SHIMADZU
Excellence in Science

Shimadzu Electronic Balances
General Catalog 2018

Providing Balances and Scales for 100 Years

Supporting manufacturing in the future, utilizing 100 years of experience and knowledge

Shimadzu began manufacturing balances in 1918. Throughout this 100-year history, we have been at the forefront of providing precision, quality solutions for the most challenging R&D and QA/QC requirements. Our steadfast customer-focused commitment and unwavering dedication to technical excellence are both hallmarks of our history and the principles that guide us into the future.

100th BALANCE ANNIVERSARY

1875 1875 Establishment of SHIMADZU CORPORATION

1918 ● 1918 Top-Pan Torsion Balance

1930 ● 1930 Chemical Balance

1960 ● 1958 Type L Direct-Reading Balance

1970
- 1970 D-1003 Digital Balance
- 1978 ED Series

1980
- 1981 AEL-160 Analytical Balance
- 1985 AEL-200 Analytical Balance
- 1987 UniBloc integrated mass sensor developed

1995 ● 1995 EL Series Load Cells

2000
- BL Series Simple Balances
- BW/BX Series General-Purpose Balances
- AW/AX/AY Series Analytical Balances
- LDS Series Platform Balances

2002 **Uni Bloc** Introduction of UniBloc
- BW/BX-K Series Medium-Size Precision Platform Balances, the first to include a UniBloc sensor
- UW/UX Series General-Purpose Balance with UniBloc

2003 AU Series Analytical Balances, world's first to include a UniBloc sensor

2004 MOC-120H Moisture Analyzer, world's first to include a UniBloc sensor

2007 **Uni Bloc** UniBloc maturation period
- 2007 TX/TXB Series General-Purpose Balances designed for easy operability

2010 AT Series Analytical Balance designed for easy operability

2011 MOC63u Low-Cost Moisture Analyzer with UniBloc sensor

2016 AP Series Analytical Balances

2018 ● 100th year of making balances!! Please continue choosing Shimadzu balances.

SHIMADZU ELECTRONIC BALANCES

A Tradition of Weighing Expertise

Established in 1875 in Kyoto, Japan, Shimadzu Corporation is one of the pioneers of scientific precision instruments.

Top-pan and torsion balance production started in 1918, and equal-beam analytical balances were introduced in 1925. Since their release, the continuous improvement of Shimadzu balances has contributed to research and development across all industries.

Around the turn of the 20th century, precision weighing was a time-consuming practice performed only by experienced operators. Placing the sample and small masses on pans hung from a beam scale with a moving indicator was a tedious process. Shimadzu strove continuously to streamline weighing procedures. The introduction of the direct reading analytical balance (patented in Japan in 1948) signified a new era in weighing technology. In the Type L balance, the sensitive mass-loading work was replaced by convenient dial operations. This reduced weighing time by 66% and, subsequently, reduced demand for conventional balances.

Shimadzu then added the top-loading direct reading balance with Roberval's mechanism in 1959. Until recently many of these instruments were still utilized in modern laboratories. Shimadzu continued to pioneer new technologies, releasing its first electronic balance in 1971—the Digibalance. This release marked a milestone in precision weighing, introducing simplicity and ease of use to analytical weighing.

Six years later (1977), the application of microprocessors in electronic balances further enhanced weighing performance. The compact ED Series provided substantial improvements in sensitivity, resolution, and stability.

More recently, Shimadzu has introduced user-friendly instruments and features to the market, such as :
temperature-based fully-automatic calibration in 1985,
the first one-piece force cell (OPF, later renamed UniBloc) in 1989, the high-sensitivity AEM-5200 Micro Balance in 1993,
and the unique WindowsDirect feature perfectly suited for the computerized laboratory of the 21st Century.

Its most recent achievement is the AP Series, advanced performance balances featuring UniBloc and a high response speed, and which are applicable for a wide range of applications.

Moving forward, Shimadzu is committed to providing innovative products for the analytical marketplace.

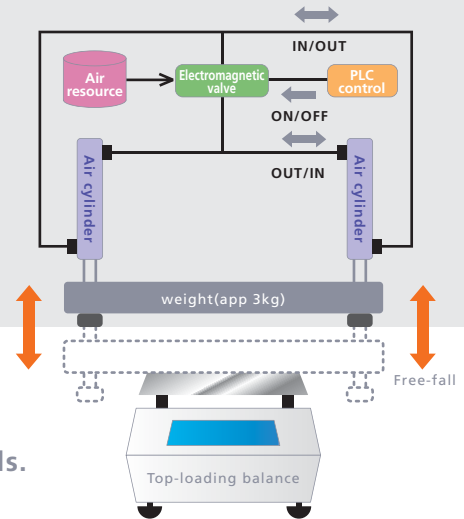## Contents

UniBloc Power!

Shimadzu balances advance to the UniBloc generation
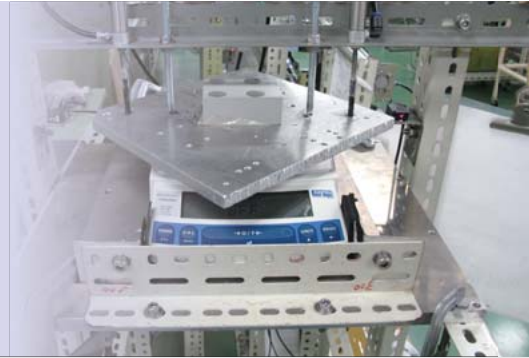
Impact resistance test for four balances made by typical manufacturers.
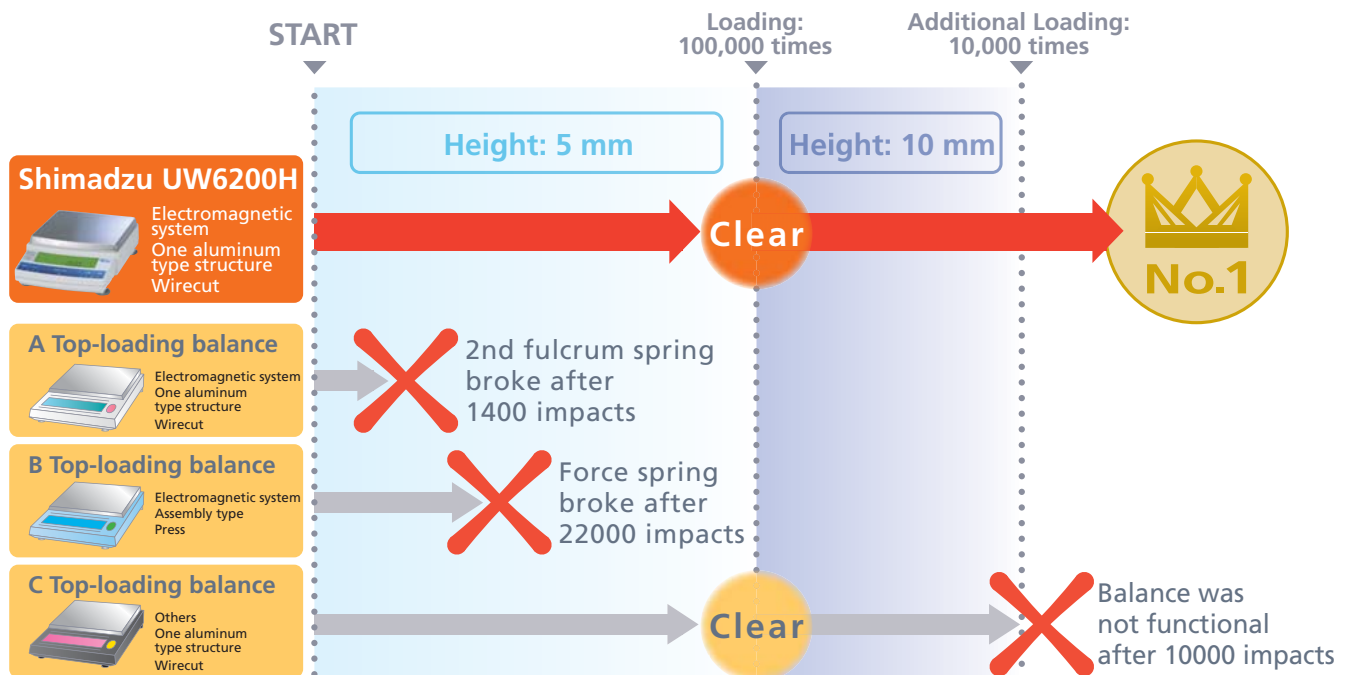
(Shimadzu internal test)

Test results of impact resistance test with top-loading balances (Minimum display: 10 mg)

Test conditions **Free-falling the weight (3 kg) at 4 sec intervals.**
(Weight was dropped from a height of 5mm for the first 100,000 impacts.
After the first 100,000 tests, it was dropped from a height of 10 mm.)

	START	Loading: 100,000 times	Additional Loading: 10,000 times
		Height: 5 mm	Height: 10 mm
Shimadzu UW6200H Electromagnetic system One aluminum type structure Wirecut		Clear	No.1
A Top-loading balance Electromagnetic system One aluminum type structure Wirecut	✕ 2nd fulcrum spring broke after 1400 impacts		
B Top-loading balance Electromagnetic system Assembly type Press	✕ Force spring broke after 22000 impacts		
C Top-loading balance Others One aluminum type structure Wirecut		Clear	✕ Balance was not functional after 10000 impacts

The results of this impact resistance test prove Shimadzu UW/UX series balances with UniBloc technology are the toughest. Put Shimadzu balances in your lab and experience UniBloc power.
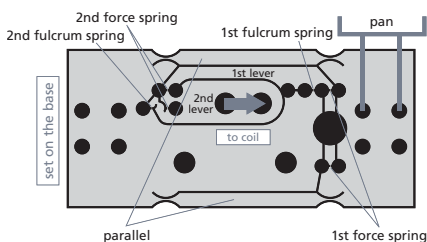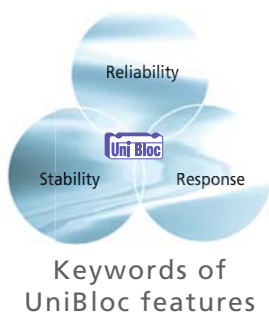
UniBloc technology leads to a new world of measurement

Shimadzu introduced one-piece force cell technology for precision balances in 1989. Today's UniBloc is created by high-precision electric discharge wire processing applied to a block of aluminum alloy, and replaces the conventional electro-magnetic balance sensor assembly. UniBloc's compact, uniform structure ensures stable temperature characteristics, excellent response time and stable corner-load performance. In addition, the UniBloc design permits a consistency of production that assures reliability and a long operational life.

The updated UniBloc technology expands the UniBloc balance lineup, which now ranges from semi-micro with a minimum display of 0.01 mg to precision platform balances up to 52 kg in capacity.

One-piece force cell patented in USA in 1989, No. 4799561, in China in 1991, No. 12729, in Japan in 1995, No. 1905686

Reliability

Uni Bloc

Stability   Response

**Keywords of
UniBloc features**

2nd force spring
2nd fulcrum spring   1st fulcrum spring   pan

1st lever

set on the base

2nd lever

to coil

parallel   1st force spring

Amount 1/70   Volume 1/10

Conventional measurement unit
It consists of app. 70pcs with various materials

Uni Bloc

Number of parts: 1 pc
Volume : app. 1/10 of conventional one

AP series   MOC63u   BX-K/BW-K series   UW/UX series   TW/TX series   ATX/ATY series   AU series

UniBloc family of balances

Shimadzu Balances Offer a Diverse Range of Functions

01 High Level Functionality

Easy Setting

During operation, if you want to make the display slightly more stable, or alternatively, want to improve the response speed, you can make one-touch adjustments without interrupting measurement. A special indicator is provided that instantly shows the adjustment status.


Menu Operation Key

Easy-to-Operate Key Layout

Keys exclusively for menu operations are arranged separately from the measurement keys. Menus can be operated intuitively using the cross-shaped key layout.

Perfect Self Calibration

Electronic balances are precision instruments very susceptible to changes in room temperature. Sensitivity must be calibrated every time the balance is used since changes in room temperature influence mass measurement values, which are not supposed to change. The balance detects changes in room temperature that affect sensitivity, and automatically starts calibration using built-in weights. As a result, sensitivity errors are always kept within a constant range. This allows the operator to concentrate on measurement tasks without having to worry about sensitivity calibration.

Room temperature changes

Constant sensitivity error
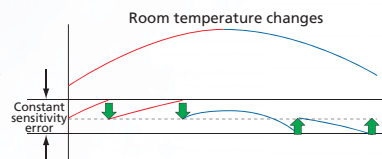
The perfect self calibration (PSC) function keeps the sensitivity error within a constant range at all times.

Clock-CAL

The balance starts calibration using built-in weights at preset times. If you set calibration times before important measurements (e.g. before starting work in the morning, or during the lunch or evening break), the balance will automatically start calibration when the preset time is reached. This lets you take stable, reliable measurements without worrying about sensitivity calibration.

Sensitivity calibrated automatically at the times determined by Clock-CAL

AM8:00   PM0:30   PM5:00
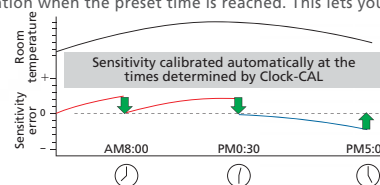
02 Durability

Next-Generation Mass Sensor: UniBloc

UniBloc is a completely new mass sensor, developed by Shimadzu through further modification of its OPF aluminum block mass sensor, a world's first in development. UniBloc is created by high-precision electric discharge wire processing applied to a block of aluminum alloy in order to replace the conventional sensor block assembly. As such, it uses no springs or screws. This uniform structure dramatically improves response and temperature characteristics, and the simple yet compact design enhances impact resistance. Balances equipped with UniBloc provide highly reliable mass measurement even with prolonged use.

03 Convenient Functions

Internal Calibration

The balance has built-in motor-driven calibration weights. Sensitivity can be calibrated whenever needed with a single key press.

Single-Lever CAL

The balance has built-in calibration weights. Sensitivity is calibrated with a simple lever operation. Sensitivity can be calibrated easily, whenever needed.

Dry Battery Operation

The balance can also run on dry cell batteries, enabling use outdoors where no power is available.

Checkweighing

Preset the upper and lower limit values to display pass, high or low, depending on the sample weight.

Comparator Output

Proper weight, high, low and other pass/fail judgments can be indicated by a buzzer, or output externally as a contact signal. (Optional comparator buzzer or relay output interface required.)

Backlight

Naturally, weight measurements can be taken even if the work site is dark, and prolonged use at normal work sites will not tire your eyes.
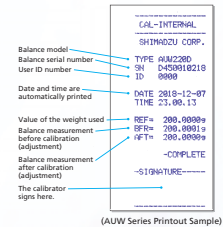
04

**ISO
GLP
GMP**

🕐 Built-in Clock

With the optional printer connected, data can be recorded with date and time stamps. Calibration reports can also be date- and time-stamped, which is ideal for establishing the measurement management and traceability required by GLP, GMP and ISO 9001.

ISO ISO Calibration Report

Simply connect an optional printer to automatically print out which balance was calibrated when, and the calibration results. Absolutely no troublesome settings are required. Furthermore, the current date and time can be printed anytime during measurement.

```
      CAL-INTERNAL

     SHIMADZU CORP.

 TYPE AUW220D
 SN   D450010218
 ID   0000

 DATE 2018-12-07
 TIME 23.00.13

 REF=  200.0000g
 BFR=  200.0001g
 AFT=  200.0000g

     -COMPLETE

 -SIGNATURE-------
```

Balance model
Balance serial number
User ID number

Date and time are automatically printed

Value of the weight used
Balance measurement before calibration (adjustment)
Balance measurement after calibration (adjustment)
The calibrator signs here.

(AUW Series Printout Sample)

05

Network

🔲 LabSolutions Balance

Connecting with LabSolutions lets you save data from balances, HPLC and other analysis instruments to a database, and create reports automatically. Uniform data management means no transcription errors, and is perfect for security.

**To Establish an Internal Analysis
Data Management System**

06

Applications

PCS Piece Counting

A built-in piece counting function enables balances to be used as parts counters (piece scales).

Specific Gravity Specific Gravity Measurement

A specific gravity calculation function based on the immersion method is built in.
Just attach the optional Specific Gravity Measurement Kit to use a balance as a specific gravity meter.

🐾 Built-in Animal Measurement Mode

The weight of mice, rats, rabbits, and other small animals can be measured. Stable measurements are obtained even if the animal moves.

❄ Carat Measurement

Results can be displayed in carats when measuring precious stones.

Excellent Performance for Multiple Industries

Chemical

- Weigh liquids and powders in development departments
- Measure specific gravity and moisture ratio of resin pellets, rubber, etc.
- Input mass values via connection to a titration system for quality management
- Measure mass and moisture ratio of dyes, pigments, and inks
- Measure and control materials accumulated on filters
- Control moisture ratio levels during catalyst production

Food

- Check weights when receiving raw materials
- Confirm the net weight of final products
- Measure the moisture ratio and control the quality of raw materials and products
- Weigh trace quantities of additives
- Weigh raw materials during formulation

Medical Products

- Control pharmaceutical usage quantities by measuring weight before and after use
- Weigh raw materials
- Confirm the weight of stents and other miniature medical devices
- Measure the moisture ratio and control the quality of raw materials and products
- Measure weight changes during animal experiments
- Measure drugs during drug manufacturing processes

Cosmetics

- Measure weight changes in creams and compresses at specified intervals
- Control the quality of product containers and cases
- Measure the moisture ratio of hair, etc.

