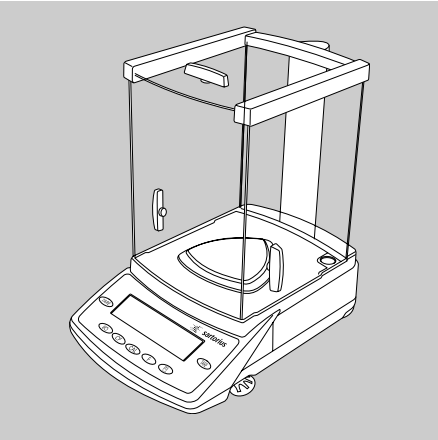
sartorius

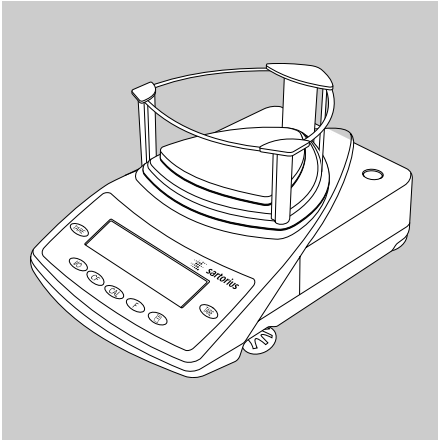
Operating Instructions

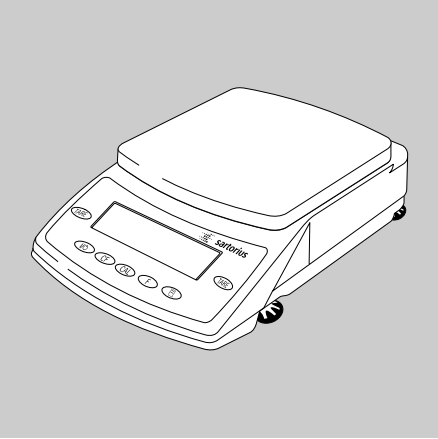
Sartorius Expert

LE Models

Electronic Analytical and Precision Balances







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Contents

Warnings and Safety Precautions

Safety Instructions

● Please read these operating instructions carefully before using your balance to prevent damage to the equipment.

⚠ Do not use this equipment in hazardous areas/locations.

⚠ The balance housing may be opened only by Sartorius service technicians who have been trained at the factory.

⚠ Make sure you disconnect the balance from power before connecting or disconnecting peripheral devices to or from the balance.

⚠ If you operate the equipment under ambient conditions that require higher safety standards, you must comply with the installation regulations applicable in your country.

When cleaning your balance, make sure that no liquid enters the balance housing; use only a slightly moistened cloth to clean the balance.

Installation

⚠ Make sure the voltage rating printed on the AC adapter is identical to your local line voltage.

– Proceed with extreme caution when using pre-wired RS-232 connecting cables, as the pin assignments may not be compatible with Sartorius equipment. Check all pin assignments against the cabling diagrams and disconnect any lines that do not match.

⚠ If there is visible damage to the equipment or power cord, disconnect the equipment from power and lock it in a secure place to ensure that it cannot be used for the time being.

– Connect only Sartorius accessories and options, as these are optimally designed for use with your balance. The operator shall be responsible for any modifications to Sartorius equipment and for any connection of cables or equipment not supplied by Sartorius and must check and, if necessary, correct these modifications and connections. On request, Sartorius will be happy to provide information on operating specifications (in accordance with the Standards for defined immunity to interference).

○ Do not open the balance. If the seal is broken, this will result in forfeiture of all claims under the manufacturer's warranty.

○ If you have any problems with your balance, please contact your local Sartorius office, dealer or service center.

IP Rating:

Industrial protection ratings for the housing:

– LE34001S, LE34001P and LE16001S models meet IP44 requirements
– Other models with readabilities ≥ 10 mg meet IP53 requirements
– Models with readabilities < 1 mg meet IP32 requirements
– The AC adapters meet IP20 requirements

Getting Started

Storage and Shipping Conditions

– Do not expose the balance to extreme temperatures, moisture, shocks, blows or vibration.

Unpacking the Balance

● After unpacking the equipment, please check it immediately for any external damage

○ If damage is evident, refer to the instructions under “Safety Inspection” in the chapter entitled “Care and Maintenance.”

○ Save the box and all parts of the packaging for any future transport. Disconnect all cables before packing the balance for shipping!

Equipment Supplied

– Balance
– Weighing pan
– AC adapter
– Dust cover

Additional equipment for models with readabilities ≤ 0.1 mg and LE...-DS models:

– Electronics box (model LE225D only)
– Draft shield with base plate
– Shield ring

Additional equipment for models with a readability of 1mg:

– Draft shield with shield plate
– Weighing pan receptor
– Base plate

Installation

Choose a location that is not subject to the following negative influences:

– Heat (heater or direct sunlight)
– Drafts from open windows and doors
– Extreme vibrations during weighing
– Excessive moisture

Conditioning the Balance

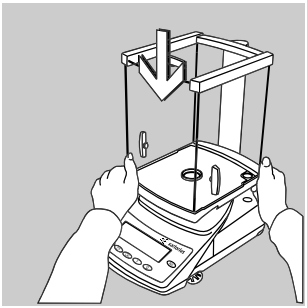
Moisture in the air can condense on the surfaces of a cold balance whenever it is brought into a substantially warmer place. If you transfer the balance to a warmer area, make sure to condition it for about 2 hours at room temperature, leaving it unplugged from AC power.

Seal on Balances Verified for Use in Legal Metrology in the EU*:

EU legislation requires that a control seal be affixed to verified balances of accuracy class Ⓘ. The control seal consists of a sticker with the “Sartorius” logo. If the seal is broken, the verification becomes null and void and the balance must be re-verified.

* Including the Signatories of the Agreement on the European Economic Area

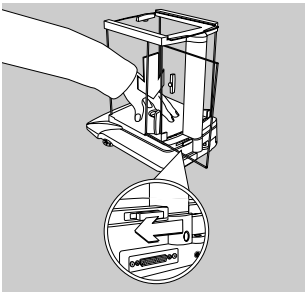
Installation



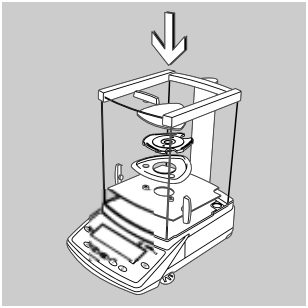
Balances with an Analytical Draft Shield

⚠ Check the sliding lock device on the back of the draft shield; make sure it is in the “open” position (to the right).

● Position the draft shield carefully on the balance



● Secure the draft shield by pressing lightly on the draft shield base and moving the sliding lock device to the left

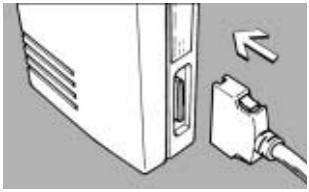


● Place components inside the chamber in the following order:

– Base plate

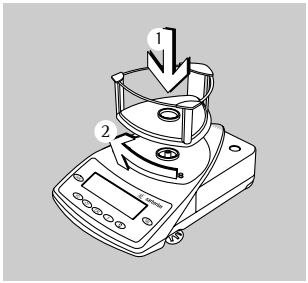
– Shield ring

– Weighing pan



Connecting Model LE225D(-0CE) to the Electronics Box

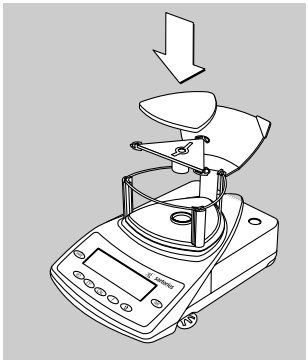
– Plug the male connector on the cable into the female connector on the electronics box



Balances with a 3-Sided Draft Shield

● Place draft shield on the balance with the cover opening in front on the right

● Turn the draft shield clockwise until it is firmly in position



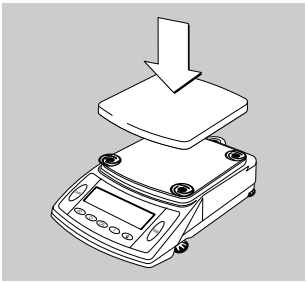
● Place components inside the chamber in the following order:

– Base plate

– Weighing pan receptor

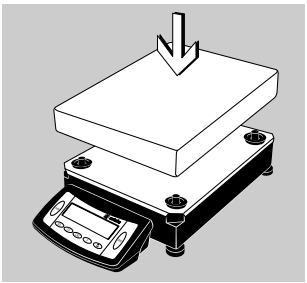
– Weighing pan

○ To access the weighing chamber from the side, remove side panels as desired



Balances with a Rectangular Weighing Pan and a Weighing Capacity up to 10 kg

- Place the weighing pan on the balance



Balances with a Rectangular Weighing Pan and a Weighing Capacity over 10 kg

- Place the weighing pan on the balance

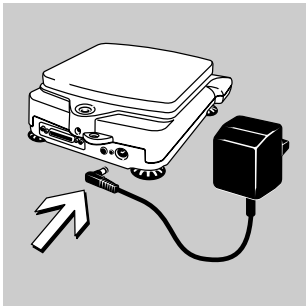
Connecting the Balance to AC Power/Safety Precautions

○ Use only original Sartorius equipment. The AC adaptor meets the requirements of IP20 in accordance with EN 60529.

○ For AC adapters with higher protection ratings or for an external rechargeable battery pack, please see “Accessories.”

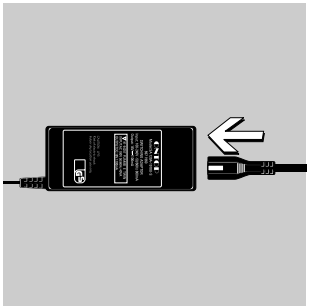
LE225D:

● Insert the right-angle plug from the AC adapter into the jack on the electronics box.



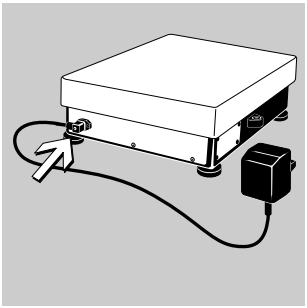
All Other Balances with a Weighing Capacity up to 10 kg:

● Insert the right-angle plug from the AC adapter into the jack on the balance.



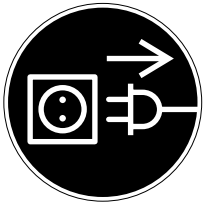
Connect the power cord to the AC adapter (on balances with weighing capacities up to 10 kg)

○ Use an original Sartorius AC adapter with a wide input voltage range (100 to 240 V~), order no. 6971966, and replaceable power cord:
6900900 (Europe)
6900901 (US/CDN)
6971945 (UK)
6900905 (AUS)
6900902 (ZA)



Balances with a Weighing Capacity over 10 kg:

- Insert the right-angle plug into the jack and tighten the screw.



Safety Precautions

Plug-in AC Adapter:
The AC adapter rated to Class 2 can be plugged into any wall outlet without additional safety precautions.

Benchtop AC Adapter 6971966:
The AC adapter rated to Class 1 can be plugged into any wall outlet without additional safety precautions.

The ground terminal is connected to the balance housing, which can be additionally grounded for operation. The data interface is also electrically connected to the balance housing (ground).

Note:
This equipment has been tested and found to comply with the limits pursuant to part 15 of FCC Rules. These limits are designed to provide reasonable protection against harmful interference. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with these instructions, may cause harmful interference to radio communications.

For information on the specific limits and class of this equipment, please refer to the Declaration of Conformity. Depending on the particular class, you are either required or requested to correct the interference.

If you have a Class A digital device, you need to comply with the FCC statements as follows: “Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.”

If you have a Class B digital device, please read and follow the FCC information given below:

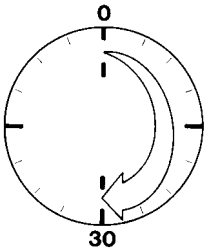
However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Before you operate this equipment, check which FCC class (Class A or Class B) it has according to the Declaration of Conformity included. Be sure to observe the information of this Declaration.

Connecting Electronic Peripheral Devices

● Make sure to unplug the balance from AC power before you connect or disconnect a peripheral device (printer or PC) to or from the interface port.



Warmup Time

To ensure accurate results, the balance must warm up for 30 minutes before operation. Only after this time will the balance have reached the required operating temperature.

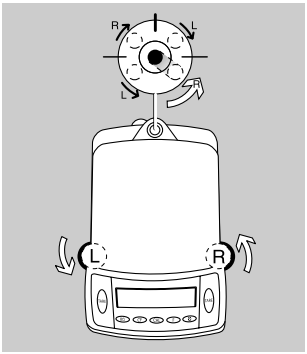
Using Verified Balances in Legal Metrology:

○ Allow the equipment to warm up for at least 24 hours after initial connection to AC power.

Leveling the Balance

Purpose:

– To compensate for unevenness at the place of installation



Leveling Balances with a Weighing Capacity up to 10 kg

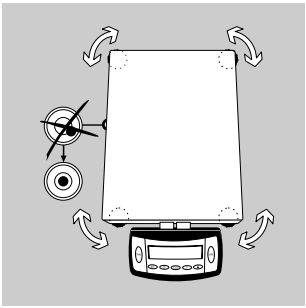
Only the 2 front feet are adjusted to level the balance.

● Retract the two rear feet (only on models with a rectangular weighing pan).

● Turn the 2 front feet as shown in the diagram until the air bubble is centered within the circle of the level indicator.

