SHIMADZU
Excellence in Science

C054-E032Q

Shimadzu Electronic Balances General Catalog

1875 Establishment of SHIMADZU CORPORATION

1920

1918 **Commence Torsion Balance and Top-pan Balance production**

1930

1930 **Model 5** Chemical Balance

1940

1939 Large-Capacity Balance

1950

1950 **DODIQ** Direct-Reading Balance

1958 **Type L** Direct-Reading Balance

1960

1960 **AL-3** Automatic Direct-Reading Balance

1965 **AL-7** Automatic Direct-Reading Balance

1967 **LU-T1100** Top-loading Direct-Reading Balance

1970

1970 **AL-8** Automatic Direct-Reading Balance (All-digital display)

1971 **Digibalance D-1003** Electronic Balance

1973 **C-160** Direct-Reading Carat Balance

1976 **NL-200P** Direct-Reading Balance

1980

1981 **EB-2800M** Electronic Animal Balance

1981 **AEL-160** Electronic Analytical Balance

1985 **AEL-200** Electronic Analytical Balance (Full-range electro-magnetic)

1985 **PSC** Fully-Automatic Calibration Based on Temperature Change Detection

1989 **EB-K** Precision Platform Balances with **OPF** (later renamed UniBloc)

1990

1993 **AEM-5200** Micro Balance

1997 First Electronic Balances with **WindowsDirect**

2000

2003 New UniBloc Balance Line-up

2004 **MOC-120H** UniBloc Moisture Balance

2007 **TX / TXB** UniBloc Top-Loading Balances

2010 **ATX / ATY** UniBloc Analytical Balances

2011 **MOC63u** UniBloc Moisture Balance

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.

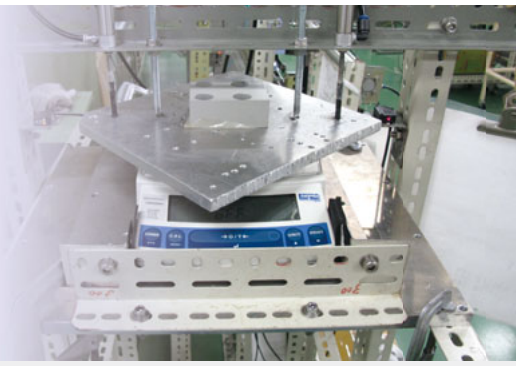
Moving forward, Shimadzu is committed to providing innovative products for the analytical marketplace.

One of the latest achievements is the MOC63u High-performance Moisture Analyzer, featuring UniBloc and applicable for a wide application area.

Contents

UniBloc Power!

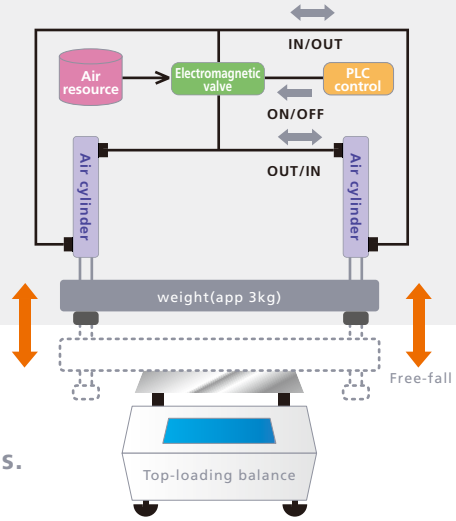
Shimadzu balances advance to the UniBloc generation



Impact resistance test for four balances

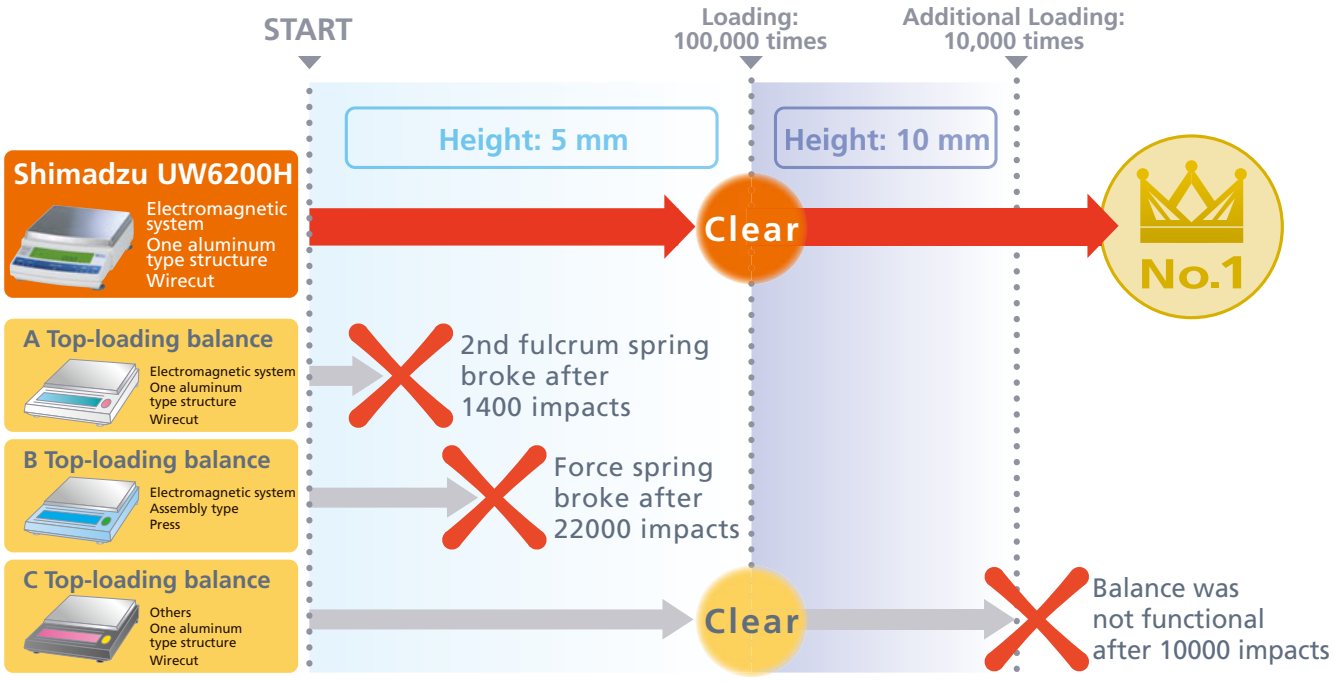
made by typical manufacturers.

(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.)



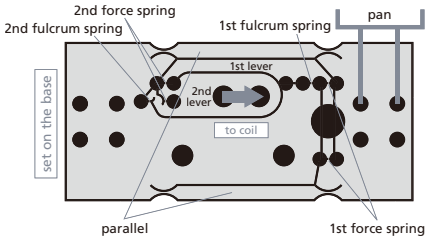
The results of this impact resistance test prove Shimadzu UW/UX series balances with UniBloc technology are the toughest. Put Shimadzu balances in your lab and experience UniBloc power.

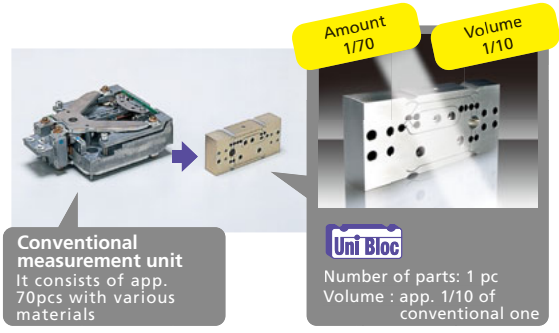
UniBloc technology leads to a new world of measurement

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

Keywords of UniBloc features





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

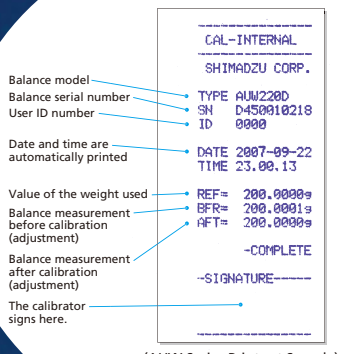
ISO GLP GMP

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 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.



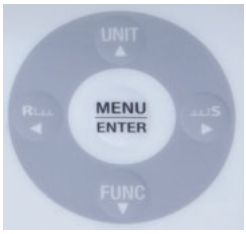
(AUW Series Printout Sample)

High Level Functionality

Menu Operation Key

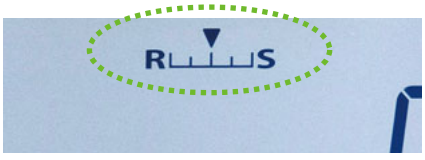
Easy-to-Operate Key Layout

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



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.

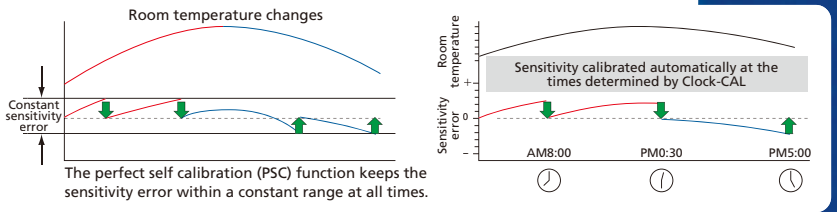


Perfect Self Calibration

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.

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.



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

Durability

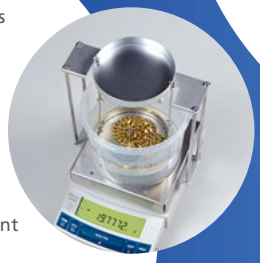
Next-Generation Mass Sensor: UniBloc

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.