Metals/Precious Metals

- Count the number of very small products
- Check the weight of coated steel sheets/plates after polishing
- Control the moisture ratio and specific gravity of iron and steel raw materials
- Measure trace quantities machined from metals, etc.
- Measure the specific gravity of rare metals and compare it to theoretical values
- Control the amount of wear on metal materials
- Weigh items when purchasing precious metals or bullion

Electronics
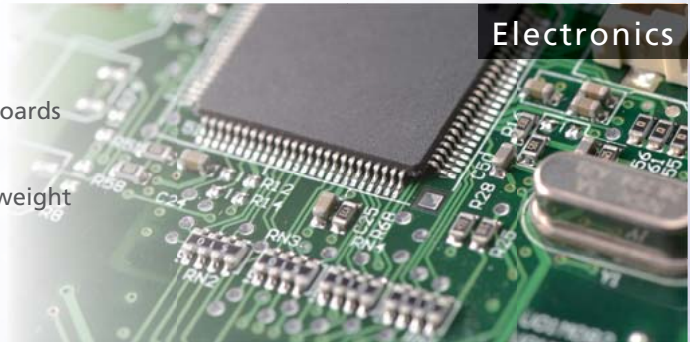
- Check weights when manufacturing electronic circuit boards
- Measure tiny semiconductor parts
- Check for missing items in product packages based on weight
- Control the quantity of plastics used in LED lenses

Automotive

- Measure exhaust gas accumulation on ceramic parts and filters
- Measure electrolyte injection quantities on lithium-ion battery production lines
- Measure moisture ratio in sheet materials
- Control contamination remaining on machinery parts

Academia

- Use for training students
- Manage reagent use by weight, in combination with a chemical substances management system
- Use in lectures to explain basic principles and theory

Product Lineup

	~100g	100g~	300g~	500g~	1kg~	3kg~
0.01mg	AP125WD (120g/0.1mg) (52g/0.01mg) AUW220D (220g/0.1mg) (82g/0.01mg) AUW120D (120g/0.1mg) (42g/0.01mg)	AP135W (135g/0.01mg) AP225WD (220g/0.1mg) (102g/0.01mg)				

AP Series (0.01mg model)

AUW-D Series

	~100g	100g~	300g~	500g~	1kg~	3kg~
0.1mg	ATX84 (82g/0.1mg) ATY64 (62g/0.1mg)	AP124W AP124X AP124Y (120g/0.1mg) AP224W AP224X AP224Y (220g/0.1mg) AUW220 AUX220 AUY220 (220g/0.1mg) ATX224 ATY224 (220g/0.1mg) AUW120 AUX120 AUY120 (120g/0.1mg) ATX124 ATY124 (120g/0.1mg) TWC623L TXC623L (620ct/0.001ct)	AP324W AP324X AP324Y (320g/0.1mg) AUX320 AUW320 (320g/0.1mg) ATX324 ATY324 (320g/0.1mg)			

AP Series (0.1mg model)

AUW/AUX/AUY Series

ATX/ATY Series

	~100g	100g~	300g~	500g~	1kg~	3kg~
0.001g (1mg)		UW220H UX220H (220g/0.001g) TW223L TX223L (220g/0.001g) BL-220H (220g/0.001g)	UW420H UX420H (420g/0.001g) TW423L TX423L (420g/0.001g) TW323L TX323L (320g/0.001g) BL-320H (320g/0.001g)	UW820H UX820H (820g/0.001g) UW620H UX620H (620g/0.001g)	UW1020H UX1020H (1020g/0.001g)	

UW/UX Series

	~100g	100g~	300g~	500g~	1kg~	3kg~
0.01g~ (10mg)		TXB222L (220g/0.01g) ELB200 (200g/0.01g) ELB120 (120g/0.01g)	UW420S UX420S (420g/0.01g) TXB422L (420g/0.01g) BL-320S (320g/0.01g) ELB300 (300g/0.01g)	UW820S UX820S (820g/0.01g) TXB622L (620g/0.01g) BL-620S (620g/0.01g) ELB600 (600g/0.05g)	UW2200H UX2200H (2200g/0.01g) TX2202L (2200g/0.01g) BL-2200H (2200g/0.01g)	UW4200H UX4200H (4200g/0.01g) TX4202L (4200g/0.01g) TX3202L (3200g/0.01g) BL-3200H (3200g/0.01g)

TW-N/TX-N/TXB Series

~100g	100g~	300g~	500g~	1kg~	3kg~
0.1g~			ELB600S (600g/0.1g)	TXB2201L (2200g/0.1g) ELB2000 (2000g/0.1g) ELB1200 (1200g/0.1g)	UW4200S UX4200S (4200g/0.1g) TXB4201L (4200g/0.1g) BL-3200S (3200g/0.1g) ELB3000 (3000g/0.1g)

ELB Series

BL Series

5kg~	10kg~	30kg~	50kg~
0.01g (10mg)	UW6200H UX6200H (6200g/0.01g)		

UW/UX Series

	5kg~	10kg~	30kg~
0.1g (100mg)	UW8200S UX8200S (8200g/0.1g) TXB6201L (6200g/0.1g)	BW22KH BX22KH (22kg/0.1g) BW12KH BX12KH (12kg/0.1g)	BW32KH BX32KH (32kg/0.1g)

BW-K/BX-K Series

1g~	TXB6200L (6200g/1g) ELB6000S (6000g/1g)	ELB12K (12kg/1g)	BW32KS BX32KS (32kg/1g)	BW52KS BX52KS (52kg/1g)

TXB Series

ELB Series

How to use

model name | capacity | minimum display

→ **BL-320S** (320 g/0.01 g)

ELB300 (300 g/0.01 g)

→ **UW420HV** (420 g/0.01 g)

AUW220D (220 g/0.1 mg) (82 g/0.01 mg) — Dual range

Internal Calibration model is in blue

Product Lineup

○ :Standard function
△ :Option

	AP-WD AP-W (NEW)	AP-X (NEW)	AP-Y (NEW)	AUW-D AUW	AUX	AUY	ATX ATY
UniBloc	○	○	○	○	○	○	○
Perfect Self Calibration	○	○		○	○		
Clock-CAL	○	○		○			
Internal Calibration	○	○		○	○		○ (ATX only)
Single-Lever CAL							
Built-in Clock	○	○	○	○	○		
ISO Calibration Report	○	○	○	○	○		
Menu Operation Key	○	○	○				
Easy Setting	○	○	○				○
Backlight				○ (AUW only)			
Organic EL Display	○	○	○				
Balance Keys	○	○	○	○	○	○	○
Built-in RS-232C Interface	○	○	○	○	○	○	△*
Built-in USB Interface	○	○	○				
Analog Bar Graphic Display	○	○	○	○	○	○	
Checkweighing	○	○	○				○
Comparator Output							
Piece Counting	○	○	○	○	○	○	○
Carat Measurement	○	○	○	○	○	○	○
Specific Gravity Measurement	○	○	○	○	○	○	
Dry Battery Operation							
Standard Below-weight Hook	○	○	○	○	○	○	
Built-in Animal Measurement Mode							
Formulation Mode	○	○	○	○	○	○	○
Internal Timer Output	○	○	○	○	○		

*Requires optional I/O-RS conversion cable or interface IFB-102A.

UW	UX	TW TX	TXB	BW-K BX-K	ELB	BL	UW-V	MOC63u MOC-120H
○	○	○		○			○	○
○							○	
○							○	
○		○ (TW-N only)					○	
				○ (BW-K only)				
○	○			○			○	○
○	○			○			○	○
		○	○					
		○	○					
○	○	○	○				○	○
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○	○	○	○	○	△*	△*	○	○
								○ (MOC63u only)
○	○			○		○	○	
○	○	○	○	○			○	
○	○						○	
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			○		○			
○	○			△	△		○	
○	○			○				
○	○	○	○	○			○	
○	○			○				○

AP Series

Advanced Performance UniBloc Balances

Provides High-speed Response and High Stability

A New Stage in Analytical Balance Performance

High Speed

The response time for trace measurements (from 1 mg) is reduced to about 2 seconds.
This significantly improves weighing efficiency.

Stress Free

The STABLO-AP ionizer can be mounted.
This eliminates the influence of static electricity, achieving reliable measurements in a simpler procedure.

For HPLC

Functions are included for the preparation of buffer solutions used in HPLC.
As a result, the operation can be performed accurately and easily, even by non-specialists.

Save Your Operation

Equipped with USB as standard*1. Includes many diverse functions to support users.

For Regulation

Interlocking with LabSolutions Balance enables compliance with a variety of regulations for measurement data integrity, including ISO 17025 for testing laboratories, ISO 9001 and ISO 14001 for the manufacturing industry, and GLP/GMP and the United States Pharmacopeia (USP) for the pharmaceutical industry.

*1 All models: USB-B type connector as standard   AP-W Series: USB-A type and B type as standard

* AP224W with optional ionizer

Watch the AP overview video on our website.

http://www.shimadzu.com/an/balance/analytical/ap.html

High Speed

Fast measurement significantly improves operational efficiency.
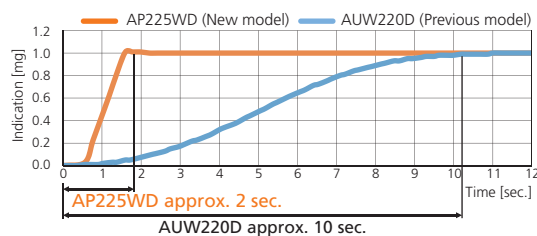
Fast Response with UniBloc AP Technology

Shimadzu analytical balances boast a one-piece UniBloc weighing sensor, which is now even more advanced.
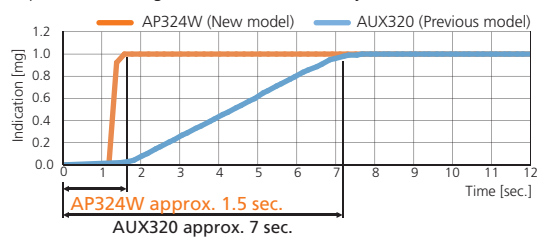
The response time is reduced to about 1/5 the time of previous models.

The improved UniBloc sensor offers a response time of just 2 seconds, an improvement from 10 seconds with the previous model.

Response During Trace Measurements with the 0.01 mg Model
(Equivalent to 1 mg / With Conditions Set by Shimadzu)

— AP225WD (New model) — AUW220D (Previous model)

Indication [mg] / Time [sec.]

AP225WD approx. 2 sec.
AUW220D approx. 10 sec.

Response During Trace Measurements with the 0.1 mg Model
(Equivalent to 1 mg / With Conditions Set by Shimadzu)

— AP324W (New model) — AUX320 (Previous model)

Indication [mg] / Time [sec.]

AP324W approx. 1.5 sec.
AUX320 approx. 7 sec.

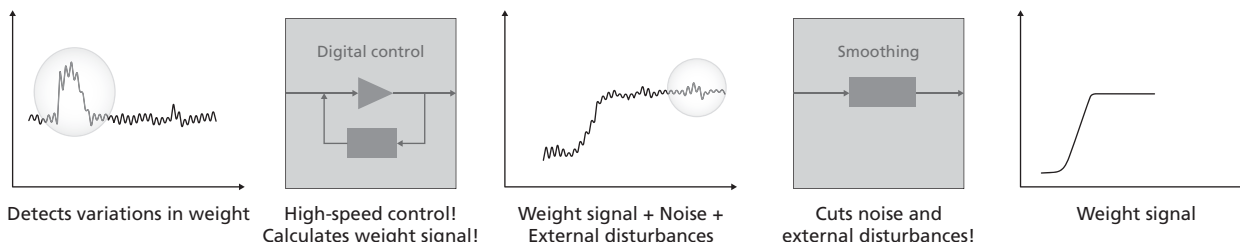| Model	Previous Model	AP Series
0.01 mg	10 sec.	2 sec.
0.1 mg	7 sec.	1.5 sec.

* AP135W

Advanced Digital Control for Fast, Reliable Weighing

The improved measuring feel provides more comfortable use.

AP-i System (intelligent - Advanced Processing System)

Detects variations in weight | High-speed control! Calculates weight signal! | Weight signal + Noise + External disturbances | Cuts noise and external disturbances! | Weight signal

Digital control

Smoothing

Measuring feel has been significantly improved by using the advanced digital control technology and smoothing technology.

AP-i system provides reliable weighing even in an environment with significant external disturbances. This promises to increase the efficiency of your measurement operations.

Stress Free

A variety of accessories and options suitable for semi-micro measurements

The multi stand can be used freely and easily.

(0.01 mg model only, equipped as standard)

With weighing paper, for example, if the tare is larger than the pan diameter, measurements can be simplified by attaching the special multi stand.

Measuring weights with a pipette can be simplified by placing a micro tube upright in the sample holder in the special multi stand.

Long rod-shaped samples can be measured in a stable state by placing them in the slot in the special multi stand.

The internal windbreak plate suppresses the influence of convection and airflow within the weighing chamber, improving the stability and response of measurement values.

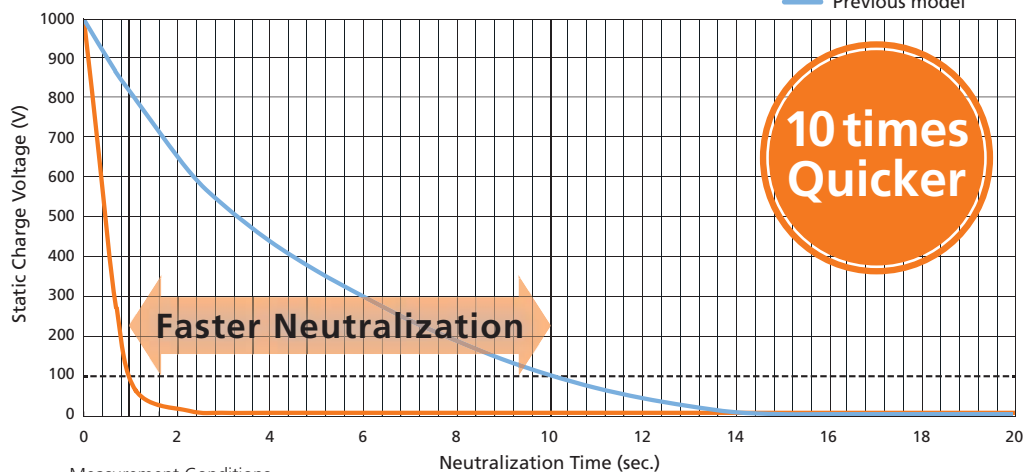## Built-in High-Performance Ionizer (Optional)

The ionizer eliminates influence of static electricity in 1/10 the time of previous models.

Note: Example of typical static electricity removal time (±1000 V → ±100 V)
    1 sec. for STABLO-AP and 10 sec. for STABLO-EX

AC Method with Excellent Ion Polarity Balance
Mount the STABLO-AP in the balance and use it as a built-in model

Comparison of Neutralization Speed (Representative Values)

━━ STABLO-AP
━━ Previous model

10 times Quicker

Faster Neutralization

Y-axis: Static Charge Voltage (V) — 0, 100, 200, 300, 400, 500, 600, 700, 800, 900, 1000
X-axis: Neutralization Time (sec.) — 0, 2, 4, 6, 8, 10, 12, 14, 16, 18, 20

Measurement Conditions
• Time from ±1000 V to ±100 V   • Distance between CPM and ionizer: 100 mm
• For this evaluation, a 150 × 150 mm charged plate monitor (CPM, 20pF) was used.

For HPLC

For Users of HPLC Systems

Buffer Solution Preparation Mode NEW
(AP-W Series only)

・**Recipes for 13 commonly used buffer solutions are included as standard**

Preparation recipes for commonly used buffer solutions are provided as standard.

e.g. disodium phosphate, sodium acid citrate

・**New buffer solution recipes can be registered**

If a buffer solution is not registered by default, it can be newly registered.

・**Instructions are shown on the display**

The target weighing value is shown on the display and analog bar in order to compare the target with the current weight. Manual calculation is not needed.

・**Record function**

Record output with date, time and operator name.

The pH level of mobile phase (eluent) solutions used in liquid chromatographs is adjusted to improve separation of components and extend the life of columns. This pH adjustment process is performed using a buffer solution. Currently, the most common method is using a pH meter to measure the pH as the solution is prepared; however, this process requires considerable time and effort, which can cause operational bottlenecks. An alternative method does not require a pH meter. It involves preparing solutions by weighing fixed theoretically calculated quantities of an acid and base.

AP series supports weighing these acids and bases. If the type and quantity of the buffer solution are specified, the balance displays the type and quantity of sample that should be weighed. Then the buffer solution can be prepared easily by adding water to the specified quantity of sample weighed accordingly.

Preparation example: When weighing and preparing 50 mM of di-sodium hydrogen phosphate, 2-hydrate and 50 mM of sodium dihydrogenphosphate, 2-hydrate in order to prepare 3 L of 100 mM phosphoric acid (sodium) buffer solution at pH=2.1:

Example of preparation by AP series
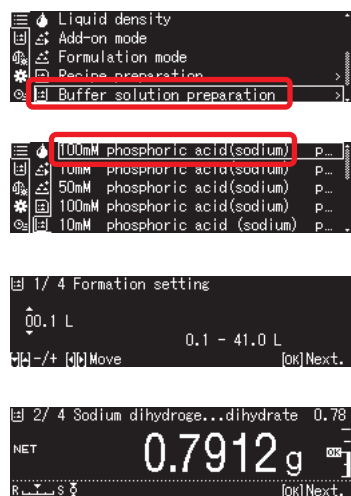
Select the buffer solution mode.

Specify the type and quantity.

Displays the name and quantity of sample.

Prepare as instructed on screen.

Complete buffer solution

* Results can be printed with date/time and user ID.

Number		Buffer solution preparation list	
1	100mM	phosphoric acid (sodium)	pH = 2.1
2	10mM	phosphoric acid (sodium)	pH = 2.6
3	50mM	phosphoric acid (sodium)	pH = 2.8
4	100mM	phosphoric acid (sodium)	pH = 6.8
5	10mM	phosphoric acid (sodium)	pH = 6.9
6	20mM	citric acid (sodium)	pH = 3.1
7	20mM	citric acid (sodium)	pH = 4.6
8	10mM	tartaric acid (sodium)	pH = 2.9
9	10mM	tartaric acid (sodium)	pH = 4.2
10	20mM	acetic acid (ethanolamine)	pH = 9.6
11	100mM	acetic acid (sodium)	pH = 4.7
12	100mM	boric acid (potassium)	pH = 9.1
13	100mM	boric acid (sodium)	pH = 9.1

Sample Preparation NEW

When preparing a standard solution from a particular component, the standard powder for this component will be a hydrochloride or a hydrate. Preparing a standard solution of the target component at a desired requires difficult calculations prior to weighing it. With the AP series, however, the required weight value is automatically calculated, so it can be weighed without performing manual calculations.

Example of preparation by AP series

Weigh 25 mg Amitriptyline to make a standard solution

Standard sample of Amitriptyline is Amitriptyline Hydrochloride.

Calculation is essential to determine part of Acidum hydrochloricum by molecular weight in order to make a 100 mg/mL Amitriptyline solution.

Molecular weight of Amitriptyline: 277.4

Molecular weight of Acidum hydrochloricum: 36.5

Molecular weight of Amitriptyline Hydrochloride: 277.4 + 36.5 = 313.9

To compare the molecular weight of Amitriptyline Hydrochloride with Amitriptyline, the following calculation is necessary.

313.9/277.4 = 1.132

The molecular weight of Amitriptyline Hydrochloride is 1.132 times of Amitriptyline.

So, if 25mg of Amitriptyline is used, it follows that the weight of Amitriptyline Hydrochloride should be:

25 mg × 1.132 = 28.3 mg.

Hence, 28.3 mg of Amitriptyline Hydrochloride is needed to make the correct standard solution.

Standard solution of Amitriptyline

Amitriptyline
100 mg

1 mL

Amitriptyline Hydrochloride

Amitriptyline
Molecular weight
277.4

Acidum hydrochloricum
Molecular weight
36.5
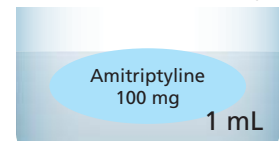
No need for manual calculation

AP series can automatically calculate the sampling weight using the molecular amount of the standard sample, molecular weight of unnecessary sample, and the target value in order to reach the correct concentration solution.

Just weigh the target weight value on display and the target weight of the standard sample can be obtained.

Target weighing value → Target 0.0283 g

Current sample value → Gross 0.0283 g

Standard sample value → Picking 0.0250 g

Sample preparation AMITRIPTYLINE

"OK" mark shown when target weight is reached.

Checking weighing conditions on the same display

Save Your Operation

Equipped with USB as standard.*1
Includes many diverse functions to support users.

*1 AP-W Series only

USB Offers Greater Expandability NEW

(USB host: AP-W Series only)

Equipped with an RS-232C connector, a USB device and a USB host as standard. You can now simultaneously send output to both a computer and printer or connect a USB flash drive, a barcode reader, or an external numeric keypad.

Transcription errors can be avoided and data can be recorded without a computer.

USB and RS-232C are standard

USB host is available for AP-W Series

USB flash drive

Connecting a USB memory device allows you to record large amounts of weighing data in CSV format. Used in combination with the interval output function, it also enables recording of long-term changes over time.

Example of a record:
File name
Date and time
Weighing value

*The information saved will differ depending on the function used.

Display capture function

Weighing display can be recorded into USB memory in BMP format. User name, date/time, and setting can be shown with display information.

The user name, time, measurement conditions, pass/fail judgments, and other information displayed on screen can be saved as is, enabling the recording of measurements, and checks after measurements.

Numeric keypad

Connecting a common external numeric keypad makes it easier to enter numeric values. This is especially useful for entering the mass value of weights, setting upper/lower limit values for the comparator function, or entering the sample count during piece counting mode.
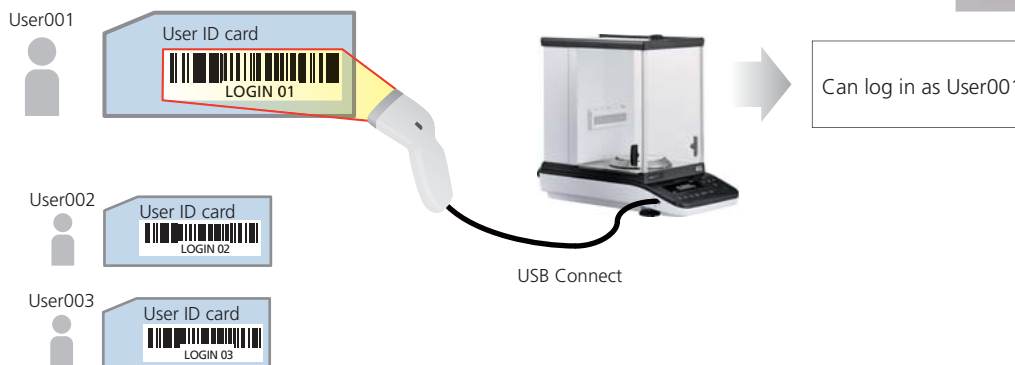
Barcode reader

A barcode reader can be connected. Simply reading a barcode makes it possible to input user ID/Password. It is possible to manage sample IDs using barcodes.