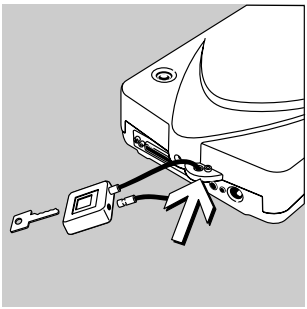
> In most cases this will require several adjustment steps.

● For weighing heavy samples: Extend the 2 rear feet until they touch the surface on which the balance rests (only on models with a rectangular weighing pan).



Leveling Balances with a Weighing Capacity over 10 kg

- Adjust the leveling feet until the air bubble is centered within the circle on the level indicator.

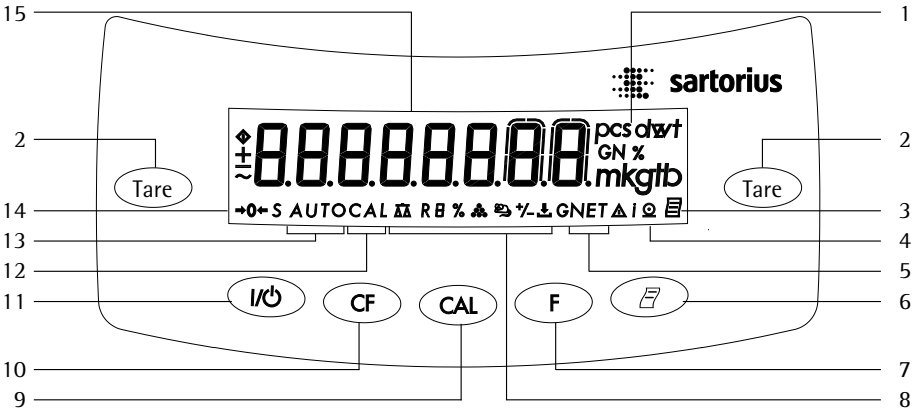


Antitheft Locking Device on Balances with a Weighing Capacity up to 10 kg

- To secure the balance at the place of installation, fasten a chain or a lock to the lug located on the rear panel of the balance.

Operation

Overview of Display and Operating Elements



Position	Designation
1	Weight units
2	Taring
3	Symbol: “GLP printing mode active”
4	Symbol: “Printing mode active”
5	Display: Data in memory for net-total formulation program
6	Data output: Press this key to output readout values to the built-in data interface.
7	Function key: Start application program
8	Symbols for active application
9	Start calibration/adjustment routine Position

Position	Designation
10	Delete (Clear Function) This key is generally used to cancel functions. – Quit application program – Cancel calibration/adjustment routine
11	On/off
12	Display: Calibration/adjustment function
13	Display: Animal weighing with automatic start
14	Symbols for stand-by mode or zero range
15	Weight value displayed in selected weight unit

Basic Weighing Function

Purpose
The basic weighing function can be used alone or in combination with an application program (counting, weighing in percent, etc.).

Features
- Taring the balance.
- Assigning IDs to weights (as needed).
- Printing weights.

Using Verified Balances as Legal Measuring Instruments in the EU*:
The type-approval certificate for verification applies only to non-automatic weighing instruments.
For automatic operation with or without auxiliary measuring devices, you must comply with the regulations applicable to the place of installation.

● Before using the balance as a legal measuring instrument, calibrate and adjust it at the place of use using the built-in motorized calibration weight; for details, see “Calibration/Adjustment” in this chapter.

○ The temperature range (°C) indicated on the verification label may not be exceeded during operation.

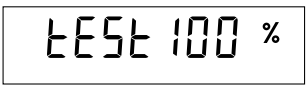
Example:
BD BL 200
+10°C to +30°C
0°C to +40°C isoCAL
Ⓘ

* Including the Signatories of the Agreement on the European Economic Area

Preparation
A circle in the upper right-hand corner of the display indicates that the balance was disconnected from power.
This symbol is shown, for example, the first time the balance is put into operation, or after a power outage.

● Switch on the balance: Press (I/⏻).

> All symbols on the display light up briefly.

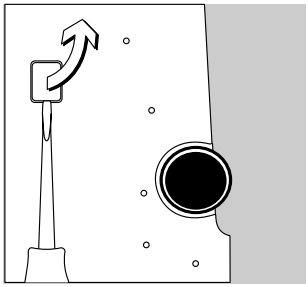


> The balance performs a display test.

○ Tare the balance, if necessary: Press (Tare)
When you turn on the balance, the ⏀ symbol is displayed until you press a key.
If the ⏀ symbol is displayed during operation, this indicates that the processor is performing a function and cannot receive further commands at the moment.

Additional Functions

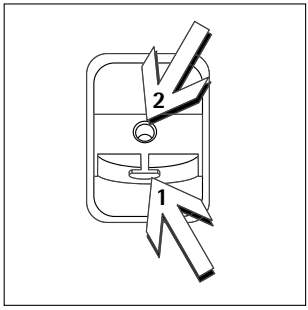
● Switching off the balance: Press (I/⏻)
A circle in the lower left-hand corner of the display indicates that the balance has been switched off and is in stand-by mode.



Below-Balance Weighing
A port for a below-balance weighing hanger is located on the bottom of the balance (for models with a weighing capacity of 12 kg or more, order the hanger directly from Sartorius).

○ Below-balance weighing is not permitted in legal metrology.

● Open cover plate on the bottom of the balance.

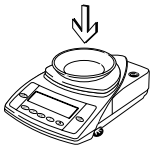


● Using the built-in hanger (1): Attach the sample (e.g., using a suspension wire) to the hanger.

○ Bore hole (2): Carefully fasten the special hanger, or order a hanger directly from Sartorius.

○ If necessary, install a shield for protection against drafts.

Example
Simple Weighing

Step	Key (or instruction)	Display/Data Output
1. Switch on the balance. Self-test is performed, followed by automatic initial tare function.	I/⏻	+ 0.0 g
2. Place container on the balance (in this example, 11.5 g).		+ 11.5 g
3. Tare the balance.	Tare	+ 0.0 g
4. Place sample in container on balance (in this example, 132 g).		+ 132.0 g
6. Print weight.	⎙	N + 132.0 g

Calibration and Adjustment

Purpose
Calibration is the determination of the difference between the weight readout and the true weight (mass) of a sample. Calibration does not entail making any changes within the balance.

Adjustment is the correction of any difference between the measured value displayed and the true weight (mass) of the sample, or the reduction of the difference to an allowable level within the maximum permissible error limits.

Using Verified Balances as Legal Measuring Instruments in the EU*: Before using your balance as a legal measuring instrument, you must perform "internal calibration" at the place of installation after the warmup period.

Features
Calibration/adjustment can be performed only when:
- there is no load on the balance,
- the balance is tared, and
- the internal signal is stable.

If these conditions are not met, an error message is displayed (Err 02).

Adjustment can be performed
- automatically following calibration (↑ 10 1), or
- manually, at operator discretion, after calibration (↑ 10 2)

The weight displayed for the sample on the balance must not differ from the nominal weight by more than 2%.

You can use any of the following weight units to calibrate/adjust the balance: g, kg, lb (↑ 11 1 to 3, factory setting: ↑ 11 1)

You can block calibration/adjustment of the balance as follows:
- Select menu code ↑ 9 7, and
- Close the menu access switch on the back of the balance
- You can have calibration/adjustment start automatically when a specified time or temperature limit is reached (isoCAL function; ↑ 15 3).

You can have calibration and adjustment results documented as an ISO/GLP-compliant printout; see page 47.

External Calibration in Verified Balances of Accuracy Class (II)
- When the balance is used in legal metrology, external calibration is blocked by a seal over the menu access switch.

* including the Signatories of the Agreement on the European Economic Area

Internal Calibration/Adjustment
The menu code setting *1 9 3*
must be selected in the Setup menu.

Inside the balance housing is a motorized calibration weight which is applied and removed automatically for internal calibration.

● Activate calibration: Press (CAL)

> The built-in calibration weight is applied automatically

> The balance is calibrated

> If "Calibrate, then auto adjust in one operation" is selected in the Setup menu, the balance is now adjusted automatically.

> The internal calibration weight is removed.

Calibration and Adjustment Sequence
In the Setup menu, you can configure whether:

– calibration is always followed automatically by adjustment (*1 10 1*; factory setting), or

– you have the choice of ending the sequence or starting adjustment after calibration (*1 10 2*)

If no difference is determined between nominal and actual weights, you can end the calibration routine following calibration.
Two keys are active at this point:

– (CAL) = start adjustment

– (CF) = end the sequence

isoCAL:
Automatic Calibration and Adjustment
The menu code setting 1 15 3 must be selected in the Setup menu.

- Temperature range with isoCAL: 0°C to +40°C

The "AUTOCAL" display automatically begins flashing if the ambient temperature has changed in relation to the temperature at the time of the last calibration/adjustment, or after a defined time interval has elapsed.
The balance is telling you that it wants to self-calibrate and adjust.

This adjustment prompt is activated when:

- The change in temperature or the elapsed time interval is greater than that shown in the table below
- The load on the pan has not been changed within the last 2 minutes
- The balance has not been operated within the last 2 minutes
- The weight on the pan is no more than 2% of the maximum capacity of the balance
- Then let the balance perform the adjustment procedure

When these requirements are met, the following symbols are displayed:

- C in the measured value line
- AUTOCAL flashes in the symbol display

In the Setup menu, you can configure the balance to display the adjustment prompt only, without performing calibration/adjustment automatically (menu code 1 15 2)

isoCAL Deactivated on Verified Balances:
The permitted operating temperature range for balances used in applications subject to legal metrology (legal for trade) is restricted as follows:

- Balances of accuracy class (I): +15°C to 25°C (+59 to +77°F)
- Balances of accuracy class (II): +10°C to +30°C (+50 to 86°F)

Fully automatic adjustment is initiated under the following conditions:

Model	When the temperature changes by	After a time interval of
LE225D, LE324S, LE244S	1.5 Kelvin	4 h
LE623S, LE623P, LE6202S, LE5202S-DS, LE6202P, LE4202S	2 Kelvin	6 h
LE323S, LE2202S, LE34001P, LE34001S	4 Kelvin	12 h
LE5201, LE10001, LE16001S	4 Kelvin	24 h

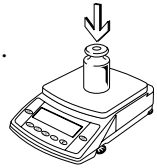
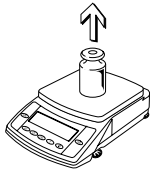
These values are also set in the corresponding verified balances (LE models with the -0CE designation).

Internal Calibration

Step	Key (or instruction)	Display
1. Tare the balance.	Tare	0.0 g
2. Start calibration. The internal weight is applied automatically.	CAL	C CAL
3. The balance is calibrated (displayed only if menu code 1 10 2 is set).		– 0.2 g CAL ± ⚠
4. If the "Calibrate, then auto adjust" setting is selected (1 10 1), the balance is now adjusted automatically.		AdJuSt* CAL
5. The calibration sequence is completed.		CC CAL
6. The internal weight is removed.		0.0 g

* = displayed only if menu item 1 10 2 is selected.

External Calibration

Step	Key (or instruction)	Display
1. Tare the balance.	w	0.0 g
2. Start calibration.	q	+ 5000.0 g CAL ⚠
3. Apply the prompted calibration weight (in this example, 5000 g).		
4. The balance is calibrated (displayed only if menu code 1 10 2 is set).		– 0.2 g CAL ± ⚠
5. If the "Calibrate, then auto adjust" setting is selected (1 10 1), the balance is now adjusted automatically.		AdJuSt* CAL
6. The calibration sequence is completed.		CC CAL
7. After calibration/adjustment, the weight is displayed with weight unit		+ 5000.0 g
8. Remove the calibration weight.		0.0 g

* Adjust shown only if menu code 1 10 2 is set.

Important note:
Afterwards, do not perform internal calibration/adjustment again.

Configuration

Purpose
To adapt the balance to individual requirements by choosing from parameters options in the Setup menu.

Features
To open the Setup menu, switch the balance off and then on again by pressing (I/⏻). While all segments are lit, press (Tare) briefly.

Scroll upward ↑: Press (CAL)
Scroll to the right →: Press (⎙)
Confirm input: Press (Tare)
Save settings and exit menu:
Press and hold (Tare) (> 2 sec.)

● **Printing the Parameter Settings**
– At the 3rd menu level (lowest level; see also the next page): Press and hold (⎙) (> 2 sec.)

> Printout (Example)
`Menu 7 1 1`

– At the 2nd menu level: Press and hold (⎙).

