High-Precision Tuning Fork Electronic Balance

ＡＬＥ-NC Series

Operation Manual

IMPORTANT

- To ensure safe and proper use of the balance, please read this manual carefully.

- After reading this manual, store it in a safe place near the balance, so you can review it as needed.

SHINKO DENSHI CO., LTD.

Preface

Thank you very much for having purchased our High Precision Tuning-Fork Electronic Balance ALE-NC series.
This document describes how to operate the product.

Instructions

● The copyright of this document belongs to SHINKO DENSHI CO., LTD.. Reprinting or duplicating of all or part of this document without notice shall not be allowed.

● Please note that product improvement or modification may cause partial discrepancy between the product and the description of this document.

● The description of this document is subject to change without notice.

● This document has been created carefully. In case that, however, any error or imperfection is found by any chance, please let us know.

● Documents of which pages are missing or irregularly bound will be exchanged. Please inform the store where you purchased the product.

● Trouble related to the product or system will be dealt with in accordance with the individual maintenance contract. Please note, however, that we will not take responsibility for consequential trouble such as discontinuation of operation caused by the product trouble.

● **ViBRA** is the registered trademark of SHINKO DENSHI CO., LTD.. Company names and product names appearing in this document are the trademarks or registered trademarks of the respective company concerned.

● Microsoft, Windows are either trademarks or registered trademarks of Microsoft Corporation in the Unites States and/or other countries.

Important Notice

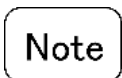| ⚠ WARNING	・It should be known that this product contains potential danger. And so please be sure to observe this document when installing, operating or servicing this product. ・SHINKO DENSHI CO., LTD. will not take any responsibility for any injury or damage caused by the non-observance of this document or misuse or unauthorized modification of this product.

● Potential dangers are increasing in the industrial equipment industries due to the advent of new materials and processing methods, and speeding up of machines. It is impossible to foresee all situations related to these dangers. In addition, there are so many "impossible" and "don'ts" and so writing all of them in the operation manual is impossible. Therefore, it is safe to think that what is not written in the operation manual "cannot be performed" unless the operation manual positively writes "it is possible." When performing installation, operation, maintenance or inspection of this product, not only observe what is written or indicated in this document or on the product surface but also pay adequate consideration to safety measures.

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● For any question or further information concerning this document, please contact the store where you purchased the product or with its model (type) name and serial number informed.

● Manufacturer: SHINKO DENSHI CO., LTD.

Address: 1-52-1 Itabashi, Itabashi-ku, Tokyo 173-0004, JAPAN

How to use this document

■Symbols used in this document

Understand the meaning of the following symbols and observe the instructions of this document.

Symbols	Meaning
⚠ DANGER	Used for the situation that invites an imminent risk of death or severe injury if proper precautions are not taken.
⚠ WARNING	Used for the situation that invites a risk of death or serious injury if proper precautions are not taken.
⚠ CAUTION	Used for caution concerning operations that may lead to a light physical injury to persons if proper precautions are not taken.
Note	Used for notation concerning operations that may lead to damage of the products/facilities/data if proper precautions are not taken. Used for accurate weighing and appropriate usage of the equipment.
Reference	Used for reference information on operation.
🚫	Used for "Prohibition" items.
❗	Used for "Mandatory" items requiring positive action.
⚡	Used for prohibition items to avoid "Electrical shock".
Legal Metrology	This symbol indicates the operation/specification related to verified balance for legal metrology purpose.

This product/ The product/ The balance	Refers to the product.
[On/Off] key	The name of an operation key located in front of the main unit is represented in square brackets "[ ]".
<message>	A message on the display is represented in angle brackets "< >".
<<F1>>	Displayed menu item assigned to each functional key is represented in double angle brackets "<< >>".
Press the key	Signifies pressing lightly an operation key once.
Press the key long	Signifies keeping pressing an operation key until the designated indication/operation occurs.

■About how to read this document

This document consists of the following contents:

1	Prior to use	Describes about operating precautions, names and functions of each section, etc. Please be sure to read this section when using this product for the first time.
2	Basic usage	Describes about basic usage related to weighing such as how to turn on and off the power in addition to the setting procedures to set various functions.
3	Functions related to the operation	Describes about setting items to change the operation of the balance.
4	Function related to the performance	Describes about setting items related to the indication stability and the response speed of the balance.
5	Comparator setting	Describes about setting items related to the comparator function.
6	External input/output functions	Describes about setting items related to the specifications and conditions regarding the external communication.
7	Functions related to the lock	Describes about setting items related to change prohibitions and invalid keystrokes on each menu item.
8	Controlling and adjustment functions	Describes about setting items related to the product administrator.
9	Troubleshooting	Describes about methods of troubleshooting this product such as how to respond to errors and when you need help.
10	How to maintain	Describes how to maintain this product.
Appendix		Provides necessary data such as the specifications of this product.

Contents

[MEMO]

1   Prior to use

1-1   Operating precautions

⚠ DANGER

⚠	■ **Do not wet the AC adapter.** That may cause an electric shock, short-circuiting or failure.
	■ **Do not handle the AC adapter with wet hands.** That may cause an electric shock, short-circuiting or failure.
🚫	■ **Do not use the balance in a dusty location.** That may cause dust explosion or fire. That may cause short-circuit or malfunction of the balance.
	■ **Do not use the balance in explosive atmosphere.** That may cause explosion or fire. Please order our explosive-proof balances to weigh in such a hazardous area.
❗	■ **Obey the SDS of the object to be weighed.** Measuring dangerous materials such as flammable liquid could cause an explosion or fire.

⚠ WARNING

🚫	■ **Do not disassemble or modify the product.** Doing so could result in injury, electric shock, fire and other accidents or failures. For inspection and adjustment, contact the retailer from whom the product was purchased.
	■ **Do not move the product with a sample to be weighed set on the balance.** That may cause the sample to fall from the weighing pan, leading to a bodily injury or destruction of the sample.
	■ **Do not route the cables across passages.** The cables could be tripped on by a passerby and the balance could fall down and break or injure someone.
	■ **Do not use the product on an unstable table or a place that is subject to vibration.** That may cause the sample to fall from the weighing pan, leading to a bodily injury or destruction of the sample. Besides inaccurate weighing may result.
	■ **Do not place an unstable sample on the weighing pan.** The sample may fall down, giving rise to a danger. Put an unstable sample in a container (tare) before weighing it.
	■ **Only use the specified power supply.** Using any power supply other than that specified could cause overheating, fire or failure.
	■ **Do not bring the balance by holding the windshield.** The main body could drop and break down or injury someone. Make sure to hold the main body to bring the balance.
	■ **Do not use the product in an abnormal condition.** If it should happen that an abnormal event such as smoking or unusual odor occurs, ask the store where you purchased the product or our sales department for repair. Keeping using the product may result in an electric shock or fire. In addition, do not ever try to repair it for yourself, or very dangerous situation is likely to occur.
❗	■ **Only use the dedicated AC adapter.** Use of other types of power or adapters may result in heat generation or malfunction of the balance.

⚠ CAUTION

🚫	■ **Do not mix old and new batteries, or batteries of different types or manufacturers.**
	■ **Do not use the batteries that leak.**
	■ **Make sure you insert batteries with the positive and negative poles correctly inserted and be careful of short circuits.** Such mishandling could damage the batteries and may lead to harmful liquid leakage or rupture.
❗	■ **Observe the precautions printed on the batteries used.**

Note

🚫	■ **Do not apply excessive force to or impact the balance.** Doing so could damage or result in failure of the balance. Carefully place samples on the balance.
	■ **Do not use volatile solvents.** The main unit could deform. Wipe the main unit using dry cloth or a cloth moistened with a small amount of neutral detergent.
	■ **Do not handle the balance with wet hands.** That may cause short-circuiting or failure.
	■ **Do not use the balance in a wet location.** That may cause short-circuiting or failure.
	■ **Do not connect to the AC adapter cord or communication cable with its connector or jack being wet.** That may cause short-circuiting or failure.
	■ **Do not install the balance in a place where it is directly exposed to airflow from air-conditioning or heating equipment.** Due to changes in the ambient temperature, the balance could fail to accurately weigh samples.
	■ **Do not install the balance in a place exposed to direct sunlight.** The internal temperature of the balance could rise and the balance could fail to accurately weigh samples.
	■ **Do not install the balance where the floor is soft.** When a sample is placed on the balance, the balance could slant and fail to accurately weigh samples.
	■ **Do not install the balance in a place where the ambient temperature or humidity change significantly.** The balance could fail to accurately weigh samples.
❗	■ **Dispose of batteries in accordance with local regulations.**
	■ **If the balance is not going to be used for a long time, store it with the batteries removed.**
	■ **Adjust (calibrate) the balance when it is installed or relocated.** Failure to do so might result in measurement errors. To ensure accurate measurements be sure to adjust (calibrate) the balance.
	■ **Check for an error periodically.** Use environment and chronological change cause an error in measured value, leading to an inaccurate measurement.
	■ **Unplug the AC adapter from the receptacle when the balance is not going to be used for a long period of time.** Unplug the balance from the receptacle to save energy and prevent degradation.
	■ **Always adjust the level of the balance before use.** A tilted balance generates errors which might cause inaccurate weighting.

Note

	■For proper disposal This product including accessories may not be disposed of in domestic waste in conformance with the specific requirements in your country or state. When you dispose of this product, please contact your local authorities or dealer and ask for the correct method of disposal.
FCC Note	Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.
	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.
	This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures: - Reorient or relocate the receiving antenna. - Increase the separation between the equipment and receiver. - Connect the equipment into an outlet on a circuit different from that to which the receiver is connected. - Consult the dealer or an experienced radio/TV technician for help.

1-2 For more accurate measurement

To make more accurate measurement, it is necessary to lessen error-causing factors in measurement to the extent possible. Error-causing factors include not only an instrument error and performance of the balance itself but also the nature and condition of a specimen, measuring environment (vibration, temperature, humidity, etc.) and the like. These factors will directly affect measurement result in the case of a balance with high resolution capability.

Measurement Errors
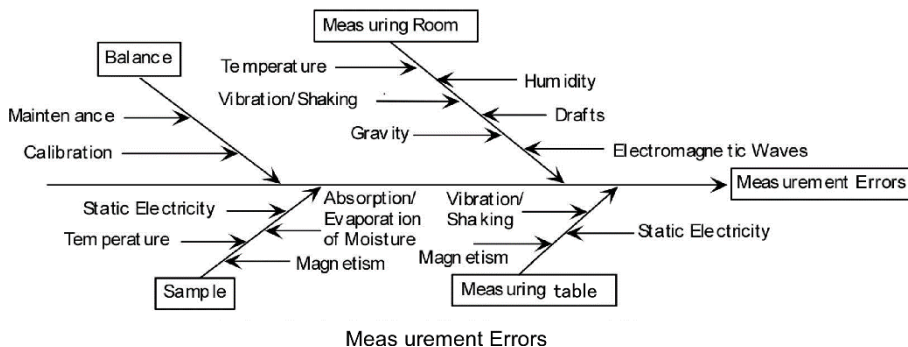
1-2-1 Precautions related to measuring environment

Temperature/ humidity/ atmospheric pressure	→ Try to keep the room temperature constant to the extent possible in order to avoid condensation and indication drift due to change in temperature.
	→ Low humidity is likely to cause generation of static electricity, resulting in inaccurate measurement.
	→ Change of atmospheric pressure is likely to cause change of buoyancy of the air on the specimen, tare and mechanism of the balance, resulting in inaccurate measurement.
Vibration/shaking	→ It is preferable to locate a measuring room on the first floor or the basement. The higher the room is, the larger the vibration and shaking become. Therefore, a highly located room is not suitable for measurement. Rooms near the railway or roadside should also be avoided.
Air draft	→ Places directly exposed to air current from an air-conditioner or to direct sun generate abrupt temperature change and resultantly cause unstable weight indication, and therefore, should be avoided.
Gravity	→ The latitude and altitude of a measuring location differentiate the gravity that affects a specimen, giving a different weight indication to the same specimen.
Electromagnetic wave	→ At a location where a strong electromagnetic wave generating object is in the proximity of a balance, the balance is affected by the electromagnetic wave, making the balance unable to indicate accurate weight, and therefore, such a location should be avoided.

1-2-2 Precautions related to measuring table

Vibration/shaking	→ Vibrations during measurement destabilizes the indication of measurement value, leading to inability to make accurate measurement. And so use of a measurement table that is robust and hardly affected by vibration is required (a vibration-proof structured table or concrete or stone-made table is suitable). In addition, placing a sheet of soft cloth or paper under the balance causes shaking or makes keeping horizontal attitude difficult, and therefore should be avoided.
	→ The measurement table should be installed in a position free from vibration to the extent possible. A corner rather than the center of a room is less affected by vibration and therefore more suitable for installation of the balance.
Magnetism/Static electricity	→ Use of the balance on the table that is subject to magnetism or static electricity should be avoided.

1-2-3   Precautions related to a specimen

Static electricity	→ In general, synthetic resin- and glass-made specimens are high in electric insulation, and so easily charged electrically. Weighing an electrically charged specimen makes the indication value unstable, reducing the reproducibility of the test result. Therefore, neutralize an electrically charged specimen before measurement.
Magnetism	→ Specimens affected by magnetism show different weight in a different position of the weighing pan, reducing the reproducibility. When weighing a magnetized specimen, either eliminate the magnetism from the specimen or place a setting plate on the weighing pan to distance the specimen from the weighing mechanism of the balance so that the mechanism may not be affected by the magnetism.
Moisture absorption/ Evaporation	→ Measuring a moist or evaporating (vaporizing) specimen increases or decreases the indication value of the balance continuously. When this is the case, put the specimen in a container equipped with a small mouth and closely seal the mouth before measurement.
Specimen temperature	→ Difference in temperature between the specimen and the windshield interior generates convection flow within the windshield, causing a measurement error. When the specimen temperature is excessively high or low, allow the specimen temperature to stabilize at the room temperature before measurement. Also, to prevent the convection flow from arising within the windshield, make the windshield interior temperature equal to the room temperature before measurement. → Measurer's body temperature also affects measurement result. Handle a specimen with tweezers instead of directly holding it with fingers and refrain from putting your hands directly in the windshield during measuring operation.

1-2-4   Precautions related to the main unit of a balance

Operating precautions	→ A dust cover, if equipped, for the balance may possibly make the weight indication unstable due to static electricity charged on the cover at a low humidity. When this is the case, wipe the cover with wet cloth or use antistatic agent or use the balance with the cover removed. → For more stable measurement, it is recommended to energize the balance for longer than 30 minutes and load the balance a few times with a weight equivalent to the weighing capacity before measurement.
For non $\boxed{\begin{smallmatrix} \text{Legal} \\ \text{Metrology} \end{smallmatrix}}$ Calibration	→ Calibrate the balance periodically with an external calibration weight. For the sake of precise calibration, use an external calibration weight weighing nearly equal to the weighing capacity of the balance. → Energize the balance for longer than 30 minutes and load the balance a few times with a weight equivalent to the weighing capacity before calibration. → Calibration is also needed in the following cases: When using the balance for the first time, When using the balance after a long period of non-use, When changing a place of installation, and When there was a large change in temperature, humidity or atmospheric pressure.
Maintenance	→ Attachment of dirt such as powder or liquid to the weighing pan or pan base will cause measurement error or unstable weight indication. For that reason, frequent cleaning of the balance is required. In cleaning the balance, take care for the dust or liquid not to enter into the balance.

1-3   Check for the articles contained in the box

The package box contains the following:

If anything missing or broken should be found, please inform the store where you purchased the product.

Legal Metrology	"Sealing kit" is already mounted on the verified balance.

Round pan type (ALE322NC)

① Main unit (Round): 1	② Round pan: 1	③ Pan base (Round): 1	④ AC adapter: 1

⑤ Operation manual: 1	⑥ Sealing kit: 1	⑦ Windshield (Assembly type): 1 ("Windshield assembly instructions" attached.)

Square pan type (ALE1501NC, ALE8200NC)

① Main unit (Square): 1	② Square pan: 1	③ Pan base (Square): 1	④ Pan base screw: 1

⑤ AC adapter: 1	⑥ Operation manual: 1	⑦ Sealing kit: 1	

1-4   Name and function of each section

Round pan type (ALE322NC)
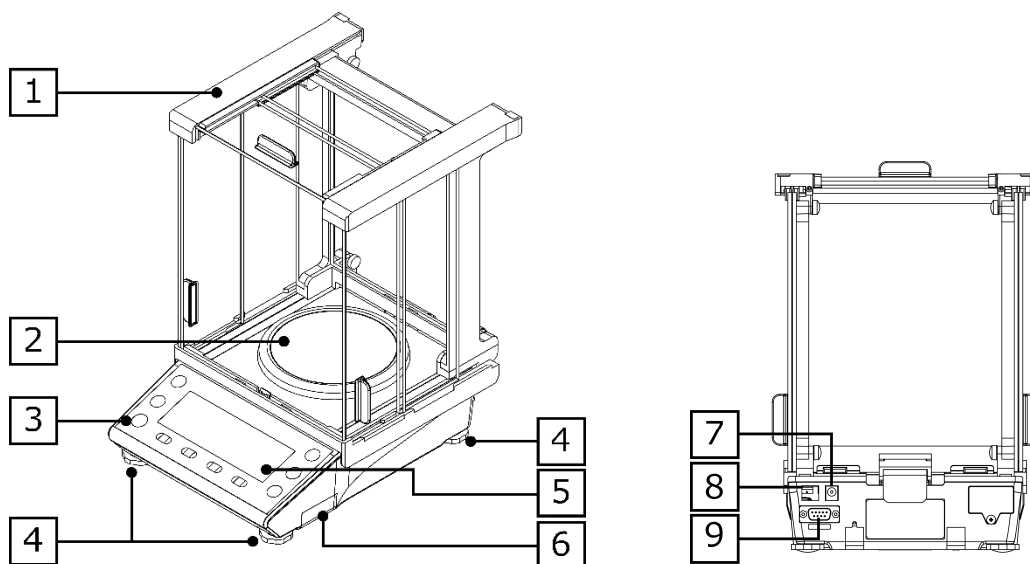
Square pan type (ALE1501NC, ALE8200NC)
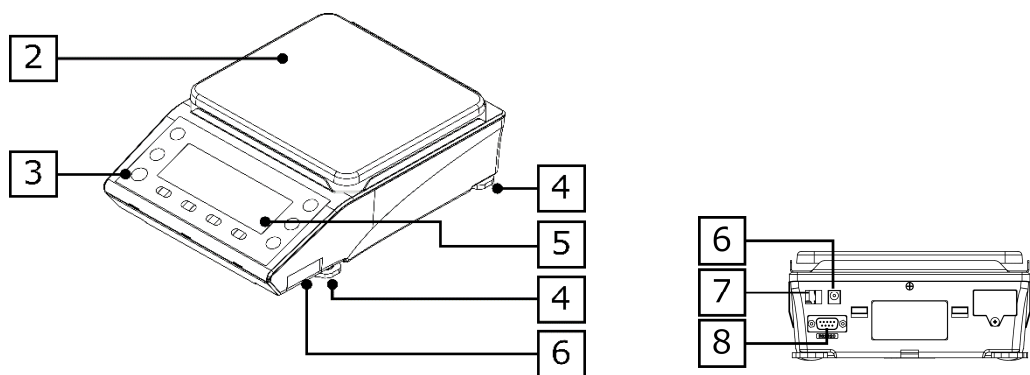
1	Windshield	2	Weighing pan
3	Level	4	Adjuster
5	Display	6	Battery case
7	AC adapter jack	8	USB connector (Type B)
9	RS-232C connector (D-sub 9 pin male)		

1-5   Assembling and installation of the product

Legal Metrology	When to use the balance for direct sales to the public (retail use) in Canada, or for direct sales to the public in USA except for prescription purpose, the balance shall be positioned so that its indications may be accurately read and the weighing or measuring operation may be observed from some reasonable "customer" and "operator" or, if this is not possible, connection with an external customer display is required and <4*B EX MODE> shall be set to <ON>. - Please ask our local dealer for compatible display. - Refer to "6 External input/output functions" for communication settings.

1-5-1   Assembling the balance (Round pan type ALE322NC)

1 **Attach the "Pan base".**
"Slider" to check that in the "Unlock" side, then attach to the balance.
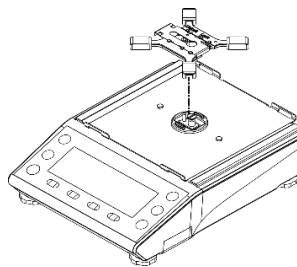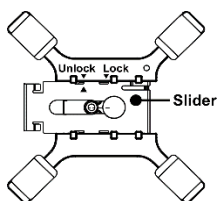
2 **Move the "Slider" to "Lock" side.**
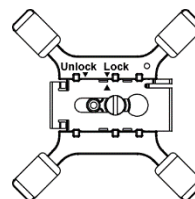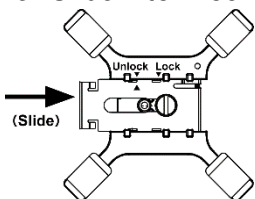
3 **Mount the weighing pan.**
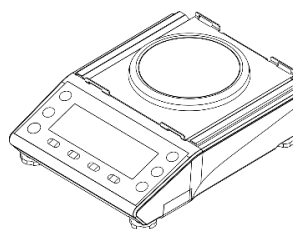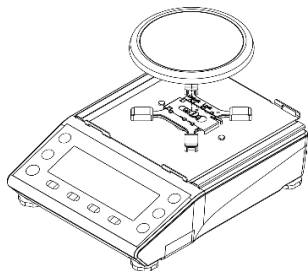
4 **Assemble the windshield.**
Refer to the attached "Windshield assembly instructions" to assemble the windshield.

5 **Connect the AC adapter.**
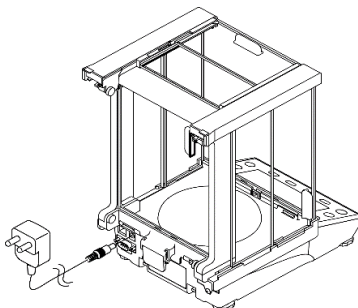
1-5-2   Assembling the balance (Square pan type ALE1501NC, ALE8200NC)

1 **Attach the "Pan base".**

(1) Direct "FRONT" to the display side.

(2) Attach to the balance, then turn the "Pan base screw" to fix.
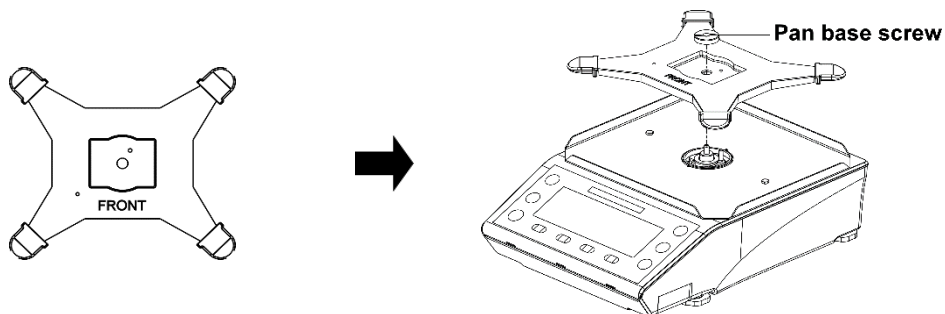
Pan base screw

2 **Tighten the "Pan base screw" firmly.**
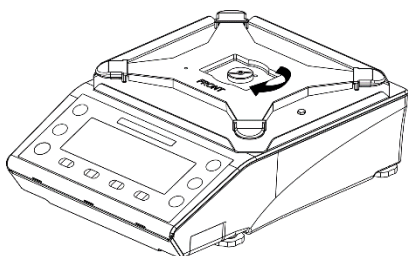
3 **Mount the weighing pan.**
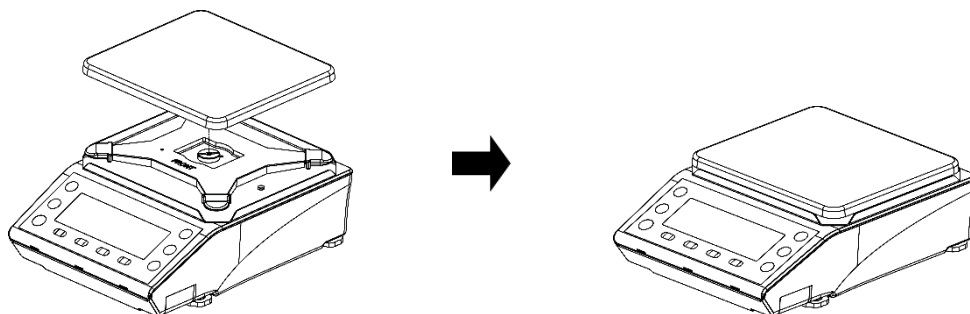
4 **Connect the AC adapter.**
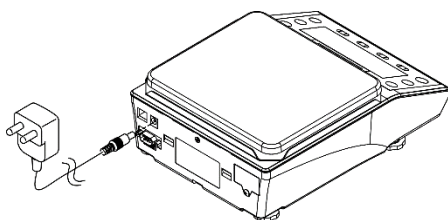
1-5-3   Level

1   **Release the transportation lock of the adjuster.**
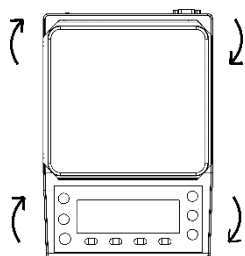
At the time of shipment, the adjusters provided at the four corners of the bottom are locked. Turn them in the direction shown in the figure on the left to loosen them.

2   **Level the balance.**
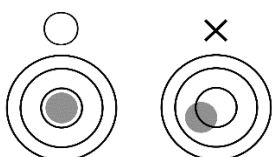
Turn the adjusters so that the bubble enters in the center circle

(1) While watching the level, turn the adjusters provided on the bottom to level the main unit.

(2) Bring the bubble enters in the center circle as shown in the figure on the left.

(3) When having leveled the main unit, slightly press the four corners of the balance to make sure that there is no rattle.

Turn the adjusters as shown below depending on the position of the bubble in the level.

or	**or**	**or**	**or**

1-6   Description of the operation keys

1-6-1   Basic

On/Off key
Zero key
Menu key
Output key

Note

These keys are called [F] keys or [F1]-[F4] key in this manual as a matter of convenience, while there are not such indications around them.

F1 key   F2 key   F3 key   F4 key

No	Key	Name of key	Performance
1	On/Off	[On/Off]	Turns on and off the power for the balance. On: Press the key, Off: Press the key long
2	Menu	[Menu]	Used for calling/exiting the setting menu. Used for canceling the setting value selection and going back to the measuring mode.
3	Output	[Output]	Use for data outputting.
4	Zero	[Zero]	Use for zero-point adjustment.
5	▪▪▪▫	[F1] ([F] key)	< ▼ > : Use for selecting the mode, function and item. < ↑ > : Use for moving up to the menu/item selections, or use for incrementing the numeric values.
6	▪▪▫▫	[F2] ([F] key)	< ▼ > : Use for selecting the mode, function and item. < ↓ > : Use for moving down to the menu/item selections, or use for decrementing the numeric value.
7	▪▫▫▫	[F3] ([F] key)	< ▼ > : Use for selecting the mode, function and item. < ← > : Use for moving to the upper menu layer, or use for selecting the digit to change.
8	▫▫▫▫	[F4] ([F] key)	< ▼ > : Use for selecting the mode, function and item. < → > : Use for moving to the lower menu layer, or use for selecting the digit to change. < ↵ > : Use for entering/executing the selected menu/item/value, or use for returning to the setting menu/measuring mode.

Reference

The [F] keys on which < ↑ >, < ↓ >, < → >, < ← >, < ↵ > or < ▼ > are displayed above are valid.
Shortcuts for various modes/functions can be assigned to [F] keys. Please refer to
"8-2 Shortcut setting for accessing various measuring modes" and "8-3 Free key setting".