An example of login by barcode

User001

User ID card

LOGIN 01

Can log in as User001

User002
User ID card
LOGIN 02

USB Connect

User003
User ID card
LOGIN 03

An ID and password are needed to log in to the AP series if protected access is activated. With the barcode, an operator can log in by scanning the barcode instead of inputting an ID and password.

* The latest information can be seen from the Shimadzu website (http://www.shimadzu.com/an/balance/)
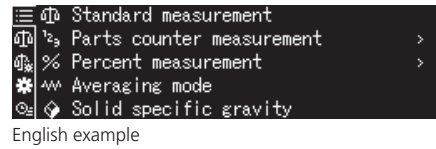
Easy-to-Read Organic EL Display (All models)

Because the pixel elements in the organic electroluminescence display emit light, the screen can be seen clearly even in dark locations. Multi-language display capability*2 provides a more intuitive operating interface. A wider viewing angle has also improved the visibility of measurement values, which helps increase the efficiency of measuring operations.

*2 Japanese, English and Chinese

Clearly visible from the side

```
≣ ⌗ Standard measurement
⌗ ¹²₃ Parts counter measurement      >
⌗ % Percent measurement              >
✳ ⋙ Averaging mode
⌗ ◇ Solid specific gravity
```
English example

Exceptional Visibility

The visibility remains the same even when viewed from different angles. The viewing angle is a wide expanse of ±85 degrees, both vertically and horizontally. That means the display is clearly visible even when working beside the balance. A high-resolution dot-matrix display makes it easy to read detailed text.
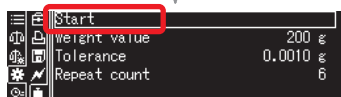
Periodic Inspection Support Function NEW (AP-W/AP-X Series only)

AP series supports periodic inspections. The function allows inspection of repeatability, corner load error, and linearity by simply following instructions displayed on the screen.
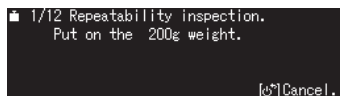
Printing sample

Example of printing
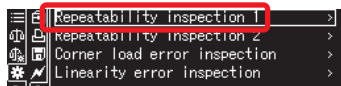
Select the inspection mode.

Place standard weights as instructed.

In this case, repeatability inspection is selected.
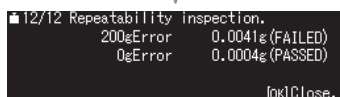
Results are displayed.

```
------------------------
      REPEATABILITY
------------------------
LOAD  = 150     g
MPE   =   0.0010 g
------------------------
N001
 IL  = 150.0000 g
 I0  =   0.0000 g
N002
 IL  = 149.9999 g
 I0  =-  0.0001 g
N003
 IL  = 149.9999 g
 I0  =-  0.0001 g
N004
 IL  = 149.9999 g
 I0  =   0.0000 g
N005
 IL  = 149.9999 g
 I0  =   0.0000 g
N006
 IL  = 149.9999 g
 I0  =   0.0000 g

TEST RESULTS
 LOAD =   0.0001 g
        (PASSED)
 ZERO =   0.0001 g
        (PASSED)
```
IL: Loaded weight
I0: Zero value

For Regulation

For the Pharmaceutical Industry

High-Security User Management NEW   (All models)

Operations can be kept secure with user ID and password protection. Access rights can be specified separately for each user to prohibit unauthorized actions such as performing calibration or changing the settings. User IDs can also be used for barcode management.

User Selection Screen

Printing Data in Accordance with Various Regulations NEW   (All models)

Printing can be customized to indicate when the measurements were taken and by whom. Users are free to set which items are to output, and in what order. The date, time, calibration log, and other information can be printed depending on the purpose of printing, which supports compliance with ISO, GLP, and GMP.
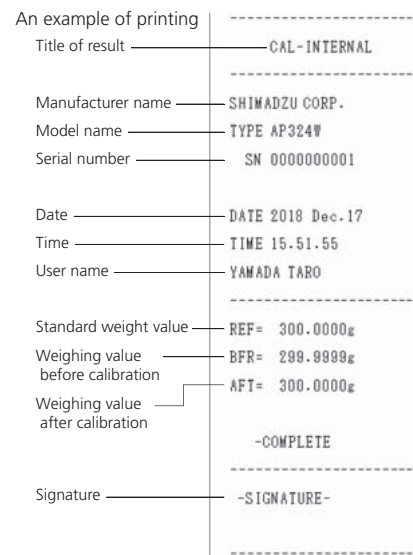
<Printed content>
- Date
- Time
- User name
- Balance manufacturer name
- User ID
- Serial number

- Balance ID
- Software version
- Minimum sample quantity
- Blank line
- Ruled line (--------)

An example of printing

Title of result — CAL-INTERNAL

Manufacturer name — SHIMADZU CORP.
Model name — TYPE AP324W
Serial number — SN 0000000001

Date — DATE 2018 Dec.17
Time — TIME 15.51.55
User name — YAMADA TARO

Standard weight value — REF= 300.0000g
Weighing value before calibration — BFR= 299.9999g
Weighing value after calibration — AFT= 300.0000g

-COMPLETE

Signature — -SIGNATURE-

Minimum Measurement Value (Warning Function) NEW   (All models)

Reproducibility can be confirmed by repeatedly measuring weights as instructed by AP series. The minimum sample quantity is automatically determined from the standard deviation and recorded in AP series.
If the minimum sample quantity requirement is not satisfied during measurement, an indicator flashes to warn the user.

Minimum sample quantity

Recipe Function NEW (Achieve Your Preferred Compounding Process)   (AP-W Series only)

Sample recipes can be registered, allowing users to simply follow displayed instructions. This is convenient when compounding medicines.

And more...

Smart Settings
(All models)

Response and stability settings can be changed during measurements with a single touch. Changing the settings for different applications can make it even easier to use.

The indicator is operated using the left and right arrow keys. Moving the setting toward [R] prioritizes response, which makes it easier to operate the balance. Conversely, moving it toward [S] makes it easier to stabilize weight values, which can improve readability in environments with vibration.

User-friendly arrow keys

Patented

Moving it left prioritizes response and moving it right prioritizes stability. Five setting levels are available.

Specific Gravity Measurement
(All models)

In combination with an optional specific gravity measurement kit, the balance can be used to measure specific gravity. Operations are simplified by a text-based navigation function. By using sinkers, the specific gravity of liquid can be measured as well. This allows measuring the specific gravity of metals, rubbers, plastics, and other materials easily.

First measure the empty weight.

Then place it in the container filled with water, as instructed on the screen.

The specific gravity value is displayed using simple steps.

PSC and Clock-CAL
(AP-W/AP-X Series only)

A Perfect Self Calibration (PSC) function is included. The analytical balance automatically detects any temperature changes that could affect sensitivity and automatically starts calibration.
The Clock-CAL function enables automatic calibration at a pre-specified time (for example, before starting work, during lunch, or after work hours).

Room temperature change

Permissible sensitivity error

PSC (Perfect Self Calibration)

Room temp.

Automatically calibrate sensitivity at times specified by the Clock-CAL function.

Sensitivity error

8:00 a.m.　　12:30 p.m.　　5:00 p.m.

Clock-CAL
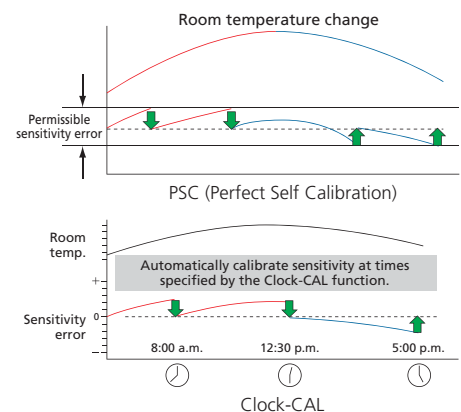
AP Series Specifications

W Series Analytical Balances

Series	W Series					
Model	**AP135W**	**AP125WD**	**AP225WD**	**AP124W**	**AP224W**	**AP324W**
Capacity	135 g	120 g / 52 g	220 g / 102 g	120 g	220 g	320 g
Minimum Display	0.01mg	0.1 mg / 0.01 mg			0.1 mg	
Calibration Weight	Built-in					
External Calibration Weight Range for Span Calibration	45 to 135.0009 g (100 g)	45 to 120.0090 g (100 g)	95 to 220.0090 g (200 g)	45 to 120.009 g (100 g)	95 to 220.009 g (200 g)	95 to 320.009 g (300 g)
Repeatability (Standard deviation)	0.05mg	0.1 mg / 0.02 mg	0.1 mg / 0.05 mg	0.1 mg		0.15 mg
Repeatability (for Low Loads)	0.015 mg (5 g low loads)			0.1 mg (5 g low loads)	0.1 mg (10 g low loads)	0.1 mg (20 g low loads)
Minimum Weight*1	30 mg			200 mg		
Linearity	±0.1 mg	±0.2 mg /±0.05 mg	±0.2 mg /±0.1 mg	±0.2 mg		±0.3 mg
Response Time for race Measurements *2	2 sec.					
Response Time*3	8 sec.	2 sec. / 8 sec.		2 sec.		
USB Host (Type A)	Included					
USB Device (Type B)	Included					
Recipe Compounding	Included					
HPLC Buffer Solution Preparation	Included					
mol Conversion Function	Included					
Sample (Concentration) Preparation	Included					
Inspection Support Function	Included					
Clock-CAL	Included					
Ionizer	Optional					
Operating Temperature/Humidity Range	5 to 40°C 20 to 85%*4					
Sensitivity Stability Against Temperature Range	±2 ppm/°C (10 to 30°C)					
Pan Size	ø91 mm					
Body Dimensions	Approx. 212(W)×411(D)×345(H)mm (power supply unit included)			Approx. 212(W)×367(D)×345(H)mm		
Weight	Approx. 7.9kg			Approx. 7.0 kg		
Display	OEL display (dot matrix)					
Input/Output Terminal	RS-232C (D-sub9P plug) USB host (Type A) USB device (Type B) Ionizer					

X Series / Y Series Analytical Balances

Series	X Series			Y Series		
Model	**AP124X**	**AP224X**	**AP324X**	**AP124Y**	**AP224Y**	**AP324Y**
Capacity	120 g	220 g	320 g	120 g	220 g	320 g
Minimum Display	0.1 mg					
Calibration Weight	Built-in			No		
External Calibration Weight Range for Span Calibration	45 to 120.009 g (100 g)	95 to 220.009 g (200 g)	95 to 320.009 g (300 g)	45 to 120.009 g (100 g)	95 to 220.009 g (200 g)	95 to 320.009 g (300 g)
Repeatability (Standard deviation)	0.1 mg		0.15 mg	0.1 mg		0.15 mg
Repeatability (for Low Loads)	0.1 mg (5 g low loads)	0.1 mg (10 g low loads)	0.1 mg (20 g low loads)	0.1 mg (5 g low loads)	0.1 mg (10 g low loads)	0.1 mg (20 g low loads)
Minimum Weight*1	200 mg					
Linearity	±0.2 mg		±0.3 mg	±0.2 mg		±0.3 mg
Response Time for race Measurements *2	2 sec.					
Response Time*3	2 sec.					
USB Host (Type A)	Not Included					
USB Device (Type B)	Included					
Recipe Compounding	Not Included					
HPLC Buffer Solution Preparation	Not Included					
mol Conversion Function	Included			Not Included		
Sample (Concentration) Preparation	Not Included					
Inspection Support Function	Included			Not Included		
Clock-CAL	Included			Not Included		
Ionizer	Optional			Not Included		
Operating Temperature/Humidity Range	5 to 40°C 20 to 85%*4					
Sensitivity Stability Against Temperature Range	±2 ppm/°C (10 to 30°C)					
Pan Size	ø91 mm					
Body Dimensions	Approx. 212(W)×367(D)×345(H)mm					
Weight	Approx. 7.0 kg			Approx. 6.5 kg		
Display	OEL display (dot matrix)					
Input/Output Terminal	RS-232C (D-sub9P plug) USB device (Type B) Ionizer			RS-232C (D-sub9P plug) USB device (Type B)		

*1 According to USP Chapter 41. This is the tested value by the weight of the balance's capacity of 5%.

*2 The response time for displaying 90% of added sample amount value in trace measurements (from 1mg)

*3 The response time value is typical.

*4 Non-condensing.

AP Series

0.01 mg / 0.1 mg model

AP135W (0.01 mg)
AP125WD(0.01 mg / 0.1 mg)
AP225WD(0.01 mg / 0.1 mg)

*Power supply unit included.

0.1 mg model

AP124W   AP124X   AP124Y
AP224W   AP224X   AP224Y
AP324W   AP324X   AP324Y

Options

STABLO-AP Ionizer

EP-100 Electronic Printer

EP-110 Electronic Printer
(multifunction printer with liquid crystal display)

SMK-601
Specific Gravity Measurement Kit

Internal Windbreak Plate

Options

Static Electricity Remover STABLO-AP Ionizer
Electronic Printer EP-100
Electronic Printer EP-110 (Multifunction Printer with Liquid Crystal Display)
Label Roll Paper for EP-100/110 (10 Rolls)
Specific Measurement Kit SMK-601
Display Protective Cover (Set of 5)
USB Cable
RS-232C Cable
AC Adapter (Standard Accessory)
Internal Windbreak Plate
RSIO Interface Cable

Static Remover (Ionizer)

Special 3-Way Ionizer for Electronic Balances

STABLO AP

**Shimadzu's proprietary 3-Way ionizer for analysts troubled by static charging of samples or containers
One-touch attachment and removal adds even more convenience**

— an excellent solution against
static electricity.

STABLO-AP provides reliable measurement by removing static electricity.

■ Comparison of Static Removal Time (Typical Examples)

— STABLO-AP
— Previous model

10 times Quicker

Quicker!
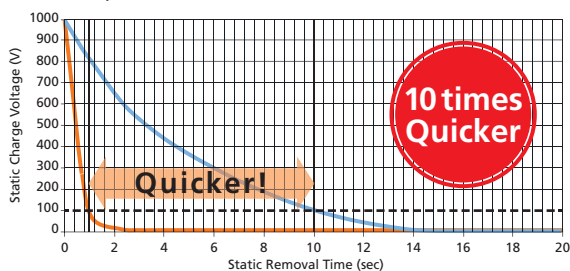
Measurement Conditions
· Time from ±1000 V to ±100 V
· 150 × 150 mm CPM (20 pF) used
· Distance between CPM and ionizer: 100 mm

► AC corona discharge method enables excellent ion polarity balance
► Wide angle static removal
► High performance maintained over a long period of use
► No inverse charging
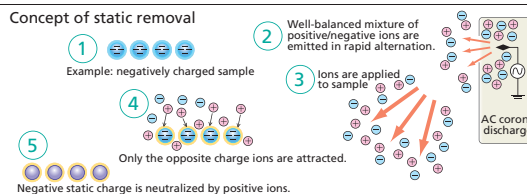► Shimadzu's unique 3-Way Ionizer: hand-held / on stand

Hand-held/On stand

Shimadzu's unique 3-Way positioning

Features of STABLO AP

Static Electricity Removal by Ion Irradiation

With the high-frequency AC corona discharge method, Shimadzu's STABLO-AP ionizer provides a stable ion balance and excellent static removal performance on samples and containers.
Precision weighing work becomes remarkably efficient.
Electrodes are safely housed inside the unit.

Concept of static removal

1 Example: negatively charged sample
2 Well-balanced mixture of positive/negative ions are emitted in rapid alternation.
3 Ions are applied to sample
AC corona discharge
4 Only the opposite charge ions are attracted.
5 Negative static charge is neutralized by positive ions.

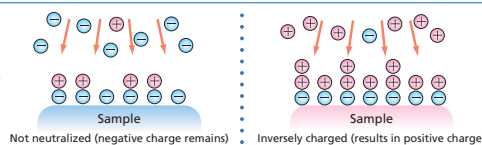### AC Method Produces Excellent Ion Balance

AC method: AC voltage is applied on the discharge needle and a well-balanced mixture of positive/negative ions is emitted in rapid alternation from one electrode.
DC method: DC voltage is applied to a couple of electrodes. One is positive and the other is negative. Each electrode emits ions of one polarity only. An effective static removal angle is limited if the two electrodes are distanced. As electrodes deteriorate, initial ion balance is lost.

AC method   **DC method**

Electrode STABLO AP

Electrodes

◢ : Effective area
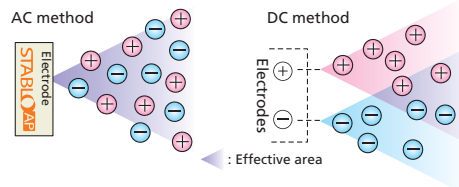
What is "ion balance"?

Ion balance is the balance of positive and negative ions that are supplied by an ionizer.
If ion balance is poor, static electricity is not removed or inverse charging may result.

If ion balance is poor……

Sample
Not neutralized (negative charge remains)

Sample
Inversely charged (results in positive charge)

Mount the STABLO-AP in the balance and use it as a built-in model →
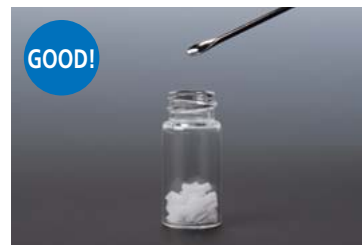
Application

Static electricity keeps the sample out of the ampoule

BAD!

The sample is hard to handle because it adheres to the ampoule inlet and sides.

STABLO-AP removes the charge from the ampoule.

GOOD!

The static charge is gone in seconds. This improves productivity.

Plastic wrap sticks to rubber gloves

BAD!

Plastic wrap adheres to rubber gloves, making it difficult to work with.

Fasten STABLO-AP to the stand, and remove the static from the gloves.

GOOD!

The static is removed in about 10 seconds, and the plastic wrap no longer sticks.

■ STABLO-AP is convenient when using an electronic balance

When the powder in the Petri dish is electrically charged, and the numerical value fluctuates

When the powdered medicine paper is electrically charged, and the numerical value is unstable

When the measurement spoon is electrically charged, and bringing it near the pan affects the numerical value

Specifications

Ion Generation Method	AC corona discharge method
Ion Balance	±10V
Effective Static Removal Range	Approx. 400 mm from the outlet
Static Elimination Time (approx.)	1 second (Typical value) (from ±1000 V to ±100 V)
Ozone Concentration	0.06ppm
Electrode Probes	Tungsten (durability: 30,000 hours)
Weight	Approx. 710 g (Main unit: 395 g, Stand: 315 g)
Operating Temperature and Humidity	0 ℃ to + 40 ℃, 25 % RH to 85 % RH (non-condensing)
Rated Electric Power Supply	DC 24 V, 1.0 A

Model name	STABLO-AP

Analytical Balances

AU series

Multi Functional Analytical Balance

UniBloc Analytical Balances

AUW-D series dual-range semi-micro balances
AUW/AUX/AUY series analytical balances

Excellent Weighing Performance

● Compact UniBloc mechanism and digital processing technology produce fast response and stability at the same time.

For Applications

● Shimadzu's unique Balance Keys
(http://www.shimadzu.com/an/balance/balance_keys/index.html)
a standard feature.
Measurement results can be transmitted to Excel or other Windows applications without installing any additional software on your computer. All you have to add is one RS-232C cable.

