 6-wire load cell connection (recommended)



(B) 4-wire load cell connection

Method	Advantage	Disadvantage	Remark
6-wire configuration (recommended)	Less error even if the length of load cell cable is long or a thin load cell cable is used. Less error even if multiple load cells are used.	Slightly complicated to wire.	When using a summing box, it is strongly recommended wiring be done with the 6-wire configuration.
4-wire configuration	Easy to wire.	The accuracy of temperature counting is affected by resistance of the conductor wire for the load cell cable.	Using a long load cell cable or multiple load cells tends to cause error.

Precautions for connecting with the 4-wire configuration

Make sure to do the following when connecting with the 4-wire configuration.

- Short-circuit between EXC+ and SEN+, and between EXC− and SEN−.
- When using a long a load cell cable, use one with a cross-sectional area that is as large as possible. Also, use a cable that is as short as possible.

Ref.: Connection examples of connecting to the SCB series, Dust & Waterproof Precision Weighing Platform (with the 4-wire configuration)

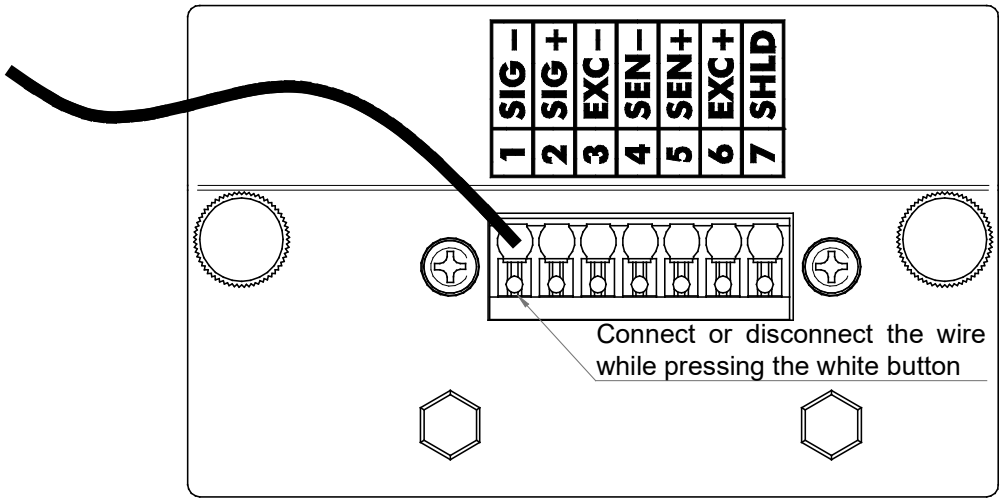
Load cell terminal number	Color of cable core for the SCB series	Function of terminals for SCB series
1	Blue	Signal − (Output terminal)
2	Green	Signal + (Output terminal)
3, 4	White	Excitation − (Input terminal)
5, 6	Red	Excitation + (Input terminal)
7	Yellow	Shield

5.5. How to Connect the Load Cell

1. Refer to “5.4. Load Cell Connection”, and connect the cable core to the terminal block of the load cell.
   - ❑ Hold down the white button on each terminal in the terminal block of the load cell when connecting or disconnecting the wire. (Additional tool is not required.)

Connect or disconnect the wire while pressing the white button

2. Once the load cell is connected, make sure that wiring has been done correctly.



5.6. Verifying Load Cell Output and Input Sensitivity

The input sensitivity is 0.1 μV/division or more.
When designing a weighing scale, the following calculation formula should be satisfied.

- ❑ The input sensitivity requires a change in output voltage, from the weighing device, to change the display value as a one digit step. In order to achieve a scale with stable performance, select the input sensitivity as large as possible.

Calculating formula:

$$0.2 \leq \frac{E \times B \times d}{A \times n}$$

A: Rated capacity of load cell
B: Rated output (mV/V)
d: Minimum division
E: Excitation voltage (mV) = 5000 mV
n: Number of load cells

Example of calculation:

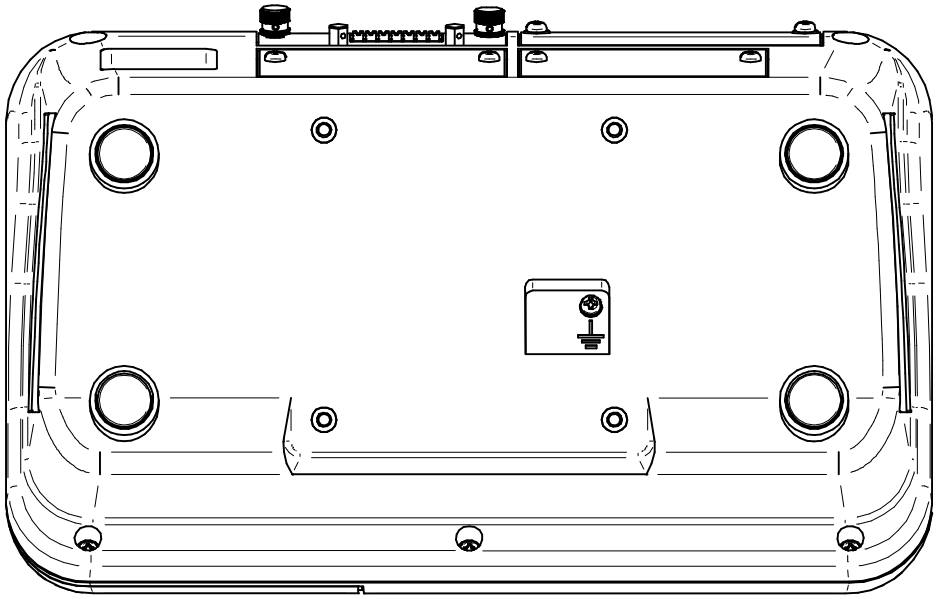
In the case of designing a scale with a capacity of 60 kg and minimum division of 0.005 kg, using one load cell with a rated capacity of 100 kg and rated output of 1 mV/V:

Rated capacity of Load cell:	***A*** = 100 kg
Rated output:	***B*** = 1 mV/V
Minimum division:	***d*** = 0.005 kg
Excitation voltage:	***E*** = 5000 mV
Number of load cells:	***n*** = 1

$$\frac{5000 \times 1 \times 0.005}{100 \times 1} = 0.25 > 0.2$$

The above indicates there is no problem with this design.

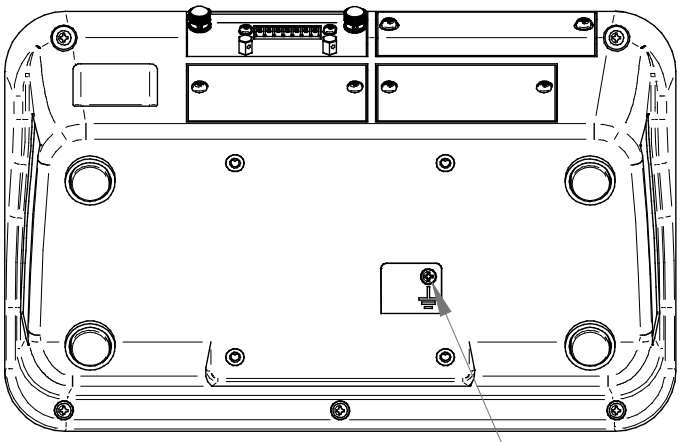
5.7. Setting Up the Indicator



Connect the included AC adapter to a power source.

- ❑ Make sure that the power source you are using is correct before connecting to it.
  For HW-D-C, you can also use four D-cell batteries (R20P / R20PU / LR20).

⚠ **If you are using the unit in a location where static electricity is likely to occur, be sure to also fasten an earth wire to the earth terminal (M3 screw).**

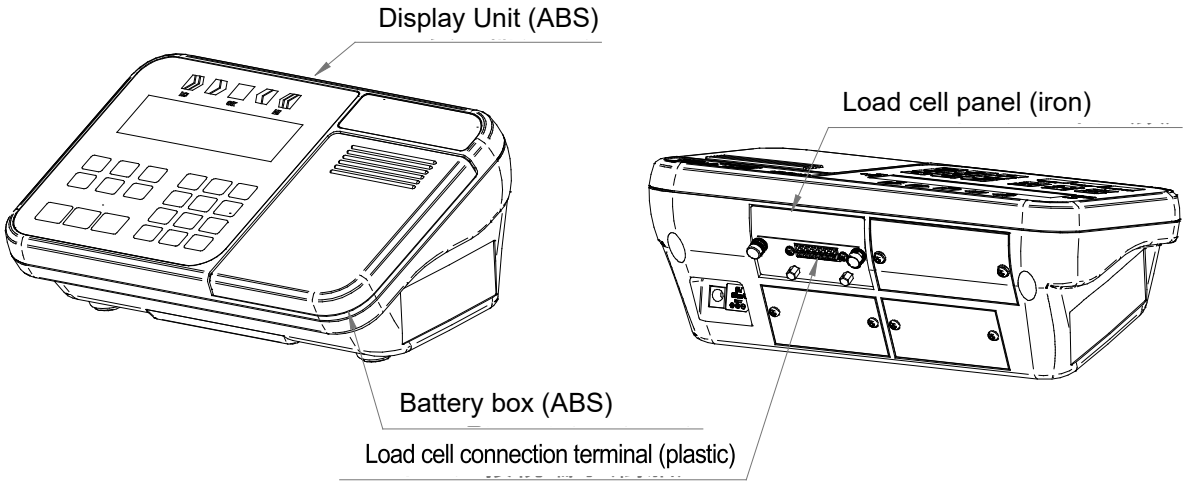


5.8. Sensitivity Adjustment and Parameter Settings

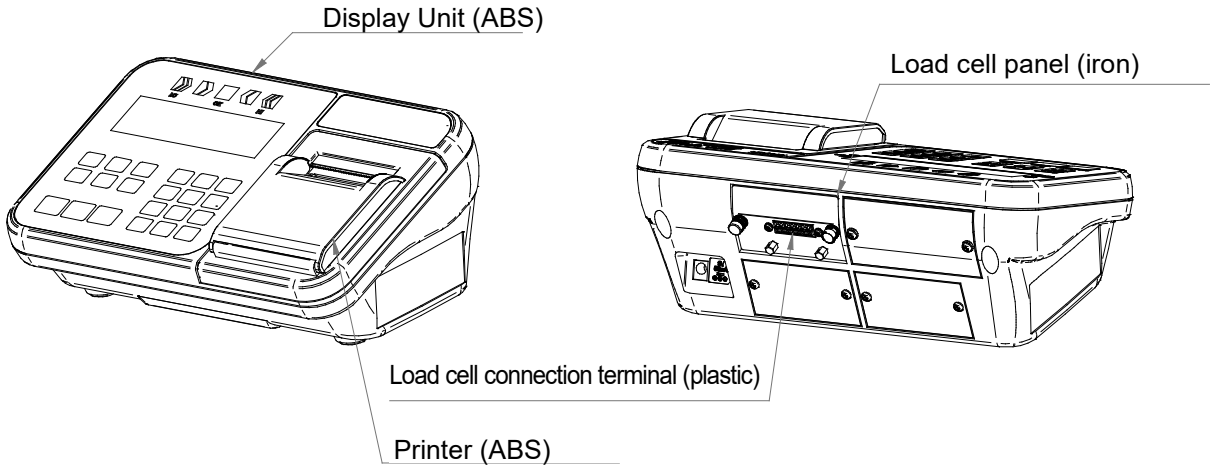
When connecting to a load cell (weighing platform), sensitivity adjustment needs to be performed.
For details, refer to "14. Sensitivity Adjustment Items".
As needed, configure the function settings. For details, refer to "16. CF Functions".

6. Part Names

<HW-D-C (battery-powered model)>

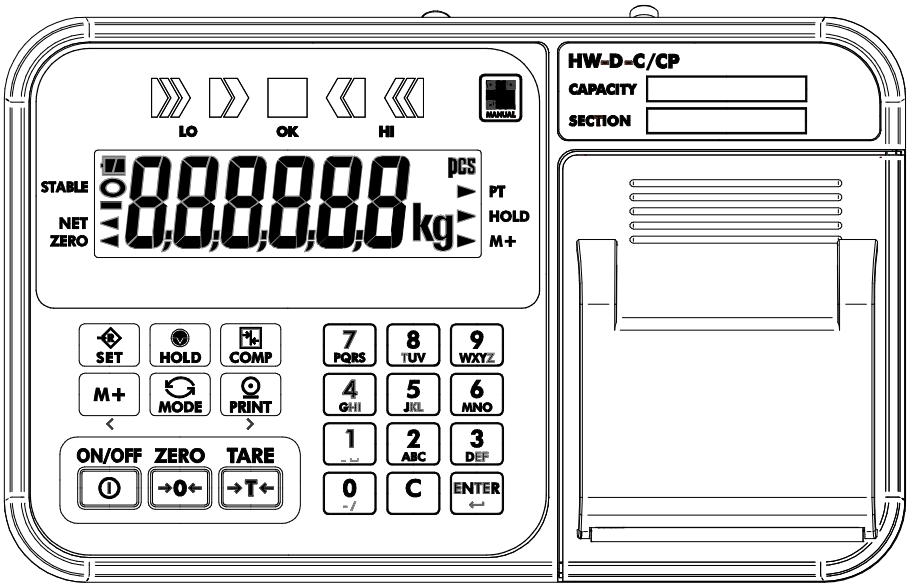


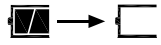
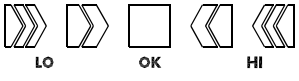
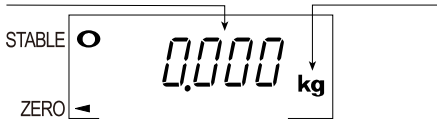
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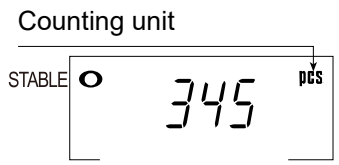
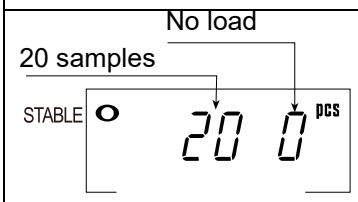
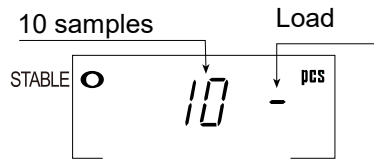
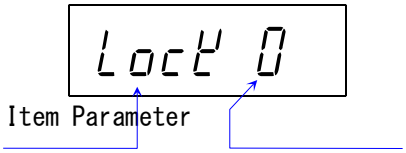
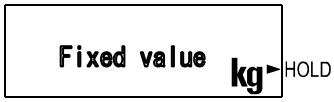
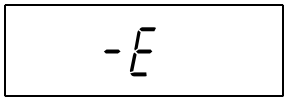
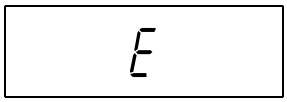
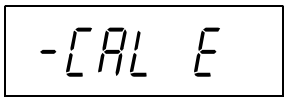
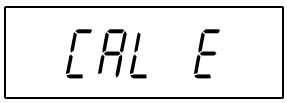


