

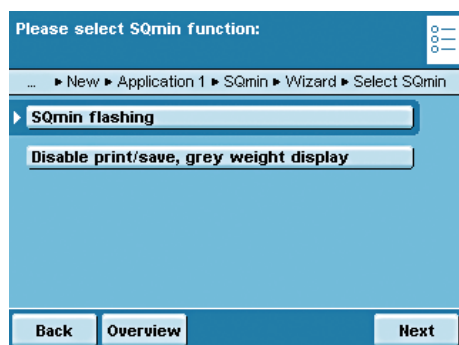
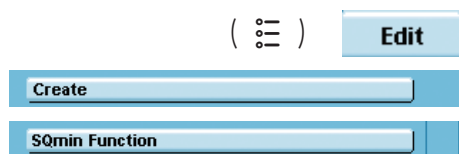
Minimum Sample Quantity SQmin

Purpose: This application is used to compare the measured weight value directly with the defined minimum sample quantity (SQmin = sample quantity minimum). This ensures that weighing results are within tolerances defined by your quality assurance system. This fulfils the requirements of United States Pharmacopeia (USP). According to USP guidelines, the measurement uncertainty can be a max. of 0.1% related to the initial weight when weighing substances for quantitative analyses.

Requirements: The balance must be set up by a service technician to be able to use the SQmin function. The technician will determine the permitted minimum sample quantity and load this to your balance using the guidelines of your QA system. He will document this setting via a “Weighing module test as per USP” certificate in which the measurements and min. sample quantity are logged. The SQmin function ensures that the weighing results correspond to USP guidelines.

Combination options: Mass unit conversion, second tare memory, individual identifiers, (DKD measurement uncertainty)

Configure Task: Minimum Sample Quantity SQmin

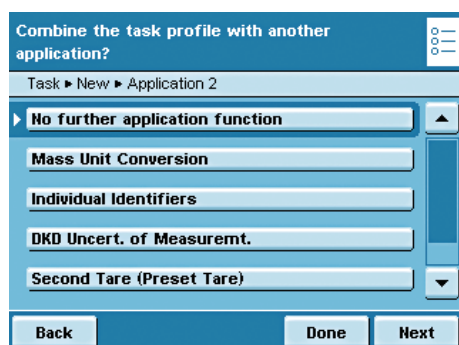


► Select which function should be triggered for minimum sample quantity.

SQmin flashing: The SQmin tab flashes.

Disable print/save...: Printout and saving of the weight value are disabled; the weight value is displayed in gray.


- ▷ An overview of all settings is displayed.
- Check all settings and change as required.



- ▷ A message asks whether you would like to add another application.
- If required, select additional applications you would like to combine.

- ▷ Now you will be prompted to configure the weighing and printing functions.
- Check all settings and change as required.
- Enter a short name and a description for the new task.
- To save the new task, touch **Save**.

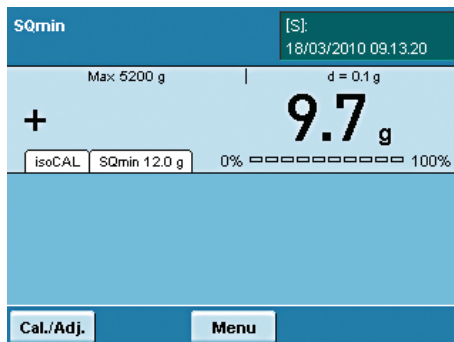
Execute Task: Minimum Sample Quantity SQmin

- () ▶ If you haven't already done so, go to Application Management.
- ▷ The task selection is displayed.
- ▶ Touch the desired task.

or



- ▶ If the desired task is already selected, press **Start**.



- ▷ When you start a task with the SQmin function, the defined SQmin value is shown on the display.
- ▷ As long as the weight value is lower than the SQmin value, the tab "SQmin" will flash.

Individual Identifiers

Purpose: You can define identifiers for the following print jobs:

- Printout by pressing PRINT
- Task start
- Task end
- Initialization (for calculating applications only)
- Result (for calculating applications only)
- Component (for logging applications only)
- Evaluation (for logging applications only)

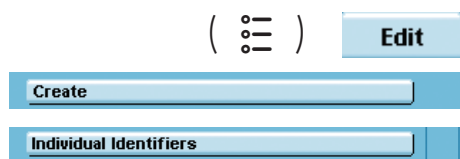
These identifiers are also printed in the log.

Combination options: Second tare, (SQmin function, DKD measurement uncertainty)

Example: You want to configure the application as follows:

- You want the printout to be activated with the PRINT key.
- You want to configure the application so that four identifiers are included in the printed log, i.e., your company address in three lines and the batch number in one line.
- The batch number is to be counted up automatically.

Configure Task: Individual Identifiers



Please enter number of IDs for subsequent results:

Task ▶ New ▶ Application 1 ▶ Identifier ▶ Wizard ▶ No. of IDs

Print output:	n	<input type="text" value="1"/>
Task start:	n	<input type="text" value="3"/>
Task exit:	n	<input type="text" value="0"/>

Back Overview Next

► Enter the desired number of individual IDs that you want to set up.

Print output: Identifier for the Print  key

Task start, task exit: Number of identifiers for task start or task end.

Please enter the identifier title:

... ▶ New ▶ Application 1 ▶ Identifier ▶ Wizard ▶ Identifier title

Title 1 for print output:	<input type="text" value="P-ID1"/>
Title 1 for task start:	<input type="text" value="T-ID1"/>
Title 2 for task start:	<input type="text" value="T-ID2"/>
Title 3 for task start:	<input type="text" value="T-ID3"/>

Back Overview Next

► The corresponding ID (P-ID1, T-ID1, T-ID2, etc.) will be displayed for each identifier.

► Enter the desired title for each ID.

Please enter the identifier title:

... ▶ New ▶ Application 1 ▶ Identifier ▶ Wizard ▶ Identifier title

Title 1 for print output:

Title 1 for task start:

Title 2 for task start:

Title 3 for task start:

- ▶ In the example, a unique title has been defined for each identifier.

Enter identifier (ID):

... ▶ New ▶ Application 1 ▶ Identifier ▶ Wizard ▶ List of IDs

Print ID 1:

Task ID1:

Task ID2:

Task ID3:

- ▶ Enter the desired value (text) for each **identifier**.

Please select identifier for entry during task:

... Application 1 ▶ Identifier ▶ Wizard ▶ ID that can be entered

☒ Print output ID1

- ▶ Select the identifiers that can be entered for executing the task.

Please select IDs for automatic incrementation:

... ▶ Application 1 ▶ Identifier ▶ Wizard ▶ Auto. incrementation

☒ Print output ID1

- ▶ Select whether or not the variable identifiers should be counted up automatically.
- ▶ In the example, the identifier for printout ID1 should be enterable and be counted up automatically.

Please check the identification parameters:

Task ▶ New ▶ Application 1 ▶ Identifier ▶ Overview

No. of IDs:


Identifier title:

List of IDs:

ID that can be entered:

- ▶ An overview of all settings is displayed.
- ▶ Check all settings and change as required.
- ▶ Now you will be prompted to configure the weighing and printing functions.
- ▶ Check all settings and change as required.
- ▶ Enter a short name and a description for the new task.
- ▶ To save the new task, touch **Save**.

Execute Task: Individual Identifiers

- ()
- ▶ If you haven't already done so, go to Application Management.
 - ▷ The task selection is displayed.
 - ▶ Touch the desired task.

or



- ▶ If the desired task is already selected, press **Start**.

Please enter the identifier title:

... ▶ New ▶ Application 1 ▶ Identifier ▶ Wizard ▶ Identifier title

Title 1 for print output:




Title 1 for task start:

Title 2 for task start:

Title 3 for task start:

- ▷ The defined identifiers are displayed (cf. example above).
- ▶ Touch **Next**.
- ▷ Now the predefined lines are printed when the task starts:

Company: Sartorius
 Street: Weender Landstr.
 City: Goettingen

- ()
- ▶ Place the sample on the weighing pan and press the PRINT key ().
 - ▷ The identifier for the printout is displayed and can be changed, if necessary.
 - ▷ In the example, CHARGE (batch) was defined for the printout.
 - ▶ If required, you can change this value now.
 - ▶ Touch **Next** or the PRINT key () once more.

Enter identifier (ID):


... ▶ New ▶ Application 1 ▶ Identifier ▶ Wizard ▶ List of IDs

Print ID 1:

Task ID1:

Task ID2:

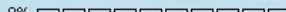
Task ID3:

- ▶ To log the value, press the Print () key.
- ▷ The complete printout looks like this:

Identifier 08/03/2010 14.46.23

Max 5200 g | d = 0.1 g

5.7 g

isoCAL 0%  100%

Company: Sartorius
 Street: Weender Landstr.
 City: Goettingen
 N + 214.5 g
 CHARGE 1
 N + 213.3 g
 CHARGE 2

Density Determination

Purpose:	You can determine the density and volume of liquid, solid or pasty materials.
Combination options:	Checkweighing, statistics, second tare or individual identifiers.
Requirements:	You require the Sartorius YDK01MS density determination kit or your own customer-specific set. The basic calculations for density determination are described at the end of this chapter.
Features	*= Factory setting
	Liquid
*Water:	for density determination using water; the density for the corresponding temperature is calculated automatically
Ethanol:	for density determination using ethanol; the density for the corresponding temperature is calculated automatically
Individual entry:	for density determination using another liquid, enter liquid and its density for corresponding temperature
Density at 20°C and coefficient:	for density determination using another liquid, enter density at 20°C and the coefficients of expansion, the density for the corresponding temperature is calculated automatically.
	Air density
*Air density at 20°C:	for measurement under standard laboratory conditions
Individual entry:	for measurement under other conditions, enter air density
	Decimal places
None:	The measurement value is displayed without decimal places.
1, *2, 3 or 4 places:	The measurement value is displayed with the selected number of decimal places.
	You can choose from four methods for density determination:
	– Determine density of liquid (with glass plummet)
	– Determine density via buoyancy with Sartorius YDK01MS density determination kit (for solid samples)
	– Determine density via displacement (for solid samples)
	– Determine density via pycnometer (for liquid, pasty and powder samples)

Configure Task: Determine the Density of a Solid

You can choose from two methods to determine the density of a solid: **Buoyancy** or **Displacement**.

() **Edit**

Create

► Density Determination ▼

Select a density determination method:

... New ► Application 1 ► Density ► Wizard ► Density method

Determ. density of liquid (w/ glass plummet)

Buoyancy (solid samples)

Displacement (solid samples)

► Pycnometer (liquid, pasty samples)

Back Overview Next

Please select your density kit:

Task ► New ► Application 1 ► Density ► Wizard ► Density kit

YDK-xxx density kit from Sartorius

Other density kit

► No density kit, no correction

Back Overview Next

- Select the method that you want to use: buoyancy or displacement.

- Select the density kit you want to use.
YDK-xxx density kit from Sartorius: For measuring with the YDK kit
Other density kit: If you want to use another kit
No density kit, no correction: If you do not want to use any kit.
- Select or enter the prompted values (for explanations see **Features** on page 79).

Additional Prompts/Settings for Another Determination Kit

* = Factory setting

Parameters for the density kit

Name: Enter a name

No. of wires: Enter the number of wires for the density kit that are immersed into the liquid.

Wire diameter: Enter wire diameter (in mm)

Vessel diameter: Enter vessel diameter (in mm)

Configure Task: Determine Density Using a Pycnometer

() **Edit**

Create

► Density Determination ▼

Select a density determination method:

... New ► Application 1 ► Density ► Wizard ► Density method

Determ. density of liquid (w/ glass plummet)

Buoyancy (solid samples)

Displacement (solid samples)

► Pycnometer (liquid, pasty samples)

Back Overview Next

Please select your density kit:

Task ► New ► Application 1 ► Density ► Wizard ► Density kit

YDK-xxx density kit from Sartorius


Other density kit

► No density kit, no correction

Back Overview Next


- Select the **Pycnometer** method.
- Select or enter the prompted values (for explanations see **Features** on page 79).

Configure Task: Determine Density of Liquid

() **Edit**

Create

► Density Determination ▼

Select a density determination method: 

... New ► Application 1 ► Density ► Wizard ► Density method

► **Determ. density of liquid (w/ glass plummet)**


Buoyancy (solid samples)

Displacement (solid samples)

Pycnometer (liquid, pasty samples)

Back Overview Next

- Select **Determine density of liquid**.

How should air density be accounted for in the result? 


... ► Application 1 ► Density ► Wizard ► Defining air density

► **With fixed air density (at 20 °C)**

User input

Back Overview Next

- Select the measurement conditions.
With fixed air density (at 20 °C): Measurement takes place under standard laboratory conditions (20 °C room and material temperature).
User input: If the measurement is to take place under deviating conditions.
- Enter the required values.


Enter the volume of the glass plummet: 

... ► Application 1 ► Density ► Wizard ► Vol. of glass plummet

Vol. of glass plummet: Pl.vol. cm³

Back Overview Next

- Enter the volume of the glass plummet.

Select decimal places for the result: 

... ► New ► Application 1 ► Density ► Wizard ► Decimal places

No decimal places

► **1 decimal place**

2 decimal places

3 decimal places

4 decimal places

Back Overview Next

- Select the number of decimal places to be used for the density results.

Please check the density determination parameters:

Task ▶ New ▶ Application 1 ▶ Density ▶ Overview

Density method: **Density of liquid**

Defining air density: **Fixed (at 20 °C/68 °F)**

Vol. of glass plummet: **10.000 cm³**

Decimal places: **1 dec. place**

Back **Wizard** **Done** **Next**

- ▶ Check all settings in the overview and change individual parameters as required.

Combine the task profile with another application?

Task ▶ New ▶ Application 2

▶ **No further application function**

Mass Unit Conversion

Individual Identifiers

Statistics

Formulation

Back **Done** **Next**

- ▷ An overview of all settings is displayed.
- ▶ Check all settings and change as required.
- ▷ A message asks whether you would like to add another application.
- ▶ If required, select additional applications to be combined.
- ▷ Now you will be prompted to configure the weighing and printing functions.
- ▶ Check all settings and change as required.
- ▶ Enter a short name and a description for the new task.
- ▶ To save the new task, touch **Save**.

Execute Task: Density Determination



- ▶ Prepare the density determination kit that you want to use.
- ▶ If you haven't already done so, go to Application Management.
- ▷ The task selection is displayed.
- ▶ Touch the desired task.

or



- ▶ If the desired task is already selected, press **Start**.

Density Administrator 04/03/2010 15:20:21

1/4

Max: 5200 g | d = 0.1 g

+ **0.2 g**

isoCAL 0% 100%

Temperature of liquid: Temp **20.0 °C**

Please check current settings
Press [**Start**] to start sample weighing

Cal./Adj. **Menu** **Start**

- ▷ The program switches to operating mode.
- ▶ Follow the instructions on the display.

Calculation Basis for Density Determination

The density determination application is based on the equations:

Rho	Density of sample (ρ)
ρ_{fl}	Density of buoyancy liquid
W_a	Weight of sample in air
W_{fl}	Weight of sample in liquid (for determining density of liquids, buoyancy and displacement)
	Weight of fill medium (for pycnometer)
W_r	Weight of sample and fill medium (for pycnometer)
LA	Air buoyancy correction = 0.0012 g/ccm

Buoyancy:
$$\text{Rho} = (W_a * (\rho_{fl} - LA)) / ((W_a - W_{fl}) * \text{corr}) + LA$$

Displacement:
$$\text{Rho} = (W_a * (\rho_{fl} - LA)) / (W_{fl} * \text{corr}) + LA$$

When the displacement method is used to correct for buoyancy by means of a wire (string) suspended in liquid, the factor 1.00000 is used in the calculation as factory-set default.

The correction factor **Corr** is calculated from: $\text{Corr} = 1 - n * d^2 / D^2$ with:

n	No. of wires:
d	Wire diameter (YKD01MS: 0.7 mm)
D	Inner diameter of the vessel being used (YKD01MS: 76 mm)

Please check the density kit parameters:

Task ► New ► App.Func. 1 ► Density ► Wizard ► D.kit param.

Name of kit:

Number of wires: n

Wire diameter: d mm

Vessel diameter: D mm

When other vessels or other submersion assemblies are used, this factor can be changed by modifying the parameters for the density kit.

Statistics

Purpose: Saving and statistical analysis of weight values and other calculated values.

The values are generated as results:

- Transaction counter
- Sum of all values
- Average value
- Standard deviation
- Lowest value (minimum)
- Highest value (maximum)
- Difference between maximum and minimum

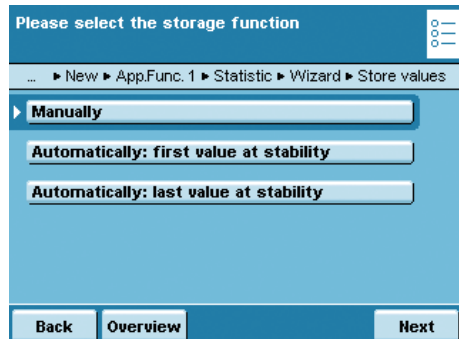
Options: You can save a maximum of 65535 components.

Combination options: Density determination, calculation, averaging, weighing in percent, parts counting, timer-controlled functions, checkweighing, mass unit conversion, second tare memory, individual identifiers (SQmin function, DKD measurement uncertainty)

Configure Task: Statistics



* = factory setting



► Define how the weight value will be applied.

***Manually:** The weight value is applied as soon as the corresponding button is touched.

Automatically: first value at stability: The weight value is applied automatically as soon as the balance has stabilized after filling and the value exceeds the minimum load.

Automatically: last value at stability: The last weight value with stability is applied automatically, as soon as the balance is unloaded and the value falls short of the minimum load. If stability was reached repeatedly between measurements, the last stable weight value will be stored.

You must now select the minimum load to be applied:

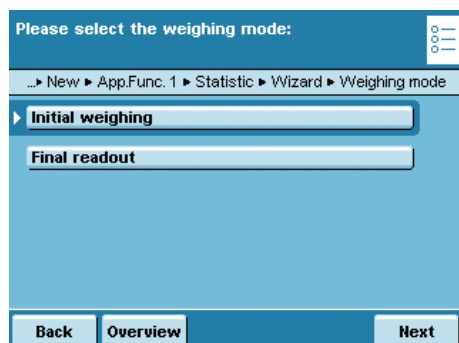
(none, 10, 20, ...*100 ... 1000 digits).

Weighing Mode with Automatic Storage:

► Select the weighing mode to be used for the weight values.

Initial weighing: Initial weighing of samples in a container.

Final readout: Final weighing of samples in a container.



Define how no. of measurements is determined

... ▶ App.Func. 1 ▶ Statistic ▶ Wizard ▶ Define no. of meas.

Fixed default defined in application setup

▶ Number can be changed

Back Overview Next

Tare automatically after storing?

... ▶ New ▶ App.Func. 1 ▶ Statistic ▶ Wizard ▶ Automatic tare

No automatic tare after store

▶ Automatic tare after store active

Back Overview Next

Please check the statistics parameters:

Task ▶ New ▶ App.Func. 1 ▶ Statistic ▶ Overview

Store values: Manual

Weighing mode: Init.wt.

Define no. of meas.: Variable input

Automatic tare: Off

Back Wizard Done Next

- ▶ Define when the number of measurements (items) will be defined.

Fixed default defined in application setup: The item number is defined beforehand.

Number can be changed: Enter the item number when you execute the task.

- ▶ Define whether or not automatic taring takes place after the transfer.

- ▶ An overview of all settings is displayed.
- ▶ Check all settings and change as required.

- ▶ A message asks whether you would like to add another application.
- ▶ If required, select additional applications to be combined.

- ▶ Now you will be prompted to configure the weighing and printing functions.
- ▶ Check all settings and change as required.
- ▶ Enter a short name and a description for the new task.
- ▶ To save the new task, touch **Save**.
- ▶ The new task is saved with your settings and displayed in the task list.

Execute Task: Statistics

- ▶ If you haven't already done so, go to Task Management.
- ▶ The task selection is displayed.
- ▶ Touch the desired task.

or

- ▶ If the desired task is already selected, press **Start**.

- ▶ The program switches to operating mode.

- ▶ If required, enter the number of items that you want to analyze.
- ▶ Place the first sample on the weighing pan.
- ▶ To start Statistics, touch **Start**.
- ▶ The first weight value is displayed.

Statistic Administrator 16/12/2008 11.13.34

Max: 10200 g | d = 0.01 g

0.00 g

isoCAL Leveling 0% 100%

Default transactions: nDef 3

Please check number of transactions

Press [Calc.] to show statistic results

Press [Start] to store in memory

Cal./Adj. Menu Calc. Start

Statistic Administrator 04/03/2010 15.32.49

Max 5200 g | d = 0.1 g

0.0 g

isoCAL 0% 100%

Accept **Item 1**

Show statistic results: Press [Calc.]
Press [Next] to store in memory

Back Calc. Next

- Place the next sample on the weighing pan and touch **Next**.
- Continue with all other samples in the same way.
- You can remove each last value from the statistics by touching **Corr**.
- During the task, you can have the result displayed at any time by touching **Calc**.

Statistic Administrator 04/03/2010 15.33.41

Max 5200 g | d = 0.1 g

0.0 g

Result:

Number of items:	n	4
Mean weight value:	x	0.05 g
Std. dev. of wt. values:	s	0.06 g
Variation coeff. wt. val.:	sRel	115.47 %

Clear evaluation: Press [Clear]
Delete last accepted value: Press [Corr.]

Back Clear Corr.

- Once all intended samples have been weighed, the result is displayed.
- To delete the results and begin the next task, touch **Clear**.

Print example:

```

-----
n                      1
Comp                   98.8 g
n                      2
Comp                   56.4 g
:
:
:
n                      5
Comp                   56.4 g
n                      5
Sum                    280.3 g
x                      56.06 g
s                      24.93 g
sRel                   44.46 %
Max                    98.8 g
Min                    37.2 g
Diff                   61.6 g
-----

```

Calculation

Purpose: This application is used to calculate the weight value using an algebraic formula that you define yourself. You can define a fixed formula or one that you can change while executing the task.

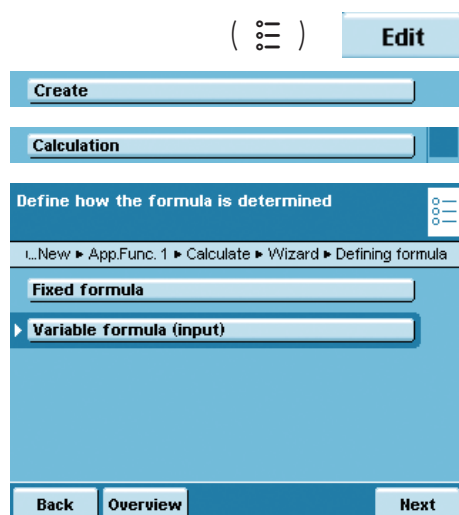
M

On balances used as legal measuring instruments, follow the directions in the “Execute Task” section!

Combination options: Second tare, (SQmin function, DKD measurement uncertainty)

Example: You want to determine the area of irregularly cut pieces of paper. The grammage of the respective paper type is known.

Configure Task: Calculation



► Select whether you want to use a fixed formula or a variable formula.

Fixed formula: All calculations are carried out with the formula that you define for this task.

Variable formula (input): You can change the formula before each calculation.

Example: The area of irregular paper samples must be determined.

The respective paper grammage in g/cm² is known. The equation for determining the paper area in cm² is:

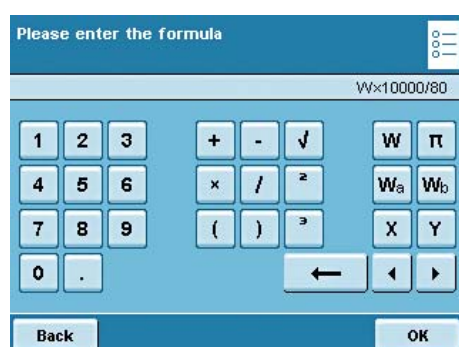
Paper area = weight value W in g * 10000 / grammage in g/cm².

The formula to be entered for a grammage of 80 g/cm² is:

Wx10000/80

To analyze different paper types, the formula must be able to be changed before each calculation (e.g., for paper with 80, 90, 100 g/cm²).

Additional formula examples are at the end of this section. Likewise, you can create several tasks, one for each paper type.



► If a fixed formula will be used, enter it now.

► If you want to work with a variable formula, enter the formula when you execute the task.



Dynamic weight value



Pi = 3.1415926



Applied weight value* a



Applied weight value* b



Fixed constant calc. value



Square root**



2nd power **



3rd magnitude**

* for calculation

** corresponding to general mathematical characters

Enter a text to identify result

Task ► New ► App.Func. 1 ► Calculate ► Wizard ► Result ID

Result ID:

Back Overview Next

- Enter a name for the event print, e.g., “Area” (max. 6 characters).

Select decimal places for the result

... ► New ► App.Func. 1 ► Calculate ► Wizard ► Decimal places

☐ No decimal places

☒ 1 decimal place

☐ 2 decimal places

☐ 3 decimal places

☐ 4 decimal places

Back Overview Next

- Define how many decimal points should be used for the results:
No decimal places, *1... 7 decimal places

Enter the unit for the result

... ► New ► App.Func. 1 ► Calculate ► Wizard ► Result unit

Result unit:

Back Overview Next

- Enter the unit to be used for the results (max. six characters, e.g., cm²)

Please check the calculation parameters:

Task ► New ► App.Func. 1 ► Calculate ► Overview

Defining formula: ►

Result ID:

Decimal places:

Result unit:

Back Wizard Done Next

- An overview of all settings is displayed.
- Check all settings and change as required.

A message asks whether you would like to add another application.

- Prompts for configuring weighing and printing appear.
- Check all settings and change as required.
- Enter a short name and a description for the new task.
- To save the new task, touch **Save**.

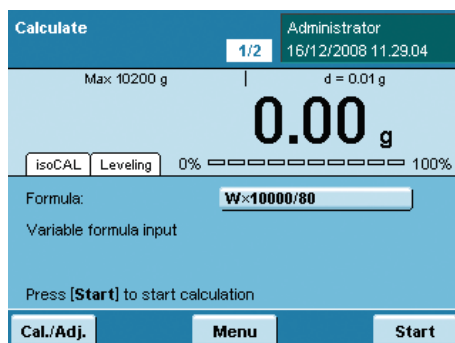
Execute Task: Calculation



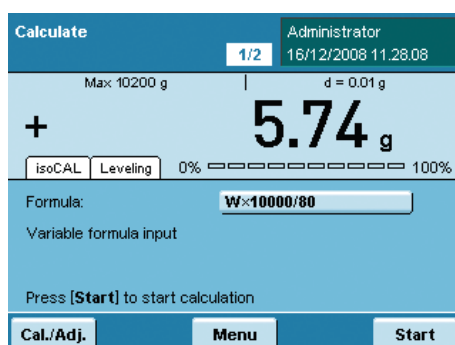
- ▶ If you haven't already done so, go to Application Management.
- ▷ The task selection is displayed.
- ▶ Touch the desired task.

or

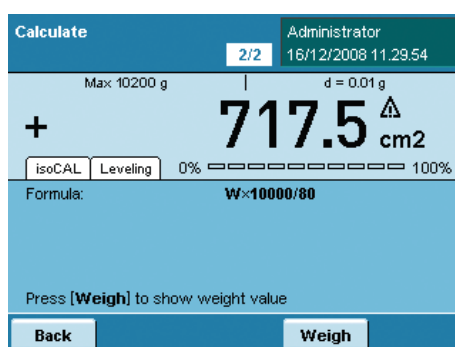
- ▶ If the desired task is already selected, touch **Start**.



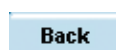
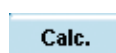
- ▶ When you want to work with a variable formula, you can now enter or change the formula.
- ▶ Place the sample on the balance.



- ▷ The weight value is displayed.
- ▶ To start the calculation, touch **Start**.



- ▷ The calculation results are displayed.
- ▶ To return to the weight value display, touch **Weigh**.



- ▶ If you want to carry out additional weighing and calculations using the same formula, place the sample on the balance and then touch **Calc.**
- ▶ If you want to carry out additional weighing using a different formula touch **Back**.
- ▶ You can now change the formula and then proceed as described above.

Examples of Calculation Formulas

1) Diameter Determination

Purpose

This application is used to determine the diameter of round wires and metal threads (cylindrical solid bodies). For example, for use in determining the diameter of filaments. The density and length of the sample is required for calculating the diameter.

Formulas and abbreviations

Definition: $d = 2 \times \sqrt{(W / (\pi \times l \times \text{Rho} / 1000))}$

with: d = diameter of sample in mm

$\sqrt{}$ = square root

W = weight value in grams

π = PI = 3.145..

l = length of sample in mm, e.g., 100 mm

Rho = density of sample in g/cm³, e.g., 8.3 g/cm³

Preparation (only required if you need to make changes)

Access the “Change” item from the Task menu. The available tasks can be loaded from the SD card (in this case, the “TASK-DIAMETER-DETERM” file).

Please check the calculation parameters:

Task > Calc. > Application 1 > Calculate > Overview

Defining formula: Fixed default formula

Formula: $2 \times \sqrt{(W / (\pi \times X \times 8.3 / 1000))}$

Result ID: d

Decimal places: 3 dec. place

Result unit: mm

Back Wizard Done Next

The “Calculation” application is set with the following parameters:

- Formula specifications: fixed
- Formula: $2 \times \sqrt{(W / \pi \times X \times 8.3 / 1000)}$
- Result identifier: d
- Number of decimal places: 3 digits
- Result unit: mm

Execute Task: Calculation “Diameter Determination”

- ▶ If you haven't already done so, go to Task Management.
- ▶ The task selection is displayed.
- ▶ Touch the “Diameter determination” task from the Task menu.
- ▶ The formula for diameter determination and the density of the sample (8.3 g/cm³) are preset..
- ▶ The length of the sample, e.g., 100 mm can be entered using the X variable.
- ▶ Touch **Start** to begin the calculation.

Calculate 1/2 23/06/2011 15:38:44

Max 2.1 g | d = 0.0000001 g

+ 0.3423172

Formula: $2 \times \sqrt{W / (\pi \times X \times 8.3 / 1000)}$

Variable X: X 100

Fixed formula, only X may be changed.
Press [Start] to start calculation

Cal./Adj. DraftShd Menu Start

- ▶ The diameter is displayed as the calculation result.
- ▶ To return to the weight value display, touch **Weigh**.
- ▶ You can view both values, the weight and the diameter.

Calculate 2/2 23/06/2011 15:39:44

Max 2.1 g | d = 0.0000001 g

+ 0.725 mm

Formula: $2 \times \sqrt{W / (\pi \times X \times 8.3 / 1000)}$

Variable X: X 100

Press [Weigh] to show weight value

Back DraftShd Weigh

- ▶ If you want to carry out additional weighing and calculations using the same formula, place the sample on the balance and then touch **Calc.**
- ▶ If you want to carry out additional weighing using a different formula, touch **Back**.
- ▶ You can now change the formula and then proceed as described above.

Calculate 2/2 23/06/2011 15:40:20

Max 2.1 g | d = 0.0000001 g

+ 0.3423129 g

isoCAL 0% 100%

Calculated value: d +0.725 mm

Show calculated value: Press [Calc.]

Back DraftShd Calc.

Print via the () key:

N	+	0.365387 g
X		100
d	+	0.749 mm

2) Diameter Determination for Cylindrical Bodies

Definition: $\text{Diameter} = 2 \times \sqrt{W / (\pi \times l \times \text{Rho})}$
 with: $\sqrt{}$ = square root
 W = weight value in g
 $\pi = 3.145$
 l = length of sample in cm
 Rho = density of sample in g/cm³ (e.g., 8.30000 g/cm³)

Formula

Input:: $2 \times \sqrt{W / (\pi \times 100 \times 8.3 / 1.000)}$

Header: d

Unit: mm

3) Air Buoyancy Correction

Purpose

This application can correct weighing errors that can arise due to air buoyancy when working with weights of different densities.

The air density value is required when calculating the air buoyancy correction.

Formulas and abbreviations

1. Definition: $m = W \times K$

with: m = mass of the sample, unit symbol “g!”
 W = weight value in grams
 K = correction factor

2. Definition: $K = 1 - (\text{RhoL} / \text{RhoST}) / 1 - (\text{RhoL} / \text{RhoG})$

with: RhoL = air density in g/cm³, e.g., 0.0012 g/cm³ (standard air density)
 RhoST = density of steel, e.g., 8.0000 g/cm³
 RhoG = density of sample, e.g., 2.4000 g/cm³

Preparation

Access an existing task, for example, via the “Change” item from the Task menu. The available tasks can be loaded from the SD card (in this case, the “TASK-AIR-BUOYANCY_CORR” file).

The “Calculation” application is set with the following parameters:

- Formula specifications: fixed
- Formula: $W \times ((1 - (0.0012 / 8.000)) / (1 - (0.0012 / X)))$
- Result identifier: m
- Number of decimal places: 6 decimal places
- Result unit: g!

Execute a Task: Calculation "Air Buoyancy Correction"

- ▶ If you haven't already done so, go to Task Management.
- ▶ The task selection is displayed.
- ▶ Touch the "Air buoyancy correction" task from the Task menu.
- ▶ The formula for the air buoyancy correction is already defined.
- ▶ Enter the density of the sample via "Variable X," in this example 2.400 g/cm³.
- ▶ Touch **Start** to begin the calculation.

- ▶ The mass is displayed as the calculation result.
- ▶ To return to the weight value display, touch **Weigh**.
- ▶ You can view both values, the weight and the mass.

- ▶ If you want to carry out additional weighing and calculations using the same formula, place the sample on the balance and then touch **Calc.**
- ▶ If you want to carry out additional weighing using a different formula, touch **Back**.
- ▶ You can now change the formula and then proceed as described above.

Print via the () key:

N	+	3.183629	g
X		2.400	
m	+	3.184744	g!

Execute Task: Calculation



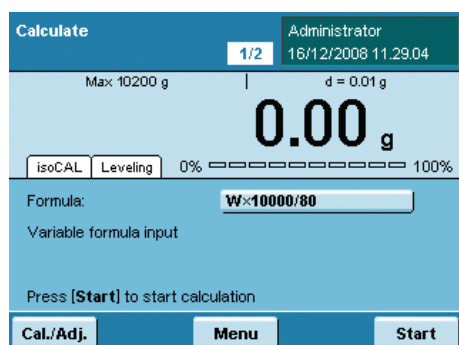
- ▶ If you haven't already done so, go to Application Management.
- ▶ The task selection is displayed.
- ▶ Touch the desired task.

or

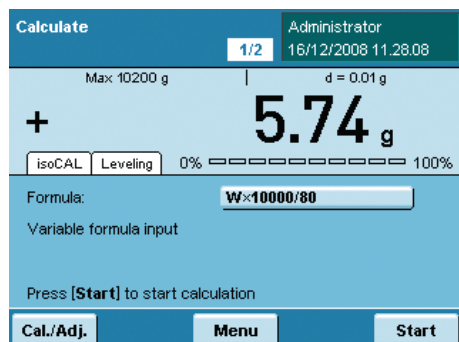
- ▶ If the desired task is already selected, touch **Start**.



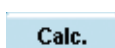
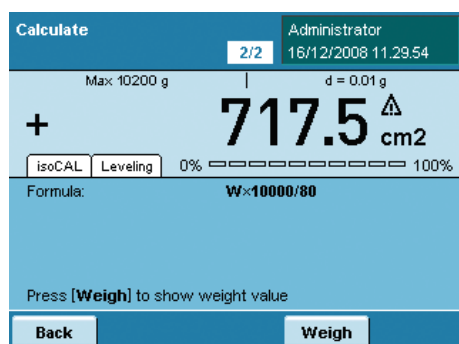
- ▶ When you want to work with a variable formula, you can now enter or change the formula.
- ▶ Place the sample on the balance.