> Printout (Example)
`Menu 7 1 1`
`Menu 7 2 1`
`Menu 7 3 1`

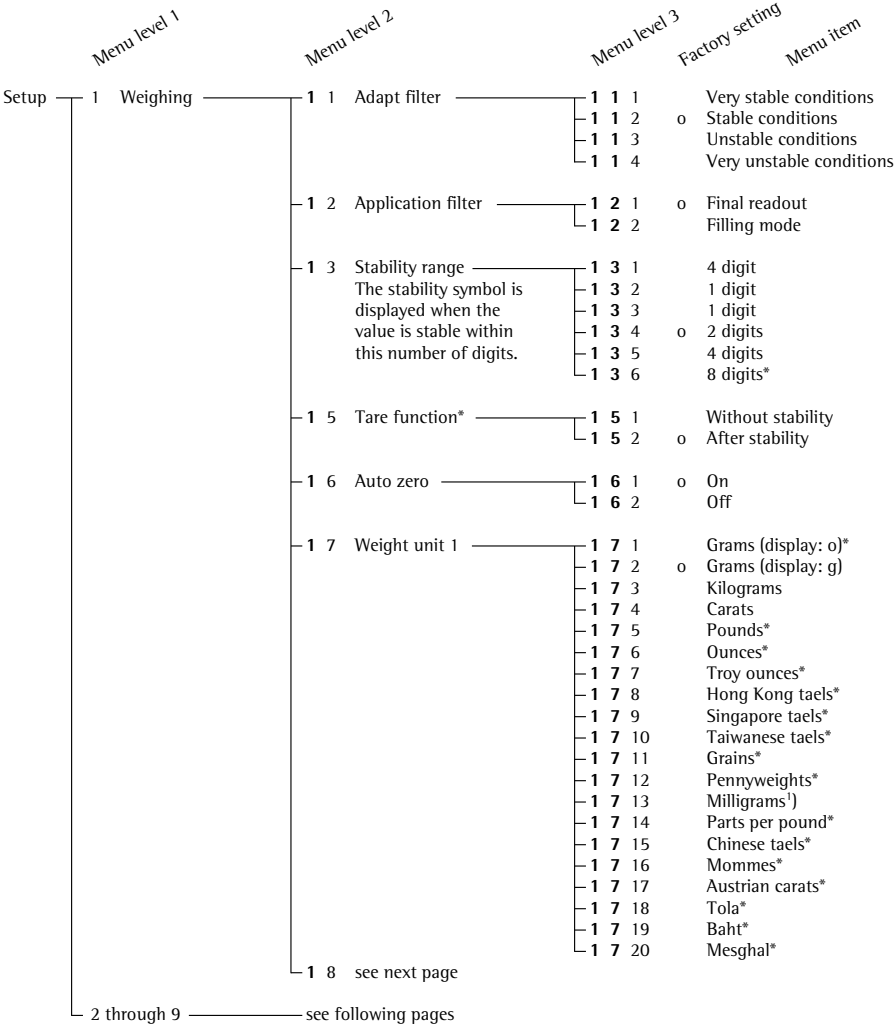
– All current menu settings are printed when the 1st menu level (highest level) is displayed:
Press and hold (⎙).

Setting the Parameters (Menu Codes)
Example: Adapting the balance to “very unstable” ambient conditions (menu code 114).

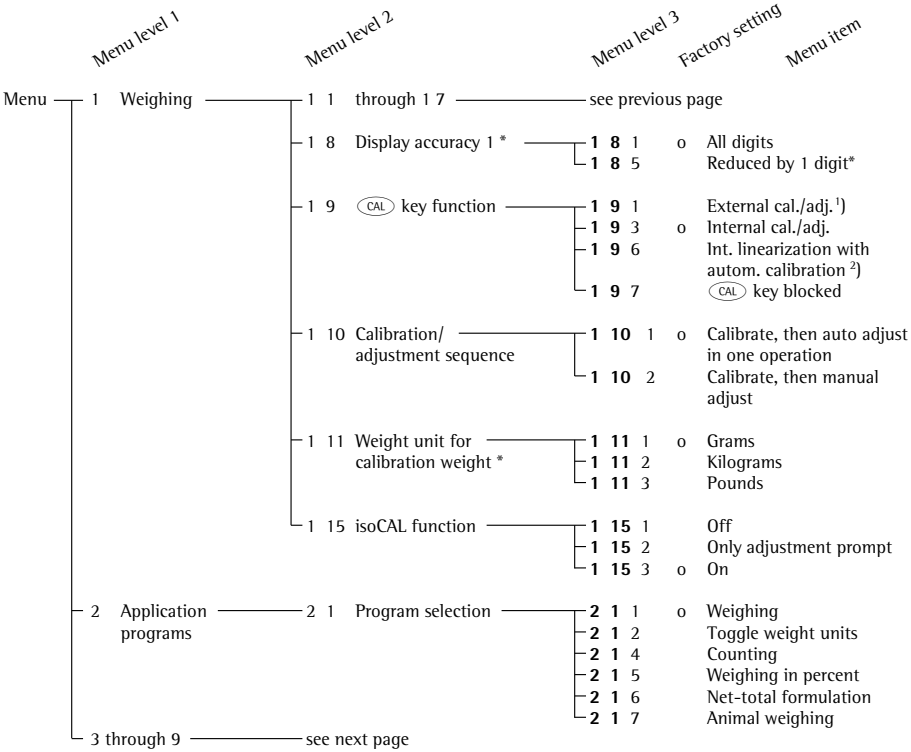
Step	Key (or instruction)	Display
1. Switch off the balance.	(I/⏻)	
2. Switch the balance on;	(I/⏻)	
while all segments are displayed:	(Tare) briefly	1
○ Scroll upward within a menu level; after the last menu code, the first code is displayed again.	(CAL) repeatedly	2 LO 1
3. Select menu level 2 (scroll to the right).	(⌸)	11
4. Select menu level 3 (scroll to the right).	(⌸)	112 o
5. Menu level 3: Scroll until the desired number is shown.	(CAL) repeatedly	114
6. Confirm change; “o” on display indicates active setting.	(Tare)	114 o
○ Return to higher menu level (from the third level).	(⌸)	1
○ Set other codes as desired.	(⌸), (CAL)	
7. Save changes and exit the menu or	Press and hold (Tare) (> 2 sec.)	
○ Exit menu without saving changes.	(I/⏻)	

Parameter Settings (Overview)

o Factory setting
√ User-defined setting

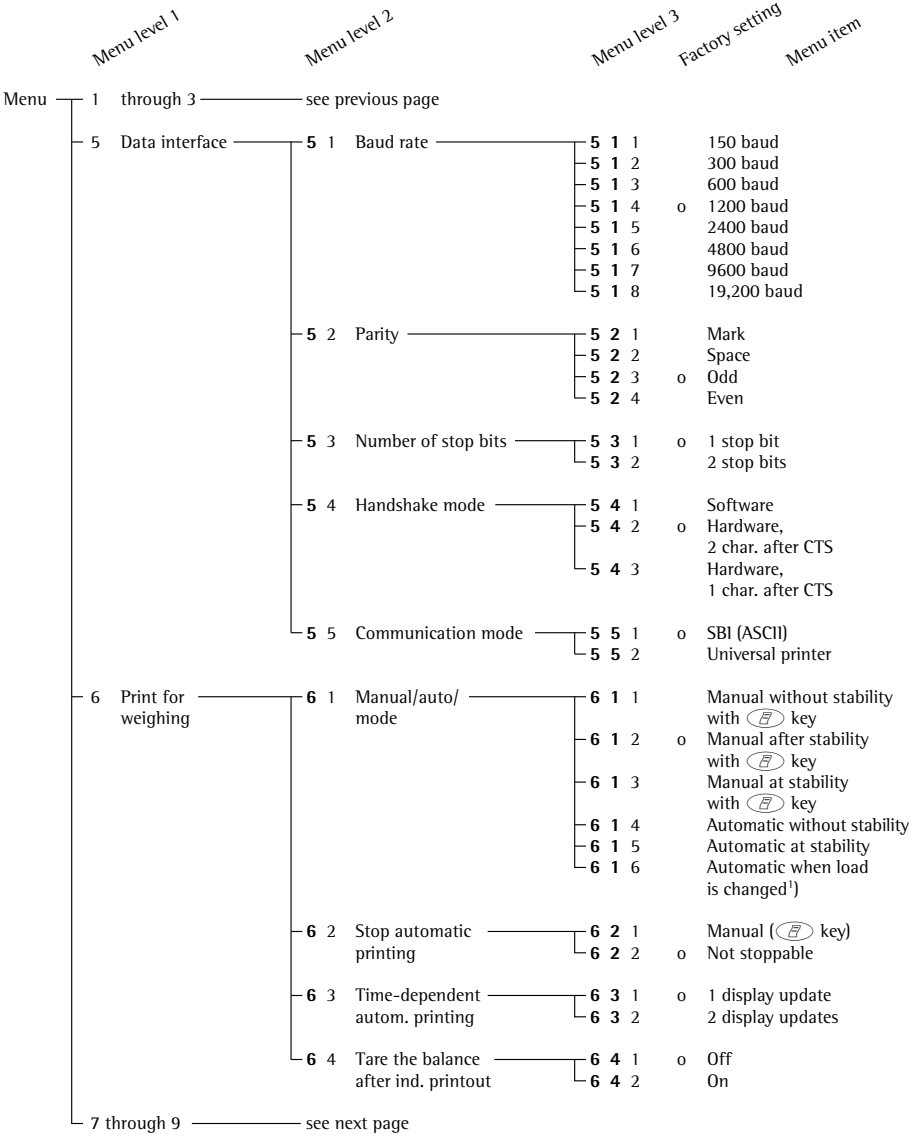


* = Not available in balances verified for use in legal metrology
1) = Not available on verified balances of accuracy class (II)

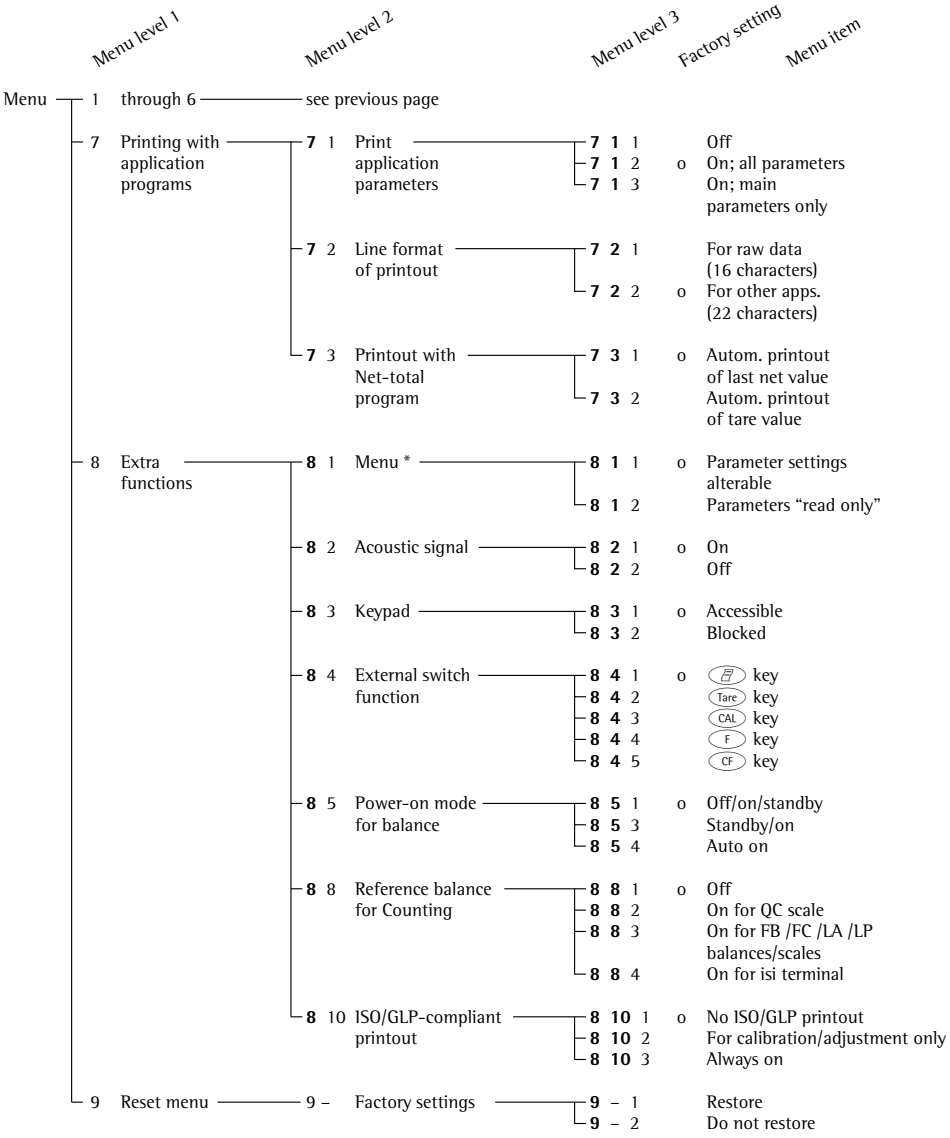


* = Setting cannot be changed on verified balances
1) = Not available on verified balances of accuracy class II
2) = only for LE225D(-OCE)

* = Setting cannot be changed on verified balances
[1]) = Not available in verified balances of accuracy class (II)



[1]) = Auto print when load change is > 10 d and stability is reached: no printout until residual difference in load value is < 5 d



*= Setting cannot be changed on verified balances

Setting IDs, Time, Date and Display Brightness

Purpose

- Configuring measurement environment parameters for ISO/GLP-compliant data records.
- Setting date and time (for ISO/GLP-compliant records only).
- Adapting display to ambient lighting conditions.

Features

- Enter up to 8 characters to identify a measurement series. Permissible characters include the numbers 0 through 9 and the dash or minus sign ("–"). A dash is output as a space on printouts. Leading zeroes are not output.
- Date and time at beginning and end of ISO/GLP-printouts.
- Display brightness [1]):
  0 = off; levels of brightness: 1 through 9

Key functions during configuration:

Activate input of IDs, time and date:
Switch the balance off and then on again by pressing (I/⏻); while all segments are displayed, press the (F) key briefly

Scroll upward ↑: Press (CAL)
Scroll to the right →: Press (⌸)

Confirm input and toggle between IDs, time and date: Press (Tare)
Save settings and exit menu:
Press and hold (Tare) (> 2 sec.)