6.1. Display and Symbols

Display



Display/Symbol	Description
STABLE O	**Stable mark** Lit when the measured value is stable and in a state suitable for being read.
NET ZERO ◄	**Zero point mark** The zero point is the reference point for the scale. When the [ZERO] key is pressed with nothing on the weighing pan, zero (the zero point) is displayed as the measured value.
NET ◄ ZERO	**Tare deducted mark** Displayed when the [TARE] key is pressed to deduct the tare. Use this to deduct the weight of objects that will not be weighed, such as containers.
► PT	**Preset tare deduction mark** Flashes when a digitally input tare value is displayed.
► HOLD	**Hold mark** The display is being held.
► M+	**Total function mark** Displayed when using the total function.
	**C type battery level mark** Displayed when the voltage of the batteries has dropped. Replace the batteries with four new D size batteries.
	**Comparator function display** When using the comparator function, displays the result of comparing with the set upper limit value and lower limit value.
Measured mass Unit of mass 	**An example of the zero point (example scale reference point).** Displays the zero point mark. Displays the stable mark. Displayed by pressing the [ZERO] key with nothing on the weighing pan.

Display/Symbol	Description
	**An example of the counting mode display.** By registering a unit mass in advance, you can count the number of objects on the weighing pan.
	**An example of registering a unit mass for the counting mode.** 20 samples are used to register the unit mass. "No load" means that there are no countable objects on the weighing pan.
	**An example of registering a unit mass for the counting mode.** 10 samples are used to register the unit mass. "-" means that there is something on the weighing pan.
	**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.**

Display/Symbol	Description
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**

- "**digit**" is a unit of display and is equivalent to the minimum measurable weighing value.
- "**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. Description of Keys

Key	Description
ON/OFF ⏻	❑ **Power key** Turns the power of the display ON or OFF. When the display is turned ON, the internal circuits are powered. When the display is turned OFF, only the minimum required power to have the scale in standby and the power consumed by the AC adapter connected to the power outlet are consumed.
ZERO →0←	❑ **Zero key** If you press the ZERO key with the measured value stabilized within ±2% of the zero point taken when the power was turned ON ("power on zero"), that point is set as the zero point, zero is displayed, and the zero point mark is lit. If a tare is being deducted, the tare is cleared. When displaying the total result, the total count and total value are cleared.
TARE →T←	**Tare deduction key** If you press the TARE key with a positive measured value stabilized, the mass on the weighing pan is deducted as the mass of the container (tare). Zero is displayed, and both the zero point mark and tare deducted mark are lit (tare deduction). If the container (tare) is removed from the weighing pan while the tare is being deducted to return to the zero point, both the zero point mark and tare deducted mark are lit. In this case, a negative tare value is displayed. **Note** ❑ **The measurement range is reduced by the tare mass.**

Key	Description
M+ <	Adds to the total.
SET	**SET key** Select +/− when setting the upper and lower limits.
SET pressed with TARE →T←	Enters the mode for setting the preset tare deduction.
SET pressed with PRINT >	Feeds the paper of the built-in printer.
SET pressed with M+ <	Displays the total result.
SET pressed with COMP	Sets the upper and lower limit values for the comparator.
SET pressed with ENTER ↵	Proceeds to the operation for registering a unit mass in the counting mode.
MODE	**MODE key** ❑ Keys the display mode (unit). Weight ⇔ Count ❑ When setting values, functions as the key for selecting the item to set.
HOLD	**HOLD key** Holds the display. Refer to the internal settings.
PRINT >	**PRINT key** Prints or outputs data for the displayed value. The operation depends on the internal settings.
Display OFF ↓ TARE →T← pressed with ON/OFF ⏻	Enters the internal settings.

7. Basic Operation

7.1. Turning the Scale On/Off and Weighing

7.1.1. When Using the AC Adapter

Step 1 Confirm that nothing is placed on the weighing pan.

Step 2 Confirm that local voltage and receptacle type are correct.

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 the 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.

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.

7.1.2. When Using the Batteries for Type C

Step 1 Install four new batteries. Refer to “4.1. 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.

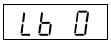
Step 6 Gently place an object to be weighed on the weighing pan.

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.

For instructions on configuring the power on zero function threshold, see Section “16.2. CF Function List”

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.

The power on tare function is executed when the initial load is greater than or equal to the configured power on zero function threshold.

7.2. 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.
- 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.

＊ The registered value remains stored even after the power is turned off.

7.3. Saving the Zero Value and Tare Weigh

On the HW-D-C/CP, saving the zero value and tare weight allows weighing to resume from the previous measurement when the power is turned on again.

Example Operation

	Operation	Display
1	Turn the power ON.	0.00 kg
2	Place the container (tare) on the scale.	5.00 kg
3	Perform tare. (Tare is stored.)	0.00 kg
4	Add the material to be weighed.	50.00 kg
5	Turn the power OFF.	-
6	Turn the power ON again.	50.00 kg

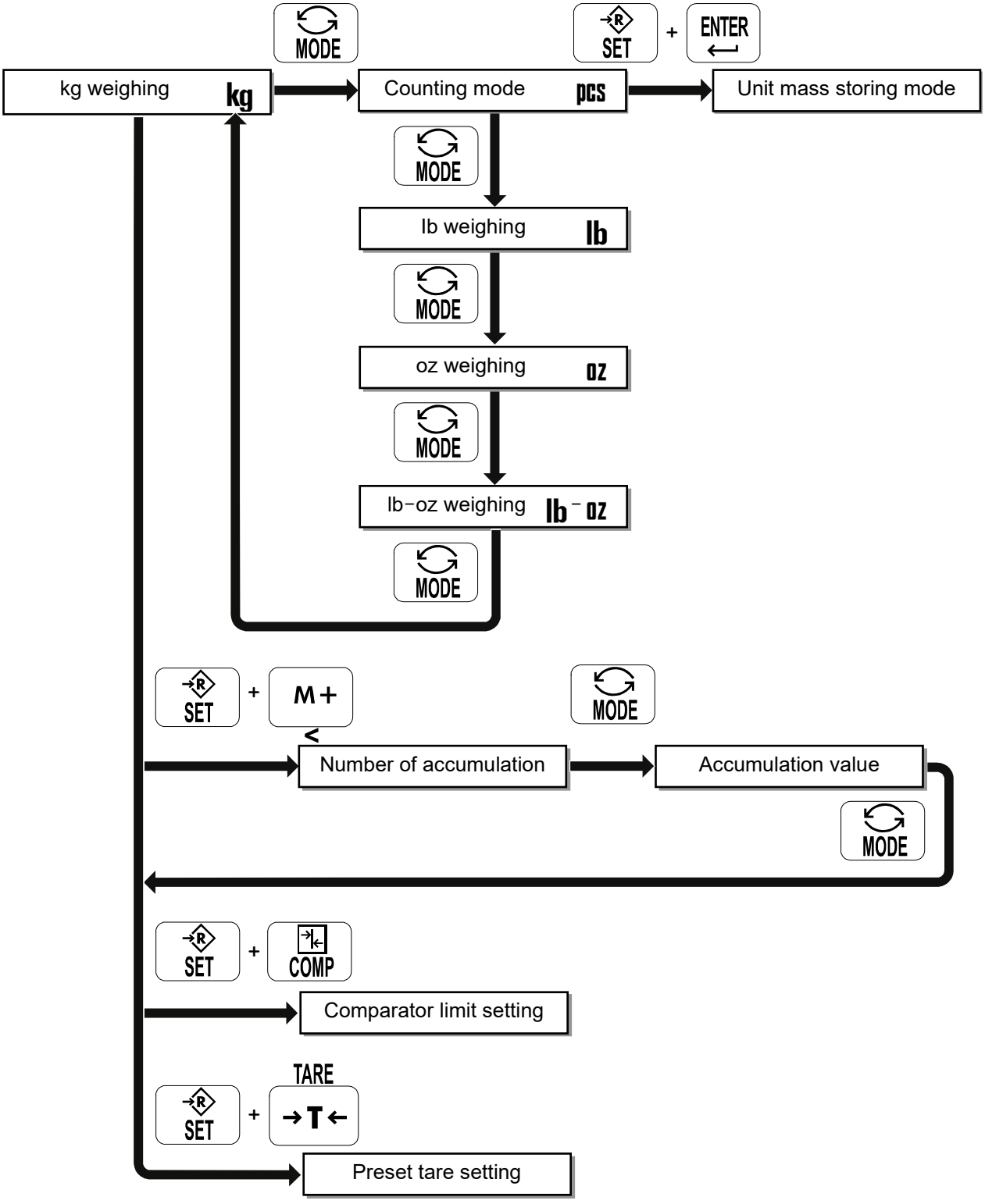
To use this function, set the following items according to “16.1. Setting of the CF Function”

- CF 9 : 0 (Power on zero range：0%)
- CF25 : 1 (Saving zero value and tare weight：Save)

＊When used together with the Automatic power on, the display can be turned ON automatically simply by applying main power, without operating the ON/OFF key.
To enable Automatic power on, refer to “15.2. Parameter List” and change the setting value.

7.4. 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.



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

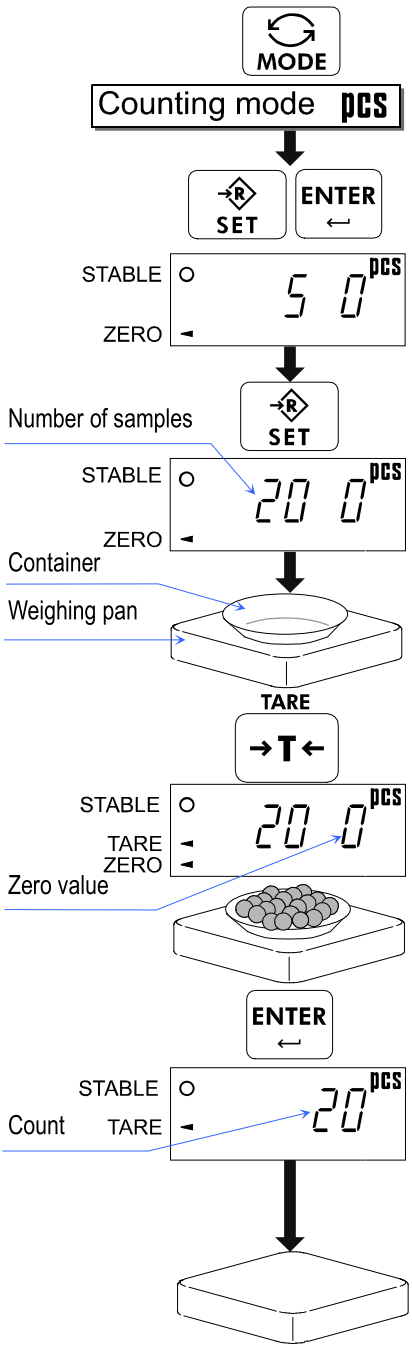
Step 1 Press the [MODE] key to display the unit PCS.

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.

8.2. Counting the Number of Objects

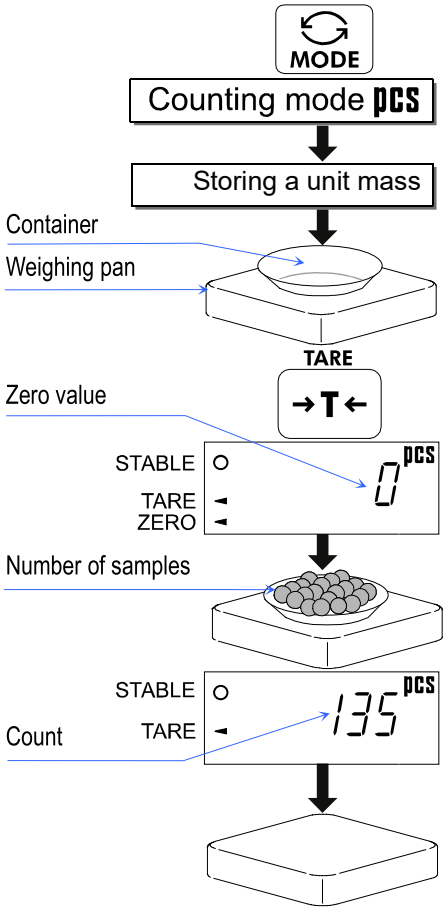
Step 1 Press the [MODE] key to display the unit PCS.

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 60.000 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).

