SHIMADZU
Solutions for Science
since 1875

Guidance of Basic Operations

AW/AX/AY Series Electronic Balances

SHIMADZU CORPORATION
Kyoto, JAPAN

This guidance

In addition to their excellent weighing performance, Shimadzu AW/AX/AY Series Analytical Balances offer various application functions.

With this brief manual, however, the most basic functions of the balance can be learned quickly, and you can start using it right now.

Refer to the main instruction manual for what is not covered in this guide.

⚠Safety Precautions

Observe the following precautions in order to use the balance safely and without trouble.

- Do not use the balance in a hazardous area where it is exposed to flammable gas, liquid, or dust.
- Use AC adapter specified by Shimadzu.
- Never disassemble the AC adapter.
- The AC adapter is designed to be used indoors. Do not use it outdoors or at any place it might get wet.
- Make sure that the supplied power voltage meets the indicated voltage of AC adapter.
- Never disassemble the balance, accessories, and peripheral units.
- Never let water or any alien objects get into the balance.
- Never attempt to open the case.
- Do not connect to the balance devices other than our peripheral units or specified cable.

CONTENTS

1. COMPONENTS
1.1 Composition
1.2 Description of Parts
1.3 Symbol Displays
1.4 Panel Key Functions

2. INSTALLATION
2.1 Installation Site
2.2 Installation
2.3 Connection to Power Supply

3. WARMING UP

4. WEIGHING
4.1 Going to Weight Display
4.2 Weighing

5. SPAN CALIBRATION (Sensitivity Adjustment)
5.1 Needs of Span Calibration and AW/AX/AY Series
5.2 Span Calibration with the Built-in Weight
5.3 Span Calibration with External Weight(s)
5.4 Full-automatic Span Calibration (AW)

6. MAINTENANCE

Important Note on CE Marking Conformity

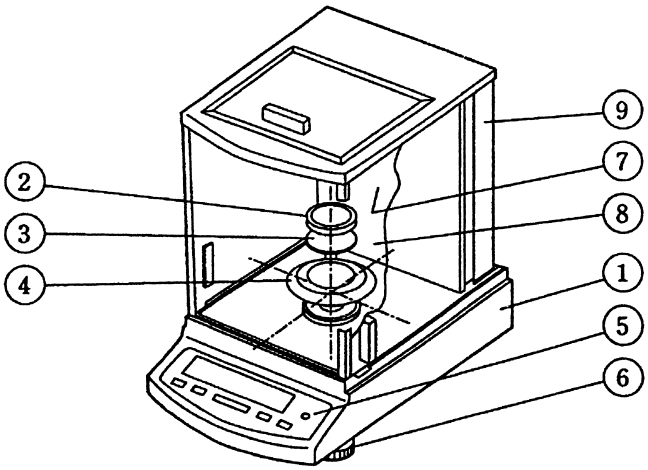
1. COMPONENTS

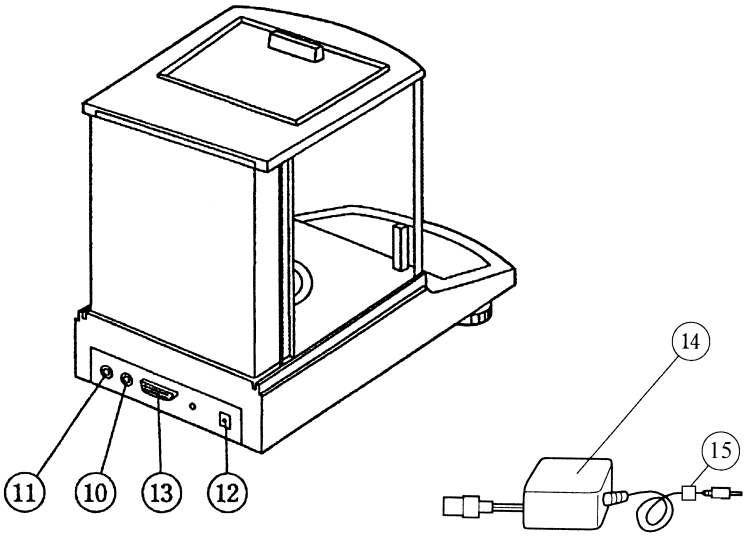
1.1 Composition:

The below items are delivered.

• Main balance body • AC adapter • Pan • Pan supporter • Anti-draft metal • Instruction manual • Inspection acceptance tag

1.2 Description of Parts:





1 Main balance body 2 Pan 3 Pan supporter 4 Anti-draft metal
5 Level 6 Level screw 7 Glass doors 8 Weighing chamber
9 Case side wall 10 Keyboard connector 11 DATA I/O connector
12 DCIN connector 13 RS232C connector 14 AC adapter 15 Ferrite core

1.3 Symbol Displays

Analog display Unit display

(The above shows all the segments in the display.)

The below table explains the displays which may appear during basic operations.