● Piece counting, various mass units, below-weigh hook, specific gravity measurement software are all standard features.
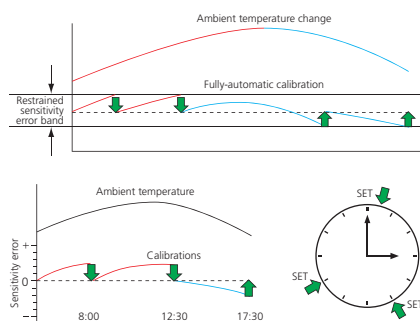
AUW-D/AUX/AUY Series   AUW Series

Choose one of the two models according to your field requirements.

Excellent response, stability and zero return performance – in a semi-micro balance.

Choice of fully-automatic calibrations: PSC and Clock-CAL

Operator can choose from two fully-automatic span calibration methods. "PSC" is initiated based on temperature change detection, whereas "Clock-CAL" operates at user pre-set times (up to three times a day).

Ambient temperature change

Fully-automatic calibration

Restrained sensitivity error band

Ambient temperature

Sensitivity error

Calibrations

8:00   12:30   17:30

SET

SET

SET

Touch-key calibration

Automated calibration can be started by pressing keys. (AUW-D,AUW,AUX series)
Also, your external calibration weights can be used for span calibration. (All models)

GLP/GMP/ISO calibration report

Calibration report can be automatically printed using an optional electronic printer.
Date and time are also output to meet GLP/GMP/ISO requirements.

Interval Timer

Data can be automatically output at time intervals set in the range from 1 second to 99 minutes 59 seconds. This function can be also combined with WindowsDirect. (AUW-D/AUW/AUX models)

Piece Counting and Unit Conversion

In addition to piece counting, the balance can also perform measurements as percentages and in a variety of mass units, such as carat.

RS-232C interface

All models a standard standard RS-232C interface for easy integration with other devices and computers.

Specific Gravity Measurement

Installing the optional SMK-401 specific gravity kit transforms the balance into a dedicated instrument for measuring specific gravity or density. Specific gravity measurement software is already installed in the Shimadzu balance.

AUW-D Series   Uni Bloc

AUW Series   Uni Bloc

AUX Series   Uni Bloc

AUY Series   Uni Bloc

AU Series

Model name	AUW-D Series		AUW Series			AUX Series			AUY Series	
	AUW220D	**AUW120D**	**AUW320**	**AUW220**	**AUW120**	**AUX320**	**AUX220**	**AUX120**	**AUY220**	**AUY120**
Capacity	220 g/82 g	120 g/42 g	320 g	220 g	120 g	320 g	220 g	120 g	220 g	120 g
Minimum display	0.1 mg/0.01 mg		0.1 mg	0.1 mg	0.1 mg	0.1 mg	0.1 mg	0.1 mg	0.1 mg	0.1 mg
Pan size (mm)	80mm dia approx.									
Body Dimensions	Approx. W220 × D330 × H310 mm									
Weight	7 kg approx.									

Optional Accessories

Description
Electronic Printer EP-100
Electronic Printer EP-110
Specific Gravity Measurement Kit SMK-401
In Use Protection Cover
RS-232C Cable
USB Conversion Cable
Application Keyboard AKB-301
Foot switch FSB-102PK
Foot switch FSB-102TK

Electronic Printer
EP-100

Electronic Printer
EP-110

Application Keyboard
AKB-301

Countermeasures for Static Electricity
Special 3-Way Ionizer for Electronic Balances

STABLO AP

Description
STABLO-AP

Specific Gravity Measurement Kit SMK-401

STABLO-AP

Analytical Balances
AT series

Standard Models of Analytical Balances

Economical Analytical Balance Equipped with UniBloc

- Adopts UniBloc, which provides excellent impact resistance, responsiveness, and stability
- Equipped with the Easy Setting function, so responsiveness and stability can be adjusted during measurements
- Buy a separately available I/O-RS cable to import the results to a PC (Equipped with the WindowsDirect function)

Uni Bloc

Internal Calibration (ATX only)

The balance has built-in motor-driven calibration weights.
Sensitivity can be calibrated whenever needed by a single key press.

Piece Counting

A built-in piece counting function enables balances to be used as parts counters (piece scales).

Checkweighing

This displays pass, high, or low judgments.

Formulation Mode

This is convenient when formulating (preparing) multiple substances.

Percentage Measurement

Measures a percentage value with respect to a preset reference.

Easy Setting

Indicator

Excellent responsiveness

Excellent stability

Smoothly! 1.235 g

Precisely! 50.000g

0.000 g

- For super-fast measurements
- For improved productivity
- For measuring out and mixing fixed quantities of liquids and powders

- If the indicator is unstable i.e. When the work site is continuously subject to fairly strong vibrations
- When continuous airflow often causes the indicator to fluctuate

ATX Series

Uni Bloc

ATY Series

Uni Bloc

ATX/ATY Series

Model	ATX324	ATX224	ATX124	ATX84	ATY224	ATY324	ATY124	ATY64
Capacity	320 g	220 g	120 g	82 g	220 g	320 g	120 g	62 g
Minimum display	0.1 mg							
Pan size (mm)	Approx. 91 dia.							
Dimensions	Approx. W213 × D356 × H338 mm							
Weight	Approx. 6.2 kg				Approx. 6.0 kg			

Optional Accessories

Description
EP-100 Printer
EP-110 Printer
I/O-RS conversion cable
USB-serial adaptor
Protective cover (5 pcs)
AC adaptor (provided as standard with main unit)

Electronic Printer
EP-100

Electronic Printer
EP-110

I/O-RS conversion cable

USB-serial adaptor

Countermeasures for Static Electricity

Special 3-Way Ionizer for Electronic Balances

STABLO AP

Description
STABLO-AP

STABLO-AP

Analytical Balances

AU series

Flagship Models

The AUW/AUX/AUY series are recommended

> **For measurements down to 0.01 mg**

> **When a chemical resistant metallic body is needed**

> **For consistently good precision**

> **For management of calibration records and measurement data by date and time**

■ Perfect self calibration (PSC)/
Clock-CAL functions are included
Built-in perfect self calibration (PSC) function
(AUW-D, AUW, and AUX only)
Detects ambient temperature changes with an impact on sensitivity, and automatically performs sensitivity calibration.
Built-in Clock-CAL function (AUW-D and AUW only)
These balances perform sensitivity calibration automatically at preset times.

■ These balances have a built-in clock function.
(AUW-D, AUW, and AUX only)
Data can be logged with the date and time.
This is ideal for establishing the measurement management and traceability required by GLP, GMP, and ISO 9000.

> **For measuring specific gravity**

The optional SMK-401 is required.

> **For outputting changes in sample quantity over time**
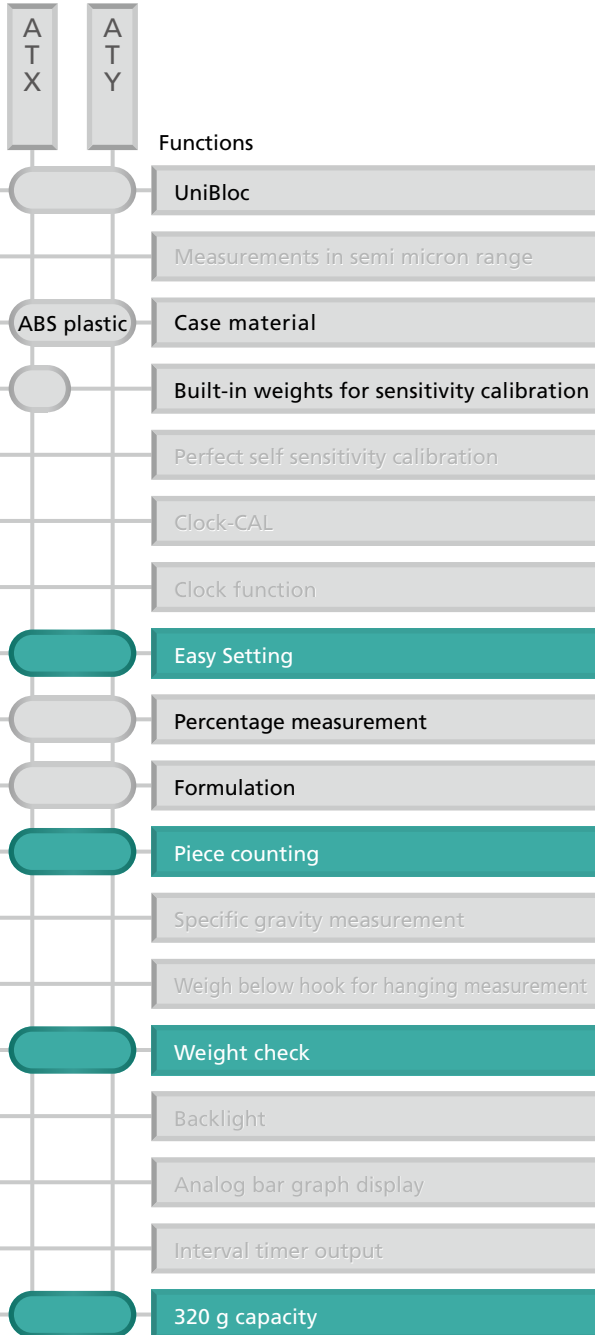
> **For measuring samples 220 g or heavier**

Functions	AUW-D	AUW	AUX	AUY
UniBloc	●	●	●	●
Measurements in semi micron range	●			
Case material	Aluminum die cast			
Built-in weights for sensitivity calibration	●	●	●	●
Perfect self sensitivity calibration	●	●	●	
Clock-CAL	●	●		
Clock function	●	●	●	
Easy Setting				
Percentage measurement	●	●	●	●
Formulation	●	●	●	●
Piece counting	●	●	●	●
Specific gravity measurement	●	●	●	●
Weigh below hook for hanging measurement	●	●	●	
Weight check				
Backlight			●	
Analog bar graph display	●	●	●	●
Interval timer output	●	●	●	
320 g capacity			●	

Balances

General Purpose
Analytical Balances

AT series

Standard Models

The ATX/ATY series
are recommended

	ATX	ATY	Functions
UniBloc	●	●	UniBloc
Measurements in semi micron range			Measurements in semi micron range
Case material	ABS plastic		Case material
Built-in weights for sensitivity calibration	●		Built-in weights for sensitivity calibration
Perfect self sensitivity calibration			Perfect self sensitivity calibration
Clock-CAL			Clock-CAL
Clock function			Clock function
Easy Setting	●	●	Easy Setting
Percentage measurement	●	●	Percentage measurement
Formulation	●	●	Formulation
Piece counting	●	●	Piece counting
Specific gravity measurement			Specific gravity measurement
Weigh below hook for hanging measurement			Weigh below hook for hanging measurement
Weight check	●	●	Weight check
Backlight			Backlight
Analog bar graph display			Analog bar graph display
Interval timer output			Interval timer output
320 g capacity	●	●	320 g capacity

The Easy Setting function eliminates troublesome settings.
They can be used anywhere, at any time.

**For balances that make weighing powders
and liquids easy
For use in environments subject to wind
and vibrations
For selectable stability and response**

For measuring counts of various samples

Five types of sample weight units can be registered.

**For measurements with reference
weights configured**

Weight check
It is possible to measure out target mass, and display pass/fail
judgments based on reference mass.

Electronic Balances

UW/UXseries

Multi Functional Top-loading Balance

The line of Shimadzu top-loading balances is engineered with the UniBloc mechanism, resulting in unrivaled response, stability and durability. Powerful features support any imaginable weighing application. The UW Series includes internal calibration and fully-automatic calibration functions.

UW4200S	UX4200S
UW8200S	UX8200S
UW2200H	UX2200H
UW4200H	UX4200H
UW6200H	UX6200H

| UW420S | UX420S |
| UW820S | UX820S |

UW220H	UX220H
UW420H	UX420H
UW620H	UX620H
UW820H	UX820H
UW1020H	UX1020H

*Windbreak can be removed.

Uni Bloc

PSC, fully-automatic calibration (UW only)

Calibration is carried out when a temperature change has been detected.

Clock-CAL, fully-automatic calibration (UW only)

Calibration carried out at user-preset times (up to three times a day).
Operators can work without unexpected interruptions.

Ambient temperature change

Fully-automatic calibration

Restrained sensitivity error band

Ambient temperature

Sensitivity error

Calibrations

8:00   12:30   17:30

SET
SET
SET
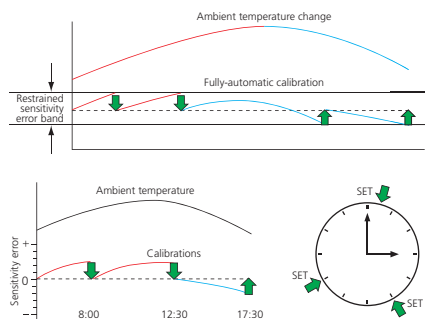
Automatic Touch-key Calibration (UW only)

Press just two keys to calibrate the balance whenever calibration is necessary.

GLP/GMP/ISO Calibration Record

Just connect the optional printer to automatically output calibration results. Date and time are supplied by the balance's built-in clock.

Backlight LCD

The backlight LCD display can be clearly read in the darkest of environments.

Checkweighing Function

When upper and lower thresholds are set, the balance indicates if the sample weight is within the range (GO), over (HI) or under (LO).

Piece Counting

A piece counting function is standard in addition to various unit conversions.

Specific Gravity Function

The standard specific gravity measurement calculation function uses the Archimedes principle. Attaching the optional specific gravity measurement kit allows the balance to be used as a density meter or a hydrometer.

Data transfer port of UW/UX Series

UW Series

Model name	UW220H	UW420H	UW620H	UW820H	UW1020H	UW420S	UW820S	UW2200H	UW4200H	UW6200H	UW4200S	UW8200S
Capacity	220 g	420 g	620 g	820 g	1020 g	420 g	820 g	2200 g	4200 g	6200 g	4200 g	8200 g
Minimum display	0.001 g	0.001 g	0.001 g	0.001 g	0.001 g	0.01 g	0.01 g	0.01 g	0.01 g	0.01 g	0.1 g	0.1 g
Pan size (mm)	108 × 105 Approx.							170 × 180 Approx.				

UX Series

Model name	UX220H	UX420H	UX620H	UX820H	UX1020H	UX420S	UX820S	UX2200H	UX4200H	UX6200H	UX4200S	UX8200S
Capacity	220 g	420 g	620 g	820 g	1020 g	420 g	820 g	2200 g	4200 g	6200 g	4200 g	8200 g
Minimum display	0.001 g	0.001 g	0.001 g	0.001 g	0.001 g	0.01 g	0.01 g	0.01 g	0.01 g	0.01 g	0.1 g	0.1 g
Pan size (mm)	108 × 105 Approx.							170 × 180 Approx.				

Optional Accessories

Electronic Printer EP-100 / EP-110	Angle Adjuster and Wall Hook for Remote Display
RS-232C Interface IFB-102A (needed only for multiple connection)	Stand for Remote Display (1m high)
Small Size Windbreak (for models with capacity of 300g to 620g only) (Std. Acc. for models with readability of 0.001g)	Foot Switch FSB-102PK (For printing)
Glass Windbreak (for models with capacity of 220g to 820g only)	Foot Switch FSB-102PK (For taring)
Large Size Windbreak (for all models)	RS-232C Cable, for IBM PC/AT Compatibles (25P-9P, Null modem, 1.5m)
Specific Gravity Measurement Kit SMK-101 (for Large size pan 170×180mm)	RS-232C Cable, for multiple connections (25P-25P, Null modem, 1.5m)
Specific Gravity Measurement Kit SMK-102 (for Small size pan 108×105mm)	Application Keyboard AKB-301
Protective in-use cover for key panel and display (5 pcs)	Remote Display Unit RDB-201 with operation keys
Small Animal Bucket set (For large pan models only)	Remote Display Unit RDB-202

Static Remover

STABLO AP

Description
STABLO-AP

Glass windbreak
WBC-102

Large size windbreak
WBC-502

Application Keyboard
AKB-301

Electronic Balances
TW/TX/TXB series

The beginning of the new standard.
Extremely capable, but easy to operate.

Uni Bloc

Touch-key Internal Calibration

Press just two keys to calibrate the balance whenever calibration is necessary (TW only). Calibration is very fast, taking only 15 sec.

Easy Setting
Best fit to weighing application

Quickly adjust the desired ratio of stability and response for every application, even during measurement, with one-touch operation.

Menu Operation Key
Easy-to-operate Key Layout

Menu navigation keys are separated from weighing operation keys and arranged in a familiar 5-way navigation circle. Up, Down, Right, Left and Enter are the simple operational steps.
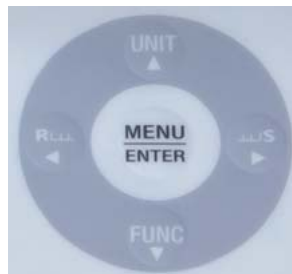
Can be used anywhere with battery power

Power the TXB series balances with an AC adaptor or batteries.

Expanded Piece Counting Function

Unit weights of up to five different samples can be easily entered, stored and recalled for use.

Change among many weighing units and functions with a single touch

In addition to grams (g), weigh in %, number of pieces, ct, kg, mg, lb, oz, TTI, etc. or a custom conversion unit, more than 20 units in all. Change quickly from display of % or counting to gram weight (g) display.

Comparator Function

Compare samples to target values or pass/fail criteria and clearly indicate the results.

TW Series

TX Series

TXB Series

TW Series

Model name	TW223L	TW323L	TW423L	TWC323L	TWC623L
Capacity	220 g	320 g	420 g	320 ct (64 g)	620 ct (124 g)
Minimum display	0.001 g	0.001 g	0.001 g	0.001 ct (0.0002 g)	
Pan size (mm)	Approx ø110			Approx ø80	
Dimensions	Approx. W206 × D291 × H241 mm				
Weight	Approx 4.2 kg			Approx 4.1 kg	

TW223L TW323L TW423L
TX223L TX323L TX423L

TX2202L TX3202L
TX4202L

TX Series

Model name	TX223L	TX323L	TX423L	TX2202L	TX3202L	TX4202L	TXC323L	TXC623L
Capacity	220 g	320 g	420 g	2200 g	3200 g	4200 g	320 ct (64 g)	620 ct (124 g)
Minimum display	0.001 g	0.001 g	0.001 g	0.01 g	0.01 g	0.01 g	0.001 ct (0.0002 g)	
Pan size (mm)	Approx ø110			Approx. W167 × D181			Approx ø80	
Dimensions	Approx. W206 × D291 × H241 mm			Approx. W200 × D291 × H80 mm			Approx. W206 x D291 x H241 mm	
Weight	Approx 3.8 kg			Approx 2.8 kg			Approx 3.8 kg	

TWC323L TXC323L
TWC623L TXC623L

TXB Series

Model name	TXB222L	TXB422L	TXB622L	TXB621L	TXB2201L	TXB4201L	TXB6201L	TXB6200L
Capacity	220 g	420 g	620 g	620 g	2200 g	4200 g	6200 g	6200 g
Minimum display	0.01 g	0.01 g	0.01 g	0.1 g	0.1 g	0.1 g	0.1 g	1 g
Pan size (mm)	ø110			ø110	ø160			
Dimensions	Approx. W199 × D260 × H77 mm							
Weight	Approx 1.5 kg							

TXB2201L TXB6201L
TXB4201L TXB6200L

TXB222L TXB622L
TXB422L TXB621L

Optional Accessories

Description
EP-100 Printer
EP-110 Printer
RS-232C cable
In-use protective cover
In-use protective cover for display
USB conversion kit

Electronic Printer
EP-100

Electronic Printer
EP-110

Shimadzu Electronic

Electronic Balances

UW/UXseries

Flagship Models

The UW/UX series are recommended

When a chemical resistant metallic body is needed

When perfect self calibration (PSC) and Clock-CAL are required

■ **Perfect self calibration (PSC)/ Clock-CAL functions are included**
Perfect self calibration (PSC) function is included (UW only).
Detects ambient temperature changes with an impact on sensitivity, and automatically performs sensitivity calibration.
Built-in Clock-CAL function (UW only)
These balances perform sensitivity calibration automatically at preset times.