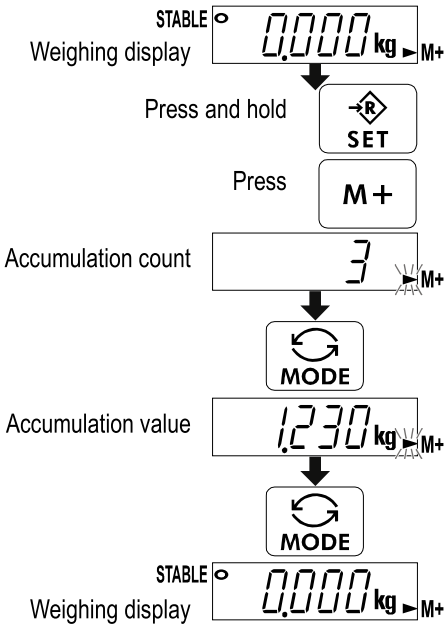
Display and Key Operations of Accumulation Function

- 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 of 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".

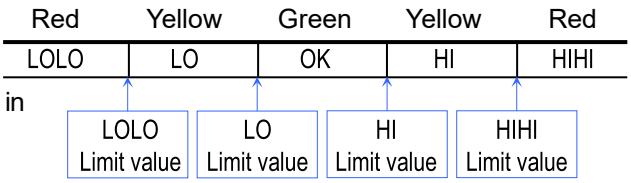
Item and Parameter	Description
Sun 0	Accumulation function not used.
Sun 1	▫ When the weighing value is a positive stable value and not "**near zero**", if the M+ key is pressed, the value is accumulated. ▫ The next accumulation can be performed after the display becomes "**near zero**" or a negative 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.

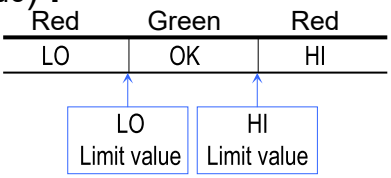
Five-Level Comparator Mode :

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) :

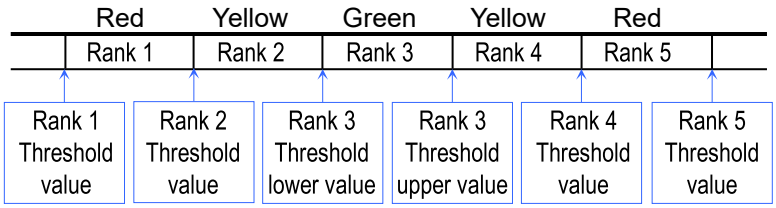
This mode compares the weighing value with two threshold values (upper and lower limit) and outputs results in three levels of LO, OK and HI.



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. 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.

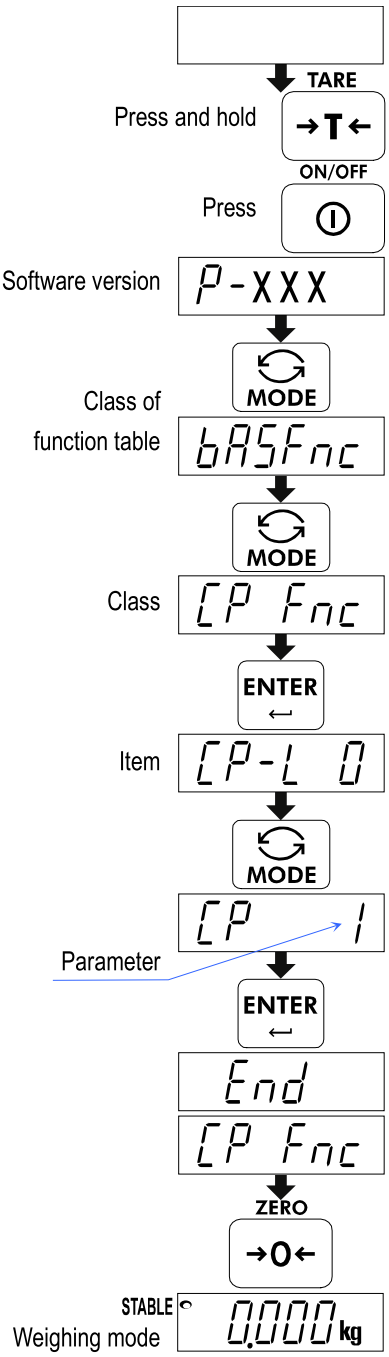
Step 2 Select class [CP Fnc] using the [MODE] key.
Press the [ENTER] key to store it.

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. Comparator Memory and Comparison Value Settings" to use the comparator mode.



10.2. 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.

10.3. Comparator Memory and Comparison Value Settings

Comparator Memory Function

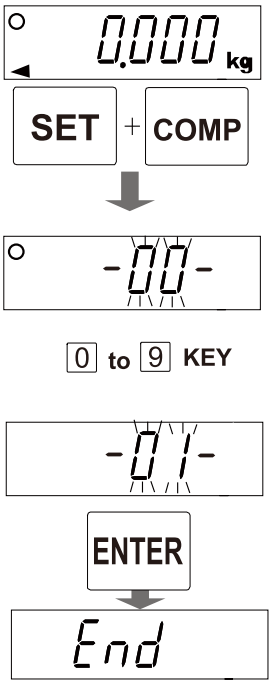
The comparator memory function can store multiple types of comparison value settings for the comparator function. It can store up to 100 types. (Memory numbers: 00 to 99)

How to Select Comparator Memory

From the mass display, press the [SET] key while pressing the [COMP] Limit key to enter the comparator memory setting mode.

The currently selected memory number (00 to 99) will be displayed. Use the [0] to [9] keys to key the display of memory numbers. The stability mark will light up for the currently selected memory number.

Enter the memory number you want to select and press the [ENTER] key to set the comparator memory. After [End] displaying, it will return to the mass display.

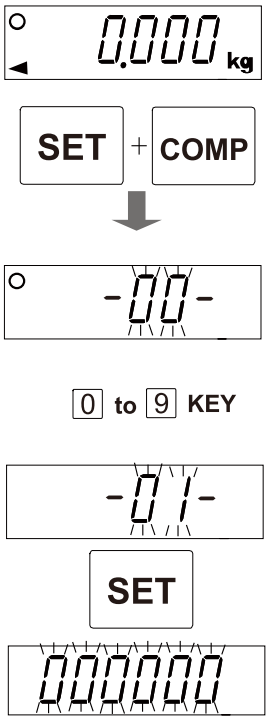


Setting Comparison Values

From the mass display, press the [SET] key while pressing the [COMP] Limit key to enter the comparator memory setting mode.

The currently selected memory number (00 to 99) will be displayed. Use the [0] to [9] keys to key the display of memory numbers. The stability mark will light up for the currently selected memory number.

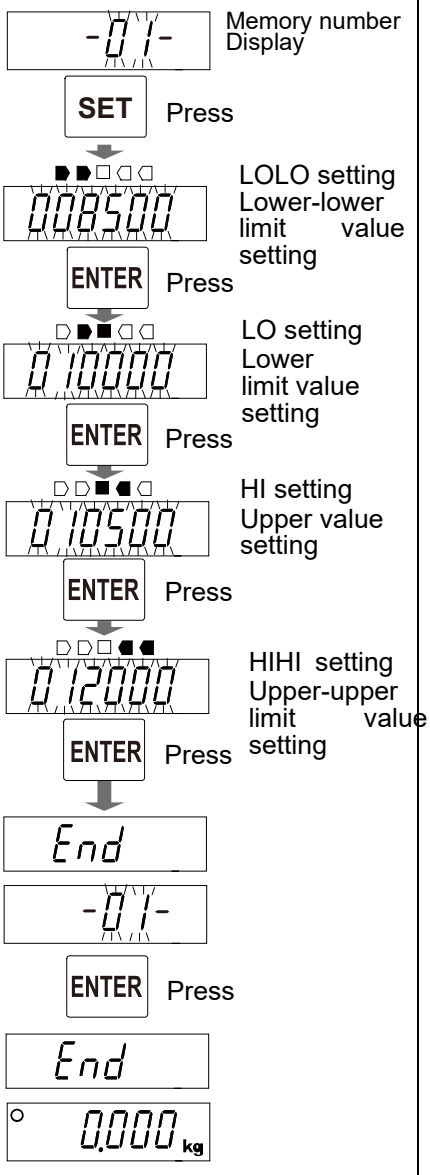
Enter the memory number for which you want to set the comparison value and press the [SET] key to set the comparator memory and enter the comparison value setting mode.



Please set each comparison value using the following key operations.
[0] to [9] : Numeric input [SET] : Toggle between + and − [ENTER] : Confirm (register) the set value
[C] : Cancel
* Each time you press the [SET] key, the "−" sign will repeatedly light up and turn off at the highest digit. When lit, it indicates a negative setting.
Once all settings are complete, the screen will return to the mass display after showing [End]. (Power-on zero is not taken at this time.)

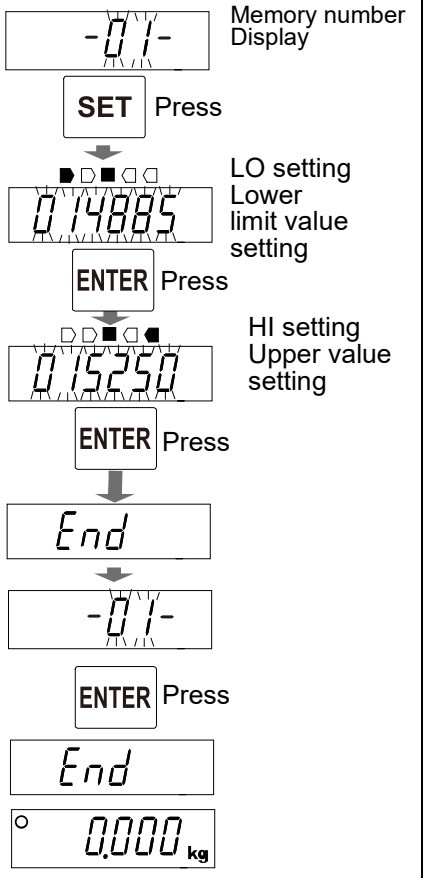
Setting 5-Stage Sorting Mode

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



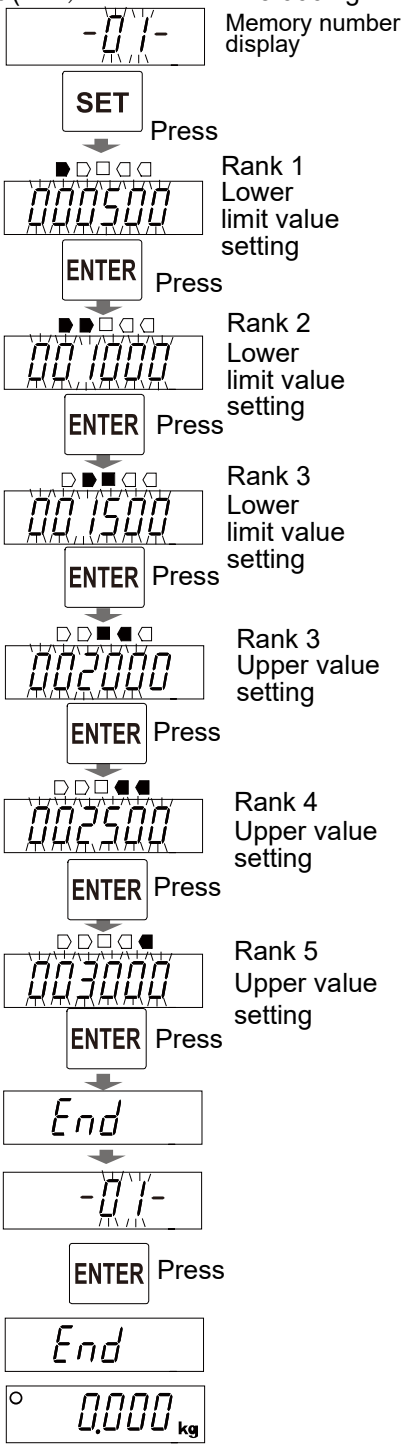
Setting 3-Stage Sorting Mode Upper/Lower Limit Mode

LO	148.85 kg
HI	152.50 kg



Setting 7-Stage Sorting Mode Ranking Mode

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)	less than	2.500 kg
Rank 5 (HIHI)	less than	3.000 kg



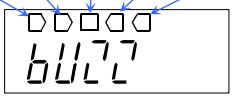
10.4. Buzzer of Comparator Mode

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 bUZZ 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.

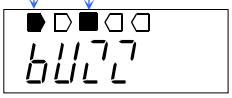
Step 1 Press the [1] key to light up the LED for LOLO.

Step 2 Press the [3] key to light up the LED for OK.

Step 3 Press the [ENTER] key to store the settings.

If the result is LOLO, buzzer sounds

If the result is OK, buzzer sounds

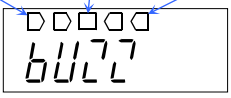


Caution

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 HW-D-C/CP 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.

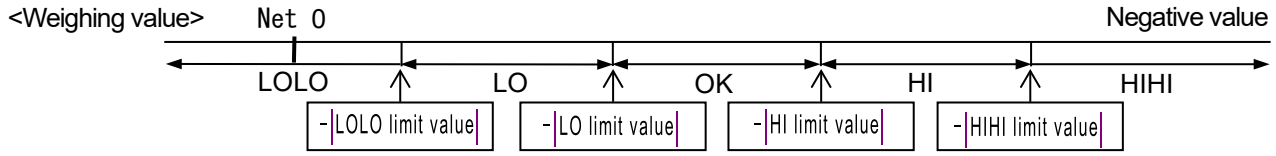
  [AT-T 0] to [9] : Select the timing to tare automatically to avoid the wrong tare operation, Example : Too early to tare, so take longer time to go to the next weighing.

- 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** Sun 4 " and "**Built-in printer output mode** PrtP 9 " are set.

- Accumulation mode Sun 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.

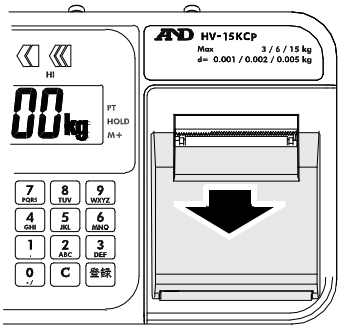
Printing example for accumulation result (accumulated data and count).