- ▶ The weight value is displayed.
- ▶ To start the calculation, touch **Start**.



- ▶ The calculation results are displayed.
- ▶ To return to the weight value display, touch **Weigh**.



- ▶ If you want to carry out additional weighing and calculations using the same formula, place the sample on the balance and then touch **Calc.**
- ▶ If you want to carry out additional weighing using a different formula touch **Back**.
- ▶ You can now change the formula and then proceed as described above.



Averaging

Purpose: This application is used for moving samples (e.g., live animals) and for weighing in unstable environments. A measurement cycle is automatically carried out with a defined number of measurements for each object to be weighed. The individual measurements are averaged and this average is displayed as the result.

M

On balances used in legal metrology, follow the directions in the “Execute Task” section!

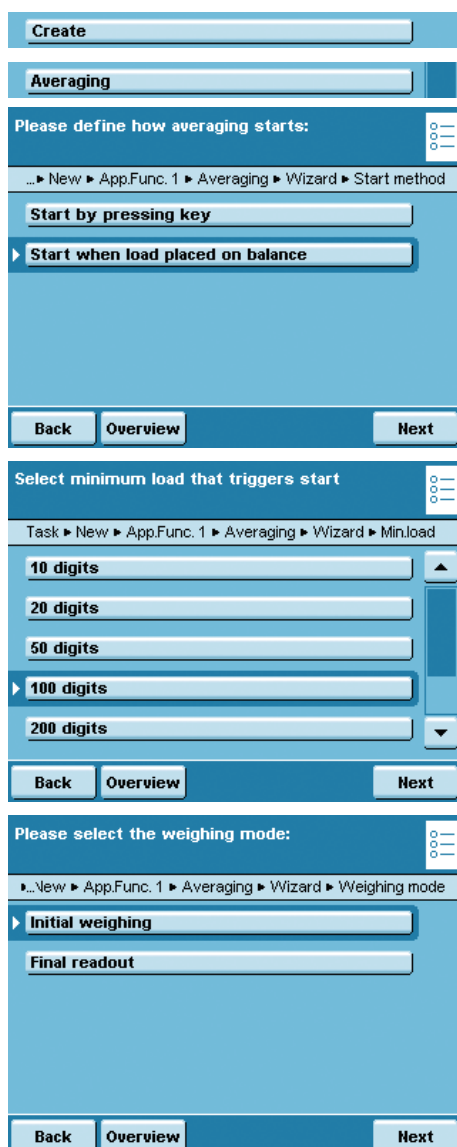
Options: You can start the measurement manually or it can start automatically as soon as the min. weight is reached. Depending on how strong the unsteadiness of the sample is, you can vary the sensitivity at the start of the measurement. The number of measurements from which the average is taken can also be defined.

Combination options: Checkweighing, timer controlled functions, totalizing, statistics, formulation, SQmin function, DKD measurement uncertainty, second tare, individual identifiers.

()

Edit

Configure Task: Averaging



Create

Averaging

Please define how averaging starts:

... New ▶ App.Func. 1 ▶ Averaging ▶ Wizard ▶ Start method

Start by pressing key

Start when load placed on balance

Back **Overview** **Next**

Select minimum load that triggers start

Task ▶ New ▶ App.Func. 1 ▶ Averaging ▶ Wizard ▶ Min.load

10 digits

20 digits

50 digits

100 digits

200 digits

Back **Overview** **Next**

Please select the weighing mode:

... New ▶ App.Func. 1 ▶ Averaging ▶ Wizard ▶ Weighing mode

Initial weighing

Final readout

Back **Overview** **Next**

► Select how the application should start.

Start by pressing key: This starts the application manually.

***Start when load placed on balance:** The application starts automatically as soon as a pre-defined min. load is exceeded.

► Define the min. load for the automatic start of the averaging and/or for the release of the result display for the manual start.

none, 10, 20, 50, *100, ...1000 digits

The number of **digits** depends on the balance resolution (see Display).

Example: For a balance with a resolution of $d = 0.1$ (100 mg), 100 digits means a min. load of $100 \times 0.1 = 10$ g. With this setting, the automatic start would be triggered as soon as a min. of 10 g was placed on the balance.

Only for automatic start:

► Determine the weighing mode: ***Initial weighing** or **Final readout**.

Please select activity to start with:

Task ▶ New ▶ App.Func. 1 ▶ Averaging ▶ Wizard ▶ Activity

Activity 1.0% of averg./object

Activity 2.0% of averg./object

Activity 5.0% of averg./object

▶ Activity 10.0% of averg./object

Activity 20.0% of averg./object

Back Overview Next

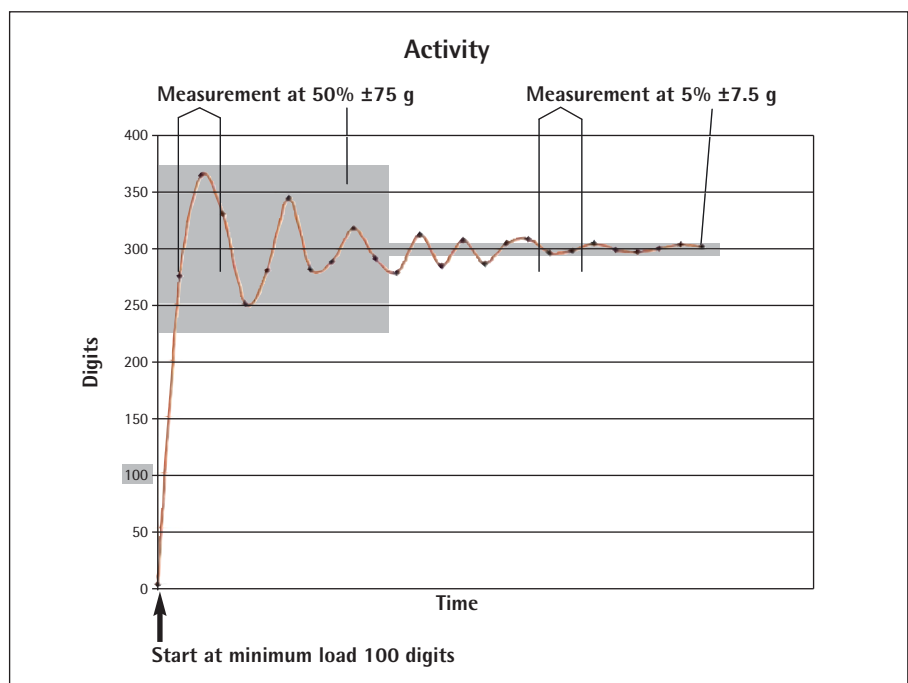
- Enter the sensitivity for the start of the measurement:

0.1%, 0.2%, 0.5% ... *10% ... 50% of averg./object

This entry estimates the strength of unrest that is caused by the activity at the beginning when loading the balance (e.g., animal movement). You can use the rough estimation or a more detailed estimation using percentages.

The weight value changes with each movement of the weighing pan. As soon as three consecutive measurement values are within the selected unrest range, the interval measurement begins.

Example: You are weighing animals with an average weight of approx. 300 g. With the “5% of averg./object” setting, the measurement starts when the movements are within a range of 15 g, i.e., ± 7.5 g. With the “50% of averg./object” setting, the interval measurement would start when the weight value was within a range of 150 g, i.e., ± 75 g.



Define how number of subweighs is determined

... App.Func. 1 ▶ Averaging ▶ Wizard ▶ Set no. of subweighs

Fixed number of subweighs

▶ Variable number of subweighs

Back Overview Next

- Define the number of measurements to be used for the average value.

Fixed number of subweighs: You must now enter a fixed number.

***Variable number of subweighs:** You will define the number when you execute the task.

- ▶ Define whether or not the weighing results should be calculated with an additional factor and how this factor should be applied.

No calculation factor

Fixed factor: You must now enter this factor.

Variable factor (input): You must enter this factor when you execute the task.

Example: Each animal should receive a food supplement of 50 mg per kg of body weight. For this, the factor 0.05 can be entered (weight value in g/1000 g × 0.05 g). During the measurement, both the weight value (animal weight, e.g., 285 g) as well as the calculated value (amount of supplement, e.g., 14.25 mg) can be displayed.

If you selected the calculation:

- ▶ Define the number of decimal places to be used for the calculation.

No decimal places, 1, *2, ... 6 decimal places

- ▶ Define whether or not the end of the measurement (and if necessary the calculation) should have an acoustical signal.

***Acoustic signal off** or **Acoustic signal on**

- ▶ An overview of all settings is displayed.
- ▶ Check all settings and change as required.
- ▶ A message asks whether you would like to add another application.
- ▶ If required, select additional applications to be combined.
- ▶ Prompts for configuring weighing and printing appear.
- ▶ Check all settings and change as required.
- ▶ Enter a short name and a description for the new task.
- ▶ To save the new task, touch **Save**.

Execute Task: Averaging with Manual Start

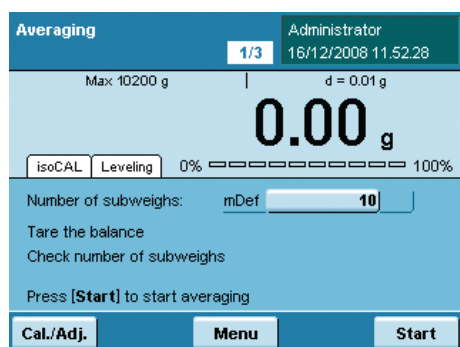


- If you haven't already done so, go to Application Management.
- The task selection is displayed.
- Touch the desired task.

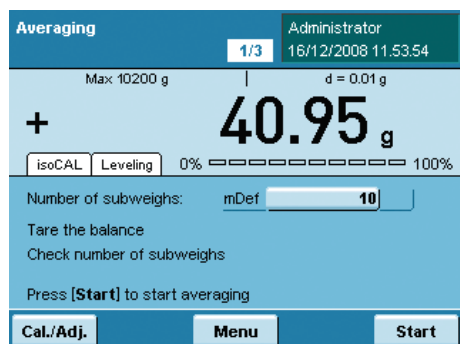
or



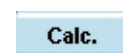
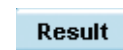
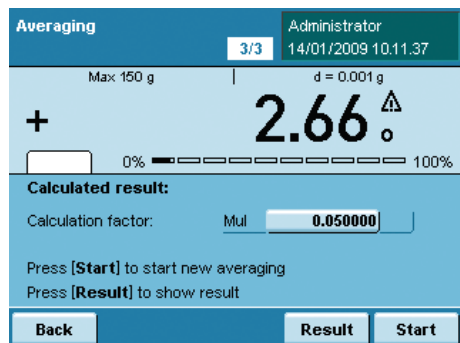
- If the desired task is already selected, press **Start**.



- When you are using a variable number of measurements, enter the desired number.
- When you are weighing live animals, place the container (cage) on the weighing pan and tare the balance.
- Place the animal in the container.



- To begin weighing, touch **Start**.
- The defined number of measurements is carried out and the average is displayed.



- To begin the measurement, touch **Start**.
- The results calculated with the entered factor are displayed.

- To display the average weight value, touch **Result**.

- To return to the display of the calculated value, touch **Calc.**

Execute Task: Averaging with Automatic Start

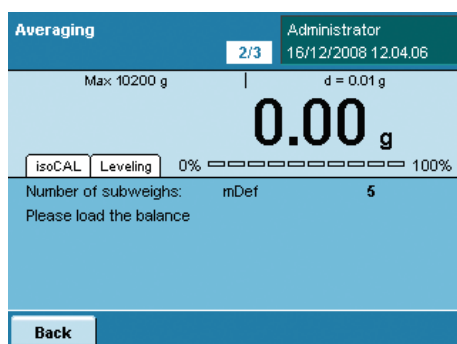


- ▶ If you haven't already done so, go to Application Management.
- ▶ The task selection is displayed.
- ▶ Touch the desired task.

or



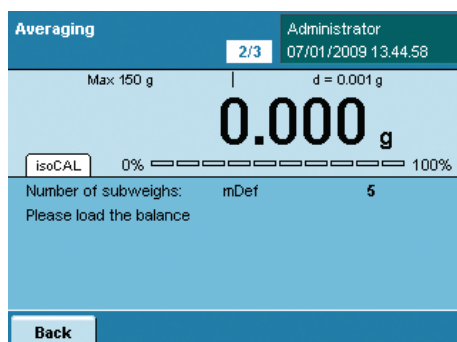
- ▶ If the desired task is already selected, press **Start**.



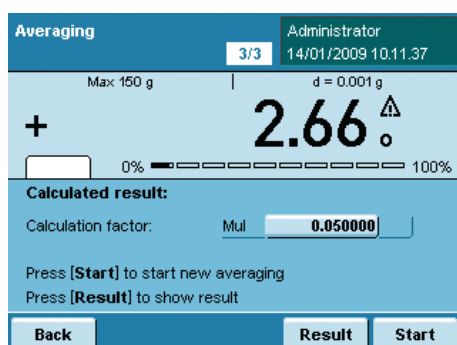
- ▶ When you are using a variable number of measurements, enter the desired number.
- ▶ When you are weighing live animals, place the container (cage) on the weighing pan and tare the balance.



- ▶ Press **Start** to begin the task.



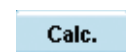
- ▶ Place the animal in the container.



- ▶ The measurement starts automatically, the defined number of measurements and averaging is carried out.
- ▶ The calculated results are displayed.



- ▶ To display the average weight value, touch **Result**.



- ▶ To return to the display of the calculated value, touch **Calc.**

Formulation

Purpose: This application is used to weigh while adding several components consecutively. The balance is tared automatically after each component. The weight values of all individual components as well as the total weight results are recorded and can be logged.
You can save a maximum of 65535 components.

Combination options: Mass unit conversion, second tare memory and individual identifiers, (SQmin function, DKD measurement uncertainty)

Options: The program allows 7 different formulations.

1) Fixed formulation in grams: Number of components and the weight portion of each component (in g) are fixed.

2) Fixed formulation in % with total = 100%, total weight is entered: Number of components and the percentage of each component are fixed. The total weight is entered when the task is started. If the percentages do not add up to 100, the individual values are converted to 100%.

Example: Number of components nDef = 3; component 1 = 25%, component 2 = 30%, component 3 = 10%; components, total = 65% is set equal to 100%.
Component 1: $25\%/65\% * 100 = 38.46\%$; Component 2: $30\%/65\% * 100 = 46.15\%$;
Component 3: $10\%/65\% * 100 = 15.38\%$

3) Fixed formulation in % with total = 100%, total weight is calculated according to the first component: Number of components and the percentage of each component are fixed. If the percentages do not add up to 100, the individual values are converted to 100% (cf. Formulation 2). After weighing the first component, the total weight (100%) is calculated.

4) Fixed formulation in % with total <> 100%, total weight is entered: Number of components and the percentage of each component are fixed. If the total of percentages does not equal 100, the individual values are **not** converted. The total weight is entered, for each component, the user-defined weight and the percentage are displayed before weighing.

5) Fixed formulation in % with total = 100%, total weight is calculated according to the first component: Number of components and the percentage of each component are fixed. If the percentages do not add up to 100, the individual values are converted to 100%. For the first component, the user-defined weight is displayed before weighing in percent. After weighing the first component, the total weight (100%) is calculated. Before weighing any other component, the respective user-defined weight is displayed in g and %.

6) Variable formulation in grams, component count are in a fixed order: Before weighing the first component, you can change the number of components; before weighing each component you can change its name.

7) Variable formulation in grams, component count are in a fixed order: Before weighing the first component, you can zero the number of components; before weighing each component you can change its name.

For all formulations, the following applies:

- The individual components can be stored manually or automatically (first reproducible value).
- If automatic storage of values was selected, the minimum load is determined when the task is created.
- After weighing the first component, the **Calc.** button is displayed. That way, you can change the display to show the intermediate result.
- Once the intermediate result is displayed, you can delete the value of the last weighed component by pressing the button **Corr.** and it will be removed from the calculation. This allows you to delete all components step-by-step in reverse order. Deleting is **not reversible!**
- Use the **Back** button to toggle the display and continue the task.
- After the defined number of components has been weighed, the evaluation is displayed. Here, too, you can still delete the components (beginning with the last component) and weigh them again.

Note: For the seventh formulation, there is no automatic evaluation because the defined number of components is zero. You have to operate the evaluation manually by touching **Calc.**

**Configure Task: Formulation**

 The screenshot shows a multi-step configuration wizard. At the top, there is a breadcrumb trail: (≡) Edit. Below this is a 'Create' button. The main title bar is 'Formulation'. The first step is 'Please select the storage function:'. It has a breadcrumb trail: ... ► New ► Application 1 ► Formul. ► Wizard ► Store values. There are two options: 'Manually' (selected) and 'Automatically: first value at stability'. At the bottom are 'Back', 'Overview', and 'Next' buttons. The second step is 'Define when the no. of components is determined'. It has a breadcrumb trail: ... ► New ► Application 1 ► Formul. ► Wizard ► Default items. There are two options: 'Enter fixed quantity' (selected) and 'Quantity can be changed during the process'. At the bottom are 'Back', 'Overview', and 'Next' buttons.

* = factory setting

- Define how the weight values will be applied.

***Manually:** The weight value is applied as soon as the corresponding button is touched.

***Automatically: first value at stability:** The weight value is applied automatically as soon as the balance has stabilized. You must now select the minimum load to be applied (**10, 20, ... *100 ... 1000 digits**).

- Set when the number of components will be defined.

Enter fixed quantity: The number of components is defined beforehand.

***Quantity can be changed during the process:** Enter the number of components only when you execute the task (Formulations 6 and 7).

- Once you fix the components, define the unit:
***Amount in weight unit** (Formulation 1)
Default in percent, sum = 100% (Formulations 2 and 3)
Default in percent, sum <> 100% (Formulations 4 and 5)

- Touch **Next**.
- Enter the number of components.

- ▷ An overview of all settings is displayed (in this case, Formulation 2).
- Check all settings and change as required.

- ▷ A message asks whether you would like to add another application.
- If required, select additional applications to be combined.

- ▷ Prompts for configuring weighing and printing appear.
- Check all settings and change as required.
- Enter a short name and a description for the new task.
- To save the new task, touch **Save**.

Execute Task: Formulation



- If you haven't already done so, go to Application Management.
- ▷ The task selection is displayed.
- Touch the desired task.

or



- If the desired task is already selected, press **Start**.

- If required, enter the number of components that you want to weigh while adding them.
- To start the formulation, touch **Start**.

- If required, enter the name of components.

Please note that you will be able to scroll through the lines as soon as a scroll bar appears at the right of the display.

Formul. 3/3 08/03/2010 15.00.46

Max: 5200 g | d = 0.1 g

0.0 g Net 2

isoCAL 0% 100%

Result:

Define components	nDef	3
No. of comp.	n	3
N-Tot:	Sum	+48.7 g
Component1	Com...	+37.2 g

Corr. Param. Start

- The evaluation is displayed as soon as all components of the formulation have been added and weighed.

You can also see the complete list here when you touch the scroll bar.

Corr.

- To delete the last component, touch **Corr.**

Param.

- To go to the parameter page, touch **Param.**

Start

- To restart the formulation (with changed parameters), touch **Start.**

Print example:

```


-----
IdCm1      Component 1
Comp1 +    39.2 g
IdCm2      Component 2
Comp2 +    23.3 g
:
:
:
IdCm5      Component 5
Comp5 +    32.4 g
nDef       5
Sum +     117.6 g
-----

```


Weighing in Percent

- Purpose: This application is used to determine the percentage share or the percentage difference of the sample related to a reference weight.
- Options: You can enter a fixed reference weight or a reference percentage.
- Combination options: Checkweighing, timer controlled functions, totalizing, statistics, formulation, second tare, individual identifiers, (SQmin function, DKD measurement uncertainty)

Configure Task: Weighing in Percent

()

► **Weighing in Percent**

Define how weighing in percent is initialised 


... ► Application 1 ► Percent.WV ► Wizard ► Percent method

► **By calculating reference weight**

- Define how the weighing in percent will be initialized.

By calculating reference weight: The reference weight is determined by weighing a reference object.

By entering reference weight: The reference weight is entered as a numerical value.

Define how reference weight is determined 

► New ► Application 1 ► Percent.WV ► Wizard ► Set reference


► **Ref. perc. can be changed during process**

If the reference weight should be **calculated**.

- Define whether the reference percentage should be fixed or variable.

Enter fixed reference percentage: You must now enter the reference percentage.

***Ref. perc. can be changed during process:** You can enter this when carrying out the task.

Define how reference weight is determined 

► Application 1 ► Percent.WV ► Wizard ► Set reference weight

► **Ref. weight can be changed during process**

If the reference weight should be **fixed**:

Enter fixed reference weight: You must enter this now.

***Reference weight can be changed during process:** You can enter this when carrying out the task.

Define which calculated percentage is displayed

... ▶ Application 1 ▶ Percent.W ▶ Wizard ▶ Displayed value

Residue

Loss

Ratio 1 (DR)

Ratio 2 (OR)

Back Overview Next

- ▶ Define which percent calculation should be used.

Example: Weight value = 10 g, reference weight = 50 g

***Residue:** The result is the percentage share of the weight value of the reference weight (residue: weight value/reference weight * 100%; in the example: 20%)

Loss: The result is the percentage loss between the weight value and the reference weight (loss: weight value - reference weight / reference weight * 100%; in the example: -80%)

Ratio 1 (DR): The result is the percentage ratio of the difference to the weight value (ratio 1: reference weight - weight value / weight value * 100%; in the example: 400%)

Ratio 2 (OR): The result is the percentage ratio of the reference weight to the weight value (ratio 2: reference weight / weight value * 100%; in the example: 500%)

Select the number of decimal places:

...ew ▶ Application 1 ▶ Percent.W ▶ Wizard ▶ Decimal places

No decimal places

1 decimal place

2 decimal places

3 decimal places

4 decimal places

Back Overview Next

- ▶ Define the number of decimal places to be used for the display of the percentage.

No decimal places ... 1, *2, 3, 4

Select accuracy (resolution) for storing value:

... ▶ New ▶ Application 1 ▶ Percent.W ▶ Wizard ▶ Accuracy

Normal resolution

10-fold (+1 dec. place)

100-fold (+2 dec. places)

Back Overview Next

- ▶ Define the accuracy to be used to apply the weight value for the reference weight.

***Normal resolution**

10-fold (+ 1 dec. place)

100-fold (+2 dec. places)

Please check the percent weighing parameters:

Task ▶ New ▶ Application 1 ▶ Percent.W ▶ Overview

Percent method: **Calc. ref. weight**

Set reference: **Variable percentage**

Displayed value: **Residue**

Decimal places: **2 dec. place**

Accuracy: **Normal accuracy**

Back Wizard Done Next

- ▶ An overview of all settings is displayed.
- ▶ Check all settings and change as required.

- ▶ A message asks whether you would like to add another application.
- ▶ If required, select additional applications to be combined.

- ▶ Prompts for configuring weighing and printing appear.
- ▶ Check all settings and change as required.
- ▶ Enter a short name and a description for the new task.
- ▶ To save the new task, touch **Save**.

Execute Task: Weighing in Percent



- If you haven't already done so, go to Application Management.
- The task selection is displayed.
- Touch the desired task.

or



- If the desired task is already selected, touch **Start**.

- If required, enter the reference percentage (e.g., 100%) or the reference weight.
- Place the sample on the weighing pan.

In the example it is the reference sample.

- The weight value of the reference is displayed.
- To begin the Weighing in percent, touch **Start**.

- The values for the reference percentage and the reference weight are displayed.
- Place the next sample on the weighing pan and touch **Weigh**.

- The weight value is displayed.
- To toggle between the display of weight and percent, touch **Percent** or **Weigh**.

Timer-controlled Functions

Purpose: This application is used to trigger individual balance functions automatically at a specific time or after specific time intervals. The time or interval must be within 24 hours (1 day).

Options: You can select the following functions:

- Acoustic signal
- Lock in readout
- Automatical printout of the display value
- Transfer of components for totalizing, formulation or statistics

Example: In order to determine the amount of evaporation of a sample over time, you can place the sample on the weighing pan and print out the weight value at fixed intervals (e.g., every two minutes).

Combination options: Totalizing, statistics, formulation, mass unit conversion, second tare, memory, individual identifiers (SQmin function, DKD measurement uncertainty)

Configure Task: Timer-controlled Functions

(☰) **Edit**

Create

Timer-Controlled Funct.

Define which function is triggered by the timer

... New ▶ Application 1 ▶ Timer Ctr. ▶ Wizard ▶ Timer function

▶ **Acoustic signal (beep tone)**

Lock in readout (hold display)

Automatic printout of values

Back **Overview** **Next**

Please select the timer mode:

... ▶ New ▶ Application 1 ▶ Timer Ctr. ▶ Wizard ▶ Timer mode

▶ **Timer set to intervals**

Timer set to a specific time

Back **Overview** **Next**

Please select the time input:

... ▶ New ▶ Application 1 ▶ Timer Ctr. ▶ Wizard ▶ Time setting

Enter fixed time

▶ **Time can be changed during process**

Back **Overview** **Next**

► Define which function should be timer controlled.

***Acoustic signal (beep tone)** The balance makes a beeping sound.

Lock in readout: The measured weight value remains on the display for the defined time period.

Automatic printout of values: The displayed value is printed at the defined time.

► Select the mode.

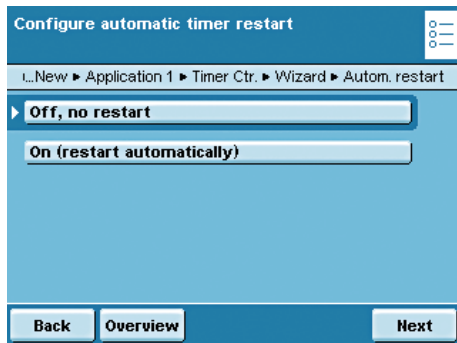
***Timer set to intervals:** The function is triggered at regular intervals (e.g., every 30 sec.).

Timer set to a specific time: The function is triggered at the fixed time (after the start of the application) (e.g., at 08:00:00).

► Specify when the time and/or interval should be entered.

Enter fixed time: You must enter this time and/or interval now.

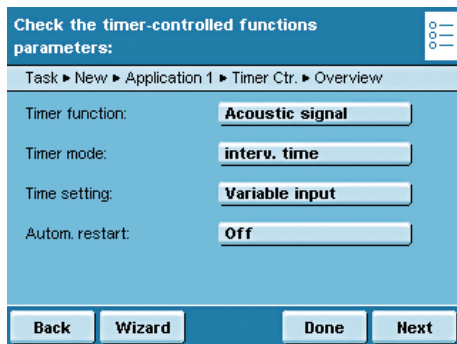
***Time can be changed during process:** The time and/or interval is only entered when the task is carried out.



- Specify whether or not there should be an automatic restart of the timer-controlled function after it has been triggered.

***Off, no restart**

On (restart automatically): The timer is restarted as soon as the timer-controlled function has been carried out.



- ▷ An overview of all settings is displayed.
- Check all settings and change as required.
- ▷ A message asks whether you would like to add another application.
- If required, select additional applications to be combined.
- ▷ Now you will be prompted to configure the weighing and printing functions.
- Check all settings and change as required.
- Enter a short name and a description for the new task.
- To save the new task, touch **Save**.

Execute Task: Timer-controlled Functions

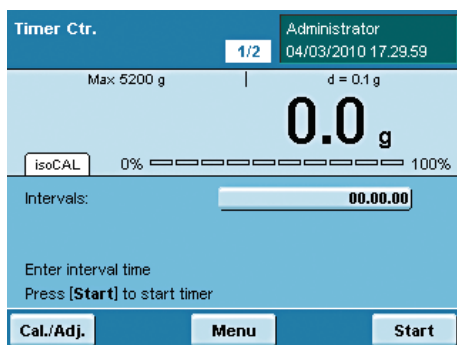


- If you haven't already done so, go to Application Management.
- ▷ The task selection is displayed.
- Touch the desired task.

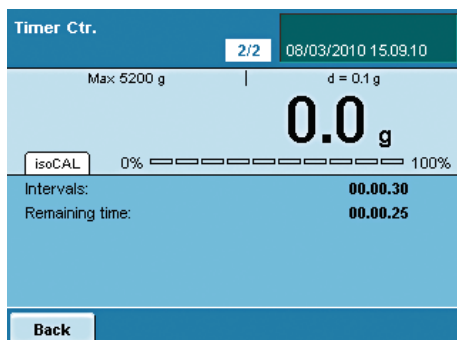
or



- If the desired task is already selected, press **Start**.



- If required, enter the time or interval.
(Enter hh:mm:ss, e.g., 00:00:30 for the 30-second interval)
- Follow the instructions on the display.

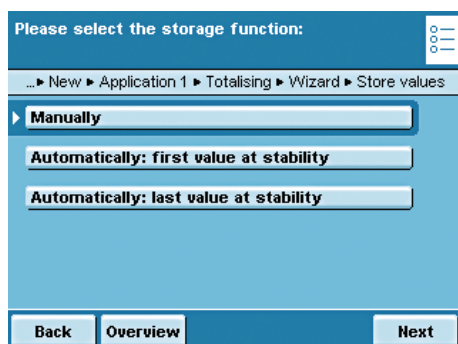


Totalizing

- Purpose:** Adding up weight values and calculating values. The weight values of all individual components are recorded and can be logged.
- Options:** You can save a maximum of 65535 components.
- User rights:** All settings for the “Totalizing” application are saved under the active user profile. Each user can make their own settings for this application. For this reason, make sure that the desired user profile is selected before you start.
- Results:** When a user creates a local totalizing task, the results are only saved locally for that user. The results of global tasks, however, are available to all users and the administrator.
- Combination options:** Calculation, averaging, weighing in percent, parts counting, checkweighing, mass unit conversion, second tare memory, individual identifiers, (SQmin function, DKD measurement uncertainty)



(* = factory setting)



- Define how the weight value will be applied.

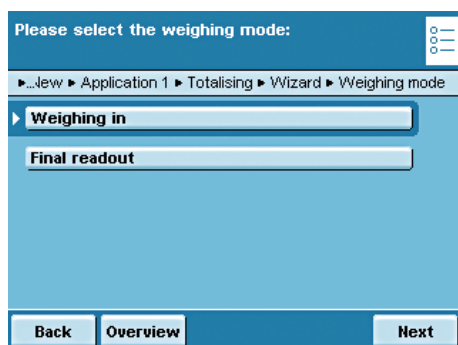
***Manually:** The weight value is applied as soon as the corresponding button is touched.

Automatically: first value at stability: The weight value is applied automatically as soon as the balance has stabilized after filling and the value exceeds the minimum load.

Automatically: last value at stability: The last weight value with stability is applied automatically, as soon as the balance is unloaded and the value falls short of the minimum load. If stability was reached repeatedly between measurements, the last stable weight value will be stored.

You must now select the minimum load to be applied:

(none, 10, 20, ... *100 .. 1000 digits).



Weighing Mode with Automatic Storage:

- Select the weighing mode to be used for storing the weight values.

Weighing in: Initial weighing of samples in a container.

Final readout: Final weighing of samples in a container.

How should the number of items be determined...

► New ► Application 1 ► Totalising ► Wizard ► Default items

Enter fixed quantity

► Quantity can be changed during the process

Back Overview Next

- Define when the number of measurements (items) will be defined.
- Enter fixed quantity:** The quantity of items is defined beforehand.
- Quantity can be changed during the process:** Enter the quantity of items when you execute the task.

Tare automatically after storing?

► New ► Application 1 ► Totalising ► Wizard ► Automatic tare

No automatic tare after store

Automatic tare after store

Back Overview Next

- Define whether or not automatic taring should take place after storing the value.

Please check the totalising parameters:

Task ► New ► Application 1 ► Totalising ► Overview

Store values: Manual

Default items: Variable input

Automatic tare: Off

Back Wizard Done Next

- An overview of all settings is displayed.
- Check all settings and change as required.
- A message asks whether you would like to add another application.
- If required, select additional applications to be combined.
- Now you will be prompted to configure the weighing and printing functions.
- Check all settings and change as required.
- Enter a short name and a description for the new task.
- To save the new task, touch **Save**.

Execute Task: Totalizing



- If you haven't already done so, go to Task Management.
- The task selection is displayed.
- Touch the desired task

or



- If the desired task is already selected, press **Start**.

Totalising

Administrator 04/03/2010 17:39:47

2/3

Max 5200 g | d = 0.1 g

0.0 g

isoCAL 0% 100%

Accept Item 1 of 2

Sum of all weight values: Sum 0.0 g

Show result: Press [Calc.]

Press [Next] to store in memory

Back Calc. Next

- If required, enter the number of items that you want to add up.
- Place the first sample on the weighing pan.
- To start Totalizing, touch **Start**.
- During the task, you can show the results of previous measurements at any time by touching **Calc.**

DKD Measurement Uncertainty

Purpose: This application is used to ensure that the measurement uncertainty is displayed dynamically so that it conforms to the data documented on the DKD calibration certificate.

Requirements: The function can only be used when the balance has been prepared for this beforehand by a service technician. The service technician determines the measurement uncertainty of the balance via a DKD calibration onsite. The technician records on the DKD calibration certificate the measurements and the measurement uncertainty for initial weighing. He also saves the calculated data on the balance.

Options: The measurement uncertainty can be displayed as an absolute value (U), a relative value (U*) or as process accuracy (PA).

Combination options: Mass unit conversion, second tare memory, individual identifiers, (SQmin function)

Configure Task: DKD Measurement Uncertainty

() Edit

Create

DKD Uncert. of Measurmt.

Select the measurement uncertainty display mode:

... Application 1 ▶ DKDMeas ▶ Wizard ▶ Result display mode

Display absolute uncertainty

Display relative uncertainty

Display process accuracy

Back Overview Next

Please enter the process accuracy factor:

... New ▶ Application 1 ▶ DKDMeas ▶ Wizard ▶ Pa factor

Pa factor: P fact 3.000000

Back Overview Next

► Select the measurement uncertainty display mode in relation to the maximum capacity.

Absolute uncertainty: Absolute value (e.g., 12.00 g)

Relative uncertainty: Relative value (e.g., 0.000045%)

Process accuracy: e.g., 0.00013%

► If you have selected **process accuracy**, enter the process accuracy factor now.

- ▷ An overview of all settings is displayed.
- ▶ Check all settings and change as required.
- ▷ A message asks whether you would like to add another application.
- ▶ If required, select additional applications to be combined.
- ▷ Now you will be prompted to configure the weighing and printing functions.
- ▶ Check all settings and change as required.
- ▶ Enter a short name and a description for the new task.
- ▶ To save the new task, touch **Save**.

Execute Task: DKD Measurement Uncertainty



- ▶ If you haven't already done so, go to Application Management.
- ▷ The task selection is displayed.
- ▶ Touch the desired task.

or



- ▶ If the desired task is already selected, press **Start**.

- ▷ If you have selected **absolute uncertainty**, the uncertainty of the weight value is displayed in a tab (e.g., U 12.01 g). This value is based on the DKD value set by a service technician.

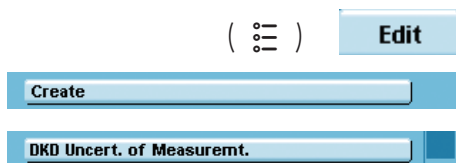
- ▷ If you have selected **relative uncertainty** the relative uncertainty of the measurement is displayed in a tab as a percentage of the weight value.

- ▷ If you have selected **process accuracy**, the process accuracy is displayed in a tab in percent.