When date and time output by the built-in clock is required

■ **These balances have a built-in clock function.**
Data can be logged with the date and time.
This is ideal for establishing the measurement management and traceability required by GLP, GMP, and ISO 9000.

For measuring specific gravity

For weighing animals

When large-range capacity is required

Functions

Model Name	Functions	UW	UX
	UniBloc	●	●
	Case material	Aluminum die cast	
	Built-in weights for sensitivity calibration	●	
	Perfect self calibration (PSC)	●	
	Clock-CAL	●	
	Clock function	●	●
	Easy Setting		
	Menu operation key		
	Piece counting	●	●
	Specific gravity measurement	●	●
	Weigh below hook for hanging measurement	●	●
	Animal measurement mode	●	●
	Backlight	●	●
	Analog bar graph display	●	●
	Interval timer output	●	●
	Peak hold	●	●
	Capacity of 600 g/6 kg or more	●	●
	Glass windbreak (Small pan models only)	Optional	

Balances

General Purpose Electronic Balances

TW/TXseries

Standard Models

TW	TX	Functions
		UniBloc
	ABS plastic	Case material
		Built-in weights for sensitivity calibration
		Perfect self calibration (PSC)
		Clock-CAL
		Clock function
		Easy Setting
		Menu operation key
		Piece counting
		Specific gravity measurement
		Weigh below hook for hanging measurement
		Animal measurement mode
		Backlight
		Analog bar graph display
		Interval timer output
		Peak hold
		Capacity of 600 g/6 kg or more
		Glass windbreak (Small pan models only)

The TW/TX series are recommended

The Easy Setting function eliminates troublesome settings. They can be used anywhere, at any time.

For balances that make weighing powders and liquids easy
For use in environments subject to wind and vibrations
For selectable stability and response

For easy operation

For registering multiple reference values for piece counting

Five types of sample weight units can be registered.

When a glass windbreak is required

Top-Loading Balances

BLseries

Basic Top-Loading Balances

High-resolution balances made affordable

BLSeries

BL-620S
BL-3200S
BL-2200H
BL-3200H

BL-320S

BL-220H
BL-320H

PCS	Piece counting function		Analog bar graph display
	Piece counting function is standard.		Remaining weighing capacity can be seen at a glance.

Data transfer port of BL Series

BLSeries

Model name	BL-220H	BL-320H	BL-320S	BL-620S	BL-2200H	BL-3200H	BL-3200S
Capacity	220 g	320 g	320 g	620 g	2200 g	3200 g	3200 g
Minimum display	0.001 g	0.001 g	0.01 g	0.01 g	0.01 g	0.01 g	0.1 g
Pan size (mm)	W100 × D100			W160 × D124			

Optional Accessories

Description
Electronic Printer EP-100
Electronic Printer EP-110
In Use Protection Cover

Portable Electronic Balances

ELBseries

Portable Electronic Balance

Precision without compromise

ELB600S
ELB6000S
ELB600
ELB1200
ELB2000
ELB3000
ELB12K

ELB120
ELB200
ELB300

Easy battery replacement

Two-way power supply
(AC or Battery operation)

Battery operation makes it portable.

Standard specific gravity software

Optional specific gravity kit is available for extra efficiency.

Various application modes

Piece counting, percent display, and specific gravity modes are easily accessible.

ELBSeries

Model name	ELB120	ELB200	ELB300	ELB600	ELB600S	ELB1200	ELB2000	ELB3000	ELB6000S	ELB12K
Capacity	120 g	200 g	300 g	600 g	600 g	1200 g	2000 g	3000 g	6000 g	12 kg
Minimum display	0.01 g	0.01 g	0.01 g	0.05 g	0.1 g	0.1 g	0.1 g	0.1 g	1 g	1 g
Pan size (mm)	ø110			W170 × D130						

Optional Accessories

Description
Electronic Printer "EP-100" "EP-110" (impact-dot print)
RS-232C Interface "IFB-102A"
Specific Gravity Measurement Kit "SMK-201" (except for ELB120,200,300 for rectangular-pan models only)
Carrying case
In-use protective cover
Below-weigh hook (except for ELB12K)

Electronic Printer
EP-100

Electronic Printer
EP-110

Data transfer port of ELB Series

Precision Platform Balances

BW-K/BX-Kseries

Precision Balance for Heavy Samples

The Shimadzu Precision Platform balances have been engineered with the innovative UniBloc mechanism since 1989. Powerful features support any imaginable weighing application. The BW-K Series includes internal calibration weight.

*Below weighing is optional

BW12KH

Hookassy for below weighing

Data transfer port of BW-K/BX-K Series

Uni Bloc

BW-K **Series**   Uni Bloc

BX-K **Series**   Uni Bloc

BW-K/BX-K Series

Model name	BW12KH	BW22KH	BW32KH	BW32KS	BW52KS	BX12KH	BX22KH	BX32KH	BX32KS	BX52KS
Capacity	12 kg	22 kg	32 kg	32 kg	52 kg	12 kg	22 kg	32 kg	32 kg	52 kg
Minimum display	0.1 g	0.1 g	0.1 g	1 g	1 g	0.1 g	0.1 g	0.1 g	1 g	1 g
Pan size (mm)	W345 × D250									

Optional Accessories

Description
RS-232C interface IFB-102A (for multiple connections)
Electronic Printer EP-100/110
Foot Switch FSB-102PK (For printing)
Application Keyboard AKB-301
USB-SERIAL Conversion Kit
RS232C cable
Below-weigh hook

Electronic Printer EP-100

Electronic Printer EP-110

Application Keyboard AKB-301

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Moisture Analyzer

MOC-120H

Moisture Analyzer with a Wide Sample Pan

MOC-120H

Uni Bloc | Windows DIRECT | Back Light DSP | RS-232C INTERFACE

Measure the Moisture Ratio of Even Large or Large Amounts of Samples

- The moisture ratio is found by heating the sample with the built-in infrared heater.
- The sample pan measures 130 mm in diameter, which is optimal for large and large amounts of samples.
- Importing results to a PC is easy (equipped with the WindowsDirect function).
- Equipped with the UniBloc aluminum block mass sensor.

MOC-120H

Model	MOC-120H
Measurement method	Infrared heating/dry mass measurement
Pan size	130 mm dia
Minimum weight displayed	0.001 g
Moisture ratio measurement range	0.01 to 100.00 %
Minimum moisture ratio displayed	0.01 %
Maximum sample quantity	120 g
Measurement modes	Automatic operation mode, Timered operation mode, High-speed drying mode, Low-speed drying mode
Drying heat source	Medium wave infrared quartz heater
Temperature settings range	30 to 200 °C (1 °C steps)
Unit dimensions and weight	W220 × D415 × H190 mm 4.5 kg
Operational temperature and humidity range	5 to 40 °C, relative humidity of 85 % max.
Required power supply	100 to 120/220 to 240 VAC, 640 W max.
Accessories	Sample pan × 2, pan holder, windbreak, sample pan tongs, aluminum sheet × 20, spatula

Printer

Drying conditions during measurement and the final measurement value can be graphed and printed out.

4

Moisture Analyzer

Optional Printer and Accessories

Description
Printer set includes a connection cord and 1 roll of printer paper (thermal paper)
Printer paper (10 rolls)

Optional Accessories   A Wealth of Accessories to Enhance Your Possibilities

Description
RS-232C cable
Sample pan
Aluminum sheets (500 pcs)
Temperature Calibration Kit*1
Protective display cover (5 pcs)

*1 Temperature calibration using the optional Temperature Calibration Kit may be necessary depending on the measurement sample and the measurement conditions. Temperature calibration makes it possible to control the drying temperature of the measurement sample more accurately.

Sample Output from Optional Printer

[Graph Format (GRP)]

Maker : SHIMADZU CORP	Company name : Shimadzu Corporation
Model : MOC-120H	Model : MOC-120H
S/N : D207300000	Serial no. : D207300000
ID : ABCD-123	Instrument ID : ABCD-123
Sample Code : B-20	Sample code : B-20
Date/Time : 2007.08.08/15:07	Measurement date/time : 15:07 Aug. 8, 2007
Condition No : 0	Measurement conditions storage area : 0
Unit : Drw Base Moist.	Measurement reference : Dry basis moisture ratio
Mode : Compare	Measurement mode : Comparative measurement
Setting Temp. : 110C	Drying temperature : 110 °C
Auto Stop Cond. : 0.05%	Automatic ending conditions : 0.05 %
Pred. Tol. : 0.5	Predictive convergence range : 0.5
Wet-Mass : 5.6892	Un-dried mass: : 5.6892 g

Measurement time
Drying temperature
Measurement value (%)

Predicted measurement value

Dried mass : 4.8637 g

⚠ **Warning**

- Use this balance to heat samples to evaporate moisture for measurement.
- The built-in heater will be hotter than the set temperature.
- Samples must not be measured if there is a risk of an explosion or fire, or a dangerous chemical reaction from heating.

Moisture Analyzer
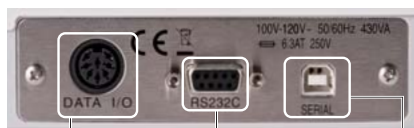# MOC63u

Easy, Reliable Moisture Content Measurements

This Unit Makes Moisture Content Measurements Quick and Easy

- The moisture ratio is found by heating the sample with the built-in halogen heater to drive out the moisture.
- The measurement procedure is simple. Just close the heater cover to start the measurement (automatic starting mode).
- Measurements are faster than the loss on drying method using a dryer.
- A USB connector is standard, so connecting to a PC is easy (built-in WindowsDirect function).
- Equipped with the UniBloc aluminum block mass sensor.

This product is certified under Shimadzu's Eco label system.
Energy savings: 30 % reduction over previous Shimadzu models

The sample pan size is a spacious 95 mm dia.

Generally, the wider, thinner, and more uniformly the sample is spread, the more precise the measurement. Uniform heating is provided by adopting a cleverly shaped reflector (patent pending).
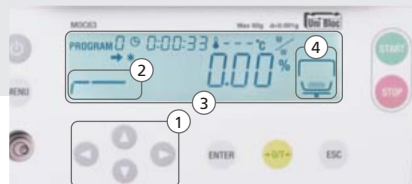
① A cross-shaped key layout has been adopted for excellent operability.

② A real-time indicator has been adopted, which blinks to show the measurement status.

③ The results are shown as a percentage using an LCD, backlit to enhance visibility.

④ Graphics are provided to let you confirm the pan status in real time.

The sample is easy to see! Wide observation window

A Total of Five Modes Makes This Balance Compatible with a Variety of Sample Measurements

Ending Modes

Automatic Ending Mode
This automatically ends measurement when the moisture change (% margin) over 30 seconds drops below a set value.

Margin (%)
30sec
t (time)
Automatic ending
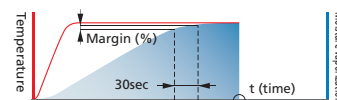
Timed Ending Mode
This automatically ends measurement after a preset amount of time (t1).

t1 (set time)
Ending set time
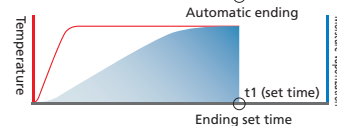
Alternate Drying Modes

Rapid Drying Mode
The sample is dried at the highest temperature for the initial drying stage, and when the moisture has been reduced, it returns to the set temperature, shortening the measurement time.

200℃
t (time)
Drying stops
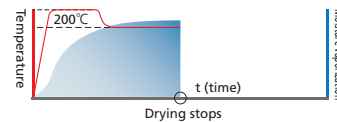
Slow Drying Mode
This gently heats samples that might form a surface film or are prone to degrading at high temperatures.

t (time)
5 min
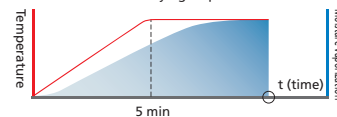
Step Drying Mode
Drying conditions are changed step by step for samples that contain a lot of moisture, such as surface water or crystallization water.

T3
T2
T1
t (time)
t 1   t 2   t 3

MOC63u

Uni Bloc
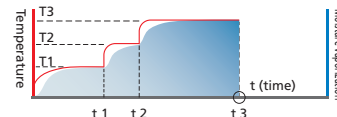
MOC63u

Model		MOC63u
Capacity	Max. sample quantity	60 g
	Min. sample quantity	0.02 g
Minimum display	Mass	0.001 g
	Moisture ratio	0.01 %
Repeatability *1		0.15 %(2 g) 0.05 %(5 g) 0.02 %(10 g)
Heat source	Method	Halogen (straight tube)
	Power	Rated at 400 W
Temperature settings		50 to 200 °C (1 °C interval) (up to 1 hour for settings over 180 °C)
Display		Backlit LCD
Pan size		95 mm dia
Dimensions (mm)		Approx. W202 × D336 × H157
Weight		Approx. 4.2 kg
Rated power		430 VA
Ambient temperature		5 to 40 °C, relative humidity of 85 % max.
Measurement modes		Standard drying mode (Automatic ending/timed ending)
		Rapid drying mode (Automatic ending/timed ending)
		Slow drying mode (Automatic ending/timed ending)
		Step (3-stage) drying mode (Automatic ending/timed ending)
Time settings		1 to 240 min, or continuous (up to 12 hours)
External output		USB
		Data I/O printer (EP-100/EP-110) output
		RS-232C（D-sub9P）
Storage of measurement conditions		10 sets
Data memory		100 items
Standard accessories		Sample pans (3 aluminum pans), pan holder, windbreak, board, aluminum sheets (50), pan handler, power cable, spare fuses (2), protective display cover, hexagonal wrench

*1 The repeatability (standard deviation) value is from a standard measurement (sample: sodium tartrate dihydrate). This value is not guaranteed for all samples, environments, and measurement conditions.

Options   A Wealth of Accessories to Enhance Measurement Possibilities

Description
EP-100 Printer
EP-110 Printer
Protective display cover (5 pcs)
Aluminum pans (disposable) (50 pcs)
Fiberglass sheets (for liquid sample measurements) (100 pcs)
Temperature Calibration Kit
Sample pan (stainless steel) (5 pcs)
Sample pan (aluminum) (5 pcs)
RS-232C cable
USB cable set
Sample pan handler (stainless steel)
Halogen heater (for replacement)*2
Power cable

*2 The halogen heater can be removed and replaced by the user.
Note: For delivery related matters, contact your Shimadzu representative.

⚠ Warning

● Use this balance to heat samples to evaporate moisture for measurement.
● The built-in heater will be hotter than the set temperature.
● Samples must not be measured if there is a risk of an explosion or fire, or a dangerous chemical reaction from heating.

Simple Operation

Select the automatic starting mode, place the sample, and close the heater cover to start the measurements. The preparation for measurement is so simple that you do not even have to press the start key.

A Wealth of PC Connection Functions

A USB connector is built in as standard for connecting to a PC. It can be used in conjunction with the WindowsDirect function.
For Windows Vista, Windows 7, Windows 8 and USB port connections, check the Shimadzu website, or contact your Shimadzu representative.

100V-120V～ 50/60Hz 430VA
6.3AT 250V

● Built-in RS-232C interface is standard.
● Compatible with printers (EP-100/EP-110). Equipped with I/O port.
● Equipped with USB interface. Importing data to a PC is easy.

Sample Printout

◆ Sample Measurement Results Output

```
SHIMADZU CORP.
TYPE MOC63u
  SN D209400009
  ID 0000
CODE 0040
DATE 18-12-17
TIME 16:27
PNO. 0
UNIT M/W
MODE AUTO
TEMP 160C
STOP 0.05 %

Wet W(g)    5.161

TIME      M/W(%)
00:00:00    0.00
00:02:00    4.40
00:04:00    7.39
*00:05:35   8.02

Dry W(g)    4.747
```

Model	:	MOC63u
Serial no.	:	D209400009
Instrument ID	:	0000
Sample code	:	0040
Date	:	Dec. 17, 2018
Time	:	16:27
Program no.	:	0
Measurement reference	:	Wet basis moisture ratio
Measurement conditions	:	Automatic ending mode
Drying temperature	:	160 ℃
Ending conditions	:	0.05 %
Mass before measurement	:	5.161 g
Progressive measurements		
Elapsed measurement time	:	Measurement value corresponding to the measurement reference
Mass after measurement	:	4.747 g

Using the EP-100/EP-110

Moisture Analyzer
MOC63u Sample Applications

Food

Measurement of Milk

- Fiberglass sheets for liquid measurement were used to promote liquid evaporation.
- Two measurement conditions were used, timed ending and automatic ending modes. Essentially, the same average values were obtained. With samples featuring a principal component that has a relatively high evaporation temperature and also contains moisture, the same results will be obtained regardless of the mode used.

Measurement of Milk

Measurement conditions: 140 °C/TIME 10 minutes

	MOC63u	
	Sample mass (g)	Moisture ratio (%)
1st	1.081	87.70
2nd	1.025	87.61
3rd	1.031	87.68
Average		87.66
Standard deviation		0.047
CV(%)		0.05

The drying curve for milk in timed ending mode is shown below.
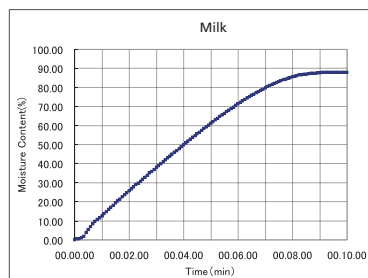
Milk

Photos of the milk before and after drying are shown below.

(Before measurement) 1 g of milk was dripped on to a fiberglass sheet for liquid measurements.

(After measurement) The moisture has evaporated from the milk, and the remaining fats have yellowed slightly.

Food

Measurement of Instant Coffee

- Commercially available powdered instant coffee was measured. A sample of approximately 1 g was placed in the pan, and the pan was shaken to spread the sample over the entire pan.
- Essentially no difference in the moisture ratio was evident in timed ending mode or automatic ending mode. When a high drying temperature is set to shorten the drying time, the radiant heat from the halogen lamp becomes significant, and sample surfaces are sometimes scorched. Accordingly, with colored samples and samples prone to degradation, it is better to set as low a drying temperature as possible.

Measurement of Instant Coffee

Measurement conditions: 120 °C/TIME 10 minutes

	MOC63u	
	Sample mass (g)	Moisture ratio (%)
1st	0.994	7.33
2nd	1.079	7.50
3rd	0.980	7.45
Average		7.43
Standard deviation		0.087
CV(%)		1.18

The drying curve for instant coffee in timed ending mode is shown below.
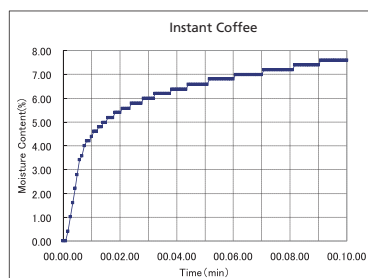
Instant Coffee

Photos of the instant coffee before and after drying are shown below.

(Before measurement) The sample was spread evenly over the pan.

(After measurement) There was basically no discoloration.
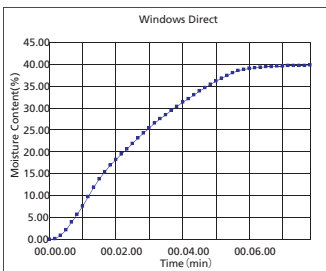
Moisture Content Measurement of Baked Sweets

- In the official test method, the drying period in a thermostatic chamber is five hours, so more than five hours are required to obtain the moisture ratio results.
- When the sample was measured using a moisture analyzer (in timed ending mode) at 110 °C, 10 °C higher than the 100 °C drying temperature specified in the official method, results similar to those from the official method were obtained with a drying time of 15 minutes.
- At 15 minutes in timed ending mode, the moisture ratio from the official test method is not reached. However, a moisture ratio similar to that from the official test method can be obtained if the drying time is set slightly longer.