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

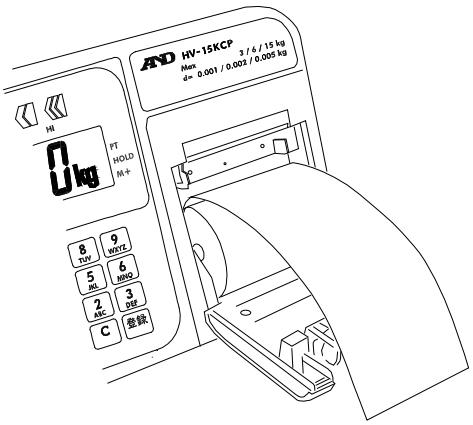
If the PRINT key is pressed while the accumulation result (accumulated data and count) is displayed, this result is printed.

12.1. Installing the Roll Paper

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

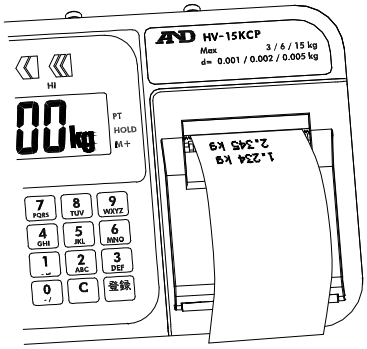


Step 2 Install the roll paper so that the end of the paper is at the top.



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 (HW-D-CP) 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.

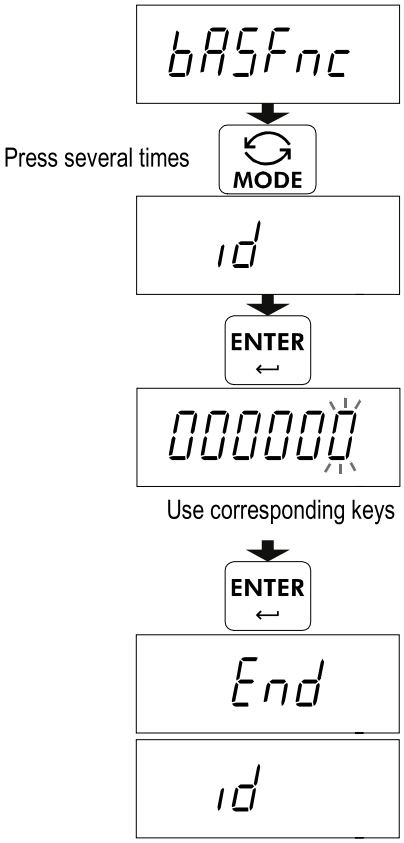
Step 2 Press the [MODE] key several times to display [id].

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	I	J	K	L	M	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.

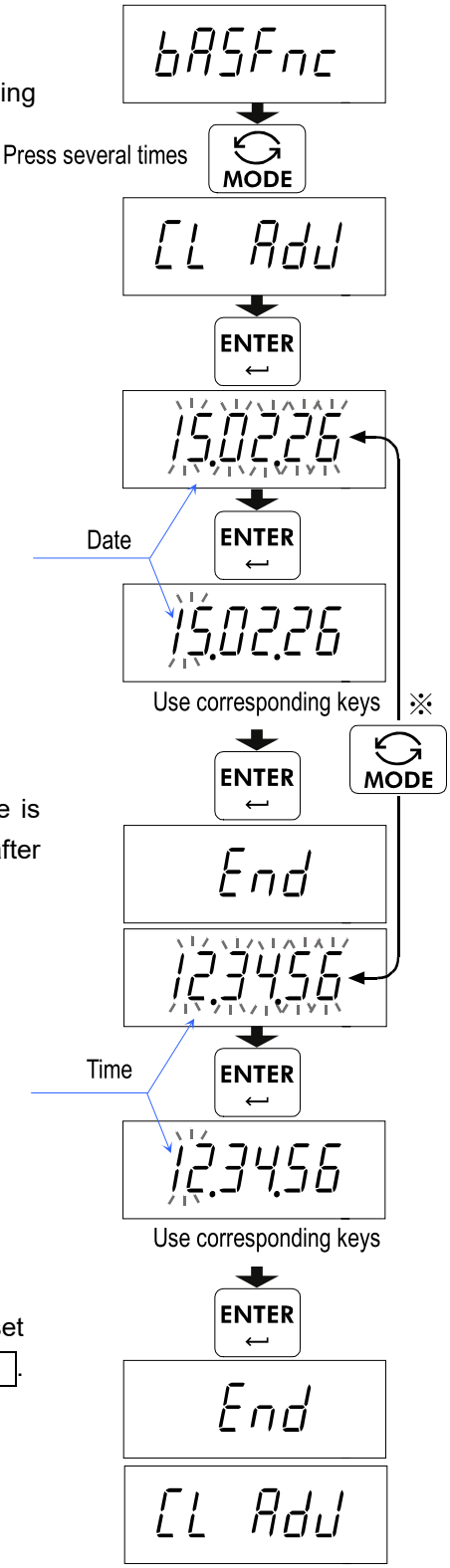
-Time setting mode -

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-8129TH printer, use "**Format of AD-8129TH**, [inF 1 1] or [inF2 1]" in the function table.
  Use "**DUMP print mode**" for the AD-8129TH.
- If the GMP report is output to a personal computer, use "the general format, [inF 1 2] or [inF2 2]" in the function table.

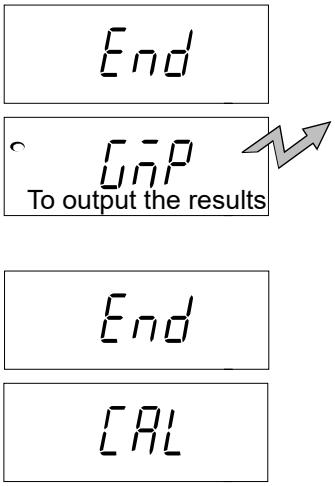
Calibration report

Step 1 Perform calibration according to "14. Sensitivity Adjustment"

Step 2 [End] appears when calibration is complete.

Step 3 [GmP] 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] key.



Printer format [inF 1 1]

```
          A & D
MODEL    HW-D-CP
S/N    6A6123456
ID         ABCDEF
DATE  2018/04/01
TIME    16:47:39
CALIBRATED(EXT.)
CAL.WEIGHT
      +15.000 kg
SIGNATURE



- - - - - - - -
```

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

General format [inF 1 2]

```
␣␣␣␣␣␣␣␣␣␣A␣&␣D<CR LF>
MODEL␣␣␣␣HW-D-CP<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>
<CR LF>
<CR LF>
-␣-␣-␣-␣-␣-␣-␣-␣-␣<CR LF>
<CR LF>
<CR LF>
```

␣ : Space, ASCII 20h
C_R : Carriage return, ASCII 0Dh
L_F : 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 key until [CC] appears, and then release the key.

- 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.

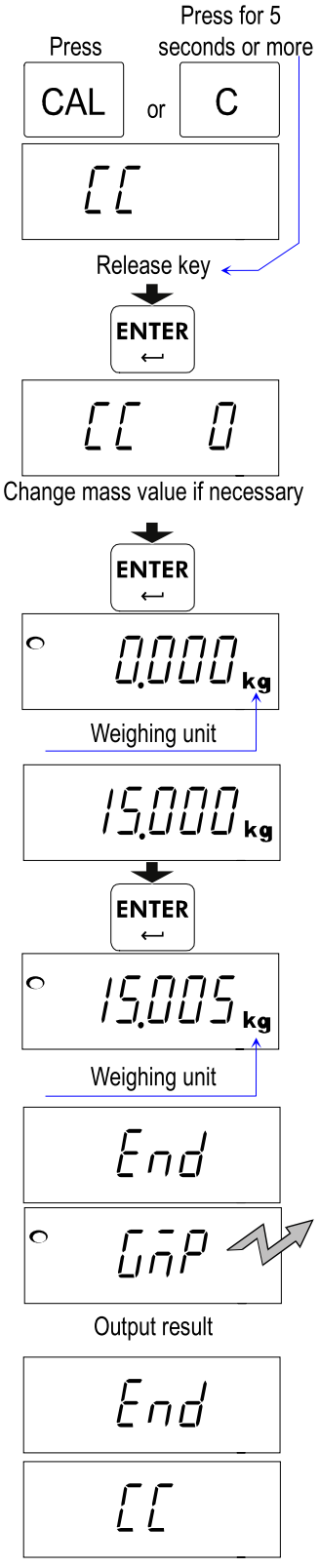
Step 4 With nothing on the weighing pan, press the ENTER key. The zero point is measured and the measured value with the unit "kg" is displayed for a few seconds. Then, the value of the calibration weight is displayed.

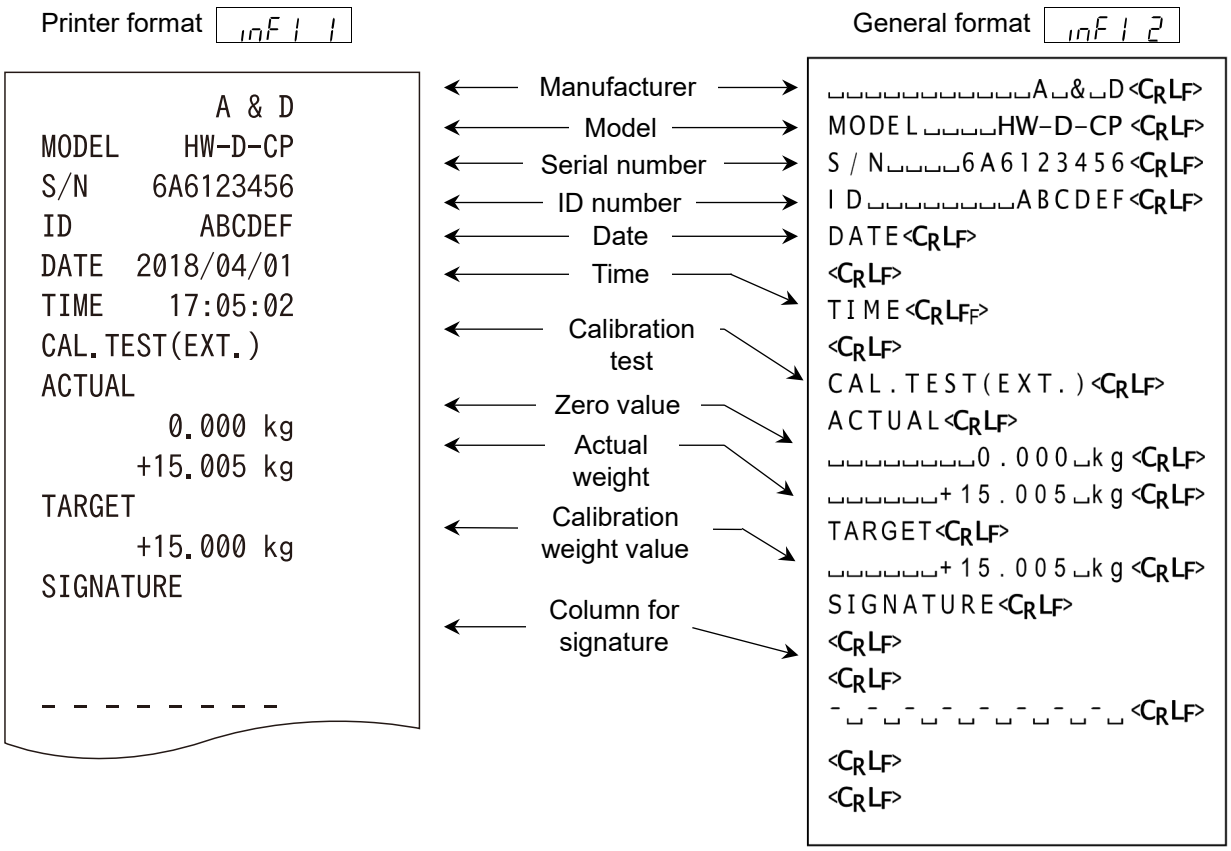
Step 5 Place a weight of the same value as displayed on the weighing pan and press the ENTER key to measure it. The measured value with the unit "kg" is displayed for a few seconds.

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 key.





␣ : Space, ASCII 20h
C$_{\mathbf{R}}$: Carriage return, ASCII 0Dh
L$_{\mathbf{F}}$: Line feed, ASCII 0Ah

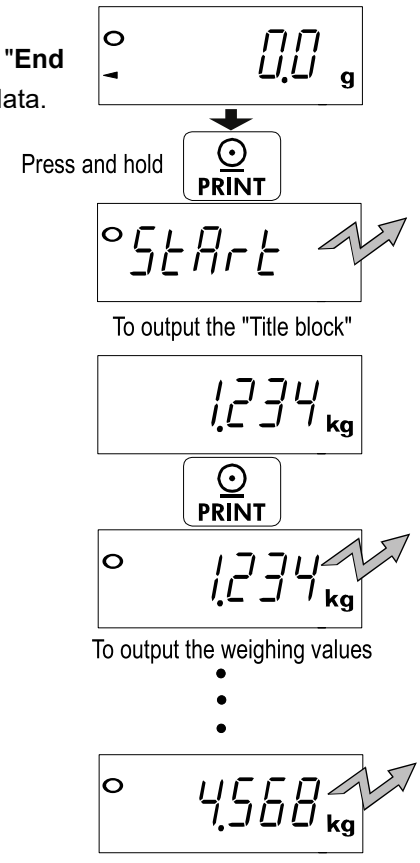
Output of "Title block" and "End block"

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

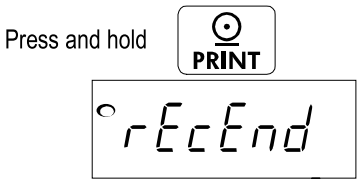
Step 1 In the weighing mode, press and hold the PRINT key until StArt appears, and release then the key. The scale outputs the "Title block."
The scale automatically returns to the weighing mode.