Second Tare Memory (Preset Tare)


- Purpose:** This application is used to define the second tare value. As soon as a second tare value is used, **Net1** appears on the display for the respective net value.
- Options:** You can either use a weight value or enter a numerical value as a second tare value.
- Combination options:** Mass unit conversion, individual identifiers, (SQmin function, DKD measurement uncertainty)

Configure Task: Second Tare Memory



- ▷ No pre-settings are required for this application.
- ▷ Now you will be to configure the weighing and printing functions.
 - ▶ Check all settings and change as required.
 - ▶ Enter a short name and a description for the new task.
 - ▶ To save the new task, touch **Save**.

Execute Task: Second Tare Memory (Preset Tare)

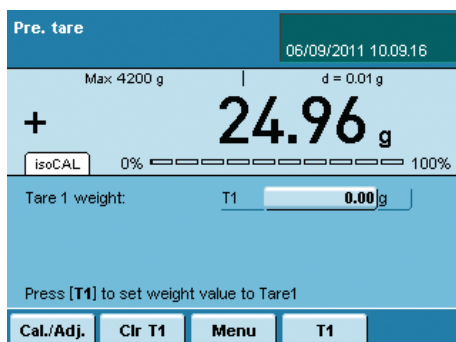
- ()
- ▶ If you haven't already done so, go to Application Management.
 - ▶ The task selection is displayed.
 - ▶ Touch the desired task.

or



- ▶ If the desired task is already selected, touch **Start**.
- ▶ You have two options for defining the second tare.

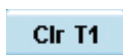
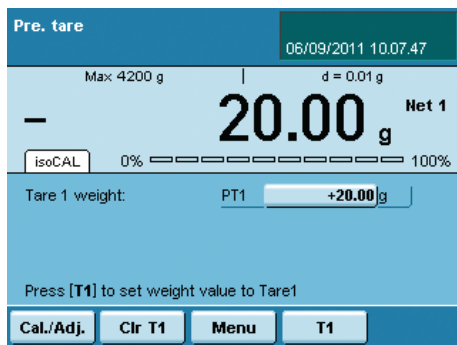
Setting a Weight Value as Second Tare



- ▶ Place the object (container) on the balance whose weight value you want to use as the second tare.

- ▶ To save the weight value as the second tare, touch **T1**.

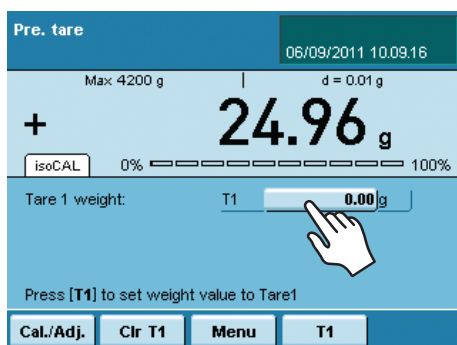
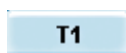
- The stored weight value is displayed as the second tare value. **Net 1** is displayed next to the current weight value.



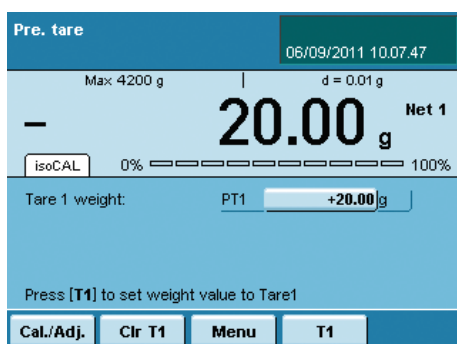
- To delete the tare memory, touch **Clr T1**.

Entering a Numerical Value as a Second Tare

- Enter the tare value for **T1** (e.g., 20 g)
- Touch **T1 0.00 g**
- Enter the desired value **PT1** (e.g., 20)



- The tare value is displayed.



- To delete the tare value, touch **Clr T1**.

Parts Counting

Purpose: This application is used to determine the number of objects which each have approximately equal weight. This saves you from having to count individual parts.

Options: You can calculate or enter the piece weight of individual objects.

Combination options: Checkweighing, timer-controlled functions, totalizing, statistics, formulation, mass unit conversion, second tare memory, individual identifiers, (SQmin function, DKD measurement uncertainty)

Configure Task: Parts Counting

() **Edit**

Create

Counting

Please select a counting method

... ▶ Application 1 ▶ Counting ▶ Wizard ▶ Counting method

▶ **With calculation of reference piece weight**

With input of reference piece weight

Back **Overview** **Next**

▶ Select the method that you want to use.

***With calculation of reference piece weight:** The piece weight is determined by weighing a known reference piece quantity.

With input of reference piece weight: The piece weight is entered as a numerical value.

How should the reference quantity be determined?

... ▶ New ▶ Application 1 ▶ Counting ▶ Wizard ▶ Set reference

Enter fixed reference quantity

▶ **Ref. quantity can be changed during process**

Back **Overview** **Next**

With calculation of the piece weight:

▶ Define how the reference piece count should be entered.

Enter fixed reference quantity: You must enter this reference piece count **nRef** now.

***Ref. quantity can be changed during process:**
The reference piece count is entered when the task is executed.

Define how the reference piece weight is determined

... ▶ Application 1 ▶ Counting ▶ Wizard ▶ Set ref. piece weight

Enter fixed piece weight

▶ **Piece weight can be changed during process**

Back **Overview** **Next**

When entering the piece count:

▶ Define how the piece weight should be entered.

Enter fixed piece weight: You must enter this piece weight **wRef** now.

***Piece weight can be changed during process:** The piece weight is entered when the task is carried out.

- Define the accuracy to be used for the weight value.

***Normal resolution:** As displayed

10-fold (+1 dec. place): With one decimal place more than in the display

100-fold (+2 dec. places): With two decimal places more than in the display

Only with **calculation of piece weight:**

- Define whether or not the piece weight should be updated when counting.

Optimisation off

By pressing key, after prompt

***Automatic updating**

- An overview of all settings is displayed.
- Check all settings and change as required.

- A message asks whether you would like to add another application.
- If required, select additional applications to be combined.

- Now you will be prompted to configure the weighing and printing functions.
- Check all settings and change as required.
- Enter a short name and a description for the new task.
- To save the new task, touch **Save**.

Execute Task:

Parts Counting with Piece Weight Calculation



- If you haven't already done so, go to Application Management.
- The task selection is displayed.
- Touch the desired task.

or

- If the desired task is already selected, touch **Start**.



- The last used reference piece quantity **nRef** is displayed.
- If you are working with a variable reference piece quantity, you must enter or change this now.
- Place this exact amount (nRef) of the objects to be counted on to the weighing pan.

Counting 1/2 Administrator 08/03/2010 10.34.13

Max: 5200 g | d = 0.1 g

+ 5.7 g

isoCAL 0% 100%

Reference quantity: nRef 10 pcs
Piece weight: wRef 0.570 g

Tare the balance
Press [Start] to start counting

Cal./Adj. Menu Start

- ▷ The weight value for the reference objects is displayed.
- ▷ To determine the average piece weight, touch **Start**.

Counting 1/2 Administrator 08/03/2010 10.34.31

Max: 5200 g | d = 0.1 g

+ 10 pcs

isoCAL 0% 100%

Question:
Do you wish to change the reference weight?

No Yes

- ▷ The reference piece count and the average piece weight are displayed.
You can now begin with the parts counting of unknown amounts.

Counting 2/2 Administrator 08/03/2010 10.35.28

Max: 5200 g | d = 0.1 g

+ 21 pcs

isoCAL 0% 100%

Reference quantity: nRef 10 pcs
Piece weight: wRef 0.570 g

Press [Weigh] to show weight value

Back Weigh

- ▷ Place any amount of the objects on to the weighing pan.
- ▷ The determined piece count is displayed.
- ▷ To display the weight value of this amount, touch **Weigh**.

Counting 2/2 Administrator 08/03/2010 10.35.46

Max: 5200 g | d = 0.1 g

+ 12.1 g

isoCAL 0% 100%

Reference quantity: nRef 10 pcs
Piece weight: wRef 0.570 g

Press [Count] to show pieces

Back Count

- ▷ The weighing results and all parameters are displayed.
- ▷ To count the next unknown amount, empty the weighing pan and place the next amount of objects on to it.
- ▷ The calculated piece count and the weighing results are immediately updated.

Execute Task: Parts Counting by Entering the Piece Weight



- If you haven't already done so, go to Application Management.
- ▷ The task selection is displayed.
- Touch the desired task.

or



- If the desired task is already selected, touch **Start**.

- ▷ The last used piece weight **wRef** is displayed.
- Enter the piece weight of the reference object (e.g., 50 g).

- ▷ The reference piece quantity and the entered piece weight are displayed.

- Place the sample with the objects to be counted on to the weighing pan.

- ▷ The determined piece count is displayed.

- To display the weight of the sample, touch **Weigh**.

- ▷ The weight of the sample is displayed.
- To toggle between the display of weight value and piece count, touch **Count** or **Weigh**.

- To count the next quantity of objects, empty the weighing pan and place the next sample on to it.
- ▷ The weighing result is updated immediately.
- To display the piece count of this sample, touch **Count**.

Checkweighing

Purpose: This application is used to check a weight value using preset control values.

Options: Control values can be exact target values or tolerance range limit values within which the check value must lie.

The check results are shown on the display. They can also be used for further electronic editing by activating the control ports at the data output.

Combination options: Totalizing, statistics, formulation, mass unit conversion, second tare memory, individual identifiers, (SQmin function, DKD measurement uncertainty)

Configure Task: Checkweighing

The first screenshot shows the 'Edit' button and a 'Create' button. Below is a dropdown menu with 'Checkweighing' selected. The main area is titled 'Select the set of values to be entered' and contains three options: 'Target, min., max. weight' (selected), 'Minimum and maximum weights', and 'Target; minimum and maximum in %'. At the bottom are 'Back', 'Overview', and 'Next' buttons.

The second screenshot is titled 'Define how checkweighing values are set'. It contains two options: 'Enter fixed limits' and 'Variable values (input)' (selected). At the bottom are 'Back', 'Overview', and 'Next' buttons.

The third screenshot is titled 'Please select the weight display mode'. It contains two options: 'Absolute value' (selected) and 'Difference betw. target and actual'. At the bottom are 'Back', 'Overview', and 'Next' buttons.

► Define which values are to be used for checkweighing.

***Target, min., max. weight** The target value and a tolerance range in absolute values

Minimum and maximum weights: Only a tolerance range in absolute values

Target; minimum and maximum in %: The target value and a tolerance range as a percentage

► Define how the control values will be entered.

Enter fixed limits: You must enter these values now.

***Variable values (input):** The check values are entered when the task is carried out.

► Select the display mode for the results.

***Absolute value:** Displays the absolute value.

Difference betw. target and actual: The deviation from the target value is then displayed.

Please select the function of the ports

Task > New > Application 1 > Checkwgh. > Wizard > Ports

Ports not active

Within checkweighing range

Ports always activated

When stable and in checkweighing range

At stability

Back Overview Next

- Define how the ports should be activated depending on the check results.

***Ports not active**

Within checkweighing range: Ports are only activated when the results are within the checkweighing range.

Ports always activated: The ports are always activated with each weight value.

When stable and in checkweighing range: The ports are only activated as soon as the balance becomes stable and the results are in the checkweighing range.

At stability: The ports are always activated as soon as the balance has stabilized.

Once at stability and in the checkweighing range: The ports are activated on a one-time basis (not dynamically) as soon as the balance has stabilized and the results are in the checkweighing range; effective until the balance has been unloaded.

Define transaction counter setting

... > New > Application 1 > Checkwgh. > Wizard > Counter

No automatic counter

Counter for OK values

Back Overview Next

- Define whether or not the automatic counter for positive results should be activated.

***No automatic counter**

Counter for OK values: All positive checked results are counted.

Please check the checkweighing parameters:

Task > New > Application 1 > Checkwgh. > Overview

Checkweighing input: Target/min/max

Set checkwgh. values: Variable

Target (setpoint): 30.0

Lower limit: 170.0

Upper limit: 0.0

Back Wizard Done Next

- An overview of all settings is displayed.
- Check all settings and change as required.

- A message asks whether you would like to add another application.
- If required, select additional applications to be combined.

- Now you will be prompted to configure the weighing and printing functions.
- Check all settings and change as required.
- Enter a short name and a description for the new task.
- To save the new task, touch **Save**.

Execute Task: Checkweighing

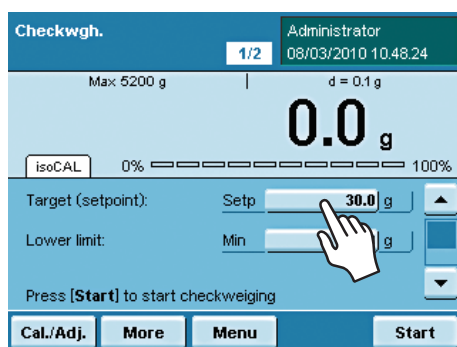


- ▶ If you haven't already done so, go to Application Management.
- ▶ The task selection is displayed.
- ▶ Touch the desired task.

or



- ▶ If the desired task is already selected, touch **Start**.



Define check values **by entry**:

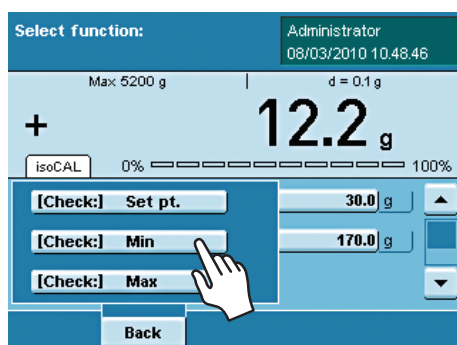
- ▶ Touch the input field Setp and enter the target.
- ▶ Touch the input field Min or Max and enter the minimum or maximum check values.

or

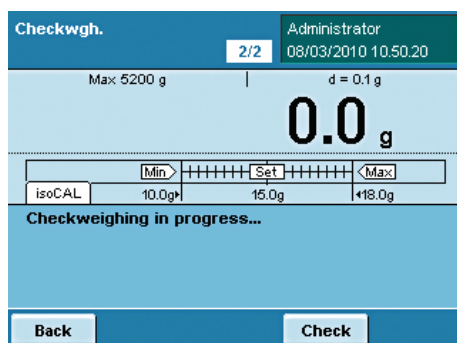


Define check values **with current load**:

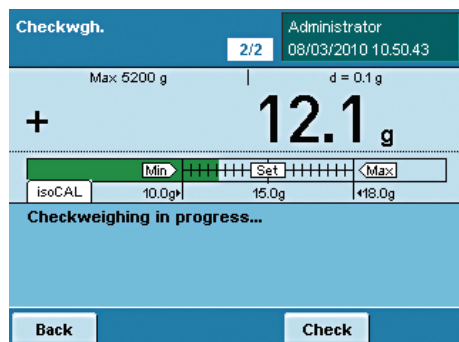
- ▶ Place the weight on the weighing pan.
- ▶ Touch **More**.
- ▶ Touch the field of the check value whose current weight value you want to use.
- ▶ If required, repeat the process with additional weights for the other check values.
- ▶ To exit the input mode **without saving the value**, touch **Back**.



- ▶ To begin checkweighing, touch **Start**.

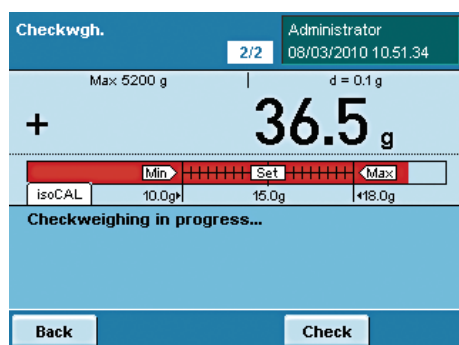


- ▶ The entered check values are displayed graphically.
- ▶ Place the object to be checked on the weighing pan.



► The test results are displayed.

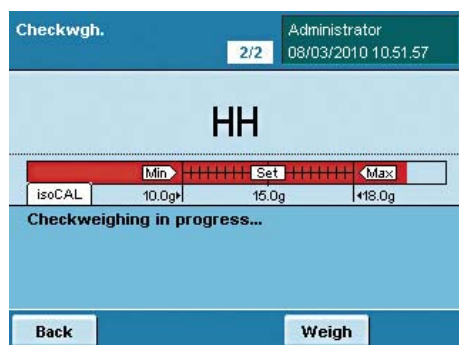
If the results are within tolerance, the weight results will always be displayed. In addition, they appear in green on the graphic scale.



If the results are outside of the tolerance, the weight results are displayed in red (above maximum) or yellow (below minimum) on the graphic scale.

► To toggle the display to the check mode, touch **Check**.

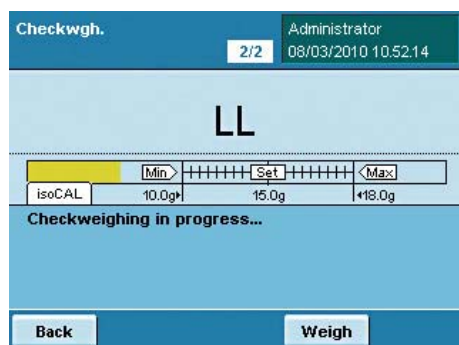
► Now the display will show whether the upper limit (**HH**) or the lower limit (**LL**) has been exceeded.



► To check additional objects, empty the weighing pan and place the next object on it.

► The display is updated dynamically.

► You can toggle between weighing and checkweighing at any time by touching **Weigh** or **Check**.

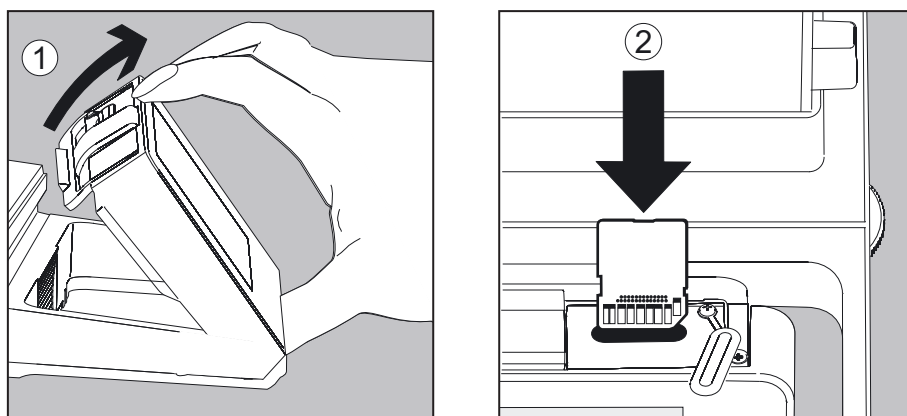


Importing/Exporting Data

You can use an SD memory card to transport and exchange data (import/export). This card is required when you want to save data externally or when you want to exchange data with other balances. For example, you can easily copy menu settings, tasks, and user profiles to several balances.

Inserting Memory Card into the Display and Control Unit

The slot for the SD card is located at the back of the display and control unit.



1. Tilt the control unit until it is nearly vertical.
2. Swivel the cover of the card slot to the front. Align the SD card so that the contacts are facing down.
3. Insert the card into the slot as far as it will go.
 - To remove the card, press it against the resistance in the direction of the slot so that the card springs out.
4. Press the position retainer and swivel the display and operating unit back into the desired position.

Importing/Exporting Data

The following data can be imported or exported via the SD card:

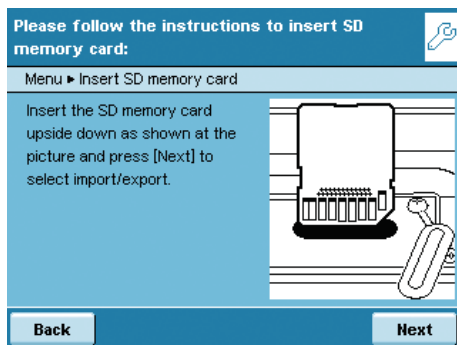
- Global tasks and separate tasks
- User profiles with their separate tasks
- Menu parameters
- Alibi memory
- Audit trail
- Calibration and adjustment data
- Individual customer-specific applications (“Q-Apps”)



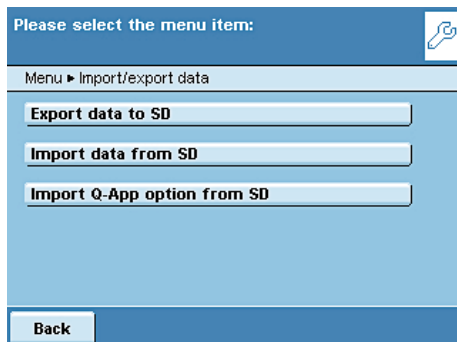
You can open the data from the Alibi memory (XML files) with any web browser and import them to Microsoft Excel as well.



- Select the menu item **Import/export data**.



- Insert the SD card into the slot as shown in the picture.

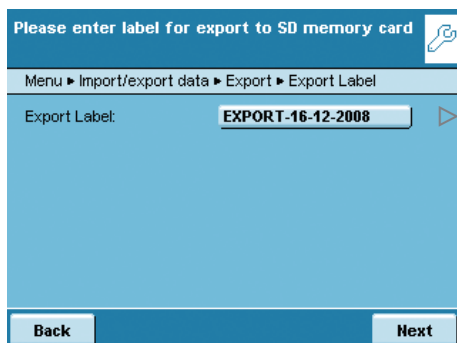


- Select whether you wish to export or import data.

Export



- Select the data you wish to export and press **Next**.



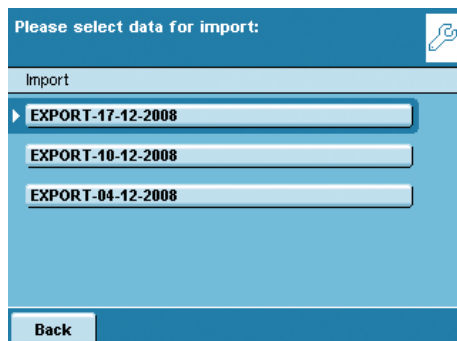
- If required, change the name of the export folder and touch **Next**.
- ▷ The data is copied to the SD card.

An icon is shown on the display during the data transfer.
The device cannot be operated during this time.

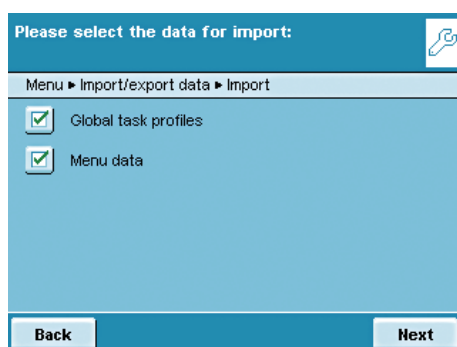
Import

In order for the data to be detected by the balance when importing them, you should not copy individual files, but always the entire subdirectory.

- data
 - all
 - EXPORT-dd-mm-yyyy
 - task



- ▶ Select the folder on the SD card from which you want to import data.



- ▶ Select the data that you want to import and touch **Next**.
- ▷ The data will be imported from the SD card.
- ▷ An icon is shown on the display during the data transfer. The device cannot be operated during this time.

If the following error message appears:

“Wrong XML version. Please check the data.”

- ▶ Touch **Next**.
- ▷ All previous data will be saved in the new format.
- ▶ Check your settings after importing the data (Menu, TASK and USER).
- ▶ If the XML files continue to cause problems, contact your local Sartorius service center.

Calibration and Adjustment

Background During **calibration**, a check weight is used to determine how much the displayed value deviates from the actual measurement value. This deviation is compared with an entered target value and this deviation is then eliminated by a subsequent **adjustment** of the balance. During **linearization**, the deviation of the values from the ideal characteristic curve is cleared.

M

Not all functions/settings can be selected on balances used in legal metrology!

When and how often

Calibration/Adjustment should be carried out on a **regular** basis, e.g., daily after the balance is turned on. In addition, it should be done **after each leveling** and always when the ambient conditions have changed (temperature, humidity or air pressure), and when the balance has been set up in another location.

isoCal

All Cubis balances are equipped with the automatic calibration function **isoCal** (time and temperature-controlled). You can adapt this function according to your requirements. You can set up a **memory function** that triggers a prompt for calibration/adjustment at specified intervals.

i

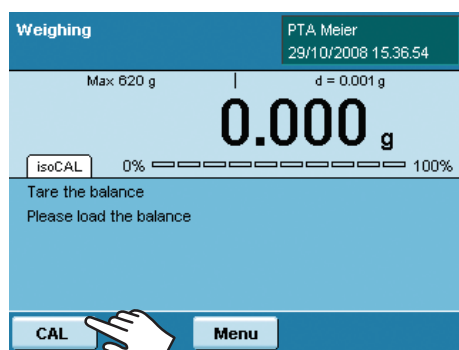
The process for the calibration/adjustment function may differ depending on the presets (see System Settings/Configuring Calibration/Adjustment). The factory settings have not been changed for the procedure described here.

Calibration/Adjustment Using Internal Check Weight

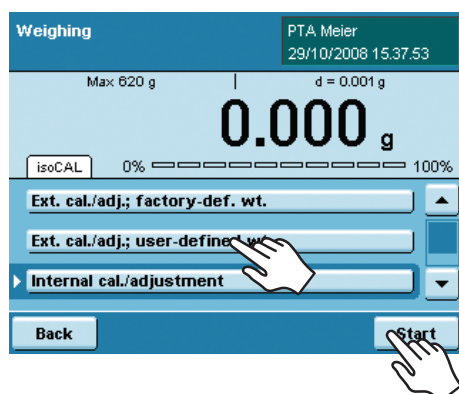
(**TARE**)

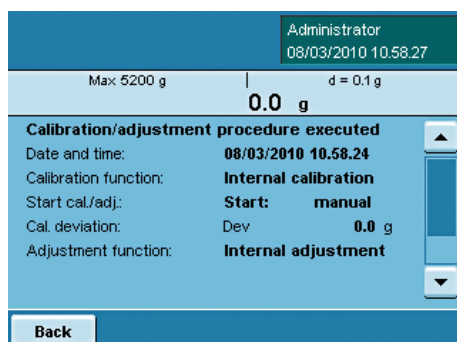
- ▶ If required, switch to operating mode.
- ▶ Make sure that the weighing pan is empty.
- ▶ Press **TARE**, to tare the balance.

- ▶ Touch **CAL**.



- ▶ Touch **Internal cal./adjustment** and then **Start**.





- ▷ The procedure will be executed.
- ▷ Wait until calibration/adjustment has been completed.
- ▷ The results are displayed again after the procedure is completed.
- ▷ To return to operating mode, touch **Back**.

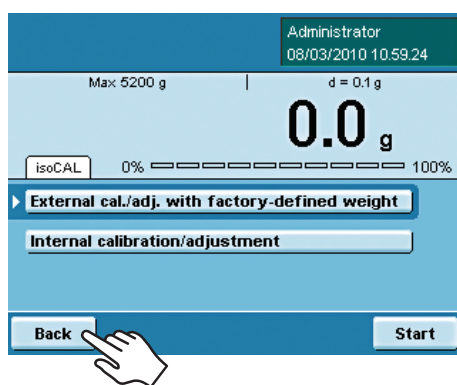
Calibration/Adjustment Using External Check Weight



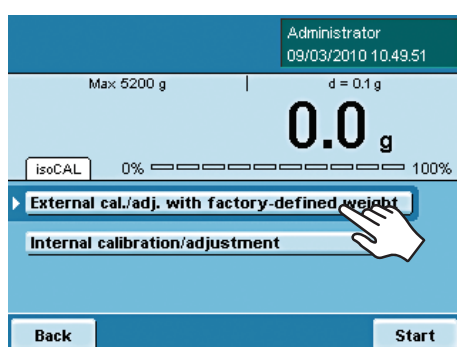
An external check weight is required for this function.
Please note the tolerance of the check weight being used.

- ▷ If required, switch to operating mode.
- ▷ Make sure that the weighing pan is empty.
- ▷ Press **TARE**, to tare the balance.
- ▷ Touch **CAL**.

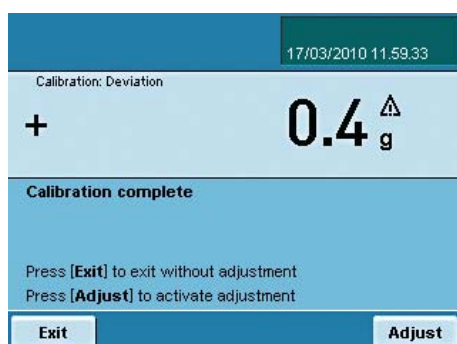
(TARE)



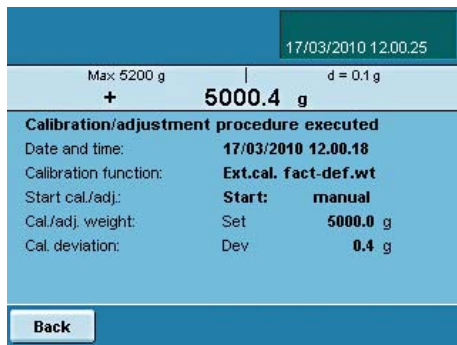
- ▷ Place the check weight on the balance.
- ▷ Touch **External cal./adj. with factory-defined weight**.



- ▷ Calibration is carried out (approx. 15 to 20 sec.).
- ▷ After calibration, the determined deviation is displayed.



- ▷ To adjust the balance, touch **Adjust**.
- ▷ To complete calibration without adjustment, touch **Exit**.



▷ Lastly, the results are shown on the display.

► To return to operating mode, touch **Back**.

User Management



You can configure the following settings in this menu:

- Create new user profiles (only possible as administrator)
- Edit user profiles (modify, copy, delete, change and delete passwords, depending on user rights)
- Activate users

User Management

The user administration allows for defining of users with distinct sets of rights: the Administrator and multiple users.

The **Administrator** can use all functions (except those in Service) and he has all user rights. Only he can create new user profiles and assign individual rights. There is only one administrator.

A **user**, on the other hand, cannot use all functions. He has limited rights. Rights that are defined in the user profile. A max. of 15 user profiles can be created.

When the balance is first delivered, there are no user profiles, all settings can be carried out. The first user profile that is created is automatically an administrator. He can then create additional user profiles.



► To open the User Management menu, touch the USER () key.

► The menu opens and the selection of user profiles is displayed.



Creating User Profiles



This function is only available to an Administrator.

The following settings can be made in the user profile, they are only valid for that user:

- Language
- Display settings (color, brightness)
- Volume and acoustical signal on/off
- User rights
- Password protection
- User name and description



- To create a new user profile, touch **Edit**.

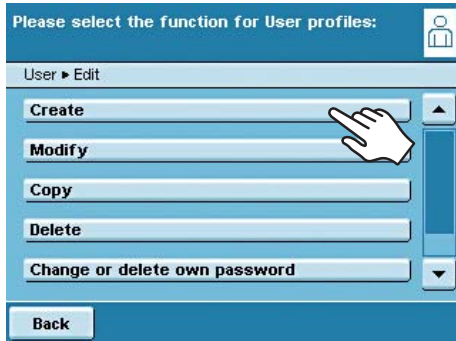
- Touch **Create**.

The program now automatically guides you through the menu. Make your selections by touching the desired option, the program then takes you to the next prompt.

or

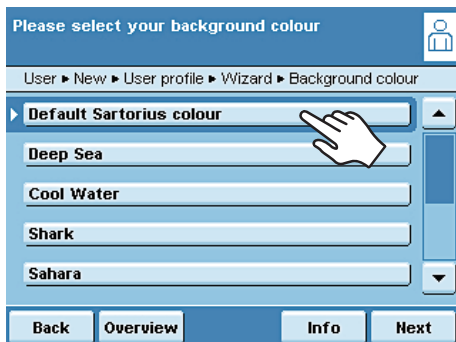
If the desired option is already selected (dark background), touch **Next**, to go to the next prompt.

If more than one option can be selected for a single setting, press **Next** after making your selection(s) to proceed to the next prompt.



Step 1: Select language

- Touch the desired language.



Steps 2 to 4: Set the color and brightness of the display

- To select the background color, touch the desired color.
The standard Sartorius factory setting for the background color is blue.
- The display changes to the color selection for the user field (see "Display in Operating Mode").
- Touch the desired color for the user field.
The standard Sartorius factory setting for user fields is dark blue.
- The display changes to the brightness setting.
- To change the brightness of the display, touch the desired setting.

Step 5: Assign user rights

- Select the corresponding options to define which functions the user can access.
The following rights can be assigned individually:
 - Creating, copying, modifying and deleting tasks
 - Importing data
 - Modifying the calibration and adjustment settings
 - Modifying the balance settings
 - Creating, modifying and deleting timer-controlled actions
 - Exporting file
 - Displaying device information
 Administrators can access all functions.
- To move to the next menu item, press **Next**.

Do you wish to protect this user profile with password?

User ► New ► User profile ► Wizard ► Password

► No, no password protection

Yes, password protection

Back Overview Next

Step 6: Define password protection

If you assign a password, this profile cannot be used until the password has been entered.

- Select the corresponding option to define whether the user profile is password-protected or not.

The password will be defined in the step after next.

Only the Administrator can open the user profile without the password (for example, if the user forgets the password) and assign a different password. The Administrator can remove the password protection so that a new password can be set, if desired.

If the administrator forgets the password: Please contact your Sartorius Service Center

Please check the user parameters:

User ► New ► User profile ► Overview

Language : English UK

Background colour: Sartorius

User field colour: Sartorius

Brightness: Bright

Acoustic signal: Medium

Back Wizard Next

Step 7: Check all settings

- Use the scroll bar or press the down arrow to view all settings.
- To modify a setting, press the corresponding button. This opens a screen showing the options for that setting.
- If the settings are correct, press **Next**.

Please enter your password twice

User ► New ► User profile ► Overview

Password:

Repeat password:

Back Enter

Step 8: Define the password (if password protection enabled)

- If you selected the option for password protection, you are now prompted to enter the desired password twice.
- Press the upper button.
- Enter the desired password (minimum 4 characters, maximum 8; only numbers and uppercase letters are permitted).
- Press the lower button, and enter the password again.
- Touch **Next**.

Change profile name here if desired:

User ► New ► Title

User Profile Name: User 1

User Description: User description 1

Back Cancel Save

Step 9: Enter user names and descriptions

- To enter a name for the user profile, touch the **User** button. The user name is shown on the top right of the display during operation as long as the respective user profile is active.
- Enter the name (max. 40 characters) and touch **OK**.
- To enter a description of the user profile, touch the **User description** button. The user description can be viewed at any time during operation of the balance by pressing the user info area in the display (see "User Interface (Touch Screen)").
- Enter the description and touch **OK**.
- To complete the process, touch **Save**.



▷ The program switches to user selection. The newly created user profile is placed at the end of the list.

▶ When you want to activate a new user, just touch the button with his name.

▷ The program switches to the operating mode and the selected user is activated.

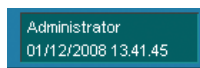
or

▶ If you want to set up additional user profiles, touch **Edit** and repeat the steps described.

or

▶ When you want to switch to operating mode without switching the user, touch **Start**.

Activating Users



With the balance in the operating mode, the active user is displayed in the user field at the top right of the screen.

To activate another user, you must switch to the **User Management** menu.



▶ Press the USER key ().



▷ The user selection is displayed. The current, active user can be recognized by the small arrow and the dark background.


▶ Touch the user you want to activate.

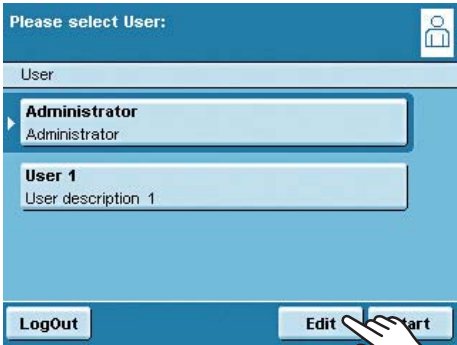
▶ If the user is password-protected, enter the password and confirm the entry.

▷ The program switches back to operating mode with the selected user activated and displayed at the top right of the user field.