●Summary of Results Found for the Moisture Ratios of Baked Sweets Using Several Methods

A summary of moisture ratios and measurement times in the official test method, timed ending mode, and rapid drying mode is shown below.

Measurement method	Moisture ratio	Measurement time
Official test method	7.6 %	5 hours
Timed ending mode	7.1 %	15 min
Rapid drying mode	7.8 %	5 min 10 sec

Drying curve for moisture ratio of baked sweets measured in rapid drying mode (vertical axis: moisture ratio; horizontal axis: time)
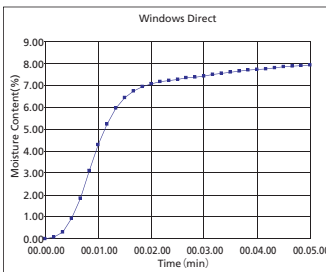
Ground up baked sweets loaded in the MOC63u

Baked sweets removed from the thermostatic chamber

Moisture Content Measurement of *Dengakumiso* (fermented soybean paste)

- In the official test method, the drying period in a thermostatic chamber is five hours, so more than five hours are required to obtain the moisture ratio results.
- When the sample was measured using a moisture analyzer (timed ending mode) at 105 °C, the same temperature as specified in the official test method, results similar to those from the official test method were obtained in about one hour.
- At one hour in timed ending mode, the moisture ratio from the official test method is not reached. However, a moisture ratio similar to that from the official test method can be obtained if the drying temperature is increased, or if the drying time is set slightly longer.

●Summary of Results Found for the Moisture Ratios of *Dengakumiso* Using Several Methods

A summary of moisture ratios and measurement times in the official test method, timed ending mode, and rapid drying mode is shown below.

Measurement method	Moisture ratio	Measurement time
Official test method	39.4 %	5 hours
Timed ending mode	37.2 %	1 hour
Rapid drying mode	40.1 %	7 min 45 sec

Drying curve for moisture ratio of *dengakumiso* measured in rapid drying mode (vertical axis: moisture ratio; horizontal axis: time)

Fiberglass sheet coated with *dengakumiso* and loaded in the MOC63u

***Dengakumiso* removed from the thermostatic chamber**

Moisture Analyzer

MOC63u Sample Applications

Moisture Content Measurement of Rice Seasoning

Food

- In the official test method, the drying period in a thermostatic chamber is four hours, so more than four hours are required to obtain the moisture ratio results.
- The sample was measured using a moisture analyzer at 110 °C, 5 °C higher than specified in the official test method (timed ending mode). Despite the increased drying temperature, the moisture ratio from the official test method was not reached at 1/4 the time from that test method.
- When the sample was measured in rapid drying mode to shorten the time, a value similar to that from the official test method was obtained in 3 minutes and 35 seconds. This is because heating the sample at 200 °C in step 1 caused immediate evaporation, thereby promoting evaporation efficiency.

● Summary of Results Found for the Moisture Ratios of Rice Seasoning Using Several Methods

A summary of moisture ratios and measurement times in the official test method, timed ending mode, and rapid drying mode is shown below.

Measurement method	Moisture ratio	Measurement time
Official test method	3.1 %	4 hours
Timed ending mode	2.5 %	15 min
Rapid drying mode	3.0 %	3 min 35 sec

Drying curve for moisture ratio of ice seasoning measured in rapid drying mode (vertical axis: moisture ratio; horizontal axis: time)
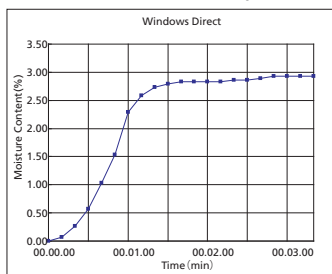
Rice seasoning loaded in the MOC63u

Rice seasoning removed from the thermostatic chamber

Moisture Content Measurement of Boiled Fish Paste

Food

- In the official test method, the drying period in a thermostatic chamber is five hours, so more than five hours are required to obtain the moisture ratio results.
- When the sample was measured using a moisture analyzer at 105 °C, the same temperature as specified in the official test method, the results after a drying time of one hour were slightly less than those from the official test method.
- At one hour in timed ending mode, the moisture ratio from the official test method is not reached. However, a moisture ratio similar to that from the official test method can be obtained if the drying temperature is set higher, or if the drying time is set slightly longer.

● Summary of Results Found for the Moisture Ratios of Boiled Fish Paste Using Several Methods

A summary of moisture ratios and measurement times in the official test method, timed ending mode, and rapid drying mode is shown below.

Measurement method	Moisture ratio	Measurement time
Official test method	73.8 %	5 hours
Timed ending mode	69.7 %	1 hour
Rapid drying mode	72.9 %	21 min 30 sec

Drying curve for moisture ratio of boiled fish paste measured in rapid drying mode (vertical axis: moisture ratio; horizontal axis: time)
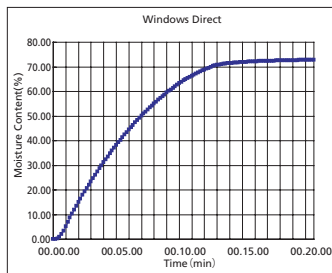
Ground up boiled fish paste loaded in the MOC63u

Boiled fish paste removed from the thermostatic chamber

Moisture Analyzer

MOC63u Sample Applications

The table below summarizes moisture ratio measurements for various samples using the moisture analyzer.

Sample	Sample Quantity	Measurement Mode		Set Temperature (°C)	Measurement Time (min)	Moisture Ratio (%)	CV (%)
		Ending Conditions	Finishing Conditions (% or min)				
Dog food	1 g	AUTO	0.05 %	160	5:48	6.45	3.17
Table salt	5 g	TIME	10 min	200	10:00	0.08	6.93
Instant coffee	1 g	TIME	10 min	120	10:00	7.43	1.18
Coffee beans (raw)	5 g	AUTO	0.05 %	140	17:30	9.32	1.68
Coffee beans (roasted)	3 g	AUTO	0.05 %	140	7:06	2.68	3.73
Green tea	5 g	AUTO	0.05 %	120	9:05	3.76	0.41
Corn starch	5 g	AUTO	0.02 %	180	9:25	12.17	0.73
Sugar (granulated sugar)	5 g	AUTO	0.05 %	160	1:02	0.13	0.01
White rice	6 g	AUTO	0.05 %	200	13:55	14.48	0.42
Mayonnaise	1 g	TIME	10 min	160	10:00	20.61	0.46
Orange juice	1 g	AUTO	0.05 %	140	10:09	88.89	0.09
Milk	1 g	AUTO	0.05 %	140	7:30	87.36	0.04
Chocolate	3 g	AUTO	0.01 %	140	6:18	2.36	1.49
Rolled oats	6 g	AUTO	0.05 %	200	10:05	12.65	0.14
Tomato ketchup	2.5 g	AUTO	0.1 %	140	19:47	69.40	0.16
Frozen sweets	2.5 g	TIME	12 min	140	12:00	84.53	0.22
Dried mangoes	5 g	AUTO	0.05 %	120	28:27	6.62	12.10
Palm oil	2.5 g	TIME	5 min	120	5:00	0.41	3.70
Hand soap	1 g	AUTO	0.05 %	200	21:36	88.89	0.39
Lipstick	1 g	TIME	3 min	100	3:00	0.73	9.37
Plastic (PMMA pellet)	10 g	TIME	25 min	100	25:00	0.13	4.56
Photocopier paper	1 g	AUTO	0.05 %	200	1:50	7.84	0.71
Sodium tartrate dihydrate	5 g	TIME	15 min	160	15:00	15.80	0.04
Detergent (powdered)	5 g	AUTO	0.05 %	160	13:08	9.79	1.59
Solid soap	3 g	TIME	16 min	200	16:00	9.09	1.66
Water-based paint	1 g	AUTO	0.05 %	200	9:27	52.39	0.75
Sludge cake	2 g	AUTO	0.05 %	200	21:31	81.55	0.40
Potting soil	5 g	AUTO	0.05 %	120	15:30	33.40	2.16
Sawdust	4 g	AUTO	0.05 %	160	8:27	34.38	0.91
Baked sweets	3 g	RAPID	Step 1 3.0 % / Step 2 0.1 %	Step 1 200 / Step 2 110	5:10	7.6	30.26
Dengakumiso	5 g	RAPID	Step 1 2.0 % / Step 2 0.1 %	Step 1 200 / Step 2 110	7:45	39.4	2.79
Rice Seasoning	3 g	RAPID	Step 1 2.0 % / Step 2 0.01 %	Step 1 200 / Step 2 110	3:35	3.1	83.87
Boiled fish paste	5 g	RAPID	Step 1 1.0 % / Step 2 0.01 %	Step 1 200 / Step 2 105	21:30	73.8	0.14
Sake lees	3 g	RAPID	Step 1 1.5 % / Step 2 0.01 %	Step 1 200 / Step 2 105	21:30	55.8	4.30
Salted rice malt	5 g	RAPID	Step 1 2.0 % / Step 2 0.05 %	Step 1 200 / Step 2 115	14:20	46.2	0.82
Soy sauce	5 g	RAPID	Step 1 1.0 % / Step 2 0.01 %	Step 1 200 / Step 2 105	10:40	68.2	0.19
Miso	5 g	RAPID	Step 1 2.0 % / Step 2 0.05 %	Step 1 200 / Step 2 115	15:22	50.8	1.79
Sardine dumplings	5 g	RAPID	Step 1 0.5 % / Step 2 0.02 %	Step 1 200 / Step 2 115	23:20	72.1	0.29
Plastic (ABS pellet)	5 g	TIME	12 min	150	12:00	0.27	4.33

Note 1: Measurement times, moisture ratios, and CV (%) values are aggregated from three data cycles.
Note 2: The CV (%) is the standard deviation divided by the average value, multiplied by 100 to represent it as a percent.

Electronic Printers

EP-100/EP-110

Enhanced Support for ISO/GLP/GMP

• Built-In Clock
• Affordably Priced

EP-100

• Enhanced Visibility for OLED Display
• Includes Functionality for Preventing Date Alterations

EP-110

EP-100 Function

Shared Functionality

- **Built-In Clock** Date/time can be printed even for balances without a clock function.
- **Customized Printing** In addition to weight measurement values, print items can also be added to the end.
- **Easy Communication Settings** Includes functionality (automatic setting function) that automatically sets communication settings based on the given balance.
  Note: This function is disabled for ELB series models and MOC63u moisture analyzers.
- Titles for measurement values can be freely customized for printing.

Compatible Balance Models

AP, AU, AT, U, TX, TXB, BX-K, BL, and ELB series,
and MOC63u moisture analyzers.
Note: The automatic setting function cannot be used with models that do not include the PRINT key,
such as ELB series balances and MOC63u moisture analyzers.

Specifications

Model	EP-100	EP-110
Display	—	OLED 128 × 64 Dot Matrix Display Easy-to-understand fluorescent dot matrix display
Protected date setting	—	Password protectable (six-character)
Printing	Paper for printing: Regular paper (does not fade with age) Method: 8-pin reciprocating impact dot matrix Speed: Approx. 1.7 lines/sec. Printer head life: 1 million lines Character size: Approx. W1.7 × H2.6 mm	
Interface	USB B-Type female, RS232 (D-sub 9-pin male)	
Power supply	AC adapter: Input 100 to 240 V AC, 50/60 Hz; Output 12 V DC/1500 mA Power consumption: 8 W (while printing) Standby power: 0.5 W (when not printing)	
Battery	—	1500 to 2500 mAh capacity rechargeable nickel metal-hydride (NiMH) batteries can be used (four AA cells). Note: Dry cell batteries cannot be used.
Installation environment	Temperature: 5 to 45 °C; Humidity: 10 to 80 % No condensation	

Maintenance Parts

Description
Recording Paper
Labeling Paper Rolls
Ink Ribbon
AC Adapter
Connection Cable

EP-110 Function

Supports GLP/GMP Using Password Protection-Based Date/Time Alteration Prevention

Powered by Rechargeable Batteries

Eliminating the need for an AC adapter connection, the printer can be used as a portable device. It also means the printer can be used in locations without a power supply outlet, such as within a fume hood. Note: Dry cell batteries cannot be used (compatible with nickel metal hydride batteries).

Status Display with Enhanced Visibility for OLED Display

The OLED display makes it easier to determine the measurement mode-based status. The OLED display also ensures visibility even in dark locations.

(Printout Samples)

Normal Mode   Statistical Calculation Mode

Manufacturer Information — Shimadzu Corporation
Device Name — Model: AUW220
Serial No. — S/N: D23452456
Sample Name (ID) — ID:
Date — Date: 2014-08-13
Measurement Start Time — Start Time: 22:23:51
Lot No. — Sample No. 00000000560

Measurement Values — No.001 10.0000 g
No.002 10.0001 g
No.003 10.0002 g

Measurement End Time — End Time: 22:23:58
Signature Field — Signature:

Shimadzu Corporation
Model: AUW220
S/N: D23452456
ID:
Date: 2018-12-07
Start Time: 22:26:24
Sample No. 00000000562

----------<STAT>----------
No.001 10.0006 g
No.002 10.0007 g
No.003 10.0008 g
----------<RESULT>----------
N= 3
T= 30.0021 g
MAX= 10.0008 g
MIN= 10.0006 g
RNG= 0.0002 g
MEAN= 10.00070 g
SD= 0.00010 g
CV= 0.0010 %

End Time: 22:26:55

Signature:

Output Items

Item	Symbol	Remarks
Title (Header)		Manufacturer information, device name, serial number (S/N), date, measurement start time, and lot number
Number of samples	N	
Total value	T	
Maximum value	MAX	
Minimum value	MIN	
Range	RNG	= MAX − MIN
Mean value	MEAN	= T / N
Standard deviation	SD	$\sqrt{\sum(Xi-MEAN)^2/(N-1)}$
Coefficient of variation	CV	(SD / MEAN x 100)%
Data suffix (footer)		Measurement end time and signature field

Specific Gravity Analyzer

AP series (NEW)

Attach Special Optional Kit for Use as Specific Gravity Analyzer

When combined with an optional specific gravity measurement kit, balances can be used to measure specific gravity.
Operations are simplified by a text-based navigation function. By using sinkers, the specific gravity of liquid can be measured as well. This allows easily measuring of the specific gravity of metals, rubbers, plastics, and other materials.

SMK-601 specific gravity measurement kit

Uni Bloc

Simple!

First measure the in-air weight.

Then place it in the container filled with water, as instructed on the screen.

The specific gravity value is displayed using simple steps.

AP Series

Model	W Series						X Series			Y Series		
	AP135W	AP125WD	AP225WD	AP124W	AP224W	AP324W	AP124X	AP224X	AP324X	AP124Y	AP224Y	AP324Y
Capacity	135g	120g / 52g	220g /102g	120g	220g	320g	120g	220g	320g	120g	220g	320g
Minimum display	0.01mg	0.1mg / 0.01mg		0.1mg								
Pan size (mm)	Approx. ø91											
Dimensions	Approx. W212 x D411 x H345 mm (including power supply unit)			Approx. 212 (W) ×367 (D) ×345 (H) mm								
Weight	Approx. 7.9kg			Approx. 7.0kg						Approx. 6.5kg		
Required power supply	AC100V　270mA　50/60Hz											

Specific Gravity Measurement Kit

Model	SMK-601

Note: The optional liquid density sinker is required for liquid density measurements.

Optional Accessories

Description
Liquid Density Sinker
Petri Dish, Square

Printer

5

6

Specific Gravity Analyzer

Specific Gravity Analyzer

AU series

Measures a Variety of Gravity Values with the Immersion Method

Measures a Variety of Gravity Values with the Immersion Method

Attach the optional SMK401 Specific Gravity Measurement Kit to a balance in the AU series, and set the balance to specific gravity measurement mode. You can then use the balance as a specific gravity analyzer, capable of automatically calculating and displaying specific gravity values.
Liquid density can also be measured by using an optional sinker.

Various models of balances are available, including a semi-micro (0.01mg) model. Choose the model best suited to the sample amount and required precision in your application.

Two kinds of weighing pans as standard.

For standard sample   For floating sample

AUW Series + SMK-401

Uni Bloc

AU Series

Model name	AUW-D Series		AUW Series			AUX Series			AUY Series	
	AUW220D	**AUW120D**	**AUW320**	**AUW220**	**AUW120**	**AUX320**	**AUX220**	**AUX120**	**AUY220**	**AUY120**
Capacity	220 g/82 g	120 g/42 g	320 g	220 g	120 g	320 g	220 g	120 g	220 g	120 g
Minimum display	0.1 mg/0.01 mg		0.1 mg	0.1 mg	0.1 mg	0.1 mg	0.1 mg	0.1 mg	0.1 mg	0.1 mg
Repeatability	0.1 mg/0.05 mg	0.1 mg/0.02 mg	0.15 mg	0.1 mg	0.1 mg	0.15 mg	0.1 mg	0.1 mg	0.1 mg	0.1 mg
Pan size (mm)	Approx ø80									
Body Dimensions	Approx. W220 × D430 × H340 mm									
Weight	Approx 7kg									

Specific Gravity Measurement kit

Description
SMK-401

Optional Accessories

Description
Liquid Density Sinker for SMK-401

Specific Gravity Analyzer
UW/UXseries

Measures a Variety of Specific Gravity Values with the Immersion Method

Measures a Variety of Specific Gravity Values with the Immersion Method

Attach the optional SMK-101/102/201 Specific Gravity Measurement Kit to a balance in the UW/UX series, and set the balance to specific gravity measurement mode. You can then use the balance as a specific gravity analyzer, capable of automatically calculating and displaying specific gravity values.
Liquid density can also be measured by using an optional sinker.

Various models of balances are available. Choose the model best suited to the sample amount and required precision in your application.

The large submersible pan makes it easy to measure bulky samples.

Uni Bloc

UW/UX Series + SMK-101

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Specific Gravity Analyzer

UW/UXSeries Balances (large pan type)

Model	UX2200H	UX4200H	UX6200H	UX4200S	UX8200S	UW2200H	UW4200H	UW6200H	UW4200S	UW8200S
						Models with built-in calibration weights				
Capacity	2200 g	4200 g	6200 g	4200 g	8200 g	2200 g	4200 g	6200 g	4200 g	8200 g
Minimum display	0.01 g	0.01 g	0.01 g	0.1 g	0.1 g	0.01 g	0.01 g	0.01 g	0.1 g	0.1 g
Pan size (mm)	Approx. 170×180	Approx. 170×180	Approx. 170×180	Approx. 170×180	Approx. 170×180	Approx. 170×180	Approx. 170×180	Approx. 170×180	Approx. 170×180	Approx. 170×180

UW/UXSeries Balances (small pan type)

Model	UX220H	UX420H	UX620H	UX420S	UX820S	UX820H	UX1020H	UW220H	UW420H	UW620H	UW420S	UW820S	UW820H	UW1020H
								Models with built-in calibration weights						
Capacity		420 g	620 g	420 g	820 g	820 g	1020 g		420 g	620 g	420 g	820 g	820 g	1020 g
Minimum display		0.001 g	0.001 g	0.01 g	0.01 g	0.001 g	0.001 g		0.001 g	0.001 g	0.01 g	0.01 g	0.001 g	0.001 g
Pan size (mm)		Approx. 108×1055	Approx. 108×1055	Approx. 108×1055	Approx. 108×1055	Approx. 108×1055	Approx. 108×1055		Approx. 108×1055	Approx. 108×1055	Approx. 108×1055	Approx. 108×1055	Approx. 108×1055	Approx. 108×1055

Specific Gravity Measurement Kit

Model	SMK-102 for small pan[1][3]
	SMK-101 for large pan[1][2]

Optional Accessories

Description
Liquid Density Sinker for SMK-101/102

[1] The optional liquid density sinker is required for liquid density measurements.
[2] For UW/UX series large-pan (170 × 180 mm) types. The actual capacity is 100 g smaller than the capacity of the balance.
[3] For UW/UX series small-pan (108 × 105 mm) types. The actual capacity is 290 g smaller than the capacity of the balance. Cannot be attached to the UW/UX 220H.