1-6-2   Setting value and numeric value inputting
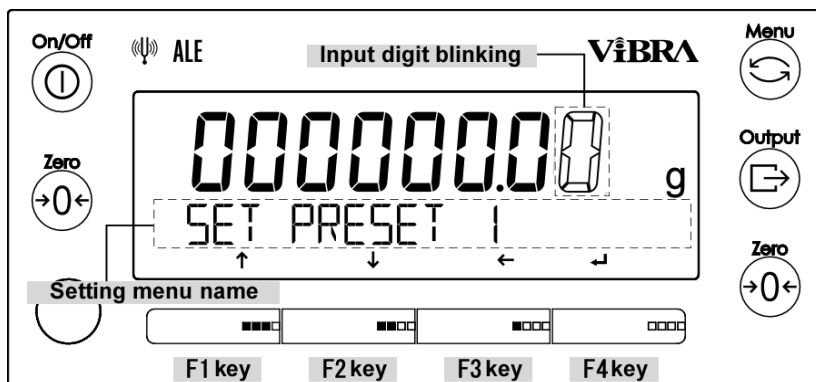
No	Key	Name of key	Performance
1	[Menu icon]	[Menu]	Cancel the input value and go back to the setting menu.
2	[Output icon]	[Output]	Use for changing polarity <+/->.
3	[Zero icon] (one on the right)	[Zero]	Input a decimal point < . > in "Specific Gravity mode".
4	■■■□	[F1] ([F] key)	< ↑ > : Use for incrementing the numeric values. <0 → 1 → 2 →···→ 9 → 0>
5	■■□□	[F2] ([F] key)	< ↓ > : Use for decrementing the numeric values. <0 → 9 → 8 →···→ 1 → 0>
6	■□□□	[F3] ([F] key)	< ← > : Use for selecting the digit to change.
7	□□□□	[F4] ([F] key)	< ↵ > : Use for entering the value.

Reference The [F] keys on which < ↑ >, < ↓ >, < → >, < ← >, < ↵ > or < ▼ > are displayed above are available.

1-7   How to interpret the display

1-7-1   Description of segment.
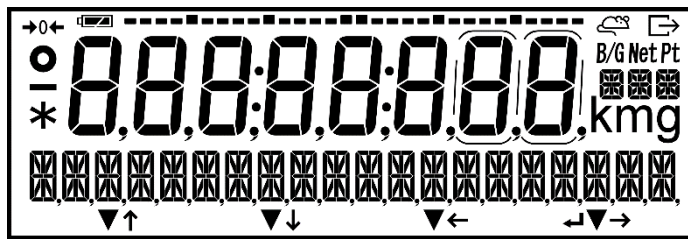
No	Mark	Name	Description
1	🐭	Animal weighing mode	Displayed when the animal weighing mode.
2	▬	Minus	Indicates the negative weight value and numeric.
3	●	Stable mark	- When displayed: The balance is in the stable condition. - When not displayed: The balance is not in the stable condition.
4	→0←	Center of zero indicator	Indicates the balance is at the zero point.
5	8	7-segment	- Indicates the weight value - Indicates the simplified character.
6	🔋	Battery mark	Display when the balance is powered by batteries.
7	⇨	Output	Displayed when data are being output to external devices.
8	g	gram	Indicates the gram unit.
9	mg	milligram	Indicates the milligram unit.
10	▦▦▦	16-segment message 16-segment unit	- Displays various messages. - Indicates the various units.
11	↑↓ →← ↵ ▼	Operation of the [F] key	Displayed when the [F1] – [F4] keys are effective.
12	:	Colon	Displayed when the time display.
13	✳	Asterisk	Lights in the standby status.
14	▮▮▮▮▮▮▮	Bar graph	Indicates the present total amount relative to the weighing capacity defined as 100%.

Legal Metrology	Nos. 1, 9 are not indicated on verified balance.

1-7-2　LCD character font

■7-segment

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	c	comma	point

1	2	3	4	5	6	7	8	9	0	space	minus / hyphen

■16-segment

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

b	c	d	g	l	m	n	o	t	w

1	2	3	4	5	6	7	8	9	0

asterisk	slash	left arrow	right arrow	space	plus	minus / hyphen

comma	point	percent	Degree Celsius

2   Basic usage

2-1   Turning on/off the power, and checking for the operation

1   Turn on the power for the balance.
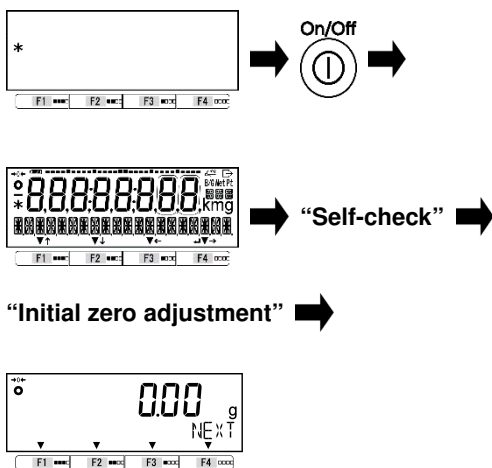
Connect the included AC adapter to the balance.
When the AC adapter is plugged in, the balance enters the standby state and an asterisk < ✳ > appears.
Press [On/Off] key.

"Self-check"

All displays on the LCD lights, followed by the self-check of the balance. During the self-check, the LCD display automatically changes.
Completion of the self-check then initial zero adjustment is followed by the weight mode.

"Initial zero adjustment"

Note	Do not press any key during the self-check.

2   Balance operation check.
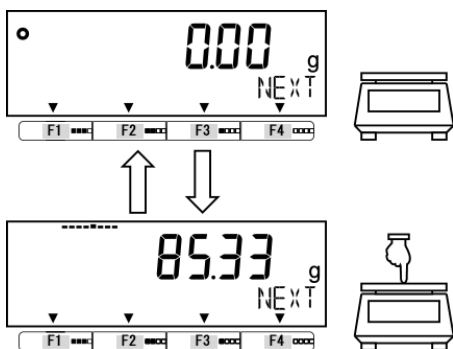
Press the weighing pan lightly to check if the indication changes.

3   Turn off the power of the balance.
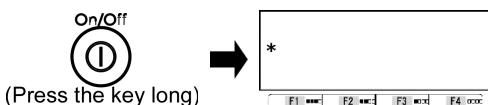
(Press the key long)

Press the [On/Off] key long (About 2 seconds).

Reference	(1) Pressing and holding [On/Off] key obtains the standby status from any operation status.
	(2) When battery driven, the balance on/shutdowns without standby status.
	(3) The balance starts up in the last measuring mode before it was switched off.

Legal Metrology	The verified balance always starts up in weighing mode.

2-2   Zero-point adjustment

Adjusting the indication to zero is called "Zero-point adjustment".

1 **Place a container on the weighing pan.**
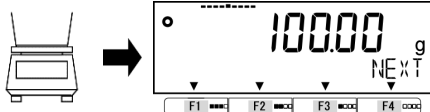
Make sure that nothing is placed on the weighing pan.

2 **Execute "Zero-point adjustment".**
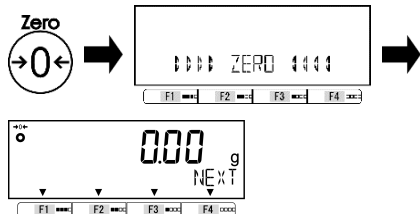
Press [Zero] key.

After the weight indication is stabilized, the indication become zero and the symbol "➜0←" lights.

Reference
(1) Performing the zero narrows the weighing range as much as the weight of the container. "Weighable range" = "weighing capacity" – "container weight"
(2) Stability waiting during the Zero-point adjustment can be disabled using the Setting menu <17 WT STABLE>.

Legal Metrology The setting of <17 WT STABLE> is not changeable and the balance always wait stability during the zero-point adjustment.

2-2-1   Zero-point adjustment range

There is a Zero-point adjustment range (limit) in this product. The base point of the zero-point adjustment range is the initial zero adjustment point.

Model	Lower limit (g)	Upper limit (g)
ALE322NC	-4.80	320
ALE1501NC	-22.5	1500
ALE8200NC	-123	8200

2-3   Basic operation

Reference Shortcuts for various modes/functions can be assigned to [F] keys. Please refer to "8-2 Shortcut setting for accessing various measuring modes" and "8-3 Free key setting".

2-3-1   Hierarchy of a setting menu

The setting menu of this product is divided into four, from the first layer to the third layer and for various settings.
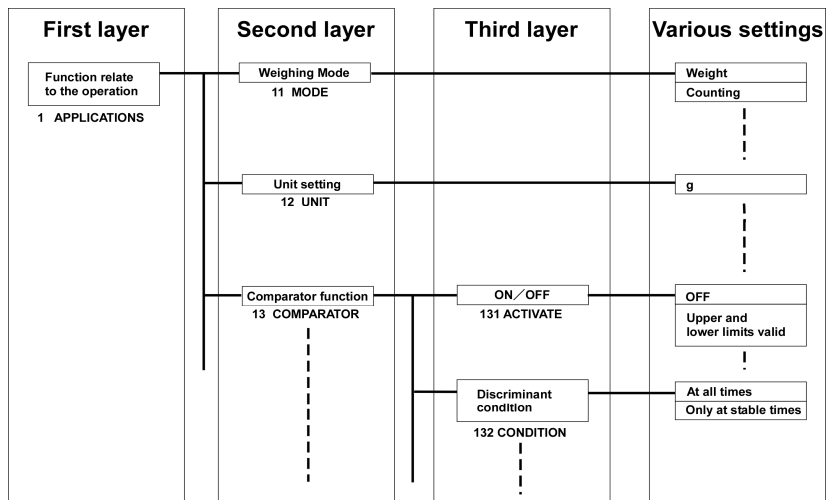
2-3-2   Operation of the setting menu

To perform settings for various functions from the state of weighing, chiefly execute the following procedure.

■Go to the menu item to set

```
            0.00 g
   B/G  DATE  TIME  NEXT
   F1    F2    F3   F4

         Menu
```

Function relate to the operation

1   APPLICATIONS

Menu

Weighing Mode
11   MODE WEIG

F4   F3   F2   F1

Unit setting
12   UNIT g

F3   F2   F1

Comparator function
13   COMPARATOR

F3   F4   F3   F2   F1

ON／OFF
131   ACTIVATE OFF

Menu

Discriminant condition
132   CONDITION FUL

At any layer → ⟳ Menu key → Exit the setting menu
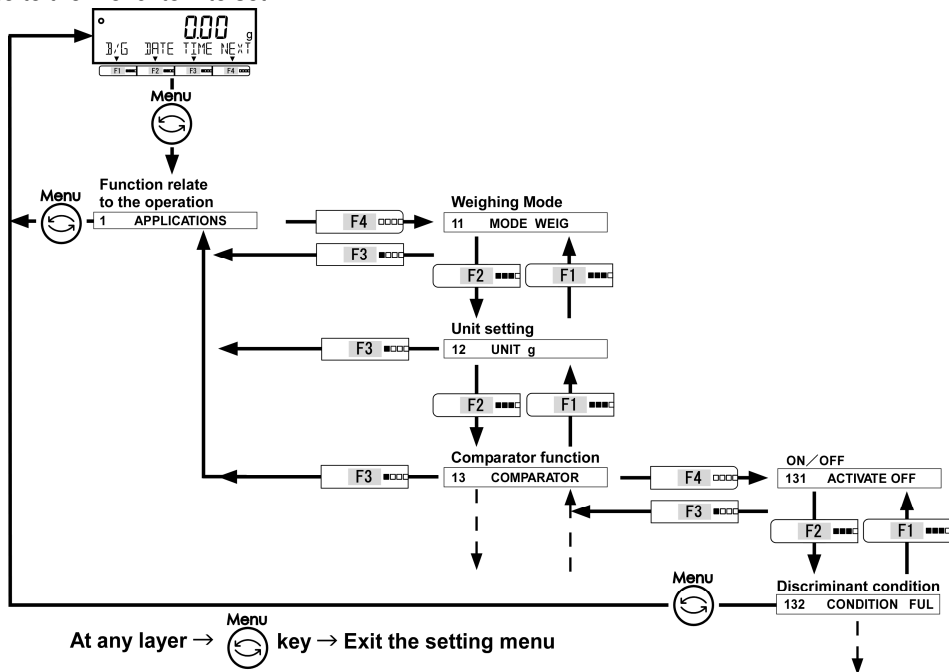
■Select the setting value and execute/fix.

Func
131   ACTIVATE   OFF

F4 →

Func
131   ACTIVATE   OFF

F4 →

Func
131   ACTIVATE   OFF

F2   F1

Func
131   ACTIVATE   H/L

F4 →

Func
131   ACTIVATE   H/L

F2   F1

Func
131   ACTIVATE   HIGH

F4 →

Func
131   ACTIVATE   HIGH

F2   F1

Func
131   ACTIVATE   LOW

F4 →

Func
131   ACTIVATE   LOW

F2   F1

Func
132   CONDITION   FUL

F4 →

Func
132   CONDITION   FUL

F4 →

Func
132   CONDITION   FUL

F2   F1

Func
132   CONDITION   STBL

F4 →

Func
132   CONDITION   STBL

At any layer → ⟳ Menu key → Exit the setting menu

2-3-3   Numeric value input

Input upper/lower limit, reference weight, specific gravity of the media liquid, water temperature,
date/time and ID/password at each mode.

> **Reference**   Numeric value inputting is limited to eight digits at a maximum.

Ex) When inputting "-5.4321".

1   **Input "–".**
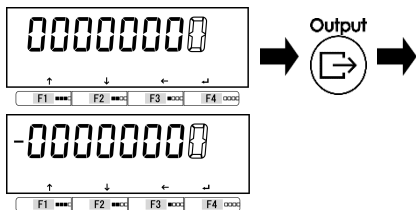
Press [Output] key to change the polarity
to "-".

2   **Input "1".**
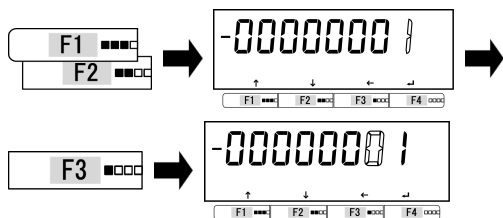
The digit for inputting is blinking.
Press [F1]/[F2] key to
increment/decrement the digit to "1".
Press [F3] key to input the next digit.

3   **Input "2, 3, 4, 5".**
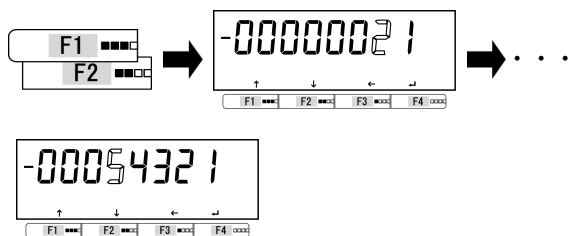
Input "2, 3, 4, 5" by the procedure above.

4   **Input ".".**
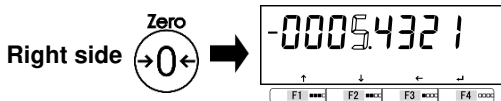
Press [Zero] key on the right to input "." on
the immediately right of the blinking digit.

5   **Fix the input value.**
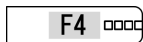
Press [F4] key to fix the input value.
"-5.4321" is saved on the balance.

> **Reference**   "-" and " . " cannot be input in ID or Password setting.
> i.e. "7-5-1 Balance ID setting"

2-3-4   [F] key switching at each measuring mode

You can switch the measuring mode, or select and set the function, by operating the [F] keys at each measuring mode.

This chapter shows the [F] keys switching by pressing the [F4] key.

Refer to "3 Function related to the operation" for the [F1]-[F3] keys operation.

Reference	(1) In weighing mode, <<F1>>-<<F6>> (Free keys) are assigned to [F] keys as described follow: <<F1>> and <<F4>>: [F1] key, <<F2>> and <<F5>>: [F2] key, <<F3>> and <<F4>>: [F3] key. Please take care not to confuse <<F1>>-<<F4>> to [F1]-[F4] keys.
	(2) Refer to "8 Controlling and adjustment functions" for assigning "Free keys" and "Shortcuts" to [F] keys.

Legal Metrology	(1) Multiplied by Coefficient mode, Statistics mode and Animal mode are not available on verified balance.
	(2) "Adding execution, Sum total" is not available on verified balance.

Weighing mode	**Counting mode**	**Percentage mode**	**Multiplied by Coefficient mode**
<<F1>>-<<F3>> (Free key)	Counting mode menu	Percentage mode menu	Multiplied by Coefficient mode menu
0.00 g / DATE TIME ID NEXT	20 PC / RMEM PCSW 9/P NEXT	10.00 % / REF NEXT	2.00 MUL / CSET F/* NEXT
F4	F4	F4	F4
<<F4>>-<<F6>> (Free key)	Adding execution, Sum total	Adding execution, Sum total	Adding execution, Sum total
0.00 g / HIGH LOW 9 NEXT	20 PCS / ADD TOTL NEXT	10.00 % / ADD TOTL NEXT	2.00 MUL / ADD TOTL NEXT
F4	F4	F4	F4
Comparator indication	Comparator indication	Comparator indication	Comparator indication
0.00 g / LOW OK HIGH NEXT	20 PC / LOW OK HIGH NEXT	10.00 % / LOW OK HIGH NEXT	2.00 MUL / LOW OK HIGH NEXT
F4	F4	F4	F4
Measuring mode switching	Measuring mode switching	Measuring mode switching	Measuring mode switching
0.00 g / WEIG COUN PCNT NEXT	20 PC / WEIG COUN PCNT NEXT	10.00 % / WEIG COUN PCNT NEXT	2.00 MUL / WEIG COUN PCNT NEXT
F4	F4	F4	F4
Return to the first menu item	Return to the first menu item	Return to the first menu item	Return to the first menu item

Specific gravity mode	**Statistics mode**	**Animal mode**
Specific gravity mode menu	Statistics mode menu	Animal mode menu

Specific gravity mode	Statistics mode	Animal mode
2.0000 SG	50.00 g	0.00 FST g
RSET WAIR WLIQ NEXT	POUT DATA DEL NEXT	FAST MID SLOW NEXT
F1 F2 F3 F4	F1 F2 F3 F4	F1 F2 F3 F4
F4	**F4**	**F4**
Measuring mode switching	Measuring mode switching	Animal mode menu
2.0000 SG	0.00 g	0.00 FST g
WEIG COUN PCNT NEXT	WEIG COUN PCNT NEXT	HOLD NEXT
F1 F2 F3 F4	F1 F2 F3 F4	F1 F2 F3 F4
F4	**F4**	**F4**
Return to the first menu item	Return to the first menu item	Measuring mode switching
		0.00 FST g
		WEIG COUN PCNT NEXT
		F1 F2 F3 F4
		F4
		Return to the first menu item

3   Functions related to the operation

Settings to change the balance operations.

3-1   Hierarchy of functions related to the operation

Legal Metrology	-	Gray-shaded items (☐☐☐) are not available on verified balance.
	*1	On ALE1501NC, "pound" and "grain" are not selectable at <12 UNIT> on verified balance.
		On ALE8200NC, <12 UNIT> is not selectable and only "gram" is available on verified balance.

★: Initial setting value

Functions related to the operation **1 APPLICATIONS**		Measuring Mode **11 MODE**		★	**WEIG**	Weighing mode
					COUN	Counting mode
					PCNT	Percentage mode
					MULT	Multiplied by Coefficient mode
					SPGR	Specific Gravity mode
					STAT	Statistics mode
					ANIM	Animal mode
	*1	Unit setting **12 UNIT**			**mg**	milligram
				★	**g**	gram
					ct	carat
					LB	pound
					OZ	ounce
					OZT	troy ounce
					GN	grain
					DWT	pennyweight
					MOM	momme
					MSG	mesghal
					TLH	tael troy (Hong Kong)
					TLS	tahil (Singapore, Malaysia)
					TLT	tael (Taiwan)
					TOLA	tola (India)
					BAT	baht
		Comparator function **13 COMPARATOR**	ON/OFF **131 ACTIVATE**	★	**OFF**	OFF
					H/L	Upper and lower limits valid
					HIGH	Upper limit alone valid
					LOW	Lower limit alone valid
			Discriminant condition **132 CONDITION**	★	**FULL**	At all times
					STBL	Only at stable times
			Discriminant range **133 RANGE**		**5**	+5 d or more
					50	+50 d or more
				★	**FULL**	Entire area
			Discriminant method **134 METHOD**	★	**ABSOL**	Absolute value method
					RELAT	Relative value method
		Adding function **14 ADDITION**	ON/OFF **141 ACTIVATE**	★	**OFF**	OFF
					ON	Valid
			Calculating method **142 OPERATION**	★	**TOTAL**	Addition accumulating method
					NET	Net adding method
			Adding direction **143 DIRECTION**	★	**PLUS**	Plus-side addition
					MINUS	Minus-side addition
		Stability waiting **17 WT STABLE**			**OFF**	OFF
				★	**ON**	Valid
		Bar graph indication **18 BARGRAPH**			**OFF**	OFF
				★	**ON**	Valid

Back light setting **1A BACKLIGHT**			**OFF**	OFF
			3MIN	3 minutes
			5MIN	5 minutes
			10MIN	10 minutes
			30MIN	30minutes
		★	**ON**	Always ON
Auto power-off **1B AUTO OFF**		★	**OFF**	Invalid
			3MIN	3 minutes
			5MIN	5 minutes
			10MIN	10 minutes
			30MIN	30minutes
Simplified SCS **1C SIMPLE SCS**		★	**OFF**	OFF
			ON	Valid

3-2   Various measuring modes of the balance

> **Reference**   Refer to "6 External input/output functions" to output the measuring data to other devices.

3-2-1   Weighing mode

Weighing mode is the basic mode for weighing.

> **Reference**   Various functions can be used with weighing mode by pressing the "Free key". Please refer to "8-3 Free key setting".

1 **Select the weighing mode.**
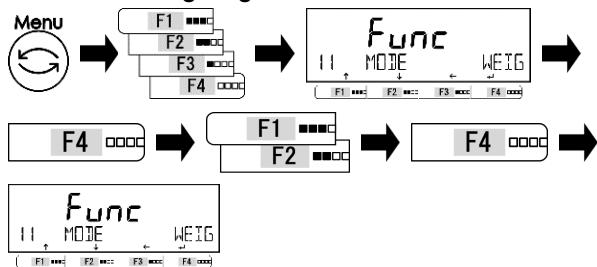
Press [Menu] key, then press [F1]-[F4] keys to go to <11 MODE>.
Press [F4] key to change the setting value.
Press [F1]/[F2] key to select.
   <<WEIG>> : Weighing mode
Press [F4] key to fix.

2 **Exit the setting menu.**

Press [Menu] key to shift to the weighing mode.

3 **Place the container on the weighing pan, then execute zero-point adjustment.**
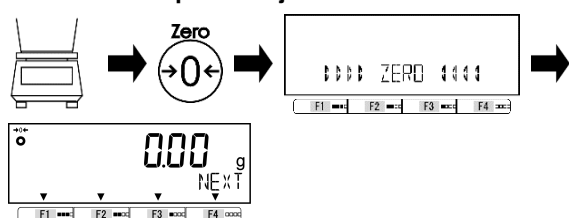
Place the container on the weighing pan if necessary.
Press [Zero] key
Zero-point adjustment is executed, and the indication returns to zero.

4 **Weigh the sample.**
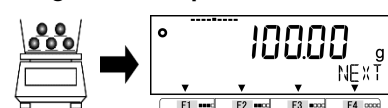
Place the weighed.
The weighing result is displayed.

3-2-2　Counting mode

Counting mode can count the number of items by placing the items for which sampling has been completed on the balance and dividing the total weight of those items by the recorded unit weight.

Legal Metrology	(1) The counting mode is legal for trade only for prescription counting in USA.
	(2) Numeric value setting method is not available on verified balance.

The unit weight is inputted by following method:
- Actual value setting method:　Place the specified number of samples on the balance to record the average unit weight.
- Numeric value setting method:　Input numeric value of the unit weight by key operation.

1　Select the Counting mode.
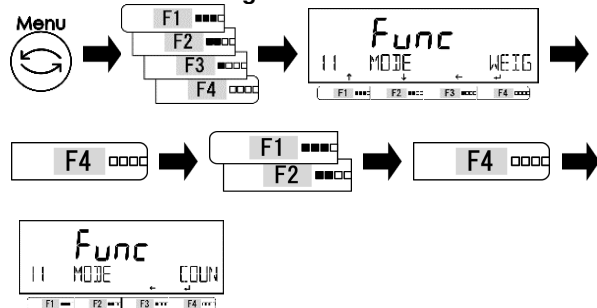
Press [Menu] key, then press [F1]-[F4] keys to go to <11 MODE>.
Press [F4] key to change the setting value.
Press [F1]/[F2] key to select.
　<<COUN>>:　Counting mode
Press [F4] key to fix.

2　Exit the setting menu.

Press [Menu] key to shift to the Counting mode.

3-2-2 (1)　Actual value setting method

Place the specified number of samples on the balance to record the average unit weight internally.

Legal Metrology	The unit weight (individual piece weight) less than 3d cannot be adopted and number of the samples less than 10 PC cannot be selected on verified balance.

1　Select whether or not employ the previous recorded unit weight.

Press [F3]/[F4] key to select whether or not employ the previous data.
When there is no data record, this step is skipped.
Press [F3]/[F4] key to select.
　<<NO>>:　Change
　<<YES>>:　Not Change
When <<OK>> is selected, go to step 6.

2　Select the number of the samples.
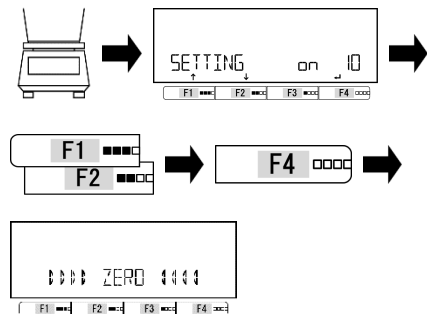
Place a container on the weighing pan.
Press [F1]/[F2] key to select.
　<<on　5>>:　5 PC
　<<on　10>>:　10 PC
　<<on　30>>:　30 PC
　<<on　50>>:　50 PC
　<<on 100>>:　100 PC
　<<on VAR>>:　1 – 999 PC
Press [F4] key to fix.
Zero-point adjustment is set automatically.

3   **Place the samples.**

```
          IO PC
ON SAMPLE    ENT
 F1    F2    F3    F4
```
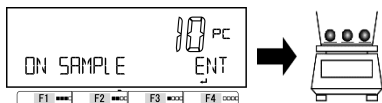
Place the set number of samples on the container.

4   **Record the unit weight.**

```
  F4               10 PC
          RMEM PCSW g/P NEXT
           F1    F2    F3    F4
```
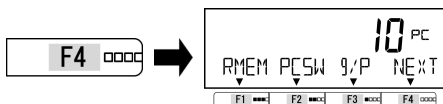
Press [F4] key to fix.

The unit weight is recorded.

5   **Simple SCS method (When enabled).**

```
          IO PC
ON SAMPLE    ENT
 F1    F2    F3    F4
```

```
          2O PC
ON SAMPLE    ENT
 F1    F2    F3    F4
```

· · ·

```
  F4
```
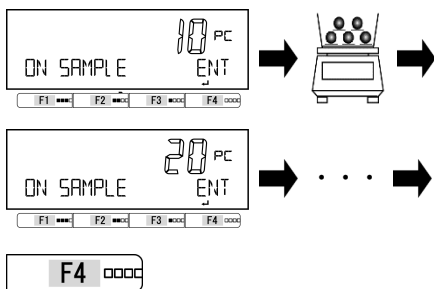
When <1C Simple SCS> is valid, Simple SCS method is activated and the sample counting indication blinks during this function.
Add more samples, then the number of samples and unit weight is automatically updated when the indication becomes stable. The number of additional samples can be up to two times the number of the samples of the latest update.
For example, when "10 PC" is set, add 20 or less samples.
Repeat this step until the number of the samples has reached approximately one-fifth to one-half of the total numbers that you are intended to count.
Press [F4] key to fix the updated unit weight.

6   **Put objects in place to count them.**

```
             2O PC
   RMEM PCSW g/P NEXT
    F1    F2    F3    F4
```
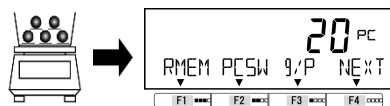
Place the objects.

Count result is displayed.

---

(1)   When <on VAR> is selected in step 2, select the specified number of the sample among 10 to 999 by operating [F1]/[F2] keys.