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



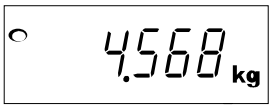
End block

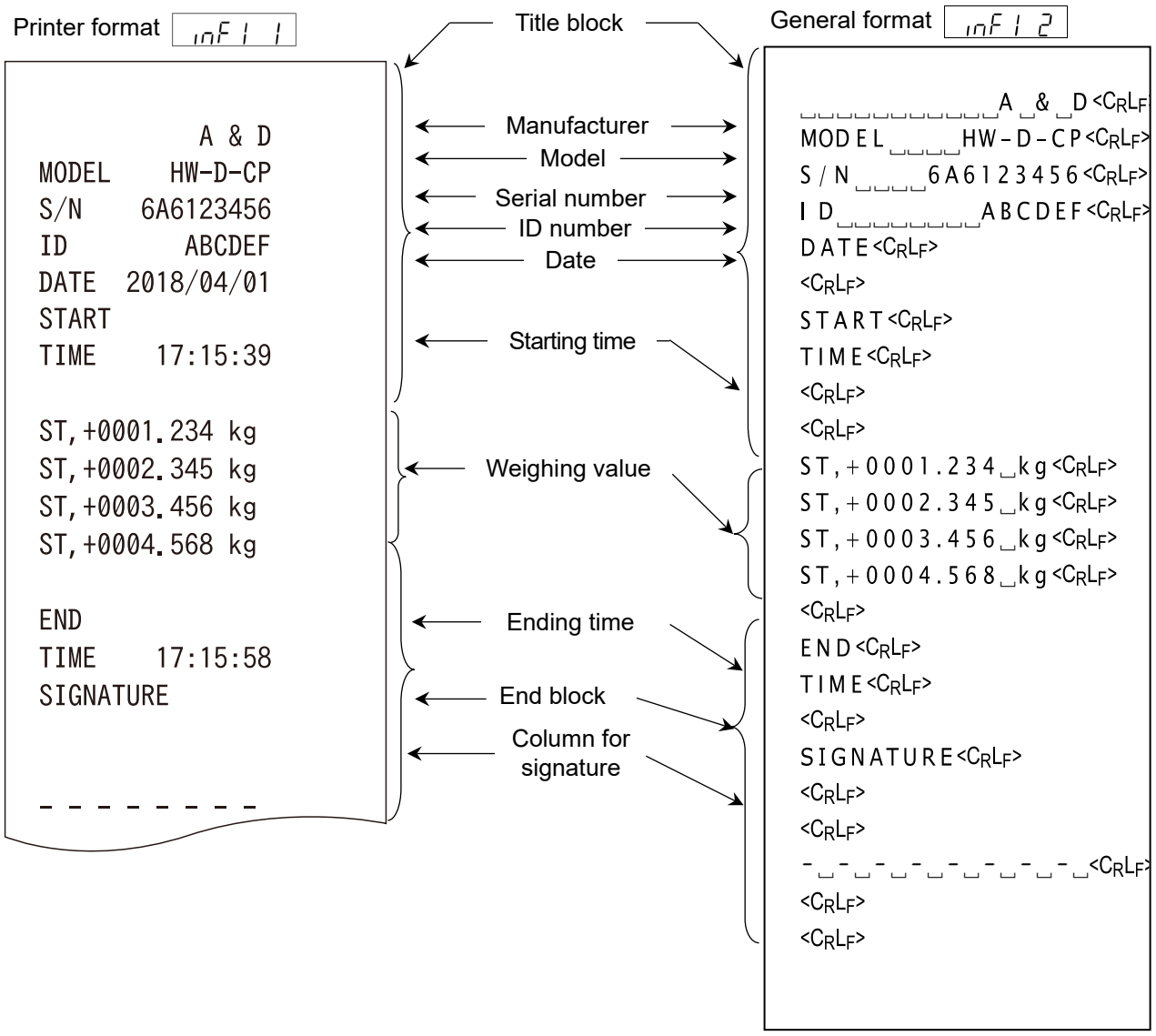
Step 3 Press and hold the PRINT key until rEcEnd appears, and release then the key.
The scale outputs the "End block."



To output the "End block"

Step 4 The scale automatically returns to the weighing mode.





␣ : Space, ASCII 20h
C$_R$: Carriage return, ASCII 0Dh
L$_F$: Line feed, ASCII 0Ah

14. Sensitivity Adjustment

- ❑ The description of sensitivity adjustment in this manual is different from that in the instruction manual for the HV-C / CP and HW-C / CP series. Please read the description below.

14.1. Sensitivity Adjustment Items

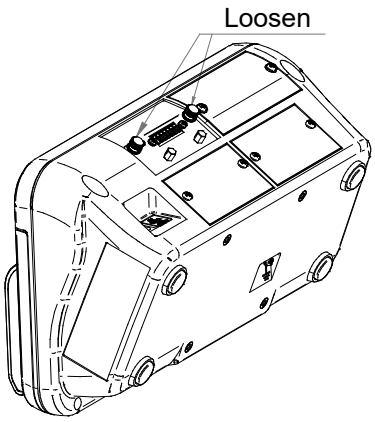
Sensitivity adjustment mode has the following three functions.

- ❑ Setting of the weighing capacity, minimum division, and decimal point position.
- ❑ Sensitivity adjustment using a weight
- ❑ Correcting for gravitational acceleration

Enter the sensitivity adjustment mode in the following way.

1. Confirm that the scale(indicator) is in weighing mode (display shows measurement unit).

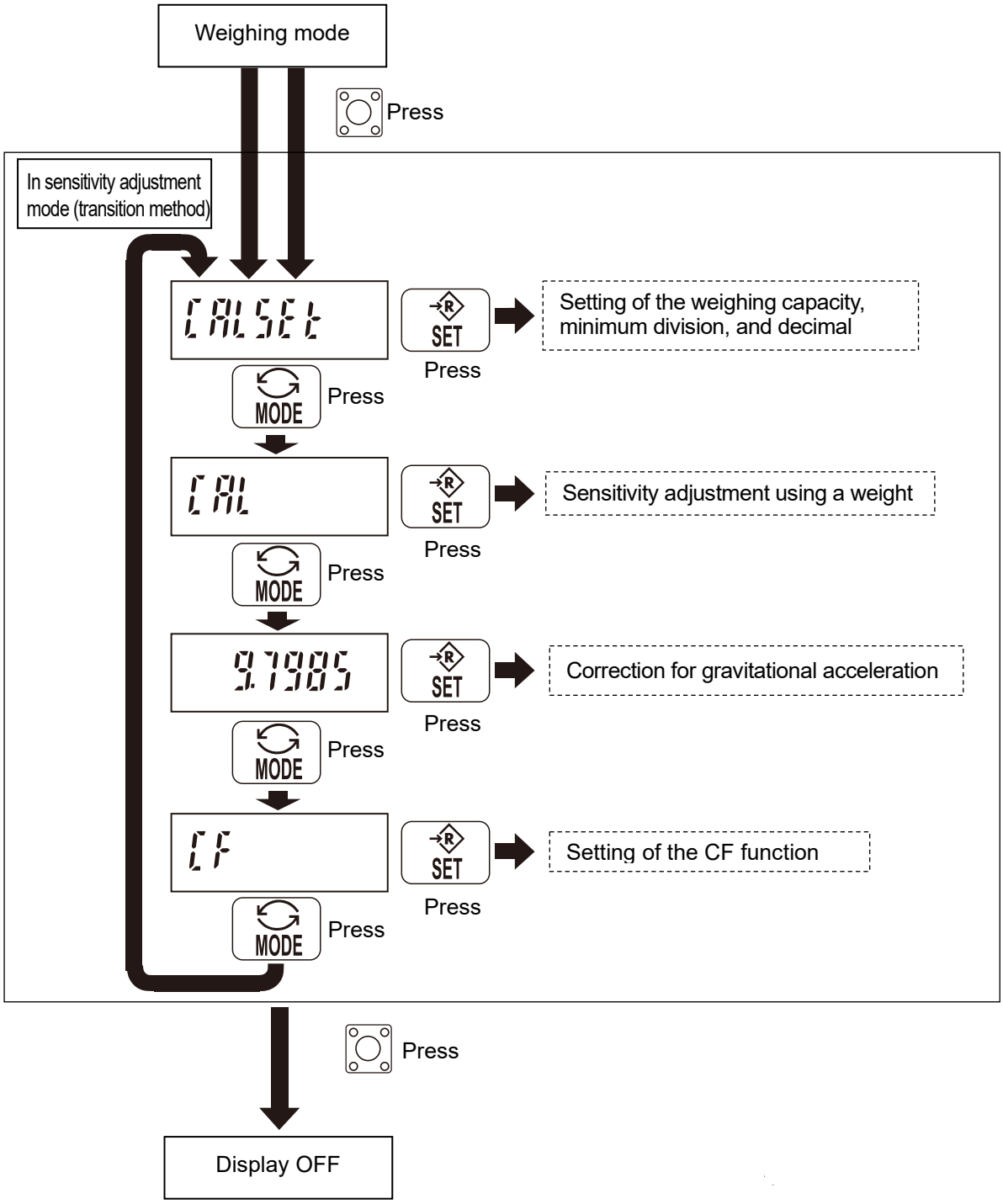
2. Remove the protective cover from the four screws of the load cell panel on the rear of the display unit, and then loosen the four screws and open the load cell panel.



3. Press the CAL key to display CALSEt (Then go to "14.2. Setting of the Weighing Capacity / Minimum Division / Decimal Point Position", "14.3. Sensitivity Adjustment Using a Weight", or "14.4. Correcting for Gravitational Acceleration")



❑ Relations between items in sensitivity adjustment mode and key operations are shown in the diagram below.



Note: Use the [MODE] key to select the item to execute, and then execute with the [TARE] key.
Note: To end sensitivity adjustment mode, press the [ZERO] key or CAL key.
The display turns off. (You can also turn it off using the [ON/OFF] keys.)

14.2. Setting of the Weighing Capacity / Minimum Division / Decimal Point Position

Set the weighing capacity, minimum division, and decimal point position. Be sure to perform these setting first when connecting to a load cell (base unit). The indicator does not require setting each time, if nothing is to be changed.

1. Refer to "14.1. Sensitivity Adjustment Items", to enter the calibration mode. The indicator displays [CALSET].
2. Press the [SET] key to enter the setting mode of the weighing capacity, minimum division, and decimal point position.
3. The indicator displays the currently set minimum division and calibration unit.

   (Display example: [d - 1 kg])
   The blinking digit indicates the minimum division. Press the [SET] key to select 1, 2, 5.
   The unit indicates the sensitivity adjustment unit.
   Press the [MODE] key to select either "kg" or "lb".

   Press the [SET] key to store the currently set minimum division and calibration unit, and proceed to the next step.
4. After displaying , "CAP" the indicator displays the currently set weighing capacity and decimal point position.
   (Display example: "060.000 kg")

   Set the weighing capacity and decimal point position using the following keys:

   [Numeric keypad] Setting the weighing capacity.

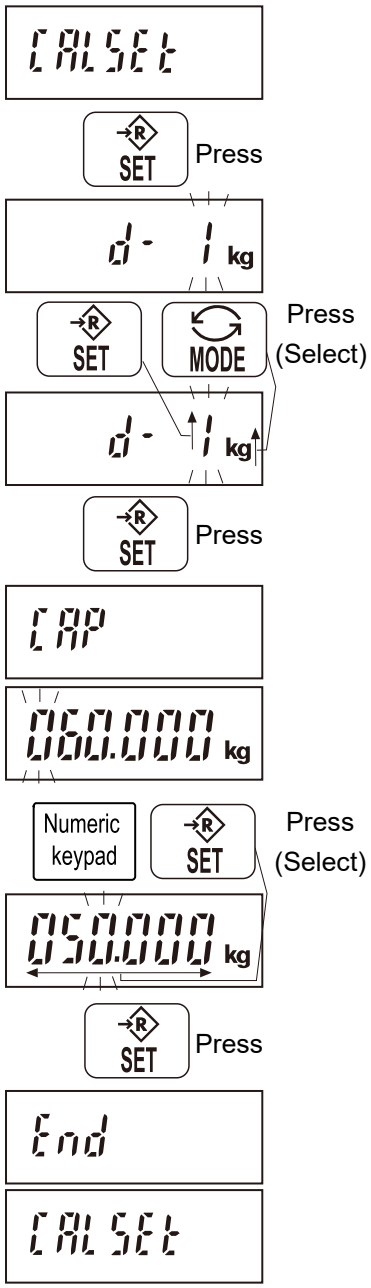
   [SET] Shift the decimal point position.

   Press the [SET] key to store the currently displayed weighing capacity and decimal point position, and proceed to the next step.

   Note: Press the C key to revert to the previous value.

   ❑ Available setting range of the resolution is 60,000 or less.
   The resolution is the value that divides the weighing capacity by the minimum division. (Decimal point position is ignored.)
5. After displaying [End], the indicator displays [CALSET] and the setting is complete.

   ❑ After setting the weighing capacity, minimum division, and decimal point position, be sure to perform "14.3. Sensitivity Adjustment Using a Weight".



14.3. Sensitivity Adjustment Using a Weight

This function adjusts the scale (indicator) for accurate weighing.

Sensitivity adjustment must be done when the HW-D-C is initially connected to a load cell (base unit) or the combination is changed.

Sensitivity adjustment may also be required according the changes in the environment.