Editing User Profiles



- ▶ If you have not already done so, open the User Management menu by touching the USER () key.
- ▶ To go to the Edit menu, touch **Edit** in the user selection.
- ▶ The selection of edit functions is displayed.



i Which options for editing user profiles are available depends on whether or not you have Administrator rights. The following table shows who can carry out which changes to user profiles. Accordingly, the displays shown in this section may differ from your screen because the administrator view is always shown here.

Option

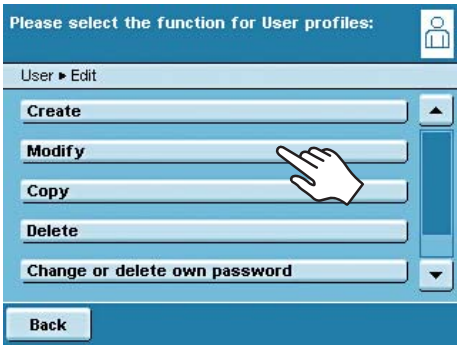
- Change own profile
- Change other profile
- Copy profile
- Delete profile
- Change or delete own password
- Change or delete other user passwords

Administrator

- ☒
- ☒
- ☒
- ☒
- ☒
- ☒

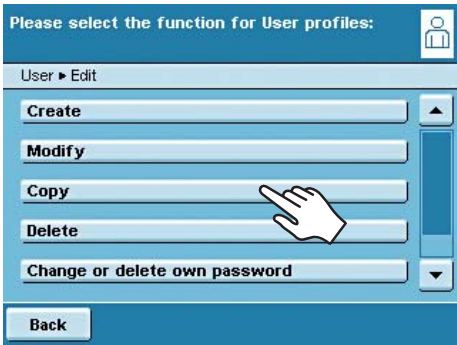
User

- ☒
-
-
-
- ☒
-



Changing User Profiles

- ▶ Select **Modify**.
- ▶ If you are an administrator, you must now select the profile that you want to change and touch **Next**.
- ▶ The overview of all settings for this profile is displayed. You can now select and change the parameters one by one.
or
- ▶ If you want to use the automatic user guide (step-by-step), touch **Wizard**. Now all setting options will be displayed one by one to be changed.
- ▶ Touch **Next**.
- ▶ If required, change the user name and description.
- ▶ Touch **Save**.
- ▶ The user profile has been changed. The display changes to the user selection.



Copying User Profiles

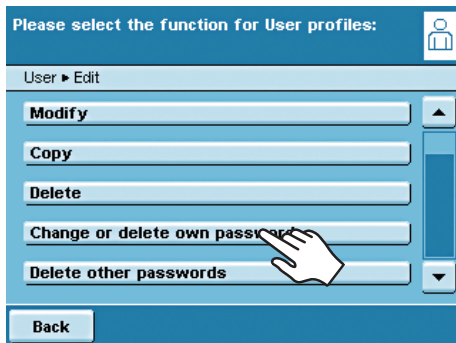


This function can only be carried out by an administrator.



When you copy a user profile with password protection, the password is not transferred to the copy, rather it is deleted.

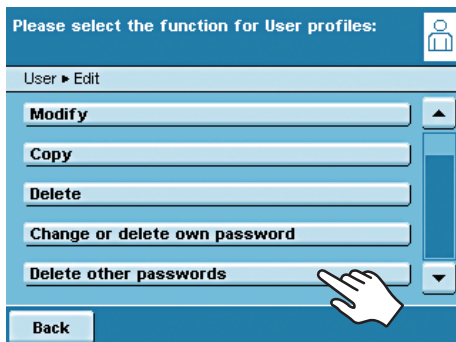
- ▶ Select **Copy**.
- ▶ All available user profiles are displayed.
- ▶ Select the profile that you want to copy.
- ▶ Touch **Next**.
- ▶ Enter a new name and description for the copied user profile.
- ▶ Touch **Save**.
- ▶ The display switches to the user selection in which the new profile is displayed.



Deleting User Profiles

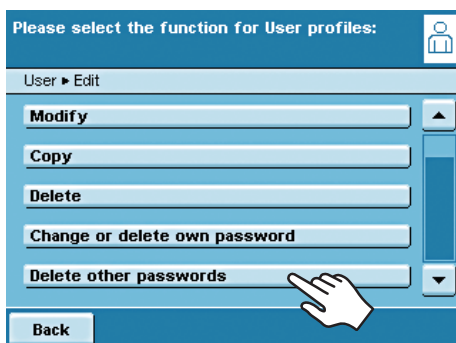
i This function can only be carried out by an administrator.

- ▶ Select **Delete**.
- ▷ All available user profiles are displayed.
- ▶ Select the profiles that you want to delete and touch **Next**.
- or
- ▶ If you want to delete all profiles, touch **All**.
- ▷ All profiles selected for deletion are displayed in a security prompt.
- ▶ If you want to change your selection, touch **No**.
- or
- ▶ Confirm the deletion with **Yes**.



Changing or Deleting Own Password

- ▶ If you haven't already done so, activate your own user profile.
- ▶ Touch **Edit** in the user selection.
- ▶ Select **Change or delete own password**.
- ▶ To **change** the password, touch **Yes**.
- ▶ Touch both buttons one after the other and enter the new password twice.
- or
- ▶ To **delete** the password, touch **No**.
- ▶ Touch **Next**.
- ▷ The display switches to the selection of change functions.



Deleting Other User Passwords

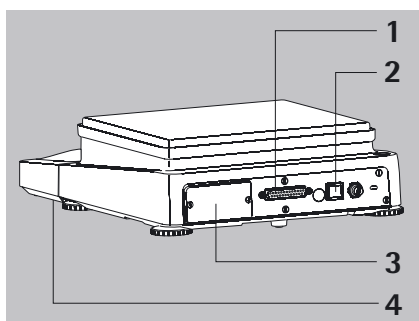
i This function is only available to an Administrator.

- ▶ Activate your own profile.
- ▶ Touch **Edit** in the user selection.
- ▶ Select **Delete other passwords**.
- ▷ An overview of all users with passwords is displayed.
- ▶ Select all users whose passwords you want to delete and touch **Next**.
- or
- ▶ If you want to delete all passwords, touch **All**.
- ▷ All users whose passwords you selected are displayed in a security prompt.
- ▶ If you want to change your selection, touch **No**.
- or
- ▶ Confirm the deletion with **Yes**.
- ▷ The display switches to the overview of user settings.

Interfaces

Purpose Interfaces are used to exchange data with ported peripheral devices: Measured values and calculated values can be output to a printer, PC or control display; conversely, control commands and data inputs can be sent to ported devices (PC, keyboard, foot switch, barcode scanner). Except for PS2, each interface has to be configured according to the peripheral device and desired function. No error messages are generated just because no device is connected to an interface port (open data port).

Features Cubis series balances have at least three interfaces:



- 1 Peripheral port (25-pin interface), **Com A**
- 2 USB interface for a PC connection, **Com B**
- 3 The slot may contain other ports (**Com C**):
 - 25-pin interface (YD001MS-R)
 - 9-pin interface with 6-pin PS2 port (YD001MS-P)
 - Bluetooth® module (YD001MS-B)
- 4 Ethernet interface (on the bottom of the display unit), **Com D**

Data Exchange Protocols For data exchange, the interfaces are configured with the following protocols:

- **Printer output**
- **SBI** (Sartorius Balance Interface): Sartorius standard protocol for output to a PC or control unit. This simple ASCII-based protocol allows you to use ESC commands from your PC to control the basic weighing functions.
- **xBPI** (eXtended Balance Processor Interface, also called X-Bus): Binary protocol with extended command volume. This protocol lets you control numerous weighing functions. For further information on this, please contact Sartorius.
- **SICS** and mini-SICS (Standard Interface Common Set): This interface protocol enables operation and control of the balance via a connected PC. You can read out measurement data, enter weighing commands and activate all operating functions.

To use the protocols, application software must be installed on the PC, e.g., SartoTerminal.

Synchronization During data communication between balance and PC, messages consisting of ASCII or binary characters are transmitted via the interface. For error-free data exchange, parameters for baud rate, parity, handshake mode and character format must be identical for both units.

You can configure the respective settings in the System Settings menu. In addition to these settings, data output for the balance can also be made dependent on several conditions that are defined in the individual tasks. These conditions are described under each of the tasks.

USB Port (PC)

Purpose Any Cubis balance can be connected to a PC equipped with a USB port. A virtual serial interface (virtual COM port) is set up as a device type at the USB port. This virtual serial interface is identified and operated by the application program. The protocols xBPI, SBI and SICS can be transferred via the USB port.



The USB port is designed for the laboratory environment and is not suitable for use in purely industrial environments. Full IP protection is only guaranteed when the USB cover is closed.

System Requirements

- Computer (PC) with Windows 98SE®, Windows ME®, Windows 2000®, Windows XP®, Windows Vista® or Windows 7®
- Available USB port on the PC
- USB cable

Software Driver and Installation Guides The VCP driver, used to set up the virtual interface on the computer, can be downloaded from the internet: <http://www.ftdichip.com/FTDrivers.htm>

The installation guides for the drivers can be found here:
<http://www.ftdichip.com/Documents/InstallGuides.htm>

Connecting the Balance via USB



The current USB port for the computer is established when the software driver is being installed. The driver must be re-installed every time you wish to change the port. Therefore, choose one USB port that can permanently or regularly be used to connect the balance.

- ▶ Switch off the balance.
- ▶ Unplug the balance from the mains.
- ▶ Connect the USB cable to the balance and to the USB port on the computer.
- ▶ Plug the balance into the mains again and switch it on.
- ▷ Windows detects the device connected to the USB port. If the device is being connected for the first time, the Windows Installation Wizard will run.

Installing Software Drivers

- ▶ Run the Installation Wizard for the driver.
- ▶ Follow the instructions that appear.
- ▶ To complete the installation, click on **Finish**.
- ▷ The virtual interface is now ready for operation.

Windows® usually adds the virtual port in the position following your highest-numbered COM port.

Example: For a PC with up to 4 COM ports, the new virtual port would then be COM5 (see Device Manager).

Installation Guides for Windows XP®, Windows Vista® and Windows 7®

Changing the Port No. If you use the USB interface with a program that limits the number of COM port designations (e.g., only COM1, 2, 3, 4), you may have to assign one of these port numbers to the new virtual port.

- ▶ Open the setting for the **USB serial port** in the Windows® system control panel:
 - START > My Computer > Control Panel
 - System > Hardware > Device Manager
 - ▶ Open the **Connections** submenu.
 - ▶ Double-click on **USB Serial Port**.
 - ▶ Select **Port Settings / Advanced**.
- Change Latency Time
- ▶ Open the settings for the USB serial port, following the above instructions.
 - ▶ For a faster rate of communication, change the setting for the **Latency Timer** to 1 msec.
- Plug & Play Mode in Autoprint (SBI)
- ▶ Open the settings for the USB serial port, following the above instructions.
 - ▶ Stop the **Plug & Play mode** from running.

Uninstalling the Driver

The software driver for the USB connection can be uninstalled with the Windows® Uninstaller.

PS2 Interface for Barcode Scanner or Keyboard

Via the PS2 port you can connect a bar code scanner or a PC “QWERTY” keyboard to enter data and operate the balance.

- Installation
- Connecting the Device
- Using the Input Device
- The interface installation is described in the installation instructions supplied.
- ▶ Plug the connector plug into the PS2 port on the balance.
 - ▷ The input device is operational, no further settings are required.
- You can input entries directly via the keyboard or bar code scanner whenever an input field is open in the display of the balance.






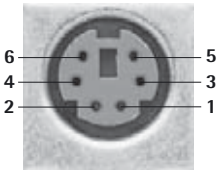
Key Assignment of the PC Keyboard

The five context-dependent buttons located at the bottom edge of the display are operated via the **function keys F1 to F5** on the PC keyboard.



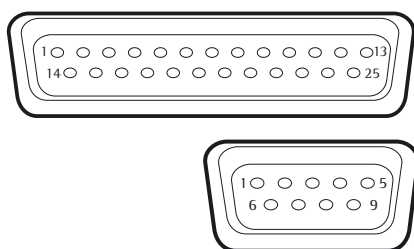
Whenever the last button on the right is assigned with the function **Back**, this function can also be activated using the **Esc** key on the keyboard.

- () **F9** The **TASK** key is operated via **F9** (Open Task menu).
- () **F10** The **USER** key is operated via **F10** (Open User menu).
- () **Print** The **PRINT** key is operated via the Print key of the keyboard.
- Shift F1** Use the shift F1 to select the **first entry** of a menu.
- Shift F2** Use shift F2 to select the **second entry** of a menu, etc.



Pin Assignment PS2

- Pin 1: Keyboard_DATA (universal)
- Pin 2: Not assigned (larger)
- Pin 3: Internal ground (GND)
- Pin 4: +5 V
- Pin 5: Keyboard_CLK (Set)
- Pin 6: Not assigned (smaller)



Interfaces (RS-232) 25-pin and 9-pin

The balance is standard-equipped with a 25-pin interface (**peripheral port**) where different Sartorius peripheral devices can be connected, e.g., hand or foot switch. This interface is also used for the control lines for the **Checkweighing** application.

A 9-pin interface can be optionally installed. This port is intended for connecting a PC.



Warning when Using Pre-wired RS-232 Connecting Cables for the 25-pin Interface: RS-232 cables purchased from other manufacturers often have incorrect pin assignments for use with Sartorius devices. Failure to do so may damage or destroy your weighing system and/or peripheral devices!

- ▶ Be sure to check the pin assignments before you connect cables purchased from other manufacturers.
- ▶ Disconnect any lines assigned differently (e.g., Pin 6).

Features (* = Factory settings)

Type of interface:	Serial Interface
Interface operating mode:	Full duplex
Level:	RS-232
Interface connector:	D-SUB female connector, 25- or 9-pin
Transmission rate:	600, 1200, 2400, 4800, *9600 and 19200 baud (selectable)
Parity:	*Even, odd, none; blank spaces (selectable)
Character transmission:	Start bit, 7/*8 bit ASCII, parity, *1 or 2 stop bits (selectable)
Handshake (selectable):	25-pin For 2-wire interface: Software (XON/XOFF) for 4-wire interface: *Hardware (CTS/DTR)
	9-pin Hardware (CTS/RTS)
Operating mode:	*SBI, xBPI, printer, SICS, 2nd display
Manual print mode	Without stability, *after stability
Auto print mode	*Without stability, at stability, after load change
Cancel automatic printing:	Not possible
Time-dependent automatic printout:	After 1 display update
Data output of balance:	16 or *22 characters
Tare after individual printout:	Off
Basic values, application:	Off

Connectable Peripherals

The following devices can be ported to the interface:

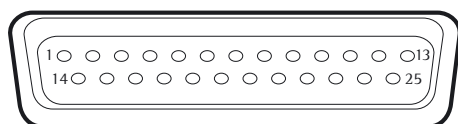
- Verifiable data printer YDP03-OCE, YDP10-OCE, YDP20-OCE
- Verifiable data printer with Bluetooth data transmission YDP10BT-OCE (module required)
- Universal (serial printer)
- Strip/label printer YDP04IS-OCEUV
- Hand switch YHS01
- Foot switch YFS01, YPE01RC
- External control display YRD11Z
- Remote display YRD03Z

Pin Assignment Chart for Connecting Peripherals

Purpose: For Sartorius peripheral devices

Female Interface Connector: 25-pin D-Submini (DB25S) with screwed fastening

Required Male Connector (Recommended): 25-pin D-Submini, DB25S, with integrated shielded cable clamp and shield plate assembly (Amp type 826 985-1C) and fastening screws (Amp type 164 868-1)



Pin assignment 25-pin socket, RS-232:

Pin 1: Signal ground	Pin 14: Internal ground (GND)
Pin 2: Data output (TxD)	Pin 15: Control input/output 1 ²⁾
Pin 3: Data input (Rx/D)	Pin 16: Control input/output 2 ²⁾
Pin 4: Signal GND	Pin 17: Control input/output 3 ²⁾
Pin 5: Clear to Send (CTS)	Pin 18: Control input/output 4 ²⁾
Pin 6: Not used	Pin 19: Control input/output 5 ²⁾
Pin 7: Internal ground (GND)	Pin 20: Data Terminal Ready (DTR)
Pin 8: Internal ground (GND)	Pin 21: Not used
Pin 9: Not used	Pin 22: Not used
Pin 10: Not used	Pin 23: Not used
Pin 11: + 12 V output	Pin 24: Not used
Pin 12: Reset _ Out ¹⁾	Pin 25: +5 V output
Pin 13: + 5 V output	

¹⁾ = Peripherals restart

²⁾ = Allocation of control input/outputs menu- is configurable (see below)

Control Inputs/Outputs

Data Output / Setting	Pin 15	Pin 16	Pin 17	Pin 18	Pin 19
Infrared sensor YHS01MS	Input 1: * "PRINT" key	Output 2: ** "Smaller"	Output 3: ** "Equal"	Output 4: ** "Larger"	Output 5: ** "Setp"
Hand switch YHS02	Input 1: * "PRINT" key	Output 2: ** "Smaller"	Output 3: ** "Equal"	Output 4: ** "Larger"	Output 5: ** "Setp"
Foot switch YFS01	Input 1: * "PRINT" key	Output 2: ** "Smaller"	Output 3: ** "Equal"	Output 4: ** "Larger"	Output 5: ** "Setp"
Triple Foot switch YPE01RC	Input 1: Left * "PRINT" key	Input 2: Right *Left Shieldpl.key	No function (disabled)	No function (disabled)	Input 5: Center * "TARE" key
Control display YRD11Z	Output 1: Currently no function	Output 2: ** "Smaller"	Output 3: ** "Equal"	Output 4: ** "Larger"	Output 5: ** "Setp"
Control inputs	Input 1: * "PRINT" key	Input 2: *Left Shieldpl.key	Input 3: *no function	Input 4: *no function	Input 5: * "TARE" key
Control outputs	Output 1: Currently no function	Output 2: ** "Smaller"	Output 3: ** "Equal"	Output 4: ** "Larger"	Output 5: ** "Setp"

* Default allocation of input, otherwise configurable

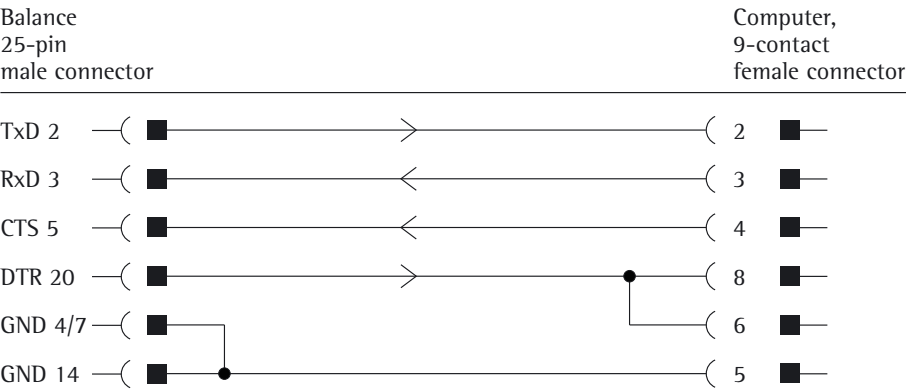
** Allocation of outputs, on checkweigher

Cabling Diagram 25-pin Interface

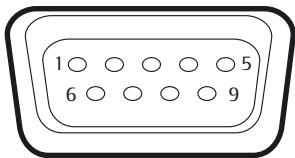
Diagram for connecting a computer or other peripheral device to the balance using the RS-232/V24 standard and cables up to 15 m (50 ft.) long



Do not connect any other pins to the cable connector of the balance!



Cable type: AWG 2 specification



Pin assignment 9-pin socket, RS-232:

- Pin 1: Not used
- Pin 2: Data output (TxD)
- Pin 3: Data input (RxD)
- Pin 4: Not used
- Pin 5: Internal ground (GND)
- Pin 6: Not used
- Pin 7: Clear to Send (CTS)
- Pin 8: Request to Send (RTS)
- Pin 9: Not used

Establish a connection via a conventional RS-232 cable.

Configuring Serial Ports



- The available interfaces are displayed.
- Select the interface you want to configure.
- Determine all settings for this interface.
- To save settings, touch **Save**.

Configuration Options for the Serial Interfaces

The following **operating modes** are possible for these interfaces:

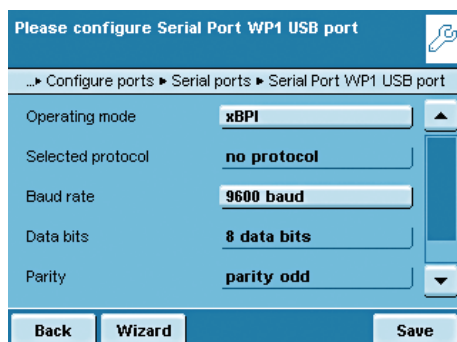
- No function; the interfaces is blocked
- xBPI
- SBI
- Remote display (SBI)
- Printer output
- SICS



Factory settings are marked with an *.

Configuration Options for the xBPI Operating Mode

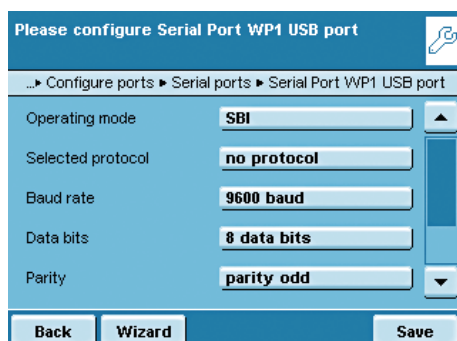
For this operating mode, you can only configure baud rate and number of stop bits.



- Selected protocol: No protocol (fixed setting)
- Baud rate: ***9600** to **115200 Baud**
- Data bits: 8 (fixed setting)
- Parity: Odd (fixed setting)
- Stop bits: ***1** or **2** stop bits

Configuration Options for the SBI Operating Mode and Remote Display

You can change all settings for this operating mode.



- Selected protocol: **No protocol/software handshake**
XON;XOFF/*Hardware handshake RTS;CTS
- Baud rate: **300** to **19200 baud** (for remote display up to 115200 baud), *9600
- Data bits: **7** or ***8**
- Parity: **None**/***Odd** (odd)/**Even** (even)
- Stop bits: ***1** or **2** stop bits
- Log data: ***Turn off**/**Turn on**

Please configure Serial Port WP1 internal port

... ▶ Serial ports ▶ Serial Port WP1 internal port

Operating mode: **Printer**

Printer type: **YDP10-0CE**

Selected protocol: **Hardware handshake...**

Baud rate: **9600 baud**

Data bits: **8 data bits**

Back **Wizard** **Save**

Configuration Options for the Printer Output Operating Mode

You can modify all settings for this operating mode depending on the configured printer type.

- Printer type: **YDP10-0CE/YDP20-0CE/YDP03-0CE/Universal/YDP04IS-0CEUV**
- Selected protocol: **Hardware handshake**
- Baud rate: 300 to 19200 baud (*9600)
- Data bits: 7 or *8
- Parity: **None/*Odd (odd)/odd (even)**
- Stop bits: *1 or 2 stop bits
- Log data: ***Turn off/Turn on**

Select type of printer to use

...▶ Configure ports ▶ Serial ports ▶ Serial Port WP1 USB port

▶ **YDP10-0CE**

YDP20-0CE

YDP03-0CE

Universal

YDP04IS-0CEUV

Back **OK**

The following setting options are available for the **Printer** types:

- **YDP10-0CE**: No setting option, all parameters are permanently defined
- **YDP20-0CE**: All can be configured except stop bits
- **YDP03-0CE**: All can be configured except data bits and stop bits
- **Universal**: All can be configured
- **YDP04IS-0CEUV**: No setting option, all parameters are permanently defined
- **YDP10BT-0CE** (only for optional Bluetooth module, Com C): No setting option, all parameters are fixed

Please configure Serial Port WP1 USB port

...▶ Configure ports ▶ Serial ports ▶ Serial Port WP1 USB port

Operating mode: **SICS**

Selected protocol: **Software handshake...**

Baud rate: **9600 baud**

Data bits: **8 data bits**

Parity: **parity odd**

Back **Wizard** **Save**

Configuration Options for the SICS Operating Mode

You can change all settings for this operating mode.

- Selected protocol: **No protocol/*Software handshake XON;XOFF/*Hardware handshake RTS;CTS**
- Baud rate: **300 to 115200 Baud**, *9600
- Data bits: **7 or *8**
- Parity: **None/*Odd/Even**
- Stop bits: ***1 or 2 stop bits**
- Log data: ***Turn off/Turn on**

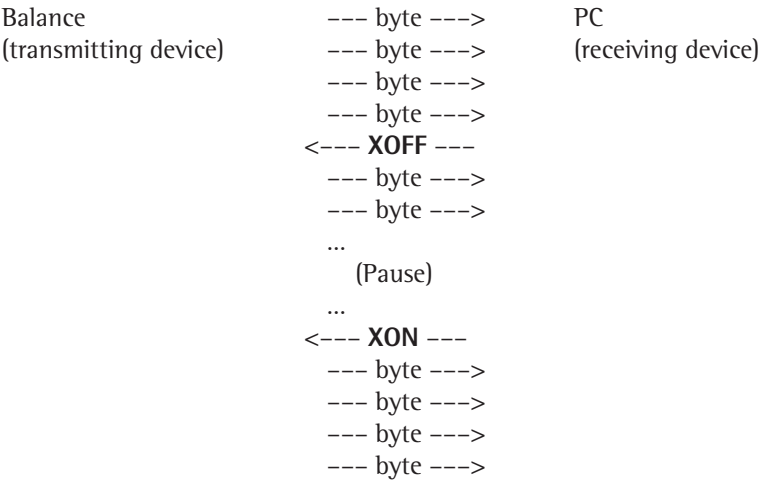
Explanations for the Setting Parameters

Selected Protocol/Handshake

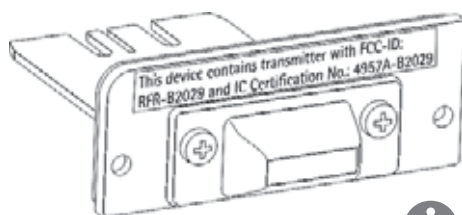
The SBI (Sartorius Balance Interface) has transmit and receive buffers.
Data transmission can be operated with a hardware or software handshake.

- Hardware Handshake (CTS/DTR): With a hardware handshake (4-wire interface) protocol, the handshake is controlled via the CTS and DTR lines.
- Software Handshake (XON, XOFF): The software handshake is controlled via the XON and XOFF control commands. When the device is switched on, XON must be transmitted to enable any connected device to communicate.

Data transmission:



- Transmitting Device: Once XOFF has been received, it prevents further transmission of characters. Once XON has been received it re-enables the transmitting device to send data.
- Receiving Device: To prevent too many control commands from being received at one time, XON is not transmitted until the buffer is almost empty.



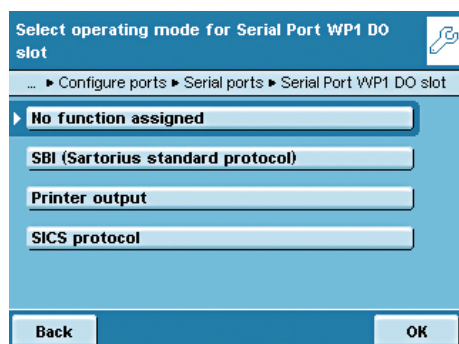
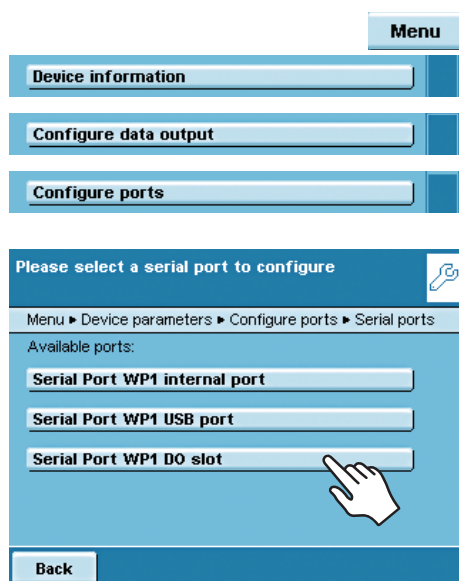
Bluetooth® Interface (COM C, Optional)

How to assemble the Bluetooth® module is described in the installation instructions supplied.

For transmitting data via the Bluetooth module, the data output has to be configured in the System Settings as follows.

Configuring the Bluetooth® Interface

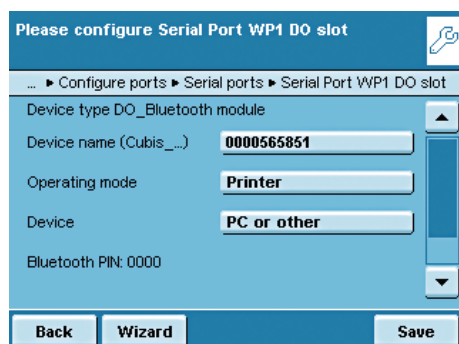
- ▶ If appropriate, toggle to the System Settings menu.
- ▶ Select the **Device information** submenu and slide the right scroll bar down.
- ▶ Select **Configure ports**.
- ▶ Open the **Serial ports** submenu.
- ▶ Select **Available ports**.



The following **operating modes** are available for this port:

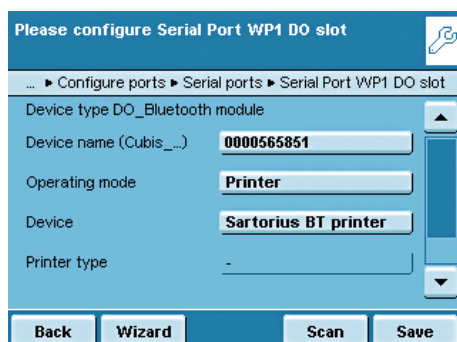
- No function
- SBI (data exchange with PC or notebook)
- Printer output
- SBI (data exchange with PC or notebook)

- ▶ Select the desired operating mode.



Bluetooth Printer Output Operating Mode

- ▶ If required, you can change the device name (only with Bluetooth modules from Version 04-10-01).
- ▶ To connect a PC/Notebook, select **PC or other**.

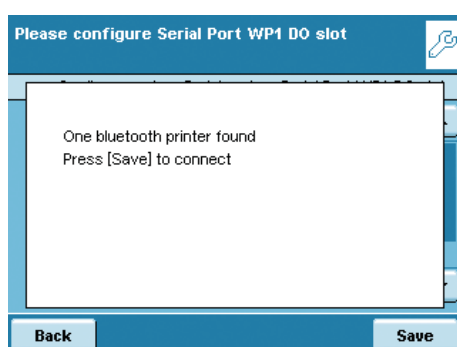


Connecting a Bluetooth Printer

- ▶ Make sure that the printer to which you wish to connect is ready to operate.
- ▶ Select the **Sartorius BT printer** as the device.

- ▶ To establish the connection, select **Scan**.

- ▷ The balance will now search for the Bluetooth device. This process may take time. Wait for the next message to appear on the display.



- ▷ A message will appear to confirm whether the printer has been found.

- ▶ To save settings, touch **Save**.

- ▶ Saving settings: Touch 2x on **Back**.

- ▷ The connection will initially be terminated after saving. The LED on the printer will continue to flash blue/red.

- ▷ As soon as the configuration menu is exited, the connection will be re-established. The LED on the printer will then illuminate permanently (blue).

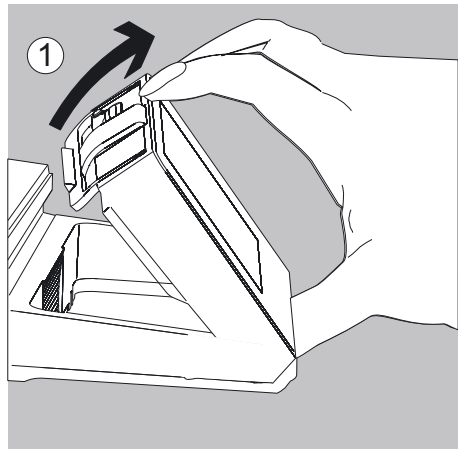
Network Interface (Ethernet)

Purpose	This interface lets you integrate your balance into a TCP/IP-based network.		
Requirements	The person configuring the Ethernet interface should have basic knowledge of TCP/IP-base networks and network technologies in general. The Ethernet interface is connected to the local network via the RJ45 slot.		
Features	Transfer rate:	10 Mbs/sec (10BASE-T, Ethernet) and 100 Mbs/sec (100BASE-TX, Fast Ethernet), auto-recognition (10/100, HalfDX/FullDX)	
	Connection type:	Network protocol: ModBus/TCP	
	Transport:	TCP/IP or UDP/IP	
	HMS certificates:	Compatible with ModBus TCP standard of the ModBus Organisation, industry-compatible CE, UL, cUL	
	Cable:	Twisted pair, shielded, CAT-5 or higher, 1:1, UTP / STP, male connector RJ45; e.g., patch cable CAT5 depending on application (straight/crossover)	
	Cable impedance:	150 Ohm	
	Cable length to HUB:	Max. 30 m	

Connecting Network Cables

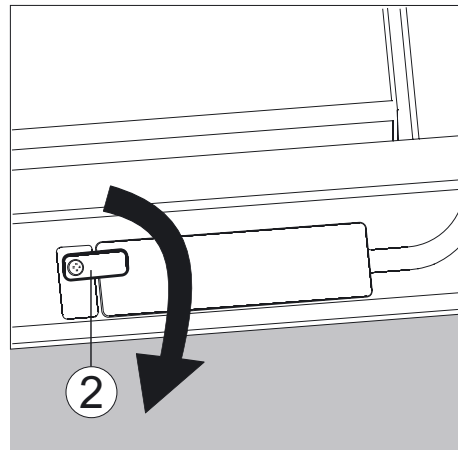
The slot for the network port is located at the back of the control unit.

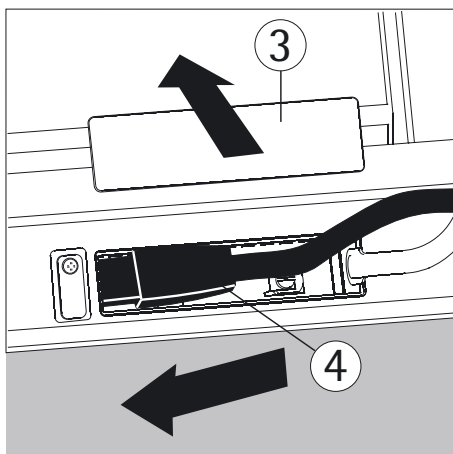
- Tilt the control unit (1) until it is nearly vertical.



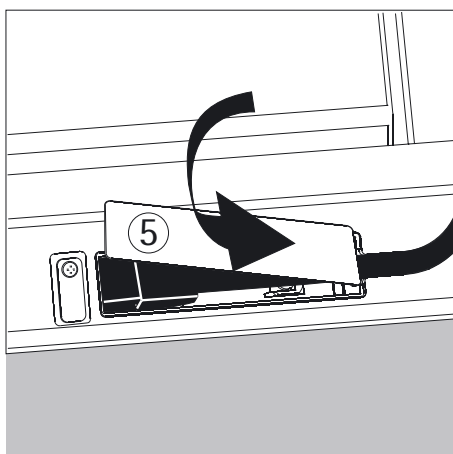
On the bottom panel of the display unit:

- Turn the locking lever (2) 90°.