Display	How to read	Meaning during weighing
➡	Stability mark	Lights when stability is detected.
▟	Weight mark	Blinks when span calibration (sensitivity adjustment) is necessary and keeps blinking until a new span calibration (sensitivity adjustment) is made either automatically or manually. **Important Note on *Verified Balance approved as Legal Measuring Instrument in the EU*:** When PSC (temperature-based fully-automatic sensitivity adjustment) is not activated or not available, operator must carry out span calibration (sensitivity adjustment) upon blinking of this mark.(*)
→T←	Tare mark	Indicates the balance has been tared.(*)
→O←	Zero mark	Indicates the balance is set by zero-setting exactly to "Zero" (within ±0.25e: e = verification scale interval).(*)
[ ]	Bracket	The figure bordered by the bracket is the auxiliary indicating device.(*3)
STAND-BY	Stand-by mark	Lights when the power is in standby.

(*) Applicable to ***Verified Balance approved as Legal Measuring Instrument in the EU***. Refer to the main instruction manual.

EU = including the signatories of the agreement on the European Economic Area

1.4 Panel Key Functions

The below table explains the functions during basic operations only.

Key	When pressed briefly	When pressed for 3 seconds
POWER/BRK	Switches between operation/standby.	
CAL/MENU	Enters span calibration (sensitivity adjustment)	
O/T	Performs taring. (Displays zero.) (*1) (*2)	
UNIT	Switches the unit of weighing. (*3)	Switches the display of 1d/10d. (*4) (*5)
PRINT	Outputs the displayed value to external units	During stand-by or weight display, current time is output to external units. (*6)

*1 Either Taring (at a weight exceeding 4% of the capacity) or Zero setting (at a weight within 4% of the capacity) is performed in ***Verified Balance approved as Legal Measuring Instrument in the EU***.

*2 Except for ***Verified Balance approved as Legal Measuring Instrument in the EU***, TARE instead of O/T may be found printed on the key, though its functions are the same.

*3 To use the units other than g, they have to be registered and set beforehand with menu selection. Only g unit is registered before shipment. Refer to the main instruction manual.

*4 When the unit is set to 10d, the minimum display is made rougher by one digit.

*5 Not applicable to ***Verified Balance approved as Legal Measuring Instrument in the EU***.

*6 Applicable to AW/AX Series only. Refer to the main instruction manual.

EU = including the signatories of the agreement on the European Economic Area

2. INSTALLATION

2.1 Installation Site

In order to obtain fast, reliable results with the balance, it must be installed at a suitable location.

Avoid installing the balance at places where it is exposed to:

Corrosive gas or flammable gas
Magnetic and electronic fields
Rain or splash water
Dust
Extreme high/low temperature or humidity
Direct sunlight

Doors and windows of the laboratory must not be opened during weighing operation.

Air flow from air-conditioners must not reach the balance directly.

The balance should be installed on a sturdy and flat table.

2.2 Installation

(1) Take out the balance and parts from the packing box and remove the adhesive packing materials.

(2) Mount the pan supporter, anti-draft metal, and pan in this order into the weighing chamber.

(3)Level the balance by turning the level screws to bring the bubble within the red circle of the level indicator.

2.3 Connection to Power Supply

With nothing placed on the pan, connect the AC adapter to the outlet and to the balance.

The balance automatically performs self-check and span calibration. Upon completion, “OFF” is displayed.

(It is not possible to interrupt the first span calibration after connection to the power supply. The span calibration is not performed with AY Series.)

Important Notes on *Verified Balance approved as Legal Measuring Instrument in the EU*

You must conduct sensitivity adjustment (span calibration) at the site of installation before using the balance as a Legal Measuring Instrument in the EU. The balance must be used within the temperature range shown on the verification

label. The balance must be warmed up (connected to power) for at least four hours before used as a Legal Measuring Instrument.

A green **M** mark is affixed on the balance which has EC Type Approval. With valid verification, balances with EC Type Approval can be used as Legal Measuring Instruments in the EU.

Legal regulations require the verified balance to be sealed. This control seal is a self-destructive adhesive label. This seal will be irreparably damaged if you attempt to remove it. In this case, the validity of the verification is lost and you must have your balance re-verified.

EU = including the signatories of the agreement on the European Economic Area

3. WARMING UP

The balance is warmed up while "OFF" or "STAND-BY" is displayed.

• Warming up the balance for more than 4 hours enables you to conduct accurate measurements.

• When the balance is not used, press the POWER/BRK key from the weighing status to bring the balance to the stand-by (warm-up) status.

• If you do not use the balance for a period of one month or longer, disconnect the AC adapter from the power outlet.

"OFF" is displayed only after newly connected to power, and "STAND-BY" is displayed after returning from weighing status with the POWER/BRK key pressed.

4. WEIGHING

4.1 Going to Weight Display

(1)Press the POWER/BRK key at "OFF" display or stand-by status.

(2)After all the display segments light, zero is displayed and the balance is ready for weighing. (Automatic span calibration may take place before zero is displayed if it is activated.)