Applications

Piece Counting

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



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.

PC Compatibility

WindowsDirect

The balance can be connected to a PC via RS-232C or USB ports. For details, refer to the Shimadzu website.

Built-in Interface

An RS-232C interface is built-in as standard. When connecting to a PC, there is no need for a separate interface.

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.

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.

Excellent Performance for Multiple Industries

Pharmaceutical industry

- Sample preparation in R&D laboratories
- Quality assurance of drugs
- Material inspection

AUW220D
Capacity: 220 g/82 g
Minimum Display: 0.1 mg/0.01 mg
► P. 17

UW1020H
Capacity: 1020 g
Minimum Display: 0.001 g
► P. 25

UW6200H
Capacity: 6200 g
Minimum Display: 0.01 g

MOC63u
Capacity: 60 g
Minimum Display: 0.001 g/0.01 %
► P. 33

Food industry

- Quality assurance of processed food
- Inspection for harvest before export
- Packaging final products

MOC63u
Capacity: 60 g
Minimum Display: 0.001 g/0.01 %
► P. 33

AUW220
Capacity: 220 g
Minimum Display: 0.1 mg
► P. 17

TX3202L
Capacity: 3200 g
Minimum Display: 0.01 g
► P. 27

Chemical industry

- Reagent preparations
- Manufacturing process inspection

AUW220
Capacity: 220 g
Minimum Display: 0.1 mg
► P. 17

UX420H
Capacity: 420 g
Minimum Display: 0.001 g
► P. 25

UX4200H
Capacity: 4200 g
Minimum Display: 0.01 g

MOC63u
Capacity: 60 g
Minimum Display: 0.001 g/0.01 %
► P. 33

Electronic and semiconductor industries

- Piece counting for small parts in factories
- Measurement of thin film on the surface of silicon wafers
- Pass/fail by checkweighing

ATX224
Capacity: 220 g
Minimum Display: 0.1 mg
► P. 19

UX420H
Capacity: 420 g
Minimum Display: 0.001 g

UX4200H
Capacity: 4200 g
Minimum Display: 0.01 g
► P. 25

TX323L
Capacity: 320 g
Minimum Display: 0.001 g

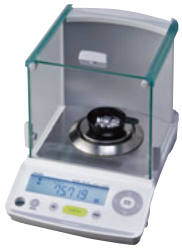
TX3202L
Capacity: 3200 g
Minimum Display: 0.01 g
► P. 27

BL320H
Capacity: 320 g
Minimum Display: 0.001 g
► P. 29

ELB300
Capacity: 300 g
Minimum Display: 0.01 g
► P. 28

Jewelry market

- Jewelry making
- In retail shop
- Purity check



TXC623L / TWC623L
Capacity: 620 ct
Minimum Display: 0.001 ct
► P. 27

TX323L
Capacity: 320 g
Minimum Display: 0.001 g

TX3202L
Capacity: 3200 g
Minimum Display: 0.01 g
► P. 27

UX420H
Capacity: 420 g
Minimum Display: 0.001 g

UX4200H
Capacity: 4200 g
Minimum Display: 0.01 g
► P. 25

TXB622L
Capacity: 620 g
Minimum Display: 0.01 g
► P. 27

Product Lineup

	~100 g	100 g~	300 g~	500 g~	1 kg~	3 kg~
0.01 mg	**AUW220D** 17 (220 g/0.1 mg) (82 g/0.01 mg) **AUW120D** 17 (120 g/0.1 mg) (42 g/0.01 mg)	 AUW-D Series				
0.1 mg	**ATX84** 19 (82 g/0.1 mg) **ATY64** 19 (62 g/0.1 mg)	**AUW220** **AUX220** **AUY220** 17 (220 g/0.1 mg) **ATX224** **ATY224** 19 (220 g/0.1 mg) **AUW120** **AUX120** **AUY120** 17 (120 g/0.1 mg) **ATX124** **ATY124** 19 (120 g/0.1 mg) **TWC623L** **TXC623L** 29 (620ct/0.001ct)	**AUX320** **AUW320** 17 (320 g/0.1 mg)  AUW/AUX/AUY Series  ATX/ATY Series			
0.001 g (1 mg)		**UW220H** **UX220H** 25 (220 g/0.001 g) **TW223L** **TX223L** 27 (220 g/0.001 g) **BL-220H** 29 (220 g/0.001 g)	**UW420H** **UX420H** 25 (420 g/0.001 g) **TW423L** **TX423L** 27 (420 g/0.001 g) **TW323L** **TX323L** 27 (320 g/0.001 g) **BL-320H** 29 (320 g/0.001 g)	**UW820H** **UX820H** 25 (820 g/0.001 g) **UW620H** **UX620H** 25 (620 g/0.001 g)	**UW1020H** **UX1020H** 25 (1020 g/0.001 g)  UW/UX Series	
0.01 g~ (10 mg)		**TXB222L** 27 (220 g/0.01 g) **ELB200** 28 (200 g/0.01 g) **ELB120** 28 (120 g/0.01 g) 	**UW420S** **UX420S** 25 (420 g/0.01 g) **TXB422L** 27 (420 g/0.01 g) **BL-320S** 29 (320 g/0.01 g) **ELB300** 28 (300 g/0.01 g)  TW/TX/TXB Series	**UW820S** **UX820S** 25 (820 g/0.01 g) **TXB622L** 27 (620 g/0.01 g) **BL-620S** 29 (620 g/0.01 g) **ELB600** 28 (600 g/0.05 g)	**UW2200H** **UX2200H** 25 (2200 g/0.01 g) **TX2202L** 27 (2200 g/0.01 g) **BL-2200H** 29 (2200 g/0.01 g)	**UW4200H** **UX4200H** 25 (4200 g/0.01 g) **TX4202L** 27 (4200 g/0.01 g) **TX3202L** 27 (3200 g/0.01 g) **BL-3200H** 29 (3200 g/0.01 g)
0.1 g~				**TXB621L** 27 (620 g/0.1 g) **ELB600S** 28 (600 g/0.1 g) **UW820S** 25 (820 g/0.1 g)	**TXB2201L** 27 (2200 g/0.1 g) **ELB2000** 28 (2000 g/0.1 g) **ELB1200** 28 (1200 g/0.1 g)	**UW4200S** **UX4200S** 25 (4200 g/0.1 g) **TXB4201L** 27 (4200 g/0.1 g) **BL-3200S** 29 (3200 g/0.1 g) **ELB3000** 28 (3000 g/0.1 g)


ELB Series


BL Series



How to use

model name / capacity / minimum display / page No.

BL-320S (320 g/0.01 g) 31
ELB300 (300 g/0.01 g) 30
UW420HV (420 g/0.01 g) 26
AUW220D (220 g/0.1 mg) (82 g/0.01 mg) 17 — Dual range

Internal Calibration model is in blue

	5 kg~	10 kg~	30 kg~	50 kg~	100 kg~
0.01 g (10 mg)	**UW6200H** **UX6200H** (6200 g/0.01 g) 25				
0.1 g (100 mg)	**UW8200S** **UX8200S** (8200 g/0.1 g) 25 **TXB6201L** (6200 g/0.1 g) 27	**BW22KH** **BX22KH** (22 kg/0.1 g) 30 **BW12KH** **BX12KH** (12 kg/0.1 g) 30	**BW32KH** **BX32KH** (32 kg/0.1 g) 30	 BW-K/BX-K Series	
1 g~	**TXB6200L** (6200 g/1 g) 27 **ELB6000S** (6000 g/1 g) 28	**ELB12K** (12 kg/1 g) 28	**BW32KS** **BX32KS** (32 kg/1 g) 30	**BW52KS** **BX52KS** (52 kg/1 g) 30	



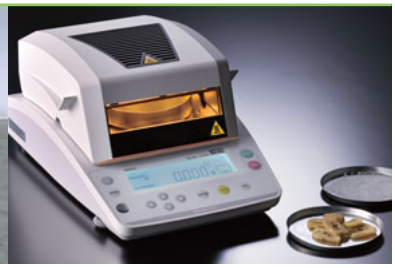

Product Lineup

○: Standard function
△: Option

	AUW-D AUW	AUX	AUY	ATX ATY	UW UX
UniBloc	○	○	○	○	○
Perfect Self Calibration	○	○			○ (UW only)
Clock-CAL	○				○ (UW only)
Internal Calibration	○	○		○ (ATX only)	○ (UW only)
Single-Lever CAL					
Built-in Clock	○	○			○
ISO Calibration Report	○	○			○
Menu Operation Key					
Easy Setting				○	
Backlight	○ (AUW only)				○
Windows Direct	○	○	○	△*	○
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.





 TW TX	 TXB	 BW-K BX-K	 ELB	 BL	 MOC63u	 MOC-120H
○		○			○	○
○ (TW only)						
		○ (BW-K only)				
		○			○	○
		○			○	○
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		○			○	○

Recommended for the Following Shimadzu

Analytical

Analytical Balance

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

Model Name	AUW-D	AUW	AUX	AUY
Functions				
UniBloc	●			
Measurements in semi micron range	■	■		
Case material	Aluminum die cast	Aluminum die cast	Aluminum die cast	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		■	■	■
WindowsDirect	●	●	●	●

Balances

General Purpose
Analytical Balance

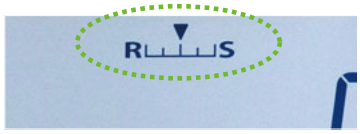
AT series

Standard Models

The ATX/ATY series are recommended

Functions	ATX	ATY
UniBloc		
Measurements in semi micron range		
Case material	ABS plastic	
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		
WindowsDirect		

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.