(2)   When simple SCS is operating, if the weight of the samples is less than the "SCS weight" — 99 times of the minimum readability (d x 99) —, <Add> blinks on the display and unit weight cannot be updated. In this case, add samples until <Add> indication disappears, or select the larger number of samples in step 2.

```
 ·  Add        O PC
   ON SAMPLE     ENT
    F1    F2    F3    F4
```
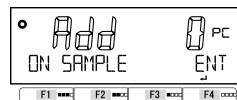
Reference

Model	Readability d (g)	SCS weight (g)
ALE322NC	0.01	0.99
ALE1501NC	0.1	9.9
ALE8200NC	1	99

(3)   When simple SCS is operating, if the number of the additional samples is larger than two times of the sample number of the latest update, <Sub> blinks on the display and unit weight cannot be updated. In this case, decrease the number of additional samples.

```
 ·  Sub       2O PC
   ON SAMPLE     ENT
    F1    F2    F3    F4
```
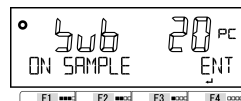
3-2-2 (2)   Numeric value setting method

| Legal Metrology | This method is not available on verified balance. |

1 **Select whether or not employ the previous recorded unit weight.**

```
  12345678  g
UNIT WEG   NO  YES
 F1 ▪▪▫  F2 ▪▪▫  F3 ▪▫▫  F4 ▫▫▫
```
➡
```
  F3 ▪▪▫▫
  F4 ▫▫▫▫
```
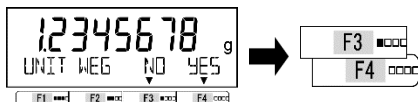
Press [F3]/[F4] key to select whether or not employ the previous data.
When there is no data record, this step is skipped.
Press [F3]/[F4] key to select.

    <<NO>>: Change
    <<YES>>: Not Change
When <<YES>> is selected, go to step 4.

2 **Select <<PCSWGT>> (Unit weight value input mode).**

```
SETTING     PCSWGT
 ↑   ↓
 F1 ▪▪▫  F2 ▪▪▫  F3 ▪▫▫  F4 ▫▫▫
```
➡
```
 F1 ▪▪▫
 F2 ▪▪▫
```
➡
```
       F4 ▫▫▫▫
```
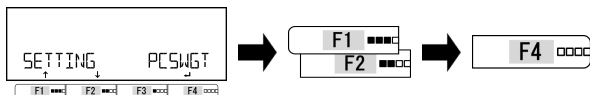
Press [F1]/[F2] key to select.
    <<PCSWGT>>: Unit weight value input
Press [F4] key to fix.

3 **Input the unit weight**

```
 0000000.0  g
PLEASE SET UNIT WGT
 ↑      ↓
 F1 ▪▪▫  F2 ▪▪▫  F3 ▪▫▫  F4 ▫▫▫
```
➡ **Numeric value input** ➡

```
  F4 ▫▫▫▫
```

(Refer to "2-5-3 Numeric value input")
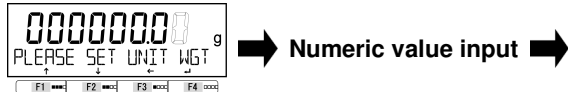
Input the unit weight.
Press [4] key to fix.

4 **Put objects in place to count them.**


```
▶▶▶▶ ZERO ◀◀◀◀
 F1 ▪▪▫  F2 ▪▪▫  F3 ▪▫▫  F4 ▫▫▫
```
➡
```
        20 PC
RMEM PCSW 9/P  NEXT
 F1 ▪▪▫  F2 ▪▪▫  F3 ▪▫▫  F4 ▫▫▫
```
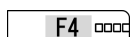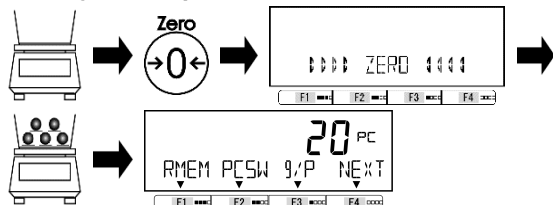
Place a container (tare) on the weighing pan.
- Press [Zero] key.
- Place the objects.
The count result is displayed.

3-2-2 (3)   Switching the display at Counting mode

1 **Press [F1]-[F4] keys to switch the display.**

```
        20 PCS
RMEM PCSW 9/P  NEXT
 F1 ▪▪▫  F2 ▪▪▫  F3 ▪▫▫  F4 ▫▫▫
```

Change the unit weight
```
  12345678  g
UNIT WEG   NO  YES
 F1 ▪▪▫  F2 ▪▪▫  F3 ▪▫▫  F4 ▫▫▫
```
Change

Unit weight
```
  12.345678  g
UNIT WEIGHT   RET
 F1 ▪▪▫  F2 ▪▪▫  F3 ▪▫▫  F4 ▫▫▫
```

Weighing mode
```
       1.23  g
RMEM PCSW 9/P  NEXT
 F1 ▪▪▫  F2 ▪▪▫  F3 ▪▫▫  F4 ▫▫▫
```

| Legal Metrology | Adding function display is not available on verified balance. |

```
        20 PCS
ADD  TOTL     NEXT
 F1 ▪▪▫  F2 ▪▪▫  F3 ▪▫▫  F4 ▫▫▫
```

Adding execute | Total value | Comparator setting menu

Measuring mode switching
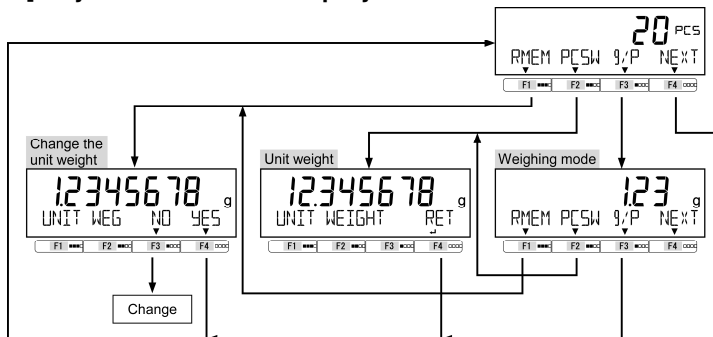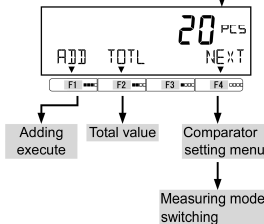
3-3   Percentage mode

The weight of a sample to be weighed is indicated in percent relative to the reference weight.
There are two methods to input the reference weight:

- Actual value setting method (<<onW>>):   Place the reference weight on the balance to record the weight.
- Numeric value setting method (<<NUM>>):   Input numeric value of the reference weight by key operation.

(1)   Minimum Reference Weight (MRW)

Models	d (g)	MRW (g)
ALE322NC	0.01	1.00
ALE1501NC	0.1	10.0
ALE8200NC	1	100

Reference   (2)   The minimum percent to be displayed is automatically set according to the recorded reference weight.

Readability (%)	Range of reference weight				
1	MRW	<=	Reference weight	<	MRW x 10
0.1	MRW x 10	<=	Reference weight	<	MRW x 100
0.01	MRW x 100	<=	Reference weight		

1 Select the percentage mode.
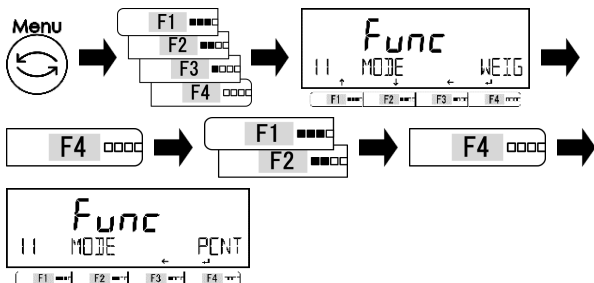
Press [Menu] key, then press [F1]-[F4] keys to go to <11 MODE>.

Press [F4] key to change the setting value.

Press [F1]/[F2] key to select.

   <<PCNT>>：Percentage mode

Press [F4] key to fix.

2 Exit the setting menu.

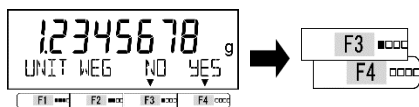Press [Menu] key to shift to the percentage mode.

3 Select whether or not employ the previous recorded reference value.
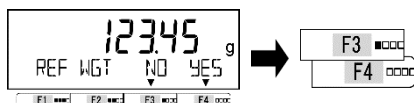
Press [F3]/[F4] key to select whether or not employ the previous data.
When there is no data record, this step is skipped.
Press [F3]/[F4] key to select.
    <<NO>>: Change
   <<YES>>: Not Change
When <OK> is selected, go to step 6.

4 Select the method of setting the reference value.
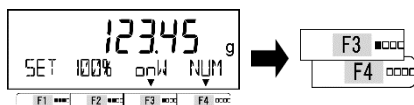
Press [F3]/[F4] key to select.

   <<onW>>：Actual value
   <<NUM>>：Numeric value

5 **Save the reference value.**

In the case of <<onW>>.

```
  ⌶̇       0.00 g
○
ON  100% WEIGHT OK
 F1 ▬▬  F2 ▬▬  F3 ▬□  F4 □□□
```
➡ ➡ | **F4** □□□ |
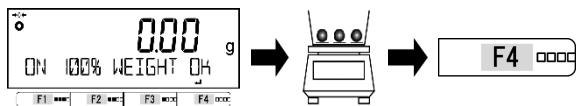
Place the reference weight on the balance.
Press [F4] key to record.

In the case of <<NUM>>.

```
00000000 g
SET  100% WEIGHT
 F1 ▬▬  F2 ▬▬  F3 ▬□  F4 □□□
```
➡

Input the reference value.
Press [F4] key to fix.
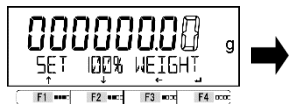
Numeric value input ➡ | **F4** □□□ |

(Refer to "2-3-3 Numeric value input")

6 **Weigh the samples.**

```
○         10.00 %
REF              NEXT
 F1 ▬▬  F2 ▬▬  F3 ▬□  F4 □□□
```
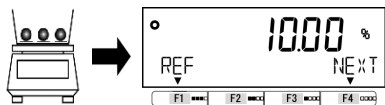
The ratio of the weight of the sample to the
reference weight is indicated in percent.

3-3-1   Switching the display at percentage mode

1 **Press [F1]-[F4] keys to switch the display.**

```
○         10.00 %
REF              NEXT
 F1 ▬▬  F2 ▬▬  F3 ▬□  F4 □□□
```

Reference value
```
         123.45 g
REF WGT    NO  YES
 F1 ▬▬  F2 ▬▬  F3 ▬□  F4 □□□
```

```
○         10.00 %
ADD  TOTL        NEXT
 F1 ▬▬  F2 ▬▬  F3 ▬□  F4 □□□
```

Setting the
Reference value

Adding
execute

Total value

Comparator
setting menu

Measuring mode
switching
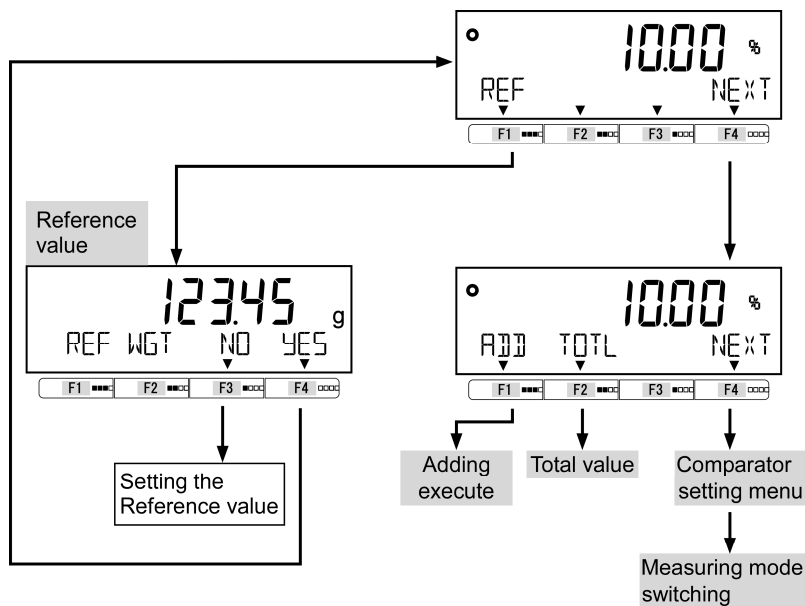
| Legal Metrology | Adding function display is not available on verified balance. |

3-4   Multiplied by Coefficient mode

Measured weight is multiplied by the preset coefficient, and the result be displayed.

Legal Metrology	This mode is not available on verified balance.

1   **Select the Multiplied by Coefficient mode.**
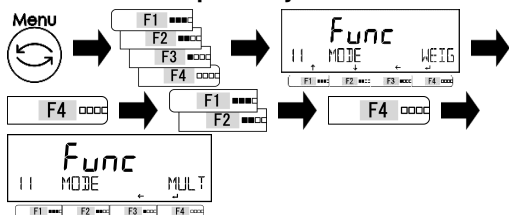
Press [Menu] key, then press [F1]-[F4] keys to go to <11 MODE>.
Press [F4] key to change the setting value.
Press [F1]/[F2] key to select.
   <<MULT>>：Multiplied by Coefficient mode
Press [F4] key to fix.

2   **Exit the setting menu.**
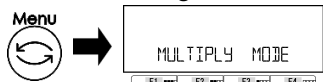
Press [Menu] key to shift to the

Multiplied by Coefficient mode.

3   **Select whether or not employ the previous recorded coefficient.**

Press [F3]/[F4] key to select whether or not employ the previous data.
When there is no data record, this step is skipped.
Press [F3]/[F4] key to select.
    <<NO>>: Change
    <<YES>>: Not Change
When <<OK>> is selected, go to step 6.

4   **Set the coefficient.**

Numeric value input ➡

(Refer to "2-5-3 Numeric value input")
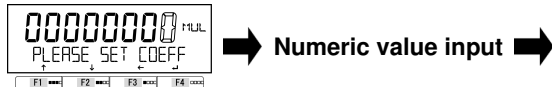
Input the coefficient.
Press [F4] key to fix.

5   **Weigh the samples.**

The weight of the sample is multiplied by the coefficient and the result is displayed.

3-4-1   Switching the display at Multiplied by Coefficient

1   **Press [F1]-[F4] keys to switch the display.**
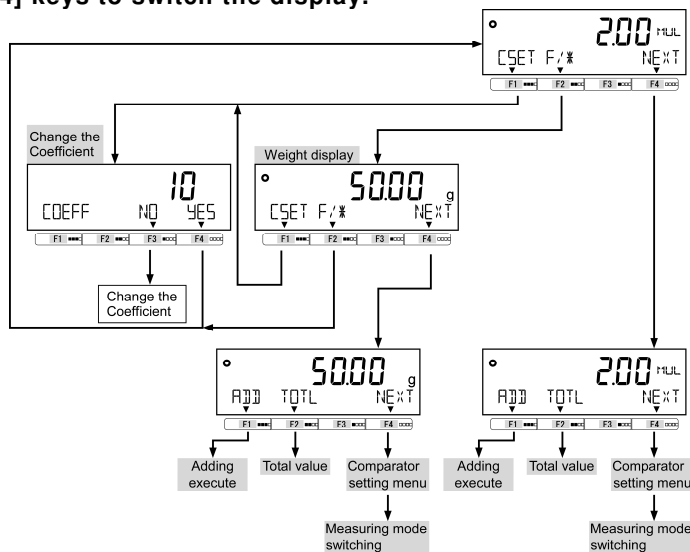
3-5 Specific gravity mode

In the specific gravity mode, the ratio of the density of a substance to the density of water at its densest (4 °C) for liquids is calculated.

| L egal M etrology | Specific gravity mode is NOT legal for trade. |

Purchase the optional "specific gravity measurement kit" or prepare the equipment — a water tank, hanging string/wire, net/basket for placing the sample, thermometer etc.— in accordance with the samples to be measured.

When purchased with "specific gravity measurement kit", please refer to the option's manual.

Procedure to measure the specific gravity:

1. Prepare the equipment or specific gravity measurement kit.
2. Input the water temperature or the specific gravity of the reference liquid.
3. Measure the sample weight in the air.
4. Compensate the buoyancy acting on the net/basket.
5. Measure the sample weight in the water/liquid.
6. The specific gravity of the sample is displayed.

1 **Select the specific gravity mode.**
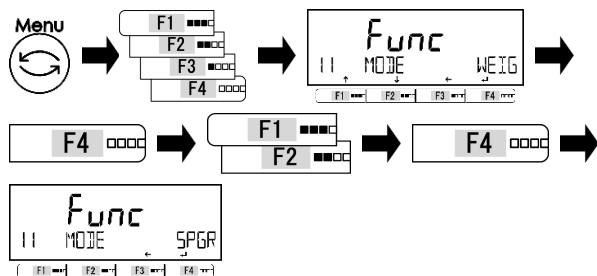
Press [Menu] key, then press [F1]-[F4] keys to go to <11 MODE>

Press [F4] key to change the setting value.

Press [F1]/[F2] key to select.

   <<SPGR>>: specific gravity mode

Press [F4] key to fix.

2 **Exit the setting menu.**
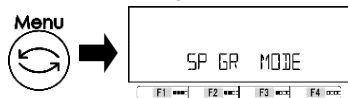
Press [Menu] key to shift to the specific gravity mode.

3 **Select the reference liquid.**

Press [F3]/[F4] key to select the reference liquid.
  <<OTHER>>: liquid other than water
    <<H2O>>: water

4 **Input the specific gravity of the reference liquid or the temperature of the water.**

<<OTHER>>: Liquid other than water
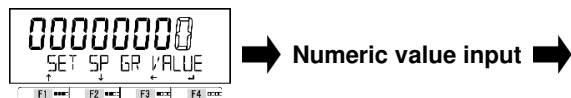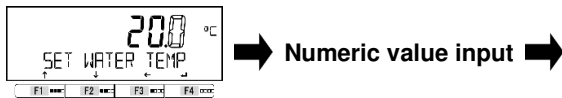
  (Refer to "2-3-3 Numeric value input")

Enter the specific gravity of the reference liquid and press [F4] key to fix.

<<H2O>>: Water

  (Refer to "2-3-3 Numeric value input")

Enter the temperature of the water and press [F4] key to fix.

5 **Measure the sample weight in the air.**
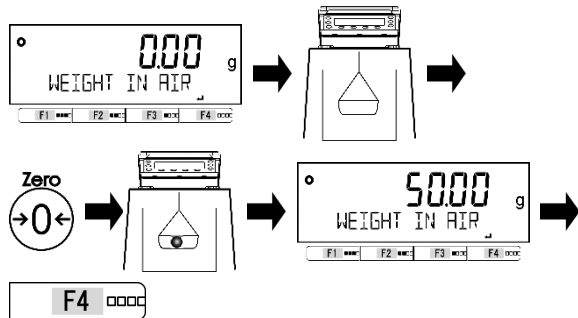
Set the net/basket on the balance and press [Zero] key.
Load the on the net/basket to measure the weight of the sample in the air, then press [F4] key to record it.

6 **Compensate the buoyancy acting on the net/basket.**
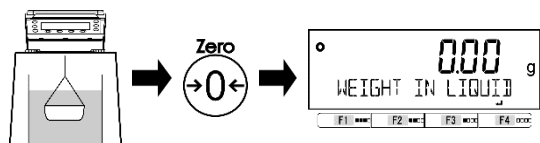
Remove the sample on the net/basket, then sink the net/basket into the water/liquid.
Press [Zero] key to compensate the buoyancy acting on the net/basket.

7 **Measure the sample weight in the water/liquid.**
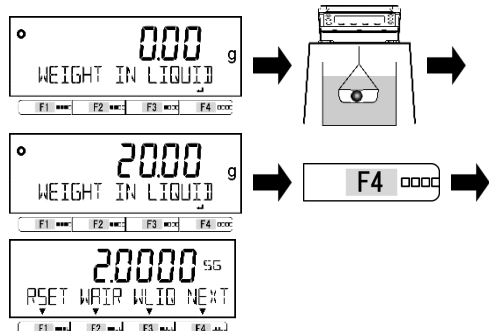
Put the sample on the net/basket in the water/liquid, then press [F4] key to record.

The specific gravity of the sample (for the 4 °C water) is automatically calculated and displayed.

3-5-1   Switching the display at "Specific gravity mode"

1 **Press [F1]-[F4] keys to switch the display.**

Select the Liquid

Weight (air)

Water / liquid

Measuring mode switching
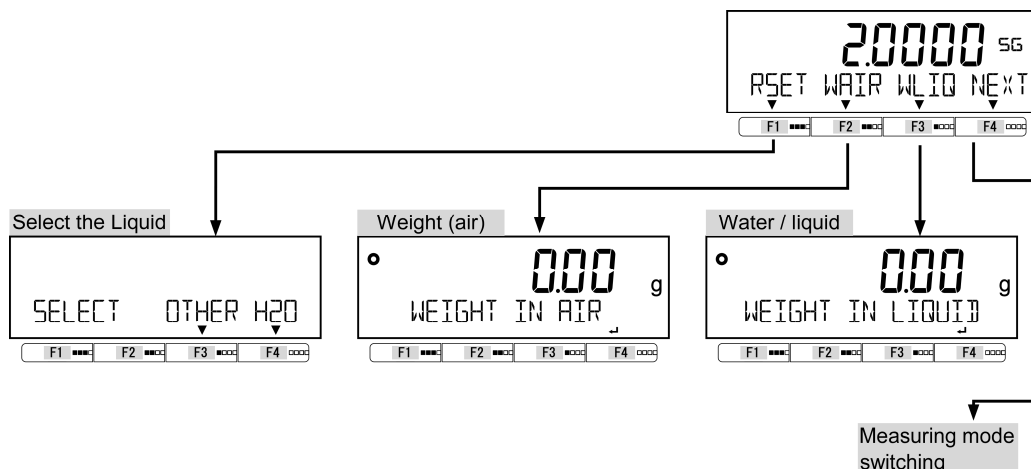
3-6   Statistics mode

The statistical operation function collects weight data and indicates maximum, average, and other statistical values.

Legal Metrology	This mode is not available on verified balance.

Reference	(1)	Only "mg" or "g" can be used.
	(2)	Up to 999 weight data can be saved.
	(3)	The output timing is fixed to "Output once immediately after [Output] key is pressed" or "Output once when balance reached stable after [Output] key is pressed", regardless of the setting value of <413/423 CONDITION> of "6 External input/output function".

The setting of <17 WT STABLE>	The output condition
<<ON>>	Once at stable after [Output] key is pressed
<<OFF>>	Once immediately after [Output] key is pressed

1 **Select the statistics mode.**
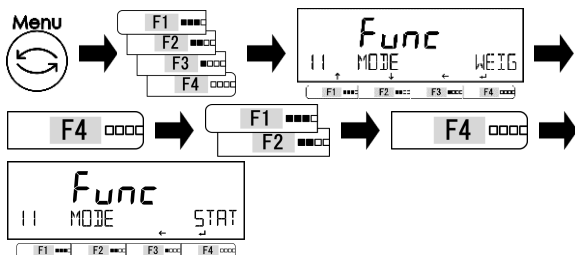
Press [Menu] key, then press [F1]-[F4] keys to go to <11 MODE>.

Press [F4] key to change the setting value.

Press [F4] key to select.

   <<STAT>>: Statistics mode

Press [F4] key to fix.

2 **Exit the setting menu.**

Press [Menu] key to shift to the statistics mode.

3 **Choose whether or not clear all the data.**
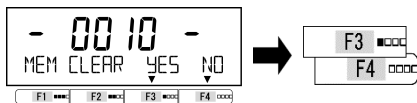
Press [F3]/[F4] key to select whether or not clear all the data.

When there is no data stored, this step is skipped.

    <<YES>>：Clear

    <<NO>>：Not clear

When <<NO>> is selected, weighing step of the next statistics data starts.

4 **Store weighing data.**
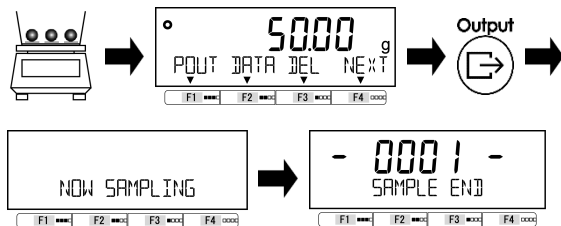
Place the sample in the weighing pan.

Press [Output] key to store the sample weight.

Weighing data is collected and then output.

5 **Collect more weighing data.**

NOW SAMPLING ➡️ - 0008 - SAMPLE END
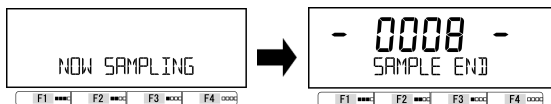
Store data in the same way as in step 4.
Repeat placing samples, storing data, and removing the samples until the required number of data items are collected.

6 **Display the statistical operation result.**

50.00 g
POUT DATA DEL NEXT

➡️ F2 ■■□□ ➡️
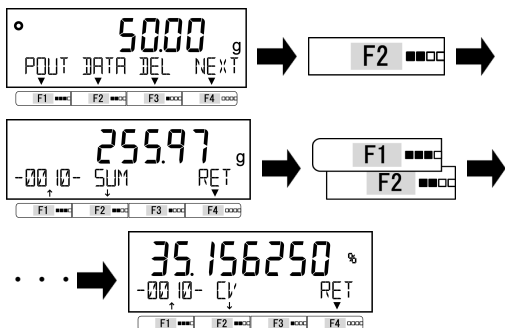
Press [F2] (<<DATA>>) key.

The display changes to the statistical operation display
Press [F1]/[F2] key to switch to another calculated item.

255.97 g
-0010- SUM   RET

➡️ F1 ■■■□
   F2 ■■□□ ➡️

· · · ➡️ 35.156250 %
-0010- CV   RET

255.97 g -0010- SUM RET	35.53 g -0010- MAX RET	14.07 g -0010- MIN RET	21.46 g -0010- RANGE RET
Sum total	Maximum value	Minimum value	Range (Max – Min)

25.60 g -0010- AVERAGE RET	9.00 g -0010- SD RET	35.156250 % -0010- CV RET	
Average value	Standard deviation	Coefficient of variation	
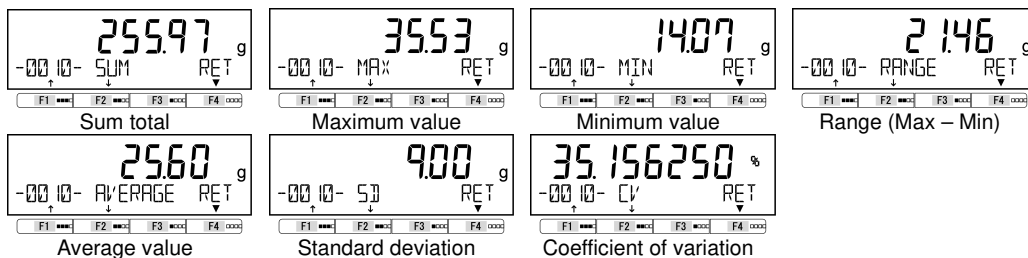
3-6-1   Switching the display at "Statistics mode"

1 **Press [F1]-[F4] keys to switch the display.**

50.00 g
POUT DATA DEL NEXT
F1 ■■□□ F2 ■■□□ F3 ■■□□ F4 □□□□

Printing
OUTPUT GLP
F1 ■■□□ F2 ■■□□ F3 ■■□□ F4 □□□□

Check the data
35.53 g
-0010- MAX   RET
F1 ■■□□ F2 ■■□□ F3 ■■□□ F4 □□□□
Data switch

Delete the data
- 0010 -
ALL LAST   RET
F1 ■■□□ F2 ■■□□ F3 ■■□□ F4 □□□□
All delete   Delete of last data

Measuring mode switching
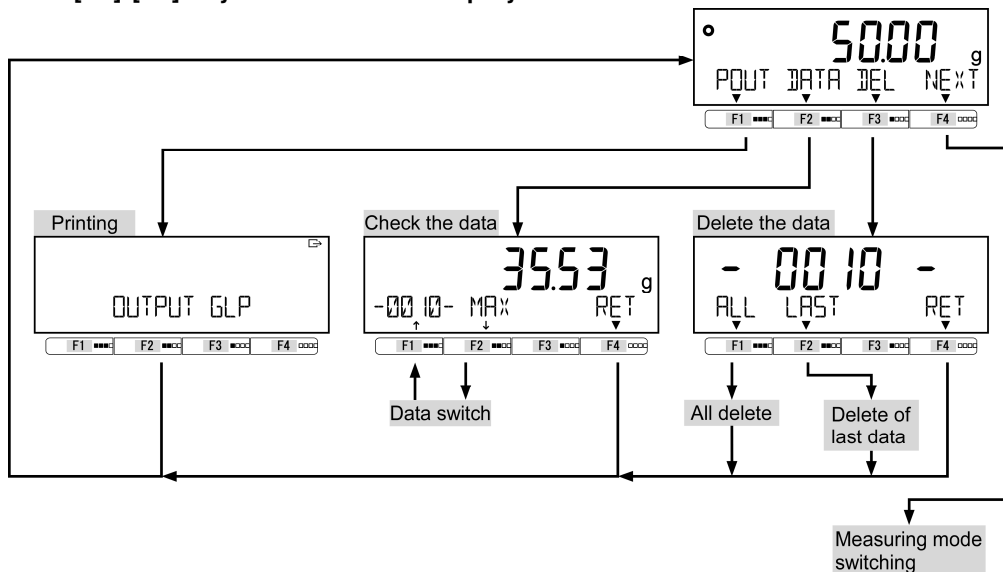
3-7 Animal mode

The balance can accurately weigh animals and other samples that move during measurement.
Even when animals and other samples move during measurement, when weight variations fit within the
set value range, the indication is held (hold) and the measurement result can be read.

| Legal Metrology | This mode is not available on verified balance. |

| Reference | When the external output is activated, the output condition is fixed as following:
(1) Output once after the indication is held except when the <<HOLD>> is pressed (step 4-b).
(2) Output once after the [Output] key is pressed during the indication is held. |

1 **Select the animal mode.**
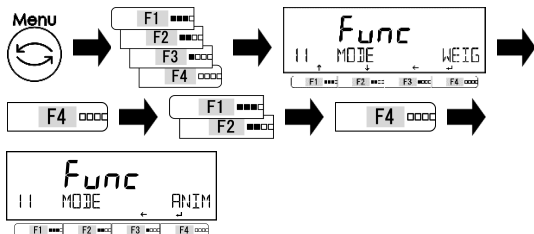
Press [Menu] key, then press
[F1]-[F4] keys to go to <11 MODE>.
Press [F4] key to change the setting
menu.
Press [F1]/[F2] key to select.
  <<ANIM>>: Animal mode
Press [F4] key to fix.