[1]) No display backlighting on models LE225D and LE225D-0CE

Example: Setting the time, date and display brightness

Step	Key (or instruction)	Display
1. Switch off the balance.	(I/⏻)	
2. Switch the balance on;	(I/⏻)	
while all segments are displayed:	(F) briefly	--------
○ To move the cursor within ID number:	(⌸) repeatedly	--------
○ To set or change ID:	(CAL) repeatedly	-3------
3. Confirm ID and activate time setting.	(Tare)	H 10. 14. 11
4. Select 24-hour clock (“H”) or 12-hour clock (“P”).	(CAL)	H 10. 14. 19
5. Toggle between hours, minutes and seconds.	(⌸)	H 10. 15. 19
6. Synchronize seconds with a reference clock.	(CAL)	H 10. 15.00
7. Confirm time and activate date.	(Tare)	29.JAn.01 11
8. Set date “Day”, “Month”, and , if desired, “Year”. Confirm date and activate display brightness.	(CAL) repeatedly, (⌸) (CAL) repeatedly, (⌸) (CAL) repeatedly (Tare)	01.JAn.01 22.APr.01 22.APr.01

Step	Key (or instruction)	Display
9. Set display brightness.	(CAL) repeatedly	LAMP 7
10. Save changes and exit the menu	Press and hold (Tare) (2 sec.)	
or		
○ Exit menu without saving changes.	(I/⏻)	

Application Programs

Function Keys

(F) key: Start application program/ store component

(CF) key: press and hold for 2 seconds: Toggle between component weight and total weight (net-total formulation); change reference quantity (counting), reference percentage (weighing in percent) or number of measurements (animal weighing)

(CF) key: End application program; delete

Using Verified Balances as Legal Measuring Instruments in the EU*:
All application programs can be selected on balances used as legal measuring instruments.
Calculated values are alternately indicated with the following symbols:

- Percent = %
- Piece count (Counting) = pcs
- Computed value = o, ⚠

* Including the Signatories of the Agreement on the European Economic Area

Net-total Formulation

Menu code: 216

Display symbol: ⬇

Purpose
With this application program you can weigh in different components up to a defined total.

Features
- Weigh up to 99 components from "0" to a defined total component weight.
- Store component weights ("Store xx comp."), with
  - display zeroed automatically after value is stored, and
  - automatic printout
- Clear component memory following cancellation of the weighing sequence (by pressing CF) and printout of the total weight.
- Toggling between component weight and total weight by pressing and holding F (2 sec.).
- Printout of the total of the individual component weights (T COMP)

Preparation
Set parameters for net-total formulation:

- Set parameters for automatic printout when component stored

2 Application programs
- 2 1 Program selection
  - 2 1 6 Net-total

7 Print for application
- 7 1 Print application parameters
  - 7 1 1 Off
  - 7 1 2 o On; all parameters
  - 7 1 3 On; main parameters only
- 7 3 Printout of net-total formulation data
  - 7 3 1 o Autom. print of last net value
  - 7 3 2 Autom. print of tare value

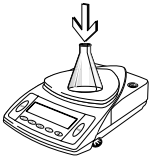
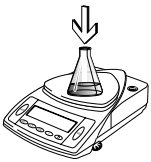
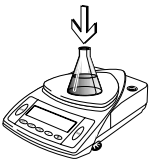
o = Factory setting

Printout of Net-total Formulation Data

COMP2 + 278.1 g:	Second component
T COMP+ 2117.5 g:	Sum of components
T1 + 1821.5 g:	Tare weight (2nd tare memory)
N1 + 278.1 g:	Net weight = Gross – tare 2nd tare memory
N + 2099.6 g:	Net weight = Gross – tare

Example: Counting parts into a container

Settings: Application program: Net-total formulation 216;
Print application parameters: On, print all 712; Automatic printout of last net value 731

Step	Key (or instruction)	Display/Data output
1. Place empty container on the balance.		+ 65.0 g
2. Tare the balance.	Tare	0.0 g
3. Add first component.		+ 120.5 g
4. Store component data.	F	0.0 g NET COMP1 + 120.5 g
5. Add next component.		+ 70.5 g
6. Store component data.	F	0.0 g NET COMP2 + 70.5 g
7. Weigh in further components as desired.	Repeat steps 5 and 6.	
8. Continue filling to target (view total).	press and hold F (2 sec.)	+ 191.0 g G

Step	Key (or instruction)	Display/Data output
9. Add last component.		+ 12.5 g G
10. Store component data.	F	0.0 g NET COMP 3+ 12.5 g
11. Display total weight.	CF	+ 203.5 g T COMP+ 203.5 g

Counting

Menu code: 2 14

Display symbol: ⁂

Purpose
With the Counting program you can determine the number of parts that each have approximately equal weight. To do this, a known number of parts (the reference sample quantity) is weighed first, and the individual piece weight (reference weight) is calculated from this result. Thus the number of parts subsequently placed on the balance can be determined from their weight.

Reference Sample Updating
Automatic reference sample updating optimizes the counting accuracy. You can activate or deactivate this function in the Setup menu.

When this function is active, automatic reference sample updating is performed when the selected stability criterion has been met.

> The abbreviation oPt, for "optimizing," is displayed briefly with the new reference sample quantity.

Reference Scale/Balance
(Counting with two balances/scales)

Purpose:
Use of a reference balance/scale affords higher precision in counting large amounts of parts. The LE balance is used to determine the reference weight. The following weighing instruments or terminals can be used for sample weighing in conjunction with a reference balance/scale:
- For a QC scale: set menu code 8 8 2
- For an FB/FC/LA/LP balance/scale: set menu code 8 8 3
- For an isi terminal: set menu code 8 8 4

● Please order the required connecting cables directly from Sartorius.

The following settings must have the same configurations in both balances/scales:
- Counting program
- Weight units
- Settings in the LE balance: Menu codes 7 1 2 and 7 2 2
- All data interface parameters:
  - Baud rate
  - Parity
  - Number of stop bits
  - Handshake mode

Transferring the Reference Value from the LE Reference Balance:
- Press the (F) key

> The reference value is passed to the counting balance/scale

Counting Balance/Scale:
○ Refer to the operating manual of the particular weighing instrument for further instructions

Preparation
Set parameters for the Counting program:

○ Select the application program in the Setup menu

● Set the following parameters:

2 Application programs
- 2 1 Program selection
  - 2 1 4 Counting

3 Application parameters
- 3 5 Storage parameter
  - 3 5 1 Standard resolution (internal resolution)
  - 3 5 2 o 10 x higher resolution

4 Application parameters for Counting
- 4 1 Autom. ref. sample updating
  - 4 1 1 o Off
  - 4 1 2 On

8 Extra functions
- 8 8 Reference balance/scale
  - 8 8 1 o Off
  - 8 8 2 On for QC scales
  - 8 8 3 On for FB-/FC-/LA-/LP models
  - 8 8 4 On for isi terminals

o= Factory setting

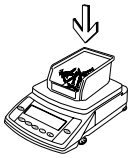
Printout: Counting

```
nRef   +       10      :
wRef   +    21.14 g    :
Qnt    +      500 pcs   :
```

Reference sample quantity
Reference weight
Calculated quantity

Example: Counting parts of equal weight

Settings:
Menu: Counting program (menu code 214)

Step	Key (or instruction)	Display/Data output
1. Place empty container on the balance/scale.		+ 22.6 g
2. Tare the balance.	Tare	0.0 g
3. Add reference sample quantity to container (in this example: 10 pcs).		
4. Initialize the balance.	F	rEF 10 (briefly) + 2.14 g + 10 pcs nRef + 10 pcs wRef + 2.14 g
5. Add uncounted parts as desired.		+ 500 pcs
6. Print piece count, if desired.	⎙	Qnt + 500 pcs
7. Display weight.	F	+ 1070.0 g
8. Display piece count.	F	+ 500 pcs
9. Unload the balance.		– 511 pcs
10. Repeat as necessary, starting from Step 6.		
11. Delete reference sample quantity	CF	0.0 g

Weighing in Percent

Menu code: 2 1 5
Display symbol: %

Purpose
This application program allows you to obtain weight readouts in percent which are in proportion to a reference weight.

Preparation
Set parameters for the Weighing in Percent program:

○ Select the application program in the Setup menu

● Set the following parameters:

2 Application programs
- 2 1 Program selection
  - 2 1 5 Weighing in percent

3 Application parameters
- 3 5 Storage parameter
  - 3 5 1 o Standard resolution (internal resolution)
  - 3 5 2 10 × higher resolution
- 3 6 Decimal places for calc.
  - 3 6 1 None
  - 3 6 2 o 1 decimal place
  - 3 6 3 2 decimal places
  - 3 6 4 3 decimal places

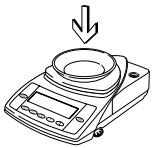
o = Factory setting

Printout: Weighing in Percent

pRef	+	100 %	: Reference percentage
Wxx%	+	111.6 g	: Reference weight net xx%
Prc	+	94.7 %	: Calculated percentage

Example: Determining residual weight in percent

Settings:
Menu: Weighing in percent program (menu code 215),
Print application parameters: On; all parameters (menu code 712),
Reference percentage: rEF 100%

Step	Key (or instruction)	Display/Data output
1. Place empty container on balance		+ 22.6 g
2. Tare the balance.	Tare	0.0 g
3. Place sample equal to 100% of reference percentage on the balance (in this example: 111.6 g).		
4. Initialize the balance.	F	rEF 100 (briefly) + 111.6 g + 100.0 % pRef + 100 % Wxx% + 111.6 g
5. Remove container; e.g., to treat sample (in this example, the sample is now dried).		
6. Place container with sample on the balance again (after treatment).		+ 94.9 %
7. Optional: print percentage.	⎙	Prc + 94.9 %
8. Display residual weight and delete reference value.	CF	+ 105.9 g
9. Optional: print net residual weight.	⎙	N + 105.9 g

Animal Weighing/Averaging

Menu code: 2 1 7
Display symbol: 

Purpose
Use this program to determine the weights of unstable samples (e.g., live animals) or to determine weights under unstable ambient conditions. With this program, the balance calculates the weight as the average of a defined number of individual weighing operations (also referred to as “subweighing operations”).

Preparation
Set parameters for the Animal Weighing program:

○ Select the application program in the Setup menu

● Set the following parameters:

- 2 Application programs
  - 2 1 Program selection
    - 2 1 7 Animal weighing
- 3 Application parameters
  - 3 7 Animal activity
    - 3 7 1 Calm (2% of the animal/object)
    - 3 7 2 o Normal (5% of the animal/object)
    - 3 7 3 Strong vibration (20% of the animal/object
  - 3 8 Start
    - 3 8 1 Manual
    - 3 8 2 o Automatic

o= Factory setting

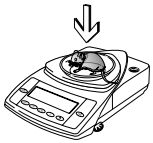
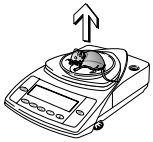
Printout: Animal Weighing

```
mDef            20   :
x-Net +     401.1 g:
```

Number of subweighing operations
Calculated average

Example: Determining animal weight with automatic start of 20 subweighing operations

Settings:
Menu: Animal weighing program (menu code 217),
Print application parameters: On; all parameters (menu code 712)

Step	Key (or instruction)	Display/Data output
1. Switch on the balance.	I/⏻	
2. Place animal weighing bowl on the balance.		+ 22.6 g
3. Tare the balance.	Tare	0.0 g
4. Place the first animal in bowl.		Weight value fluctuates due to animal activity.
5. Start automatic animal weighing starts. The balance delays starting the subweighing operation until successive subweights lie within the range defined.	F	888 20 19 18 ... 1
6. After 20 subweighing operations the arithmetic average "x-Net" is displayed.		+ 410.1 g ⚠ mDef 20 x-Net + 410.1 g
7. Unload the balance.		0.0 g
8. Weigh next animal (if applicable). Next weighing series begins automatically.		

Toggling between Weight Units

Menu code: 2 12

With this application program you can switch the display of a weight value back and forth between two weight units.

Configure the “Toggle Weight Units” application in the Setup menu: see “Configuring the Balance.” Menu code: 2 12

Menu code Weight unit 1	Weight unit 2	Unit	Conversion	Display	Printout
1 7 1	3 1 1 o	Grams*	1.00000000000	o	o
1 7 2 o	3 1 2 o	Grams	1.00000000000	g	g
1 7 3	3 1 3	Kilograms	0.00100000000	kg	kg
1 7 4 o	3 1 4	Carats	5.00000000000	ct	ct
1 7 5	3 1 5	Pounds*	0.00220462260	lb	lb
1 7 6	3 1 6	Ounces*	0.03527396200	oz	oz
1 7 7	3 1 7	Troy ounces*	0.03215074700	ozt	ozt
1 7 8	3 1 8	Hong Kong taels*	0.02671725000	tl	tlh
1 7 9	3 1 9	Singapore taels*	0.02645544638	tl	tls
1 7 10	3 1 10	Taiwanese taels*	0.02666666000	tl	tlt
1 7 11	3 1 11	Grains*	15.4323583500	GN	GN
1 7 12	3 1 12	Pennyweights*	0.64301493100	dwt	dwt
1 7 13	3 1 13 o	Milligrams [1])	1000.00000000	mg	mg
1 7 14	3 1 14	Parts per pound*	1.12876677120	o	/lb
1 7 15	3 1 15	Chinese taels*	0.02645547175	tl	tlc
1 7 16	3 1 16	Mommes*	0.26670000000	m	mom
1 7 17	3 1 17	Austrian carats*	5.00000000000	K	K
1 7 18	3 1 18	Tola*	0.08573333810	t	tol
1 7 19	3 1 19	Baht*	0.06578947437	b	bat
1 7 20	3 1 20	Mesghal*	0.21700000000	m	MS

o = Factory setting, depends on model
* = Not available in verified balances
[1]) = Not available in verified balances of accuracy class (II)

Function

● Press (F) to toggle between weight unit 1 and weight unit 2

Generating a Printout

Purpose
You can generate printouts that include weights, other measured values and identification codes for documentation purposes. You can format the printout to meet individual requirements.