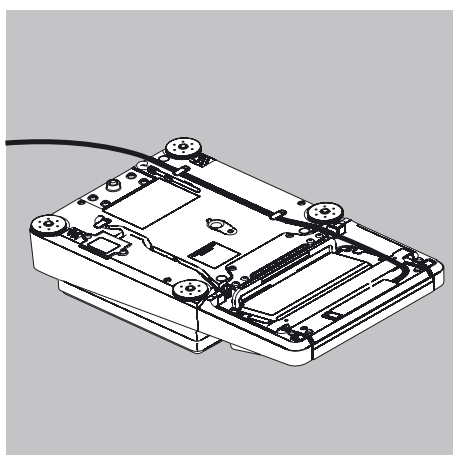




- ▶ Remove the cover plate (3).
- ▶ Insert the Ethernet cable plug (4) so that it clicks audibly into place.



- ▶ Reattach the cover plate (5).
- ▶ Turn the locking lever back to its locked position.



Exercise caution to avoid glass breakage for models with a draft shield.

- ▶ Turn over the balance and place it on a soft surface.
- ▶ Lay the Ethernet cable (6) through the cable channel of the weighing module.

Configuring Network Operation (Ethernet)

Preparation: Before you can start with the configuration, you will require some information about your network. Please contact your network administrator. The important question is whether your network supports DHCP or not.

DHCP With DHCP, you can automatically link a (new) balance to an existing network without having to configure it manually. Normally, the balance (client) only requires the automatic acquisition setting for IP address (factory setting). In this case, no additional information is required.

DHCP is supported
DHCP is not supported

In this case, you need the following information from the network administrator:

- IP address
 - Subnet mask
 - Default gateway address
- Device name (host name): This name can be changed if required.
This name is used to select the balance in the network.

Select Network Settings (Fixed Setting)

- If appropriate, toggle to the System Settings menu.
- Select the **Device information** submenu and slide the right scroll bar down.
- Select **Configure ports**.
- Open the **Network parameter (Ethernet)** submenu.

- To change the IP settings, touch the input field behind **Network configuration** input field.

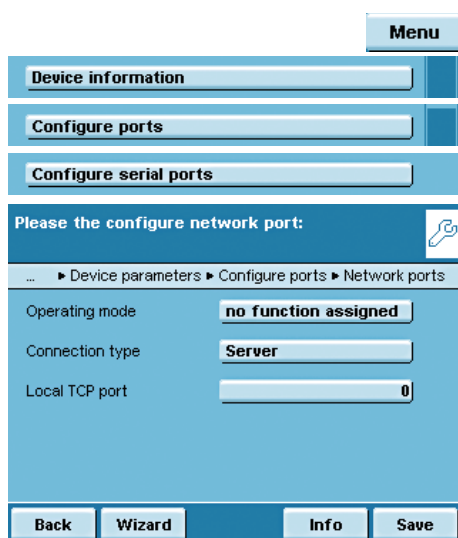
- Select **Use fixed IP address** and confirm with **OK**.

- In the overview, check all settings and change as required.

Host name (device name): You can select this name freely.
This name is used to select the balance in the network.

- If you then want to produce an Ethernet connection, write down the IP address now.
- To save the network configuration, touch **Save**.
- The Configure ports submenu is displayed.

The screenshots illustrate the steps to configure the network settings on the Cubis MSA device. The interface is a touch-screen menu system. The first menu shows the navigation path: Device information > Configure ports > Network parameter (Ethernet). The second screen, 'Please edit the network settings', shows the current configuration: Hostname is 'Cubis-C345B6', Network configuration is 'via DHCP/AutoIP', IP address is '172.16.252.170', Subnet mask is '255.255.252.0', and Default gateway is '172.16.254.254'. The third screen, 'Please configure IP address mode', shows the option to 'Use fixed IP address' selected. The fourth screen shows the final configuration with 'Fixed IP address' selected and the same IP settings.



Configuring Network Interface (Com D)

- ▶ If appropriate, toggle to the System Settings menu.
- ▶ Select the **Device information** submenu and slide the right scroll bar down.
- ▶ Select **Configure ports**.
- ▶ Open the **Network ports** submenu.

- ▶ Define the operating mode and, depending on the connection type, either Server port and address or the local TCP port.

Operating mode: **No function/XBPI/SBI/Printer output/SICS protocol**

Connection type (of the balance): **Server/Client**

- ▶ To save settings, touch **Save**.

Examples:

For the connection type **Balance = Server** you only need to enter the local TCP port (e.g., for working with the Sartorius **SartoCollect** software for data communication).

For the connection type **Balance = Client**, you have to enter the server TCP port and the server IP address (e.g., for working with “**Virtual serial port emulator**” as the server for all previous serial PC applications with the balance or for printing on a network printer server).

Remote Control of the Balance from a PC via Ethernet

System Requirements

- PC with internet browser
- Operating system Windows, Mac OS, Linux, Unix or Solaris.



Installation

- ▶ Connect the balance to your network via the Ethernet interface.
- ▶ Enter the IP address of the balance in the address field of your Windows browser. The IP address of your balance is listed under Menu/Device Information/Basic data.

Port Release

- If you are having problems with the connection, you must configure your firewall to release the right TCP/IP UDP port.
- If you are using a router and want to access your computer on the internet via your IP address, the port must also be set in the router's virtual server settings. This means that you must forward the port to the IP address of the server.
- If you still have problems, you may have to deactivate your firewall temporarily while using a browser connection.

Selecting Functions

- Click on the desired function in the browser.
- To exit a function, click on >>Back or on the back key of your browser.

Remote configuration (VNC): Use this function for remote control of the balance. The display screen on the balance is reproduced in the browser, you can operate the balance now by using the mouse and keyboard of your PC.

Software version: You can view the version of the balance, control unit and application software.

Screenshot: You can print the current screen or save it as GIF file.

Browse alibi memory: You can view the alibi memory.

Show settings: You can view the following settings:

- Task profiles
- User profiles
- System settings (menu)
- Service information (service)
- Interface information (ports)
- Timer-controlled actions

Show log files: You can view respective log files.

Viewing a Print File Directly in an Internet Browser:

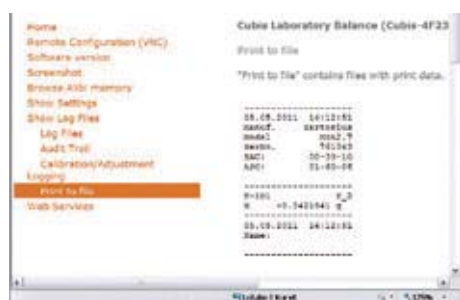


Prerequisites:

The configuration settings can be found in the chapter System Settings (Menu): "Print to File." Select the following file format for viewing directly in an Internet browser: Print to TXT file.

- In the browser, click on "Show Log Files" and then "Print to File."
- To view the printout directly in the internet browser, click on "print.txt."

► The printout is displayed in the Internet browser.



Data Output


You can define the data output parameter so that output is activated either when a print command is received or automatically synchronized with the display or at defined intervals (see application programs and autoprint settings).

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 **Autoprint** mode, data is output to the data interface port without an extra print command. You can have synchronized data output automatically at defined display update intervals, with or without the stability parameter. The interval time depends on the balance operating status and balance type.

If the automatic data output is activated in the Device Configuration, it starts immediately after the balance is turned on. You can also configure whether the automatic data output can be stopped and started by pressing the () key.

Data Output Formats

You can output the value displayed in the measured value line and the weight unit, with or without a data ID code. Configure this output parameter in the Device Configuration menu (Menu/Device Configuration/Configure data output/Line format).

Example: Output Without an ID Code **+ 2 5 3 p c s** 16 characters are output

Example: Output Without an ID Code **Q n t + 2 5 3 p c s** 22 characters are output

Data Output Format with 16 Characters

Display segments that are not activated are output as spaces.

Display values without a decimal point are output without a decimal point.

The type of character that can be output depends on the character's position.

Normal Operation

Position	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
	+	A	A	A	A	A	A	A	A	A	*	E	E	E	CR	LF
or	—	*	*	*		
or		*	*	*	*	*	*	*	*	*	*					

*: Spaces

A: Displayed characters

E: Characters for the unit,
or “!” as a warning symbol
for calculated values

CR: Carriage return

LF: Line feed

Special Outputs

Position	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
	*	*	*	*	*	*	-	-	*	*	*	*	*	*	CR	LF
or*		*	*	*	*	*	A	*	*	*	*	*	*	*	CR	LF
or*		*	*	*	*	*	A	B	*	*	*	*	*	*	CR	LF
and only upon request with ESC w0 (no print command):																
		*	*	*	*	*	W	*	X	X	X	Y	Y	Y	CR	LF
or*		*	*	*	*	*	1	*	X	X	X	*	*	*	CR	LF

*: Spaces
 AB = - -: Final readout
 A = H: Overload
 AB = H H: Overload in checkweighing
 A = L: Underweight
 AB = L L: Underweight in checkweighing
 A = C: Adjustment
 W: Draft shield status (optional):
 I: Ionizer (optional)
 Y,Y,Y = Draft shield doors
 XXX = Decimal value calculated from binary data

Decimal value	Binary value	Control information
1	Bit0 = 0:	No error/ionizer off
	Bit0 = 1:	Draft shield error/ionizer on
2	Bit1 = 0:	Draft shield motors off
	Bit1 = 1:	Draft shield in motion
8	Bit3 = 0:	Learning function off
	Bit3 = 1:	Learning function on
16	Bit4 = 0:	At least one draft shield door open
	Bit4 = 1:	All draft shield doors closed
32	Bit6 = 0:	Motorized draft shield operation
	Bit6 = 1:	Manual draft shield operation

R,M,L = COO: **R**ight door closed (**C**losed), **M**iddle and **L**eft doors open (**O**pen)
 R,M,L = OCC: **R**ight door open (**O**pen), **M**iddle and **L**eft doors closed (**C**losed)

Error Message

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

*: Spaces # # #: Error code number

Example: Output of the weight value + 111.255 g

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

Position 1: Plus +, or minus – or space
 Position 2: Space or weight value
 Position 3 – 10: Weight value with decimal point, leading zeros are output as spaces.
 Position 11: Spaces
 Position 12 – 14: Characters for unit of measure or space
 Position 15: Carriage return
 Position 16: Line feed

Data Output Format with 22 Characters

When data is output in this format, ID codes with 6 characters will precede data with a 16-character format. These six characters identify the subsequent value.

Normal Operation

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
K	K	K	K	K	K	+	A	A	A	A	A	A	A	A	A	*	E	E	E	CR	LF
*	*	*	*	*	*	-	*	*	*	*		
							*	*	*	*	*	*	*	*	*						

- K: ID code character¹⁾

*: Spaces

A: Displayed characters

LF: Line feed
- E: Unit symbol character¹⁾

See chapter “Mass Unit Conversion”
or “!” as a warning symbol for
calculated values

CR: Carriage return

Special Outputs

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	H									
												L	L									
												C										

- *: Spaces

- -: Final readout

H: Overload

H H: Overload in checkweighing
- L: Underweight

L L: Underweight in checkweighing

C: Adjustment


Draft shield and ionizer status
similar to data output format with
16 characters

Error Message

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

*: Spaces # # #: Error code number

ID Code for the Character K

 The ID code depends on the model, e.g., not all units and IDs are available for verified balances

Device Information, Basic Data

Manuf.	Manufacturer
Model	Model
SerNo.	Serial number
BAC:	Balance version
APC:	Display version

Print function

Name	Name
-------------	------

Task profiles

Task	Task title
TskDes	Task description

User profiles

User	User title
UsrDes	User description

Data Memory

MemNo.	Memory number
MemID	Memory ID

Basic Weighing

G#	Gross weight 2
N	Net weight
N1	Net weight (T1·0)
T	Tare weight
T1	Tare weight 1
T2	Tare weight 2

Calibration/Adjustment

Set	Target weight
Stat	Status
Dev	Deviation weight
s =	Result ReproTEST

Leveling

LevRes	Leveling result
---------------	-----------------

SQmin Function

SQmin	Minimum weight
--------------	----------------

Individual Identifiers

P-ID1	Print ID1
T-ID1	Task start ID1
I-ID1	Initialization ID1
R-ID1	Result output ID1
C-ID1	Component ID1
E-ID1	Evaluation ID1
X-ID1	Task end ID1

Density Determination

ID-Dk	Name of density determination kit
n	No. of wires
d	Wire diameter
D	Vessel diameter
Id-Liq	Name of liquid
RefFL	Density of liquid
b	Coefficient of expansion of the liquid
LA	Correction for air density
PL.vol	Volume of glass plummet
Temp	Temperature of liquid
RhoFL	Density of liquid
Corr	Correction factor of the density determination kit
Wa	Weight of sample in air
WfL	Weight of sample in liquid or weight of liquid
Wt	Residual liquid
Wr	Sample plus weight of liquid
Rho	Density of sample
Vol	Volume of sample

Statistics

nDef	Default number of items
n	Transaction counter
x	Average value of the weight values
s	Standard deviation of the weight values
sRel	Variation coefficient of the weight values
Sum	Total of all weight values
Max	Highest weight value
Min	Lowest weight value
Dif	Difference between highest and lowest weight value

ID Code for the Character K (Continued)

Calculation

Form	Formula
Res	Results using equations
X	Variable X
Y	Variable Y
a	Variable a
b	Variable b

Animal Weighing

mDef	Target value
Mul	Calculation factor
mAct	Actual number
x-Net	Results
x-Res	Calculated result

Formulation

IDCm1	Id Component 1
TCmp1	Reference weight Comp. 1
PCmp1	Reference percentage weight Comp. 1
Comp1	Weight value Comp.1
WD1	Difference Weight 1
PD1	Difference Percent 1
WghMod	Mode for inputting initial weight
nDef	Default number of components
Total	Total of weight values
RSum	Total reference
n	Transaction counter
IniWgt	Default total weight

Weighing in Percent

pRef	Percentage of reference
Wxx%	Reference percentage weight
Prc	Percent
D	Percent loss
DR	Ratio in percent 1
OR	Ratio in percent 2

Timer-controlled Functions

InvTim	Interval
FixTim	Fixed point in time
ResTim	Remaining time
Hold	Display blocked

Totalizing

nDef	Default number of items
Comp	Weight value start
Comp	Current weight value
n	Number of the item
CompC	Weight value start: calculated components
CompC	Current weight value: calculated components
Sum	Total of all weight values

DKD Measurement Uncertainty

a1	Addend a1
b1	Factor b1
b1 e-	Exponent b1
a2	Addend a2
b2	Factor b2
b2 e-	Exponent b2
P fact	Pa Factor
U	Absolute inaccuracy of the process
U*	Relative inaccuracy of the process
PA	Inaccuracy of the process

Parts Counting

wRef	Reference piece weight
nRef	Reference sample quantity
Qnt	Piece count

Checkweighing

Setp	Target value
Min	Min. tolerance for checkw.
Max	Upper tolerance for checkw.
Lim-	Lower percentage
Lim+	Upper percentage
Count	Counter for correct values
CountLL	Counter for too small values
CountHH	Counter for too large values
Diff	Check result measure

Motorized Draft Shield

WPC	Draft shield version
Stat	Draft shield status

Ionizer

Stat	Ionizer status
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Data Input

SBI Commands (Data Input Format)

The computer connected via the data port can send commands to the balance to control balance and application program functions.

These control commands may have different formats and contain up to 26 characters. Each of these characters must be sent based on the setup configuration for data transmission.

Formats for Control Commands

Format 1:	Esc	!	CR	LF					
Format 2:	Esc	!	#	_	CR	LF			
Format 3:	Esc	!	#	&t	(max. 20 &t)	&t	_	CR	LF

Esc: Escape

!: Command character

#: Number

&t: Number or letter

_: Underline (ASCII: 95)

CR: Carriage return (optional)

LF: Line feed (optional)

max: Depends on command character (parameters): The entry is truncated after the max. length, and not rejected as when entered via the keyboard.

Examples:

Format 1: Esc P

Format 2: Esc x1_

Format 3: Esc t Article1_

Format 4: Esc e!{MESSAGE.SHOW_ERROR "Weight too low!"}

Esc e?{WEIGH.WGT_NET}_1)

(e.g., query net weight value)

Esc ea{Art.413}_1)

(determine weight and tare values and save to the alibi memory together with the label)

Overview of SBI Commands

Format	Command	Action/Function	Comments
1	ESC P	Print to the interface where the prompt originated	Corresp. to Menu, with/without stability
1	ESC T	“TARE” key taring or zeroing	
1	ESC K	Filter “Very stable conditions”	
1	ESC L	Filter “Stable conditions”	
1	ESC M	Filter “Unstable conditions”	
1	ESC N	Filter “Very unstable conditions”	
1	ESC O	Block keys	
1	ESC Q	Acoustic signal	
1	ESC R	Unblock keys	
1	ESC S	Restart	
1	ESC Z	Internal calibration/adjustment	Depending on menu, 1/2 step increments
1	ESC U	Tare	
1	ESC V	Zero key	
1	ESC W	Ext. adjustment with default weight	Depending on menu, 1/2 step increments
2	ESC f3_	Zero	
2	ESC f4_	Tare only	
2	ESC f5_	Left draft shield key (closing and opening as learned or default)	Only if available
2	ESC f6_	Right draft shield key (closing and opening as learned or default)	Only if available
2	ESC kF1_	Soft key 1, first from right	Depends on application
2	ESC kF2_	Soft key 2, second from right	Depends on application
2	ESC kF3_	Soft key 3, third from right	Depends on application
2	ESC kF4_	Soft key 4, fourth from right	Depends on application
2	ESC kF5_	Soft key 5, fifth from right	Depends on application
2	ESC kF7_	“Menu” soft key	
2	ESC kF9_	“TASK” key	
2	ESC kF10_	“USER” key	
2	ESC kP_	Print as with “PRINT” key (e.g., to several interfaces)	
2	ESC m0_	Ionizer status	Only if available
2	ESC m1_	Ionizer on, with preset time	Only if available
2	ESC m2_	Ionizer off	Only if available
2	ESC s3_	Back, exit, cancel	
		Models with the analytical draft shield	Analytical and rotational draft shield
2	ESC w0_	Draft shield status	Draft shield status
2	ESC w1_	Open left door	Open draft shield 100% to the left
2	ESC w2_	Close all doors	Close draft shield
2	ESC w3_	Open upper door	Open draft shield up to position saved
2	ESC w4_	Open right door	Open draft shield door 100% to the right
2	ESC w5_	Open left and upper doors	–
2	ESC w6_	Open left and right doors	–
2	ESC w7_	Open right and upper door	–
2	ESC w8_	Open all doors	–
2	ESC x0_	Perform internal calibration	
2	ESC x1_	Print weigher type	
2	ESC x2_	Print serial number	
2	ESC x3_	Print balance software version	
2	ESC x4_	Print softw. version of display and control unit	
2	ESC x5_	Print user/device ID	
2	ESC x6_	Print cal./adjust. weight ID	
2	ESC x7_	Print measurement sequence ID	
3	ESC txxx_	Input text	
3	ESC txxx_ESC f5_	Enter opening angle xxx in degrees for left key	
3	ESC txxx_ESC f6_	Enter opening angle xxx in degrees for right key	
3	ESC z5xxx_	Input user/device ID	
3	ESC z6xxx_	Input cal./adjust. weight ID	
3	ESC z7xxx_	Input measurement sequence ID	
4	ESC e! {xxx}_	Execute application command, {xxx} = Task ID	
4	ESC e? {xxx}_	Query parameter, {xxx} = Parameter ID	
4	ESC ea {xxx}_	Save weight value to alibi memory (with optional label), {x...x} = Memory ID	

SICS Commands



The computer connected via the data port can send control commands to the balance to control balance and application program functions.

Please consult the separate SICS documentation for a description of the syntax.

¹⁾ Marked commands can also be mini-SICS commands.

Command	Action/Function
Level 0 Version 2.3x	
@	Reset all SICS commands
I 0	List all available commands
I 1	Send information about the level and its versions
I 2	Balance model prompt
I 3	Prompt for input of software version of balance (BAC)
I 4	Prompt for balance serial number
I 5	Prompt for software version of display (APC)
S	Send weight value at stability
S I	Send weight value without stability
S I R	Send automatic weight values at and without stability
Z	Zero the balance at stability
Z I	Zero the balance without stability
Level 1 Version 2.2x	
T	Tare the balance at stability
T I	Tare the balance without stability
D	Write text in display
D W	Delete text from display
K	Key control
T A	Prompt for and allocate tare memory
T A C	Delete tare memory
S R	Send weight value if weight changes
Level 2	
M 1 3	Activate/deactivate touch screen softkeys
P W R	Turn balance on/off (standby)
S U	Send weight value at stability with current weight unit (with motorized draft shield)
W S	Query door position of motorized draft shield / Open or close door
M 0 7	Query / Activate / Deactivate automatic draft shield
M 2 4	"Print" key query / deactivate / print the stable or unstable weight values
S U	Send weight value at stability with current weight unit (with motorized draft shield)
W S	Query door position of motorized draft shield / Open or close doors
P W R	Turn balance on/off (standby)
I 1 0	Query/set the balance ID
I 1 1	Query balance type
I 1 4	Query balance components
M 0 1	Query/set application filter
M 0 2	Query/set filter adjustment
M 0 3	Query/set automatic zeroing
M 0 4	Query/set I/O inputs
M 0 7	Query/activate/deactivate automatic draft shield
M 1 2	Acoustic signal (beep)
M 1 3	Activate/deactivate touch screen softkeys
M 2 1	Query/set unit of weight
M 2 4	Query/deactivate "Print" key / Print the stable or unstable weight values
M 3 9	Query/activate bar graph display in working environment
P 1 0 0	Send text line to printer
C 1	Execute calibration/adjustment (as set in menu)

Remote Control (Remote)

P 1 1 2	Write text in selected line on display
P 1 1 3	Delete text from selected line on display
P 1 1 4	Overwrite task or user names
P 1 2 0	Turn off bar graph in checkweigher
P 1 2 1	Turn on bar graph in checkweigher
RM 2 0	Activate/deactivate user input
RM 3 0	Assign new function to softkeys
RM 3 2	Assign new order to softkeys
RM 3 4	Create a dynamic parameter
RM 3 5	Immediately change softkey designations
RM 3 6	Assign/query function of multiple softkey lines
RM 3 7	Prepare preset softkey designations for display
RM 3 8	Activate RM36-assigned softkey lines
RM 3 9	Activate/deactivate RM30-assigned softkey functions
RM 4 4	Query/set input with barcode scanner
RM 4 8	Change order of standard keys
RM 4 9	Activate/deactivate message
RM 5 1	Activate/deactivate selection window
RM 5 2	Define properties for a window with info text
RM 5 3	Activate/deactivate window with info text
RM 5 4	Activate/deactivate window with info

Additional Sartorius Commands

S A	Send weight value at stability and store in alibi memory (with optional label)
C M D	Execute application command
P A R	Query parameter
M N 3 6	Assign a description to several menus
M N 3 8	Activate/deactivate MN36-assigned menus
T X 3 6	Assign texts to several text pages
T X 3 7	Overwrite a line of a text page
T X 3 8	Activate/deactivate TX36-assigned text pages

Updating the Software

Purpose: To better serve our customers, Sartorius continues to improve its balance software. Sartorius makes the latest software versions available online so that you can quickly and easily remain up-to-date. Sartorius, however, makes no guarantee regarding the use of this software.
The software should only be updated by an administrator.



On verified balances, observe the audit trail instructions under (3) Uploading the Software Update to the Balance.



Before updating the software, save all data (see chapter **Exporting Data**).



If you are working with User Management (user profiles are defined), the software can only be updated by the administrator.

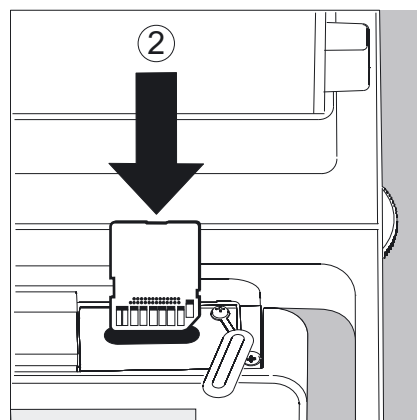
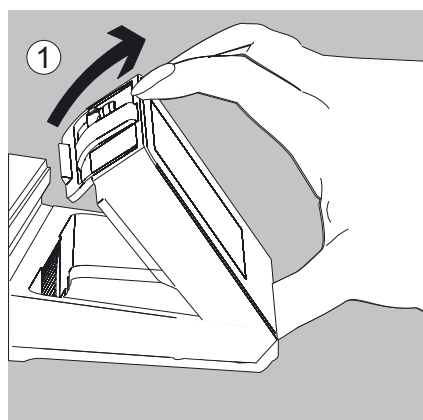
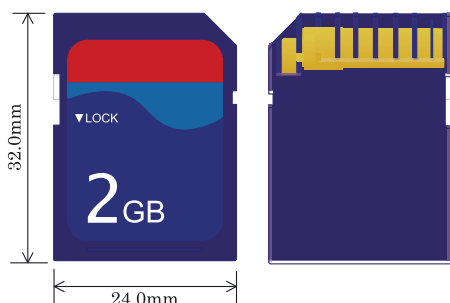
1) Download the software update from the Internet

The first step is to download the software to your computer:

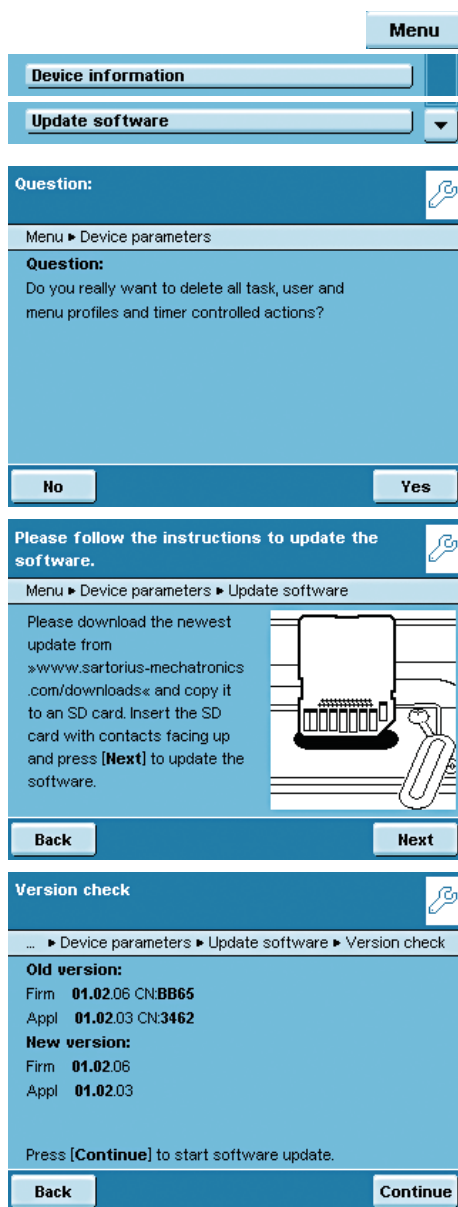
- ▶ In your browser, go to website “www.sartorius.com/downloads” and click on the “Software” link.
- ▶ Select the update packet for your balance.
- ▶ Enter the information required for registration.
- ▶ Download the software packet to your computer.
- ▶ Unpack the zip file.
- ▶ Copy the software update to a SD card (32 × 24 × 2.1 mm).

2) Insert the memory card into the control unit

The slot for the SD card is located at the back of the control unit.



1. Tilt the display and control unit.
2. Swivel the cover of the card slot to the front.
Align the SD card so that the contacts are facing forward.
3. Insert the card into the slot as far as it will go.
 - ▶ To remove the card, press it against the resistance in the direction of the slot so that the card springs out.



3) Upload the software update to the balance

- ▶ If you are working with User Management, it is necessary to log on as administrator.
- ▶ Toggle to the System Settings menu.
- ▶ Open the **Update software** submenu.

- ▶ You are asked if you want to delete the existing profiles.
- ▶ Touch **No** or **Yes**.

- ▶ Once the SD card with the current software is inserted, touch **Next**.

If the following error message appears:

Wrong XML version. Please check the data.

- ▶ Touch **Next**.
- ▶ All previous data will be saved in the new format.
- ▶ After updating your software, check your settings (Menu, TASK and USER).
- ▶ If the XML files continue to cause problems, contact your local Sartorius service center.

- ▶ After a version check is run, the versions of the current and the new software are displayed.

- ▶ To start the update, press **Continue**.


- ▶ An acoustical signal will sound when the update is complete and the balance then carries out a self test.

Audit Trail for Software Download on Models Verified for Legal Metrology

Software Status of the Balance

Models verified for use in legal metrology are assigned an authorized software status when the balance is shipped for delivery. This can be indicated in the display. If something concerning the software or the legal regulations changes, the software status must be updated.

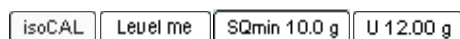
Display Audit Trail of the Balance Software

- ▶ Turn off the balance and disconnect it from the power supply.
- ▶ Keep () pressed and reconnect the balance back to the power supply.
- ▶ The "Bios" menu is displayed.
- ▶ Press the "Settings" menu item.
- ▶ Select the "Audit trail of software updates" menu item.
- ▶ Select "Show audit trail."
- ▶ The Audit Trail with modification date, name, new and old software and version number are indicated in the display.

M

Error and Status Messages

Error messages appear directly in the respective active application, usually with a descriptive text on how to correct it. Warning and reminder functions are displayed with a fixed 3-level action hierarchy:



Status display (tab).

The available status displays and their meanings are described in the “User interface” section.



Warning text with a repeating reminder



Error text with mandatory prompt for troubleshooting

You cannot proceed until you have eliminated the error.

Ineffective key commands or entries

If you press a key that has no function or not allowed, this error is indicated as follows:

- A double beep indicates that the key has no function assigned to it.
- An error message indicates invalid input.
- An error code or error message indicates incorrect operation.

Error messages are shown on the display for 2 seconds or must be acknowledged by pressing a key. The error text provides direct suggestions on how to proceed. If the error cannot be resolved by following the suggestions, please contact Sartorius customer service.

GPL License

Devices of the Cubis series also contain “free software” in the firmware that is licensed under the GNU General Public License (GPL) Version 2, June 1991 and the GNU Lesser General Public License (LGPL) Version 2.1, February 1999. This third-party developed “free software” is copyrighted and is provided free of charge.

The licensing conditions of the Free Software Foundation, Inc. are available in English on the included CD-ROM.

You can purchase the GPL source text from Sartorius on CD under the VF no. 4043 for a shipping cost of €-20.

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 offers its customers service contracts with regular maintenance intervals ranging from 1 month to 2 years. The frequency of the maintenance intervals depends on the operating conditions and user's tolerance requirements.

Repairs

Repair work must only be performed by trained service technicians. Repairs performed by untrained persons may result in considerable hazards for the user.



The device should be unplugged during repair work.

Unplug the power cord from the outlet.

Repair work must only be performed by Sartorius-trained service technicians. As needed: Please contact your Sartorius dealer!

Cleaning the Balance



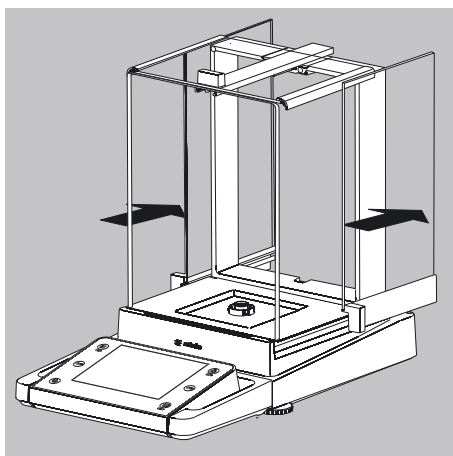
Ensure that no dust or liquid enters the balance weighing system.

Do not use aggressive cleaning agents (solvents or similar agents).

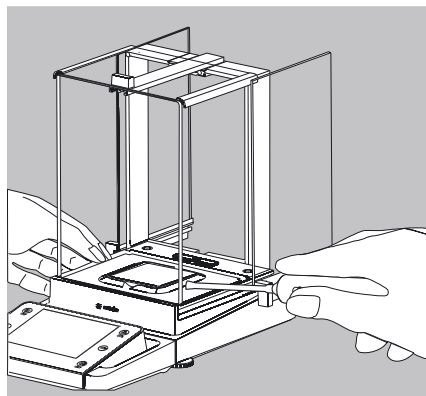
Disconnect from the voltage supply: Unplug the power cord from the wall outlet and unplug any data cables connected to the balance.

Models with a Readability of ≥ 10 mg:

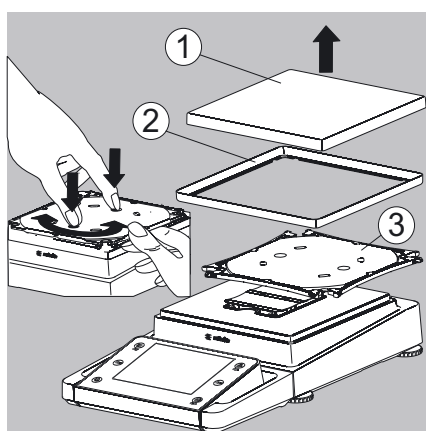
- These models meet the requirements of protection class IP54. The IP protection only applies to the balance housing and not to the AC adapter.
- The IP protection is only guaranteed when the weighing pan is mounted.
- Retain the cover cap for the data output. When the data output is not in use, reapply the cover cap to protect it against vapors, moisture, and dust or dirt.



- Open the panels of the analytical draft shield completely.
- Clean the housing and interior of the balance with a cloth lightly moistened with a soap solution.
- Dry all parts with a soft, dry cloth or use blotting paper to absorb dampness. Then replace all dried parts.
- Remove panels from the analytical draft shield and clean them with commercially available glass cleaner. Dry the panels and then reinstall them in the balance.

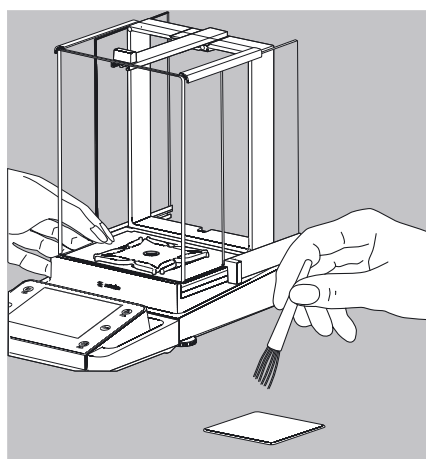


- Carefully remove any sample residue/spilled powder using a brush or hand-held vacuum.



- If necessary, remove the weighing pan, shield plate and pan support.

- 1) Weighing pan
- 2) Shield plate/draft shield
- 3) Pan support



- Clean parts with a cloth or brush.

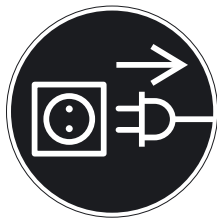
Then replace the parts.

Cleaning Stainless Steel Surfaces

All stainless steel parts should be cleaned at regular intervals.

Use a damp cloth or sponge to clean stainless steel parts on the balance. Only use conventional household cleaning agents which are suitable for stainless steel (e.g., Stahlfix). After this, let the device dry. For additional protection, protective oil may be applied.

Remove the stainless steel weighing pan and thoroughly clean it separately. Only use solvents for cleaning stainless steel parts. The stainless steel weighing pan should be cleaned simply by rubbing. After this, rinse the equipment thoroughly until all residue is removed. No protective oil should be applied to the stainless steel weighing pan!



Safety Inspection

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

- ▶ Disconnect from the supply voltage: Unplug the power cord from the outlet.
- ▶ Secure the AC adapter and cord so that they cannot be used.

Safe operation of the mass comparator with the AC adapter is no longer ensured when:

- The AC adapter or the mains connecting lead shows visible damage.
- The AC adapter no longer functions properly.
- Following extended storage in adverse conditions.
In this case, notify the Sartorius Service Center.

Maintenance and repair work may be performed only by authorized service technicians who have access to the required maintenance manuals and instructions and who have received the necessary training.