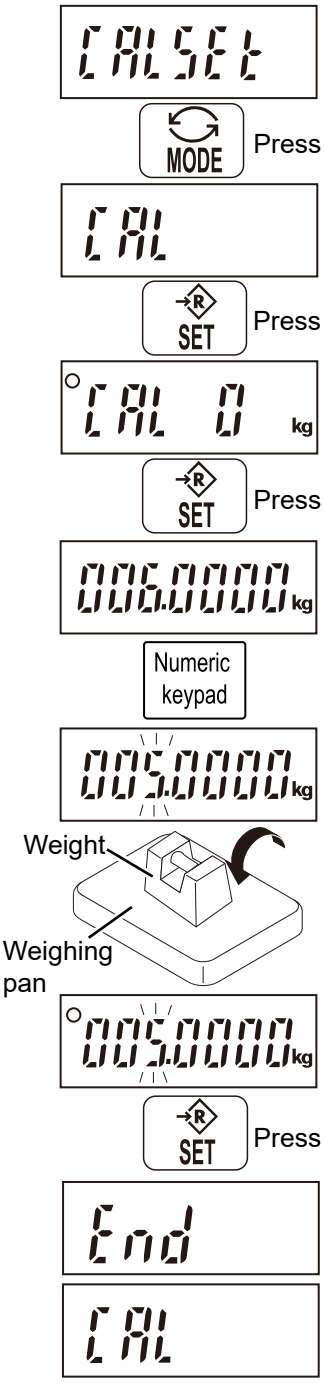
- ❑ When the scale (indicator) is initially installed.
- ❑ When the scale (indicator) is moved to a location far away.
- ❑ When the ambient environment has greatly changed.
- ❑ In periodic sensitivity adjustment.

Note

❑ **Prepare a weight. (A weight equivalent to the weighing capacity of the scale to be adjusted is recommended. However, the value for the weight can be set (changed).)**

1. Turn on the scale and supply it with power for 30 minutes or longer.
   - ❑ Change the parameter for the internal settings item [PoFF] or place something on the weighing pan to keep the automatic power off function from activating.
2. Refer to "14.1. Sensitivity Adjustment Items". [CALSEt] is displayed when you enter sensitivity adjustment mode.
3. Press the [MODE] key to display [CAL] .
4. Press the [SET] key to display [CAL 0] .
   Make sure there is nothing on the weighing pan and wait for the stability indicator to light up.
5. Press the [SET] key to save the zero point on the scale and display the value for the weight.
   - ❑ The value for the weight is the same as the weighing capacity. (Initial state)
   - ❑ To adjust just the zero point, turn off the scale to end without performing step 6.
6. To adjust with a weight value different than the weighing capacity, change the value with the numeric keypad.

   * Press the C key to revert to the previous value.
   - ❑ A weight equivalent to the weighing capacity of the scale is ordinarily used. If using a different weight, it should be at least 2/3 the weighing capacity.
7. Place on the weighing pan a weight of the value displayed. Wait for the stability indicator to light up.
8. Press the [SET] key to end sensitivity adjustment. [End] will be displayed. After displaying [CAL] , the setting is complete.
9. To end setting, press the CAL key. The display turns off.



Note

- **If the scale (indicator) is moved to a distant location after sensitivity adjustment, adjust the gravitational acceleration value to that of the area where it will be adjusted next. Then adjust the scale. See the next chapter for setting gravitational acceleration.**

14.4. Correcting for Gravitational Acceleration

When relocating a scale (indicator), you need to perform sensitivity adjustment with a weight. If a weight is not available, you can adjust the scale (indicator) by correcting the gravitational acceleration. Refer to the acceleration map on the last page, and change the gravitational acceleration value recorded in the scale (indicator) to the one for appropriate location.

Note

- **If sensitivity adjustment is done using a weight at the place where the scale (indicator) is used, it does not need to be corrected for gravitational acceleration.**

1. Refer to "14.1. Sensitivity Adjustment Items". [CALSEt] is displayed when you enter sensitivity adjustment mode.



2. Press the [MODE] key twice to display the gravitational acceleration parameter (Example: "9.7985").





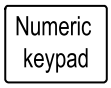
3. Press the [SET] key to enter the gravitational acceleration setting mode.





4. To adjust the gravitational acceleration value displayed, change the value with the numeric keypad.

   * Press the C key to revert to the previous value.





5. Press the [SET] key to display [End] and save the parameter. After displaying the gravitational acceleration parameter (Example: "9.7985"), the setting is complete.



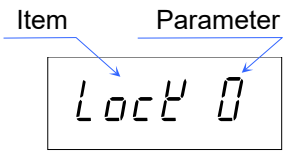


6. To adjust using a weight, return to step 2 of "14.3.Sensitivity Adjustment Using a Weight". To end setting, press the CAL key. The display turns off.



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

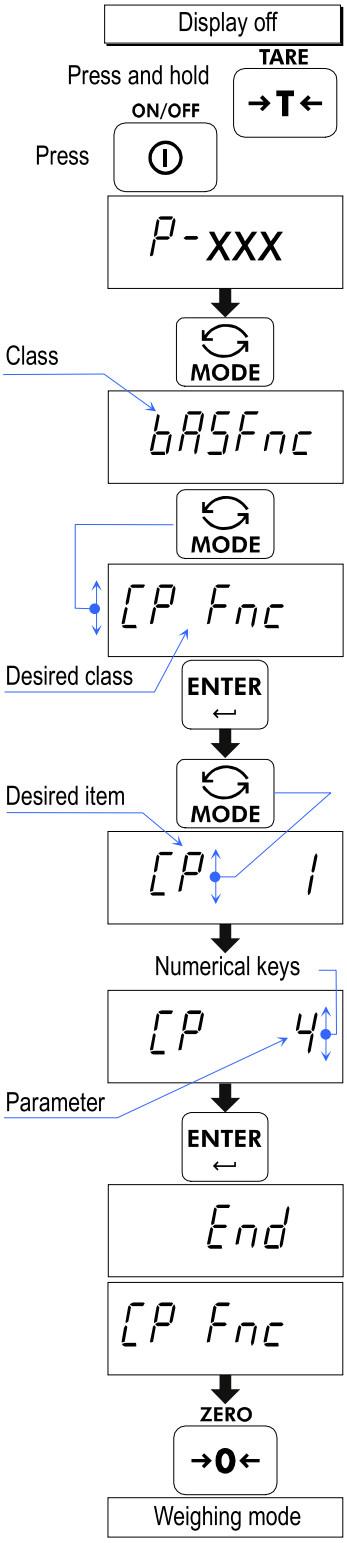
Step 1 Turn off the display.
While pressing and holding the [TARE] key, press the [ON/OFF] key to display software version [P-XXX].
Press the [MODE] key to enter function setting mode.
First class [bASFnc] is displayed.

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 Factory settingsList

Class	Items	Parameter	Details and usage
bASFnc	Key lock LocK *1	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
		1	After 5 minutes
		2	After 10 minutes
		3	After 15 minutes
		4	After 30 minutes
		5	After 60 minutes
			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.
	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
		1	±1 digit
		2	±2 digits
	Stability band time St-t	0	0.5 seconds
		1 ■	1.0 second
		2	1.5 seconds
			Condition for lighting stability mark : Factory settings for stability mark is "within ±0.5 digits" and "within 1.0 second".
	Weighing stabilization level Cond	0	Fast response / sensitive to vibration ↕ Slow response / stable weighing
		1	
		2 ■	
		3	
		4	Weighing at good environment ↕ For stable weighing
	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

*1 External contacts and commands are excluded.

- "**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 SUn	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  Bright	
		1		
		2 ■		
		3		
		4		
	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 "17.5. 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-8129TH.
		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-8129TH
		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-8129TH.
Use the "**dump print mode**" of the AD-8129TH.

□ "**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-8129TH.
		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-8129TH
		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-8129TH.
Use the "**dump print mode**" of the AD-8129TH.

□ "**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 [CLrFnG].

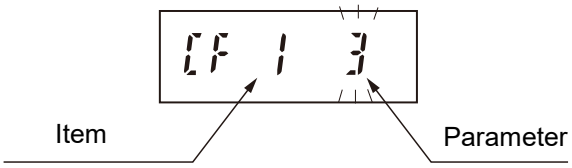
Step 3 Press the [SET] key to display [CLrFG0].

Step 4 When [CLrFG0] is displayed,
press the [ENTER] key to initialize parameters to the factory settings.
The scale displays [End] and enters weighing mode.

16. CF Functions

The indicator has CF function settings to specify the indicator performance.
After installing the indicator, the indicator does not require resetting or changing of this CF function as far as it is used normally.

16.1. Setting of the CF Function



1. Refer to "14.1. Sensitivity Adjustment Items", to enter the sensitivity adjustment mode. The indicator displays [CALSET] .

2. Press the [MODE] key three times to display [CF] .

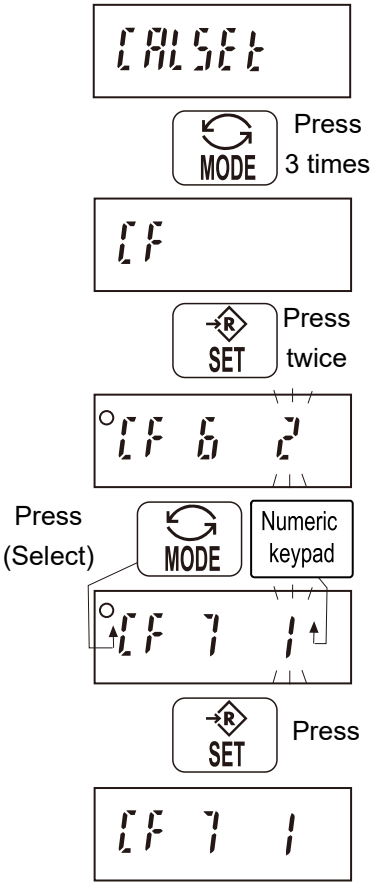
3. Press the [SET] key to display the setting item.
   Press the [SET] key again and the setting value will start blinking.

4. Select the setting item and parameter using the following keys:

[MODE]	Proceed to next setting item.
[Numeric keypad]	Change the blinking digit

5. Press the [SET] key to stop the blinking and record the setting.

6. If you want to adjust the sensitivity using a weight, proceed to step 2 of "14.3. Sensitivity Adjustment Using a Weight". To end the setup, press the [ZERO] key, and after [CF] is displayed, press the CAL key.
   The display turns off.



16.2. CF Function List

Item	Parameter	Description	
Used internally CF 1	-	Not available for setting change	
Used internally CF 2	-	Not available for setting change	
Used internally CF 3	-	Not available for setting change	
Used internally CF 4	-	Not available for setting change	
Used internally CF 5	-	Not available for setting change	
Zero tracking width / time CF 6	0	No zero tracking	Zero tracking: Function to track the zero point and keep the display at zero. When the setting value is 0, the internal settings trc (zero tracking), St-b (stability detection width), and St-t (stability detection time) cannot be changed and the setting items are not displayed.
	1	0.5 d/0.5 seconds	
	◆ 2	0.5 d/1.0 seconds	
	3	0.5 d/1.5 seconds	
Zero point mark when net weight is zero during taring CF 7	0	Not available	
	◆ 1	Available	
Push zero range CF 8	◆ 0	±2%	The percentage of the weighing capacity that can be set to zero when the ZERO key is pressed.
	1	Unlimited	
Power on zero range CF 9	0	0% (Do not power on to zero)	Percentage of the weighing capacity that can be set to zero when powered on.
	1	±10%	
	◆ 2	±50%	
	3	±100%	
	4	Unlimited	
Power on Tare CF 10	0	Not available	Taring is done when power is turned on. (power on zero takes priority)
	◆ 1	Available	
Clear tare by zero operation CF 11	0	Not available	
	◆ 1	Available	
Tare CF 12	0	Tare the weight at the indicated scale interval	
	◆ 1	Tare at the internal count	
Used internally CF 13	-	Not available for setting change	

Item	Parameter	Description	
Decimal point display selection CF 14	◆ 0	Select with internal settings Pnt	
	1	Dot	
	2	Comma	
Used internally CF 15	-	Not available for setting change	
Hold function CF 16	0	Not available	A function that freezes the weighing value when the HOLD key is pressed.
	◆ 1	Available	
Preset Tare CF 17	0	Not available	
	◆ 1	Available	
Used internally CF 18	-	Not available for setting change	
Used internally CF 19	-	Not available for setting change	
Used internally CF 20	-	Not available for setting change	
Used internally CF 21	-	Not available for setting change	
Used internally CF 22	-	Not available for setting change	
Used internally CF 23	-	Not available for setting change	
Zero tracking, response characteristics, and stability detection function display CF 24	0	Not available	When the setting value is 0 or 2, the internal settings trc (zero tracking), St-b (stability detection width), St-t (stability detection time), and Cond (response characteristics) cannot be changed and the setting items are not displayed.
	◆ 1	Available	
	2	Not available Center zero mark does not light up when total weight is zero after taring.	
Saving zero value and tare weight CF 25	◆ 0	Do not save	Zero and tare values are stored even when the power is turned off.
	1	Save	
Used internally CF 26	-	Not available for setting change	

◆: Factory settings d = minimum division

The settings are not changeable for CF 1 to 5, 13, 15, 18 to 22 or 26.