2 **Exit the setting menu.**

Press [Menu] key to shift to the
animal mode.

3 **Select the activity level.**
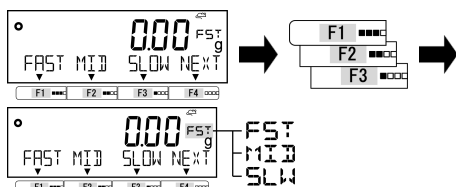
Press [F1]-[F3] keys to select.
  <<FAST>>: Wild
  <<MID>>: In-between
  <<SLOW>>: Quiet

4 **a) Weigh the animal.**
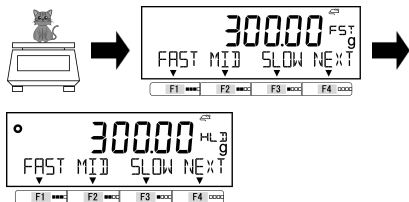
Place the animal on the weighing
pan.
After the weight variations fit within the
set range, the weighing indication is held
and <HLD> indication appears.

**b) Weigh the animal using manual <<HOLD>>
key.**
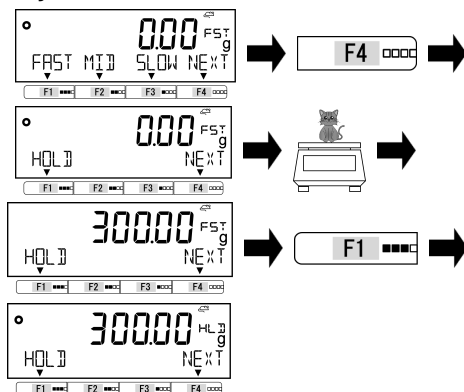
Press [F4] (<<NEXT>>) key to
display the <<HOLD>> menu on [F1]
key.
Place the animal on the weighing
pan.
Press [F1] (<<HOLD>>) key, then the
weighing indication is held and
<HLD> indication appears.

− 33 −

5 **Remove the animal**
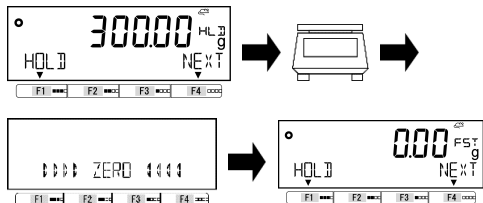
Remove the animal, then automatically zero-point adjusted.

3-8 Unit setting

Various units can be selected. Please also refer to "Appendix 1-1 Basic specifications" and "Appendix 3 Unit conversion table".

Legal Metrology	(1)	On ALE322NC, only "gram", "carat", "pound", "ounce", and "grain" are not selectable after verification.
	(2)	On ALE1501NC, only "gram", "carat", and "ounce" are selectable after verification.
	(3)	On ALE8200NC, <12 UNIT> is not selectable and only "gram" is available after verification.
	(4)	Carats may only be used when weighing gemstones.

1 **Select the unit setting.**
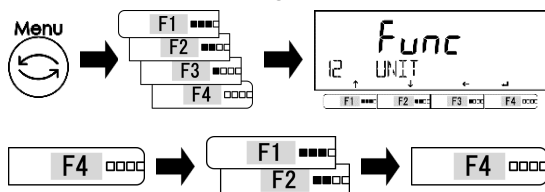
Press [Menu] key, then press [F1]-[F4] keys to go to <12 UNIT>.
Press [F4] key to change the setting value.
Press [F1]/[F2] key to select the unit (Refer to Unit Setting Menu List).
Press [F4] key to fix.

Unit Setting Menu List

<<mg>> : milligram	<<g>> : gram	<<ct>> : carat	<<LB>> : pound
<<OZ>> : ounce	<<OZT>> : troy ounce	<<GN>> : grain	<<DWT>> : pennyweight
<<MOM>> : もんめ (momme)	<<MSG>> : مثقال (mesghal)	<<TLH>> : tael troy - Hong Kong	<<TLS>> : tahil - Singapore, Malaysia
<<TLT>> : 兩 (tael) - Taiwan	<<TOLA>> : tola - India	<<BAT>> : บาท (baht)	

2 **Exit the setting menu.**
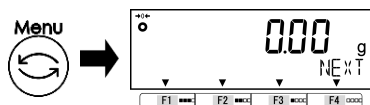
Press [Menu] key to shift to the measuring mode.

3-9   Comparator function

It is possible to preset threshold values (limits) and determine whether or not a measured value is within the range defined by the preset values.
Refer to "5 Comparator setting" to preset the threshold values.

Reference	The comparator function can be used in Weighing mode, Percentage mode, Counting mode, and Multiplied by Coefficient mode.

3-9-1   How to perform discrimination

Switch to the "Comparator indication" according to "2-3-4 [F] key switching at each measuring mode".
Whether the measured value of the sample is "LOW" (lower than the lower limit), "OK" (appropriate) or "HIGH" (higher than the upper limit), is indicated on the LCD with "16-segment messages".

16-segment messages			
LOW	OK	HIGH	NEXT

Discrimination	Single point setting (lower limit)		Single point setting (upper limit)		Two-point setting (upper and lower limits)	
Over the upper limit	< OK >	Blinking	< HIGH >	Blinking	< HIGH >	Blinking
Appropriate amount	< OK >	Blinking	< OK >	Blinking	< OK >	Blinking
Below the lower limit	< LOW >	Blinking	< OK >	Blinking	< LOW >	Blinking

The discrimination is performed according to the following criteria:
- Absolute value: The discrimination is performed based on the upper and lower limit values that have been set in advance.
- Relative value: A reference numeric value is set in advance, and the discrimination is performed based on the range defined by the upper and lower limit values that have been set for the reference numeric value.

（For example） Two-point (upper and lower limits) setting, Reference value = 100.00 g,
Lower limit value = 90.00 g, Upper limit value = 120.00 g

Discrimination method	Reference value	Lower limit value	Upper limit value
	100.00 g	90.00 g	120.00 g
Absolute value		90.00 g	120.00 g
Relative value	100.00 g	-10.00 g	20.00 g

3-9-2   Comparator function setting

Reference	Refer to "5 Comparator setting" to preset the threshold values. The threshold values also can be set by [F1] (<<LOW>>) key, [F2] (<<OK>>) key and [F3] (<<HIGH>>) key at "Comparator indication" display.

1   **Select the comparator function.**

Menu ➡ F1/F2/F3/F4 ➡ Func 131 ACTIVATE OFF ➡

F4 ➡ F1/F2 ➡ F4
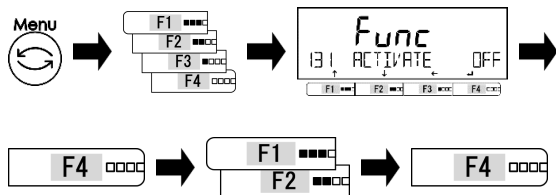
Press [Menu] key, then press [F1]-[F4] keys to go to <131 ACTIVATE>

Press [F4] key to change the setting value.

Press [F1]/[F2] key to select.

    <<OFF>>: OFF
    <<H / L>>: Upper and lower limits valid
    <<HIGH>>: Upper limit alone valid
    <<LOW>>: Lower limit alone valid

Press [F4] key to fix.

2 **Select the discriminant condition.**
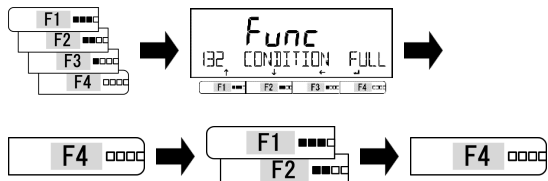
Press [F1]-[F4] keys to go to
<132 CONDITION>
Press [F4] key to change the setting value.
Press [F1]/[F2] key to select.

<<FULL>>: At all times
<<STBL>>: Only at stable times

Press [F4] key to fix.

3 **Select the discriminant range.**
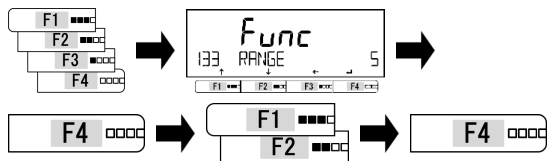
Press [F1]-[F4] keys to go to
<133 RANGE>
Press [F4] key to change the setting value.
Press [F1]/[F2] key to select.

<<5>>: +5 d or more
<<50>>: +50 d or more
<<FULL>>: Entire area

Press [F4] key to fix.

4 **Select the discriminant method.**
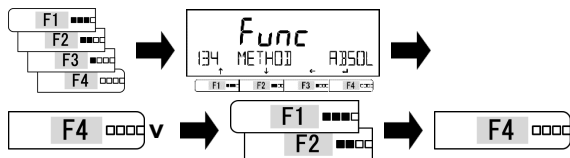
Press [F1]-[F4] keys to go to
<134 METHOD>
Press [F4] key to change the setting value.

Press [F1]/[F2] key to select.

<<ABSOL>>: Absolute value method
<<RELAT>>: Relative value method

Press [F4] key to fix.

5 **Exit the setting menu.**
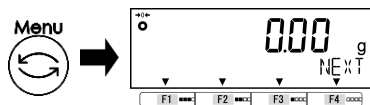
Press [Menu] key to shift to the measuring mode.

3-10   Adding function

Weigh a plurality of samples to be weighed in sequence and indicates its total value.
The adding function includes two ways of calculating method.

- Addition accumulating method:	Method of weighing samples to be weighed while replacing the samples.
- Net adding method:	Method of weighing samples to be weighed without replacing the samples.

L_{egal} M_{etrology}	This function is not available on verified balance.

Reference	The adding function can be used in Weighing mode, Percentage mode, Counting mode, and Multiplied by Coefficient mode.

1   **Select the adding function.**
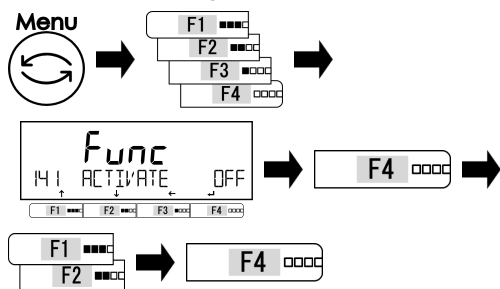
Press [Menu] key, then press [F1]-[F4] keys to go to <141 ACTIVATE>
Press [F4] key to change the setting value.
Press [F1]/[F2] key to select.
    <<OFF>>: Invalid
    <<ON>>: Valid
Press [F4] key to fix.

2   **Select the calculating method.**
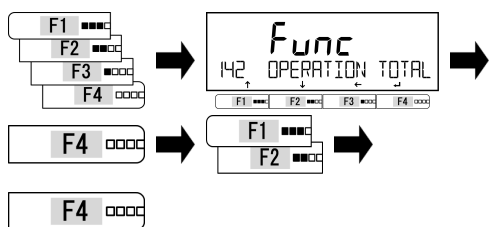
Press [F1]-[F4] keys to go to
<142 OPERATION>
Press [F4] key to change the setting value.
Press [F1]/[F2] key to select.
    <<TOTAL>>: Addition accumulating method
    <<NET>>: Net adding method
Press [F4] key to fix.

3   **Select the adding direction.**

Press [F1]-[F4] keys to go to
<143 DIRECTION>
Press [F4] key to change the setting value.
Press [F1]/[F2] key to select.
    <<PLUS>>: Plus-side addition
    <<MINUS>>: Minus-side addition
Press [F4] key to fix.

4   **Set the "Free key".**
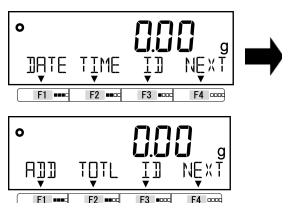
Set the following function to the <<F1>>-<<F6>>
(Free keys).
  <<62* F* KEY   ADD>> : Adding execute
  <<62* F* KEY TOTL>> : Total indication
(Refer to "8-3 Free key setting" for setting the free keys.)

Reference	Step 4 is required only when you are using an adding function on the weighing mode.

3-10-1   Weighing by means of the plus-side addition

When <<ADD>> is assigned to [F1] key and <<TOTL>> is assigned to [F2] key:

1   **Place a first sample to be weighed.**
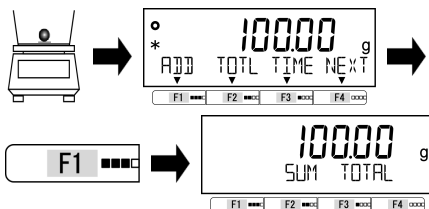
Place a first sample to be weighed.
After <✱> appears, press [F1]
(<<ADD>>) key.

The weighed value is stored and
<SUM TOTAL> is indicated for a few
seconds.

2   In the case of the addition accumulating
Replace a sample to be weighed with a new one.
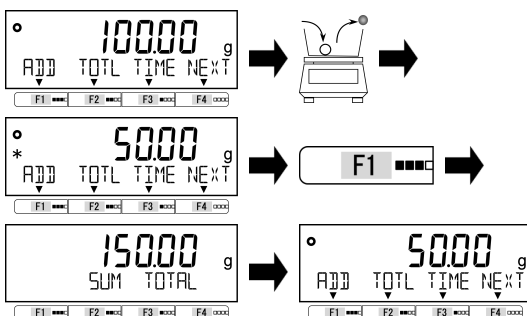
Remove the previous sample to be
weighed to return the indication to zero
and then place a next sample to be
weighed.
After <✱> appears, press [F1]
(<<ADD>>) key.

The weighed value is stored and
<SUM TOTAL> is indicated for a few
seconds.
Repeat this operation to perform addition.

In the case of the net addition
Add a sample to be weighed.
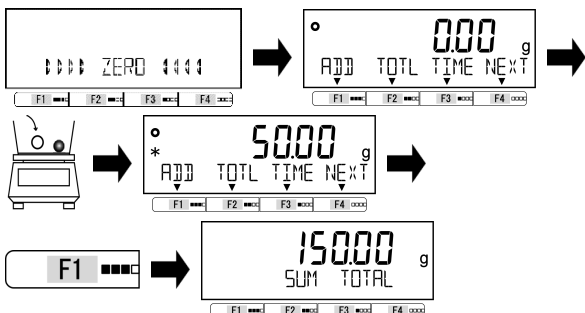
Add a sample to be weighed without doing
any other operation.
After <✱> appears, press [F1]
(<<ADD>>) key.

After indicating <SUM TOTAL> and the
accumulated value for a few seconds, the
scale returns to the weight indication,
followed by the automatic zero-point
adjustment.
Repeat this operation to perform addition.
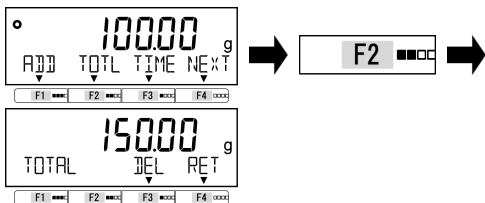
3   **Indicate the total value.**

Press [F2] (<<TOTL>>) key to indicate
the total value.

4   **Delete the total value.**
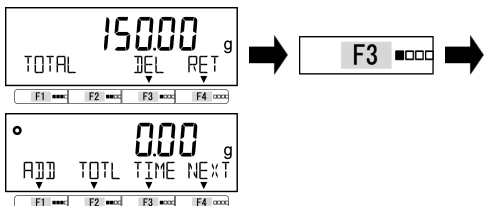
Press [F3] (<<DEL>>) key to delete
the total value.

3-10-2   Weighing by means of the minus-side addition

When <<ADD>> is assigned to [F1] key and <<TOTL>> is assigned to [F2] key.

1   **Place a sample to be weighed.**

Place a sample to be weighed.
Press [Zero] key.
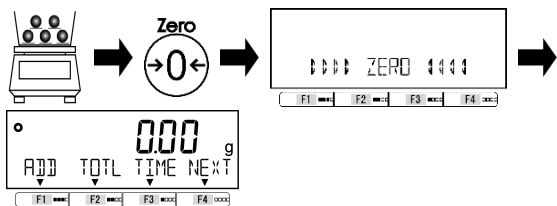
2   In the case of the addition accumulating
Remove the sample to be weighed and perform adding.

Remove the sample to be weighed.
After <✳> appears, press [F1] key.

The weighed value is stored and <SUM TOTAL> is indicated for a few seconds.
Press [Zero] key.
Repeat this operation to perform addition.
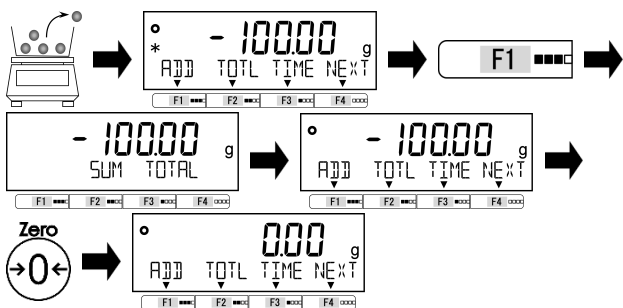
In the case of the net addition
Remove the sample.

Remove the sample to be weighed.
After <✳> appears, press [F1] key.

After indicating <SUM TOTAL> and the accumulated value for a few seconds, the scale returns to the weight indication, followed by the automatic zero-point adjustment.
Press [Zero] key.
Repeat this operation to perform addition.

3   **Indicate the total value.**

Press [F2] (<<TOTL>>) key to indicate the total value.

4   **Delete the total value.**

Press [F3] (<<DEL>>) key to delete the total value.

3-11   Stabilization wait setting

Set when to indicate the weighed value after the zero-point adjustment:
either after or before the weighed value stabilizes.

Legal Metrology	(1)	This setting menu is not available on verified balance.
	(2)	The verified balance always wait stabilization before indicating weighed value after the zero-point adjustment.

1   **Select the stabilization wait setting.**
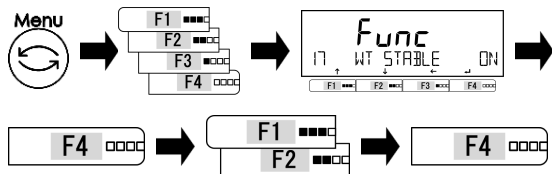
Press [Menu] key, then press [F1]-[F4] keys to go to <17 WT STABLE>.
Press [F4] key to change the setting value.
Press [F1]/[F2] key to select.

   <<OFF>>: Invalid
   <<ON>>: valid
Press [F4] key to fix.

2   **Exit the setting menu.**
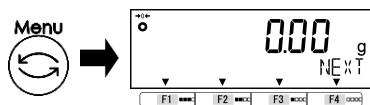
Press [Menu] key to shift to the measuring mode.

3-12   Bar graph indication

Set the indication/non-indication of the bar graph.

1   **Select the bar graph indication.**
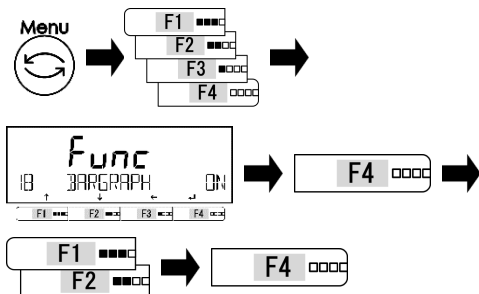
Press [Menu] key, then press [F1]-[F4] keys to go to <18 BARGRAPH>.
Press [F4] key to change the setting value.
Press [F1]/[F2] key to select.

   <<OFF>>: Invalid
   <<ON>>: valid
Press [F4] key to fix.

2   **Exit the setting menu.**
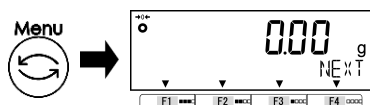
Press [Menu] key to shift to the measuring mode.

3-13   Backlight setting

Setting the backlight control.

1   **Select the backlight setting.**
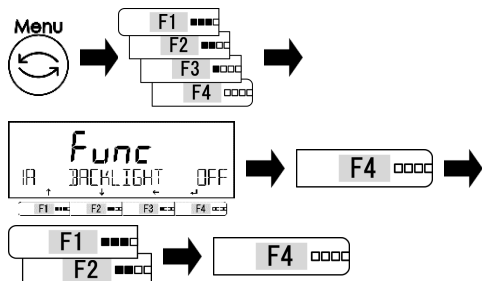
Press [Menu] key, then press [F1]-[F4] keys to go to <1A BACKLIGHT>.

Press [F4] key to change the setting value.

Press [F1]/[F2] key to select.

Refer to the "Set List".

Press [F4] key to fix.

Set List		
<<OFF>> : Invalid	<<3MIN>> : 3 minutes	<<5MIN>> : 5 minutes
<<10MIN>> : 10 minutes	<<30MIN>> : 30 minutes	<<ON>> : Always ON

2   **Exit the setting menu.**
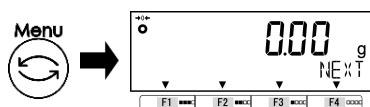
Press [Menu] key to shift to the measuring mode.

Reference   For accurately weighing, please set <1A BACKLIGHT> to <<OFF>> or <<ON>>.
When the balance is battery powered, it is recommended to set backlight settings to <<OFF>> to save the power.

3-14   Auto power-off

This function is to automatically turn off the power for the balance.

1   **Select the auto power-off.**
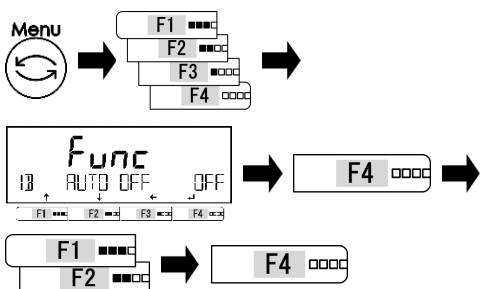
Press [Menu] key, then press [F1]-[F4] keys to go to <1B AUTO OFF>.

Press [F4] key to change the setting value.

Press [F1]/[F2] key to select.

Refer to the "Set List".

Press [F4] key to fix.

Set List		
<<OFF>> : Invalid	<<3MIN>> : 3 minutes	<<5MIN>> : 5 minutes
<<10MIN>> : 10 minutes	<<30MIN>> : 30 minutes	

2   **Exit the setting menu.**
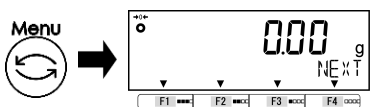
Press [Menu] key to shift to the measuring mode.

Reference   The "Backlight setting" and "Auto power-off" function does not work under the following conditions:
(1)   Setting menu is being displayed.
(2)   A sample is placed on the weighing pan and the display is not stable (When < **O** > is not displayed).

3-15   "Simple SCS (Self Counting System) method" setting

"Simple SCS method" is auxiliary function for Counting mode.
First, put a set number of samples in place. Next, put up to two times the set number of additional samples in place. The balance will automatically update the average sample weight. Repeating this step allows accurate counting.

1   **Select the simple SCS.**
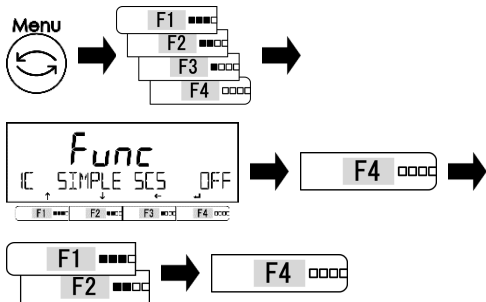
Press [Menu] key, then press [F1]-[F4] keys to go to <1C SIMPLE SCS>.

Press [F4] key to change the setting value.

Press [F1]/[F2] key to select.

   <<OFF>>: Invalid
   <<ON>>: valid

Press [F4] key to fix.

2   **Exit the setting menu.**
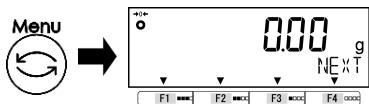
Press [Menu] key to shift to the measuring mode.

4   Functions related to the performance

Set the parameters relating measurement performance.

| Legal Metrology | For verified balance, these functions are not available. |

4-1   Hierarchy of functions related to the performance

| Legal Metrology | - Gray-shaded items (▢) are not available on verified balance.
*1 <21 STABLE> is fixed to <<1>>, <22 RESPONSE> is fixed to <<0>>,
    and <23 ZERO TRAC> is fixed to <<OFF>> on verified balance. |

★: Initial setting value

Functions relating to the performance **2 PERFORMANCE**	*1	Stability discrimination width **21 STABLE**	*1 ★	0.5	±0.5d
				1	±1d
				2	±2d
				4	±4d
	*1	Response speed **22 RESPONSE**	*1	0	Sensitive mode
				1	Fast
			*1 ★	2	Medium fast
				3	Medium
				4	Medium slow
				5	Slow
	*1	Automatic Zero-Tracking **23 ZERO TRAC**	*1	OFF	OFF
			*1 ★	0.5	0.5 d/s
				1	1 d/s
				2	2 d/s
				4	4 d/s
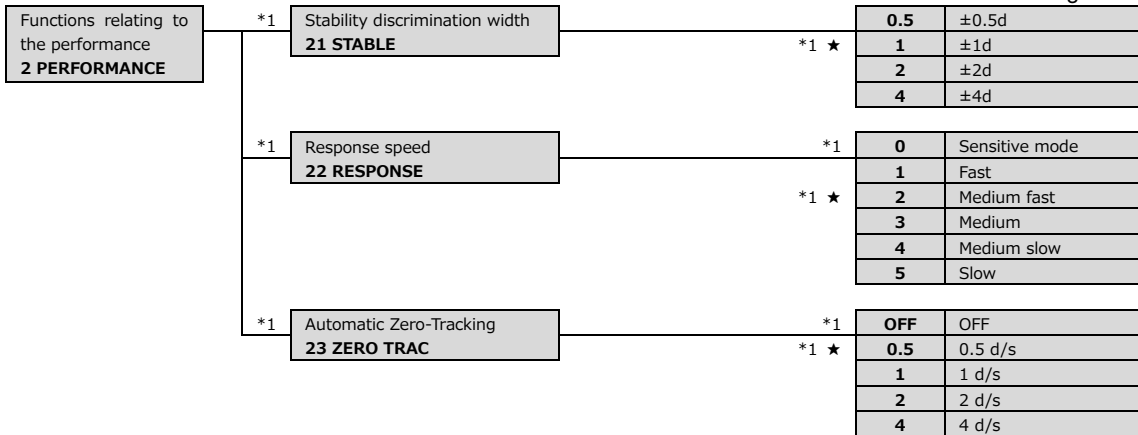
4-2   Stability discrimination width

When the larger numeric value is set in this setting menu, the laxer stability judgement is applied, and the balance indicate "Stable mark" < ● > in more unstable conditions.

| Legal Metrology | For verified balance, this function is not available and <21 STABLE> is fixed to <<1>>. |

1 **Select the stability discrimination width.**
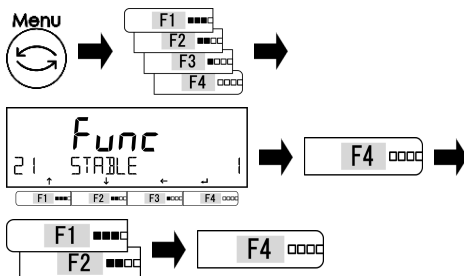
- Press [Menu] key, then press [F1]-[F4] keys to go to <21 STABLE>.
- Press [F4] key to change the setting value.
- Press [F1]/[F2] key to select.