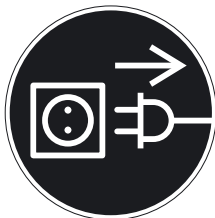
We recommend that the AC adapter be inspected by a qualified service technician with regard to the following:

- Leakage current: $<0.25 \text{ mA}$ measured with a properly calibrated multimeter.
- Insulation resistance $>7 \text{ MOhm}$ as measured with a constant voltage of at least 500 volts at a 500 kOhm load.

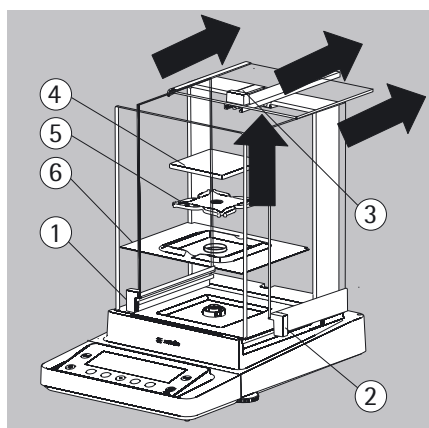
The duration and number of checks should be determined by a qualified Sartorius service technician on site based on specific ambient and operating conditions (once a year as a minimum).

Packing the Balance for Shipping

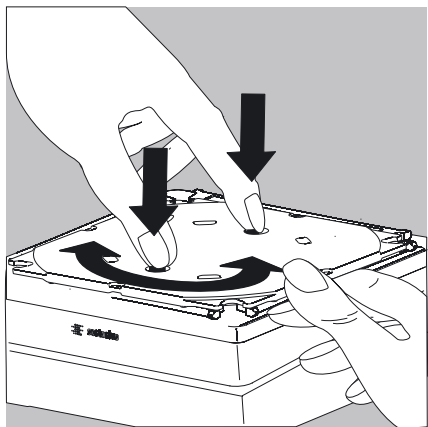
If repairs are required, use the original packaging to transport the balance. To ensure adequate protection for safe shipment, Sartorius products have been packaged to the extent necessary using environmentally friendly materials. Only the original packaging provides optimum protection for the equipment.



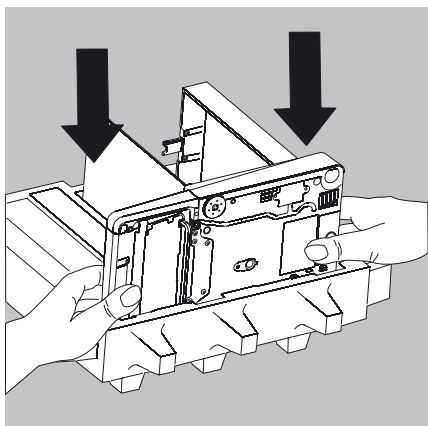
- ▶ Disconnect the device from the power supply.
- ▶ Disconnect any data cables from the device.



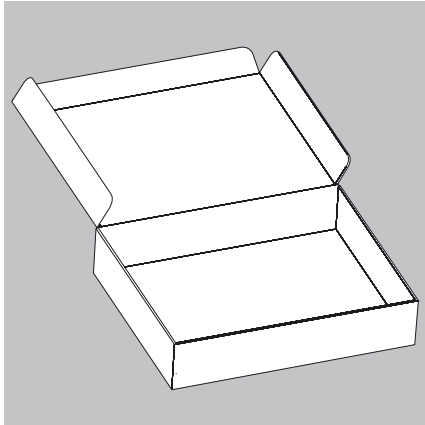
- ▶ Remove all items (such as weights, sensors, etc.) from the weighing chamber.
- 1) Remove the left side panel
- 2) Remove the right side panel
- 3) Remove the upper draft shield panel
- 4) Remove the weighing pan
- 5) Remove the pan support
- 6) Remove the shield plate/draft shield



- ▶ On models without a draft shield: press down on the two pan support fasteners.
- ▶ Rotate and remove the pan support.

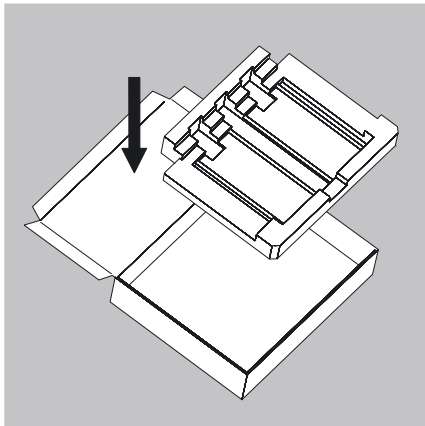


- ▶ Place the balance in the lower part of the packaging.

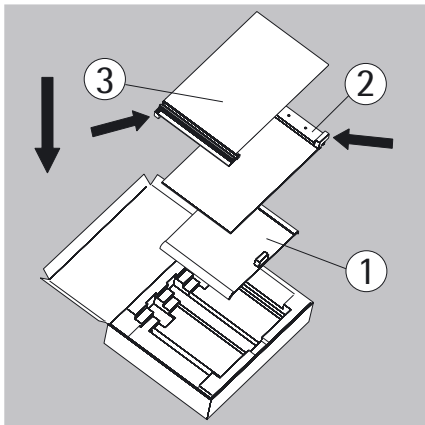


Transporting the Parts (Large Analytical Draft Shield)

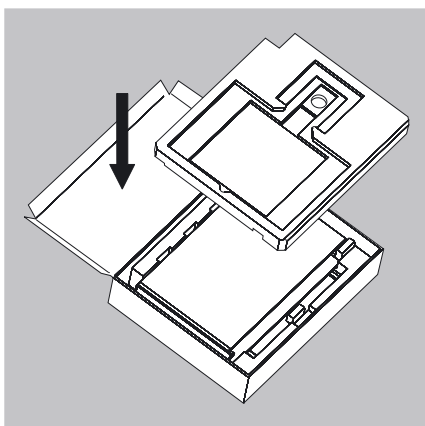
- Get the box for the individual parts of the balance ready.



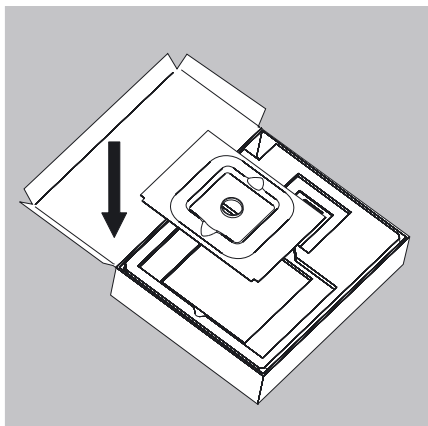
- Place the bottom foam piece in the box.



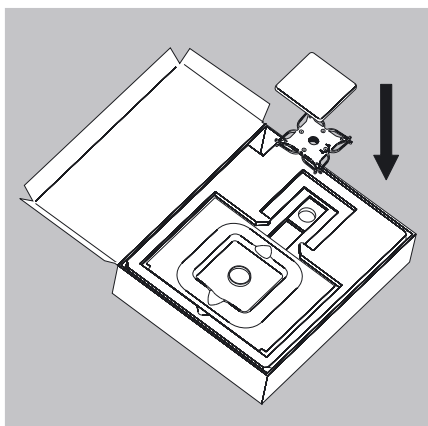
- Place the panels in the packaging:
 - 1) Place the upper draft shield panel into the packaging (handle upwards).
 - 2) Place the side draft shield panel into the packaging (handle upwards).
 - 3) Place the other side panel into the packaging (handle downwards).



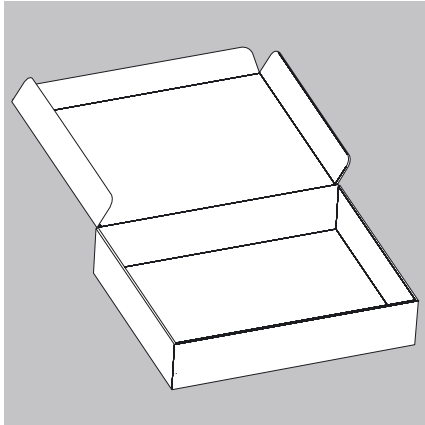
- Then place the top foam piece in the box.



- Place the shield plate into the box.

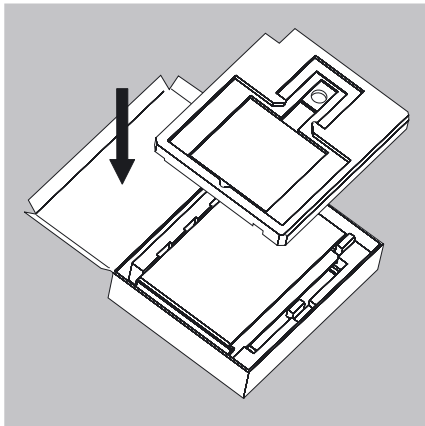


- Place the pan support and weighing pan into the opening.
- Close the box.

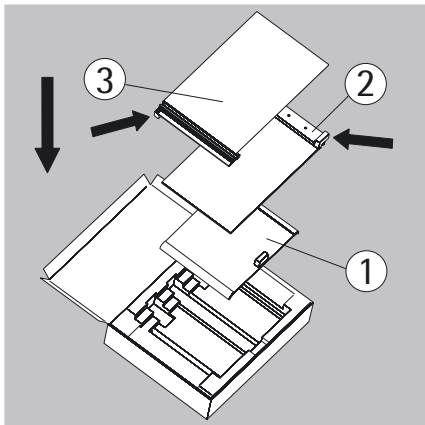


Transporting the Parts (Small Analytical Draft Shield)

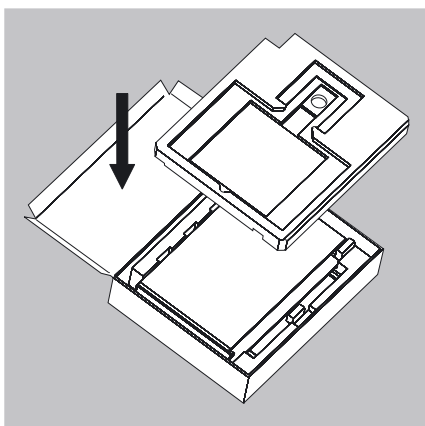
- Get the box ready for the individual parts of the balance.



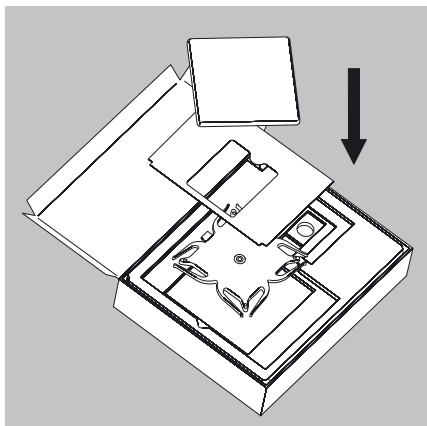
- Place the bottom foam piece in the box.



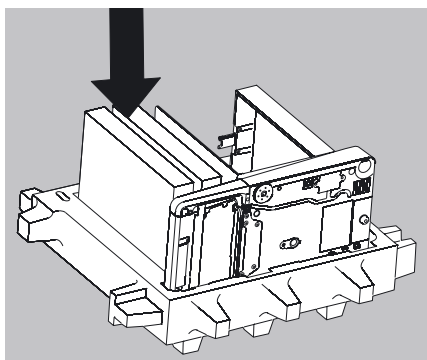
- Place the panels in the packaging:
 - 1) Place the upper draft shield panel into the packaging (handle upwards).
 - 2) Place the side draft shield panel into the packaging (handle upwards).
 - 3) Place the other side panel into the packaging (handle downwards).



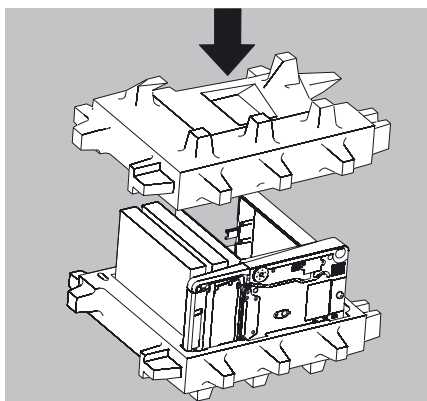
- Then place the top foam piece in the box.



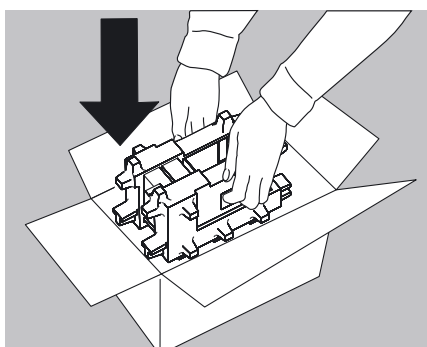
- Place the following parts into the foam piece in the order given:
 - 1) Pan support
 - 2) Shield plate
 - 3) Weighing pan
- Close the box.



- Place the box into the packaging.

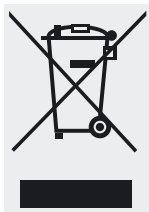


- Place the top part on to the packaging.



- Insert the balance into the box with cushioning.
- Send the packaged balance.

Disposal



The packaging is made of environmentally friendly materials that can be used as secondary raw materials. If you no longer require the packaging, you can dispose of it free of charge in Germany through the Vfw dual system (contract number D-59101-2009-1129). Otherwise you should dispose of the material in accordance with the waste disposal regulations that are applicable in your area. The device, including its accessories and batteries, should not be disposed of as household waste. It should instead be recycled as electrical/electronic equipment. For more information regarding disposal and recycling, please contact our local service representatives. Our partners listed on the following website will also be able to provide assistance within the EU:

- 1) Go to <http://www.sartorius.com>.
- 2) Select "Services" under the "Lab Products & Services" tab.
- 3) Then select "Information on Disposal."
- 4) Addresses for the local Sartorius disposal contacts can be found in the PDF files available for download on this page.

Sartorius will not take back equipment contaminated with hazardous materials (ABC contamination) either for repair or disposal.

Please refer to our website (www.sartorius.com) or contact the Sartorius Service Center for more detailed information regarding repair service addresses or the disposal of your device.

Specifications

General Data

Sartorius Power Supply	Model 6971987
Primary	100–240 V~, -15%/+10%, 50–60 Hz, 1.0 A
Secondary	15 V, $\pm 5\%$, 2.66 A (max.), protected electronically against short circuit
Other data	Protection class II as per EN/IEC 60950-1 up to 3000 m above sea level IP40 as per EN 60529/IEC 60529
Power Supply Connection Cable	Two-sided plug with a 3-pin country-specific power plug and 3-pin socket (IEC/EN60320-1/C14) for connection to the power supply
Other data	See the power supply label
Balance	
Voltage supply	Only via Sartorius power supply 6971987
Input voltage	15 V DC, $\pm 5\%$
Power consumption	7 W (max.)
IP protection for models with a readability of ≥ 10 mg	IP54 as per EN 60529/IEC 60529
Ambient Conditions	
Environment	For indoor use only
Storage and shipping temperature	-10°C to +60°C
Ambient temperature, operation*	+5°C to +40°C
Height	2000 m above sea level
Maximum relative humidity**	80% for temperatures up to 31°C, decreasing linearly up to 50% relative humidity at 40°C
Safety of electrical equipment	According to EN 61010-1:2001 Safety requirements for electrical equipment for measurement, control, and laboratory use – Part 1: General requirements
Electromagnetic compatibility	In accordance with EN 61326-1:2006 Electrical equipment for measurement, control, and laboratory use EMC requirements – Part 1: General requirements
Defined immunity to interference:	Suitable for use in industrial areas
Limitation of emissions:	Class B (suitable for use in residential areas and areas that are connected to a low voltage network that also supplies residential buildings).



-.CE model balances verified for use in legal metrology comply with the requirements of Council Directive No. 90/384/EEC (2009/23/EC) with EN 45501:1992 and OIML R76:2006.



* For -.CE model balances verified for use in legal metrology, refer to the information on the balance.

** For -.CE model balances verified for use in legal metrology, the legal regulations apply.

Model-specific Data

Microbalances 0.001mg

Model		MSA6.6S	MSA6.6S-F	MSA3.6P
Readability	mg	0.001	0.001	0.001/0.002/0.005
Weighing capacity	g	6.1	6.1	1.1/2.1/3.1
Tare range (subtractive)	g	-6.1	-6.1	-3.1
Repeatability	≤±mg	0.001	0.001	0.003/0.004/0.005
Linearity	≤±mg	0.004	0.004	0.004
Corner load (test load [g])	µg	4 (2 g)	4 (2 g)	5 (1 g)
Min. initial weight	mg	2	-	4
Sensitivity drift between +10...+30°C	±ppm/K	1	1	1
Typical stabilization time	s	≤ 5	≤ 5	≤ 5
Typical measurement time	s	≤ 8	≤ 8	≤ 8
External standard calibration value (min. accuracy class)	g	5 (E2)	5 (E2)	3 (E2)
Display result (depending on the set filter level)		0.1 – 0.4	0.1 – 0.4	0.1 – 0.4
Weighing pan size Ø	mm	30	50/30 ¹⁾	30
Weighing chamber height	mm	70	15	70
Protection		Protected against dust and water		

Ultra-Microbalances 0.0001mg

Model		MSA2.7S	MSA2.7S-F
Readability	mg	0,0001	0,0001
Weighing capacity	g	2.1	2.1
Tare range (subtractive)	g	-2.1	-2.1
Repeatability	≤±mg	0.00025	0.00025
Linearity	≤±mg	0.0009	0.0009
Corner load (test load [g]) ¹⁾	µg	0.5 (1 g)	0.5 (1 g)
Min. initial weight	mg	1	-
Sensitivity drift between zw. +10...+30°C	±ppm/K	1	1
Typical stabilization time	s	≤ 7	
Typical measurement time	s	≤ 10	
External standard calibration value (min. accuracy class)	g	2 (E2)	2 (E2)
Display result (depending on the set filter level)		0.1 – 0.4	0.1 – 0.4
Weighing pan size Ø	mm	20	50/20 ¹⁾
Weighing chamber height	mm	70	15
Protection		Protected against dust and water	

¹⁾ = Standard pan

* = Typical min. initial weighing according to USP (United States Pharmacopeia), USP31-NF26

Model-specific Data

Semi-microbalances 0.01 mg

Model		MSA225S	MSA225P	MSA125P
Readability	mg	0.01	0.01/0.02/0.05	0.01/0.1
Weighing capacity	g	220	60/120/220	60/120
Tare range (subtractive)	g	– 220	– 220	– 120
Repeatability	≤±mg	0 to 6 g: 0.015 60 to 220g: 0.025	0 to 6 g: 0.015 60 to 220g: 0.04	0 to 6 g: 0.015 60 to 120g: 0.06
Linearity	≤±mg	0.1	0.15	0.15
Corner load (test load [g])	mg	0.15 (100)	0.2 (100)	0.15 (50)
Min. initial weight*	mg	20	20	20
Sensitivity drift between +10 to +30°C	±ppm/K	1	1	1
Typical stabilization time	s	≤ 2	≤ 2	≤ 2
Typical measurement time	s	≤ 6	≤ 6	≤ 6
External standard calibration value (min. accuracy class)	g	200 (E2)	200 (E2)	100 (E2)
Display result (depending on the set filter level)		0.2 – 0.4		
Weighing pan size (W × D)	mm	85 × 85		
Weighing chamber height (draft shield DU)	mm	261		
Protection		Protected against dust and water		

* = Typical min. initial weighing according to USP (United States Pharmacopeia), USP31-NF26

Analytical balances 0.1 mg

Model		MSA524S	MSA524P	MSA324S	MSA224S	MSA324P	MSA124S
Readability	mg	0.1	0.1/0.2/0.5	0.1	0.1	0.1/0.2/0.5	0.1
Weighing capacity	g	520	120/240/520	320	220	80/160/320	120
Tare range (subtractive)	g	– 520	– 520	– 320	– 220	– 320	– 120
Repeatability	<±mg	0.1	0.15/0.2/0.4	0.1	0.07	0.1/0.2/0.4	0.1
Linearity	<±mg	0.4	0.5	0.3	0.2	0.5	0.2
Corner load (test load [g])	mg	0.3 (200)	0.4 (200)	0.3 (200)	0.2 (100)	0.4 (200)	0.2 (50)
Min. initial weight*	mg	120	120	120	120	120	120
Sensitivity drift between +10 to +30°C	±ppm/K	1	1	1	1	1	1
Typical stabilization time	s	< 1	< 1	< 1	< 1	< 1	< 1
Typical measurement time	s	< 3	< 3	< 3	< 3	< 3	< 3
External standard calibration value (min. accuracy class)	g	500	500	200+100 (E2)	200 (E2)	200+100 (E2)	100 (E2)
Display result (depending on the set filter level)		0.1 – 0.4					
Weighing pan size (W × D)	mm	85 × 85					
Weighing chamber height (draft shield DU)	mm	261					
Protection		Protected against dust and water					

* = Position according to OIML R76

Model-specific Data

Precision balances

Models		MSA5203S	MSA5203P	MSA3203S	MSA3203P
Readability	mg	1	1/2/5	1	1/10
Weighing capacity	g	5200	1200/2400/5200	3200	1010/3200
Tare range (subtractive)	g	- 5200	- 5200	- 3200	- 3200
Repeatability	≤±mg	1	1	1	1/6
Linearity	≤±mg	5	5	5	5
Corner load (test load [g])	mg	2 (2000)	2 (2000)	2 (1000)	2 (1000)
Min. initial weight*	g	1.5	1.5	1.5	1.5
Sensitivity drift between +10 to +30°C	±ppm/K	1	1	1	1
Typical stabilization time	s	≤ 1	≤ 1	≤ 1	≤ 1
Typical measurement time	s	≤ 2	≤ 2	≤ 2	≤ 1.5
External standard calibration value (min. accuracy class)	g	5000	5000	2000	2000 (E2)
Display result (depending on the set filter level)		0.1 – 0.4			
Weighing pan size (W × D)	mm	140 × 140			
Weighing chamber height (draft shield DE)	mm	172			
Protection		Protected against dust and water			

* = Position according to OIML R76

Models		MSA2203S	MSA2203P	MSA1203S
Readability	mg	1	1/10	1
Weighing capacity	g	2200	1010/2200	1200
Tare range (subtractive)	g	- 2200	- 2200	- 1200
Repeatability	≤±mg	1	1/6	0.7
Linearity	≤±mg	3	5	2
Corner load (test load [g])	mg	2 (1000)	3 (1000)	2 (500)
Min. initial weight*	g	1.5	1.5	1.5
Sensitivity drift between +10 to +30°C	±ppm/K	1	1	1.5
Typical stabilization time	s	≤ 1	≤ 1	≤ 1
Typical measurement time	s	≤ 1.5	≤ 1.5	≤ 1.5
External standard calibration value (min. accuracy class)	g	2000 (E2)	1000 (E2)	1000 (E2)
Display result (depending on the set filter level)		0.1 – 0.4		
Weighing pan size (W × D)	mm	140 × 140		
Weighing chamber height (draft shield DE)	mm	172		
Protection		Protected against dust and water		

* = Position according to OIML R76

Model-specific Data

Precision balances

Models		MSA623S	MSA623P	MSA323S
Readability	mg	1	1/2/5	1
Weighing capacity	g	620	150/300/620	320
Tare range (subtractive)	g	– 620	– 620	– 320
Repeatability	≤±mg	0.7	1/2/4	0.7
Linearity	≤±mg	2	5	2
Corner load (test load [g])	mg	2 (200)	4 (200)	2 (200)
Min. initial weight*	g	1.5	1.5	1.5
Sensitivity drift between +10 to +30°C	±ppm/K	2	2	2
Typical stabilization time	s	≤ 0.8	≤ 0.8	≤ 0.8
Typical measurement time	s	≤ 1	≤ 1	≤ 1
External standard calibration value (min. accuracy class)	g	500 (E2)	500 (F1)	200 (E2)
Display result (depending on the set filter level)		0.1 – 0.4		
Weighing pan size (W × D)	mm	140 × 140		
Weighing chamber height (draft shield DE)	mm	172		
Protection		Protected against dust and water		

* = Position according to OIML R76

Models		MSA14202S	MSA14202P	MSA10202S	MSA8202S
Readability	mg	10	10/20/50	10	10
Weighing capacity	g	14,200	3,500/7,000/14,200	10,200	8,200
Tare range (subtractive)	g	–14,200	–14,200	–10,200	–8,200
Repeatability	<±mg	10	10/20/40	7	7
Linearity	<±mg	30	50	20	20
Corner load (test load [g])	mg	20 (5,000)	40 (5,000)	20 (5,000)	20 (5,000)
Min. initial weight*	g	15	15	12	12
Sensitivity drift between +10 to +30°C	±ppm/K	1.5	1.5	2	2
Typical stabilization time	s	≤ 1	≤ 1	≤ 1	≤ 1
Typical measurement time	s	≤ 1.5	≤ 1.5	≤ 1.5	≤ 1.5
External standard calibration value (min. accuracy class)	kg	10 (E2)	10 (E2)	10 (E2)	5 (E2)
Display result (depending on the set filter level)		0.1 – 0.4			
Weighing chamber height (draft shield DE)	mm	206 + 206			
Protection		Protected against dust and water			

* = Position according to OIML R76

Model-specific Data

Precision balances

Models		MSA6202S	MSA6202P	MSA5202S	MSA4202S
Readability	mg	10	10/20/50	10	10
Weighing capacity	g	6,200	1,500/3,000/ 6,200	5,200	4,200
Tare range (subtractive)	g	– 6,200	– 6,200	– 5,200	– 4,200
Repeatability	<±mg	7	7/20/40	6	7
Linearity	<±mg	20	50	10	20
Corner load (test load [g])	mg	20 (2,000)	50 (2,000)	10 (2,000)	30 (2,000)
Min. initial weight*	g	12	12	10	12
Sensitivity drift between +10 to +30°C	±ppm/K	2	2	2	2
Typical stabilization time	s	≤ 1	≤ 1	≤ 0.8	≤ 0.8
Typical measurement time	s	≤ 1.5	≤ 1.5	≤ 1	≤ 1
External standard calibration value kg 5 (E2) 5 (F1) 5 2 (E2)					
(min. accuracy class)					
Display result					
(depending on the set filter level) 0.1 – 0.4					
Weighing pan size (W + D) mm 206 + 206 206 + 206 140 + 140 206 + 206					
Protection		Protected against dust and water			

* = Position according to OIML R76

Models		MSA2202S	MSA1202S	MSA70201S	MSA36201S	MSA36201P
Readability	mg	10	10	100	100	100/1000
Weighing capacity	g	2200	1200	70,200	36,200	10,200/36,200
Tare range (subtractive)	g	– 2200	– 1200	– 70,200	– 36,200	– 36,200
Repeatability	<±mg	7	7	70	70	70/500
Linearity	<±mg	20	20	500	200	200
Corner load (test load [g])	mg	20 (1000)	20 (500)	500 (20,000)	300 (10,000)	300 (10,000)
Min. initial weight*	g	12	12	120	120	120
Sensitivity drift between +10 and +30°C	±ppm/K	2	2	3	2	2
Typical stabilization time	s	≤ 0,8	≤ 0,8	≤ 1	≤ 1	≤ 1
Typical measurement time	s	≤ 1	≤ 1	≤ 1,5	≤ 1,5	≤ 1,5
External standard calibration value		kg 2 (F1)	1 (F1)	50 (F1)	20 (F1)	20 (F1)
(min. accuracy class)						
Display result						
(depending on the set filter level)		0,1 – 0,4				
Weighing pan size (W + D)	mm	206 × 206	206 × 206	400 × 300	400 × 300	400 × 300
IP protection		IP54				

* = Position according to OIML R76

Model-specific Data

Precision balances

Models		MSA20201S	MSA12201S	MSA8201S	MSA5201S
Readability	mg	100	100	100	100
Weighing capacity	g	20,200	12,200	8200	5200
Tare range (subtractive)	g	- 20,200	- 12,200	- 8200	- 5200
Reproducibility	≤±mg	70	50	50	50
Linearity	≤±mg	200	100	100	100
Corner load (test load [g])	mg	300 (5000)	200 (5000)	200 (5000)	200 (2000)
Min. initial weight*	g	120	100	100	100
Sensitivity drift between +10 and +30°C	±ppm/K	2	4	4	4
Typical stabilization time	s	≤ 1	≤ 0,8	≤ 0,8	≤ 0,8
Typical measurement time	s	≤ 1,5	≤ 1	≤ 1	≤ 1
External standard calibration value (min. accuracy class)	kg	20 (F1)	10 (F1)	5 (F2)	5 (F2)
Display result (depending on the set filter level)		0.1 – 0.4			
Weighing pan size (W × D)	mm	206 × 206			
IP protection		IP54			

* = Position according to OIML R76

Models		MSA70200S	MSA36200S
Readability	mg	1000	1000
Weighing capacity	g	70,200	36,200
Tare range (subtractive)	g	- 70,200	- 36,200
Reproducibility	≤±mg	500	500
Linearity	≤±mg	1000	1,000
Corner load (test load [g])	mg	1000 (20,000)	1,000 (10,000)
Min. initial weight*	g	1000	1000
Sensitivity drift between +10 and +30°C	±ppm/K	3	2
Typical measurement time	s	≤ 0.8	≤ 0.8
Typische Messzeit	s	≤ 1	≤ 1
External standard calibration value (min. accuracy class)	kg	50 (F1)	20 (F1)
Display result (depending on the set filter level)		0.1 – 0.4	
Weighing pan size (W × D)	mm	400 × 300	
IP protection		IP54	

* = Position according to OIML R76

Model-specific Data

Verified Models with EC Type Approval Certificate: Micro- and ultramicrobalances

Model		MSA6.6S-OCE	MSA2.7S-OCE	MSA3.6P-OCE
Accuracy class*		(I)	(I)	(I)
For verified models: EC Type Approval Certificate D09-09-015, Type: MSX				
Scale interval d*	mg	0.001	0.0001	0.001/0.002/0.005
Weighing capacity max*	g	6.1	2.1	1.1/2.1/3.1
Calibration value e*	mg	1	1	1
Min. load min*	mg	0.1	0.01	0.1
Tare equalization range (subtractive)		≤ 100 % from max. weighing capacity		
Application range according to DIR*	g	0.001 – 6.1	0.001 – 2.1	0.001 – 3.1
Min. initial weight**	mg	2	1	4
Typical stabilization time	s	≤ 5	≤ 7	≤ 5
Typical measurement time	s	≤ 8	≤ 10	≤ 8
External standard calibration value (min. accuracy class)	g	5	2	3
Application range (temperature)		With “isoCAL” function: +5 to +40°C Without “isoCAL” function: +15 to +25°C		
Display result (depending on the set filter level)		By selection of 1 of 4 optimized filter levels		
Weighing pan size Ø	mm	30	20	30
Weighing chamber height (draft shield DM)	mm	70	70	70
Protection		Protected against dust and water		

* DIR = Directive 90/384/EEC on non-automatic weighing instruments used within the European Economic Area

** = Typical min. initial weighing according to USP (United States Pharmacopeia), USP31-NF26

Model-specific Data

Verified models with EC Type Approval Certificate: Semi-microbalances 0.01 mg

Model		MSA225S-OCE	MSA225P-OCE	MSA125P-OCE
Accuracy class*		(I)	(I)	(I)
For verified models: EC Type-Approval Certificate D09-09-015, Type: MSX				
Scale interval d*	mg	0.01	0.01/0.02/0.05	0.01/0.1
Weighing capacity max*	g	220	60/120/220	60/120
Calibration value e*	mg	1	1	1
Min. load min*	mg	1	1	1
Tare equalization range (subtractive)		≤ 100% from max. weighing capacity		
Application range according to DIR*	g	0.001 – 220	0.001 – 220	0.001 – 120
Min. initial weight**	mg	20	20	20
Typical stabilization time	s	≤ 2	≤ 2	≤ 2
Typical measurement time	s	≤ 6	≤ 6	≤ 6
External standard calibration value (min. accuracy class)	g	200 (E2)	200 (E2)	100 (E2)
Application range (temperature)		With “isoCAL” function: +5 to +40 °C Without “isoCAL” function: +15 to +25 °C		
Adaptation to ambient conditions		By selection of 1 of 4 optimized filter levels		
Display result (depending on the set filter level)		0.2 – 0.4		
Weighing pan size (W × D)	mm	85 × 85		
Weighing chamber height (draft shield DU)	mm	261		
Protection		Protected against dust and water		

Verified models with EC Type Approval Certificate: Analytical balances 0.1 mg

Model		MSA524S-OCE	MSA524P-OCE	MSA324S-OCE	MSA224S-OCE	MSA324P-OCE	MSA124S-OCE
Accuracy class*		(I)	(I)	(I)	(I)	(I)	(I)
For verified models: EC Type-Approval Certificate D09-09-015, Type: MSX							
Scale interval d*	mg	0.1	0.1/0.2/0.5	0.1	0.1	0.1/0.2/0.5	0,1
Weighing capacity max*	g	520	120/240/520	320	220	80/160/320	120
Calibration value e*	mg	1	1	1	1	1	1
Min. load min*	mg	10	10	10	10	10	10
Tare equalization range (subtractive)		≤ 100% from max. weighing capacity					
Application range according to DIR*	g	0.01–520	0.01–520	0.01–320	0.01–220	0.01–320	0.01–120
Min. initial weight**	mg	120	120	120	120	120	120
Typical stabilization time	s	≤ 1	≤ 1	≤ 1	≤ 1	≤ 1	≤ 1
Typical measurement time	s	≤ 3	≤ 3	≤ 3	≤ 3	≤ 3	≤ 3
External standard calibration value (min. accuracy class)	g	500 (E2)	500 (E2)	200+100 (E2)	200 (E2)	200 +100 (E2)	100 (E2)
Application range (temperature)		With “isoCAL” function: +5 to +40 °C Without “isoCAL” function: +15 to +25 °C					
Display result (depending on the set filter level)		0.1 – 0.4					
Weighing pan size (W × D)	mm	85 × 85					
Weighing chamber height (draft shield DU)	mm	261					
Protection		Protected against dust and water					

* DIR = Directive 90/384/EEC on non-automatic weighing instruments used within the European Economic Area

** = Typical min. initial weighing according to USP (United States Pharmacopeia), USP31-NF26

Model-specific Data

Verified models with EC Type Approval Certificate: Precision balances

Models		MSA5203S-OCE	MSA5203P-OCE	MSA3203S-OCE	MSA3203P-OCE
Accuracy class*		(I)	(I)	(I)	(I)
For verified models: EC Type-Approval Certificate D09-09-015, Type: MSX					
Scale interval d*	mg	1	1/2/5	1	1/10
Weighing capacity max*	g	5200	1200/2400/5200	3200	1010/3200
Calibration value e*	mg	10	10	10	10
Min. load min*	mg	100	100	100	100
Tare equalization range (subtractive)		≤ 100% from max. weighing capacity			
Application range according to DIR*	g	0.1 – 5200	0.1 – 5200	0.1 – 3200	0.1 – 3200
Min. initial weight**	g	1.5	1.5	1.5	1.5
Typical stabilization time	s	≤ 1	≤ 1	≤ 1	≤ 1
Typical measurement time	s	≤ 2	≤ 2	≤ 2	≤ 1.5
External standard calibration value (min. accuracy class)	g	5000 (E2)	5000 (E2)	2000 (E2)	2000 (E2)
Application range (temperature)		With “isoCAL” function: +5 ... +40 °C Without “isoCAL” function: +15 ... +25 °C			
Display result (depending on the set filter level)		0.1 – 0.4			
Weighing pan size (W × D)	mm	140 × 140			
Weighing chamber height (draft shield DE)	mm	172			
Protection		Protected against dust and water			