17. Options

Option name	Contents
HVW-02CB	USB interface
HVW-03C	RS-232C interface
HVW-04C	Comparator relay output/buzzer/contact input
HVW-27C	*Bluetooth*® interface
HVW-11C	Wall mounting bracket

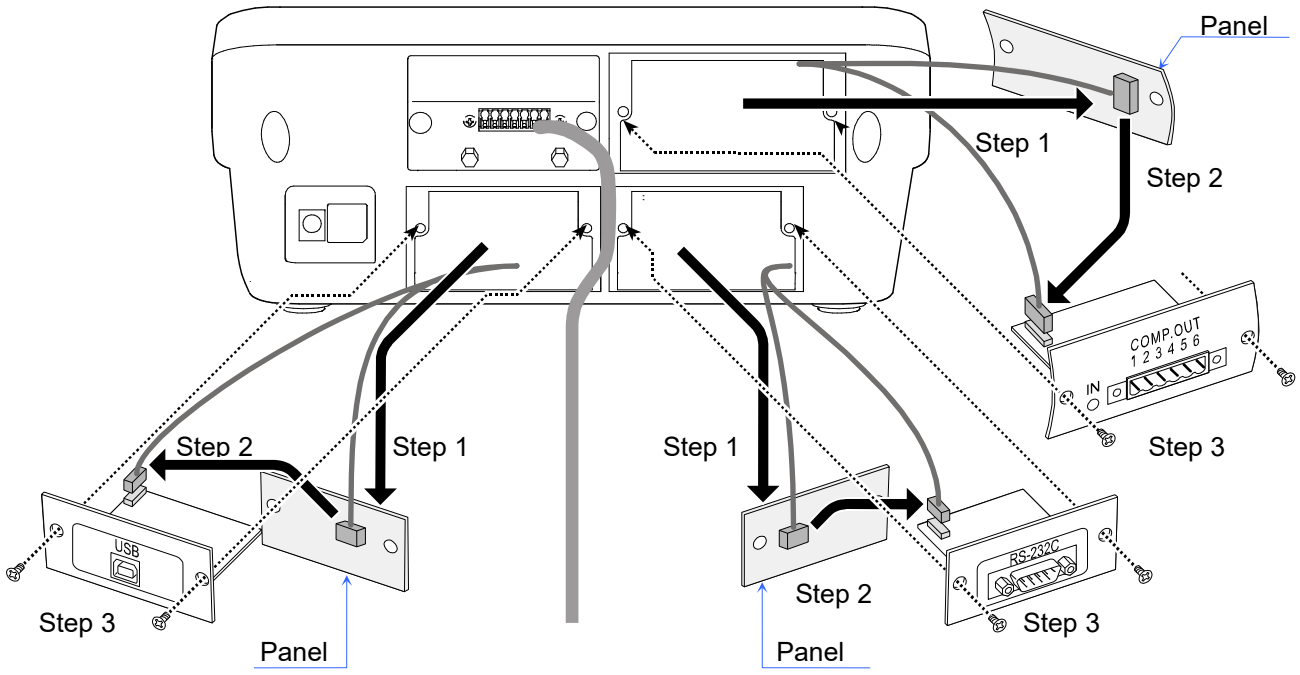
17.1. Installing Options

For details on HVW-27CJA and HVW-11C, please refer to their respective instruction manuals.

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.



17.2. 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. Doing so may cause failure and malfunctions.

17.2.1. 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**.

17.2.2. 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 https://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.



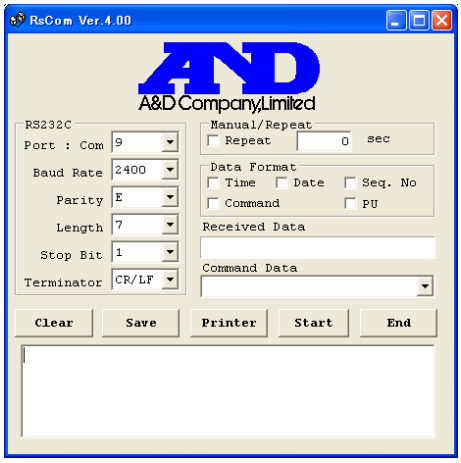
Note : The COM port number may differ depending on the hardware of the computer.
Confirm the COM port number in device manager.

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 https://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.

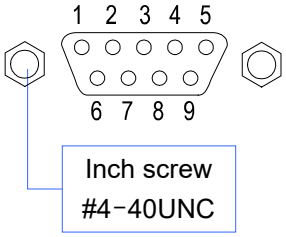
Step 3 When the PRINT key of the scale is pressed and weighing value is output, **RsCOM** can receive it.

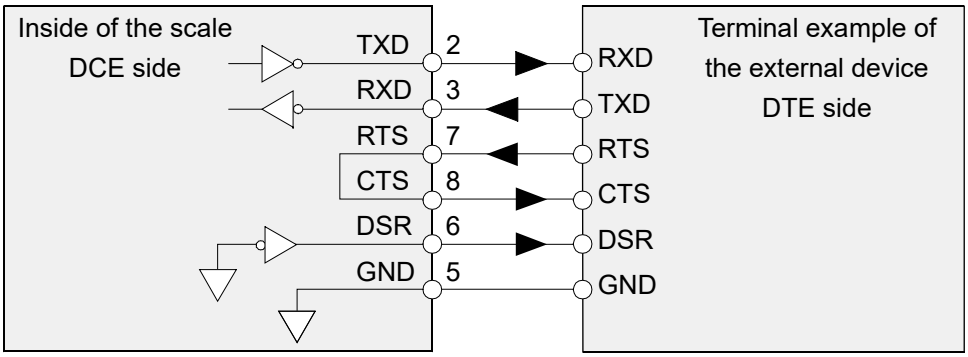
* The weighing value to be output to the interface depends on the parameters of the function table.

17.3. 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 "17.5. Communication Format"
- Pin assignment

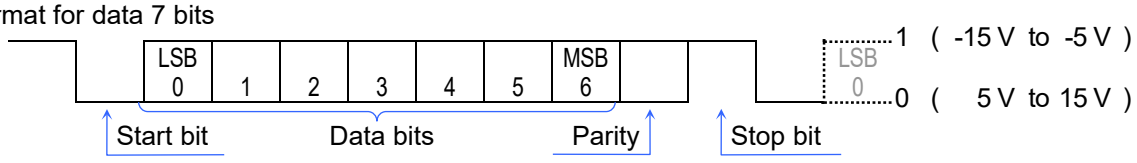
Pin No.	Signal name of DCE side	Direction	Description
1	—	—	No connection
2	TXD	→	Transmit data
3	RXD	←	Receive data
4	—	—	No connection
5	GND	—	Signal ground
6	DSR	→	Data set ready
7	RTS	←	Request to send
8	CTS	→	Clear to send
9	—	—	Used internally



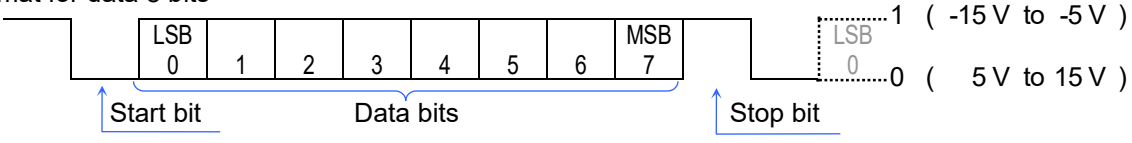


Transmission	EIA RS-232C			
Transmission form	Asynchronous, bi-directional			
Data format	Baud rate :	2400, 4800, 9600 bps		
	Data length :	7 bits or 8 bits		
	Parity :	1 bit	EVEN, ODD	Data length is 7 bits
			NONE (Non-parity)	Data length is 8 bits
	Start bit :	1 bit		
	Stop bit :	1 bit		
	Code :	ASCII		

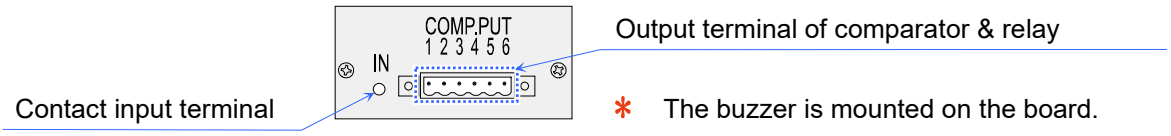
Bit format for data 7 bits



Bit format for data 8 bits



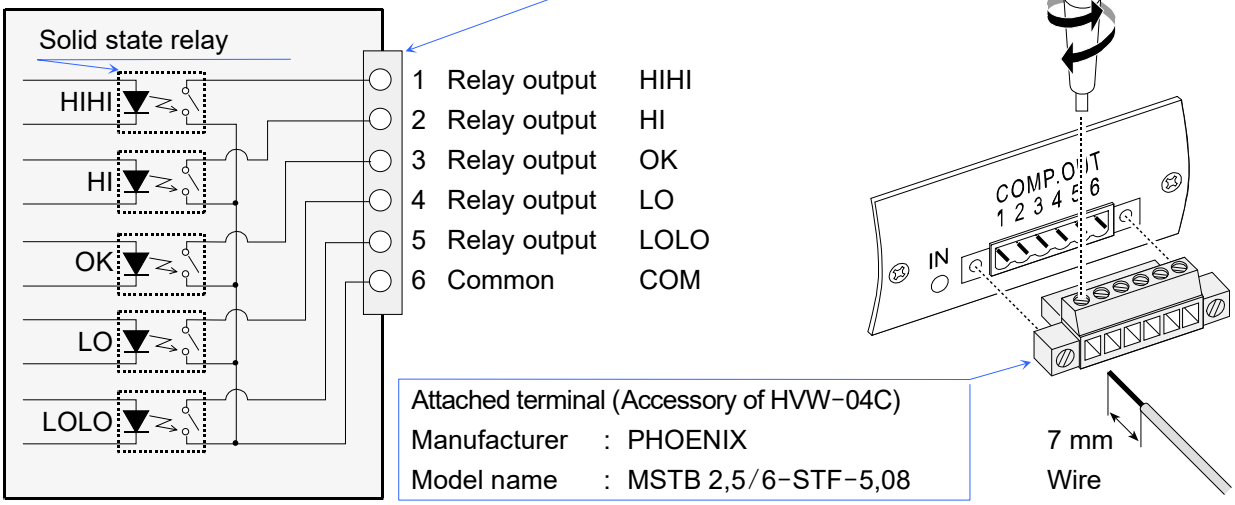
17.4. HVW-04C, Comparator Relay Output / Buzzer / Contact Input



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

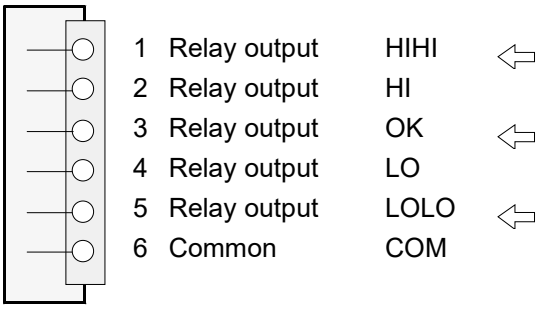
Maximum voltage : 50 V DC
Maximum current : 100 mA DC
Maximum ON resistance : 8 Ω

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



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 bUZZ of the function table.

Refer to "10.1.4. Buzzer of Comparator Mode".

External Contact Input Plug and Wiring Example

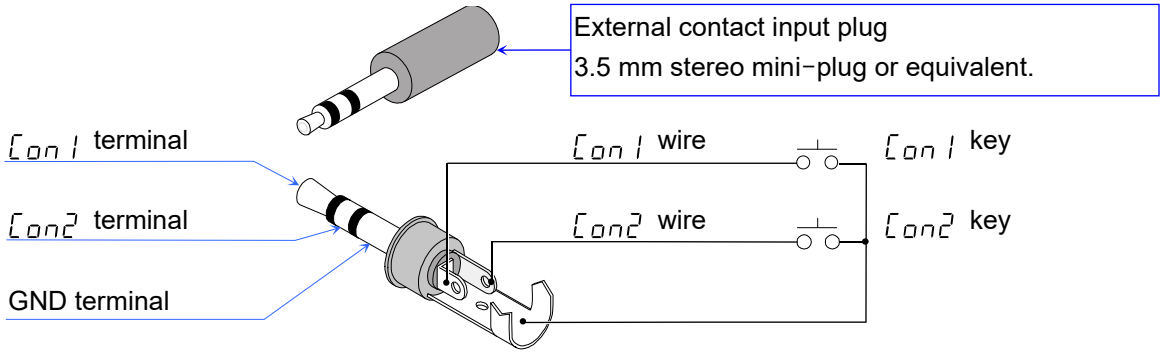
An external contact input plug is included.

Solder the plug and electrical wires according to the circuit diagram below.

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

Con2 : The function of the [Con2] key 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.



17.5. 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

- 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 "17.5.1. Command Mode".

- **Stream mode** (Prt∗0)

  Specify Prt1 0 or Prt2 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-8129TH 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.

17.5.1. 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	Keys 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.	
CN	Switch Comparator Memory (Switch the memory in use)		
?CN	Output Comparator Memory (Output the memory in use)		

Command Examples

The examples below are for the function setting SIF1 1 (Reply to commands).
The character ␣ means "Space (20h)".

To request data output immediately.

Command	Q	C_R	L_F													
Reply	S	T	,	+	0	0	1	2	.	3	4	5	␣	k	g	C_R	L_F	Stable positive data
	U	S	,	+	0	0	0	7	.	8	9	0	␣	k	g	C_R	L_F	Unstable positive data
	O	L	,	+	9	9	9	9	.	9	9	9	␣	k	g	C_R	L_F	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	C_R	L_F	
Reply	Z	C_R	L_F	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	C_R	L_F	
Reply	T	C_R	L_F	Net value has been displayed. (No reply If SIF*0 is set.)

To switch the weighing unit.

The weighing unit is switched.

Command	U	C_R	L_F	
Reply	U	C_R	L_F	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	C_R	L_F
Reply	C	T	C_R	L_F 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	C_R	L_F
Reply	P	T	,	+	0	0	0	1	2	0	C_R	L_F

To output accumulation values.

Command	A	C_R	L_F											
Reply	A	,	+	0	0	1	2	.	3	0	0	␣	k	g	C_R	L_F

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	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.

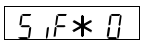
Five-level comparator mode ····· Not used
Three-level comparator mode ····· Not used
Seven-level comparator mode..... Threshold value of rank 1 is output.

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.

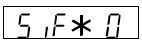
Template	H	3	,	[**parameter**]								
Command	H	3	,	+	0	0	0	5	0	0	C_R	L_F
Reply	H	3	,	+	0	0	0	5	0	0	C_R	L_F

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.

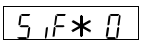
Template	**H**	**2**	,	[**parameter**]								
Command	**H**	**2**	,	**+**	**0**	**0**	**0**	**4**	**0**	**0**	C_R	L_F
Reply	**H**	**2**	,	**+**	**0**	**0**	**0**	**4**	**0**	**0**	C_R	L_F

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.