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 WindowsDirect is 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.

  WindowsDirect works with Windows® 95, 98, NT4.0, 2000, ME and XP.
  PC must be IBM PC/AT compatible.

  If you'd like to use "WindowsDirect" with "Windows 7" "Windows Vista", or a USB port, please contact our distributors.
- Piece counting, various mass units, below-weigh hook, specific gravity measurement software are all standard features.

AUW-D/AUX/AUY Series

AUW Series

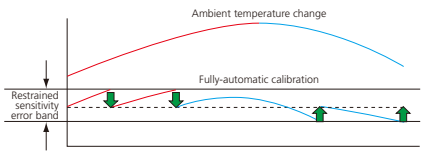
Uni Bloc

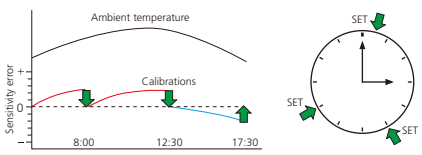
Choose one of the two models according to your field requirements.

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).





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)

WindowsDirect

Weighed data can be directly typed into any Windows application; no interface software is required. If you'd like to use "WindowsDirect" with "Windows 7" "Windows Vista", or a USB port, please contact our distributors.

Piece Counting and Unit Conversion

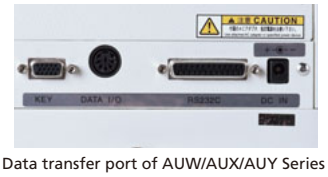
In addition to piece counting, the balance can also perform measurements as percentages and in a variety of mass units, such as carat.

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.



Data transfer port of AUW/AUX/AUY Series

AUW-D Series

AUW Series

AUX Series

AUY Series

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.									

Note: See page 48 for external dimensions.

Optional Accessories

Description
Electronic Printer EP-80
Electronic Printer EP-90
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-80

Application Keyboard
AKB-301

Specific Gravity Measurement Kit SMK-401

Countermeasures for Static Electricity

Special 2-Way Ionizer for Electronic Balances

STABLO-EX®

Description
STABLO-EX

Note: For details, see pages 20 and 21.

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)

Internal Calibration (ATX only)

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

WindowsDirect

The balance can be connected to a PC via RS-232C or USB ports. For details, refer to the Shimadzu website.

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.

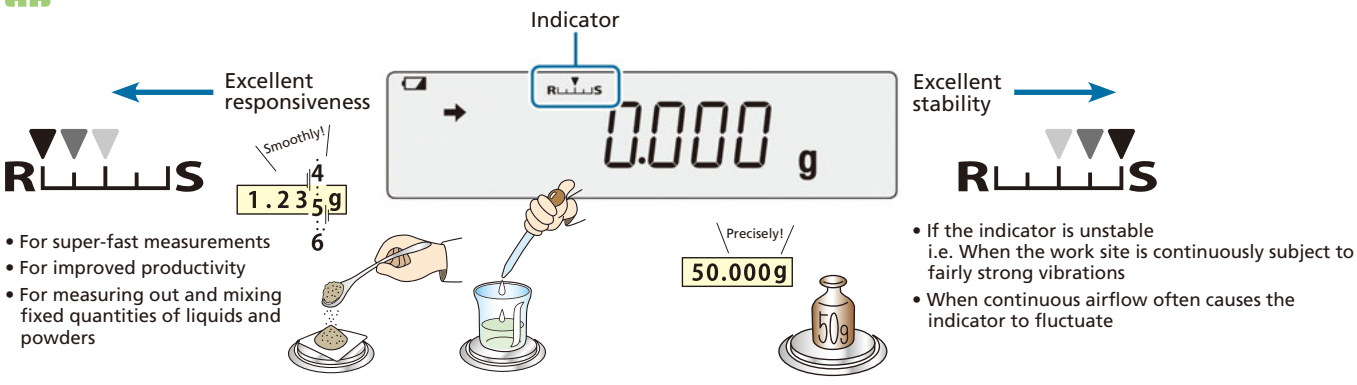
Formulation Mode

This is convenient when formulating (preparing) multiple substances.

Percentage Measurement

Measures a percentage value with respect to a preset reference.

Easy Setting



- 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

ATY Series

ATX/ATY Series

Model	ATX224	ATX124	ATX84	ATY224	ATY124	ATY64
Capacity	220 g	120 g	82 g	220 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		
Required power supply	AC adaptor (Input 100 VAC 50/60 Hz; Output 12 V 1 A)					

Note: See page 48 for external dimensions.

Optional Accessories

Description
EP-80 Printer
EP-90 Printer
I/O-RS conversion cable
USB-serial adaptor
Protective cover (5 pcs)
AC adaptor (provided as standard with main unit)

EP-90 Electronic Printer

I/O-RS conversion cable

Countermeasures for Static Electricity

Special 2-Way Ionizer for Electronic Balances

STABLO-EX®

Description
STABLO-EX

Note: For details, see pages 20 and 21.

Data transfer port of ATX/ATY Series

Static Remover (Ionizer)

Special 2-Way Ionizer for Electronic Balances

STABLO EX®

Shimadzu's proprietary 2-way ionizer for analysts troubled by static charging of samples or containers
One-touch attachment and removal adds even more convenience

Secure static removal

The excellent ion polarity balance achieved by the AC method ensures

- **No inverse charging**
- **Wide angle static removal**
- **High performance maintained over a long period of use**

Air blower switched ON/OFF

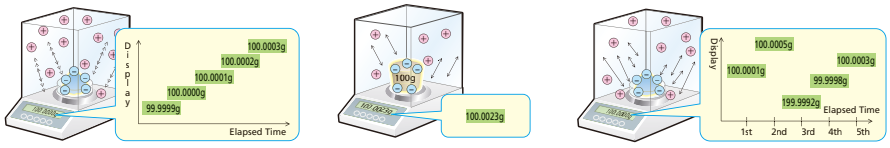
Operation can be optimized for solid or powdered samples.

Space-saving design

Compact main unit requires minimal space. Holder height and angle are adjustable.

Due to static electricity...

- Display fluctuates or drifts over a long time.
- Measurement error
- Poor repeatability in weighed results



Examples of Applications

Quickly discharge container or bulk samples with fan ON.

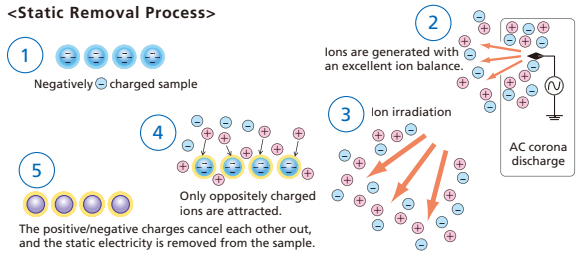
For powdered samples, fan can be turned OFF.

As a handheld unit

STABLO EX® Feature

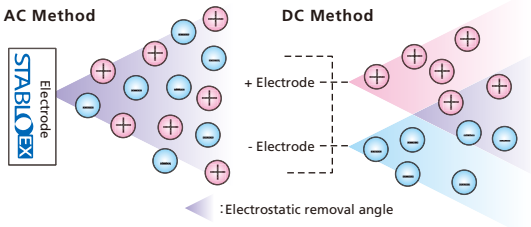
Static Removal by Ion Irradiation

If samples or containers are prone to static charging, static electricity can cause measurement instability, particularly in analytical balances and similar instruments.
With the Shimadzu STABLO-EX ionizer, irradiation with ions generated by an AC corona discharge, which provides excellent ion balance, removes static electricity, providing reliable, stable measurements.



AC Method with Excellent Ion Polarity Balance

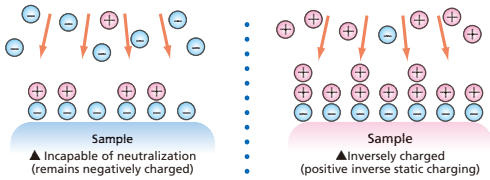
The AC Method: In this method, alternating voltage is applied to a discharge needle, and equivalent amounts of positive and negative ions are released from the same electrode.
The DC Method: In this method, DC voltages, positive and negative respectively, are applied to two electrodes, which then release the corresponding ions. The electrostatic removal angle is limited if the electrodes are separated. Also, the ion balance is lost if a discharge needle becomes worn.



Ion Balance

This is the balance of positive and negative ions provided by the ionizer.
If the ion balance is poor, the ionizer cannot neutralize the charge, and inverse charging can occur.

If the ion balance is poor...



Plays an Active Role in These Situations

Static electricity keeps the sample out of the ampoule

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

STABLO-EX removes the charge from the ampoule.