In addition to the above-mentioned, balances with the [Specific Gravity] mark are equipped with a specific gravity calculation function, so they can be used for specific gravity measurement.

So
Simple!

Introduction to the Specific Gravity Measurement Procedures (AU Series)

1 Assemble the Specific Gravity Measurement Kit.

2 Set the balance to specific gravity measurement mode. Then press the UNIT key several times until the display unit changes to "▼d."
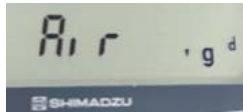
As shown in the photo at left, "Air" will be displayed for a while, and the in-air weight is then measured.

3 Press the O/T key to subtract the tare.

4 Load the solid sample on the in-air pan.

5

When the stability mark is lit, press the CAL key.

As shown in the photo at left, "wAtEr" will be displayed for a while, and the submerged weight is then measured.

6

Load the solid sample on the submerged pan.

7

When the stability mark is lit, press the CAL key.

8

A "*" will be displayed in the numerical display, and the specific gravity of the solid sample will be displayed.

To return to in-air measurement, press the CAL key to display "Air" for in-air weight measurement.

Sample Data Example

Sample	Specific gravity
Aluminum	2.68±0.1
Brass	8.45±0.4
Copper	8.8 ±0.4

*Results will differ depending on the shape and surface status of the sample, and the measurement conditions.
The values in the table are at best reference values, and their precision is not guaranteed.

Animal Balances
UW/UXseries

Attach an optional animal bucket to a UW/UX series balance, and set the unit to animal mode. The balance can now be used as a user-friendly animal balance.

Quick, Stable Measurements of Animal Weight

Bucket for small animals   Deep round bucket   Rectangular bucket

Animal Measurement Mode

When the animal is unloaded, residual weight from excretions and other materials is automatically subtracted and the display is set to zero. The next animal can be loaded without pressing the TARE button, which increases efficiency.
● Thanks to the specially developed animal measurement software, the weight of moving animals is measured quickly and stably.

UW series is equipped with built-in calibration weights

The Clock-CAL function automatically performs sensitivity calibration at preset times, significantly reducing the labor for routine inspections. Naturally, one-touch sensitivity calibrations are also possible at any time.

UWSeries   Uni Bloc

UXSeries   Uni Bloc

UW/UXSeries (balance)

Model	Standard models					Models with built-in calibration weights				
	UX2200H	UX4200H	UX6200H	UX4200S	UX8200S	UW2200H	UW4200H	UW6200H	UW4200S	UW8200S
Capacity	2200 g	4200 g	6200 g	4200 g	8200 g	2200 g	4200 g	6200 g	4200 g	8200 g
Minimum display	0.01 g	0.01 g	0.01 g	0.1 g	0.1 g	0.01 g	0.01 g	0.01 g	0.1 g	0.1 g

Small Animal Bucket Shape: round / Size: bottom 110 dia. × top 200 dia. × height 130 (mm)
Deep Round Bucket Shape: round / Size: bottom 155 dia. × top 195 dia. × height 200 (mm)
Rectangular Bucket[*1] Shape: rectangular / Size: bottom 250 × 210; top 290 × 250; height 150 (mm)

*1 The rectangular bucket can only be attached to the UX8200S and UW8200S.

Three movement levels can be selected corresponding to the animal movement.
Animals can be measured whether they are docile or extremely active.

When the animal is loaded and the stability mark is displayed, the weight is output automatically.
Needless operation is eliminated to increase efficiency.

When the animal is unloaded, residual weight from excretions and other materials is automatically subtracted and the display is set to zero.
The next animal can be loaded without pressing the TARE button, which increases efficiency.

Animal Balances

BW-K/BX-K series

Quick, Stable Measurements of Animal Weight

Attach an optional animal bucket to a BW-K/BX-K series balance, and set the unit to animal mode. The balance can now be used as a user-friendly animal balance.

Animal Measurement Mode

- Models with a range of capacities are available. Ideal for medium weight measurements of rabbits and small dogs.
- Thanks to the specially developed animal measurement software, the weight of moving animals is measured quickly and stably.
- When the animal is unloaded, residual weight from excretions and other materials is automatically subtracted and the display is set to zero. The next animal can be loaded without pressing the TARE button, which increases efficiency.

Medium bucket set   Small bucket set

BW-K Series   Uni Bloc

BX-K Series   Uni Bloc

BW-K/BX-K Series (balance)

Model	Models with built-in calibration weights					Standard models				
	BW12KH	BW22KH	BW32KH	BW32KS	BW52KS	BX12KH	BX22KH	BX32KH	BX32KS	BX52KS
Capacity*1 *2	12 kg	22 kg	32 kg	32 kg	52 kg	12 kg	22 kg	32 kg	32 kg	52 kg
Minimum display	0.1 g	0.1 g	0.1 g	1 g	1 g	0.1 g	0.1 g	0.1 g	1 g	1 g

Bucket

Small Bucket (mainly suited to rabbits)	Shape: rectangular / Size: bottom 305 × 215; top 335 × 245; height 215 (mm)
Medium Bucket (mainly suited to small dogs)*3	Shape: rectangular / Size: bottom 335 × 245; top 445 × 295; height 345 (mm)

*1 When an animal bucket is attached, the capacity will be reduced about 2 kg from the value indicated.
*2 When an animal bucket is attached, the capacity will be reduced about 6 kg from the value indicated.
*3 The bucket cannot be attached to the BW12KH or BX12KH.

Shared Options for the UW/UX & BW-K/BX-K

Description
EP-100 Printer
EP-110 Printer
RS-232C cable (1.5 m)
USB-serial conversion kit

Integrate Analysis Data Acquired from Balances to Analytical Network Data System Compliant with ER/ES Regulations

LabSolutions Balance (NEW)

To Establish an Internal Analysis Data Management System

Improves Operational Efficiency and Data Reliability

- Eliminate manual entry and all the weighing data are saved automatically in a safe database without transcription mistakes.
- Reports appropriate for weighing methods, such as the mass variation test, drying weight loss test and particle size test, can be created automatically after the measurement. In addition, customized reports featuring such information as system conformance, content uniformity and elution tests together with the analysis results obtained by HPLC, etc. can be created.
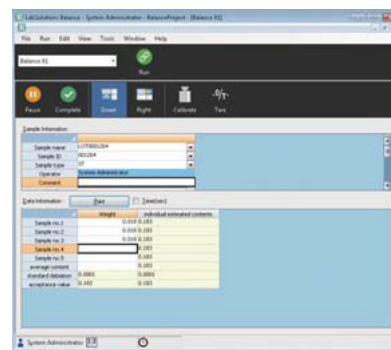
Main Window of LabSolutions Balance

Integrated Management of Analytical Data on Network System Using LabSolutions

Server	LC	GC	LCMS	GCMS	TOC	Office
DB						Data search, analysis and approval

LabSolutions

| Other vendor's instrument | Thermal analyzer | AA | UV | FTIR | Balance | |
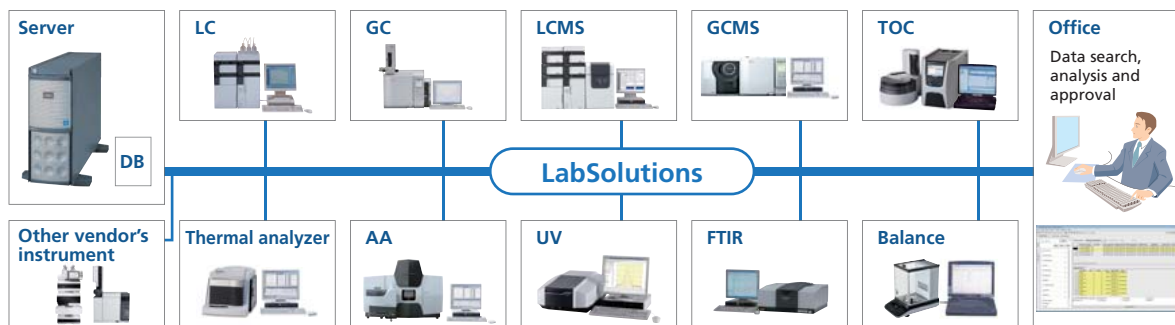
Compliant with the Latest Data Integrity Guidance (U.S. FDA 21 CFR Part 11)

• Weighing results can be automatically saved in the database together with other information, including sample ID, operator name, operation date and series number of instrument used. This enables quick data searching based on sample information.
• It allows setting up user authority to ensure only the authorized user can create a template for weighing.
• It prevents improper manipulation, unintended overwriting and deletion of data. In addition, measurement results, all the operation histories and reasons will be saved in the database as log files.
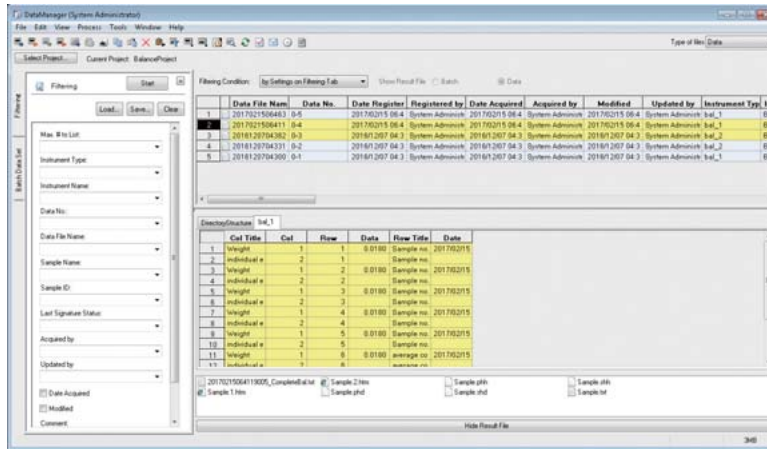
LabSolutions Data Manager

Integrated Report Creation Function Combines Analysis Results from HPLC and Weighing Results from Balance

Creation of Report Template
It enables creating the report by reading sample data and confirming the sample report at the same time.

Select Report Template

After Analysis

PDF

Batch Analysis Window

Report template formats can be freely customized.

Automatically print reports and create PDF files.
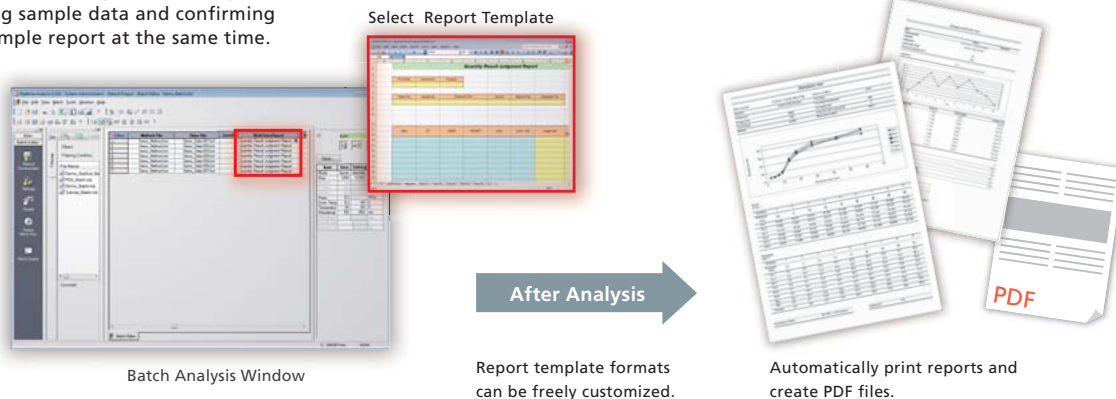
Note: Multi-data report creation (optional) is necessary to use this function.

Specifications

OS	Windows 7 Professional (32bit/64bit), Windows 10 Pro
Compatible Instruments	Shimadzu AP, AU, AT and UW/UX series
Other Functions	Controls up to 2 balance units, generation of PDF files, interface supporting linkage to LIMS system (option)

Accessories for Shimadzu Balances

		AP	AUW-D AUW AUX AUY	ATX ATY	UW UX	TX	TXB	BL	ELB	BW-K BX-K	MOC-120H	MOC63u
EP-100		✓	✓	✓	✓	✓	✓	✓	✓	✓		✓
EP-110												
Printer for MOC-120H											✓	
IFB-102A-UNC		[no need]	[no need]	✓	[no need]	[no need]	[no need]	✓	✓	[no need]	[no need]	
I/O–RS Cable		[no need]	[no need]	✓	[no need]	[no need]	[no need]	✓	✓	[no need]	[no need]	[no need]
AKB-301 Application keyboard			✓		✓					✓		
Windbreak WBC-102 for UW/UX small-pan type					✓							
Large windbreak WBC-502 for UW/UX Series					✓							
USB conversion kit with RS-232C cable			✓	✓	✓	✓	✓	✓	✓	✓	*1	✓
Foot switch for print **FSB-102PK**			✓		✓					✓		
for TARE **FSB-102TK**			✓		✓					✓		
Specific gravity measurement kit	**SMK-101, -102**				✓							
	SMK-201 for ELB large-pan model								✓			
	SMK-401			✓								
	SMK-601	✓										

*1 USB serial adaptor and RS-232C cable for MOC are needed.

Optional accessories list

Balances	Optional accessories
AP Series	Static Electricity Remover STABLO-AP Ionizer
	Electronic Printer EP-100
	Electronic Printer EP-110 (Multifunction Printer with Liquid Crystal Display)
	Label Roll Paper for EP-100/110 (10 Rolls)
	Specific Measurement Kit SMK-601
	Display Protective Cover (Set of 5)
	USB Cable
	RS-232 Cable
	AC Adapter (Standard Accessory)
	Internal Windbreak Plate
	RSIO Interface Cable
AUW-D/ AUW / AUX / AUY Series	Electronic Printer EP-100 / EP-110
	Foot Switch FSB-102TK (For taring)
	Foot Switch FSB-102PK (For printing)
	Specific Gravity Measurement Kit SMK-401
	Application Keyboard AKB-301
	RS-232C Cable, for IBM PC/AT Compatibles (25P-9P, Null modem, 1.5m)
	In-use Protective Cover (5 pcs)
ATX / ATY Series	Electronic Printer EP-100 / EP-110
	IFB-102A-UNC
	USB Conversion Kit
	In-use Protective Cover (5 pcs)
	I/O–RS Cable
TX / TW / TXB / TXC / TWC Series	Electronic Printer EP-100 / EP-110
	In-use Protective Cover (5 pcs)
	RS-232C Cable
BL Series	Electronic Printer EP-100 / EP-110
	In-use Protective Cover (5 pcs)
	Simple Windbreak
	Lid for Simple Windbreak
	IFB-102A-UNC
ELB Series	Electronic Printer EP-100 / EP-110
	RS-232C Interface IFB-102A-UNC
	In-use Protective Cover (5 pcs)
	Specific Gravity Measurement Kit SMK-201 (Cannot be used with small-pan models)
BW-K / BX-K Series	Electronic Printer EP-100 / EP-110
	RS-232C Interface IFB-102A (for multiple connections)
	Foot Switch FSB-102PK (For printing)
	Application Keyboard AKB-301

Balances	Optional accessories
UW / UX Series	EP-100 / EP-110 Printer
	RS-232C Interface IFB-102A (for multiple connections)
	Small Size Windbreak (for models with capacity of 300 to 620 g only) (Std Acc. for models with readability of 1 mg)
	Glass Windbreak (for models with capacity of 220 to 820 g only)
	Large Size Windbreak (for all models)
	Specific Gravity Measurement Kit SMK-101 (for models with capacity of 2200 g and up only)
	Specific Gravity Measurement Kit SMK-102 (for models with capacity of 420 to 820 g only)
	In-use Protective Cover (5 pcs)
	Foot Switch FSB-102PK (For printing)
	Foot Switch FSB-102TK (For taring)
	RS-232C Cable, for IBM PC/AT Compatibles (25P-9P, Null modem, 1.5 m)
	RS-232C Cable, for multiple connections (25P-25P, Null modem, 1.5 m)
	Application Keyboard AKB-301
	Remote Display Unit RDB-201 with operation keys
	Remote Display Unit RDB-202
	Angle Adjuster and Wall Hook for Remote Display
	Stand for Remote Display (1-m high)
MOC63u	EP-100 Printer
	EP-110 Printer
	In-use Protection Cover for Display (5 pcs)
	Aluminum Sheet
	Fiberglass Sheet
	Temperature Calibration Kit
	Sample Pan (SUS)
	RS-232C Cable
	USB Connection Cable
	Halogen Heater For Replacement

9

Optional Accessories

Physical Dimensions

AP Series

AP124W, AP224W, AP324W, AP124X, AP224X, AP324X Weight: Approx. 7.0 kg
AP124Y, AP224Y, AP324Y Weight: Approx. 6.5 kg
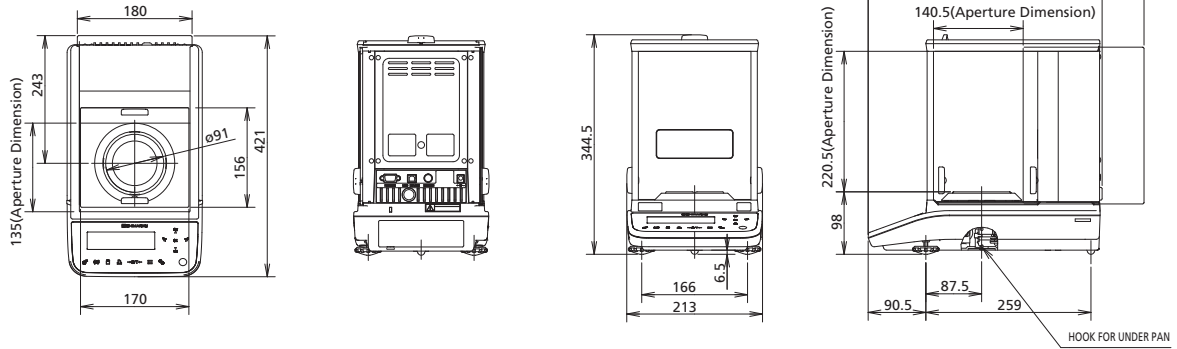
AP135W, AP125WD, AP225WD Weight: Approx. 7.9 kg
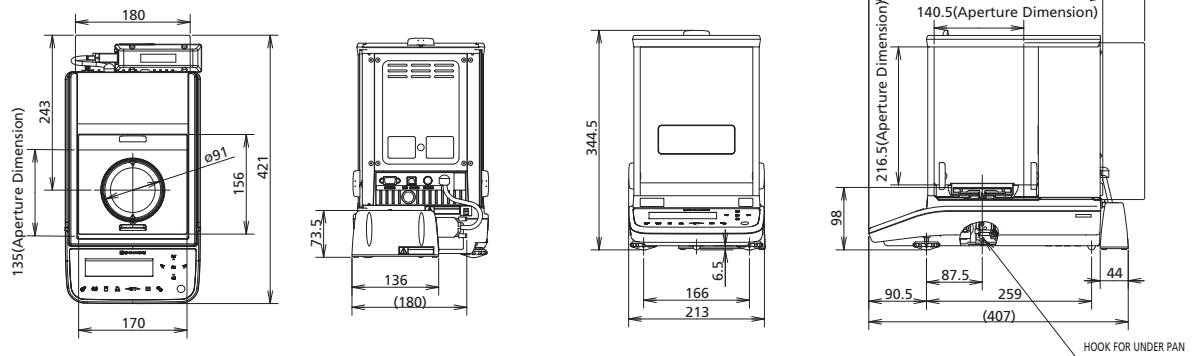
AUW-D/AUW/AUX/AUY Series
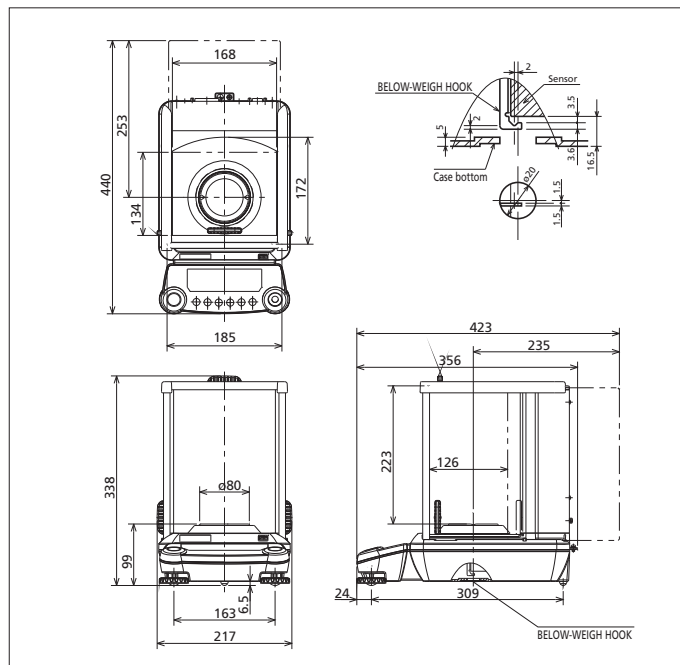
ATX/ATY Series
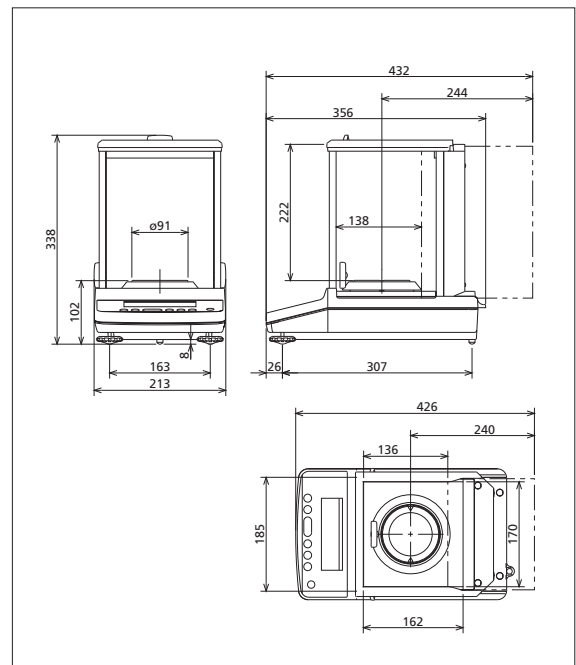
AW/AX/AY Series