    <<0.5>>: 0.5d
    <<1>>: 1.0d
    <<2>>: 2.0d
    <<4>>: 4.0d
- Press [4] key to fix.

2 **Exit the setting menu.**
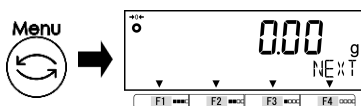
- Press [Menu] key to shift to the measuring mode.

4-3   Response speed

The larger numeric value is set in this setting menu, the more stable the balance indication becomes in unstable conditions.

> Legal Metrology — For verified balance, this function is not available and <22 RESPONSE > is fixed to <<0>>.

1   **Select the response speed.**
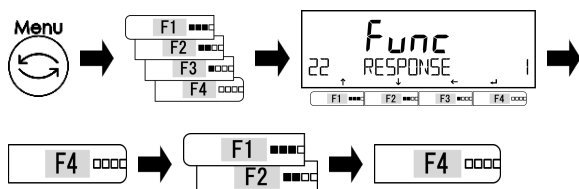
- Press [Menu] key, then press [F1]-[F4] keys to go to <22 RESPONSE>.
- Press [F4] key to change the setting value.
- Press [F1]/[F2] key to select.

    Refer to Set List.

- Press [F4] key to fix.

Set list		
<<0>> : Sensitive mode	<<1>> : Fast	<<2>> : Medium fast
<<3>> : Medium	<<4>> : Medium slow	<<5>> : Slow

2   **Exit the setting menu.**
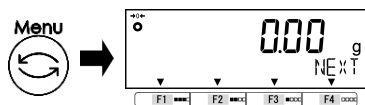
- Press [Menu] key to shift to the measuring mode.

4-4   Automatic zero tracking

The Automatic zero tracking makes it possible to automatically correct the zero-point fluctuation caused by the temperature fluctuation, etc. when "0" is indicated, through which the "0" indication is maintained.

> Legal Metrology — For verified balance, this function is not available and <23 ZERO TRAC> is fixed to <<OFF>>.

1   **Select the automatic zero tracking.**

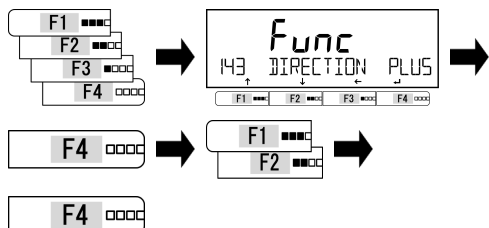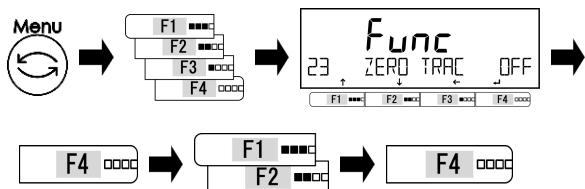- Press [Menu] key, then press [F1]-[F4] keys to go to <23 ZERO TRAC>.
- Press [F4] key to change the setting value.
- Press [F1]/[F2] key to select.

    Refer to Set List.

- Press [F4] key to fix.

Set list		
<<OFF>> : Invalid	<<0.5>> : 0.5d	<<1>> : 1d
<<2>> : 2d	<<4>> : 4d	

2   **Exit the setting menu.**
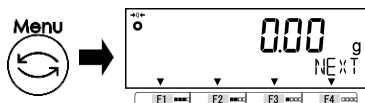
- Press [Menu] key to shift to the measuring mode.

5   Comparator setting

Describes about setting items related to the comparator function.

5-1   Hierarchy of comparator setting

Legal Metrology - Gray-shaded items (⬚) are not available on verified balance.

Comparator setting **3 USER INFO**			
	Weight Comparator **33 COMPARE WEIGHT**	Upper limit value setting **331 WEIGHT HIGH**	Setting value input
		Target value setting **332 WEIGHT REF**	Setting value input
		Lower limit value setting **333 WEIGHT LOW**	Setting value input
	% Comparator **34 COMPARE PERCENT**	Upper limit value setting **341 PERCENT HIGH**	Setting value input
		Target value setting **342 PERCENT REF**	Setting value input
		Lower limit value setting **343 PERCENT LOW**	Setting value input
	Counting Comparator **35 COMPARE COUNT**	Upper limit value setting **351 COUNT HIGH**	Setting value input
		Target value setting **352 COUNT REF**	Setting value input
		Lower limit value setting **353 COUNT LOW**	Setting value input
	Multiplying Comparator **36 COMPARE MULT**	Upper limit value setting **361 MULTIPLY HIGH**	Setting value input
		Target value setting **362 MULTIPLY REF**	Setting value input
		Lower limit value setting **363 MULTIPLY LOW**	Setting value input

5-2   Setting of the discrimination value of the comparator function

There are two ways of inputting a reference value and upper and lower limit values as described below:
 - Actual value setting method: Weighing a sample with a balance and then making it a setting value.
 - Numeric value setting method: Inputting a setting value directly via key operation.

The discrimination is performed according to the following criteria:
 - Absolute value: The discrimination is performed based on the upper and lower limit values that have
                        been set in advance.
 - Relative value: A reference numeric value is set in advance, and the discrimination is performed
                        based on the range defined by the upper and lower limit values that have been set
                        for the reference numeric value.
 （For example）   Two-point (upper and lower limits) setting, Reference value = 100.00 g,
                        Lower limit value = 90.00 g, Upper limit value = 120.00 g

Discrimination method	Reference value	Lower limit value	Upper limit value
	100.00 g	90.00 g	120.00 g
Absolute value		90.00 g	120.00 g
Relative value	100.00 g	-10.00 g	20.00 g

1 **Select the "Actual value setting method" or "Numeric value setting method".**
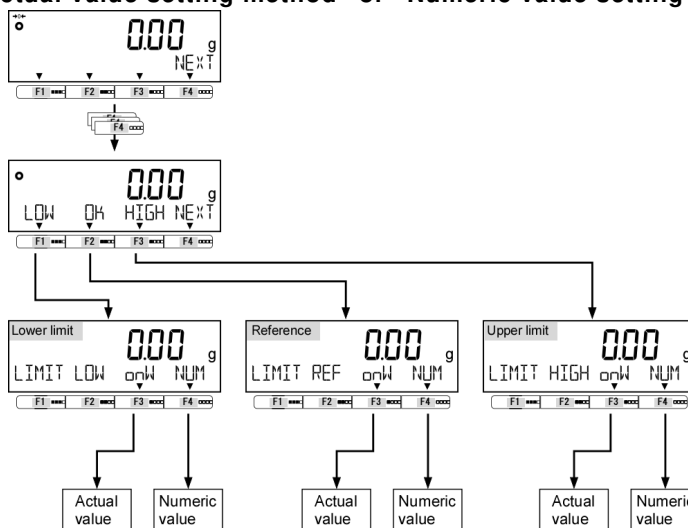
Reference	(1) Reference value, Lower limit value and Upper limit value can be set also via Setting menu below.
	- Comparator setting for Weighing mode: <33 COMPARE WEIGHT>
	- Comparator setting for Percentage mode: <34 COMPARE PERCENT>
	- Comparator setting for Counting mode: <35 COMPARE COUNT>
	- Comparator setting for Multiplied by Coefficient mode: <36 COMPARE MULT>
	(2) Comparator function is available in Weighing mode, Percentage mode, and Counting mode.

5-2-1   Actual value setting method

1 **Set a lower limit value.**

Lower limit   0.00 g
LIMIT LOW onW NUM
➡ F3 ■□□□ ➡

0.00 g
ON LOW WEIGHT OK
➡ [scale] ➡ F4 □□□□
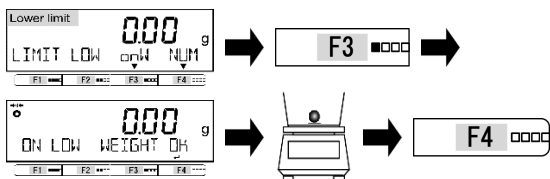
Press [F3] key to select.
  <<onW>>：Actual value
 Place a sample to be weighed that is
 equivalent to the lower limit value.
Press [F4] key to fix.
 The lower limit value is recorded.

2 **Set a reference value.**
(In the case of the relative value discrimination)

Reference   0.00 g
LIMIT REF onW NUM
➡ F3 ■□□□ ➡

0.00 g
ON REF WEIGHT OK
➡ [scale] ➡ F4 □□□□
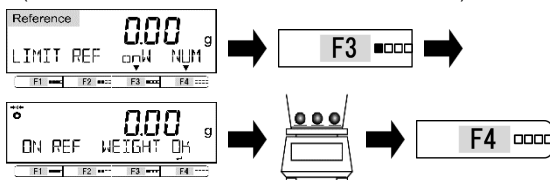
Press [F3] key to select.

  <<onW>>：Actual value
 Place a sample to be weighed that is
 equivalent to the reference limit value.
Press [F4] key to fix.
 The reference value is recorded.

3 **Set an upper limit value.**

Upper limit   0.00 g
LIMIT HIGH onW NUM
➡ F3 ■□□□ ➡

0.00 g
ON HIGH WEIGHT OK
➡ [scale] ➡ F4 □□□□
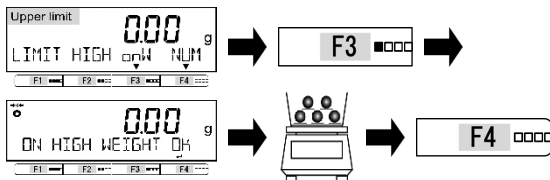
Press [F3] key to select.
  <<onW>>：Actual value
 Place a sample to be weighed that is
 equivalent to the upper limit value.
Press [F4] key to fix.
 The upper limit value is recorded.

5-2-2   Numeric value setting method

1 **Set a lower limit value.**

Lower limit   0.00 g
LIMIT LOW onW NUM
➡ F4 □□□□ ➡

00000.00 g
SET COMPARATOR LOW
➡ **Numeric value input** ➡

F4 □□□□
(Refer to "2-3-3 Numeric value input")
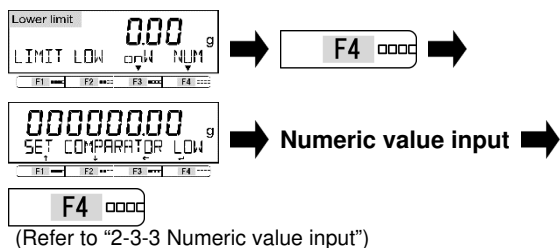
Press [F4] key to select.

  <<NUM>>：Numeric value
 Input the lower limit value.
Press [F4] key to fix.
 The lower limit value is saved.

2 **Set a reference value.**
(In the case of the relative value discrimination)

Reference   0.00 g
LIMIT REF onW NUM
➡ F4 □□□□ ➡

00000.00 g
SET COMPARATOR REF
➡ **Numeric value input** ➡

F4 □□□□
(Refer to "2-3-3 Numeric value input")
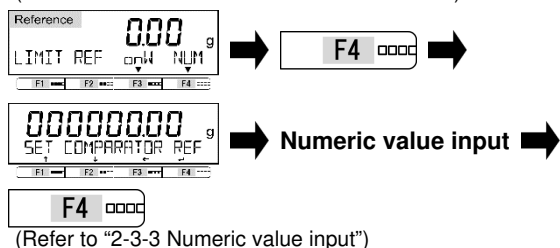
Press [F4] key to select.

  <<NUM>>：Numeric value
 Input the reference value.
Press [F4] key to fix.
 The reference value is saved.

3 **Set an upper limit value.**

Upper limit   0.00 g
LIMIT HIGH onW NUM
➡ F4 □□□□ ➡

00000.00 g
SET COMPARATOR HIGH
➡ **Numeric value input** ➡

F4 □□□□
(Refer to "2-3-3 Numeric value input")
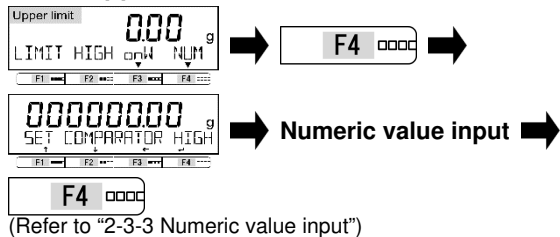
Press [F4] key to select.

  <<NUM>>：Numeric value
Input the upper limit value.
Press [F4] key to fix.
 The upper limit value is saved.

6   External input/output functions

This function is used for communication through the external peripheral devices. There are RS-232C (D-SUB 9P), USB (Type B) and Bluetooth v4.0 interface as standard equipment.

6-1   Hierarchy of the external input/output functions

Note

- When connect with USB, communication setting of your PC is required.
- Please refer to "Appendix 5 USB communication and bus power input".

Reference

*1   <43 BLUETOOTH > and <44 BLUETOOTH/BLE> are invalid.

Legal Metrology

For verified balance:
- Grey-shaded items (☐) are not indicated;
*2   <412 FORMAT> and <422 FORMAT> are not indicated and fixed to <<CBM>>.

★: Initial setting value

External input/output functions **4 EXTERNAL I/O**	RS232C **41 RS232C**				
		ON/OFF **411 ACTIVATE**		**OFF**	OFF
			★	**ON**	ON
		*2 Communication format **412 FORMAT**		**6**	6-digit numeric format
				7	7-digit numeric format
				8	8-digit numeric format
				CSP6	CSP 6-digit format
				CSP7	CSP 7-digit format
			*2 ★	**CBM**	CBM format
		Output condition **413 CONDITION**		**OFF**	Output stop
				1	Output continuously at all times
				2	Output continuously when stable
				3	Output once immediately after the [Output] key is pressed
				4	Auto output
				5	Output once when balance reached stable
				6	Output continuously when unstable, then output once when balance reached stable
			★	**7**	Output once when balance reached stable after the [Output] key is pressed
		Comparator output setting **414 COMPARE**	★	**0**	As per the output setting
				1	Output when discrimination result is OK or absent
		Baud rate **415 BAUD RATE**		**1200**	1200 bps
				2400	2400 bps
				4800	4800 bps
			★	**9600**	9600 bps
				19200	19200 bps
				38400	38400 bps
				57600	57600 bps
				115.2K	115200 bps
		Parity **416 PARITY**	★	**OFF**	None
				ODD	Odd number
				EVEN	Even number
		Stop bit **417 STOP BIT**		**1BIT**	1 bit
			★	**2BIT**	2 bit
		Unused high order digit **418 BLANK**		**ZERO**	Zero padding (0x30)
			★	**SPACE**	Fill with spaces (0x20)
		Response command **419 RESPONSE**	★	**1**	A00/Exx format
				2	ACK/NAK format
		External display output mode **41B EX MODE**	★	**OFF**	Disabled
				ON	Operation

USB **42 USB**	ON/OFF **421 ACTIVATE**		**OFF**	OFF
		★	**ON**	ON
	*2 Communication format **422 FORMAT**		**6**	6-digit numeric format
			7	7-digit numeric format
			8	8-digit numeric format
			CSP6	CSP 6-digit format
			CSP7	CSP 7-digit format
		*2 ★	**CBM**	CBM format
	Output condition **423 CONDITION**		**OFF**	Output stop
			1	Output continuously at all times
			2	Output continuously when stable
			3	Output once immediately after the [Output] key is pressed
			4	Auto output
			5	Output once when balance reached stable
			6	Output continuously when unstable, then output once when balance reached stable
		★	**7**	Output once when balance reached stable after the [Output] key is pressed
	Comparator output setting **424 COMPARE**	★	**0**	As per the output setting
			1	Output when discrimination result is OK or absent
	Baud rate **425 BAUD RATE**		**1200**	1200 bps
			2400	2400 bps
			4800	4800 bps
		★	**9600**	9600 bps
			19200	19200 bps
			38400	38400 bps
			57600	57600 bps
			115.2K	115200 bps
	Parity **426 PARITY**	★	**OFF**	None
			ODD	Odd number
			EVEN	Even number
	Stop bit **427 STOP BIT**		**1BIT**	1 bit
		★	**2BIT**	2 bit
	Unused high order digit **428 BLANK**		**ZERO**	Zero padding (0x30)
		★	**SPACE**	Fill with spaces (0x20)
	Response command **429 RESPONSE**	★	**1**	A00/Exx format
			2	ACK/NAK format
	External display output mode **42B EX MODE**	★	**OFF**	Disabled
			ON	Operation

*1				
43 BLUETOOTH	**431 ACTIVATE**		OFF	
		★	ON	
	432 FORMAT		6	
			7	
			8	
			CSP6	
			CSP7	
		★	CBM	
	433 CONDITION		OFF	
			1	
			2	
			3	
			4	
			5	
			6	
		★	7	
	434 COMPARE	★	0	
			1	
	438 BLANK		ZERO	
		★	SPACE	
	439 RESPONSE	★	1	
			2	
	43B EX MODE	★	OFF	
			ON	
*1 **44 BLUETOOTH/BLE**	**441 INIT**		INIT	

6-2   RS-232C Connecter terminal numbers and their functions

The RS-232C connector pin alignment for this product is as shown below:

	Terminal no	Signal name	Input/ output	Function
D-SUB9P male connector Cable fixing screw : No.4-40 UNC 1 2 3 4 5 ○ ○ ○ ○ ○ ○ ○ ○ ○ 6 7 8 9	1	–	–	–
	2	RXD	Input	Receiving data
	3	TXD	Output	Transmitting data
	4	DTR	Output	Data Terminal Ready (This signal is always "1" as long as the balance is powered on.)
	5	GND	–	Signal grounding
	6	–	–	–
	7	–	–	–
	8	–	–	–
	9	–	Input	External contact input for zero-point adjustment

Legal Metrology	Zero-point adjustment by external contact input is not available on verified balance.

Note	Use shielded crossover serial cable up to 15 m length.
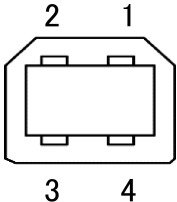
Reference	Use the following examples as a guide to connect the balance to external devices using the cable.	PC (D-SUB9P) Balance (D-SUB9P) TXD 3 ◀── 2 RXD RXD 2 ──▶ 3 TXD GND 5 ─── 5 GND DCD 1 RTS 7 ● CTS 8 DSR 6 ◀ DTR 4
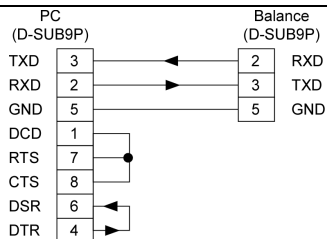
6-3   USB Connecter terminal numbers and their functions

The USB (Type B) connector pin alignment for this product is as shown below:

Terminal no.	Signal name	Function
1	V$_{BUS}$	Bus power Rating: 4.4 to 5.25 V$\overline{\cdots}$
2	D −	Data signal
3	D +	Data signal
4	GND	Signal grounding

6-4   Communication format

6-4-1   Basic communication specification

Items		Description
Communication method		RS-232C: Full-duplex communication method USB: Half-duplex communication method
Synchronization method		Asynchronous communication method
Electrical specification		RS-232C: EIA-232-D/E USB: USB2.0
Baud rate		1200/2400/4800/9600/ 19200/38400/57600/115200 bps
Transmission code Composition	Start bit	1 bit
	Parity bit	None/Odd number/Even number
	Data bit	8 bit
	Stop bit	1 bit/2 bit

6-4-2   Basic data output format / CSP format

Legal
Metrology   These formats are not available for verified balance.

1. Data composition
・Measurement result:
  - 6-digit numeric format, CSP 6-digit format
  Consists of 14 characters, including terminators (CR=0x0D, LF=0x0A).

1	2	3	4	5	6	7	8	9	10	11	12	13	14
P1	D1	D2	D3	D4	D5	D6	D7	U1	U2	S1	S2	CR	LF

  - 7-digit numeric format, CSP 7-digit format
  Consists of 15 characters, including terminators (CR=0x0D, LF=0x0A).

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
P1	D1	D2	D3	D4	D5	D6	D7	D8	U1	U2	S1	S2	CR	LF

  - 8-digit numeric format
  Consists of 16 characters, including terminators (CR=0x0D, LF=0x0A).

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
P1	D1	D2	D3	D4	D5	D6	D7	D8	D9	U1	U2	S1	S2	CR	LF

・Others (Date, Time etc.):
  - 6-digit numeric format, 7-digit numeric format, 8-digit numeric format
  The message "M1 M2 … Mn" is suffixed with terminators (CR=0x0D, LF=0x0A).

1	2	…	n	n+1	n+2
M1	M2	…	Mn	CR	LF

  - CSP 6-digit format, CSP 7-digit format
  The message "M1 M2 … Mn" is:
    prefixed with device control code (DC2=0x12); and
    suffixed with terminators (CR=0x0D, LF=0x0A) and device control code (DC4=0x14).

1	2	3	…	n+1	n+2	n+3	n+4
DC2	M1	M2	…	Mn	CR	LF	DC4

2. Meaning of the data

Symbol		Code		Description
[P1] (one character) Indicates the polarity of data.				
+		0x2B		Zero or positive data
-		0x2D		Negative data
[D1 to D7/D8/D9] (seven to nine characters) Stores numeric data.				
0 – 9		0x30 – 0x39		Numeric value 0 is also used for zero padding.
.		0x2E		-　Decimal point (floating)
(SP)		0x20		-　A space at the top of a numeric value -　Output to the least significant digit in the absence of a decimal point -　Unused high-order digit
[U1, U2] (two characters) Indicates the unit used to show numeric data.				
M	G	0x4D	0x47	milligram
(SP)	G	0x20	0x47	gram
C	T	0x43	0x54	carat
L	B	0x4C	0x42	pound
O	Z	0x4F	0x5A	ounce
O	T	0x4F	0x54	troy ounce
G	R	0x47	0x52	grain
D	W	0x44	0x57	pennyweight
M	O	0x4D	0x4F	momme
T	L	0x54	0x4C	tael troy (Hong Kong)
T	L	0x54	0x4C	tahil (tael) (Singapore and Malaysia)
T	L	0x54	0x4C	tael (Taiwan)
t	o	0x74	0x6F	tola (India)
M	S	0x4D	0x53	mesghal
B	A	0x42	0x41	baht
P	C	0x50	0x43	parts counting
(SP)	%	0x20	0x25	percentage weighing
(SP)	#	0x20	0x23	Multiplied by Coefficient
[S1] (one character) Indicates the judgment result when the limit function is used.				
L		0x4C		Shortage（LOW）
G		0x47		Proper（OK）
H		0x48		Over（HIGH）
(SP)		0x20		No judgment result or data type specified
e		0x65		Net weight
T		0x54		Total value (Accumulated value)
U		0X55		Unit weight
d		0x64		Gross
[S2] (one character) Indicates the status.				
S		0x53		Data stable
U		0x55		Data unstable
E		0x45		Data error (Indicates that data other than [S2] is invalid and should be ignored.)
(SP)		0x20		No status specified

6-4-3   CBM format

1. Data composition

- Measuring data except Specific Gravity:

Composed of 26 characters including a terminator (CR=0x0D, LF=0x0A)

1	2	3	4	5	6	7	8	9	10	11	12	13
S1	C1	Z1	T1	T2	T3	T4	T5	T6	D1	D2	D3	D4

14	15	16	17	18	19	20	21	22	23	24	25	26
D5	D6	D7	D8	D9	D10	D11	D12	(SP)	U1	U2	CR	LF

(SP): space

- ERROR:

Composed of 26 characters including a terminator (CR=0x0D, LF=0x0A)

1	2	3	4	5	6	7	8	9	10	11	12	13
*	*	(SP)	E	R	R	O	R	(SP)	*	*	*	*

14	15	16	17	18	19	20	21	22	23	24	25	26
*	*	*	*	*	*	*	*	*	*	(SP)	CR	LF

(SP): space

- Legal Metrology Unstable condition output at External display mode from verified balance:

Composed of 26 characters including a terminator (CR=0x0D, LF=0x0A)

1	2	3	4	5	6	7	8	9	10	11	12	13
*	*	(SP)	U	N	S	T	A	B	L	E	(SP)	*

14	15	16	17	18	19	20	21	22	23	24	25	26
*	*	*	*	*	*	*	*	*	*	(SP)	CR	LF

(SP): space

- Others (Date, Time, Specific Gravity etc.):

The message "M1 M2 … Mn" is output with a terminator (CR=0x0D, LF=0x0A)

1	2		n	12	13
M1	M2	…	Mn	CR	LF

2. Meaning of the data

Symbol	Code	Description	
[S1] (1 character) Represents the status.			
(SP)	0x20	Data stable	
*	0x2A	Data unstable	
[C1] (1 character) Represents the result of comparator function.			
(SP)	0x20	Comparator result:	Proper (OK) or No result
H	0x48		Over (HIGH)
L	0x4C		Shortage (LOW)
[Z1] (1 character) Represents center of zero. (Available when <41B EX MODE> is set to <ON>.)			
(SP)	0x20	Other than zero ± ¼ d.	
~	0x7E	Within zero ± ¼ d.	
[T1-T6] (6 characters) Represents the type of the data.			
(SP) (SP) (SP) (SP) (SP) (SP)	0x20 0x20 0x20 0x20 0x20 0x20	Weight	
T O T A L (SP)	0x54 0x4F 0x54 0x41 0x4C 0x20	Total value (Adding function)	
U N I T (SP) (SP)	0x55 0x4E 0x49 0x54 0x20 0x20	Unit weight (Counting mode)	
[D1-D12] (12 characters) Numeric value data is stored.			
+	0x2B	When the data is positive	
-	0x2D	When the data is negative	
0 – 9	0x30 – 0x39	Numeric value 0 is also used for zero padding.	
.	0x2E	Decimal point (floating decimal point)	
(SP)	0x20	- Spaces fill the top of the data. - Output to the least significant digit in the absence of a decimal point - Unused high-order digit	

For non [Legal Metrology]

Symbol		Code		Description
colspan				

Symbol		Code		Description
[U1, U2] (2 characters) Represents the unit of numeric value data.				
m	g	0x6D	0x67	milligram
(SP)	g	0x20	0x67	gram
c	t	0x63	0x74	carat
o	z	0x6F	0x7A	ounce
l	b	0x6C	0x62	pound
O	T	0x4F	0x54	troy ounce
d	w	0x64	0x77	pennyweight
G	R	0x47	0x52	grain
t	l	0x74	0x6C	tael troy (Hong Kong), tahil (Singapore/Malaysia), tael (Taiwan)
t	o	0x74	0x6F	tola (India)
M	S	0x4D	0x53	mesghal
B	A	0x42	0x41	baht
P	C	0x50	0x43	parts counting
(SP)	%	0x20	0x25	% (percentage weighing)
(SP)	#	0x20	0x23	# (Multiplied by Coefficient)

For [Legal Metrology]

Symbol		Code		Description
[U1, U2] (2 characters) Represents the unit of numeric value data.				
(SP)	g	0x20	0x67	gram
c	t	0x63	0x74	carat
o	z	0x6F	0x7A	ounce
l	b	0x6C	0x62	pound
g	r	0x67	0x72	grain
P	C	0x50	0x43	parts counting
(SP)	%	0x20	0x25	% (percentage weighing)

6-5   Input command

6-5-1   Transmission procedure

| Legal Metrology | Zero-point adjustment command and External contact input are not available on verified balance. |

1 Send an input command from an external device to the balance.

The table below shows the enable/disable of input commands in each measuring mode.

Measuring mode	Commands	
	Zero-point adjustment, Date/Time output	Output control, Comparator setting, Interval time setting
Weighing	x	x
Counting	x	x
Percentage	x	x
Multiply	x	x
Specific gravity	x	-
Statistics	x	-
Animal	x	-

2 Upon successful completion of an input command, the balance will send either a normal completion response or the result data requested by the command to the external device.

- If the operation has not resulted in successful completion, or if the command is invalid (an error), the balance will transmit an error response.
- When the balance is in normal display mode, it usually sends a response to a command within one second of receiving the command. For output commands which require the balance being stable, a response is sent after the commands are completely processed.

| Note | (1) Do not send another command to the balance until the external device receives a response from the balance. |
| | (2) If the balance receives a command when you are setting a function, when the balance is under span calibration, or the balance is busy for other reasons, the command is ignored. |

| Reference | After you have sent an input command, the balance return the response command approximately in 1 second. |
| | In the case that <17 WT STABLE> is <ON>, the balance waits the weighing stability after receiving Zero-point adjustment command and the balance needs additional response time. |

6-5-2   Input command composition 1

Composed of four characters including a terminator (CR=0x0D/LF=0x0A).