Features
Printouts generated automatically or manually (at the press of a key): weight or calculated value is output.

Line format: Values printed with up to 6 preceding characters for identification.

Print application parameters:
Printout of initialization values before printing measurement results.

ISO/GLP-compliant printout: Printout of ambient characteristics.

Printouts generated automatically or by pressing (⎙), dependent on or independent of stability.

You can have the following values output automatically when using the application programs if menu code 712 is configured (printout with data ID codes):

- Net-total: Component or total weight
- Counting:
  Reference sample quantity (nRef)
  Reference weight for one piece (wRef)
- Weighing in percent:
  Reference percentage (pRef)
  Reference weight (Wxx%)
- Animal weighing/averaging:
  Number of subweighing operations (mDef)
  Calculated average (x-Net)

Factory settings:
Print manual/automatic: Individual printout dependent on stability:
Manual at stability (menu code: 612)

Line format:
Up to 6 characters at the beginning of each line to identify the weight or calculated value: Print net, tare, or gross value, reference sample quantity, or average piece weight with ID (menu code 722).

Print application parameters:
Printout of one or more initialization values for the active application program: On (menu code 712)

ISO/GLP-compliant printout:
No ISO/GLP-compliant printout (menu code 810 1)

Auto print:
Automatic printout of weight values: No default setting; see print manual/automatic (menu code 612). Auto print cannot be interrupted by pressing (⎙) (menu code 622). Auto print after each display update (menu code 631).

● Setting menu codes for the printout: see “Configuring the Balance”

Printout without Data ID Codes: Examples

The value currently displayed is printed (weight or calculated value with unit)

```
      +  1530.0 g
      +  58.562 ozt
      +    253 pcs
      +   88.23 %
```

Weight in grams
Weight in Troy ounces
Piece count
Percentage

Printout with Data ID Codes:

The current value displayed can be printed with a data ID code of up to 6 characters at the beginning of the line.

```
ID          12345678
N     +    153.0 g
T1    +     23.4 g
Qnt   +      253 pcs
Prc   +    88.23 %
```

Identification*
Current net value
Value in 2nd tare memory
Piece count
Percentage

* = on ISO/GLP records only

Print Application Parameters:

You can have one or more of the values configured for initialization of an application printed automatically on initialization.

```
COMP7 +    278.1 g
T COMP+    21.14 g
nRef  +       10
wRef  +    21.14 g
Wxx%  +  1200.0 g
```

Net-total:
7th component weight
Net-total: Total
Counting:
Reference sample quantity
Counting: Reference weight
Weighing in percent:
Reference weight

Auto Print:

You can have the weight readout printed automatically.

```
N     +    153.0 g
Stat
Stat          L
Stat          H
```

Net weight
Display blank
Display underload
Display overload

ISO/GLP-compliant Printout/Record

Features
You can have the parameters pertaining to the ambient weighing conditions printed before (GLP header) and after (GLP footer) the values of a weighing series. These parameters include:

GLP header:
- Date
- Time at beginning of measurement
- Balance manufacturer
- Balance model
- Balance serial number
- Software version number
- Identification number of the current sampling operation

GLP footer:
- Date
- Time at end of measurement
- Field for operator signature

The record is output to a Sartorius data printer or a computer.

Settings

● Setting menu codes for the printout (see “Configuring the Balance”):

– ISO/GLP-compliant record after calibration/adjustment only: menu code 8 102; or ISO/GLP-compliant record always on: menu code 8 103

– Line format for printout: With data ID codes - 22 characters: menu code 722

⚠ No ISO/GLP-compliant record is output if any of the following settings are configured:
menu code 614, 615, 616 (automatic printout) or 721

Function Keys
Press (⎙) to output header and first measured value.

> Header is output the first time (⎙) is pressed

Press (F) to include output header and reference data on automatic printouts when an application program is active

Close the application:
1) Output GLP footer:
Press (CF)
2) End application program:
Press (CF)

The ISO/GLP-compliant printout can contain the following lines:

`--------------------`	Dotted line
`17-Jan-2003  10:15`	Date/time (beginning of measurement)
`SARTORIUS AG`	Balance manufacturer
`Mod.  LE10001`	Balance model
`Ser. no.  10105355`	Balance serial number
`Ver. no.  00-13-46`	Software version
`ID  2690 923`	ID
`--------------------`	Dotted line
`L ID`	Measurement series no.
`nRef + 10 pcs`	Counting: Reference sample quantity
`wRef + 21.14 g`	Counting: Reference weight
`Qnt + 235 pcs`	Counting result
`Qnt + 567 pcs`	Counting result
`--------------------`	Dotted line
`17-Jan-2003  10:20`	Date/time (end of measurement)
`Name:`	Field for operator signature
	Blank line
`--------------------`	Dotted line

ISO/GLP-compliant printout for external calibration/adjustment:

`--------------------`	Dotted line
`17-Jan-2003  10:30`	Date/time (beginning of measurement)
`SARTORIUS AG`	Balance manufacturer
`Mod.  LE10001`	Balance model
`Ser. no.  10105355`	Balance serial number
`Ver. no.  00-13-46`	Software version
`ID  2690 923`	ID
`--------------------`	Dotted line
`Cal. Ext.`	Calibration/adjustment mode
`Set + 5000.0 g`	Calibration weight
`Diff. + 0.2 g`	Difference determined in calibration
`Cal. Ext. Complete`	Confirmation of completed calibration procedure
`Diff. + 0.0 g`	Difference from target following adjustment
`--------------------`	Dotted line
`17-Jan-2003  10:32`	Date/time (end of measurement)
`Name:`	Field for operator signature
	Blank line
`--------------------`	Dotted line

Interface Port

Purpose
Your balance is equipped with an interface port for connection to a computer or other peripheral device.
You can connect a computer to change, start and/or monitor the functions of the balance and the application programs.

Features
Type of interface: Serial interface
Operating mode: Full duplex
Standard: RS-232
Transmission rates:
150, 300, 600, 1200, 2400, 4800, 9600 and 19,200 baud
Parity: Mark, space, odd, even
Character format:
1 start bit, 7-bit ASCII, parity,
1 or 2 stop bits
Handshake:
2-wire interface:
via software (XON/XOFF)
4-wire interface:
Hardware via handshake lines (CTS/DTR)
Operating mode: SBI
Data output format of the balance:
16 or 22 characters

Factory settings:

Transmission rate:
1200 baud (5 1 4)
Parity: Odd (5 2 3)
Stop bits: 1 stop bit (5 3 1)
Handshake: Hardware, 2 characters after CTS (5 4 2)
Operating mode: Standard SBI (5 5 1)
Print manually/automatically:
Manual after stability (6 1 2)

Preparation
- see “Pin Assignments” and “Pin Assignment Chart”

Identification of Non-Verified Digits
Non-verified digits when “e ≠ d” are automatically identified on the printout:
Select universal printer:
menu code 5 5 2.
Brackets are used to identify non-verified digits.

Output Format with 16 Characters

Display segments that are not activated are output as spaces.

The following characters can be output, depending on the characters displayed on the balance:

Normal Operation

Position	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
	+				D	D	D	D	D	D	*	U	U	U	CR	LF
or	–		.	.	.	.	.	.	.	.		*	*	*		
or	*		*	*	*	*	*	*	*	*						

*: Space
D: Digit or letter
U: Unit symbol
CR: Carriage return
LF: Line feed

Special Codes

Position	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
					*	*	*	*	*	*	*	*	*	*	CR	LF
or							H	*								
or							L	*								
or							C	*								

*: Space
C: Calibration/adjustment
H: Overload
L: Underload

Error Codes

Position	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
				E	r	r	*	#	#	#	*	*	*	*	CR	LF

*: Space
#: Error code number

Data output example: +123.56 g

Position	1	2	3	4	5	6	7	8	9	0	1	2	3	4		
	+				1	2	3	.	5	6		g			CR	LF
	+			1	2	3	.	5	[	6	]	g			CR	LF

Position 1: Plus or minus sign or space
Position 2: Space
Positions 3-10: Weight with a decimal point; leading zeros = space
Position 11: Space
Positions 12-14: Unit symbol or space
Position 15: Carriage return
Position 16: Line feed

Output Format with 22 Characters

When data is output with an ID code, the ID code (consisting of 6 characters) precedes the 16-character string described above.
These 6 characters identify the subsequent value.

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
I	I	I	I	I	I	+	*	D	D	D	D	D	D	D	D	*	U	U	U	CR	LF
	*	*	*	*	*	–		.	.	.	.	.	.	.	.		*	*	*		
						*		*	*	*	*	*	*	*	*						

I: ID code character
*: Space
D: Digit or letter
U: Unit symbol[1])
CR: Carriage return
LF: Line feed

Example:

1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0		
N						+				1	2	3	.	5	6		g			CR	LF
N						+			1	2	3	.	5	[	6	]	g			CR	LF

[1]) depends on balance type; for example, not all units or characters are available on balances verified for use in legal metrology.

Special Codes

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
S	t	a	t	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	CR	LF
												H	*								
												L	*								

*: Space

H: Overload
L: Underload

Error Codes

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
S	t	a	t	*	*	*	*	*	E	r	r	*	#	#	#	*	*	*	*	CR	LF

*: Space

#: Error code number

ID code characters l	Meaning
Stat	Status
T1	Tare T1
N	Net N
N1	Net N1
COMPxx	Net-total: Component no.
T COMP	Net-total: Total weighed in
Qnt	Counting: Quantity
wRef	Counting: Reference weight
nRef	Counting: Reference sample quantity
Prc	Weighing in percent: Percentage
Wxx%	Weighing in percent: Reference weight
pRef	Weighing in percent: Reference percentage
mDef	Animal weighing: No. of measurements remaining
x-Net	Animal weighing: Calculated average

Data Input Format

You can connect a computer to your balance to send commands via the balance interface port to control balance functions and applications.
The commands sent are control commands and may have different formats.
Control commands consist of up to 13 characters. Each character must be transmitted according to the settings configured in the operating menu for data transmission.

Format for Control Commands

Format 1:	Esc	!	CR	LF		
Format 2:	Esc	!	#	_	CR	LF

Esc: Escape
!: Command character
CR: Carriage return (optional)
LF: Line feed (optional)

Command character !	Format 1: Meaning
K	Weighing mode 1 (very stable conditions)
L	Weighing mode 2 (stable conditions)
M	Weighing mode 3 (unstable conditions)
N	Weighing mode 4 (very unstable conditions)
O	Block keys
P	(print) key (print, auto print; activate or block)
R	Unblock keys
S	Restart/self-test
T	(Tare) key
Z	Internal calibration/adjustment

Command character !#	Format 2: Meaning
f0	Function key (F)
f1	Function key (CAL)
s3	(CF) key
x0	Perform internal calibration
x1	Print balance model
x2	Print weighing cell serial number

Synchronization

During data communication between the balance and a connected device (computer), messages consisting of ASCII characters are transmitted via the interface. For error-free data communication, the parameters for baud rate, parity, handshake mode and character format must be the same for both units.

You can set these parameters in the Setup menu so that they match those of the connected device. You can also define parameters in the balance to make data output dependent on various conditions. The conditions that can be configured are listed in the descriptions of the application programs.

If you do not connect a peripheral device to the balance interface port, this will not generate an error message.

Handshake

The balance interface (Sartorius Balance Interface = SBI) has transmit and receive buffers. You can define the handshake parameter in the Setup menu:

- Hardware handshake (CTS/DTR)
- Software handshake (XON, XOFF)

Hardware Handshake

With a 4-wire interface, 1 more character can be transmitted after CTS (Clear to Send).

Software Handshake

The software handshake is controlled via XON and XOFF. When a device is switched on, XON must be transmitted to enable any connected device to communicate.

Data Output by Print Command

The print command can be transmitted by pressing  or by a software command (Esc P).

Automatic Data Output

In the “auto print” operating mode, data is output to the interface port without a print command. You can have data output automatically at defined print intervals, with or without the stability parameter. The length of a print interval depends on the settings for “Adapting the filter” (1 1 x) and “Time-dependent automatic printing” (6 3 x).

If you select the auto print setting, data will be transmitted immediately the moment you turn on the balance. In the operating menu, you can define whether automatic printing can be stopped by pressing  .

Faster Output Speeds

If you require output speeds faster than 10 Hz, please contact Sartorius for information.

Pin Assignment Charts

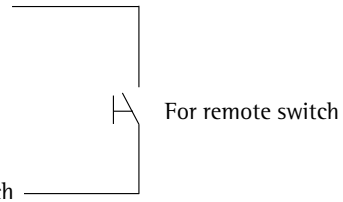
Female Interface Connector:
25-contact D-Submini (DB25S) with screw lock hardware

Male connector used (please use connectors with the same specifications):
25-pin D-Submini DB25 with integrated shielded cable clamp assembly
(Amp 826 985-1C) and fastening screws (Amp 164 868-1)

⚠ **Warning When Using Pre-wired RS-232 Connecting Cables:**
RS-232 cables purchased from other manufacturers often have incorrect pin assignments for use with Sartorius weighing systems. Be sure to check the pin assignments against the chart below before connecting the cable, and disconnect any lines identified differently from those specified by Sartorius (e.g., pin 6).
Failure to do so may damage or even completely ruin your weighing system and/ or peripheral device.