Models		MSA2203S-OCE	MSA2203P-OCE	MSA1203S-OCE
Accuracy class*		(I)	(I)	(I)
For verified models: EC Type-Approval Certificate D09-09-015, Type: MSX				
Scale interval d*	mg	1	1/10	1
Weighing capacity max*	g	2200	1010/2200	1200
Calibration value e*	mg	10	10	10
Min. load min*	mg	100	100	100
Tare equalization range (subtractive)		≤ 100% from max. weighing capacity		
Application range according to DIR*	g	0.1 – 2200	0.1 – 2200	0.1 – 1200
Min. initial weight**	g	1.5	1.5	1.5
Typical stabilization time	s	≤ 1	≤ 1	≤ 1
Typical measurement time	s	≤ 1.5	≤ 1.5	≤ 1.5
External standard calibration value (min. accuracy class)	g	2000 (E2)	1000 (E2)	1000 (E2)
Application range (temperature)		With “isoCAL” function: +5 ... +40 °C Without “isoCAL” function: +15 ... +25 °C		
Display result (depending on the set filter level)		0.1 – 0.4		
Weighing pan size (W × D)	mm	140 × 140		
Weighing chamber height (draft shield DE)	mm	172		
Protection		Protected against dust and water		

* DIR = Directive 90/384/EEC on non-automatic weighing instruments used within the European Economic Area

** = Typical min. initial weighing according to USP (United States Pharmacopeia), USP31-NF26

Model-specific Data

Verified models with EC Type Approval Certificate: Precision balances

Models		MSA623S-OCE	MSA623P-OCE	MSA323S-OCE
Accuracy class*		Ⓐ	Ⓐ	Ⓐ
For verified models: EG-Type-Approval Certificate D09-09-015, Type: MSX				
Scale interval d*	mg	1	1/2/5	1
Weighing capacity max*	g	620	150/300/620	320
Calibration value e*	mg	10	10	10
Min. load min*	mg	20	20	20
Tare equalization range (subtractive)		≤ 100% from max. weighing capacity		
Application range according to DIR*	g	0.02 – 620	0.02 – 620	0.02 – 320
Min. initial weight**	g	1.5	1.5	1.5
Typical stabilization time	s	≤ 0.8	≤ 0.8	≤ 0.8
Typical measurement time	s	≤ 1	≤ 1	≤ 1
Application range (temperature)		With “isoCAL” function: +5 to +40 °C Without “isoCAL” function: +10 to +30 °C		
Display result (depending on the set filter level)		0.1 – 0.4		
Weighing pan size (W × D)	mm	140 × 140		
Weighing chamber height (draft shield DE))	mm	172		
Protection		Protected against dust and water		

Models		MSA14202S-OCE	MSA14202P-OCE	MSA10202S-OCE	MSA8202S-OCE
Accuracy class*		Ⓐ	Ⓐ	Ⓐ	Ⓐ
For verified models: EC Type-Approval Certificate D09-09-015, Type: MSX					
Scale interval d*	g	0.01	0.01/0.02/0.05	0.01	0.01
Weighing capacity max*	g	14,200	3500/7000/14,200	10,200	8200
Calibration value e*	g	0.1	0.1	0.1	0.1
Min. load min*	g	1	1	1	0.5
Tare equalization range (subtractive)		≤ 100% from max. weighing capacity			
Application range according to DIR*	g	1 – 14,200	1 – 14,200	1 – 10,200	0.5 – 8200
Min. initial weight**	g	15	15	12	12
Typical stabilization time	s	≤ 1	≤ 1	≤ 1	≤ 1
Typical measurement time	s	≤ 1.5	≤ 1.5	≤ 1.5	≤ 1.5
Application range (temperature):					
With “isoCAL” function		+5 to +40 °C	+5 to +40 °C	+5 to +40 °C	+5 to +40 °C
Without “isoCAL” function		+15 to +25 °C	+15 to +25 °C	+15 to +25 °C	+10 to +30 °C
Display result (depending on the set filter level)		0.1 – 0.4			
Weighing pan size (W × D)	mm	206 × 206			
Protection		Protected against dust and water			

* DIR = Directive 90/384/EEC on non-automatic weighing instruments used within the European Economic Area

** = Typical min. initial weighing according to USP (United States Pharmacopeia), USP31-NF26

Model-specific Data

Verified models with EC Type Approval Certificate: Precision balances

Models		MSA6202S- OCE	MSA6202P- OCE	MSA5202S- OCE	MSA4202S- OCE
Accuracy class*		(II)	(II)	(II)	(II)
For verified models: EC Type-Approval Certificate D09-09-015, Type: MSX					
Scale interval d*	g	0.01	0.01/0.02/0.05	0.01	0.01
Weighing capacity max*	g	6200	1500/3000/6200	5200	4200
Calibration value e*	g	0.1	0.1	0.1	0.1
Min. load min*	g	0.5	0.5	0.5	0.5
Tare equalization range (subtractive)		≤ 100% from max. weighing capacity			
Application range according to DIR*	g	0.5 – 6200	0.5 – 6200	0.5 – 5200	0.5 – 4200
Min. initial weight**	g	12	12	10	12
Typical stabilization time	s	≤ 1	≤ 1	≤ 0.8	≤ 0.8
Typical measurement time	s	≤ 1.5	≤ 1.5	≤ 1	≤ 1
Application range (temperature):					
With “isoCAL” function		+5 to +40 °C	+5 to +40 °C		+5 to +40 °C
Without “isoCAL” function		+10 to +30 °C	+10 to +30 °C		+10 to +30 °C
Display result (depending on the set filter level)		0.1 – 0.4			
Weighing pan size (W × D)	mm	206 × 206	206 × 206	140 × 140	206 × 206
Protection		Protected against dust and water			

Models		MSA2202S- OCE	MSA1202S- OCE	MSA36201S- OCE	MSA36201P- OCE	MSA20201S- OCE
Accuracy class*		(II)	(II)	(II)	(II)	(II)
For verified models: EC Type-Approval Certificate D09-09-015, Type: MSX						
Scale interval d*	mg	10	10	100	100/1000	100
Weighing capacity max*	g	2200	1200	36,200	10,200 / 36,200	20,200
Calibration value e*	g	0.1	0.1	1	1	1
Min. load min*	g	0.5	0.5	5	5	5
Tare equalization range (subtractive)		≤ 100% from max. weighing capacity				
Application range according to DIR*	g	0.5 – 2200	0.5 – 1200	5 – 36,200	5 – 36,200	5 – 20,200
Min. initial weight**	g	12	12	120	120	120
Typical stabilization time	s	≤ 0.8	≤ 0.8	≤ 1.5	≤ 1.5	≤ 1.5
Typical measurement time	s	≤ 1	≤ 1	≤ 2	≤ 2	≤ 2
Application range (temperature)		With “isoCAL” function: +5 to +40 °C Without “isoCAL” function: +10 to +30 °C				
Display result (depending on the set filter level)		0.1 – 0.4				
Weighing pan size (W + D)	mm	206 × 206	206 × 206	400 × 300	400 × 300	400 × 300
IP protection		IP54				

* DIR = Directive 90/384/EEC on non-automatic weighing instruments used within the European Economic Area

** = Typical min. initial weighing according to USP (United States Pharmacopeia), USP31-NF26

Model-specific Data

Verified models with EC Type Approval Certificate: Precision balances

Models		MSA12201S- OCE	MSA8201S- OCE	MSA5201S- OCE	MSA70200S- OCE	MSA36200S- OCE
Accuracy class*		Ⓔ	Ⓔ	Ⓔ	Ⓔ	Ⓔ
For verified models: EC Type-Approval Certificate D09-09-015, Type: MSX						
Scale interval d*	mg	100	100	100	1000	1000
Weighing capacity max*	g	12,200	8200	5200	70,200	36,200
Calibration value e*	g	1	1	1	10	1
Min. load min*	g	5	5	5	50	50
Tare equalization range (subtractive)		≤ 100% from max. weighing capacity				
Application range according to DIR*	g	5 – 12,200	5 – 8200	5 – 5200	50 – 70,200	50 – 36,200
Min. initial weight**	g	100	100	100	1000	1000
Typical stabilization time	s	≤ 0.8	≤ 0.8	≤ 0.8	≤ 1	≤ 1
Typical measurement time	s	≤ 1	≤ 1	≤ 1	≤ 1.2	≤ 1.2
Application range (temperature)		With “isoCAL” function: +5 to +40°C Without “isoCAL” function: +10 to +30°C				
Display result (depending on the set filter level)		0,1 – 0,4				
Weighing pan size (W × D)	mm	206 × 206	206 × 206	400 × 300	400 × 300	400 × 300
IP protection		IP54				

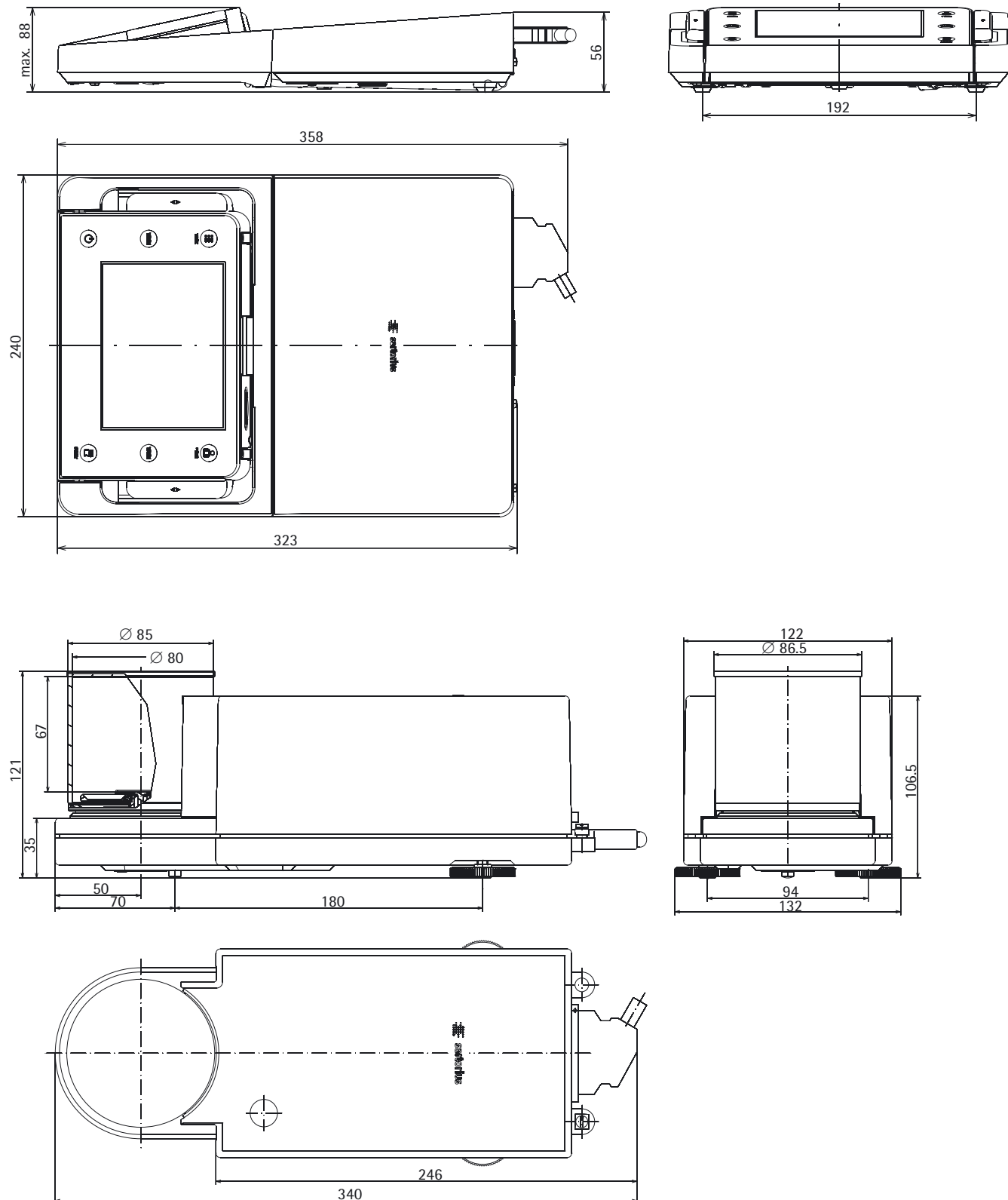
* DIR = Directive 90/384/EEC on non-automatic weighing instruments used within the European Economic Area

** = Typical min. initial weighing according to USP (United States Pharmacopeia), USP31-NF26

Balance Dimensions

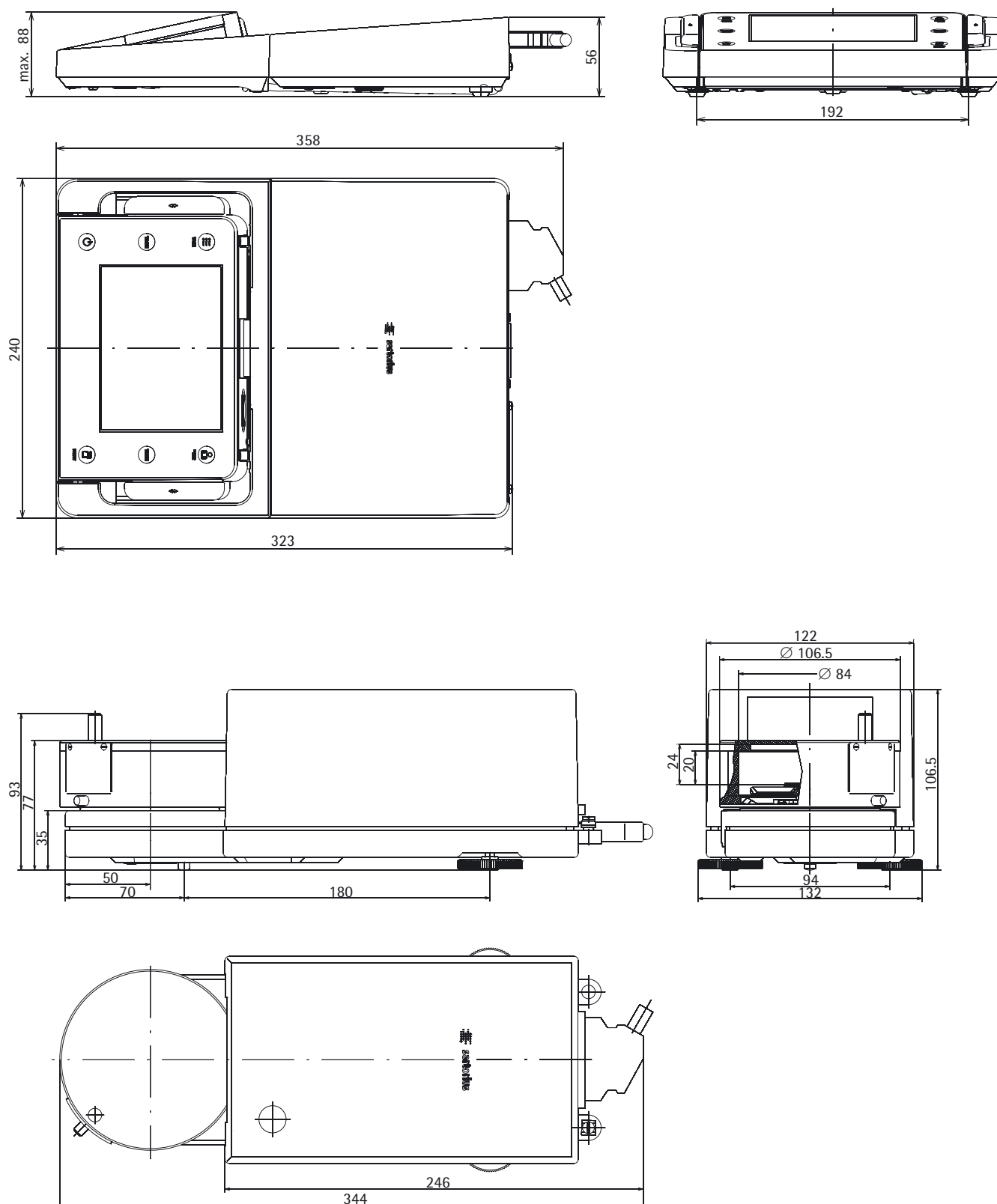
Microbalances

All dimensions are given in millimeters



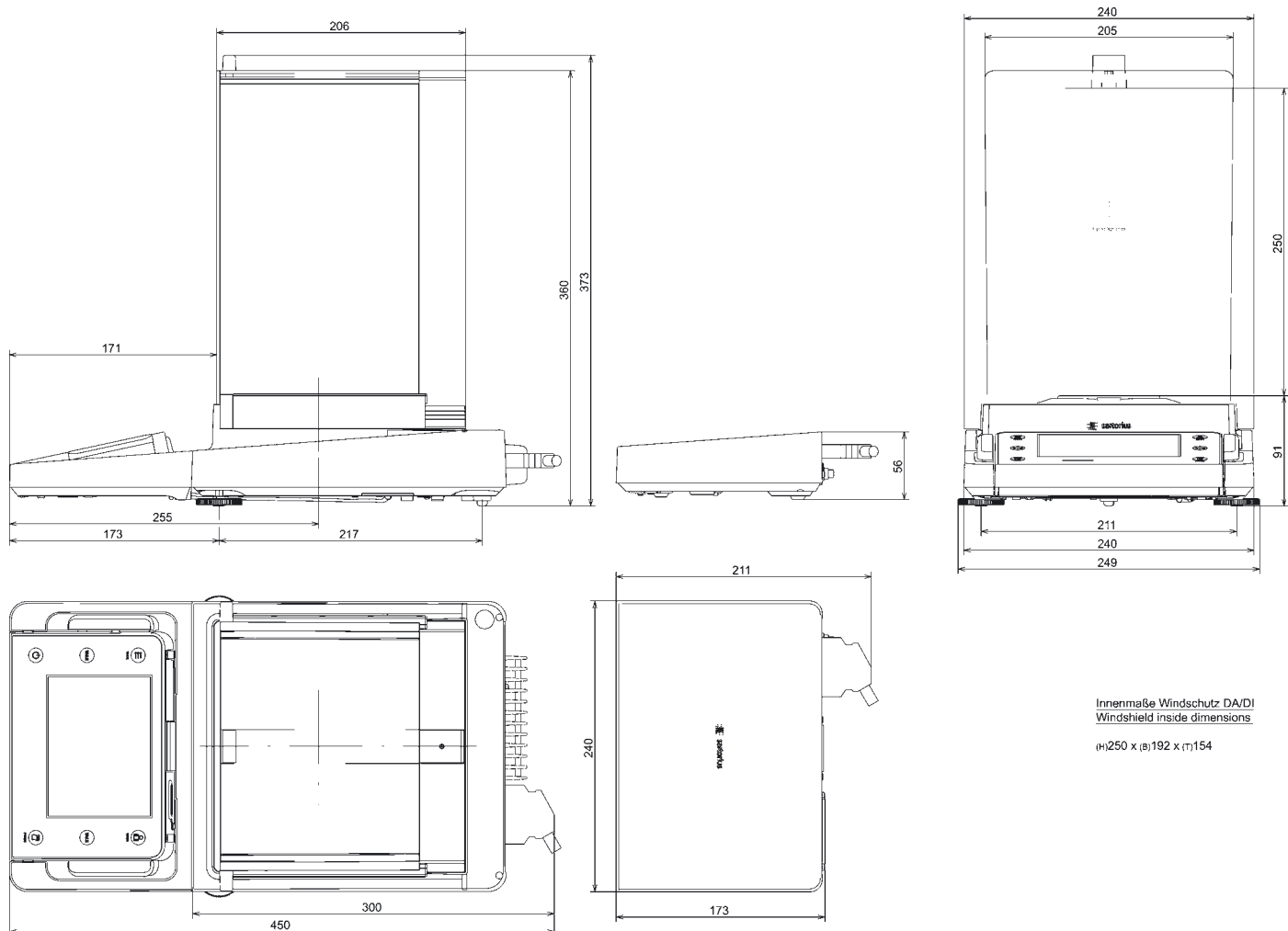
Filter-Microbalances

All dimensions are given in millimeters



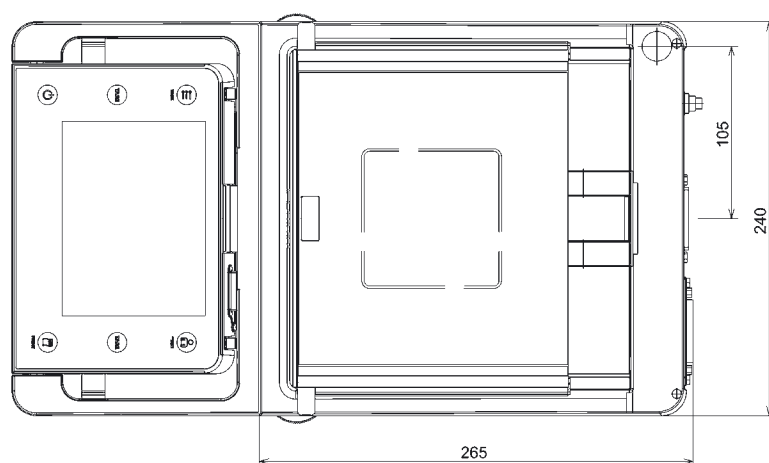
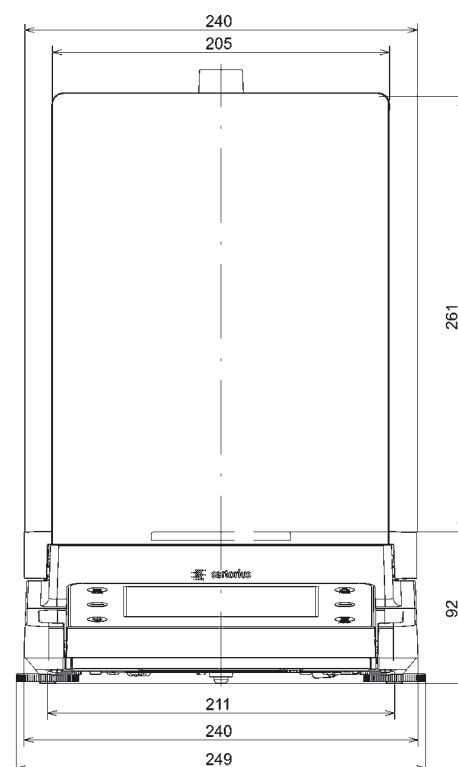
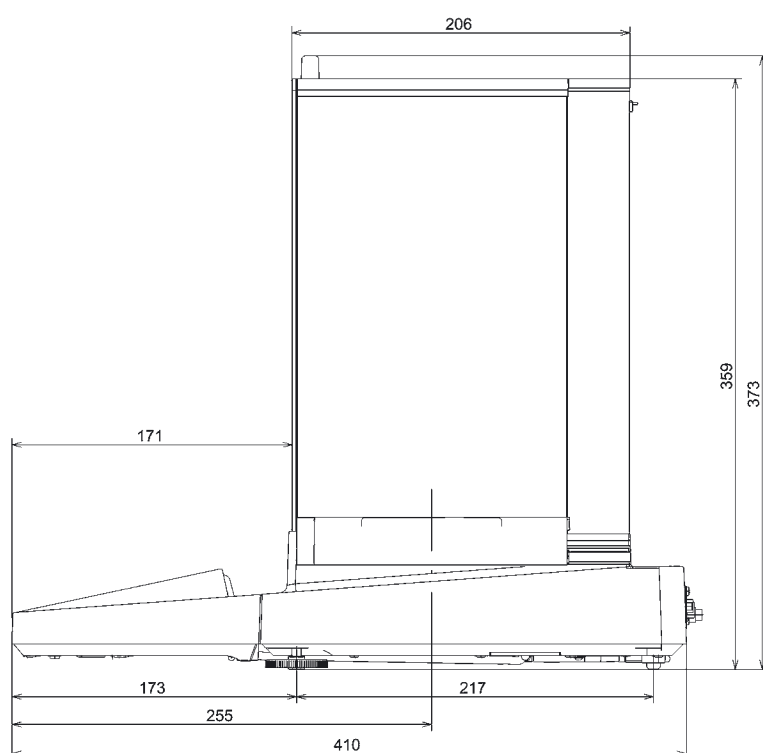
Semi-microbalances

All dimensions are given in millimeters



Analytical Balances with Manual DU Draft Shield

All dimensions are given in millimeters

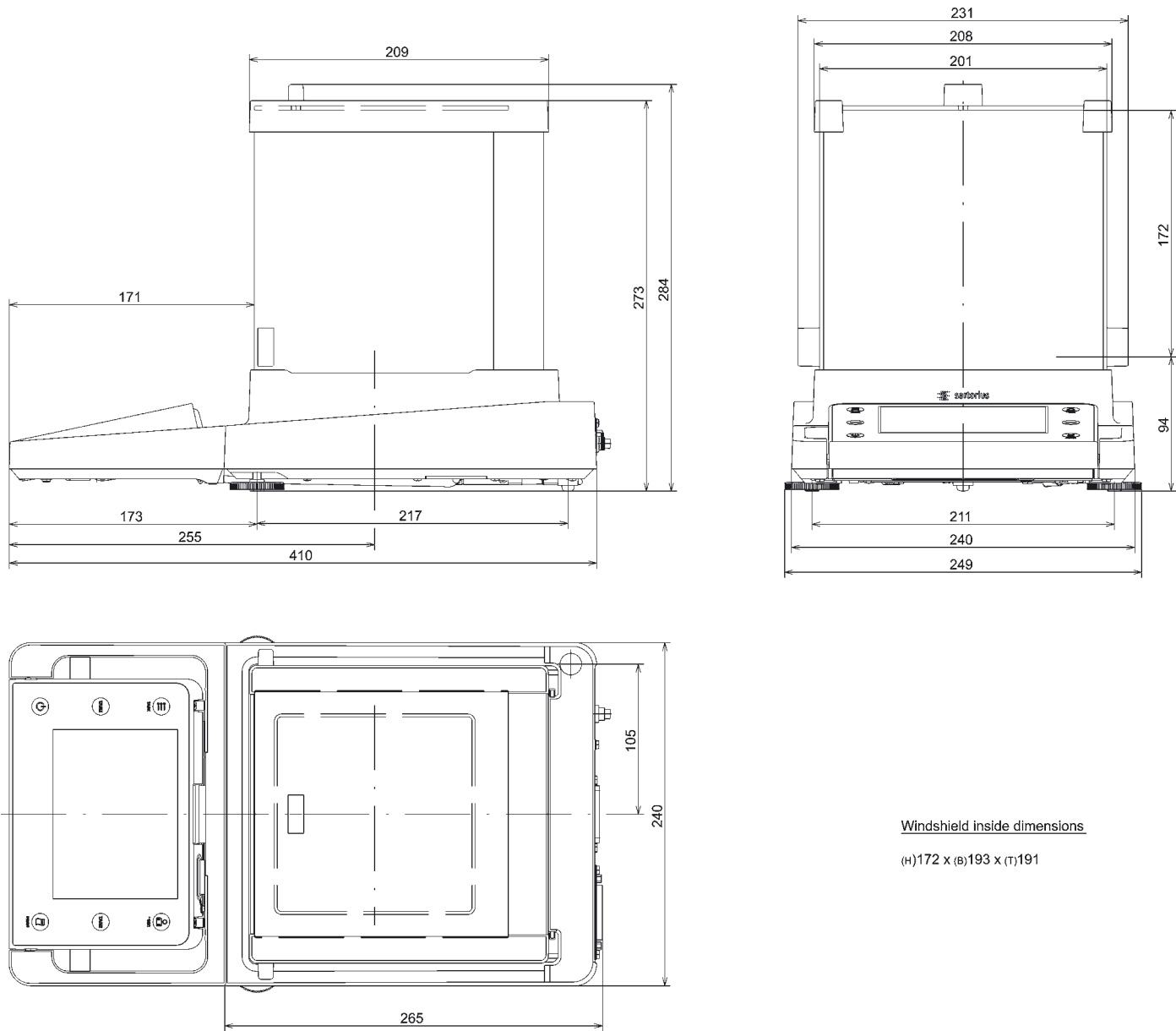


Windshield inside dimensions

(H)261 x (B)193 x (T)191

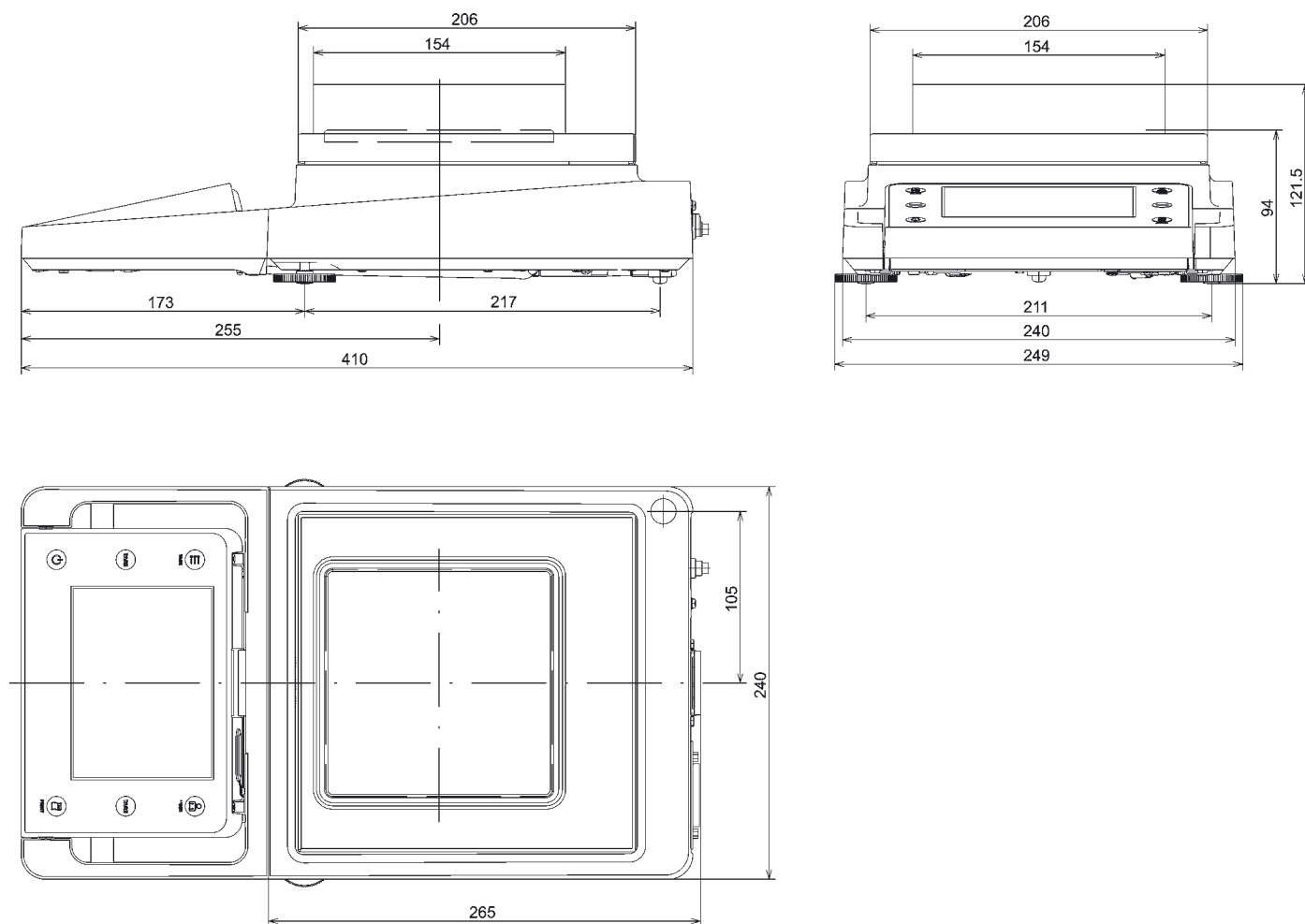
Precision Balances with a Readability of 1 mg and Manual DE Draft Shield

All dimensions are given in millimeters



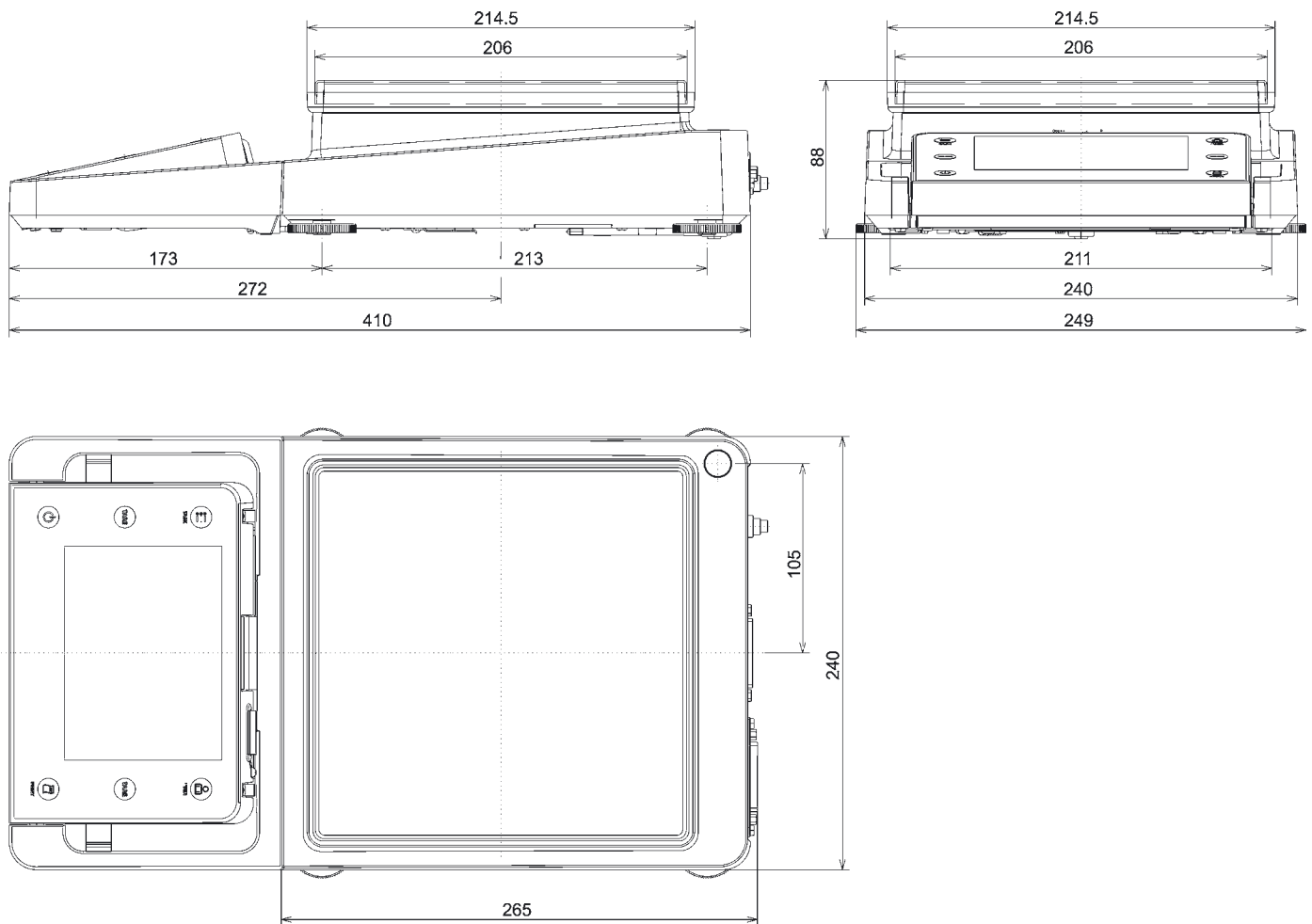
Precision Balances with a Readability of 1 mg and Framed DR Draft Shield