1	2	3	4
C1	C2	CR	LF

6-5-2 (1)   Zero-point adjustment and Output control setting command

Legal Metrology	Zero-point adjustment command is not available on verified balance.

Note	Please take care not to take alphabetical "O" for Arabic number "0".

C1	C2	Code (C1)	Code (C2)	Description	Response	
					A00/Exx format	ACK/NAK format
Z	(SP)	0x5a	0x20	Zero-point adjustment	A00: Normal response E01: Abnormal response	ACK: Normal response NAK: Abnormal response
O	0	0x4f	0x30	Stop output.		
O	1	0x4f	0x31	Continuous output at all times		
O	2	0x4f	0x32	Continuous output at stable times (Output stop at unstable times)		
O	3	0x4f	0x33	One-time output immediately after [Output] key is pressed		
O	4	0x4f	0x34	Auto output		
O	5	0x4f	0x35	One-time output every time when the balance reaches stable (Output stop at unstable times)		
O	6	0x4f	0x36	Continuous output at unstable times and one-time output every time when the balance reaches stable		
O	7	0x4f	0x37	One-time output after [Output] key is pressed and the balance reaches stable		
O	8	0x4f	0x38	One-time instant output		
O	9	0x4f	0x39	One-time output after the balance reaches stable		
O	A	0x4f	0x41	Interval function (Output once each time the output time has elapsed)		
O	B	0x4f	0x42	Interval function (Output once during stabilization, each time the output time has elapsed)		

Reference	(1) Commands O8 and O9 are used to request data from the balance. (2) Once the O0 to O7 commands are executed, the output control setting is maintained until the balance is turned off. If [Menu] key is pressed, the <413 CONDITION> setting is overwritten. When the balance is turned on again, the output control setting is reset to the <413 CONDITION> setting. (3) When the OA or OB command is input, the interval function starts, and when input again, the interval function ends. (4) After the O8 or O9 command is executed, it returns to "O0."

6-5-2 (2)   Date output request and time output request

C1	C2	Code (C1)	Code (C2)	Description	Response
D	D	0x44	0x44	Date output request	Date data
D	T	0x44	0x54	Time output request	Time data

6-5-3   Input command composition 2

Composed of 15 characters including a terminator (CR=0x0D/LF=0x0A)

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
C1	C2	,	C3	C3	C3	C3	C3	C3	C3	C3	C3	C3	CR	LF

Reference

(1) 'C3' is maximum ten-digit (including the polarity +/-, comma and point) numeric data.
Example) Upper limit input 120.0g: "LA,120.0"
Interval time input 12:34:56: "IA,12,34,56" (marked off by commas)
(2) Make sure not input the measuring unit (g, ct, etc.).
(3) Input the command when Weighing mode, Percentage mode, Counting mode or Multiplied by Coefficient mode is operating.
If it is input while the other mode operation, the balance output an abnormal response.
(4) If the input value is invalid, the balance output an abnormal response.

6-5-3 (1)   Comparator setting command

C1	C2	Code (C1)	Code (C2)	Description	C3	Response A00/Exx format	ACK/NAK format
L	A	0x4C	0x41	Lower limit value setting	Numeric value setting	A00: Normal response E01: Abnormal response	ACK: Normal response NAK: Abnormal response
L	B	0x4C	0x42	Upper limit value setting	Numeric value setting		
L	C	0x4C	0x43	Reference value setting	Numeric value setting		

6-5-3 (2)   Interval (output) time setting command

C1	C2	Code (C1)	Code (C2)	Description	C3	Response A00/Exx format	ACK/NAK format
I	A	0x49	0x41	Interval (output) time setting	Numeric value setting	A00: Normal response E01: Abnormal response	ACK: Normal response NAK: Abnormal response

6-6   Response

6-6-1   Response command format (A00/Exx format)

Consists of five characters including terminators.

1	2	3	4	5
A1	A2	A3	CR	LF

A1	A2	A3	code(A1)	code(A2)	code(A3)	Description
A	0	0	0x41	0x30	0x30	Normal response
E	0	1	0x45	0x30	0x31	Abnormal response

6-6-2   Response command format (ACK/NAK format)

Consists of one character without a terminator.

1
A1

A1	code(A1)	Description
ACK	0x06	Normal response
NAK	0x15	Abnormal response

6-7   External contact input

Legal Metrology	External contact input is not available on verified balance.

Zero-point adjustment can be executed from an external device by connecting a contact or a transistor switch between the pin for external zero-point adjustment(Pin 9) and the signal ground pin (Pin 5) of the D-sub9P Connector. When doing so, allow at least 400 ms for connection (ON) time (Maximum voltage: 15 V when the balance is turned OFF, sink current: 20 mA when it is turned ON).

Reference	(1) While external contact input is selected, command input is not available. (2) There is no response command corresponding to external contact input.

6-8   Communication setting

6-8-1   RS232C/USB

Reference	When connect with USB, communication setting of your PC is required.
	Please refer to "Appendix 5 USB communication setup for PC"

Legal Metrology	(1)	Be sure to set <4*B EX MODE> to <<ON>> when connect with external customer display for retail use.
	(2)	For verified balance:
		- Setting menu <412 FORMAT> and <422 FORMAT> are not available. They are fixed to <<CBM>> (CBM format) and other formats are not available;
		- Output conditions <<1>>, <<3>> and <<6>> are not available for <413 CONDITION> and <423 CONDITION>.

1 **Select the RS-232C communication operation.**
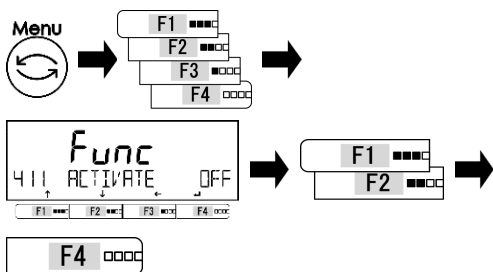
Press [Menu] key, then press [F1]-[F4] keys to go to <411 ACTIVATE>.

Press [F4] key to change the setting value.

Press [F1]/[F2] key to select.

    <<OFF>>: Stop

    <<ON>>: Operation

Press [F4] key to fix.

Select the USB communication operation.
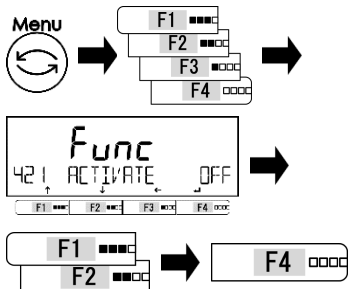
Press [Menu] key, then press [F1]-[F4] keys to go to <421 ACTIVATE>.

Press [F4] key to change the setting value.

Press [F1]/[F2] key to select.

    <<OFF>>: Stop

    <<ON>>: Operation

Press [F4] key to fix.

2   Select the communication setting.

Refer to the step 1 to key operation for setting.

Select the communication format.

4 12 FORMAT / 422 FORMAT

Set list

<<6>>: 6-digit numeric format	<<7>>: 7-digit numeric format	<<8>>: 8-digit numeric format
<<CSP6>>: CSP 6-digit format	<<CSP7>>: CSP 7-digit format	<<CBM>>: CBM format

Select the output conditions.

4 13 CONDITION / 423 CONDITION

Set list

<<0>>: Output stop	<<1>>: Continuous output at all times	<<2>>: Continuous output at stable times (Output stop at unstable times)
<<3>>: One-time output immediately after [Output] key is pressed	<<4>>: Auto output (One-time output when the balance is loaded and stabilized. The next output for another sample loading is executed once the indication becomes stabilized at less than or equal to zero by unloading and zero-point adjustment.)	<<5>>: One-time output every time when the balance reaches stable (Output stop at unstable times)
<<6>>: Continuous output at unstable times and one-time output every time when the balance reaches stable	<<7>>: One-time output after [Output] key is pressed and the balance reaches stable.	

Select the comparator output.

4 14 COMPARE / 424 COMPARE

Set list

<<0>> : As per the output setting	<<1>> : Output when discrimination result is OK or absent

Select the baud rate.

4 15 BAUD RATE / 425 BAUD RATE

Set list

<<1200>> : 1200 bps	<<2400>> : 2400 bps	<<4800>> : 4800 bps
<<9600>> : 9600 bps	<<19200>> : 19200 bps	<<38400>> : 38400 bps
<<57600>> : 57600 bps	<<115.2 k>> : 115200 bps	

Select the parity bit.

4 16 PARITY / 426 PARITY

Set list

<<OFF>> : None	<<ODD>> : Odd number	<<EVEN>> : Even number

Select the stop bit.

4 17 STOP BIT / 427 STOP BIT

Set list

<<1BIT>> : 1 bit	<<2BIT>> : 2 bit

Select unused high order digit.

4 18 BLANK / 428 BLANK

Set list

<<ZERO>> : Fill with 0 (0x30)	<<SPACE>> : Fill with blank spaces (0x20)

Select the response command format.

4 19 RESPONSE / 429 RESPONSE

Set list

<<1>> : A00/Exx format	<<2>> : ACK/NAK format

External display mode

4 1B EX MODE / 42B EX MODE

Set list

<<OFF>> : Disabled	<<ON>> : Operation

6-8-2 External display mode

Legal Metrology	<41B/42B EX MODE> is required to be set to <<ON>> when connected with customer display for retail use.

When <41B/42B EX MODE> is activated, the communication is set as following:

Output condition	Continuous output - Unstable data is flagged with "*" (0x2A). - Center-of-zero condition is flagged with "~" (0x7E).
<4*5 BAUD RATE>	<<115.2K>> 115200bps
<4*6 PARITY>	<<OFF>> None
<4*7 STOP BIT>	<<1BIT>> 1 bit
<4*8 BLANK>	<<SPACE>> Fill with blank spaces (0x20)
<4*9 RESPONSE>	<<2>> ACK/NAK format

7   Functions related to the lock

Impose limitations on key operation and accessing the menu items, etc.

7-1   Hierarchy of functions related to the lock

> | Legal Metrology | - Gray-shaded items (▭) are not available on verified balance.

★: Initial setting value

Functions relating to the lock **5 LOCK**					
	Total lock release **51 ALL UNLOCK**			**YES**	Execute (All locking disabled)
				NO	Cancel
	Key lock **52 KEY LOCK**			★ **OFF**	Locking disabled
				1	[On/Off] key invalid for power off
				2	Measuring mode: - All keys excluding [Menu] key invalid Setting menu: - [On/Off] key invalid
	Menu lock **53 MENU LOCK**	Functions related to the operation **531 OPERATION**		★ **OFF**	Locking disabled
				ON	Setting menu is hidden and unmodifiable
		Functions relating to the performance **532 PERFORM**		★ **OFF**	Locking disabled
				ON	Setting menu is hidden and unmodifiable
		Comparator setting **533 USER**		★ **OFF**	Locking disabled
				ON	Setting menu is hidden and unmodifiable
		External input/output function **534 I/O**		★ **OFF**	Locking disabled
				ON	Setting menu is hidden and unmodifiable

7-2   Total lock release

All locks that have been set can be released.

1   **Select the total lock release.**
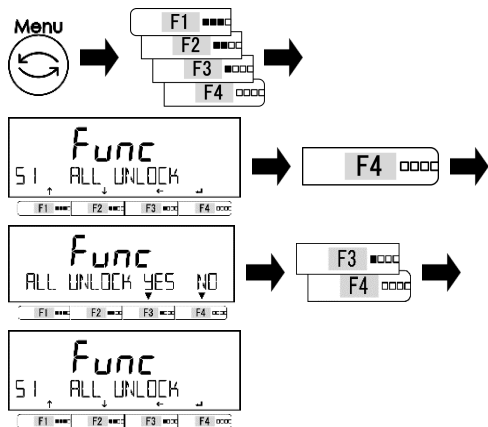
Press [Menu] key, then press [F1]-[F4] keys to go to <51 ALL UNLOCK>.
Press [F4] key.
Press [F1]/[F2] key to select.

    <<YES>>: Execute
    <<NO>>: NO execute
Unlock all the settings.

2   **Exit the setting menu.**
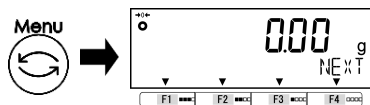
Press [Menu] key to shift to the measuring mode.

7-3   Key lock function

Key operation can be locked.

1 **Select the key lock function.**
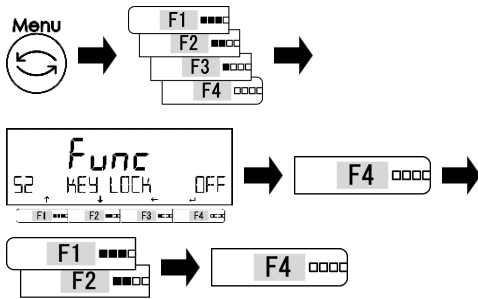
Press [Menu] key, then press [F1]-[F4] keys to go to <52 KEY LOCK>.

Press [F4] key to change the setting value.

Press [F1]/[F2] key to select.

<<OFF>>: No restriction
<<1>>: [On/Off] key invalid for power off
<<2>>: All keys excluding [Menu] key invalid (Except in Setting menu)

Press [F4] key to fix.

2 **Exit the setting menu.**
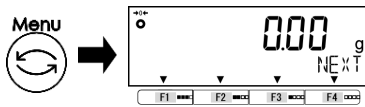
Press [Menu] key to shift to the measuring mode.

7-4   Menu lock function

Various setting menus can be locked.

| Legal Metrology | <532 PERFORM> is not available on verified balance. |

1 **Select the menu lock function.**
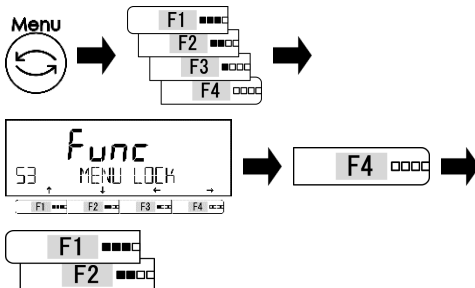
Press [Menu] key, then press [F1]-[F4] keys to go to <53 MENU LOCK>.

Press [F4] key to change.

Press [F1]/[F2] key to select.

Refer to Set List.

Set list			
<531 OPERATION>	: Function related to the operation <1 APPLICATIONS>	<532 PERFORM>	: Function related to the performance <2 PERFORM>
<533 USER>	: Comparator setting <3 USER INFO>	<534 I/O>	: External input/output functions <4 EXTERNAL I/O>

2 **Select modifiable/unmodifiable of each menu.**
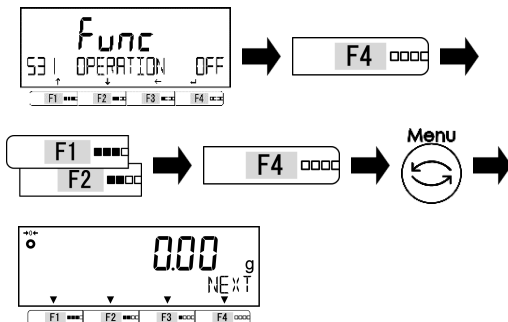
Press [F4] key to change the setting value.

Press [F1]/[F2] key to select.

<<OFF>>: Modifiable
<<ON>>: Unmodifiable

Press [F4] key to fix.

Press [Menu] key to shift to the measuring mode.

8   Controlling and adjustment functions

Make short cut and free key assignments, perform span adjustment/test, and perform various settings.

8-1   Hierarchy of controlling and adjustment functions

Reference	*1	<644 SET USER PASS> appears only when you log in in administrator mode with <642 PASSWORD> set to <<ON>>.

Legal Metrology	-	Gray-shaded items (▭) are not available on verified balance.
	*2	On ALE8200NC after verification, <g> and <ct> are not available at <62 FREE KEY>, and the initial setting value of <626 F6 KEY> is <NONE> instead of <g>.

★: Initial setting value

Controlling and adjustment **6 ADMIN/ADJUST**	Key assignment for mode selection **61 SHORT CUT MODE**	Shortcut 1 **611 F1 KEY**	★F1	**WEIG** Weighing mode
		Shortcut 2 **612 F2 KEY**	★F2	**COUN** Counting mode
		Shortcut 3 **613 F3 KEY**	★F3	**PCNT** Percentage mode
				MULT Multiplied by Coefficient mode
				SPGR Specific Gravity mode
				STAT Statistics mode
				ANIM Animal mode

*2	Key assignment for free key **62 FREE KEY**	Free key 1 **621 F1 KEY**	*2	**NONE** OFF
		Free key 2 **622 F2 KEY**	★F1	**DATE** Date indication
		Free key 3 **623 F3 KEY**	★F2	**TIME** Time indication
		Free key 4 **624 F4 KEY**	★F4	**HIGH** Upper limit value indication
		Free key 5 **625 F5 KEY**	★F5	**LOW** Lower limit value indication
		Free key 6 **626 F6 KEY**	★F3	**ID** ID number indication
			*2 ★F6	**g** Set unit to gram
				mg Set unit to milligram
			*2	**ct** Set unit to carat
				CAL Execute span adjustment with external weight
				ADD Adding execute
				TOTL Total value indication
				HOLD Hold measurement indication
				GLPH GLP header output
				GLPF GLP footer output
				RESP Response speed setting

Adjustment and test **63 MAINTENANCE**		Span adjustment with external weight **631 EX CAL**		Execute
		Span test with external weight **632 EX SPAN TEST**		Execute

Balance management setting **64 SCALE MANAGE**		Balance ID setting **641 SCALE ID**			Setting value input
		Password control **642 PASSWORD**	★	**OFF**	OFF
				ON	Valid
		Admin password registration **643 SET ADMIN PASS**			Setting value input
	*1	User password registration **644 SET USER PASS**			Setting value input
		Span adjustment result output **645 SPAN OUT**	★	**OFF**	OFF
				ON	Valid
		Date format **646 DATE DISP**		**Y/M/D**	yyyy.mm.dd
				D/M/Y	dd.mm.yyyy
			★	**M/D/Y**	mm.dd.yyyy
		Date setting **647 DATE SETTING**			Setting value input
		Time setting **648 TIME SETTING**			Setting value input
		Output Language **649 PRT LANG**	★	**ENG**	English
				DEU	Deutsch
				ESP	Español
				FRC	Français
				JPN	日本語
		Direct start **64C DIRECT ST**	★	**OFF**	Disabled
				ON	Enabled
		Resetting to the factory settings **64D INITIALIZE**		**YES**	Execute
				NO	Cancel

8-2　Shortcut setting for accessing various measuring modes

Shortcuts for various measuring mode can be assigned to
<<F1>>-<<F3>> which are displayed above [F1]-[F3] key.

```
    →0←
  ○          0.00
                        g
    WEIG COUN PCNT   NEXT
         ▼    ▼    ▼
   F1 ▬▬  F2 ▬▭  F3 ▭▭  F4 ▭▭▭
```

Legal Metrology	For verified balance, only Weighing mode <WEIG>, Counting mode <COUN>, Percentage mode <PCNT> and Specific Gravity mode <SPGR> can be selected.

---

1 **Select <<F1>>-<<F3>>.**

Menu ↻ ➡ F1/F2/F3/F4 ➡

```
    Func
  611  F1 KEY    WEIG
   F1 ▬▬  F2 ▬▭  F3 ▭▭  F4 ▭▭▭
```
➡ F1 / F2 ➡

F4 ▭▭▭

Press [Menu] key, then press [F1]-[F4] keys
to go to <611 F1 KEY>.

Press [F4] key to change.

Press [F1]/[F2] key to select.

　<611 F1 KEY>：<<F1>> above [F1] key
　<612 F2 KEY>：<<F2>> above [F2] key
　<613 F3 KEY>：<<F3>> above [F3] key

Press [F4] key to fix.

2 **Select the measuring modes.**
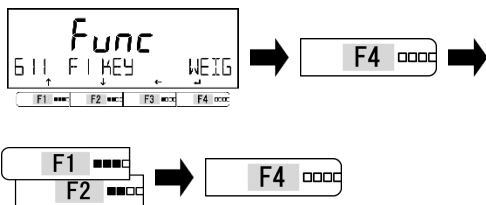
```
    Func
  611  F1 KEY    WEIG
   F1 ▬▬  F2 ▬▭  F3 ▭▭  F4 ▭▭▭
```
➡ F4 ▭▭▭ ➡

F1 / F2 ➡ F4 ▭▭▭

Press [F4] key to change the setting value.

Press [F1]/[F2] key to select.

　Refer to Set List.

Press [F4] key to fix.

Set list		
<<WEIG>>：Weighing mode	<<COUN>>：Counting mode	<<PCNT>>：Percentage mode
<<MULT>>：Multiplied by Coefficient mode	<<SPGR>>：Specific gravity mode	<<STAT>>：Statistics mode
<<ANIM>>：Animal mode		

3 **Exit the setting menu.**

Menu ↻ ➡
```
    →0←
  ○          0.00
                    g
                  NEXT
   F1 ▬▬  F2 ▬▭  F3 ▭▭  F4 ▭▭▭
```
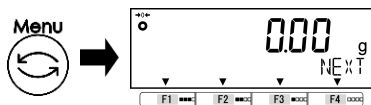
Press [Menu] key to shift to the measuring
mode.

8-3   Free key setting

Note	Free key setting is valid only in the weighing mode.

Legal Metrology	- <<mg>>, <<CAL>>, <<HOLD>>, <<ADD>>, <<TOTL>> and <<RESP>> are not available on verified balance.
	- On ALE8200NC, <g> and <ct> are not available at <62 FREE KEY> after verification.

Various function can be assigned to the <<F1>>-<<F6>> (Free key), which are displayed above the [F1]-[F3] keys.

Display1 (<<F1>>-<<F3>>)   Display2 (<<F4>>-<<F6>>)
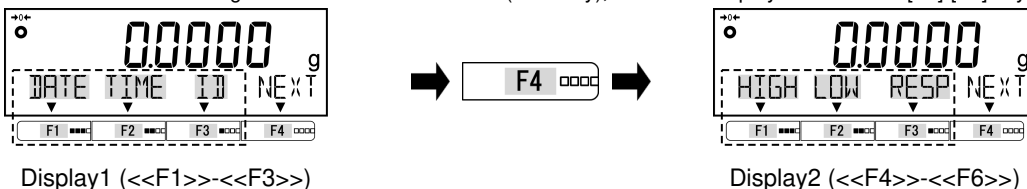
1 **Select the <<F1>>-<<F6>> setting menu.**

Press [Menu] key, then press [F1]-[F4] keys to go to <621 F1 KEY>.

Press [F1]/[F2] key to select each Free key setting menu.

Refer to "Free key setting menu list".

Free key setting menu list		
<621 F1 KEY> : <<F1>>	<622 F2 KEY> : <<F2>>	<623 F3 KEY> : <<F3>>
<624 F4 KEY> : <<F4>>	<625 F5 KEY> : <<F5>>	<626 F6 KEY> : <<F6>>

2 **Select the function to assign to the Free key.**

Press [F4] key to change the setting value.

Press [F1]/[F2] key to select.

Refer to Set List.

Press [F4] key to fix.

Set list	
<<NONE>> : OFF	<<DATE>> : Date indication
<<TIME>> : Time indication	<<HIGH>> : Upper limit value indication
<<LOW>> : Lower limit value indication	<<ID>> : ID number indication
<<g>> : Unit set "gram"	<<mg>> : Unit set "milligram"
<<ct>> : Unit set "carat"	<<CAL>> : Span adjustment with external weight
<<ADD>> : Adding execute	<<TOTL>> : Total value indication
<<HOLD>> : Measurement indication hold	<<GLPH>> : GLP header output
<<GLPF>> : GLP footer output	<<RESP>> : Response speed setting

3 **Exit the setting menu.**

Press [Menu] key to shift to the weighing mode.
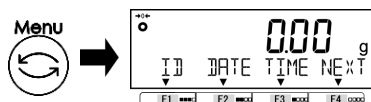
8-4   Maintenance settings

8-4-1   Span adjustment and span test

Span adjustment is to "decrease" the difference between an indicated value and the true value (mass), and span test is to "check" the difference between an indicated value and the true value.

This must be performed without fail in the case of doing high-accuracy weighing work.

Because an electronic balance is affected by the acceleration of gravity, adjustment/test is needed at every weighing location. The adjustment/test is also needed when (1) using a long period and (2) an accurate indication does not appear any longer.

Note	(1) An external weight used for the span adjustment shall be the one equivalent to the OIML F1 class.
	(2) The span adjustment significantly affects the weighing accuracy. Please read this procedure carefully before getting to the adjustment.

8-4-1(1)   Span adjustment with external weight

Legal Metrology	This mode is available only before verification.

1 **Select the span adjustment with external weight.**

Menu ➡ F1 / F2 / F3 / F4 ➡ *Func* 631 EX CAL ➡

F4 ➡ [CAL STARTED]
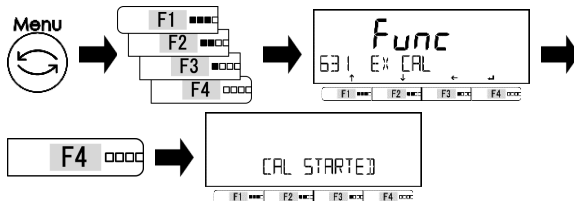
Press [Menu] key, then press [F1]-[F4] keys to go to <631 EX CAL>.
Press [F4] key to execute.

2 **Select a weight used for the span adjustment.**

CAL SELECT WEIGHT 3200 ➡ F1 / F2 ➡

F4
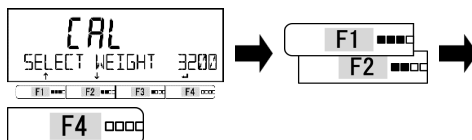
Press [F1]/[F2] key and select a weight used for the span adjustment.
(Refer to List of "weights used for the span adjustment by model")
Press [F4] key to fix.

3 **Zero-point adjustment starts.**
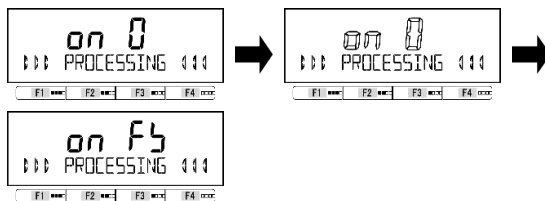
on 0 PROCESSING ➡ *on 0* PROCESSING ➡

on FS PROCESSING

Display changes to the order of <on 0> → "blinking of <on 0>".
On completion of the zero-point adjustment, the display automatically changes to <on FS>.

4 **The span adjustment starts.**
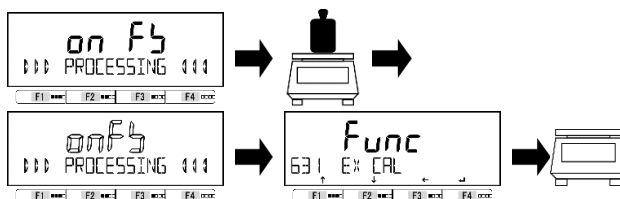
on FS PROCESSING ➡ [weight] ➡

onFS PROCESSING ➡ *Func* 631 EX CAL ➡ [balance]

Place the weight on the center of the weighing pan.
Display changes to the order of <on FS> → "blinking of <on FS>" and span adjustment starts.
On completion of the span adjustment the display automatically changes to <631 EX CAL>.
Unload the weight from the weighing pan.

5 **Exit the setting menu.**

Menu ➡ 0.00 g NEXT
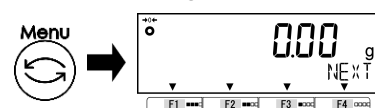
Press [Menu] key to shift to the measuring mode.

Reference

(1) List of weights used for the span adjustment by model (Unit: g).

Model	ALE322NC	ALE1501NC	ALE8200NC
	320	1500	8200
	300	1000	8000
Selectable weight on the menu	200	1000	5000
	100	500	2000
	50	200	1000
	5	20	100
VAR set	1 to 320	1 to 1500	1 to 8200

(2) The span adjustment by the use of a weight less than the weighing capacity may possibly indicate <UC> on the display. When this is the case, the weighing accuracy is not guaranteed.
Conditions under which <UC> is indicated when a sample that is more than two times heavier than the weight that was used for the span adjustment is weighed.

8-4-1(2)   Span test with external weight

Note   Make sure to use the external weight which is equal to the weighing capacity of each model.