Pin Assignment Chart:

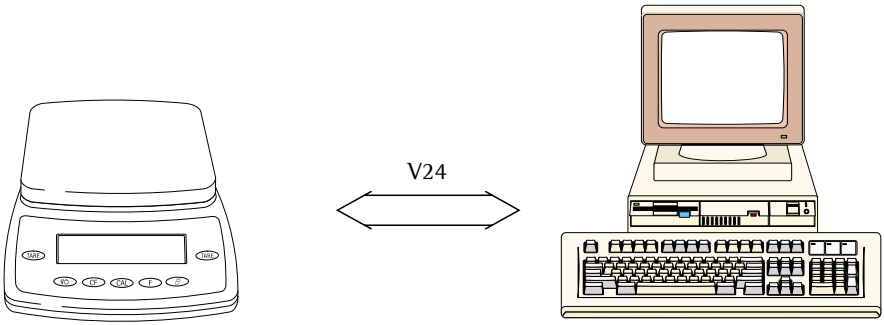
Pin 1: Signal ground
Pin 2: Data output (TxD)
Pin 3: Data input (RxD)
Pin 4: Internal ground (GND)
Pin 5: Clear to send (CTS)
Pin 6: Internally connected
Pin 7: Internal ground (GND)
Pin 8: Internal ground (GND)
Pin 9: Reset _ In*)
Pin 10: Not connected
Pin 11: + 12 V
Pin 12: Reset _ Out *)
Pin 13: + 5 V
Pin 14: Internal ground (GND)
Pin 15: Universal remote switch
Pin 16: Not connected
Pin 17: Not connected
Pin 18: Not connected
Pin 19: Not connected
Pin 20: Data terminal ready (DTR)
Pin 21: Ground input for external voltage supply
Pin 22: Not connected
Pin 23: Not connected
Pin 24: Ext. supply voltage input + 12 to 30 V
Pin 25: + 5 V



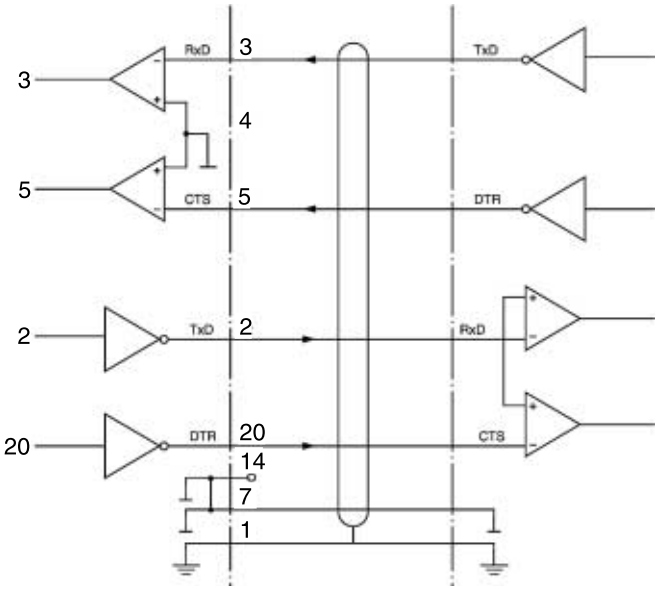
*) = Hardware restart

Cabling Diagram

– For connecting a computer or other peripheral device to the balance using the RS-232C/V24 protocol and cables up to 15 m (50 ft.) long.



Balance



Peripheral device		
PC 25-pin	**or**	**PC 9-pin**
2		3
20		4
3		2
5		8
6		6
7		5

Cable type: AWG 24 specification

Troubleshooting Guide

Error codes are shown on the main display for 2 seconds. The program then returns automatically to the previous mode (e.g., weighing).

Display	Cause	Solution
No segments appear on the display	No AC power is available	Check the AC power supply
	The power supply is not plugged in	Plug in the power supply
H	The load exceeds the balance capacity	Unload the balance
L or Err 54	Something is touching the weighing pan	Move the object that is touching the weighing pan
Err 01	Data output not compatible with output format	Change the configuration in the operating menu
Err 02	Calibration parameter not met; e.g.: – balance not zeroed – load on weighing pan	Calibrate only when zero is displayed – Press (Tare) to tare the balance – Unload the balance
Err 10	The (Tare) key is blocked when there is data in the second tare memory (net-total); only 1 tare function can be used at a time	Press (CF) to clear the tare memory and release the tare key
Err 11	Tare memory not allowed	Press (Tare)
Err 22	Weight is too light or, when using an application program, there is no sample on the balance	Increase the weight on the balance
Err 30	Interface port for printer output is blocked	Reset the menu factory settings, or Contact your local Sartorius Service Center

Display	Cause	Solution
Err 235 on model LE225D	Connecting cable not connected correctly	Connect the cable correctly
	Cable connected to junction box on a different balance	Connect the equipment correctly
The weight readout changes constantly	Unstable ambient conditions (excessive vibration or draft) at the place of installation	Set up the balance in another area
	A foreign object is caught between weighing pan and balance housing	Remove the foreign object
The weight readout is obviously wrong	The balance was not calibrated/adjusted before weighing	Calibrate/adjust the balance
	The balance was not tared/zeroed defore weighing	Tare or zero the balance before weighing

If any other errors occur, contact your local Sartorius Service Center!

Contact information:
Please point your Internet browser to: http://www.sartorius.com

Care and Maintenance

Service
Regular servicing by a Sartorius technician will extend the service life of your balance and ensure its continued weighing accuracy. Sartorius can offer you service contracts, with your choice of regular maintenance intervals ranging from 1 month to 2 years. The optimum maintenance interval depends on the operating conditions at the place of installation and on the individual tolerance requirements.

Repairs
Repair work must be performed by trained service technicians. Any attempt by untrained persons to perform repairs may lead to hazards for the user.

Cleaning

- Unplug the AC adapter from the wall outlet (mains supply). If you have an interface cable connected to the balance port, unplug it from the port.

- Clean the balance using a piece of cloth which has been wet with a mild detergent (soap).

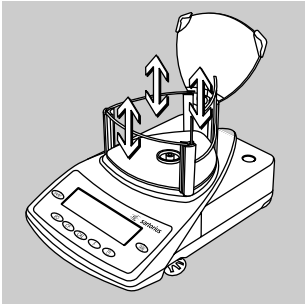
- After cleaning, wipe down the balance with a soft, dry cloth

⚠ Make sure that no dust or liquid enters the balance housing.

⚠ Do not use any aggressive cleaning agents (solvents or similar agents)

Cleaning Stainless Steel Surfaces
Clean all stainless steel parts regularly. Remove the stainless steel weighing pan and thoroughly clean it separately. Use a damp cloth or sponge to clean any stainless steel parts on the balance. You can use any commercially available household cleaning agent that is suitable for use on stainless steel. Clean stainless steel surfaces by wiping them down. Then rinse the equipment thoroughly, making sure to remove all residues. Afterwards, allow the balance to dry. If desired, you can apply oil to the cleaned surfaces as additional protection.

Solvents are permitted for use only on stainless steel parts.



Cleaning the Weighing Chamber and Draft Shield

- Open the draft shield cover and take out the removable parts
- Use a hand-held vacuum cleaner and mini-hose to remove any powdered sample material carefully.
- Use blotting paper to remove any liquid sample material.
- On models with a 3-sided draft shield, pull the 3 draft shield walls upwards to remove, if necessary.

Safety Inspection

If there is any indication that safe operation of the balance is no longer warranted:

- Turn off the power and disconnect the equipment from AC power immediately

> Lock the equipment in a secure place to ensure that it cannot be used for the time being.

Notify your nearest Sartorius Service Center. Repair work must be performed by trained service technicians.

We recommend having the power supply inspected by a certified electrician at regular intervals, according to the checklist given below:

- Insulating resistance: > 7 megaohms measured with a constant voltage of at least 500 volts at a 500 K-ohm load
- Leakage current: < 0.05mA measured with a properly calibrated multimeter

Instructions for Recycling

To ensure safe shipment, your balance has been packaged using environmentally friendly materials. After successful installation of the balance, you should return this packaging for recycling. For information on recycling options, including recycling of old weighing equipment, contact your municipal waste disposal center or local recycling depot.

Overview

Specifications

Model		LE225D	LE324S	LE244S
Weighing capacity	g	40/100/220	320	240
Readability	mg	0.01/0.01/0.1	0.1	0.1
Tare range (subtractive)	g	–220	–320	–240
Repeatability (std. deviation)	≤±mg	0.02/0.05/0.1	0.2	0.1
Linearity	≤±mg	0.03/0.1/0.2	0.3	0.2
Response time (average)	s	≤ 6/3	≤ 3	≤ 2
Operating temperature range	°C	10° to 30° (50° to 86°F)		
Allowable ambient operating temperature	°C	5° to 40° (41° to 104°F)		
Sensitivity drift within 10 to 30°C	<±/K	$1 \cdot 10^{-6}$		
External calibration weight (of at least accuracy class...)	g	200 (E2)	200 + 100 (E2)	200 (E2)
Net weight, approx.	kg	7.6	6.5	6.5
Weighing pan size (inner diameter)*	mm	80 ∅		
Weighing pan surface*	cm^2	64		
Weighing chamber height (weighing pan to draft shield cover)	mm	232	232	232
Dimensions (W × D × H)				
– Balance	mm	213 × 342 × 340		
– Electronics box	mm	134 × 51 × 155	–	–
AC power source/ power requirements	V~	AC adapter STNG6, 230 V or15 V, +15% to – 20% (protection rating IP20)		
Frequency	Hz	48 – 60		
Power consumption (average)	VA	maximum 16; typical 8		
Approx. hours of operation with the YRB05Z rechargeable battery pack	h	20	22	22
Selectable weight units		Grams, carats, pounds, ounces, Troy ounces, Hong Kong taels, Singapore taels, Taiwanese taels, grains, pennyweights, milligrams, parts per pound, Chinese taels, mommes, Austrian carats, tola, baht and mesghal		
Built-in interface		RS-232C-S/V24-V28; 7-bit; parity: even, odd, mark, or space; transmission rates: 150 to 19,200 baud; 1 or 2 stop bits; software/hardware handshake		

* Three-sided weighing pan: ∅ = diameter of inner circle.
The cross-hatched section can be fully utilized.

Model		LE623S	LE323S	LE623P
Weighing capacity	g	620	320	120/240/620
Readability	g	0.001	0.001	0.001/0.002/0.005
Tare range (subtractive)	g	–620	–320	–320
Repeatability (std. deviation)	≤± g	0.001	0.001	0.001/0.001/ 0.003
Linearity	≤± g	0.002	0.002	0.002/0.002/0.005
Response time (average)	s	≤ 1.5		
Operating temperature range	°C	10° to 30° (50° to 86°F)		
Allowable ambient operating temperature	°C	0 to 40° (32° to 104°F)		
Sensitivity drift within +10 to +30°C	≤±/K	$2 \cdot 10^{-6}$		
External calibration weight (of at least accuracy class...)	g	500 (E2)	200 (F1)	500 (F1)
Net weight, approx.	kg	4.6		
Weighing pan size (inner diameter)*	mm	110 ∅		
Weighing pan surface*	cm^2	120		
Weighing chamber height (weighing pan to draft shield cover)	mm	50		
Dimensions (W × D × H)	mm	213 × 342 × 153		
AC power source/ power requirements	V~	AC adapter STNG6, 230 V or 115 V, +15% to – 20% (protection rating IP20)		
Frequency	Hz	48 – 60		
Power consumption (average)	VA	maximum 16; typical 8		
Approx. hours of operation with the YRB05Z rechargeable battery pack	h	27		
Selectable weight units		Grams, carats, pounds, ounces, Troy ounces, Hong Kong taels, Singapore taels, Taiwanese taels, grains, pennyweights, milligrams, parts per pound, Chinese taels, mommes, Austrian carats, tola, baht and mesghal		
Built-in interface		RS-232C-S/V24-V28; 7-bit; parity: even, odd, mark, or space; transmission rates: 150 to 19,200 baud; 1 or 2 stop bits; software/hardware handshake		

* Three-sided weighing pan: ∅ = diameter of inner circle.
The cross-hatched section can be fully utilized.