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

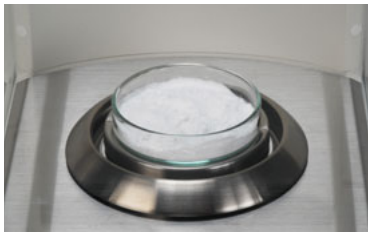
Plastic wrap sticks to rubber gloves

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

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

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

STABLO-EX 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

STABLO EX

Description
STABLO-EX unit (with stand)

Optional Accessories

Description
AC adaptor (provided as standard with main unit)

Primary Specifications	
Static removal method	AC corona discharge
Ion balance	±20 V
Electrostatic removal range	Distance (from the discharge electrode): Approx. 5 to 50 cm (with fan ON)
Static removal performance	Approximate time to reach 100 V or less from a 1 kV static charge (at time of shipment) Reference values (fan ON): 8 sec/5 cm; 12 sec/10 cm; 100 sec/50 cm
Ozone concentration	0.04 ppm (measured at 2 cm from the discharge electrode, with fan ON)
Discharge electrode (material)	Stainless steel (SUS304), lifetime of 10,000 hours
Maximum blow rate	0.06 m^3/min
Weight	Approx. 540 g (ionizer body: approx. 110 g; stand: approx. 430 g)
Usage environment	0 to 40 °C; relative humidity of 35 to 80 % (no condensation)
Required power supply	AC adaptor (output: 12 VDC ±1 V, 1 A)

Recommended for the Following Shimadzu

Electronic

Electronic Balances

UW/UX series

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 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	
WindowsDirect		

Balances

General Purpose
Electronic Balances

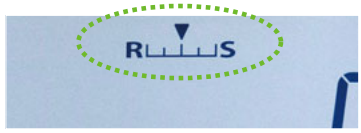
TW/TX series

Standard Models

Functions	TW	TX
UniBloc		
Case material	ABS plastic	
Built-in weights for sensitivity calibration		
Perfect self sensitivity calibration		
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)	■	
WindowsDirect		

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

Electronic Balances

UW/UX series

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 *Windbreak can be removed.
UW420H UX420H
UW620H UX620H
UW820H UX820H
UW1020H UX1020H

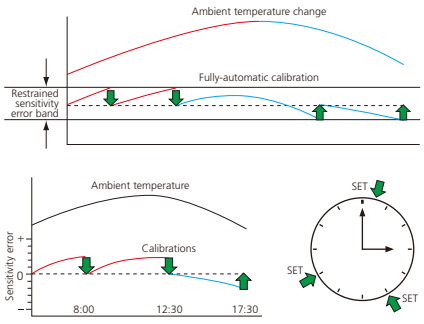
Uni Bloc

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.



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).

WindowsDirect

Weighed data can be directly typed into any Windows application; no interface software is required. If you'd like to use "WindowsDirect" with "Windows 7" "Windows Vista", or a USB port, please contact your local representative.

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

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.				

Note: See page 50 for external dimensions.

Optional Accessories

Electronic Printer EP-80 / EP-90	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-EX

Description
STABLO-EX

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.

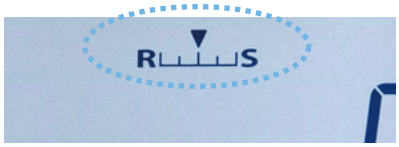
Uni Bloc (TW/TX only)

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.

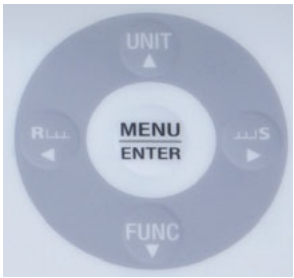
Easy Setting
Best fit to weighing application

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.

WindowsDirect Communication Function

Send balance data to Excel or other Windows applications without any data communication software installation required. Simply add one RS-232C cable. By combining standard AutoPrint functions with typical spreadsheet functions, even difficult applications can be easily automated.
If you'd like to use "WindowsDirect" with "Windows 7" "Windows Vista", or USB port, please contact your local representative.

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

TW223L TW323L TW423L
TX223L TX323L TX423L

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	

TX2202L TX3202L
TX4202L

TWC323L TXC323L
TWC623L TXC623L

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 × D291 × H241 mm	
Weight	Approx 3.8 kg			Approx 2.8 kg			Approx 3.8 kg	

TXB2201L TXB6201L
TXB4201L TXB6200L

TXB222L TXB622L
TXB422L TXB621L

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							

Note: See page 49 for external dimensions.

Optional Accessories

Description
EP-80 Printer
EP-90 Printer
RS-232C cable
In-use protective cover
In-use protective cover for display
USB conversion kit

Electronic Printer
EP-80

Portable Electronic Balances

ELB series

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.

ELB Series

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						

Note: See page 51 for external dimensions.

Optional Accessories

Description
Electronic Printer “EP-80” “EP-90” (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-80

Data transfer port of ELB Series

Top-Loading Balances

BL series

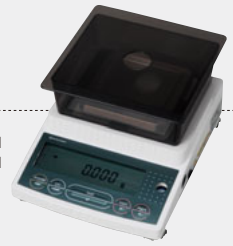
Basic Top-Loading Balances

High-resolution balances made affordable

BL Series

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

BL-320S



BL-220H
BL-320H

CARAT PCS

PCS Piece counting function

Piece counting function is standard.

Analog bar graph display

Remaining weighing capacity can be seen at a glance.

Data transfer port of BL Series

BL Series

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			

Note: See page 49 for external dimensions.

Optional Accessories

Description
Electronic Printer EP-80
Electronic Printer EP-90
In Use Protection Cover

Analytical Balances

AW/AX/AY series

AY Series

AW PSC ISO RS-232C PCS METAL BODY

AX ISO RS-232C PCS METAL BODY

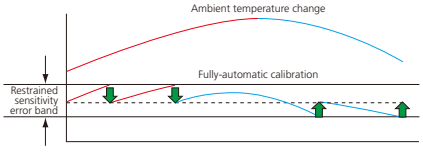
AY RS-232C PCS METAL BODY

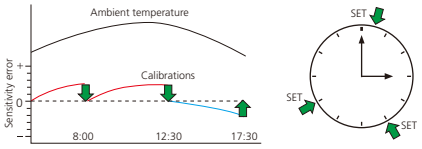
PSC Fully-automatic calibration; PSC (AW only)

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

Clock-CAL function (AW only)

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





ISO GLP/GMP/ISO calibration report

Meets requirements of GLP/GMP/ISO9000.
Calibration reports can be output with date and time, provided by the built-in clock.

WindowsDirect

Weighed data can be directly typed into any Windows application; no interface software is required.
If you'd like to use "WindowsDirect" with "Windows 7" "Windows Vista", or a USB port, please contact your local representative.

Unit conversion

Automatic unit conversion at the push of a button.
Carat and other units are standard.

Data transfer port of AW/AX/AY Series

AW/AX/AY Series

Model name	AW120	AW220	AW320	AX120	AX200	AY120	AY220
Capacity	120 g	220 g	320 g	120 g	200 g	120 g	220 g
Minimum display	0.1 mg						
Pan size (mm)	80						

Note: See page 49 for external dimensions.

Precision Platform Balances

BW-K/BX-K series

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									

Note: See page 49 for external dimensions.

Optional Accessories

Description
RS-232C interface IFB-102A (for multiple connections)
Electronic Printer EP-80/90
Foot Switch FSB-102PK (For printing)
Application Keyboard AKB-301
USB-SERIAL Conversion Kit
RS232C cable
Below-weigh hook

Electronic Printer EP-80

Application Keyboard

Moisture Analyzer

MOC-120H

Moisture Analyzer with a Wide Sample Pan

MOC-120H

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 ending, timed ending, rapid drying, slow drying, step drying, predictive (comparative) measurement
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

Note: See page 51 for external dimensions.

Printer

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

Special Printer and Accessories

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

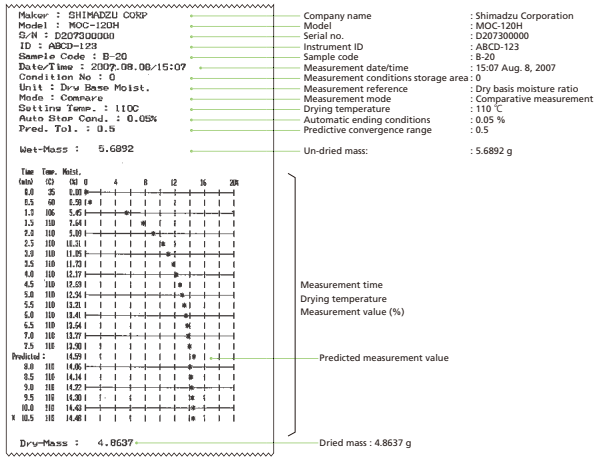
Optional Accessories A Wealth of Accessories to Enhance Your Possibilities

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 Special Printer

[Graph Format (GRP)]



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 Ratio Measurements

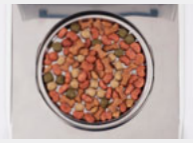
This Unit Makes Moisture Ratio Measurements Quick and Easy

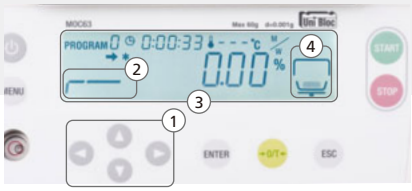
- The moisture ratio is found by heating the sample with the built-in halogen heater to drive out the moisture.
- The measurement procedure is simple. Just close the heater cover to start the measurement (automatic starting mode).
- Measurements are faster than the loss on drying method using a dryer.
- 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.

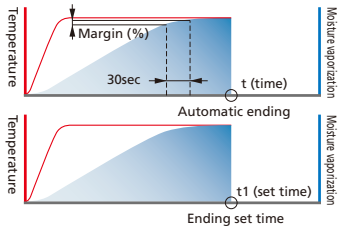
The sample is easy to see!
Wide observation window

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.

Timed Ending Mode
This automatically ends measurement after a preset amount of time (t1).

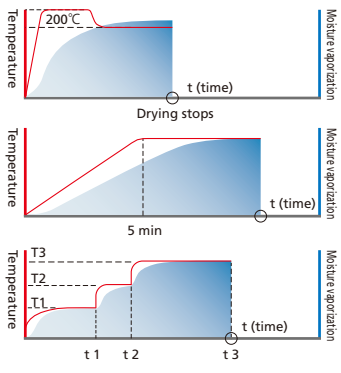


Alternate Drying Modes

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.