1   **Select the span test with external weight.**
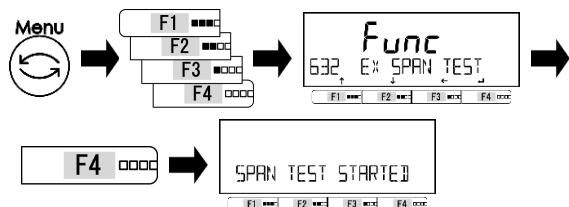
Press [Menu] key, then press [F1]-[F4] keys to go to <632 EX SPAN TEST>. Press [F4] key to execute.

2   **Zero-point adjustment starts.**
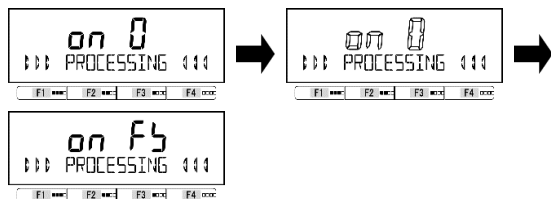
Display changes to the order of <on 0> → "blinking of <on 0>".
On completion of the zero-point adjustment, the display automatically changes to <on FS>.

3   **The span test starts.**
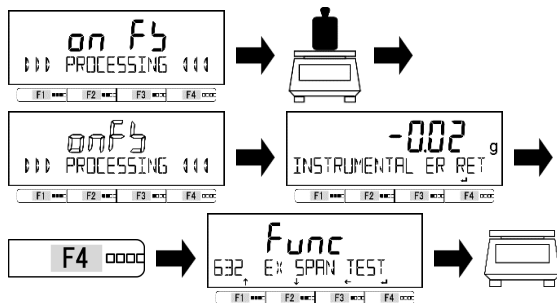
Place the weight on the center of the weighing pan.
Display changes to the order of <on FS> → "blinking of <on FS>".
Start of the span test.
On completion of the span test, the display automatically changes to < INSTRUMENTAL ER> and the instrumental error of the balance is displayed.
Press [F4] key.
<632 EX SPAN TEST> is displayed.
Unload the weight from the weighing pan.

4   **Exit the setting menu.**
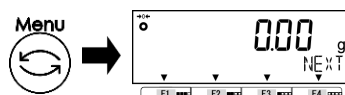
Press [Menu] key to shift to the measuring mode.

8-5   Balance control setting

8-5-1   Balance ID setting

A balance ID (Scale ID) can be set to discriminate the balance. The balance ID is output with GLP header output and external span adjustment/test result output. Balance ID can be checked by free key <<ID>>.

1   **Select the balance ID setting.**

Press [Menu] key, then press [F1]-[F4] keys to go to <641 SCALE ID>.

Press [F4] key.
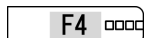
2   **Input the balance ID.**
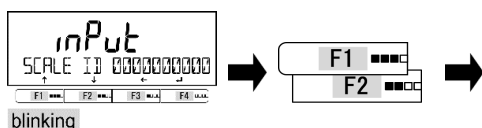
blinking

The digit for inputting is blinking.
Press [F1]/[F2] key to increment/decrement the digit to select.

Press [F3] key to input the next digit.
Press [F1]/[F2] key.

Repeat the input by the procedure above.
Press [F4] key to fix the balance ID and shift to <641 SCALE ID>.

Repeat the input
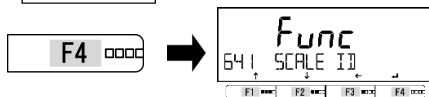
3   **Exit the setting menu.**
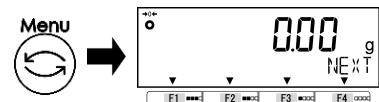
Press [Menu] key to shift to the measuring mode.

8-5-2   Password control

Enable/disable the password protection.

Reference	(1) Refer to "8-5-2(1) Administrator password registration" and "8-5-2(2) User password registration" for password registration/changing.
	(2) Refer to "Appendix 6 Balance operation with password control function" for using the balance with password control.

1   **Enable/disable the password protection.**
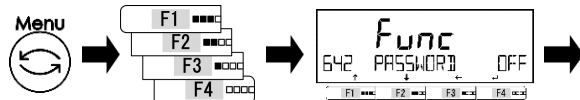
Press [Menu] key, then press [F1]-[F4] keys to go to <642 PASSWORD>.

Press [F4] key to change.

Press [F1]/[F2] keys to select:
    <<OFF>> ：Disable
    <<ON>> ：Enable
Press [F4] key to fix.

2   **Exit the setting menu.**
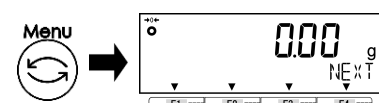
Press [Menu] key to shift to the measuring mode.

Password input display appears from next power on.

8-5-2 (1)   Administrator password registration

Note	(1) Make sure not to forget the administrator password. (2) In case that the administrator password is lost, please contact the store where you purchased the product.

Reference	Only one password can be set for administrator.

1   **Select the Administrator password registration.**

Menu → F1 / F2 / F3 / F4 → *Func* 643 SET ADMIN PASS →

F4
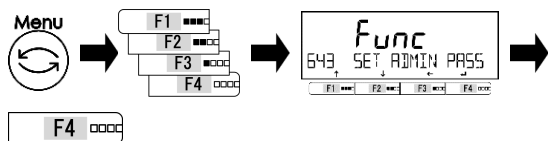
Press [Menu] key, then press [F1]-[F4] keys to go to <643 SET ADMIN PASS>.
Press [F4] key to input the password.

2   **Input the password to register.**

0000 SET ADMIN PASSWORD → **Numeric value input** →

F4

(Refer to "2-3-3 Numeric value input")

Input to set the password.
Four digits of 0-9 can be selected.
Press [F4] key to fix.

3   **Exit the setting menu.**

Menu → 0.00 g NEXT

Press [Menu] key to shift to the measuring mode.

8-5-2 (2)   User password registration

Administrator can register the user password for each user(operator).

Reference	(1) Refer to "Appendix 6 Balance operation with password control function" for setting each user's authority. (2) User password can be set only for User 1 and User 2. (3) User 0 (guest) cannot be assigned a password. (4) This mode can be operated only when you log in in administrator mode with <642 PASSWORD> set to <<ON>>.

1   **Select the User password registration.**

Menu → F1 / F2 / F3 / F4 → *Func* 644 SET USER PASS →

F4
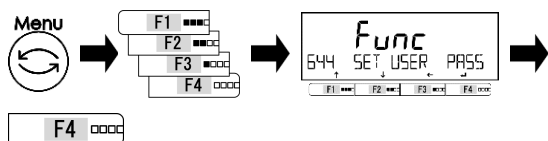
Press [Menu] key, then press [F1]-[F4] keys to go to <644 SET USER PASS>.
Press [F4] key to input the password.
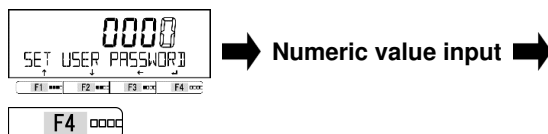
2   **Input the password to register.**

0000 SET USER PASSWORD → **Numeric value input** →

F4

(Refer to "2-3-3 Numeric value input")

Input to set the password.
Four digits of 0-9 can be selected.
Press [F4] key to fix.

3   **Exit the setting menu.**

Menu → 0.00 g NEXT
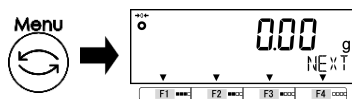
Press [Menu] key to shift to the measuring mode.

8-5-3   Outputting of the span adjustment/test result

After span adjustment/test, the result can be output automatically.

> **Reference**   Make sure to activate <41 RS232C> and/or <42 USB> to output the data.

1   **Select the outputting.**
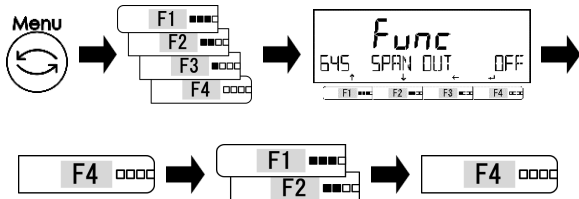
Press [Menu] key, then press [F1]-[F4] keys to go to <645 SPAN OUT>.
Press [F4] key to change the setting menu.
Press [F1]/[F2] key to select.
  <<OFF>>: Disable
  <<ON>>: Enable
Press [F4] key to fix.

2   **Exit the setting menu.**
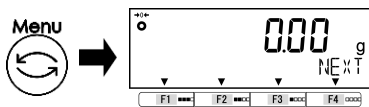
Press [Menu] key to shift to the measuring mode.

8-5-4   Date indication format

Date indication format can be selected.

1   **Select the Date indication format.**
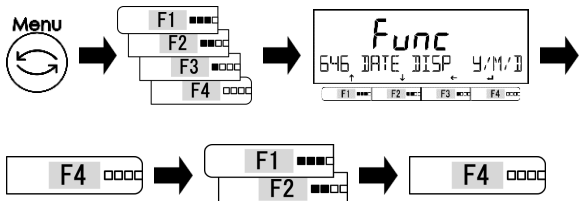
Press [Menu] key, then press [F1]-[F4] keys to go to <646 DATE DISP>.
Press [F4] key to change the setting value.
Press [F1]/[F2] key to select.
  <<Y/M/D>>: Year, Month, Day
  <<D/M/Y>>: Day, Month, Year
  <<M/D/Y>>: Month, Day, Year
Press [F4] key to fix.

2   **Exit the setting menu.**
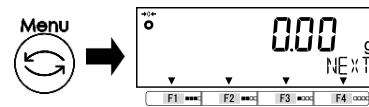
Press [Menu] key to shift to the measuring mode.

8-5-5   Date setting

1   **Select the date setting.**

Menu

F1 ▬▬▭
F2 ▬▬▭▭
F3 ▬▭▭▭
F4 ▭▭▭▭

Func
647   DATE SETTING
F1 ▬▭ F2 ▬▭▭ F3 ▭▭▭ F4 ▭▭▭

Press [Menu] key, then press [F1]-[F4] keys to go to <647 DATE SETTING>. Press [F4] key to change the setting value.

The digit for inputting is blinking.
Input the date.
Press [F4] key to fix the date setting.

F4 ▭▭▭▭ ➡ 00.00.00
DATE SETTING
F1 ▬▭ F2 ▬▭▭ F3 ▭▭▭ F4 ▭▭▭

Numeric value input ➡ F4 ▭▭▭▭ ➡

Func
647   DATE SETTING
F1 ▬▭ F2 ▬▭▭ F3 ▭▭▭ F4 ▭▭▭

(Refer to "2-3-3 Numeric value input")

2   **Exit the setting menu.**

Menu ➡ 0.00 g
NEXT
F1 ▬▭ F2 ▬▭▭ F3 ▭▭▭ F4 ▭▭▭

Press [Menu] key to shift to the measuring mode.

3   **Indication of the date.**

0.00 g
DATE TIME ID NEXT
F1 ▬▭ F2 ▬▭▭ F3 ▭▭▭ F4 ▭▭▭
➡ F1 ▬▬▭ ➡

14.10.2016
DATE TODAY RET
F1 ▬▭ F2 ▬▭▭ F3 ▭▭ F4 ▭▭▭
➡ F4 ▭▭▭▭ ➡

0.00 g
DATE TIME ID NEXT
F1 ▬▭ F2 ▬▭▭ F3 ▭▭▭ F4 ▭▭▭

Press [F1] (<<DATE>>) key.
The date is indicated.
Press [F4] key to return to the measuring mode.

8-5-6   Time setting

1   **Select the time setting.**

Menu ➡ F1 / F2 / F3 / F4 ➡ *Func* 648 TIME SETTING ➡

F4 ➡ 00:00:00 TIME SETTING ➡

Numeric value input ➡ F4 ➡

Func 648 TIME SETTING

(Refer to "2-3-3 Numeric value input")
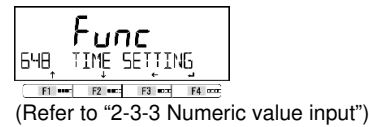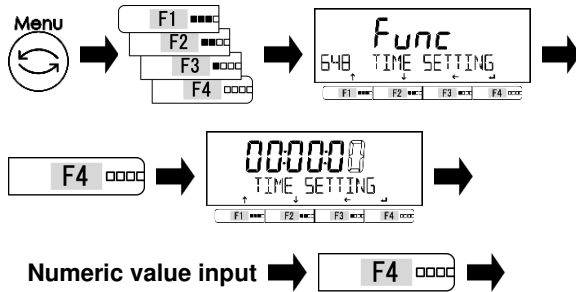
Press [Menu] key, then press [F1]-[F4] keys to go to <648 TIME SETTING>.

Press [F4] key to change the setting menu.

The digit for inputting is blinking.
Input the time.
Press [F4] key to fix the time setting.

2   **Exit the setting menu.**

Menu ➡ 0.00 g NEXT

Press [Menu] key to shift to the measuring mode.

3   **Indication of the time.**

0.00 g
DATE TIME ID NEXT ➡ F2 ➡

12:34:56
TIME NOW   RET ➡ F4 ➡

0.00 g
DATE TIME ID NEXT
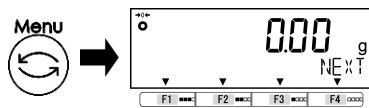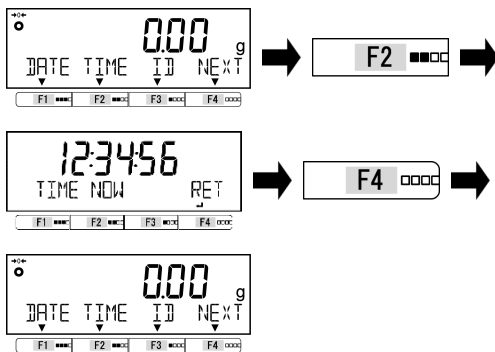
Press [F2] (<<TIME>>) key.

The time is indicated.
Press [F4] key to return to the measuring mode.

8-5-7   Direct start setting

This is a function to turn on the balance automatically without pressing [On/Off] key when it is connected to the AC power or USB bus powered from PC. You can use this function when the balance is used in conjunction with other devices.

> **Reference**   This function does not operate when the balance is power-supplied ONLY from dry-cell batteries.

1 **Select the direct start.**
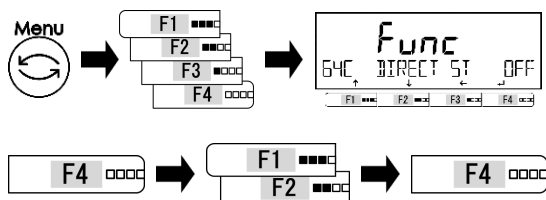
Press [Menu] key, then press [F1]-[F4] keys to go to <64C DIRECT ST>.

Press [F4] key to change the setting value.

Press [F1]/[F2] key to select.

    <<OFF>>: Disable
    <<ON>>: Enable

Press [F4] key to fix.

2 **Exit the setting menu.**
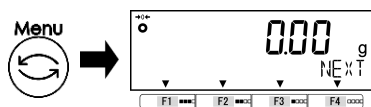
Press [Menu] key to shift to the measuring mode.

8-5-8   Initialize

This function is to initialize the balance to the factory settings except span adjustment, the date and time setting.

1 **Select the initialize.**
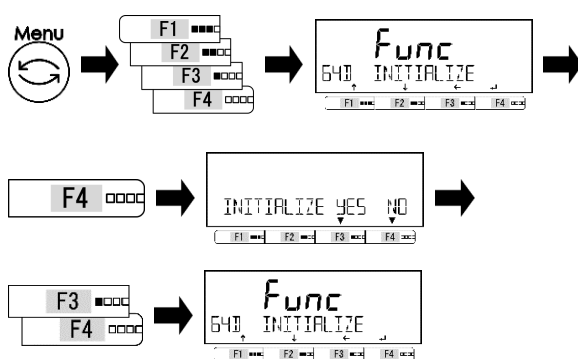
Press [Menu] key, then press [F1]-[F4] keys to go to <64D INITIALIZE>.

Press [F4] key.

Press [F3]/[F4] key to select.

    <<NO>>: Cancel
    <<YES>>: Execute

<64D INITIALIZE> is displayed.

2 **Exit the setting menu.**
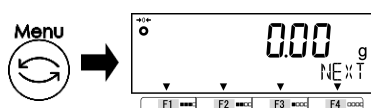
Press [Menu] key to shift to the measuring mode.

9   Troubleshooting

Reference	If the trouble persists after following the procedures below, please contact the store you purchased.

9-1   Error message

Error Message/ Error Code	Cause	Coping method
OVER ERROR	- The weight of the sample to be weighed is in excess of the maximum capacity. - The calculation result has exceeded the maximum display digit.	- Split the sample into several pieces and weigh them. - Replace the container with a lighter one. - Clear the calculation result, and then re-execute the addition/computation while being careful of the display digit.
UNDER ERROR	The negative load is below the lower limit.	- Improper setting of the weighing pan or pan base is suspected. - Check for contact with other object. Use the dedicated weighing pan and pan base only.
DATA MAX ERROR	Number of the data is over the memory at statistics mode.	Clear the data.
LOWER ERROR	The unit/reference weight in Counting/Percentage mode is below the lower limit.	Choose the samples of which unit weight/reference weight is larger than the lower limit.
ERR001 to ERR099	System error	Record the error code and notify the store where you purchased the product.
ERR703	- The operation key was pressed at the time of starting from the standby status. If the error message is displayed nevertheless the operation key wasn't pressed, there is something wrong with the hardware.	Do not press the operation key while the balance is in the process of starting from the standby status.
ERR705	Initial zero adjustment error. The initial zero adjustment was not completed in the process of starting from the standby status because of the unstable load.	- Improper setting of the weighing pan or pan base is suspected. - Check for contact with other object. - Check for any wind or vibration.
ERR706	The load is out of the initial zero adjustment range.	- Do not put any load on the weighing pan at the power-on of the balance.
ERR709 ERR710 ERR711	- The load is unstable at the zero adjustment. Span adjustment/test time-out error. -	- Improper setting of the weighing pan or pan base is suspected. - Check for contact with other object. - Check for any wind or vibration.
ERR717	The mass of the calibration weight is 1% differ from the designated mass at the span test with external weight.	Check the calibration value of the weight and use the proper calibration weight.
ERR718	The mass of the calibration weight is under 50% of the maximum capacity at the span adjustment with external weight.	Use the calibration weight of which weight is equal to the maximum capacity.
ERR719	The adjust value by "span adjustment with external weight" is over 1% of the maximum capacity.	- Check the mass of the weight used for the span adjustment with external weight.
ERR723	Out of Zero adjustment range (-1.5% to 100% of the capacity from the initial zero-adjustment point).	Chose the container of which weight is within the zero-adjustment range.
ERR734	Weight of the sample is out of the importing range at Percent weighing mode (lower limit to maximum capacity).	Set the reference weight within the importing range.

Error Message/ Error Code	Cause	Coping method
ERR735	Time-out error of importing the sample weight in the actual value setting method at Percent weighing mode.	- Improper setting of the weighing pan or pan base is suspected. - Check for contact with other object. - Check for any wind or vibration.
ERR736	The setting value is out of the setting range at numeric value setting method at Percent weighing mode (lower limit to maximum capacity).	Set the value within the range.
ERR737	- Sample weight in the air is out of the importing range at specific gravity mode (over 0g to maximum capacity). - Sample weight in the water/liquid is out of the importing range at specific gravity mode ("0 – maximum capacity" to "maximum capacity").	- Divide the sample so as to its weight in the air is within the importing range. - Divide the sample so as to its weight in the air is within the importing range.
ERR738	Time-out error of importing the sample weight in the water/liquid at specific gravity mode.	- Improper setting of the weighing pan or pan base is suspected. - Check for contact with other object. - Check for any wind or vibration.
ERR746	Invalid date or time was input at <647 DATE SETTING> or <648 TIME SETTING>.	Set the date and time correctly.
ERR747	Time-out error of importing the sample weight in the actual value setting method at Comparator function.	- Improper setting of the weighing pan or pan base is suspected. - Check for contact with other object. - Check for any wind or vibration.
ERR748	The setting value is out of the setting range at numeric value setting method or actual value setting method at Comparator mode ("0 – maximum capacity" to "maximum capacity").	Set the value within the range.
ERR751	The unit weight of the samples is lighter than the minimum piece weight (MPW) of the balance at Counting mode.	Choose the samples of which unit weight is larger than the Minimum Piece Weight (MPW) of the balance.
ERR752	The unit weight of the samples is 0 g and under at Counting mode.	- Choose the samples of which unit weight is larger than the minimum interval of the balance. - Counting mode cannot operate subtractive counting.
ERR753	Time-out error of importing the unit weight at Counting mode.	- Improper setting of the weighing pan or pan base is suspected. - Check for contact with other object.
ERR754	Deleted the latest data then executed deleting operation of the second latest data at statistics mode.	- Only the latest data can be deleted. - Select <<ALL>> to delete all the other data.
ERR756	Weight of the sample is out of the importing range at Statistics mode (0g to maximum capacity).	Choose the sample of which weight is within the importing range.
ERR763	The calculation error of the specific gravity of the sample at specific gravity mode.	Re-execute the specific gravity function.
ERR764	External weight used for <631 EX CAL> is different from the selected weight range at <SELECT WEIGHT>.	Use the external weight of which weight is within the selected range.

10   How to maintain

> Note   Take care not to let dust or liquid get inside the balance.

10-1   Method for Maintenance (Round pan type ALE322NC)

1 **Remove the windshield.**
Refer to the attached "Windshield assembly instructions" to remove the windshield.

2 **Remove the round pan.**
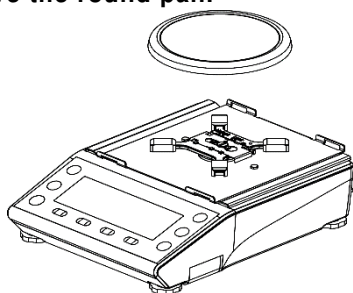
3 **Move the slider to "Unlock" side.**
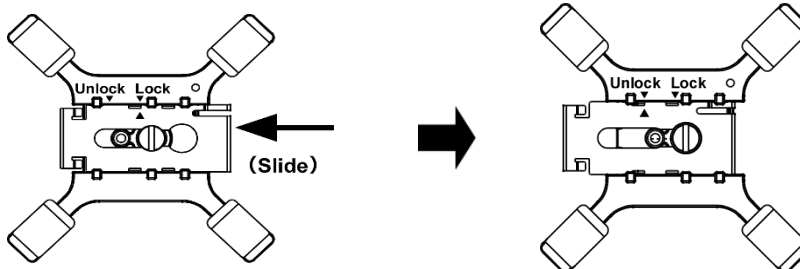
4 **Remove the pan-base.**
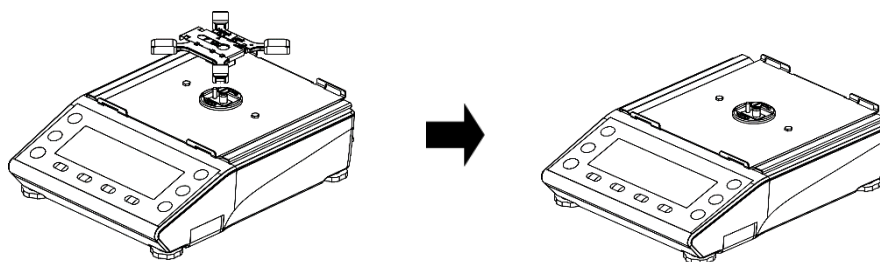
5 **Maintenance method.**
(1) Wipe dirt from the balance with dry and soft cloth.

(2) In the case of heavy soil, dismount the weighing pan and/or the pan-base and clean them with a piece of cloth slightly wet with neutral detergent.

10-2   Method for Maintenance (Square pan type ALE1501NC, ALE8200NC)

1   **Remove the square pan.**
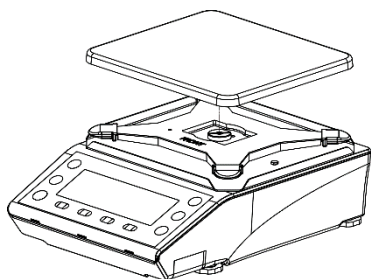
2   **Remove the pan-base.**
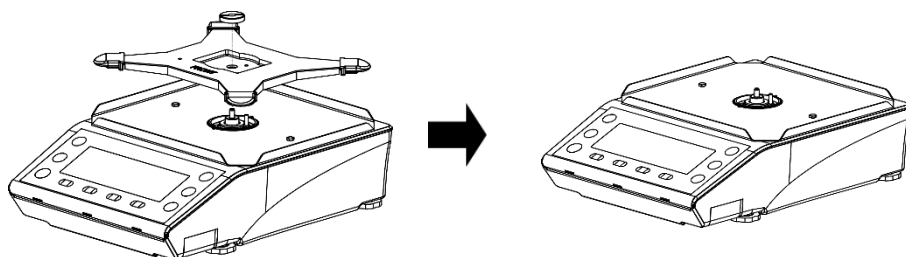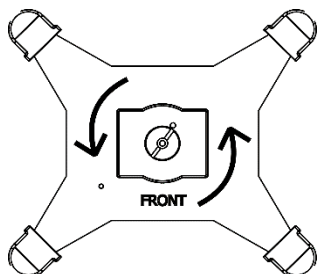
3   **Maintenance method.**

(1) Wipe dirt from the balance with dry and soft cloth.

(2) In the case of heavy soil, dismount the weighing pan and/or the pan-base and clean them with a piece of cloth slightly wet with neutral detergent.

Appendix

Appendix 1   Specifications

Appendix 1-1   Basic Specifications

For non [Legal Metrology]

Model	Unit	Capacity	d	Counting mode minimum unit weight	Percentage mode minimum reference weight	Indication limit	Windshield	Span adjustment
ALE322NC	gram	320	0.01	0.01	1	320.09	X	
	carat	1600	0.1	0.1	10	1600.9		
	pound	0.7	0.0001	0.0001	0.01	0.7009		
	ounce	11	0.001	0.001	0.1	11.009		
	grain	4900	1	1	100	4909		
	milligram	320000	10	10	1000	320090		
	momme	85	0.01	0.01	1	85.09		
	ounce troy	10	0.001	0.001	0.1	10.009		
	pennyweight	200	0.01	0.01	1	200.09		
	tael troy (HK)	8.5	0.001	0.001	0.1	8.509		
	tahil (SGP/MYS)	8.4	0.001	0.001	0.1	8.409		
	tael (TWN)	8.5	0.001	0.001	0.1	8.509		
	tola (IND)	27	0.001	0.001	0.1	27.009		
	mesghal	69	0.01	0.01	1	69.09		
	baht	21	0.001	0.001	0.1	21.009		
ALE1501NC	gram	1500	0.1	0.1	10	1500.9		External
	carat	7500	1	1	100	7509		
	pound	3.3	0.001	0.001	1	3.309		
	ounce	52	0.01	0.01	1	52.09		
	grain	23000	10	10	1000	23090		
	milligram	1500000	100	100	10000	1500900		
	momme	400	0.1	0.1	10	400.9		
	ounce troy	48	0.01	0.01	1	48.09		
	pennyweight	960	0.1	0.1	10	960.9		
	tael troy (HK)	40	0.01	0.01	1	40.09		
	tahil (SGP/MYS)	39	0.01	0.01	1	39.09		
	tael (TWN)	40	0.01	0.01	1	40.09		
	tola (IND)	120	0.01	0.01	1	120.09		
	mesghal	320	0.1	0.1	10	320.9		
	baht	98	0.01	0.01	1	98.09	-	
ALE8200NC	gram	8200	1	1	100	8209		
	carat	41000	10	10	1000	41090		
	pound	18	0.01	0.01	1	18.09		
	ounce	280	0.1	0.1	10	280.9		
	grain	120000	100	100	10000	120900		
	milligram	8200000	1000	1000	100000	8209000		
	momme	2100	1	1	100	2109		
	ounce troy	260	0.1	0.1	10	260.9		
	pennyweight	5200	1	1	100	5209		
	tael troy (HK)	210	0.1	0.1	10	210.9		
	tahil (SGP/MYS)	210	0.1	0.1	10	210.9		
	tael (TWN)	210	0.1	0.1	10	210.9		
	tola (IND)	700	0.1	0.1	10	700.9		
	mesghal	1700	1	1	100	1709		
	baht	540	0.1	0.1	10	540.9		

For Legal Metrology

Model	Unit	Capacity	e	d	MPW	MSS	Indication limit	Accuracy Class	Windshield	Span adjustment
ALE322NC	gram	320	0.01	0.01	0.03		320.09			
	carat	1600	0.1	0.1	0.3		1600.9			
	pound	0.7	0.0001	0.0001	0.0003		0.7009	II	X	
	ounce	11	0.001	0.001	0.003		11.009			
	grain	4900	1	1	3	10 PC	4909			-
ALE1501NC	gram	1500	0.1	0.1	0.3		1500.9			
	carat	7500	1	1	3		7509	II		
	ounce	52	0.01	0.01	0.03		52.09		-	
ALE8200NC	gram	8200	1	1	3		8209	II		

Legal Metrology	MPW (Minimum Piece Weight) and MSS (Minimum Sample Size) are regarding the Prescription Filling Count Feature for Class I and II Scales and those values are regulated in NIST HB 44 in US.