4.2 Weighing

(1) Press the O/T key, and confirm that zero is displayed before you place the object on the pan. If you use a container, place it first and press the O/T key.

(2) Place the object on the pan and read the display when the stability mark (the arrow mark) is lit.

Do not load the pan exceeding the capacity.

Do not bring any magnetized article close to the balance.

Do not give impact to the pan.

Note on *Verified Balance approved as Legal Measuring Instrument in the EU*.

The symbol ⊙← in the display shows that the balance is set by zero-setting, exactly to "zero" (within ±0.25e: e = verification scale interval).

EU = including the signatories of the agreement on the European Economic Area

5.SPAN CALIBRATION (Sensitivity Adjustment)

5.1 Needs of span calibration and AW/AX/AY Series

Span calibration is necessary after the balance is installed at a new location, because even a slight difference of the gravity affects the result of weighing. Also it is necessary when the ambient temperature has been changed. A deviation of one degree Celsius is not ignorable for analytical balances.

AW/AX Series are equipped with a motor-driven built-in calibration weight. Span calibration is made by a simple key operation. In addition, AW Series has full-automatic functions which allow you to disregard calibration. AY Series is calibrated with external calibration weight(s) following a simple program.

Regardless of the type of span calibration, the balance must have been installed properly and warmed up, and nothing should be on the pan during span calibration. The balance must stay strictly free from vibration, air flow, and temperature change.

Disconnecting the power supply or transferring the balance during span calibration may cause failure.

Standard settings before shipment,

AW Series: Calibration using built-in weight, and full-automatic span calibration (PSC) is ON, Clock-CAL is OFF.
AX Series: Calibration using built-in weight.
AY Series: External weight only.

To use external weight for AW/AX, and for switching ON/OFF PSC or Clock-CAL of AW Series, refer to the main instruction manual.

5.2 FULL-AUTOMATIC SPAN CALIBRATION (AW Series only)

Span calibration (sensitivity adjustment) is performed automatically when a temperature change which would affect accuracy is detected, or when approximately four hours have passed since the previous span calibration.

Thus, it keeps the accuracy without manual operation.

Approximately two minutes prior to initiate each full-automatic span calibration, the weight mark starts to blink. Empty the pan at this occasion and leave the balance without vibration, air flow, or temperature change. By pressing the POWER/BRK key while the weight mark is blinking, the span calibration can be aborted.

This full-automatic span calibration is suspended at stand-by status.

5.3 Span Calibration with the Built-in Weight (AW/AX Series)

Span calibration can be made any time with a key operation.

(1)From the weight display, press the CAL/MENU key

(2)When "iCAL " appears, press the O/T key. Span calibration is initiated.

(3)After "CAL 2", "CAL 1", and "CAL 0" were displayed, "CAL End" is shown for several seconds and the display returns to the weight display. Calibration is complete.

5.4 Span Calibration with External Weights (AY Series)

With external calibration weight(s), span calibration can be made by following a simple procedure.

(1)From the weight display, press the CAL/MENU key. When "E CAL " appears, press the O/T key. Span calibration program will be initiated.

(2)After zero appears on the display and blinks, the weight required for calibration is displayed and blinks.

(3)Place the indicated weight of calibration weight(s) on the pan.

(4)When, zero appears on the display and blinks, unload the pan.

(5)"CAL End" is displayed for several seconds and the display returns to the weight display. Calibration is complete.

Important Note on *Verified Balance approved as Legal Measuring Instrument in the EU*:

When PSC (temperature-based fully-automatic sensitivity adjustment) is not activated or not available, operator must carry out sensitivity adjustment upon blinking of weight mark in the display (See the Symbol Displays table.).

EU = including the signatories of the agreement on the European Economic Area

6. Maintenance

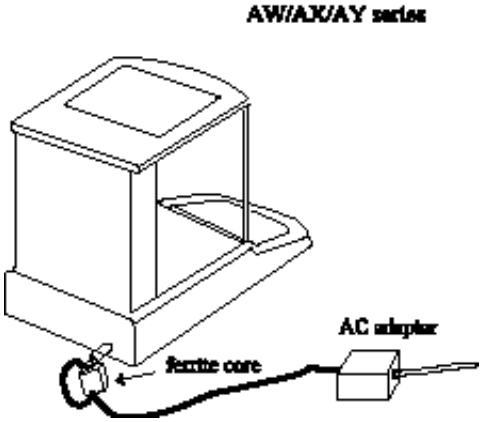
Unplug from the power outlet before cleaning the balance.

Wipe with a soft moistened cloth with a neutral detergent. Do not use organic solvent, chemicals, or chemical duster. They may damage the coating or the display panel.

The pan can be removed from the balance and washed with water. Completely dry it before returning it on to the balance.

Important Note on CE Marking Conformity

AC Adapter



When using AW/AX/AY Series, attach the ferrite core to the D.C. supply cable at the balance side.

AC adapter for the balance must be conforming to the following directives.
Directive 73/23/EEC (Basic standard EN61010-1)
Directive 89/336/EEC (Basic standard EN55022 class B)