Slow Drying Mode
This gently heats samples that might form a surface film or are prone to degrading at high temperatures.

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.



MOC63u

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-80/EP-90) output RS-232C (D-sub9P)
Storage of measurement conditions		10 sets
Data memory		10 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.

Note: See page 51 for external dimensions.

Options A Wealth of Accessories to Enhance Measurement Possibilities

Description
EP-80 Printer
EP-90 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.

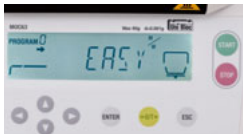
Note: For delivery related matters, contact your Shimadzu representative.

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.

- Built-in RS-232C interface is standard.
- Compatible with printers (EP-80/EP-90). 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 11-02-16
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 : Feb. 16, 2011
- 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-80/EP-90

Moisture Analyzer

MOC63u Sample Applications

Food Product Industry

Measurement of Milk

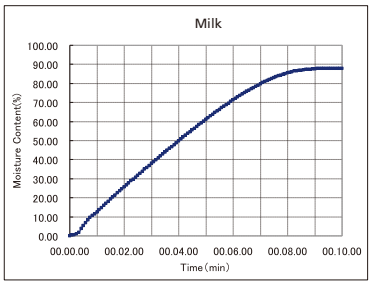
- Fiberglass sheets for liquid measurement were used to promote liquid evaporation.
- Two measurement conditions were used, timed ending and automatic ending modes. Essentially, the same average values were obtained. With samples featuring a principal component that has a relatively high evaporation 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

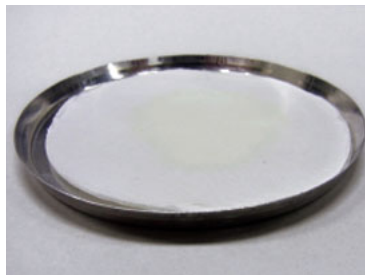
MOC63u		
	Sample mass (g)	Moisture ratio (%)
1st	1.081	87.70
2nd	1.025	87.61
3rd	1.031	87.68
Average		87.66
Standard deviation		0.047
CV(%)		0.05

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



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 Product Industry

Measurement of Instant Coffee

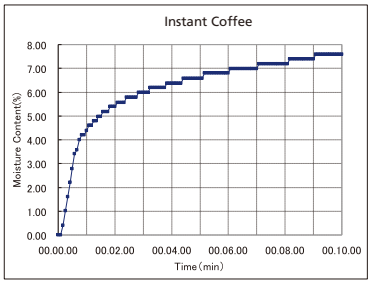
- Commercially available powdered instant coffee was measured.
  A sample of approximately 1 g was placed in the pan, and the pan was shaken to spread the sample over the entire pan.
- Essentially no difference in the moisture ratio was evident in timed ending mode or automatic ending mode. When a high 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.



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.

Food Product Industry

Measurement of White Rice

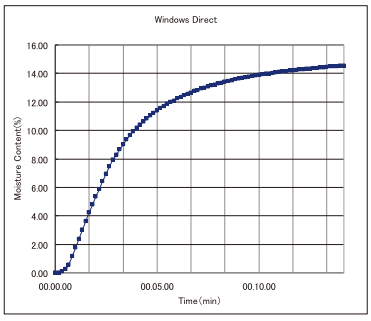
- Polished white rice was used as the sample. The grains were measured as is, without pulverization.
- Almost no rice bran remained, so it was assumed that any lost weight would be due solely to moisture evaporation. There were few volatile components aside from moisture, so favorable repeatability was obtained.
- The entire sample turned yellow after drying. This was likely due to surface scorching.

Measurement of White Rice

Measurement conditions: 200 °C/AUTO 0.05 %

	MOC63u		
	Measurement time	Sample mass (g)	Moisture ratio (%)
1st	14:19	5.938	14.55
2nd	13:40	5.942	14.47
3rd	13:45	5.979	14.43
Average			14.48
Standard deviation			0.061
CV(%)			0.42

The drying curve for white rice in automatic ending mode is shown below.



Photos of the white rice before and after drying are shown below.

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

(After measurement) The entire sample turned yellow.

Food Product Industry

Pharmaceuticals and Cosmetics Industries

Measurement of Corn Starch

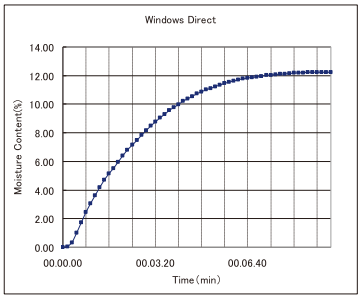
- Approx. 5 g of corn starch was added to the pan, and was spread over the entire surface using the tip of a spoon.
- No change in appearance was evident after drying.
- Favorable repeatability of 1 % max. was obtained.

Measurement of Corn Starch

Measurement conditions: 180 °C/AUTO 0.02 %

	MOC63u		
	Measurement time	Sample mass (g)	Moisture ratio (%)
1st	9:49	5.133	12.27
2nd	9:14	4.910	12.10
3rd	9:12	5.097	12.14
Average			12.17
Standard deviation			0.09
CV(%)			0.73

The drying curve for corn starch in automatic ending mode is shown below.



Photos of the corn starch before and after drying are shown below.

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

(After measurement) There was basically no change in appearance.

Moisture Analyzer

MOC63u Sample Applications

Food Product Industry

Moisture Ratio Measurement of Baked Sweets

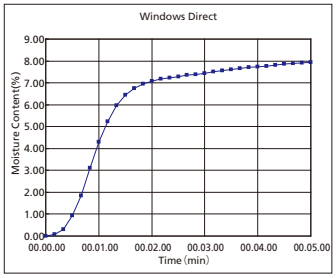
- In the official test method, the drying period in a thermostatic chamber is five hours, so more than five hours are required to obtain the moisture ratio results.
- When the sample was measured using a moisture analyzer (in timed ending mode) at 110 °C, 10 °C higher than the 100 °C drying temperature 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

Food Product Industry

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

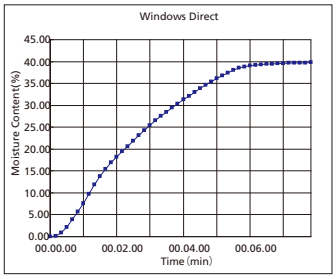
- In the official test method, the drying period in a thermostatic chamber is five hours, so more than five hours are required to obtain the moisture ratio results.
- When the sample was measured using a moisture analyzer (timed ending mode) at 105 °C, the same temperature as specified in the official 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**

Food Product Industry

Moisture Ratio Measurement of Rice Seasoning

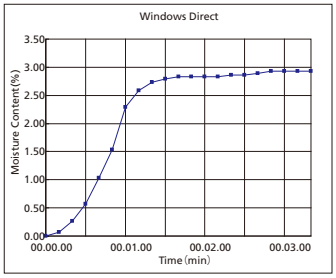
- In the official test method, the drying period in a thermostatic chamber is four hours, so more than four hours are required to obtain the moisture ratio results.
- The sample was measured using a moisture analyzer at 110 °C, 5 °C higher than specified in the official test method (timed ending mode). 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.

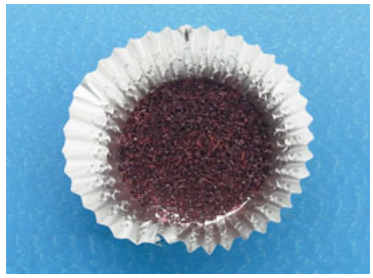
Measurement method	Moisture ratio	Measurement time
Official test method	3.1 %	4 hours
Timed ending mode	2.5 %	15 min
Rapid drying mode	3.0 %	3 min 35 sec

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



Food Product Industry

Moisture Ratio Measurement of Boiled Fish Paste

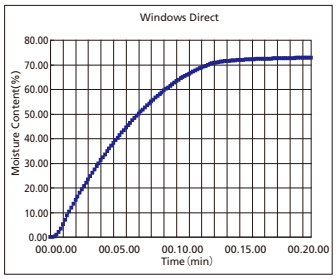
- In the official test method, the drying period in a thermostatic chamber is five hours, so more than five hours are required to obtain the moisture ratio results.
- When the sample was measured using a moisture analyzer at 105 °C, the same temperature as specified in the official test method, the results 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.

Printer

EP-80

- Dot impact printer uses standard paper, suitable for long-term storage
- High-speed printing performance of approx. 3 rows/second
- Thick roll paper reduces need for paper replacement (30 m, can print approx. 8000 lines)
- Equipped with newly developed ergonomic-design push buttons
- Also uses dry cell batteries (6 AA)
- WindowsDirect function compatibility
- Print calibration results by connecting to a balance equipped with ISO print functionality
- Includes statistic calculation functions
- Can turn ON/OFF the balance's autoprint function

Print Method	Dot impact
Inking	Ink ribbon (purple color)
Print Format	24 digits/line (5 × 7 dot matrix)
Print Speed	2.7 lines/sec. (mechanical printing performance)
Character Size	Approx. W1.7 mm × H2.6 mm
Printer Paper	Standard paper 57.5 mm (W) (30 m, for approx. 8,000 lines)
Printer Mechanism Durability	1.5 million lines
Operating Temperature	5 °C to 40 °C
Power Source	AC adaptor (9 V DC/2 A) or alkaline dry cells (6 AA batteries) Battery life: Approx. 10 hours (printing 1 line/5 sec.)
Interface	Serial I/O TTL level
Dimensions	W154 mm × D215 mm × H78.5 mm
Weight	Approx. 630 g
Functions	Statistic calculations (no. of data points, total, maximum value, minimum value, range, average value, standard deviation), Turns ON/OFF balance's autoprint function, PRINT command, TARE command, WindowsDirect function compatibility
Accessories	AC adaptor, paper roll (1 roll), ink ribbon cartridge (1), connection cable

Printer

EP-90

This model augments EP-80 functionality with the following additional functions:

- Simultaneous printing of date, time*, ID, and sample numbers together with measurement results
- Automatic incrementation of sample numbers
- Multiplication function
- Comparator function
- Easily turn ON/OFF a variety of balance applications/functions, such as loading, live animal measurement, and %.