Model		LE6202S	LE5202S-DS	LE4202S	LE6202P	LE2202S, LE2202S-DS
Weighing capacity	g	6200	5200	4200	1500/3000/ 6200	2200
Readability	g	0.01	0.01	0.01	0.01/0.02/ 0.05	0.01
Tare range (subtractive)	g	–6200	–5200	–4200	–6200	–2200
Repeatability (std. deviation)	≤± g	0.01	0.01	0.01	01/0.01/ 0.03	0.01
Linearity	≤± g	0.02	0.02	0.02	0.02/0.02/ 0.05	0.02
Response time (average)	s	< 1.5				
Operating temperature range	°C	10° to 30° (50° to 86°F)				
Allowable ambient operating temperature	°C	0 to 40° (32° to 104°F)				
Sensitivity drift within +10 to +30°C	≤±/K	$2 \cdot 10^{-6}$				
External calibration weight (of at least accuracy class...)	g	5000 (E2)	5000 (E2)	4000 (E2)	5000 (F1)	2000 (F1)
Net weight, approx.	kg	4.7				
Weighing pan size Weighing pan surface	mm cm^2	190×204 388	∅ 130 133	190×204 388	190×204 388	190×204/ ∅ 130 388/133
Dimensions (W × D × H)	mm	213 × 342 × 88				
AC power source/ power requirements	V~	AC adapter STNG6, 230 V or 115 V, +15% to – 20% (protection rating IP20)				
Frequency	Hz	48 – 60				
Power consumption (average)	VA	maximum 16; typical 8				
Approx. hours of operation with the YRB05Z rechargeable battery pack	h	27				
Selectable weight units		Grams, kilograms, carats, pounds, ounces, Troy ounces, Hong Kong taels, Singapore taels, Taiwanese taels, grains, pennyweights, milligrams, parts per pound, Chinese taels, mommes, Austrian carats, tola, baht and mesghal				
Built-in interface		RS-232C-S/V24-V28; 7-bit; parity: even, odd, mark, or space; transmission rates: 150 to 19,200 baud; 1 or 2 stop bits; software/hardware handshake				

Model		LE10001	LE5201	LE34001S	LE34001P	LE16001S
Weighing capacity	kg	10	5.2	34	8	16
Readability (scale interval)	g	0.1	0.1	0.1	0.1/0.2/0.5	0.1
Tare range (subtractive)	kg	–10	–5.2	–34	–34	–16
Repeatability (std. deviation)	≤±g	0.1	0.1	0.1	0.05/0.05/	0.05
Linearity	≤±g	0.2	0.1	0.2	0.2	0.2
Response time (average)	s	< 1				
Operating temperature range	°C	10° to 30° (50° to 86°F)				
Allowable ambient operating temperature	°C	0° to 40° (32° to 104°F)				
Sensitivity drift within 10° to 30°C	≤±/K	$4 \cdot 10^{-6}$	$4 \cdot 10^{-6}$	$2 \cdot 10^{-6}$	$2 \cdot 10^{-6}$	$2 \cdot 10^{-6}$
External calibration weight (of at least accuracy class...)	kg	5 (F1)	5 (F2)	10 (F1)	10 (F2)	10 (F1)
Net weight, approx.	kg	4.7	4.7	16	16	16
Weighing pan size	mm	190×204	190×204	300×400	300×400	300×400
Dimensions (W×D×H)	mm	213×342×90	213×342×90	313×532×120	313×532×120	313×532×120
AC power source/ power requirements	V~	AC adapter STNG6, 230 V or 115 V, +15% to – 20% (protection rating IP20)				
Frequency	Hz	48 – 60				
Power consumption (average)	VA	maximum 16; typical 8				
Approx. hours of operation with a rechargeable ibattery pack	h	40	40	22	22	22
Selectable weight units		Grams, kilograms, carats, pounds, ounces, Troy ounces, Hong Kong taels, Singapore taels, Taiwanese taels, grains, pennyweights, milligrams, parts per pound, Chinese taels, mommes, Austrian carats, tola, baht and mesghal				
Built-in interface		RS-232C-S/V24-V28; 7-bit; parity: even, odd, mark, or space; transmission rates: 150 to 19,200 baud; 1 or 2 stop bits; software/hardware handshake				

* Three-sided weighing pan: ∅ = diameter of inner circle.
The cross-hatched section can be fully utilized.

Verified models with EC type-approval

Model		LE225D-OCE	LE324S-OCE	LE244S-OCE
Type		**BC BL 100**	**BD BL 100**	**BD BL 100**
Accuracy class[1])		Ⓘ	Ⓘ	Ⓘ
Weighing capacity, Max[1])	g	100/220	320	240
Scale interval d[1])	mg	0.01/0.1	0.1	0.1
Tare range (subtractive)	g	< 100% of the maximum capacity		
Verification scale interval e[1])	g	0.001	0.001	0.001
Minimum capacity, Min[1])	g	0.001	0.01	0.01
Response time (average)	s	< 6/3	≤ 3	≤ 2
Range of use according to CD[1])	g	0.001–220	0.01–320	0.01–240
Allowable ambient operating temperature: – with »isoCAL« function – without »isoCAL« function	 °C °C	 0° to +40° (+32° to +104°F) +15° to +25° (+59° to +77°F)		
External calibration weight (of at least accuracy class...)	g	200 (E2)	200 + 100 (E2)	200 (E2)
Net weight, approx.	kg	7.6	6.5	6.5
Weighing pan size (inner diameter)* Weighing pan surface*	mm cm^2	80 ∅ 64		
Weighing chamber height (weighing pan to draft shield cover)	mm	232	232	232
Dimensions (W×D×H) – Balance – Electronics box	 mm mm	 213×342×340 134×51×155	 – –	 – –
AC power source/ power requirements	V~	AC adapter STNG6, 230 V or 115 V, +15%...– 20% (protection rating IP20)		
Frequency	Hz	48 – 60		
Power consumption (average)	VA	maximum 16; typical 8		
Approx. hours of operation with the YRB05Z reachargeable battery pack	h	20	22	22
Selectable weight units		Grams, carats, milligrams		
Built-in interface		RS232C-S/V24-V28; 7-bit; parity: even, odd, mark, or space; transmission rates: 150 to19,200 baud; 1 or 2 stop bits; software/hardware handshake		

[1]) CD= Council Directive 90/384/ECC for non-automatic weighing instruments; applicable to the European Economic Area

* Three-sided weighing pan: ∅ = diameter of inner circle. The cross-hatched section can be fully utilized.

Model		LE623S-OCE	LE323S-OCE	LE623P-OCE
Type		**BD BL 200**	**BD BL 200**	**BD BL 200**
Accuracy class[1])		(II)	(II)	(II)
Weighing capacity, Max[1])	g	620	320	120/240/620
Scale interval d[1])	g	0.001	0.001	0.001/0.002/0.005
Tare range (subtractive)	g	< 100% of the maximum capacity		
Verification scale interval e[1])	g	0.01	0.01	0.01
Minimum capacity, Min[1])	g	0.02	0.02	0.02
Response time (average)	s	< 1,5		
Range of use according to CD[1])	g	0.02–620	0.02–320	0.02–620
Allowable ambient operating temperature: – with »isoCAL« function – without »isoCAL« function	 °C °C	 0° to +40° (+32° to +104°F) +10° to +30° (+50° to +86°F)		
Net weight, approx.	kg	4.6		
Weighing pan size (inner diameter)* Weighing pan surface*	mm cm^2	110 ∅ 120		
Weighing chamber height (weighing pan to draft shield cover)	mm	50		
Dimensions (W×D×H)	mm	213×342×153		
AC power source/ power requirements	V~	AC adapter STNG6 230 V or 115 V, +15% to – 20% (protection rating IP20)		
Frequency	Hz	48 – 60		
Power consumption (average)	VA	maximum 16; typical 8		
Approx. hours of operation with the YRB05Z reachargeable battery pack	h	27		
Selectable weight units		Grams, carats		
Built-in interface		RS232C-S/V24-V28; 7-bit; parity: even, odd, mark, or space; transmission rates: 150 to19,200 baud; 1 or 2 stop bits; software/hardware handshake		

[1]) CD= Council Directive 90/384/ECC for non-automatic weighing instruments; applicable to the European Economic Area

* Three-sided weighing pan: ∅ = diameter of inner circle. The cross-hatched section can be fully utilized.

Model		LE6202S-OCE	LE4202S-OCE	LE6202P-OCE	LE2202S-OCE
Type		**BD BL 200**	**BD BL 200**	**BD BL 200**	**BD BL 200**
Accuracy class[1])		(II)	(II)	(II)	(II)
Weighing capacity, Max[1])	g	6200	4200	1500/3000/6200	2200
Scale interval d[1])	g	0.01	0.01	0.01/0.02/0.05	0.01
Tare range (subtractive)	g	< 100% of the maximum capacity			
Verification scale interval e[1])	g	0.1	0.1	0.1	0.1
Minimum capacity, Min[1])	g	0.5	0.5	0.5	0.5
Response time (average)	s	< 1.5			
Range of use according to CD[1])	g	0.5–6200	0.5–4200	0.5–6200	0.5–2200
Allowable ambient operating temperature: – with »isoCAL« function – without »isoCAL« function	 °C °C	 0° to +40° (+32° to +104°F) +10° to +30° (+50° to +86°F)			
Net weight, approx.	kg	4.7			
Weighing pan size Weighing pan surface*	mm cm^2	190×204 388			
Dimensions (W×D×H)	mm	213×342×88			
AC power source/ power requirements	V~	AC adapter STNG6 230 V or 115 V, +15% to – 20% (protection rating IP20)			
Frequency	Hz	48 – 60			
Power consumption (average)	VA	maximum 16; typical 8			
Approx. hours of operation with the YRB05Z reachargeable battery pack	h	27			
Selectable weight units		Grams, kilograms, carats			
Built-in interface		RS232C-S/V24-V28; 7-bit; parity: even, odd, mark, or space; transmission rates: 150 to19,200 baud; 1 or 2 stop bits; software/hardware handshake			

[1]) CD= Council Directive 90/384/ECC for non-automatic weighing instruments; applicable to the European Economic Area

* Three-sided weighing pan: ∅ = diameter of inner circle. The cross-hatched section can be fully utilized.

Model		LE10001-OCE	LE5201-OCE
Type		**BD BL 200**	**BD BL 200**
Accuracy class[1])		(II)	(II)
Weighing capacity, Max[1])	g	10,000	5200
Scale interval d[1])	g	0.1	0.1
Tare range (subtractive)	g	< 100% of the maximum capacity	
Verification scale interval e[1])	g	1	1
Minimum capacity, Min[1])	g	5	5
Response time (average)	s	< 1	
Range of use according to CD[1])	g	5–10,000	5–5200
Allowable ambient operating temperature: – with »isoCAL« function – without »isoCAL« function	 °C °C	 0° to +40° (+32° to +104°F) +10° to +30° (+50° to +86°F)	
Net weight, approx.	kg	4.7	4.7
Weighing pan size Weighing pan surface*	mm cm^2	190×204 388	190×204 388
Dimensions (W×D×H)	mm	213×342×90	213×342× 90
AC power source/ power requirements	V~	AC adapter STNG6 230 V or 115 V, +15% to – 20% (protection rating IP20)	
Frequency	Hz	48 – 60	
Power consumption (average)	VA	maximum 16; typical 8	
Approx. hours of operation with the YRB05Z reachargeable battery pack	h	40	40
Selectable weight units		Grams, kilograms, carats	
Built-in interface		RS232C-S/V24-V28; 7-bit; parity: even, odd, mark, or space; transmission rates: 150 to19,200 baud; 1 or 2 stop bits; software/hardware handshake	

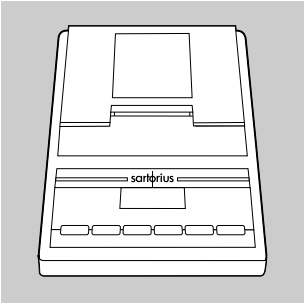
[1]) CD= Council Directive 90/384/ECC for non-automatic weighing instruments; applicable to the European Economic Area

* Three-sided weighing pan: ∅ = diameter of inner circle. The cross-hatched section can be fully utilized.

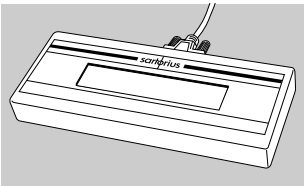
Model		LE34001S-OCE	LE34001P-OCE	LE16001S-OCE
Type		**BF BL 500**	**BF BL 500**	**BF BL 500**
Accuracy class[1])		(II)	(II)	(II)
Weighing capacity, Max[1])	kg	34	8/16/34	16
Scale interval d[1])	g	0.1	0.1/0.2/0.5	0.1
Tare range (subtractive)	g	< 100% of the maximum capacity		
Verification scale interval e[1])	g	1	1	1
Minimum capacity, Min[1])	g	5	5	5
Response time (average)	s	< 2	< 2	< 2
Range of use according to CD[1])	g	5–34,000	5–34,000	5–16,000
Allowable ambient operating temperature:				
– with »isoCAL« function	°C	0° to +40° (+32° to +104°F)		
– without »isoCAL« function	°C	+10° to +30° (+50° to +86°F)		
Net weight, approx.	kg	16	16	16
Weighing pan size	mm	300×400	300×400	300×400
Dimensions (W×D×H)	mm	313×532×120	313×532×120	313×532×120
AC power source/ power requirements	V~	AC adapter STNG6, 230 V or 115 V, +15% to –20% (protection rating IP20)		
Frequency	Hz	48 – 60		
Power consumption (average)	VA	maximum 16; typical 8		
Approx. hours of operation with the YRB05Z reachargeable battery pack	h	22		
Selectable weight units		Grams, kilograms, carats		
Built-in interface		RS232C-S/V24-V28; 7-bit; parity: even, odd, mark, or space; transmission rates: 150 to19,200 baud; 1 or 2 stop bits; software/hardware handshake		

[1]) CD= Council Directive 90/384/ECC for non-automatic weighing instruments; applicable to the European Economic Area

Accessories (Options)



Product	Order No.
Data printer with date, time, statistics evaluation and transaction counter functions and LCD	**YDP03-0CE**



Remote display[1]), reflective (data interface required)	**YRD02Z**

External rechargeable battery pack

– for models with weighing capacities under 10 kg	**YRB05Z**
– for models with weighing capacities over 10 kg	**YRB06Z**

With battery-level indicator (LED); can be recharged using the AC adapter (time it takes to charge the discharged battery pack: 15 hours); see "Specifications" for hours of operation

To recharge the battery pack:
– Unplug the AC adapter from the balance and plug it into the battery pack

Carrying case

– for models with analytical draft shield chamber	**YDB01CP**
– for models with weighing capacities up to 10 kg and without analytical draft shield chamber	**YDB02CP**

[1]) Not available in verified balances

Product	Order No.
SartoConnect[1]) data transfer software for connecting your Sartorius balance to a PC running the Windows 95, 98 or NT operating system	**YSC01L**
– with RS232C adapter cable; length: 1 m	**YSC01L**
– with RS232C adapter cable; length: 5 m	**YSC01L5**
– with RS232C adapter cable; length: 15 m	**YSC01L15**
Density determination kit[1])	
– for LE225D	**YDK01**
– for LE324S, LE244S	**YDK01LP**
Antistatic weighing pan[1])	
– for LE225D, LE324S, LE244S	**YWP01CP**
Calibration weights for all LE balances; extensive assortment, optionally available with DKD certificate	**Information available on request**
Standard Operating Procedure optimum use of your balance in quality-management systems	**YSL01E**
Industrial AC adapter, model ING1 for balances with weighing capacities up to 10 kg; protection rating: IP65 in accordance with DIN VDE 0470/DIN EN 60529	
– for 230 V	**69 71476**
– for 120 V	**69 71480**
Industrial AC adapter, model ING2 for balances with weighing capacities over 10 kg; protection rating: IP65 in accordance with DIN VDE 0470/DIN EN 60529	
– for 230 V	**69 71899**
– for 120 V	**69 71500**
Analytical draft shield chamber	
– for LE623S, LE323S, LE623P	**YDS01CP**