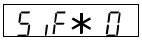
Template	**H**	**1**	,	[**parameter**]								
Command	**H**	**1**	,	**+**	**0**	**0**	**0**	**3**	**0**	**0**	C_R	L_F
Reply	**H**	**1**	,	**+**	**0**	**0**	**0**	**3**	**0**	**0**	C_R	L_F

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.

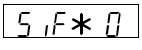
Template	**L**	**1**	,	[**parameter**]								
Command	**L**	**1**	,	**+**	**0**	**0**	**0**	**2**	**0**	**0**	C_R	L_F
Reply	**L**	**1**	,	**+**	**0**	**0**	**0**	**2**	**0**	**0**	C_R	L_F

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.

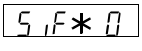
Template	**L**	**2**	,	[**parameter**]								
Command	**L**	**2**	,	**+**	**0**	**0**	**0**	**1**	**0**	**0**	C_R	L_F
Reply	**L**	**2**	,	**+**	**0**	**0**	**0**	**1**	**0**	**0**	C_R	L_F

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.

Switch Comparator Memory

Switch the comparator memory in use to the specified memory number.

Command	C N , X X C **L_F**	XX is the memory number. (00 to 99)
Response example	C N , X X C **L_F**	No response with `S,F10` .

Output Comparator Memory

Output the comparator memory in use.

Command	? C N C_R **L_F**	
Response example	C N , X X C_R **L_F**	XX is the memory number. (00 to 99)

Response when `S,F11` or `S,F21` is specified in the function table

If `S,F11` or `S,F21` 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** **L_F**	
Reply	**I** **C_R** **L_F**	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** **L_F**	
Reply	**?** **C_R** **L_F**	The scale received an undefined command.

Response when `S,F10` or `S,F20` is specified in the function table

`S,F10` or `S,F20` does not use a reply. The undefined command is ignored.

17.6. 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 `S.F1 2`, `S.F2 2` or `S.FP 1` 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-8129TH Printer

AD-8129TH format for

SIF12 or SIF22

```
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
```

C_R L_F

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.

18. Maintenance

- ❑ Refer to “5. Cautions” regarding use.
- ❑ Refer to “18.3. Error Code Table” and corresponding mode for displayed error code.
- ❑ Refer to “14. Sensitivity Adjustment” regarding precision weighing.
- ❑ Periodically check the accuracy of weighing. Adjust the scale (indicator), if it is moved to another location or the environment has changed.

18.1. Repair

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

18.2. Error Display

In this situation	Confirm these items
Product does not turn on. Nothing displayed.	❑ Is the power turned ON properly? ❑ Are the batteries exhausted? ❑ Are you using the correct AC adapter?
The product does not display zero at first.	❑ Check whether something is touching the weighing pan. Remove any objects from the weighing pan. ❑ Perform zero point calibration for the scale.
[------] is displayed.	❑ This error is displayed if the measured value is unstable when the power is turned ON. Avoid wind and vibration. Check whether something is touching the weighing pan. ❑ Is the load cell cable correctly connected inside the display? ❑ This error is displayed if zero cannot be displayed when the display is turned ON. Remove any objects from the weighing pan. ❑ Perform zero point calibration for the scale.
[CAL E] is displayed.	❑ This error is displayed during sensitivity adjustment. Check whether the weighing pan is attached properly and whether the weight is too heavy, and try again.
[-CAL E] is displayed.	❑ This error is displayed during sensitivity adjustment. Check whether the weighing pan is attached properly and whether the weight is too light, and try again.
[E] is displayed.	❑ The load is too heavy. Remove objects from the weighing pan.
[-E] is displayed.	❑ The measured value is too low. Check whether the weighing pan is attached properly.
The displayed value does not change.	❑ Is the hold function enabled? Change [HoLd] in the internal settings. ❑ Turn the power OFF.
[Lb 0] is displayed.	❑ The voltage of the batteries is low. Replace the batteries with new batteries.
[Lb 1] is displayed.	❑ The output voltage of the AC adapter is low. Check whether you are using an AC adapter with the correct specifications.

18.3. Error Code Table

When any of the following errors are displayed, try turning the display off and on again.

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

19. Specifications

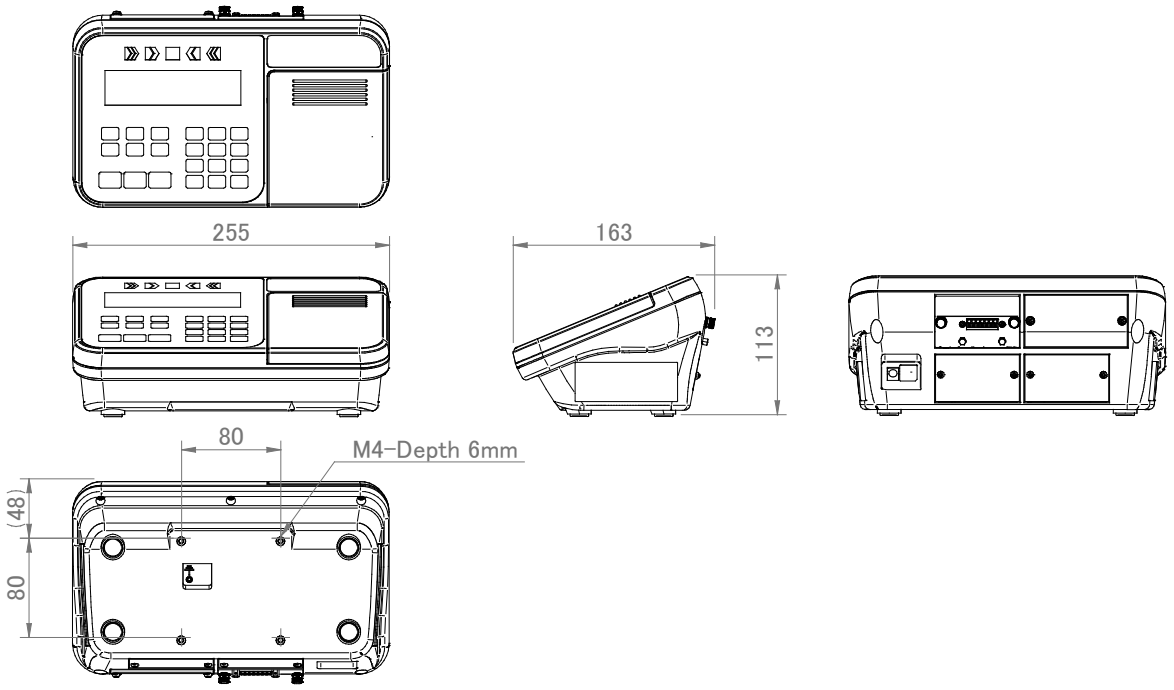
19.1. Specifications List

Specifications are subject to change without notice.

Input sensitivity		0.2 μV/d min. (d is the minimum scale interval)	
Input signal range		-16 mV to 16 mV	
Load cell excitation voltage		5 V ±10%	
Load cell drive capacity		350 Ω × 4 maximum	
Temperature coefficient zero		±0.02 μV/°C typ. ±0.1 μV/°C max.	
Temperature coefficient span		±3 ppm/°C typ. ±15 ppm/°C max.	
Linearity		±0.01% of full scale	
Maximum display resolution		60,000	
Display		Backlit seven segment LCD display with text height of 26 mm Three color five level comparator LED	
Display update		Approx. 10 times/sec.	
Power supply	HW-D-C	AC adapter	Confirm that the AC adapter matches the voltage and plug type of your region. An AC adapter is not provided in some regions. 50 Hz/60 Hz
		Batteries	Size D (R20P/R20PU/LR20) × 4
	HW-D-CP	AC adapter	Confirm that the AC adapter matches the voltage and plug type of your region. An AC adapter is not provided in some regions. 50 Hz/60 Hz
Battery life (HW-D-C)		Load cell × 1 (1 kΩ) Approx. 1,200 hours Load cell × 1 (350 Ω) Approx. 600 hours Load cell × 4 (350 Ω × 4) Approx. 200 hours	
Operating environment		-10°C to 40°C 85% RH or lower (without condensation)	
Dimensions	HW-D-C	255 mm (W) × 163 mm (D) × 113 mm (H)	
	HW-D-CP		
Weight (approximately)	HW-D-C	0.8 kg	
	HW-D-CP	1.0 kg	

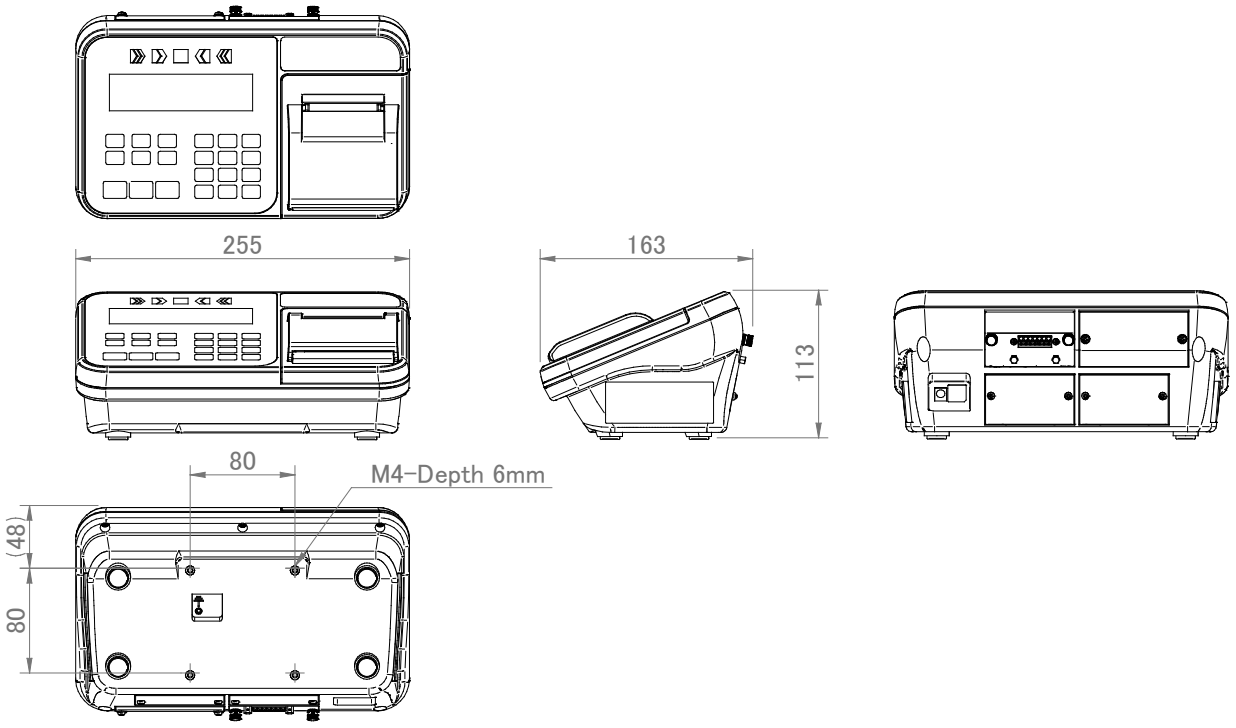
19.2. Dimensions

HW-D-C



Unit: mm

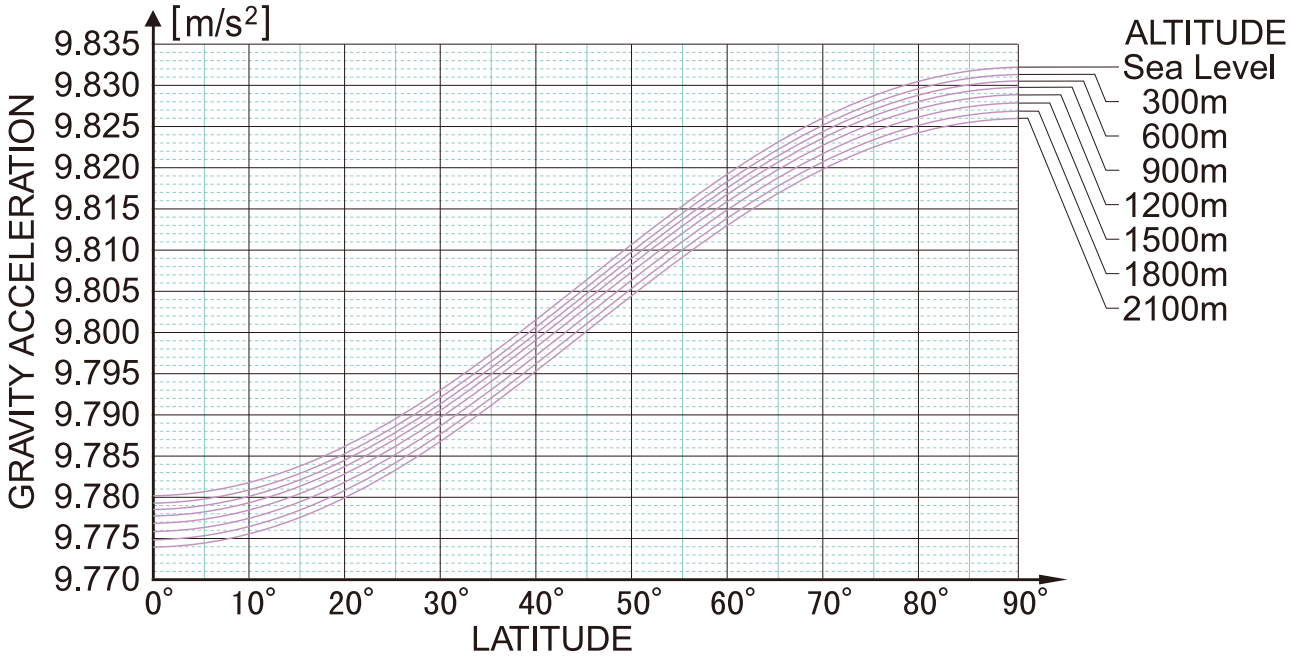
HW-D-CP



Unit: mm

19.3. Gravity Acceleration Map

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



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