* Date and time printout is performed using data from the balance's internal clock. Printout of this data is not possible if the balance does not have a built-in clock.

Print Method	Dot impact
Inking	Ink ribbon (purple color)
Print Format	24 digits/line (5 × 7 dot matrix)
Print Speed	2.7 lines/second
Character Size	Approx. W1.7 mm × H2.6 mm
Printer Paper	Standard paper 57.5 mm (W) (30 m, for approx. 8,000 lines)
Printer Mechanism Durability	1.5 million lines
Operating Temperature	5 °C to 40 °C
Power Source	AC adaptor (9 V DC/2 A) or alkaline dry cells (6 AA batteries) (Approx. 10 hours continuous use, printing 1 line/5 sec.)
Interface	Serial I/O TTL level
Dimensions	W154 mm × D215 mm × H78.5 mm
Weight	Approx. 630 g
Functions	Statistic calculations, output (PRINT) command, TARE command, date and time printing* (can be printed automatically for each measurement result, based on the balance's internal clock), ID printing, sample number (automatic incrementation) printing, multiplication, comparator, autoprint, ON/OFF command for balance applications/functions, WindowsDirect simultaneous output
Accessories	AC adaptor, paper roll (1 roll), ink ribbon cartridge (1), connection cable

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

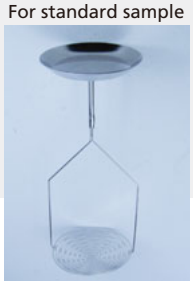
Attach the optional SMK401 Specific Gravity Measurement Kit to a balance in the AU series, and set the balance to specific gravity measurement mode. You can then use the balance as a specific gravity analyzer, capable of automatically calculating and displaying specific gravity values.
Liquid density 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. (See pages 16 and 17.)

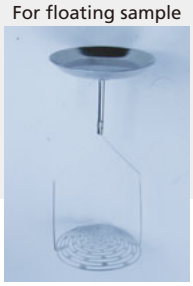
AUW Series + SMK-401

Two kinds of weighing pans as standard.

For standard sample



For floating sample



For detailed Balance specifications see pages 16 and 17.

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/UX series

Measures a Variety of Specific Gravity Values with the Immersion Method

UW/UX Series + SMK-101

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. (See pages 24 and 25.)

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

For detailed balance specifications, see pages 24 and 25.

Uni Bloc

UW/UX Series Balances (large pan type)

						Models with built-in calibration weights				
Model	**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
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/UX Series Balances (small pan type)

								Models with built-in calibration weights						
Model	**UX220H**	**UX420H**	**UX620H**	**UX420S**	**UX820S**	**UX820H**	**UX1020H**	**UW220H**	**UW420H**	**UW620H**	**UW420S**	**UW820S**	**UW820H**	**UW1020H**
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
Required power supply		100 VAC 50/60 Hz (AC adaptor) 12 VA max.							100 VAC 50/60 Hz (AC adaptor) 12 VA max.					

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.
Note: See page 50 for external dimensions.

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!

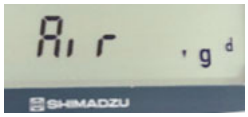
Introduction to the Specific Gravity Measurement Procedures (AU Series)

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.

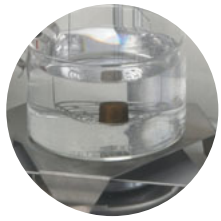
5

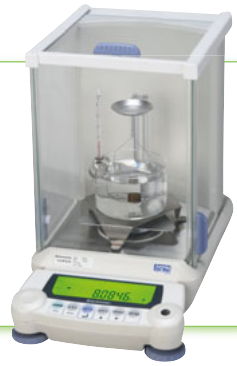
When the stability mark is lit, press the CAL key.

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

6

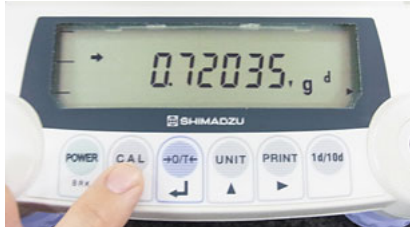
Load the solid sample on the submerged pan.





7

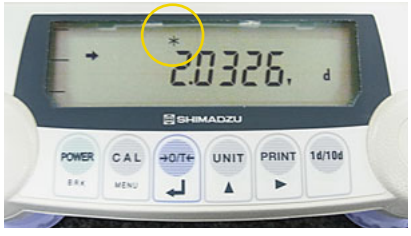
When the stability mark is lit, press the CAL key.



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/UX series

Quick, Stable Measurements of Animal Weight

Bucket for small animals | Deep round bucket | Rectangular bucket

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.

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.

UW Series Uni Bloc

UX Series Uni Bloc

UW/UX Series (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.

For detailed specifications for the UW/UX series, see pages 24 and 25.

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

BX-K Series

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.

For detailed specifications for the BW-K/BX-K series, see page 30.

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

For optional accessories, also see the compatibility table on pages 46 and 47.

Description
EP-80 Printer
EP-90 Printer
RS-232C cable (1.5 m)
USB-serial conversion kit

Accessories for Shimadzu Balances

	AUW-D AUW AUX AUY	ATX ATY	AW AX AY	UW UX	TX	TXB	BL	ELB	BW-K BX-K	MOC-120H	MOC63u
EP-80 	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓
EP-90 											
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**	✓			✓					✓		
for print **FSB-101P**			✓								
for TARE **FSB-101T**			✓								
Specific gravity measurement kit **SMK-101, -102** 				✓							
SMK-201 for ELB large-pan model								✓			
SMK-301 			✓								
SMK-401	✓										

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

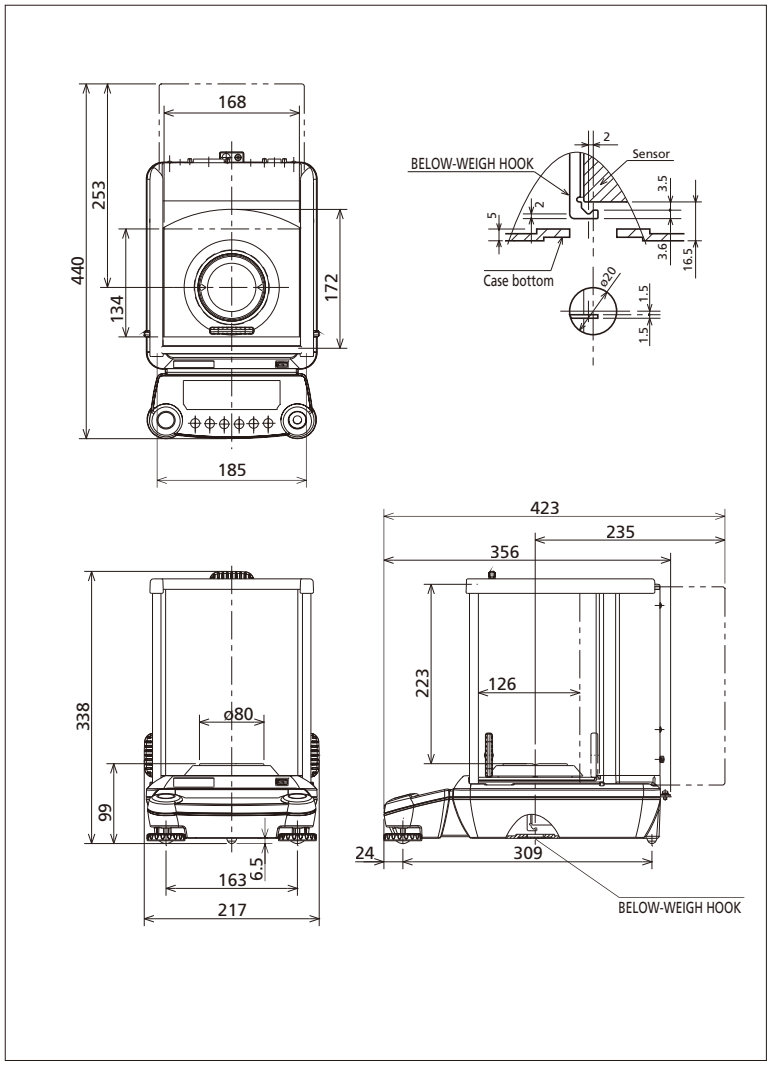
Optional accessories list

Balances	Optional accessories
AUW-D/ AUW / AUX / AUY Series	Electronic Printer EP-80 / EP-90
	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-80 / EP-90
	IFB-102A-UNC
	USB Conversion Kit
	In-use Protective Cover (5 pcs)
	I/O–RS Cable
AW / AX / AY Series	Electronic Printer EP-80 / EP-90
	Foot Switch FSB-102TK (For taring)
	Foot Switch FSB-102PK (For printing)
	Specific Gravity Measurement Kit SMK-301
	RS-232C Cable, for IBM PC/AT Compatibles (25P-9P, Null modem, 1.5m)
TX / TW / TXB / TXC / TWC Series	Electronic Printer EP-80 / EP-90
	In-use Protective Cover (5 pcs)
	RS-232C Cable
BL Series	Electronic Printer EP-80 / EP-90
	In-use Protective Cover (5 pcs)
	Simple Windbreak
	Lid for Simple Windbreak
	IFB-102A-UNC
ELB Series	Electronic Printer EP-80 / EP-90
	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-80 / EP-90
	RS-232C Interface IFB-102A (for multiple connections)
	Foot Switch FSB-102PK (For printing)
	Application Keyboard AKB-301