Appendix 1-2   Functional specification

Legal Metrology	Items with "*" are not available on verified balance.

Item	Description
Weighing system	Tuning-fork vibration method
Measuring mode	Weighing/Counting/Percentage/*Multiplied by Coefficient/ Specific gravity (solid)/*Statistics/*Animal mode
Function	- Function related to the operation Unit setting/Comparator/*Adding/*Stability wait setting/Bar graph/Backlight/ Auto power-off/Simple SCS
	- *Function related to the performance *Stability discrimination width/*Response speed/*Automatic zero tracking
	- Comparator setting Weight/Percentage/Counting/*Multiplying Comparator
	- Functions related to the lock Total lock release/Key lock/Menu lock
	- Controlling and adjustment functions Shortcut/Free key/*Span adjustment with external weight/ Span test with external weight/Balance ID/Password/ Span adjustment & test result output/Date format setting/Date setting/Time setting/ Output language (English, German, Spanish, French, Japanese)/Direct start/ Initialize
	- Other functions which can be assigned to free keys GLP footer, header output/Date indication/Time indication/Balance ID indication/ Upper limit value indication/Lower limit value indication/*Hold

Item	Description
Display	LCD with backlight 　7-segment　　　: Maximum 8-digit/Segment height up to 16.5 mm 　16-segment　　: Maximum 20-digit/Segment height up to 8.5 mm 　Bar graph　　　: 30-step
*Automatic zero tracking	*Provided (*Can be disabled via setting)
Display when overloaded	When indication limit is exceeded, <OVER ERROR> is indicated. (See Appendix 1-1 "Basic Specification" for the indication limit.)
Output	RS-232C compliant output is equipped as standard (D-sub9P Male connector) USB (Type B connector)
Power	Dedicated AC adapter (100-240 V∼ / 50-60 Hz) 4 AA Dry cell batteries
Ratings	AC adapter jack　　　　　　　　　　: 4-6 V⎓　　0.3 A Battery box (4 AA batteries)　　　: 4-6 V⎓　　0.3 A 　　　　　　　　　　　　　　　　　　　　(Maximum current consumption)
Dimensions of the weighing pan	ALE322NC　　　　　　　　　　　　　: Ø118 mm ALE1501NC, ALE8200NC　　　　: 160 x 180 mm
Weight of the balance (NET)	ALE322NC　　　　　　　　　　　　　: 2.6 kg　　(Approximately) ALE1501NC, ALE8200NC　　　　: 2.7 kg　　(Approximately)
Operating condition	Temperature　　　　　　　　　　　: 5-35 °C Humidity　　　　　　　　　　　　　: 85% RH or lower (no condensation) Pollution degree　　　　　　　　　: 2 Altitude　　　　　　　　　　　　　: 2000 m or less above sea level location of use　　　　　　　　　　: Indoor use only
Option	Specific gravity measurement kit (ALE322NC), Underweighing-hook (ALE322NC / ALE1501NC and ALE8200NC)

Appendix 2   Dimensional outline drawing

■ ALE322NC
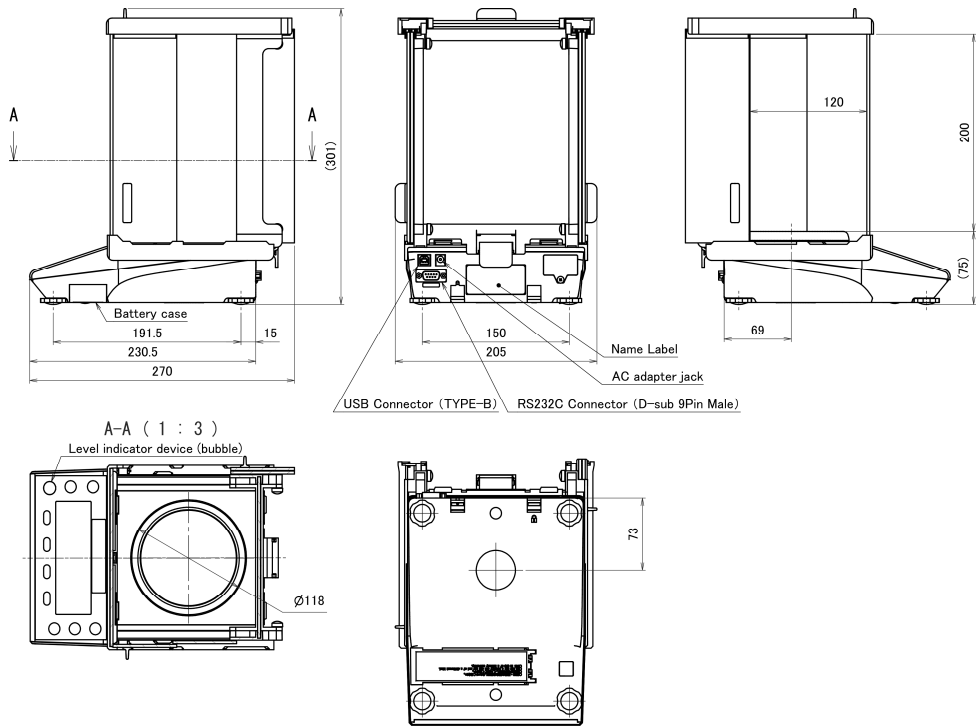
■ ALE1501NC, ALE8200NC
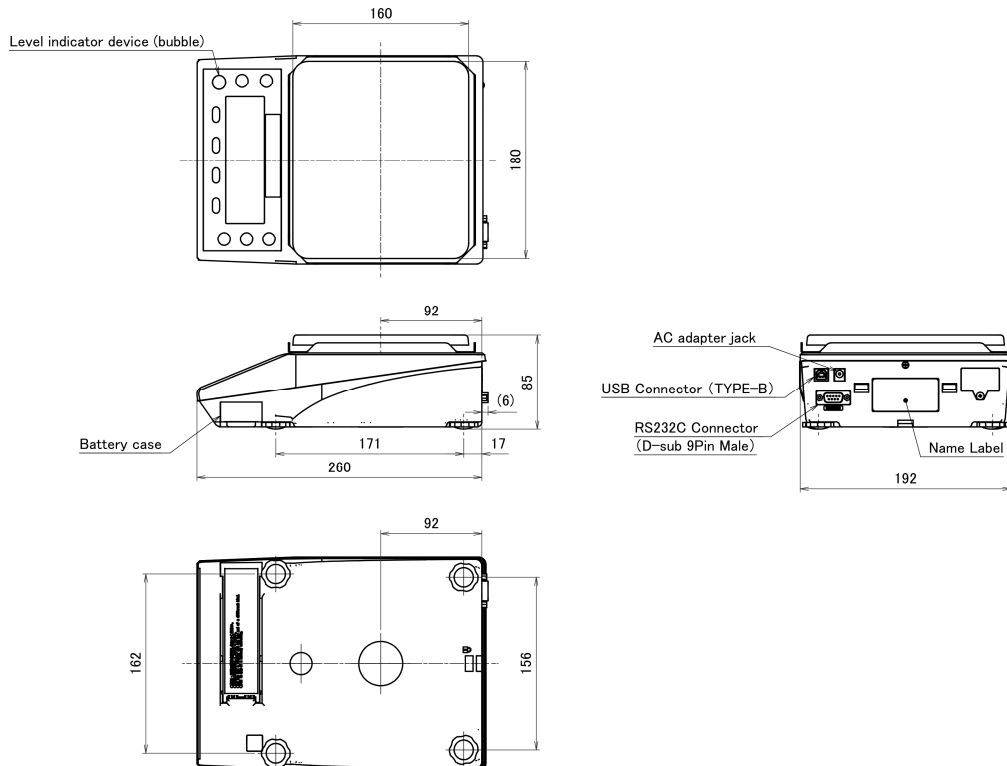
Appendix 3   Unit indication and conversion table

Unit indication		Conversion coefficient
1 **g**	(gram)	1.00000000E+00
1 **mg**	(milligram)	1.00000000E+03
1 **ct**	(carat)	5.00000000E+00
1 **lb**	(pound)	2.2046226E-03
1 **oz**	(ounce)	3.5273961E-02
1 **ozt**	(troy ounce)	3.2150746E-02
1 **GN gr**	(grain)	1.5432358E+01
1 **dwt**	(pennyweight)	6.4301493E-01
1 **mom**	(もんめ (momme))	2.6666667E-01
1 **MSG**	(مثقال (mesghal))	2.16999761E-01
1 **t:H**	(tael troy - Hong Kong)	2.6717251E-02
1 **t:S**	(tahil - Singapore, Malaysia)	2.6455471E-02
1 **t:T**	(兩 (tael) - Taiwan)	2.6666667E-02
1 **to**	(tola - India)	8.5735324E-02
1 **BAt**	(บาท (baht))	6.59630607E-02

Appendix 4   Installation of batteries

This product can operate with four AA batteries.
Alkaline, manganese, Nickel-metal hydride batteries can be used.

1 **Pull out the battery case.**
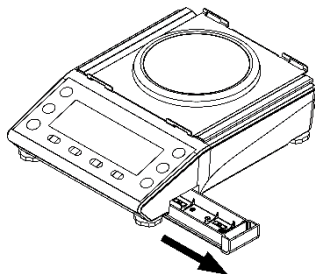
2 **Put four AA batteries.**   Make sure insert batteries with the positive
                                                   and negative poles correctly inserted.
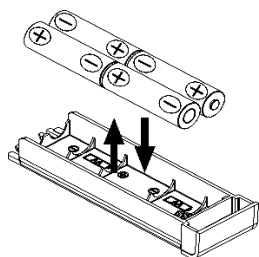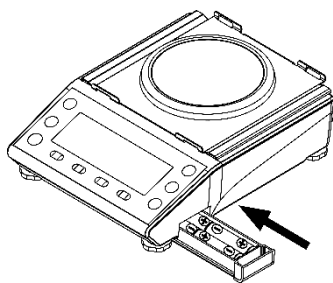
3 **Insert the battery case.**   Insert the battery case until it clicks in place.

When the balance is battery-operated, "▭▰◢" is displayed. It changes in accordance with the remaining battery capacity.

Mark	Description
▭▰◢	The battery level is sufficient.
▭ ◢	The battery level is low.
▭ ◢	The batteries have run down. Replace them with new ones.

Reference Continuous battery runtime: About 150 hours (Alkaline batteries. Backlight and external output: off).

Appendix 5   USB communication setup for PC

1 **Download the USB driver on your PC.**

Go to the Website below and download the USB driver.

https://www.silabs.com/developers/usb-to-uart-bridge-vcp-drivers

If you are unable to access the above address, please visit the Silicon Labs website (https://www.silabs.com) and perform in-site search using the search term "CP210x USB to UART Bridge VCP Driver".

2 **Install the USB driver on your PC.**

Install the USB driver by referring to the Website.

3 **Connect the balance to the PC.**

Connect the balance with the PC and power on the balance.

4 **Set the communication setting of the PC.**

For Windows 10:

1) Right click the Windows icon and select "Device Manager" to open the "Device Manager" window.

2) Click the "Port (COM and LPT)" to open the thread and double click the "Silicon Labs CP210x USB to UART Bridge (COM*)" to open the properties window.

3) Go to the "Port" tab.

4) Input the communication setting in accordance with the communication settings of the balance (See "6 External input/output functions").

Appendix 6   Balance operation with password control function

This chapter describes how to use the balance with "8-5-2 Password control". This function is useful for setting different authority for each user/guest.

Appendix 6-1   User's authority setting

1 **Power on the balance.**
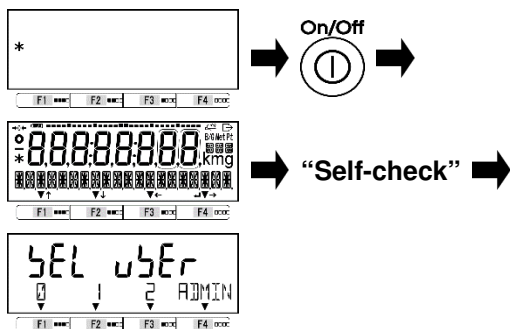
Enable the <642 PASSWORD> and register the administrator password in <643 SET ADMIN PASS>, then power-off the balance.
Press [On/Off] key, then the balance shifts to User login mode after start-up operation.

"Self-check"

2 **Go to the Administrator login mode.**
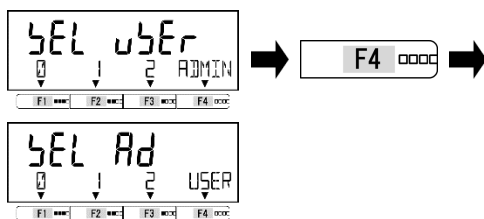
Press [F4] key to go to "Administrator login mode".
< 5EL Ad > is indicated on the 7-segment display.

3 **Select the user to set the authority.**
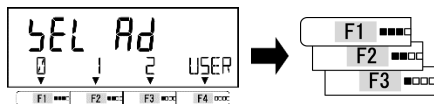
Select the user
    <<0>>：Guest user
    <<1>>：User 1
    <<2>>：User 2
  <<USER>>：Shift to the User login mode

4 **Input the administrator password.**

Input the administrator password by pressing [F1]-[F4] keys.
Each digit increments as "0, 1, …, 8, 9, 0" by pressing each [F] key.

First digit from the left	：[F1] key
Second digit from the left	：[F2] key
Third digit from the left	：[F3] key
Fourth digit from the left	：[F4] key

5 **Start up the balance.**

Press [Output] key.

When the password is authenticated, the balance starts up.

6 **Register the user password.**
Refer to "8-5-2(2) User password registration".

> **Reference**
> (1) The user password of which selected in Step 3 is registered.
> (2) When "0: Guest user" is selected at step 3, skip this step.

7 **Set the functions and setting values which are intended to be fixed.**
Refer to "3 Functions related to the operation", "4 Functions related to the performance" "5 Comparator setting", "6 External input/output functions" and "8 Controlling and adjustment functions" to set functions/setting values to be fixed.

> **Reference**
> <5 LOCK> and <6 ADMIN/ADJUST> are displayed only for the administrator.
> When to authorize each user to operate "Span adjustment with external weight", "Adding function", etc., please assign the functions to <<F1>>-<<F6>> (Free key). (Refer to "8-3 Free key settings".)

8 **Set the user's authority (Lock setting).**
Refer to "7 Functions related to the lock" to set user's authority for key operation and/or accessing to setting menus.

Appendix 6-2   User/guest login

1 **Power on the balance and go to the User login mode.**

"Self-check"
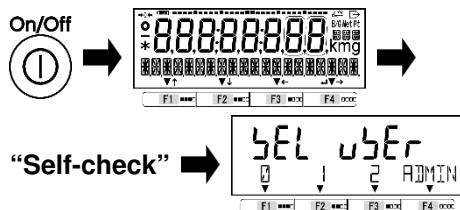
Press [On/Off] key, then the balance shifts to User login mode after start-up operation.

< 5EL u5Er > is indicated on the 7-segment display.

2 **Select the user number.**

Select the user (operator) number:
- <<0>>: Guest user
- <<1>>: User 1
- <<2>>: User 2
- <<ADMIN>>: Shift to the Administrator login mode

3 **Input the user password.**

Input the user password by pressing [F1]-[F4] keys.
Each digit increment as "0, 1, …, 8, 9, 0" by pressing each [F] key.

First digit from the left	: [F1] key
Second digit from the left	: [F2] key
Third digit from the left	: [F3] key
Fourth digit from the left	: [F4] key

4 **Start up the balance.**

Press [Output] key.

When the password is authenticated, the balance starts up.

5 **Use the balance with the user's/guest's authority.**
Lock setting configured by administrator is reflected.

> **Reference**   When "0: Guest user" is selected at step 2, step 3 and 4 are skipped.

Appendix 7   Hierarchy of functions

Reference	*1	<644 SET USER PASS> appears only when you log in in administrator mode with <642 PASSWORD> set to <<ON>>.
	*6	<43 BLUETOOTH > and <44 BLUETOOTH/BLE > are invalid.

Legal Metrology	-	Gray-shaded items (☐) are not available on verified balance.
	*2	On ALE1501NC, "pound" and "grain" are not selectable at <12 UNIT> on verified balance. On ALE8200NC, <12 UNIT> is not selectable and only "gram" is available on verified balance.
	*3	<21 STABLE> is fixed to <<1>>, <22 RESPONSE> is fixed to <<0>>, and <23 ZERO TRAC> is fixed to <<OFF>> on verified balance.
	*4	<412 FORMAT> and <422 FORMAT> are not indicated and fixed to< <CBM>> on verified balance.
	*5	On ALE8200NC, <g> and <ct> are not available at <62 FREE KEY> after verification.

★: Initial setting value

Functions related to the operation **1 APPLICATIONS**		Measuring Mode **11 MODE**		★	**WEIG**	Weighing mode
					COUN	Counting mode
					PCNT	Percentage mode
					MULT	Multiplied by Coefficient mode
					SPGR	Specific Gravity mode
					STAT	Statistics mode
					ANIM	Animal mode
	*2	Unit setting **12 UNIT**			**mg**	milligram
				★	**g**	gram
					ct	carat
					LB	pound
					OZ	ounce
					OZT	troy ounce
					GN	grain
					DWT	pennyweight
					MOM	momme
					MSG	mesghal
					TLH	tael troy (Hong Kong)
					TLS	tahil (Singapore, Malaysia)
					TLT	tael (Taiwan)
					TOLA	tola (India)
					BAT	baht
		Comparator function **13 COMPARATOR**	ON/OFF **131 ACTIVATE**	★	**OFF**	OFF
					H/L	Upper and lower limits valid
					HIGH	Upper limit alone valid
					LOW	Lower limit alone valid
			Discriminant condition **132 CONDITION**	★	**FULL**	At all times
					STBL	Only at stable times
			Discriminant range **133 RANGE**		**5**	+5 d or more
					50	+50 d or more
				★	**FULL**	Entire area
			Discriminant method **134 METHOD**	★	**ABSOL**	Absolute value method
					RELAT	Relative value method
		Adding function **14 ADDITION**	ON/OFF **141 ACTIVATE**	★	**OFF**	OFF
					ON	Valid
			Calculating method **142 OPERATION**	★	**TOTAL**	Addition accumulating method
					NET	Net adding method
			Adding direction **143 DIRECTION**	★	**PLUS**	Plus-side addition
					MINUS	Minus-side addition
		Stability waiting **17 WT STABLE**			**OFF**	OFF
				★	**ON**	Valid
		Bar graph indication **18 BARGRAPH**			**OFF**	OFF
				★	**ON**	Valid

Back light setting 1A BACKLIGHT		OFF	OFF
		3MIN	3 minutes
		5MIN	5 minutes
		10MIN	10 minutes
		30MIN	30minutes
	★	ON	Always ON
Auto power-off 1B AUTO OFF	★	OFF	Invalid
		3MIN	3 minutes
		5MIN	5 minutes
		10MIN	10 minutes
		30MIN	30minutes
Simplified SCS 1C SIMPLE SCS	★	OFF	OFF
		ON	Valid

★: Initial setting value

Functions relating to the performance 2 PERFORMANCE	*3	Stability discrimination width 21 STABLE		0.5	±0.5d
			*3 ★	1	±1d
				2	±2d
				4	±4d
	*3	Response speed 22 RESPONSE	*3	0	Sensitive mode
				1	Fast
			*3 ★	2	Medium fast
				3	Medium
				4	Medium slow
				5	Slow
	*3	Automatic Zero-Tracking 23 ZERO TRAC	*3	OFF	OFF
			*3 ★	0.5	0.5 d/s
				1	1 d/s
				2	2 d/s
				4	4 d/s

★: Initial setting value

Comparator setting 3 USER INFO	Weight Comparator 33 COMPARE WEIGHT	Upper limit value setting 331 WEIGHT HIGH	Setting value input
		Target value setting 332 WEIGHT REF	Setting value input
		Lower limit value setting 333 WEIGHT LOW	Setting value input
	% Comparator 34 COMPARE PERCENT	Upper limit value setting 341 PERCENT HIGH	Setting value input
		Target value setting 342 PERCENT REF	Setting value input
		Lower limit value setting 343 PERCENT LOW	Setting value input
	Counting Comparator 35 COMPARE COUNT	Upper limit value setting 351 COUNT HIGH	Setting value input
		Target value setting 352 COUNT REF	Setting value input
		Lower limit value setting 353 COUNT LOW	Setting value input
	Multiplying Comparator 36 COMPARE MULT	Upper limit value setting 361 MULTIPLY HIGH	Setting value input
		Target value setting 362 MULTIPLY REF	Setting value input
		Lower limit value setting 363 MULTIPLY LOW	Setting value input

★: Initial setting value

External input/output functions **4 EXTERNAL I/O**	RS232C **41 RS232C**	ON/OFF **411 ACTIVATE**			
				OFF	OFF
			★	**ON**	ON

*4	Communication format **412 FORMAT**			
			6	6-digit numeric format
			7	7-digit numeric format
			8	8-digit numeric format
			CSP6	CSP 6-digit format
			CSP7	CSP 7-digit format
		*4 ★	**CBM**	CBM format

Output condition **413 CONDITION**			
		OFF	Output stop
		1	Output continuously at all times
		2	Output continuously when stable
		3	Output once immediately after the [Output] key is pressed
		4	Auto output
		5	Output once when balance reached stable
		6	Output continuously when unstable, then output once when balance reached stable
	★	**7**	Output once when balance reached stable after the [Output] key is pressed

Comparator output setting **414 COMPARE**			
	★	**0**	As per the output setting
		1	Output when discrimination result is OK or absent

Baud rate **415 BAUD RATE**			
		1200	1200 bps
		2400	2400 bps
		4800	4800 bps
	★	**9600**	9600 bps
		19200	19200 bps
		38400	38400 bps
		57600	57600 bps
		115.2K	115200 bps

Parity **416 PARITY**			
	★	**OFF**	None
		ODD	Odd number
		EVEN	Even number

Stop bit **417 STOP BIT**			
		1BIT	1 bit
	★	**2BIT**	2 bit

Unused high order digit **418 BLANK**			
		ZERO	Zero padding (0x30)
	★	**SPACE**	Fill with spaces (0x20)

Response command **419 RESPONSE**			
	★	**1**	A00/Exx format
		2	ACK/NAK format

External display output mode **41B EX MODE**			
	★	**OFF**	Disabled
		ON	Operation

★: Initial setting value

USB **42 USB**	ON/OFF **421 ACTIVATE**		**OFF**	OFF
		★	**ON**	ON
	*4 Communication format **422 FORMAT**		**6**	6-digit numeric format
			7	7-digit numeric format
			8	8-digit numeric format
			CSP6	CSP 6-digit format
			CSP7	CSP 7-digit format
		*4 ★	**CBM**	CBM format
	Output condition **423 CONDITION**		**OFF**	Output stop
			1	Output continuously at all times
			2	Output continuously when stable
			3	Output once immediately after the [Output] key is pressed
			4	Auto output
			5	Output once when balance reached stable
			6	Output continuously when unstable, then output once when balance reached stable
		★	**7**	Output once when balance reached stable after the [Output] key is pressed
	Comparator output setting **424 COMPARE**	★	**0**	As per the output setting
			1	Output when discrimination result is OK or absent
	Baud rate **425 BAUD RATE**		**1200**	1200 bps
			2400	2400 bps
			4800	4800 bps
		★	**9600**	9600 bps
			19200	19200 bps
			38400	38400 bps
			57600	57600 bps
			115.2K	115200 bps
	Parity **426 PARITY**	★	**OFF**	None
			ODD	Odd number
			EVEN	Even number
	Stop bit **427 STOP BIT**		**1BIT**	1 bit
		★	**2BIT**	2 bit
	Unused high order digit **428 BLANK**		**ZERO**	Zero padding (0x30)
		★	**SPACE**	Fill with spaces (0x20)
	Response command **429 RESPONSE**	★	**1**	A00/Exx format
			2	ACK/NAK format
	External display output mode **42B EX MODE**	★	**OFF**	Disabled
			ON	Operation

★: Initial setting value

*6 **43 BLUETOOTH**	**431 ACTIVATE**		OFF	
		★	ON	
	432 FORMAT		6	
			7	
			8	
			CSP6	
			CSP7	
		★	CBM	
	433 CONDITION		OFF	
			1	
			2	
			3	
			4	
			5	
			6	
		★	7	
	434 COMPARE	★	0	
			1	
	438 BLANK		ZERO	
		★	SPACE	
	439 RESPONSE	★	1	
			2	
	43B EX MODE	★	OFF	
			ON	
*6 **44 BLUETOOTH/BLE**	**441 INIT**		INIT	

★: Initial setting value

Functions relating to the lock **5 LOCK**	Total lock release **51 ALL UNLOCK**		YES	Execute (All locking disabled)
			NO	Cancel
	Key lock **52 KEY LOCK**	★	OFF	Locking disabled
			1	[On/Off] key invalid for power off
			2	Measuring mode: - All keys excluding [Menu] key invalid Setting menu; - [On/Off] key invalid
	Menu lock **53 MENU LOCK**	Functions related to the operation **531 OPERATION**	★ OFF	Locking disabled
			ON	Setting menu is hidden and unmodifiable
		Functions relating to the performance **532 PERFORM**	★ OFF	Locking disabled
			ON	Setting menu is hidden and unmodifiable
		Comparator setting **533 USER**	★ OFF	Locking disabled
			ON	Setting menu is hidden and unmodifiable
		External input/output function **534 I/O**	★ OFF	Locking disabled
			ON	Setting menu is hidden and unmodifiable

★: Initial setting value

Controlling and adjustment **6 ADMIN/ADJUST**	Key assignment for mode selection **61 SHORT CUT MODE**	Shortcut 1 **611 F1 KEY**	★F1	**WEIG**	Weighing mode
		Shortcut 2 **612 F2 KEY**	★F2	**COUN**	Counting mode
		Shortcut 3 **613 F3 KEY**	★F3	**PCNT**	Percentage mode
				MULT	Multiplied by Coefficient mode
				SPGR	Specific Gravity mode
				STAT	Statistics mode
				ANIM	Animal mode
	Key assignment for free key **62 FREE KEY** *5	Free key 1 **621 F1 KEY**	*5	**NONE**	OFF
		Free key 2 **622 F2 KEY**	★F1	**DATE**	Date indication
		Free key 3 **623 F3 KEY**	★F2	**TIME**	Time indication
		Free key 4 **624 F4 KEY**	★F4	**HIGH**	Upper limit value indication
		Free key 5 **625 F5 KEY**	★F5	**LOW**	Lower limit value indication
		Free key 6 **626 F6 KEY**	★F3	**ID**	ID number indication
			*5★F6	**g**	Set unit to gram
				mg	Set unit to milligram
			*5	**ct**	Set unit to carat
				CAL	Execute span adjustment with external weight
				ADD	Adding execute
				TOTL	Total value indication
				HOLD	Hold measurement indication
				GLPH	GLP header output
				GLPF	GLP footer output
				RESP	Response speed setting
	Adjustment and test **63 MAINTENANCE**	Span adjustment with external weight **631 EX CAL**			Execute
		Span test with external weight **632 EX SPAN TEST**			Execute
	Balance management setting **64 SCALE MANAGE**	Balance ID setting **641 SCALE ID**			Setting value input
		Password control **642 PASSWORD**	★	**OFF**	OFF
				ON	Valid
		Admin password registration **643 SET ADMIN PASS**			Setting value input
		User password registration **644 SET USER PASS** *1			Setting value input
		Span adjustment result output **645 SPAN OUT**	★	**OFF**	OFF
				ON	Valid
		Date format **646 DATE DISP**		**Y/M/D**	yyyy.mm.dd
				D/M/Y	dd.mm.yyyy
			★	**M/D/Y**	mm.dd.yyyy
		Date setting **647 DATE SETTING**			Setting value input
		Time setting **648 TIME SETTING**			Setting value input
		Output Language **649 PRT LANG**	★	**ENG**	English
				DEU	Deutsch
				ESP	Español
				FRC	Français
				JPN	日本語
		Direct start **64C DIRECT ST**	★	**OFF**	Disabled
				ON	Enabled
		Resetting to the factory settings **64D INITIALIZE**		**YES**	Execute
				NO	Cancel