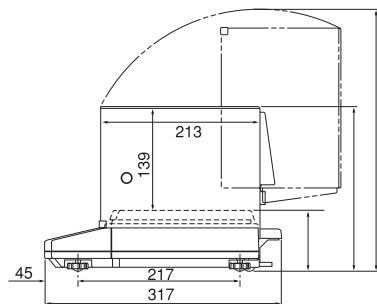## TW/TX/TXB/TWC/TXC Series

TX/TW series

TXB series

BL Series

Large-pan model   Small-pan model

Figure shows combination with windbreak
(standard only for BL220H and BL320H)
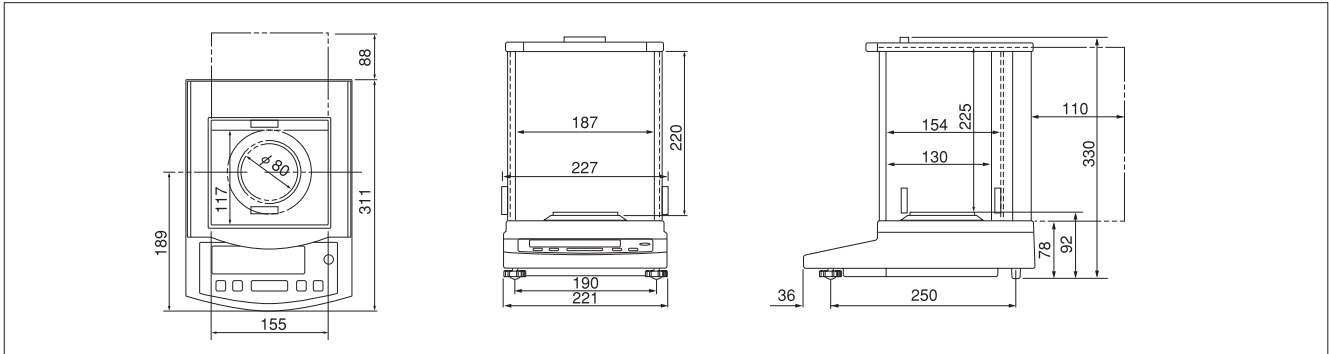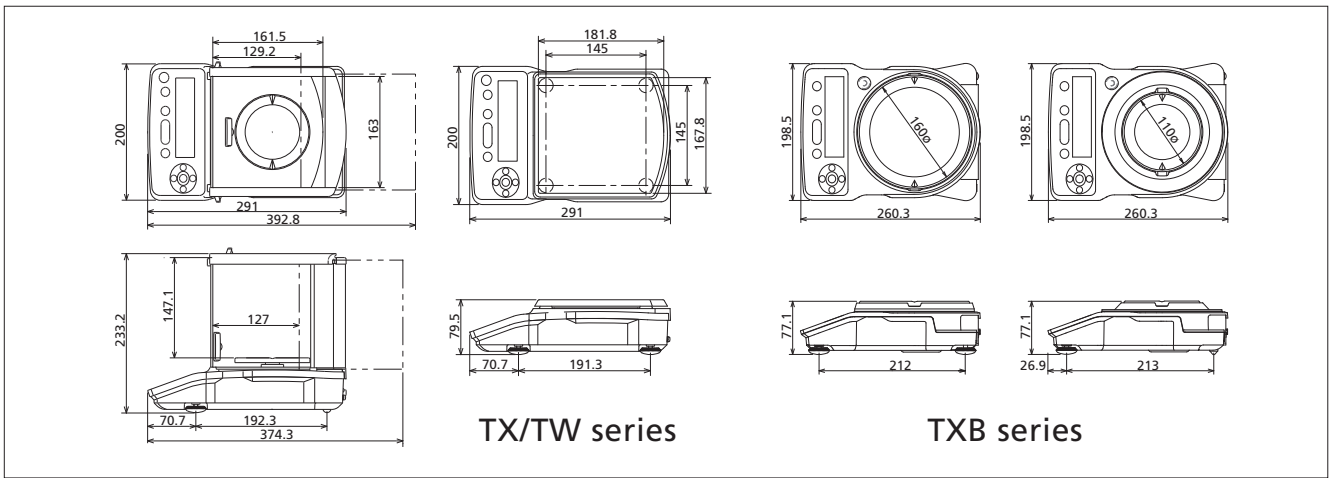
BW-K/BX-K Series
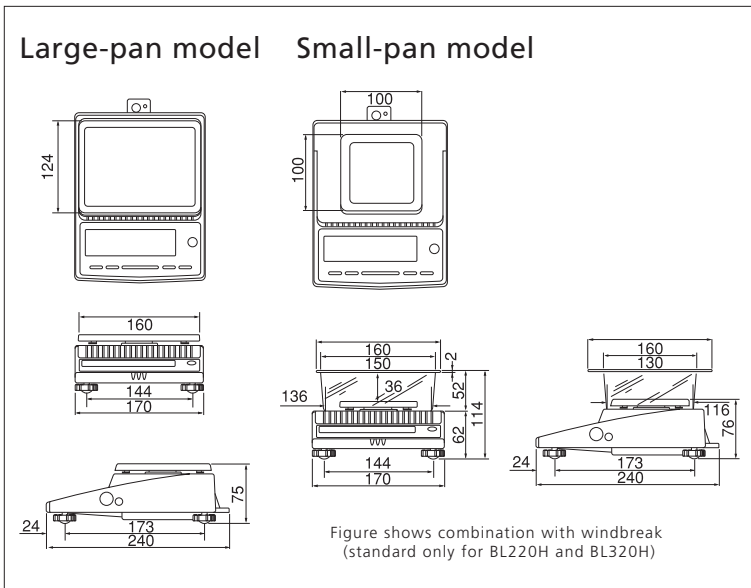
BW-K Series   BX-K Series
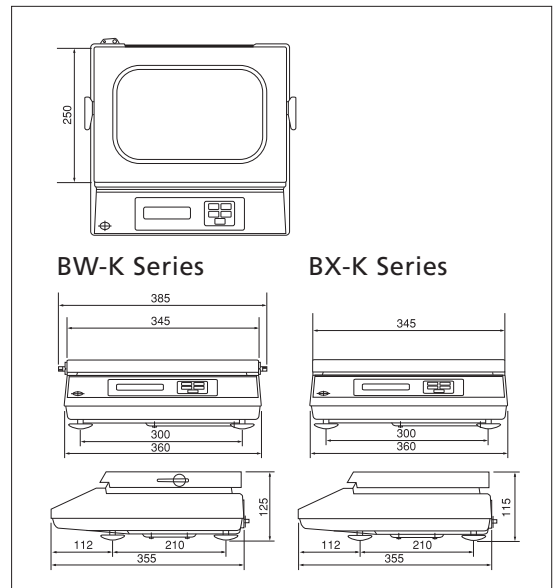
Physical Dimensions

UW/UX Series

BELOW-WEIGH HOOK
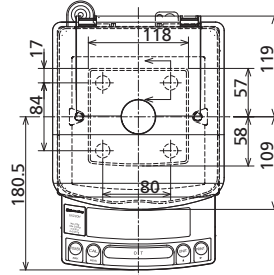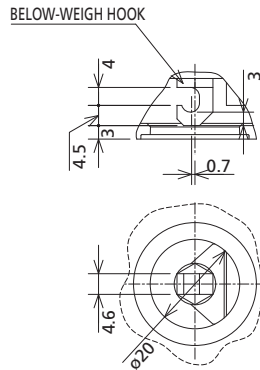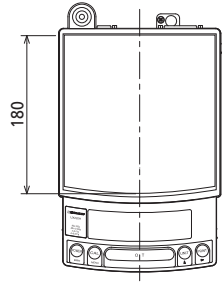
Small-pan model *1

Large-pan model

BELOW-WEIGH HOOK

BELOW-WEIGH HOOK
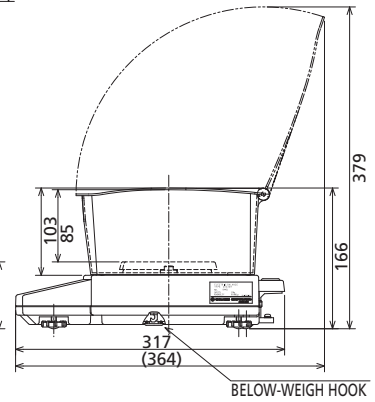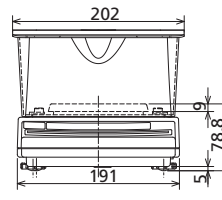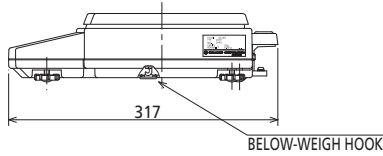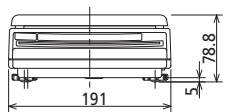
*1 Figure shows combination with simple windbreak (standard only for models with minimum display of 0.001 g).
The delivered windbreak may differ slightly in size and shape.
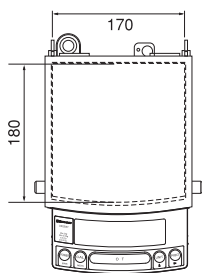
UW/UX large-pan model
with large windbreak
(optional accessory)
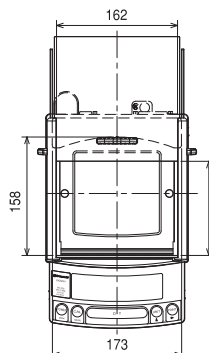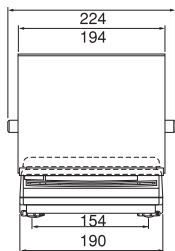
UW/UX small-pan model
with glass windbreak
(optional accessory)

ELB Series

Large-pan model   Small-pan model

170

130

ø110

Front leg:144 / Rear leg: 158
188

Front leg:144 / Rear leg: 158
188

58

58

56   145
216

56   145
216

EP-100/EP-110

114.6   86.6

188.2

STABLO-AP

87

124

49

70±3

10±2   110±3

147

164

130   4

147.7

35

90

MOC63u

201.6

(The height between pan and protection glass.)

64.5   129.8

ø95

24.6

291.4

157
144
84

144

160

70.4   250

174.4   161.6   3.7

202

336   13.6

MOC-120H

415

220

190

400
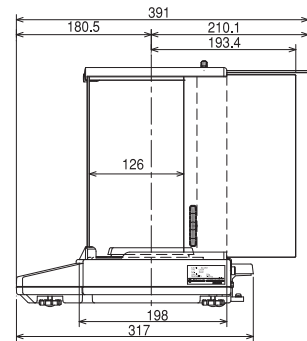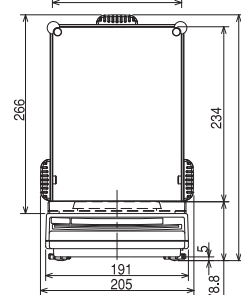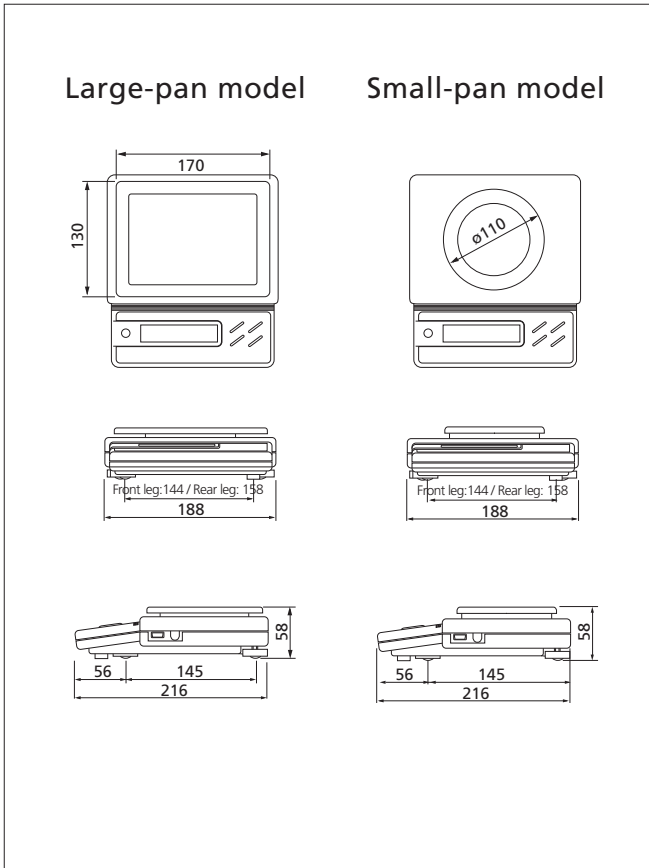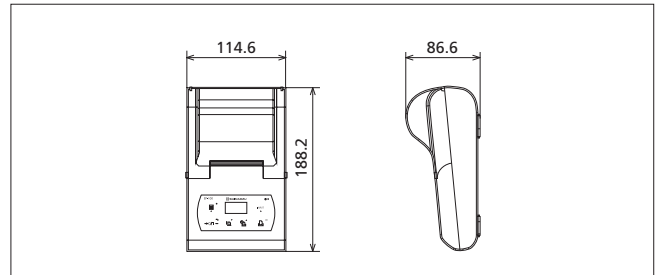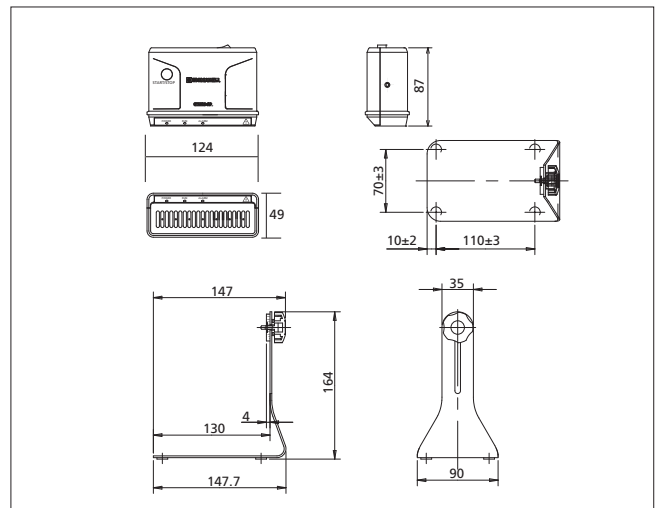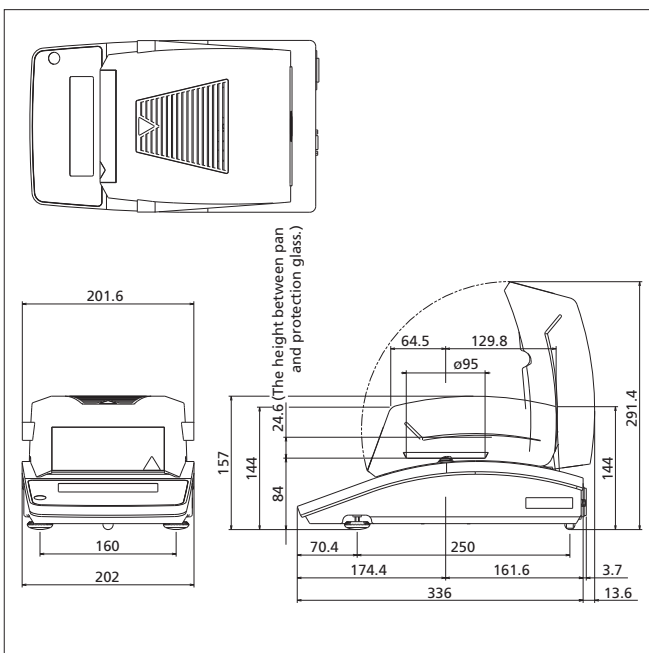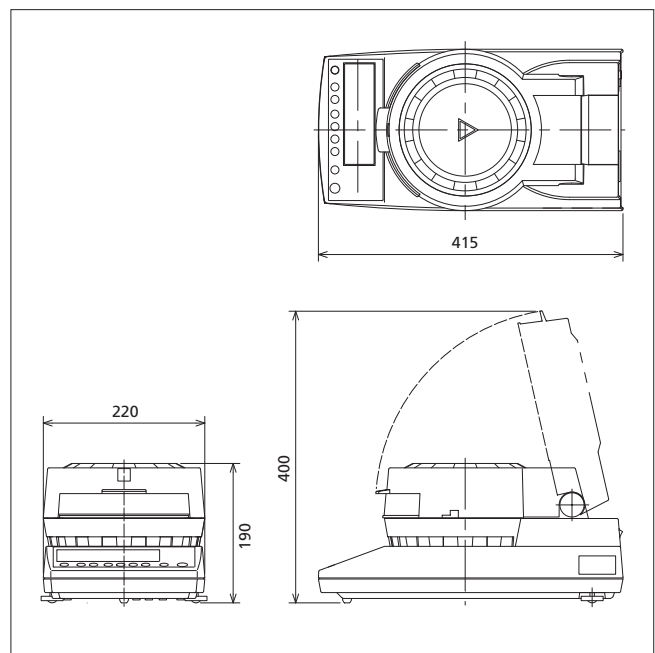
Shimadzu Electronic Balances Demonstration Movies

https://www.youtube.com/playlist?list=PLCPY11zjvhZPmTi_xW1oGJeSuI-YR6qaV

ATX ATY Series

UniBloc

TX TXB TXC Series Top-loading Balances

Analytical Balance AP Series

Analytical Balance AP Series

Effects Of Static Electricity

Effects of static electricity

Improved Response Time of AP series

Sample Preparation by Analytical Balance, AP Series

Effects of Static Electricity

Recipe Preparation by Analytical Balance, AP Series SETUP

Recipe Preparation by Analytical Balance, AP Series OPERATION

SHIMADZU

Shimadzu Corporation

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