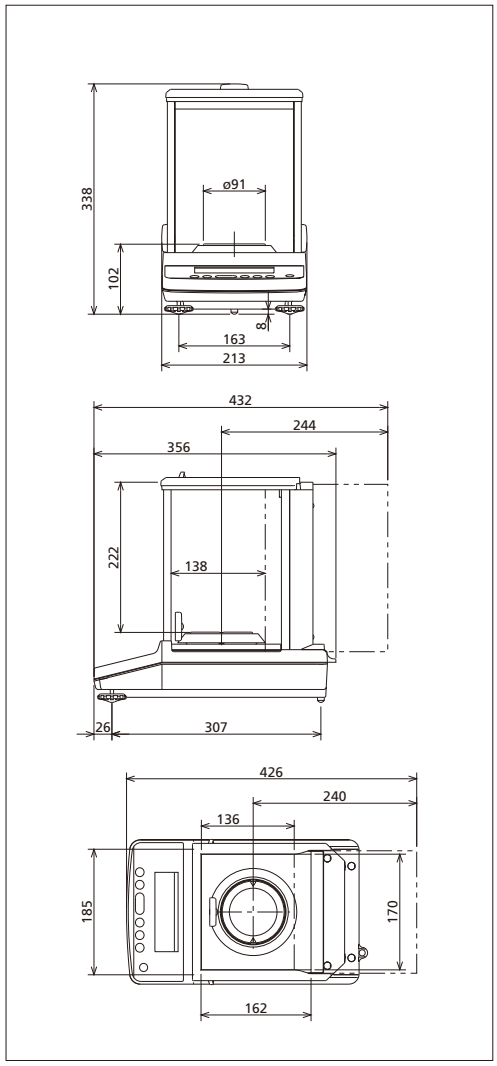
Balances	Optional accessories
UW / UX Series	EP-80 / EP-90 Printer
	RS-232C Interface IFB-102A (for multiple connections)
	Small Size Windbreak (for models with capacity of 300 to 620 g only) (Std Acc. for models with readability of 1 mg)
	Glass Windbreak (for models with capacity of 220 to 820 g only)
	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-80 Printer
	EP-90 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

Physical Dimensions

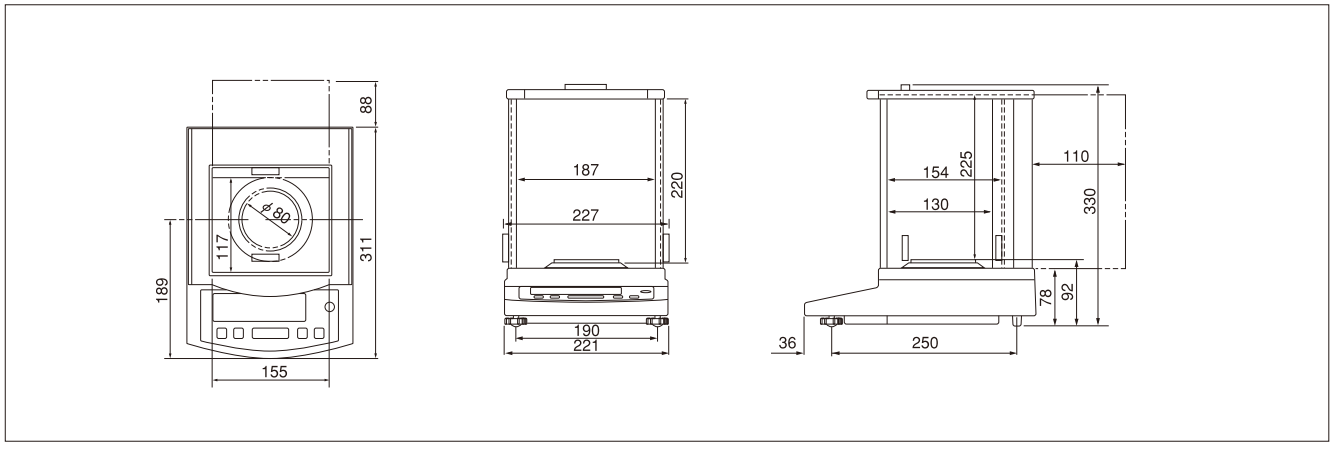
AUW-D/AUW/AUX/AUY Series



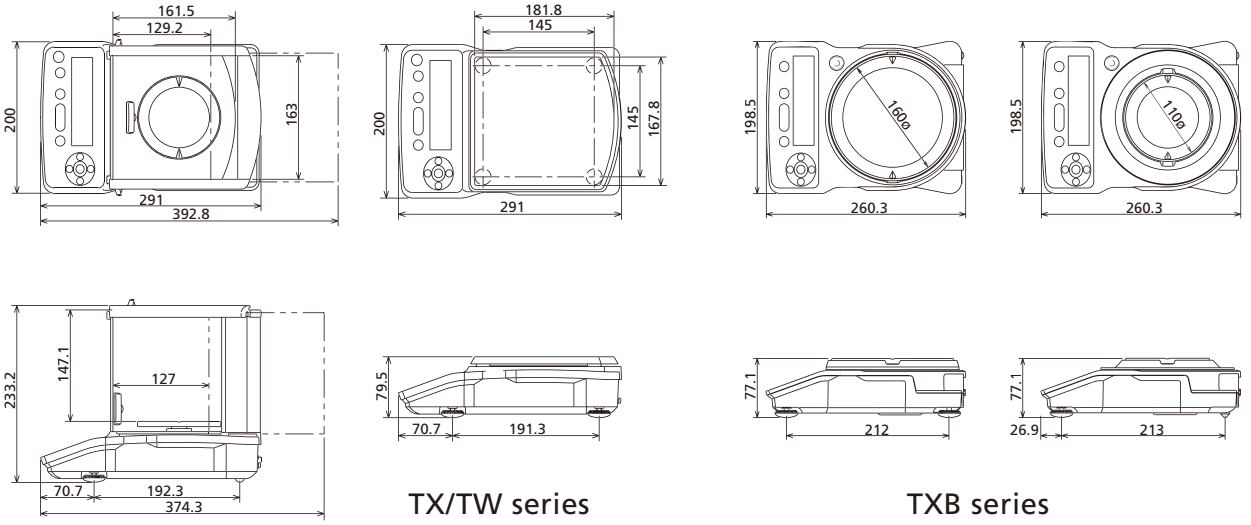
ATX/ATY Series



AW/AX/AY Series



TW/TX/TXB/TWC/TXC Series

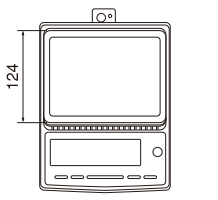


TX/TW series

TXB series

BL Series

Large-pan model



Small-pan model

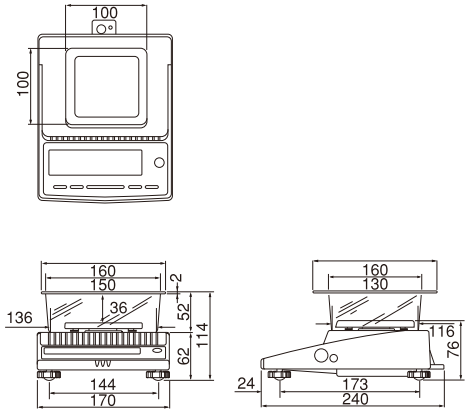
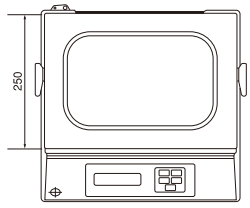


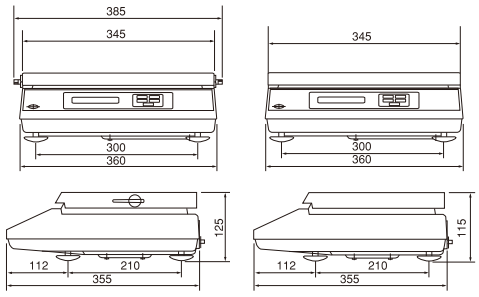
Figure shows combination with windbreak (standard only for BL220H and BL320H)