[1]) Not available in verified balances

Product	Order No.
Draft shield cover with opening (d 30 mm)	
– for LE623S, LE323S, LE623P	**YDS02CP**
Data cable	
– for PC connection, 25-pin	**7357312**
– for PC connection, 9-pin	**7357314**
Adapter: D -Sub 25-pin male connector to D-Sub 9-position, length: 0.25 m	**6965619**
Universal remote control switch for remote control of the following functions (configured in the balance menu): ⌸, Tare, CF or F (see "Configuring the Balance" for details):	
Foot switch with T-connector	**YFS01**
Hand switch with T-connector	**YHS02**
T-connector	**YTC01**
⚠ The T-connector is not intended for use with multiple intelligent peripheral devices, such as PCs or YDP03-0CE printers.	
Hanger for below-balance weighing[1])	
– for models LE34001S, LE34001P, LE16000S	**69EA0040**
Weighing bowl, nickel chromium steel, with pouring spout;	
– weighing capacity: >300 g; volume: 1000 ml	**641211**
– Vol.: 500 ml	**641212**
– Vol.: 3000 ml	**641213**
Dust cover	
– for display unit on models LE34001S, LE16001S, LE34001P	**6960CP01**
– for model LE623P	**6960CP02**
– for models LE6202S, LE4202S, LE6202P, LE10001, LE623S, LE323S	**6960CP03**
– for display and control unit on models LE225D, LE324S, LE244S	**6960CP04**

[1]) Not available in verified balances

Declaration of Conformity

Weighing Instruments for Use in Legal Metrology:
Council Directive 90/384/EEC
"Non-automatic weighing instruments"
This Directive regulates the determination of mass in legal metrology.

For the respective Declaration of Type Conformity for weighing instruments that have been verified by Sartorius for use as legal measuring instruments and that have an EC Type-Approval Certificate, see the page after next.

This Directive also regulates the performance of the EC verification by the manufacturer, provided that an EC Type-Approval Certificate has been issued and the manufacturer has been accredited by an officer of a Notified Body registered at the Commission of the European Community for performing such verification.

Sartorius complies with EC Directive No. 90/384/EEC for non-automatic weighing instruments, which has been in effect since January 1, 1993, within the Single European Market, as well as the accreditation of the Quality Management System of Sartorius AG by Lower Saxony's Regional Administrative Department of Legal Metrology (Niedersächsisches Landesverwaltungsamt – Eichwesen) from February 15, 1993.

For additional information on the CE mark on Sartorius equipment, see Sartorius Publication No. W--0052-e93081.

"New Installation" Service
Initial verification is covered in our "New Installation" service package. In addition to initial verification, this package provides you with a series of important services which will guarantee you optimal results in working with your weighing instrument:
– Installation
– Startup
– Inspection
– Training
– Initial verification

"EC Verification" – A Service Offered by Sartorius
Our service technicians authorized to perform the verification* of your weighing instruments that are acceptable for legal metrological verification can inspect and verify the metrological specifications at the place of installation within the Member States of the European Union and the Signatories of the Agreement on the European Economic Area.

Subsequent Verifications within the European Countries
The validity of the verification will become void in accordance with the national regulations of the country in which the weighing instrument is used. For information on verification and legal regulations currently applicable in your country, and to obtain the names of the persons to contact, please contact your local Sartorius office, dealer or service center.

For more information on the verification of weighing instruments for use in legal metrology, contact the Sartorius Service Center.

* = in accordance with the accreditation certificate received by Sartorius AG

CE Declaration of Conformity to Council Directives 89/336/EEC and 73/23/EEC

The electronic precision weighing instrument of the series LE.....-...

meets the requirements of the test standards listed below, in conjunction with the associated power supplies, auxiliary peripheral devices and installation equipment listed in Annex A2 (see Annex A1for a technical description and variants).

1. Electromagnetic Compatibility
1.1 Source for 89/336/EEC: EC Official Journal, No. 2002/C62/02

EN 61326-1 Electrical equipment for measurement, control and laboratory use– EMC requirements
Part 1: General requirements

Limitation of emissions: Residential areas, Class B
Defined immunity to interference: Industrial areas, continuous unmonitored operation

2. Safety of Electrical Equipment
2.1 Source for 73/23/EEC: EC Official Journal, No. 2001/C106/03

EN 61010 Safety requirements for electrical equipment for measurement, control and laboratory use
Part 1: General requirements
EN 60950 Safety of information technology equipment

Sartorius AG
37070 Goettingen, Germany
2003

W. Obermann
(Senior Vice President, R&D
Electronic Engineering
Mechatronics Division)

i.V.
Dr. K. Klein
(Senior Vice President, R&D
Mechanical Engineering
Mechatronics Division)

CE Declaration of Type Conformity to Directive No. 90/384/EEC

This declaration is valid for non-automatic electromechanical weighing instruments for use in legal metrology. These weighing instruments accepted for legal metrological verification have an EC Type-Approval Certificate. The model(s) concerned is(are) listed below along with the respective type, accuracy class, and number of the EC Type-Approval Certificate:

Model	Type	Accuracy Class	EC Type Approval No.
CP...-0CE	BC BL 100	(I)	D01-09-019
CP...-0CEV1	BD BL 100	(I)	D01-09-019
CP...-0CE	BD BL 200	(II)	D01-09-019
CP...-0CE	BF BL 500	(II) (III)	D01-09-019
CP...-ACE	BC BL 100	(I)	D01-09-019
CP...-ACE	BD BL 200	(II)	D01-09-019
LE...-0CE	BC BL 100	(I)	D01-09-019
LE...-0CE	BD BL 100	(I)	D01-09-019
LE...-0CE	BD BL 200	(II)	D01-09-019
LE...-0CE	BF BL 500	(II) (III)	D01-09-019
GC...-0CE	BC BL 100	(I)	D01-09-019
GC...-0CEV1	BD BL 100	(I)	D01-09-019
GP...-0CE	BD BL 200	(II)	D01-09-019

SARTORIUS AG declares that its weighing instrument types comply with the requirements of the Council Directive on non-automatic weighing instruments, no. 90/384/EEC of 20 June 1990; the associated European Standard "Metrological aspects of non-automatic weighing instruments," No. EN 45501; the amended, currently valid versions of the national laws and decrees concerning legal metrology and verification in the Member States of the European Union, the EU, and the Signatories of the Agreement on the European Economic Area, which have adopted this Council Directive into their national laws; and with the requirements stipulated on the Type-Approval Certificate for verification. This Declaration of Type Conformity is valid only if the ID label on the weighing instrument has the CE mark of conformity and the green metrology sticker with the stamped letter "M" (the two-digit number in large print stands for the year in which the mark has been affixed):

CE 04 0111 M

If these marks are not on the ID label, this Declaration of Type Conformity is not valid. Validity can be obtained, for example, by submitting the weighing instrument for final action to be taken by an authorized representative of SARTORIUS AG. The period of validity of this Declaration of Type Conformity shall expire upon any tampering with, repair or modification of this weighing instrument or, in some Member States, on the date of expiration.
The operator of this weighing instrument shall be responsible for obtaining an authorized renewal of the verification, such as subsequent or periodic verification, of the weighing instrument for use as a legal measuring instrument.

Sartorius AG
37070 Goettingen, Germany
Signed in Göttingen, 25.03.2004

Dr. G. Maaz
(President of the Mechatronics Division)

i.V. J. Rehwald
J. Rehwald
(Head of the Production Department
Mechatronics / Weighing Technology Division)

OAW–113-2/02.96
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Physikalisch-Technische Bundesanstalt

Braunschweig und Berlin

PTB

EG-Bauartzulassung

EC type-approval certificate

Zulassungsinhaber: *Issued to:*	Sartorius AG Weender Landstr. 94-108 37075 Göttingen
Rechtsbezug: *In accordance with:*	§ 13 des Gesetzes über das Mess- und Eichwesen *(verification act)* vom*/dated* 23. März 1992 (BGBl. I S. 711), zuletzt geändert am *(last amended on)* 25.11.2003 (BGBl. I S. 2304), in Verbindung mit Richtlinie *(in connection with council directive)* 90/384/EWG, geändert durch *(amended by)* 93/68/EWG
Bauart: *In respect of:*	Nichtselbsttätige elektromechanische Waage mit oder ohne Hebelwerk *Nonautomatic electromechanical weighing instrument with or without lever system*
Typ / *Type*:	BC BL 100, BD BL 100, BD BL 200, BF BL 500 (I) Max 50...320 g, e = 1...5 mg, n ≤ 320000 Option: Mehrteilungswaage (II) Max 1...34000 g, e = 0,01...5 g, n ≤ 62000 *multi-interval instrument* (III) Max 100...34000 g, e = 1...50 g, n ≤ 10000
Zulassungsnummer: *Approval number:*	**D01-09-019 3. Revision**
Gültig bis: *Valid until:*	03.09.2011
Anzahl der Seiten: *Number of pages:*	10
Geschäftszeichen: *Reference No.:*	PTB-1.12-4011585
Benannte Stelle: *Notified Body:*	0102

Im Auftrag
By order

Marcus Link

PHYSIKALISCH-TECHNISCHE BUNDESANSTALT 40

Braunschweig, 17.03.2004

Siegel
Seal

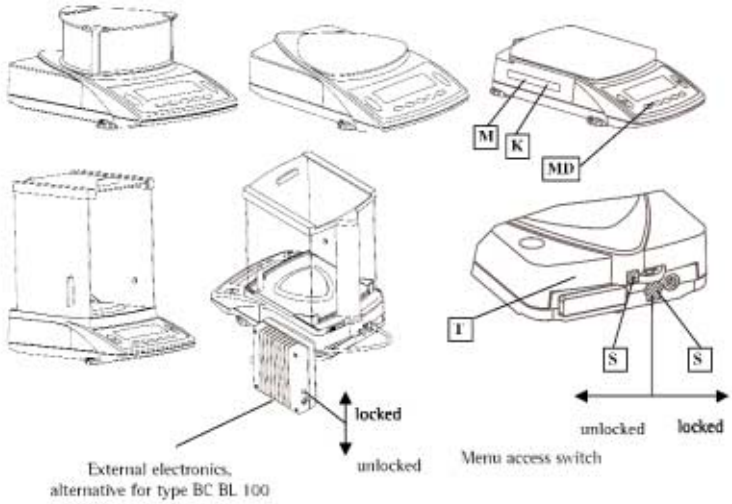
R3-0023

Die Hauptmerkmale, Zulassungsbedingungen und Auflagen sind in der Anlage enthalten, die Bestandteil der Revision der EG-Bauartzulassung ist. Hinweise und eine Rechtsbehelfsbelehrung befinden sich auf der ersten Seite der Anlage

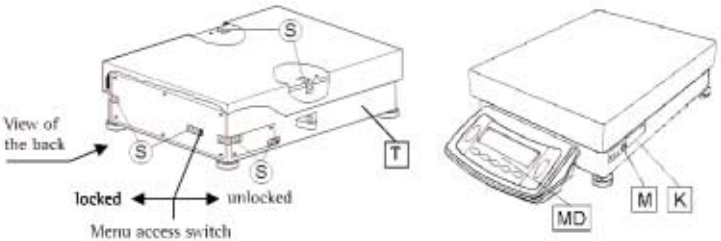
The principal characteristics, approval conditions and special conditions, if any, are set out in the Annex which forms an integral part of this Revision of the EC type-approval certificate. For notes and information on legal remedies, see first page of the Annex.

Plates and Markings

Types BC BL 100, BD BL 100, BD BL 200



Type BF BL 500



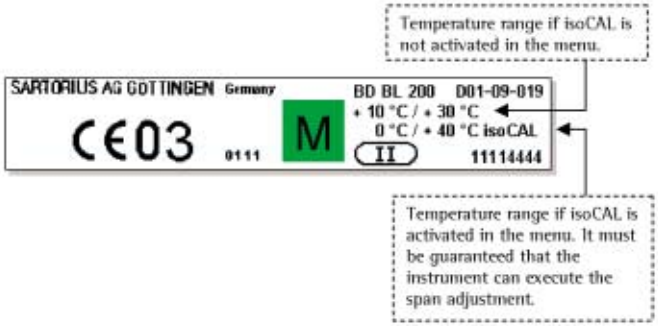
K	Descriptive plate with CE mark of conformity
M	Mark for EC verification (green metrology sticker)
S	Protective seal, for accuracy classes (ii) and (iii) only
MD	Metrological data
T	Plate with model designation

PPLF220104-

Type: BC BL 100, BD BL 100, BD BL 200, BF BL 500
EC type-approval certificate D01-09-019

Example of plate with model designation [T]

Example of descriptive plate on a weighing instrument already verified [K]



PPLE220304e

Type: BC BL 100, BD BL 100, BD BL 200, BF BL 500
EC type-approval certificate D01-09-019

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The status of the information,
specifications and illustrations
in this manual is indicated
by the date given below.
Sartorius AG reserves the
right to make changes to the
technology, features,
specifications and design of the
equipment without notice.

Status:
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Goettingen, Germany

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