BW-K/BX-K Series



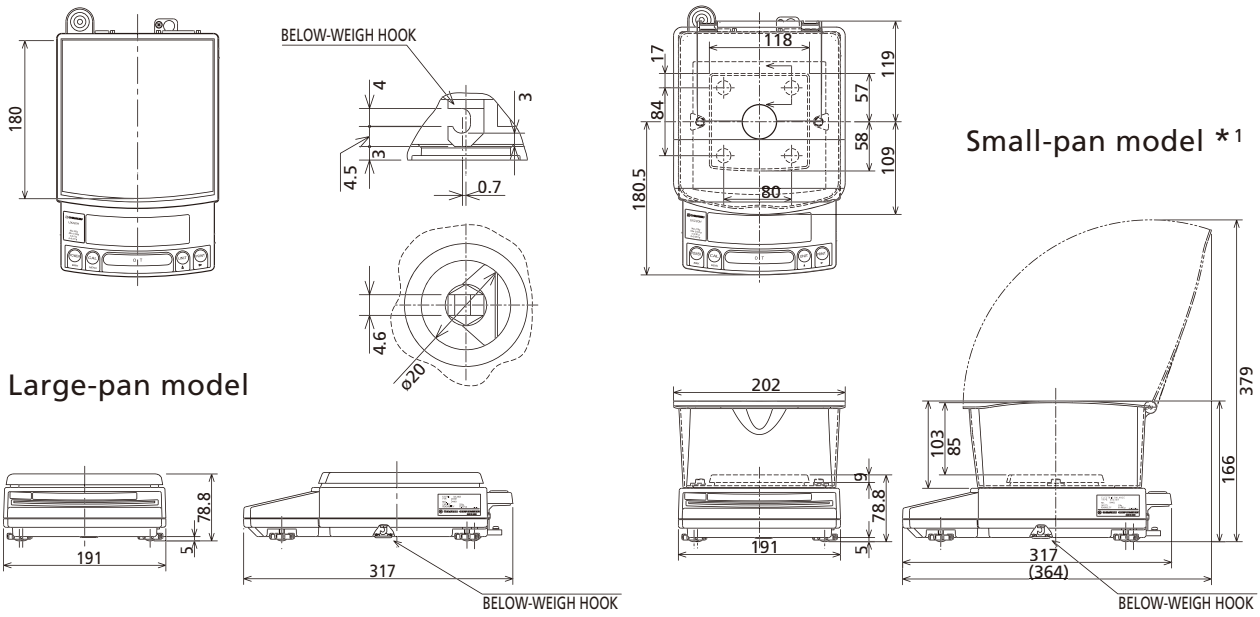
BW-K Series

BX-K Series

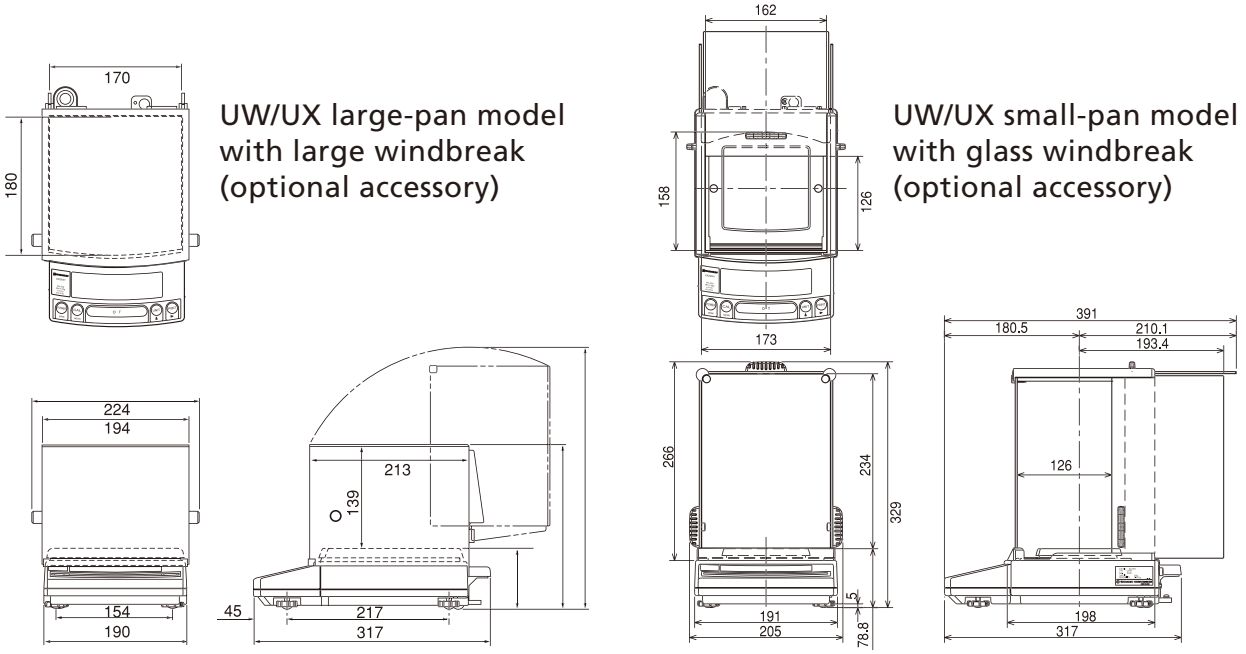


Physical Dimensions

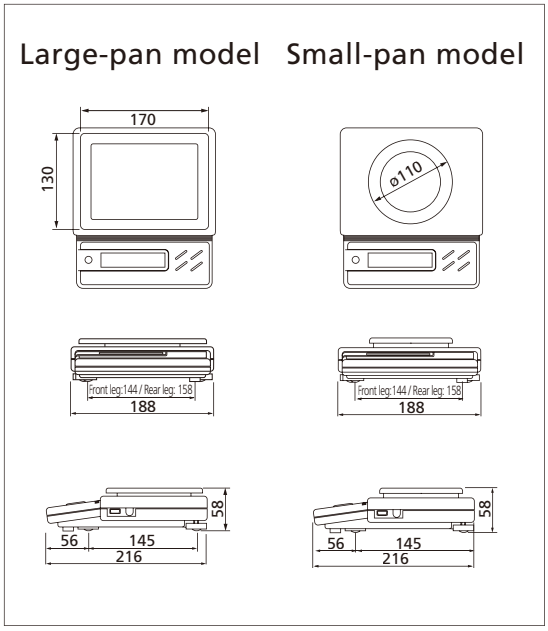
UW/UX Series



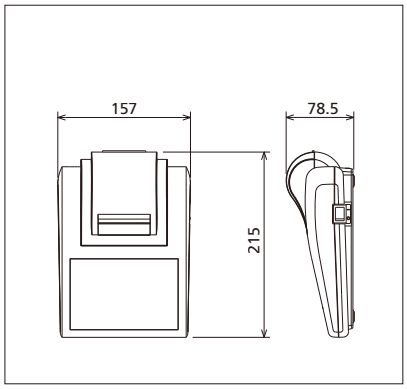
*1 Figure shows combination with simple windbreak (standard only for models with minimum display of 0.001 g).
The delivered windbreak may differ slightly in size and shape.



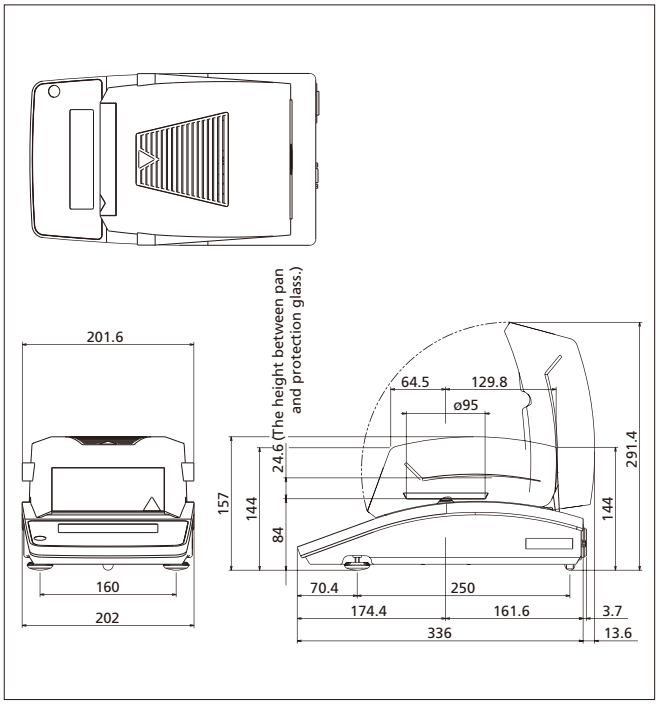
ELB Series



EP-80/EP-90



MOC63u



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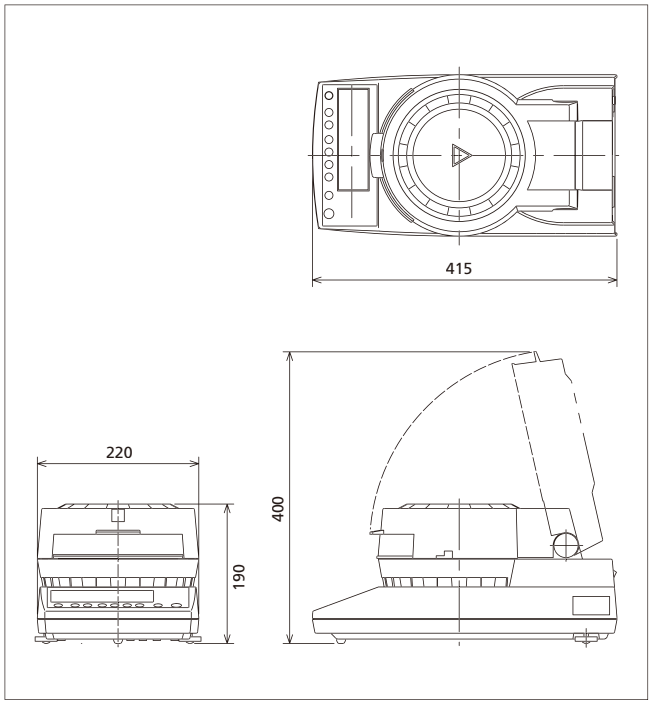

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Printed in Japan 3655-12314-30ANS