All dimensions are given in millimeters



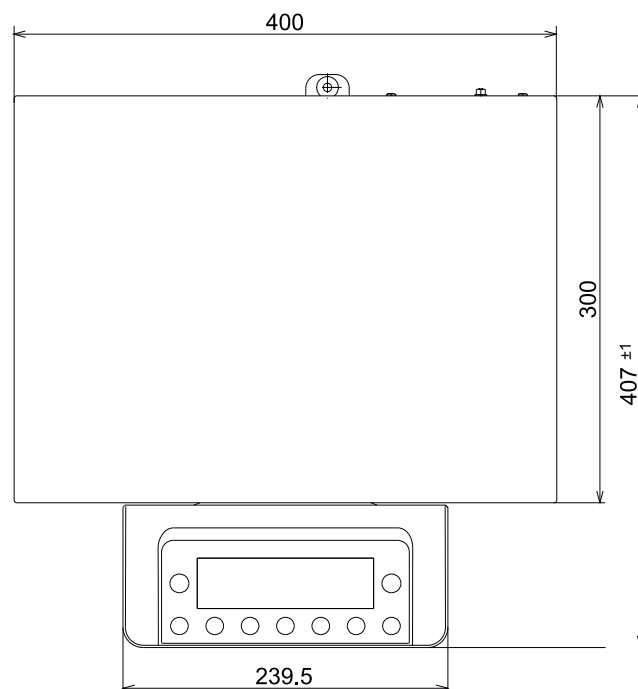
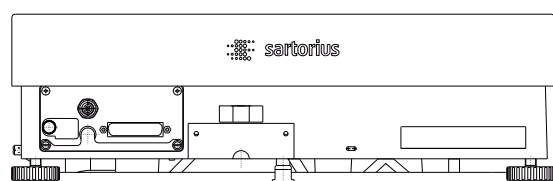
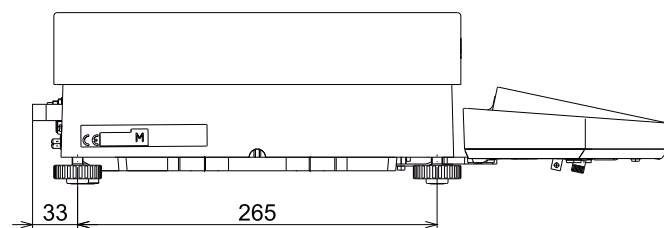
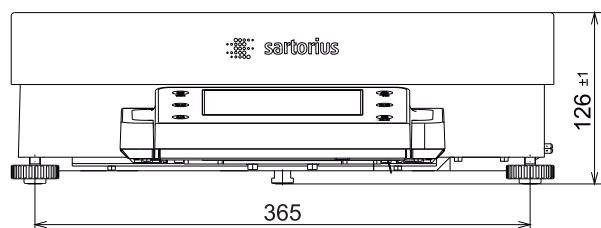
Precision Balances with no Draft Shield with a Weighing Range of up to 15 kg

All dimensions are given in millimeters



Precision Balances with no Draft Shield with a Weighing Range of 20 kg or More

All dimensions are given in millimeters



Accessories

Cubis® Optional Accessories

Printers and Communication

Verifiable data printer for connection to RS-232, 25-pin accessory interface	YDP10-OCE
Verifiable data printer with <i>Bluetooth</i> ® data transmission (with YD001MS-B or IB option only)	YDP10BT-OCE
Color ribbon for YDP10-OCE and YDP10BT-OCE	6906918
Paper rolls for printer YDP10-OCE; 5 rolls 50 m each	6906937
<i>Bluetooth</i> ® data interface for wireless connection of data printer YDP10BT	YD001MS-B
RS-232C data interface, 9-pin including PS/2 for connecting a PC, a barcode scanner or PC “QWERTY” keyboard	YD001MS-P
RS-232C data interface, 25-pin for connection of Cubis® accessories	YD001MS-R
Display cable 3 m for Cubis® MSA and MSU models, for separate setup of display and weighing unit (Installation by Sartorius Service or in factory [order VF4016])	YCC01-MSD3
Cable 3 m between weighing module and electronics module for Cubis® models with 0.01 mg 0.001 mg 0.0001 mg readability	YCC01-MSM3
Installation display cable 3 m for Cubis® models, for separate setup of display and weighing unit	VF4016
RS-232C connection cable to connect PC with 9-pin COM interface, length 1.5 m	7357314
SartoCollect software for data communication between balance and PC	YSC02
Sartorius OPC Server for connecting all Sartorius Cubis® balances Requires 32-bit Microsoft Windows 2000 or XP with current service packs. (free download of a 30-day trial version from the Sartorius website)	
– Initial license	62890PC
– Each additional license within an order	62890PC-L

Displays and Input | Output Elements

MSA control unit with color TFT graphic display and touch screen	YAC01MSA
MSE display unit with backlit LC display and tactile keys	YAC01MSE
MSU control unit with backlit b w graphic display and tactile navigation keys	YAC01MSU
Barcode reader with connection cable, 120 mm reading range	YBR03PS2
Foot switch for printing, taring, or using function keys, selection via menu, incl. T connector	YFS01
Infrared sensor for touch-free activation of functions (e.g., draft shield control)	YHS01MS
Hand switch for printing, taring, or using function keys, selection via menu, incl. T connector	YHS02
Foot switch for the draft shield OPEN CLOSED functions (only in combination with DA and DI draft shield), taring and printing	YPE01RC
Additional display, LCD, figure size 13 mm, backlit	YRD03Z
3-segment control display, red – green – red, for plus minus measurements, incl. T connector	YRD11Z

Pipette Calibration Hardware and Software

Pipette calibration kit (hardware) for models with 0.1 mg and 0.01 mg readability Consists of moisture trap and all required adapters	YCP04MS
Pipette calibration kit (hardware) for microbalance weighing modules 6.6S and 3.6P Consists of moisture trap and all required adapters	VF988
Pipette Tracker pipette calibration software. Software and user manual in English only.	YCP04-PT
Pipette Tracker Pro pipette calibration software, for use in regulated areas, networkable and validatable, according to the 21 CFR Part 11 regulations. Software and user manual in English only.	YCP04-PTPro
Documentation basis for validation (IQ, OQ) of Pipette Tracker PRO version. All documents are in English only.	YCP04-VTK

Filter Weighing and Antistatic Accessories

Antistatic weighing pan, diameter 130 mm, for weighing modules with a readability of 0.1 mg or 0.01 mg	YWP01MS
Filter weighing pan d 75 mm, for ultramicrobalance or microbalance models (weighing modules 6.6S, 2.7S; only together with DF draft shield)	VF2562
Filter weighing pan d 90 mm, for ultramicrobalance or microbalance models (weighing modules 6.6S, 2.7S; only together with DF draft shield)	VF2880
Ionization blower to eliminate electrostatic charges on sample containers and samples	YIB01-ODR
Stat-Pen ionization probe for discharging electrostatically charged samples and filters	YSTP01

Special Applications

Density determination kit for solids and liquids for weighing modules with a readability < 1 mg	YDK01MS
Density determination kit for solids and liquids for weighing modules with a readability of 1 mg	YDK02MS
Q-Grip, flexible holder for weigh-in containers and filters up to 120 mm diameter (replaces the original weighing pan, for Cubis® models with 0.01 and 0.1 mg readability)	YFH01MS
Q-Grid grid weighing pan for Cubis® models with a readability of 10 mg or 100 mg for weighing in laboratory hoods, safety weighing cabinets or workbenches (reduced wind attack surface of the weighing pan; replaces the standard weighing pan)	YWP03MS

Weighing Tables

Weighing table made from synthetic stone, with vibration dampening	YWT03
Wall console	YWT04
Weighing table made from wood with synthetic stone for precise, reliable measurements	YWT09

Weighing Accessories

Weighing scoop made from chrome nickel steel, 90 + 32 × 8 mm	641214
Aluminum weighing scoop, 4.5 mg (250 pieces) for ultramicrobalance and microbalance models	6565-250
Aluminum weighing scoop, 52 mg (50 pieces) for ultramicrobalance and microbalance models	6566-50
Support arm for 10/100 mg precision weighing modules for raising the control units MSE, MSU, MSA	YDH01MS
Support arm for precision weighing modules with 100 mg 1 g readability and weighing capacity ≥ 20 kg for raising control units MSE, MSU, MSA	YDH02MS
Hook for below-balance weighing for precision weighing modules with 100 mg 1 g readability and weighing capacity ≥ 20 kg (not for verified models, CE mark)	69EA0040

The brand name and logo for *Bluetooth*® wireless technology are the property of Bluetooth SIG Inc. The use of this brand name and trademark by Sartorius is under license. Other brand names and trademarks are the property of their respective owners.

Declarations of Conformity

Weighing instruments for use in legal metrology: Council Directive 2009/23/EC "Non-automatic Weighing Instruments"

This Directive regulates the determination of mass in legal metrology.

For the respective Declaration of 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 next page.

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

The legal basis for Sartorius to perform the EC verification is EC Directive No. 2009/23/EC for non-automatic weighing instruments. This Council Directive has been in effect since January 1, 1993 in the Internal Market. The further legal basis is founded on the Sartorius Quality Management System issued by the Metrology Department of the Regional -Administration Office of Lower Saxony, Germany ("Niedersächsisches Landesverwaltungsamt - Eichwesen") on February 15, 1993.

"Installation" Service in Germany

Our "Installation" service package provides a range of important services that guarantee your satisfaction with our work:

- Setup
- Operation
- Inspection
- Instruction

If the initial installation of the weighing instrument is to be carried out by Sartorius, please request this service from a customer service employee.

Re-verification in Germany

The validity of the verification ends when the next but one calendar year has elapsed. When the weighing instrument is used for the control of filling quantities according to the regulation on prepackaging, the verification ends when the next calendar year has elapsed. Re-verification should be requested in good time from the local Weights and Measures office. As appropriate, please observe all statutory amendments.

Subsequent Verifications within the European Countries

The expiration date of the verification depends on 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.

Further information concerning verification can be obtained from our customer service centers.



EG-/EU-Konformitätserklärung EC / EU Declaration of Conformity


sartorius

Hersteller
Manufacturer

Sartorius Lab Instruments GmbH & Co. KG
Weender Landstrasse 94 – 108, D-37075 Goettingen, Germany

erklärt in alleiniger Verantwortung, dass das Betriebsmittel
declares under own responsibility that the equipment

Geräteart
Device type

Elektronische Semimikro-, Mikro-, Präzisions- und Analysenwaage
Electronic Semi-micro, Micro, Precision and Analytical Balance

Baureihe
Type series

MSA....., MSE....., MSU.....

in der von uns in Verkehr gebrachten Ausführung mit den grundlegenden Anforderungen der folgenden Europäischen Richtlinien übereinstimmt und die anwendbaren Anforderungen der im Anhang aufgelisteten harmonisierten Europäischen Normen erfüllt:

in the form as delivered complies with the essential requirements of the following European Directives and meets the applicable requirements of the harmonized European Standards listed in the Annex:

2004/108/EG
2004/108/EC

Elektromagnetische Verträglichkeit
Electromagnetic compatibility

2006/95/EG
2006/95/EC

Elektrische Betriebsmittel zur Verwendung innerhalb bestimmter Spannungsgrenzen
Electrical equipment designed for use within certain voltage limits

2011/65/EU
2011/65/EU

Beschränkung der Verwendung bestimmter gefährlicher Stoffe in Elektro- und Elektronikgeräten (RoHS)
Restriction of the use of certain hazardous substances in electrical and electronic equipment (RoHS)

Nur für Geräte mit Bluetooth® – Datenausgang Typ YBT03 | *Only for devices with Bluetooth® data output interface type YBT03:*

1999/5/EG

Funkanlagen und Telekommunikationsendeinrichtungen und die gegenseitige Anerkennung ihrer Konformität

1999/5/EC

Radio equipment and telecommunications terminal equipment and the mutual recognition of their conformity

Jahreszahl der CE-Kennzeichenvergabe | *Year of the CE mark assignment:* 13

Sartorius Lab Instruments GmbH & Co. KG
Goettingen, 2013-09-17

i.v. P. B. / 14

Dr. Reinhard Baumfalk
Vice President R&D

i.v. / K. A.

Dr. Dieter Klausgrete
Head of International Certification Management

Diese Erklärung bescheinigt die Übereinstimmung mit den genannten EG- und EU-Richtlinien, ist jedoch keine Zusicherung von Eigenschaften. Bei einer mit uns nicht abgestimmten Änderung des Produktes verliert diese Erklärung ihre Gültigkeit. Die Sicherheitshinweise der zugehörigen Produktdokumentation sind zu beachten.

This declaration certifies conformity with the above mentioned EC and EU Directives, but does not guarantee product attributes. Unauthorised product modifications make this declaration invalid. The safety information in the associated product documentation must be observed.

SLI13CE002-00.de,en

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34785-000-58

OP-1.113-fo2



EG-/EU-Konformitätserklärung EC / EU Declaration of Conformity

Anhang / Annex

Liste der angewendeten harmonisierten Europäischen Normen
List of the applied harmonized European Standards

Richtlinie 2004/108/EG | Directive 2004/108/EC

EN 61326-1:2006

Elektrische Mess-, Steuer-, Regel- und Laborgeräte - EMV- Anforderungen - Teil 1: Allgemeine Anforderungen

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

Richtlinie 2006/95/EG | Directive 2006/95/EC

EN 61010-1:2010

Sicherheitsbestimmungen für elektrische Mess-, Steuer-, Regel- und Laborgeräte - Teil 1: Allgemeine Anforderungen

Safety requirements for electrical equipment for measurement, control, and laboratory use - Part 1: General requirements

Richtlinie 2011/65/EU | Directive 2011/65/EU

EN 50581:2012

Technische Dokumentation zur Beurteilung von Elektro- und Elektronikgeräten hinsichtlich der Beschränkung gefährlicher Stoffe

Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances

Richtlinie 1999/5/EG | Directive 1999/5/EC

EN 301489-1 V1.9.1:2011

Elektromagnetische Verträglichkeit und Funkspektrumangelegenheiten (ERM) – Elektromagnetische Verträglichkeit (EMV) für Funkeinrichtungen und -dienste – Teil 1: Gemeinsame technische Anforderungen

Electromagnetic compatibility and Radio spectrum Matters (ERM) – ElectroMagnetic Compatibility (EMC) standard for radio equipment and services – Part 1: Common technical requirements

EN 301489-17 V1.3.2:2008

Elektromagnetische Verträglichkeit und Funkspektrumangelegenheiten (ERM) – Elektromagnetische Verträglichkeit für Funkeinrichtungen und -dienste – Teil 17: Spezifische Bedingungen für Breitbandübertragungssysteme im 2,4 GHz Band, Einrichtungen in lokalen Hochleistungs-Funknetzen (RLAN) im 5 GHz Band und Breitband-Datenübertragungssysteme im 5,8 GHz Band

Electromagnetic compatibility and Radio spectrum Matters (ERM) – ElectroMagnetic Compatibility (EMC) standard for radio equipment – Part 17: Specific conditions for 2,4 GHz wideband transmission systems, 5 GHz high performance RLAN equipment and 5,8 GHz Broadband Data Transmitting Systems

EN 300328 V1.8.1:2012

Elektromagnetische Verträglichkeit und Funkspektrumangelegenheiten (ERM) – Breitband-Übertragungssysteme – Datenübertragungsgeräte, die im 2,4-GHz-ISM-Band arbeiten und Breitband-Modulationstechniken verwenden – Harmonisierte EN, die die wesentlichen Anforderungen nach Artikel 3.2 der R&TTE-Richtlinie enthält

Electromagnetic compatibility and Radio spectrum Matters (ERM) – Wideband transmission systems – Data transmission equipment operating in the 2,4 GHz ISM band and using wide band modulation techniques – Harmonized EN covering the essential requirements of article 3.2 of the R&TTE Directive

• • • • •



EG-Konformitätserklärung - 2009/23/EG
 EC Declaration of Conformity - 2009/23/EC
 Declaración de Conformidad CE - 2009/23/CE
 Déclaration de conformité CE - 2009/23/CE
 Dichiarazione di conformità CE - 2009/23/CE

Sartorius Lab Instruments GmbH & Co. KG, Weender Landstrasse 94 - 108, D-37075 Goettingen, Germany
 erklärt in alleiniger Verantwortung, dass die elektromechanischen nichtselbsttätigen Waagen
 declares under its own responsibility that the electromechanical non-automatic weighing instruments
 declara, bajo su propia responsabilidad, que los instrumentos de pesaje electromecánicos de funcionamiento no automático
 déclare en engageant sa propre responsabilité que les instruments de pesage électromécaniques à fonctionnement non automatique
 dichiara sotto la propria responsabilità che gli strumenti per pesare a funzionamento non automatico elettromeccanici

Modell Model Modelo Modèle Modello	Bauart Type Tipo de construcción N° de série Numero di serie	Genauigkeitsklasse Accuracy class Clase de precisión Classe de précision Classe di precisione	EG-Bauartzulassung EC type-approval certificate Certificado de aprobación CE de modelo Certificat d'approbation CE de type Certificato di omologazione CE del tipo
MS...-CE	MSX	I	D09-09-015
GBB...-CE	MSX	I	D09-09-015
MS...-CE	MSX	II	D09-09-015
Typ Wägemodul / Type of weighing module / Tipo de módulo de pesaje / Type du module de pesage / Tipo di modulo de pesatura: SA EA, SB EA, SC EA, SD EE, SE EA, SF EA, SB EB, SC EB, SC EC, SG EE, SH EE, SI EF, SJ EF Typ Anzeige und Bedienterminal / Type of indicating and operator terminal / Tipo de unidad de indicación y manejo / Type de l'unité d'affichage et de commande / Tipo dell'unità del display e di controllo: YAC01MSA, YAC01MSE, YAC01MSU			

in der von uns in Verkehr gebrachten Ausführung mit den grundlegenden Anforderungen der folgenden Europäischen Richtlinie übereinstimmen
 und die anwendbaren Anforderungen folgender harmonisierter Europäischer Norm einhalten:

in the design we have placed on the market comply with the basic requirements of the following European Directive and meet the applicable
 requirements of the harmonized European Standard listed below:

en el diseño que hemos puesto en el mercado cumplen con los requisitos básicos de la Directiva Europea siguiente y satisfacen las prescripciones
 aplicables de la siguiente Norma Europea armonizada:

basés sur la conception du produit que nous avons mis sur le marché sont conformes aux exigences fondamentales de la directive européenne
 suivante et répondent aux exigences applicables de la norme harmonisée européenne énumérée ci-dessous:

sulla base della progettazione del prodotto che abbiamo immesso sul mercato sono conformi ai requisiti essenziali della seguente direttiva
 europea e soddisfanno le prescrizioni applicabili della norma europea armonizzata elencata di seguito:

Richtlinie 2009/23/EG Nichtselbsttätige Waagen
 Directive 2009/23/EC Non-automatic weighing instruments
 Directiva 2009/23/CE Instrumentos de pesaje de funcionamiento no automático
 Directive 2009/23/CE Instruments de pesage à fonctionnement non automatique
 Direttiva 2009/23/CE Strumenti per pesare a funzionamento non automatico

EN 45 501:1992 Metrologische Aspekte Nichtselbsttätiger Waagen
 Metrological aspects of non-automatic weighing instruments
 Aspectos metroológicos de los instrumentos de pesar de funcionamiento no automático
 Aspects métrologiques des instruments de pesage à fonctionnement non automatique
 Aspetti metrologici di strumenti per pesare a funzionamento non automatico

Fundstelle der Richtlinie und Norm: Server der EU / Source of the directive and the standard: EU server / Fuente de la Directiva y Norma: servidor
 eur-lex.europa.eu / Source de la directive et de la norme: serveur UE / Origine della direttiva e la norma: server UE: eur-lex.europa.eu

Diese Konformitätserklärung gilt nur für die Richtlinie 2009/23/EG wenn die folgenden Angaben auf dem Kennzeichnungsschild vorhanden sind:
 This Declaration of Conformity is valid for Directive 2009/23/EC only if the following inscriptions are present on the data ID plate:

Esta Declaración de Conformidad es válida para la Directiva 2009/23/CE sólo si las siguientes inscripciones figuran en la placa de características:
 Cette déclaration de conformité CE est valide pour la Directive 2009/23/CE uniquement si les inscriptions suivantes figurent sur la plaque de
 données:

Questa Dichiarazione di Conformità CE è valida per la direttiva 2009/23/CE solo se le iscrizioni sequenti sono presenti sulla targhetta di supporto:



Beispiel (Jahreszahl und Nummer der benannten Stelle können variieren)
 Example (date/year and number of the notified body may vary)
 Ejemplo (El año y el número de lugar mencionado pueden variar)
 Exemple (la date/l'année et le numéro de l'organisme notifié peuvent varier)
 Esempio (anno e numero del punto menzionato possono variare)

Die Hinweise der zugehörigen Produktdokumentation sind zu beachten / The information in the associated product documentation must be
 observed / Debe observarse la información contenida en la documentación asociada del producto / Les informations contenues dans la
 documentation associée du produit doivent être respectées / Le informazioni contenute nella documentazione associata al prodotto devono
 essere osservate.

Sartorius Lab Instruments GmbH & Co. KG
 Goettingen, 2013-09-16

Dr. Reinhard Baumfalk
 Vice President R&D

Jürgen Rehwald
 Head of the Production Department

Physikalisch-Technische Bundesanstalt

Braunschweig und Berlin



EG-Bauartzulassung

EC Type-approval Certificate

Zulassungsinhaber:
Issued to:

Sartorius Lab Instruments GmbH & Co. KG
Weender Landstr. 94-108
37075 Göttingen

Rechtsbezug:
In accordance with:

Richtlinie 2009/23/EG vom 23. April 2009 über nichtselbsttätige Waagen
(ABl. L 122 S. 6). Directive 2009/23/EC of 23 April 2009 on non-automatic
weighing instruments (OJ L 122 p. 6)

Bauart:
In respect of:

Nichtselbsttätige elektromechanische Präzisionswaage
Non-automatic electromechanical high accuracy weighing instrument

Typ:
Type:

MSX

Zulassungsnummer:
Approval No.:

D09-09-015 6. Revision

Gültig bis:
Valid until:

18.06.2019

Anzahl der Seiten:
Number of pages:

28

Geschäftszeichen:
Reference No.:

PTB-1.12-4063385

Benannte Stelle:
Notified Body:

0102

Zertifizierung:
Certification:

Braunschweig, 05.09.2013

Bewertung:
Evaluation:

Im Auftrag
On behalf of PTB

Siegel
Seal

Im Auftrag
On behalf of PTB

Dr. Oliver Mack



Dipl.-Ing. K. Schulz

RG-0023

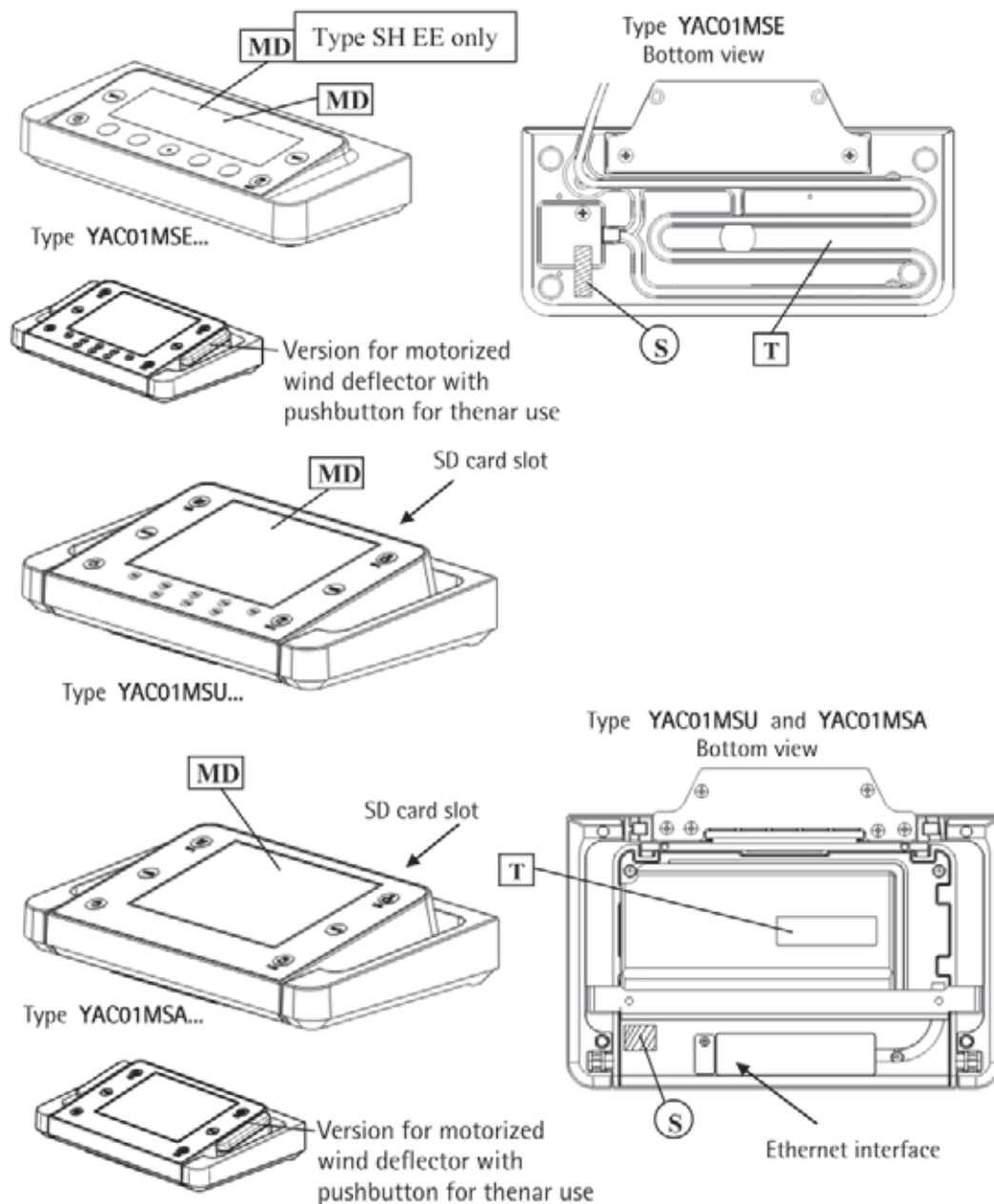
EG-Bauartzulassungen ohne Unterschrift und Siegel haben keine Gültigkeit. Diese EG-Bauartzulassung darf nur unverändert weiterverbreitet werden. Auszüge bedürfen der Genehmigung der Physikalisch-Technischen Bundesanstalt.

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Die Hauptmerkmale, Zulassungsbedingungen und Auflagen sind in der Anlage enthalten, die Bestandteil der EG-Bauartzulassung ist. The principal characteristics, the approval conditions and the special conditions, if any, are set out in the Annex which forms an integral part of the EC Type-approval Certificate.

Plates and Markings

Indicating and operator terminals



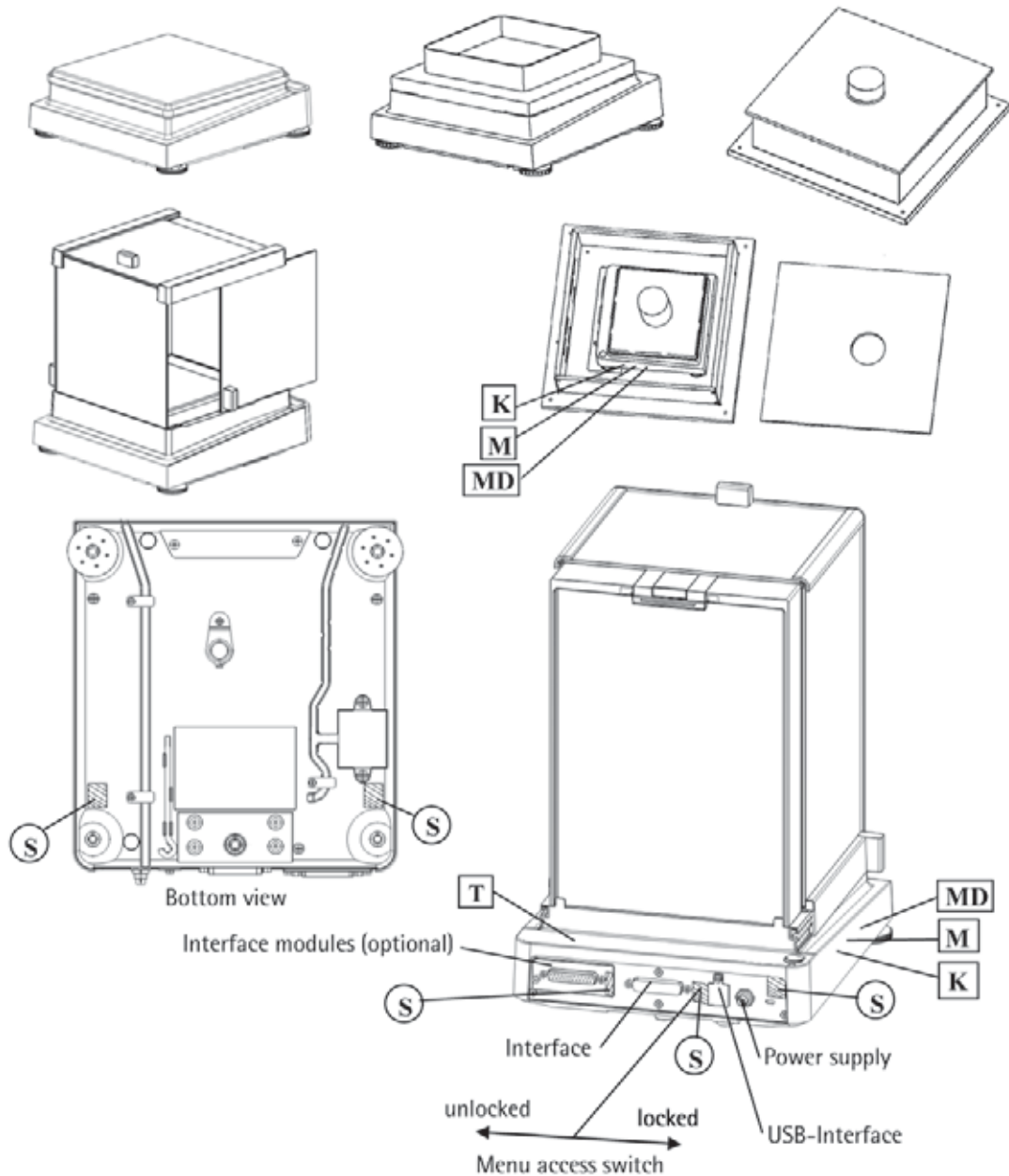
- T** Plate with model designation (terminal)
- S** Protective mark (self-adhesive mark or seal)
- MD** Metrological data Max, Min, e and if existent d of the active weighing range

PPCU110913e

Type weighing instrument: MSX
EC type-approval certificate: D09-09-015

Weighing modules

SA EA, SB EA, SB EB, SC EA, SC EB, SC EC, SE EA, SF EA



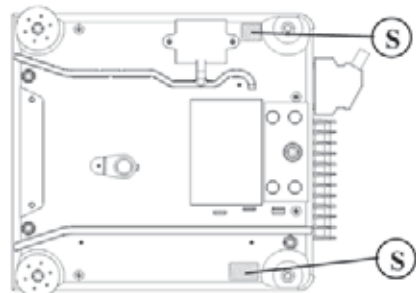
- K** Descriptive plate with CE-sign
- M** Mark for EC verification (green metrology sticker)
- S** Protective mark (self-adhesive mark or seal)
- MD** Metrological data Max, Min, e and if existent d
- T** Plate with model designation (weighing module)

PPCU110913e

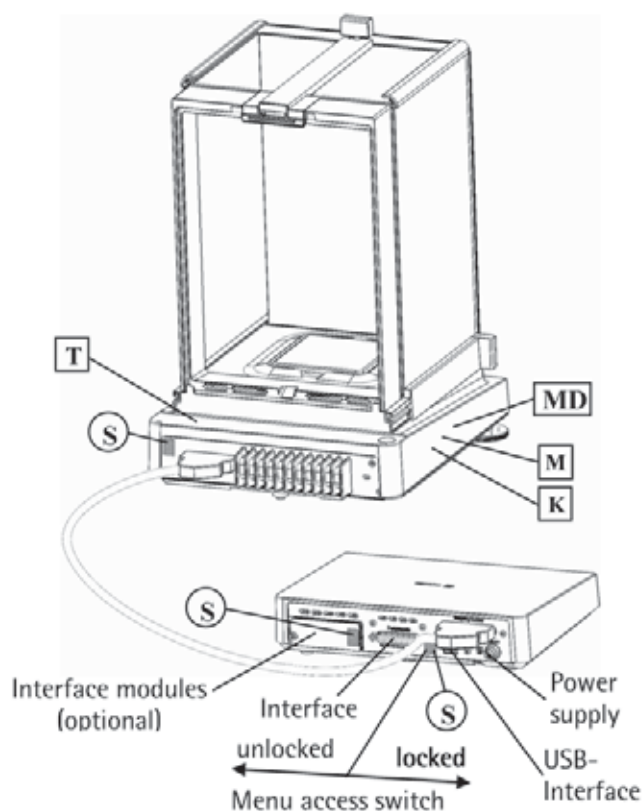
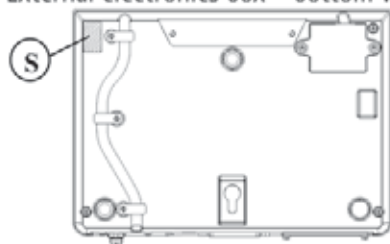
Type weighing instrument: MSX
 EC type-approval certificate: D09-09-015

Weighing modules SD EE

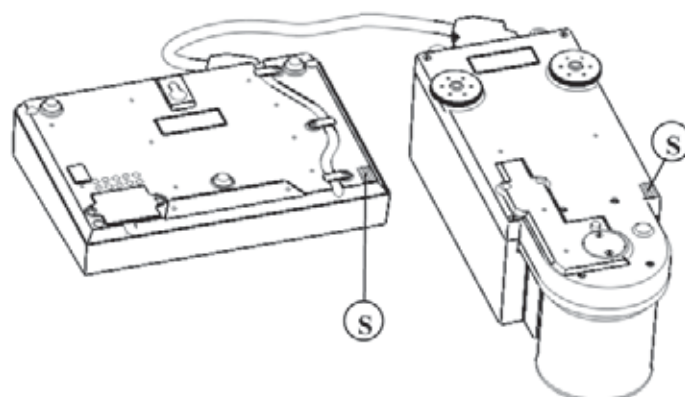
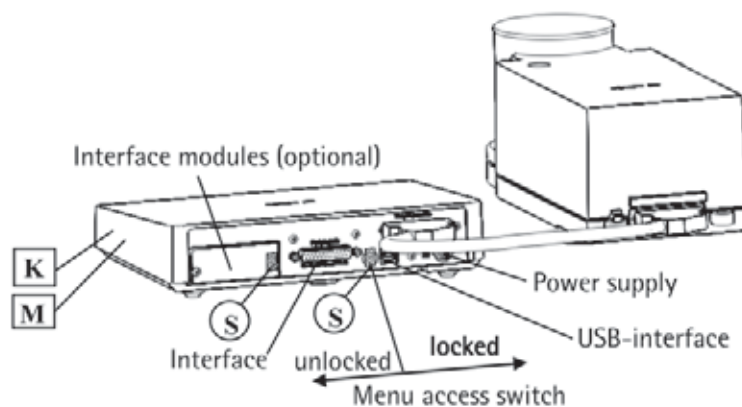
Load receptor – bottom view



External electronics box – bottom view



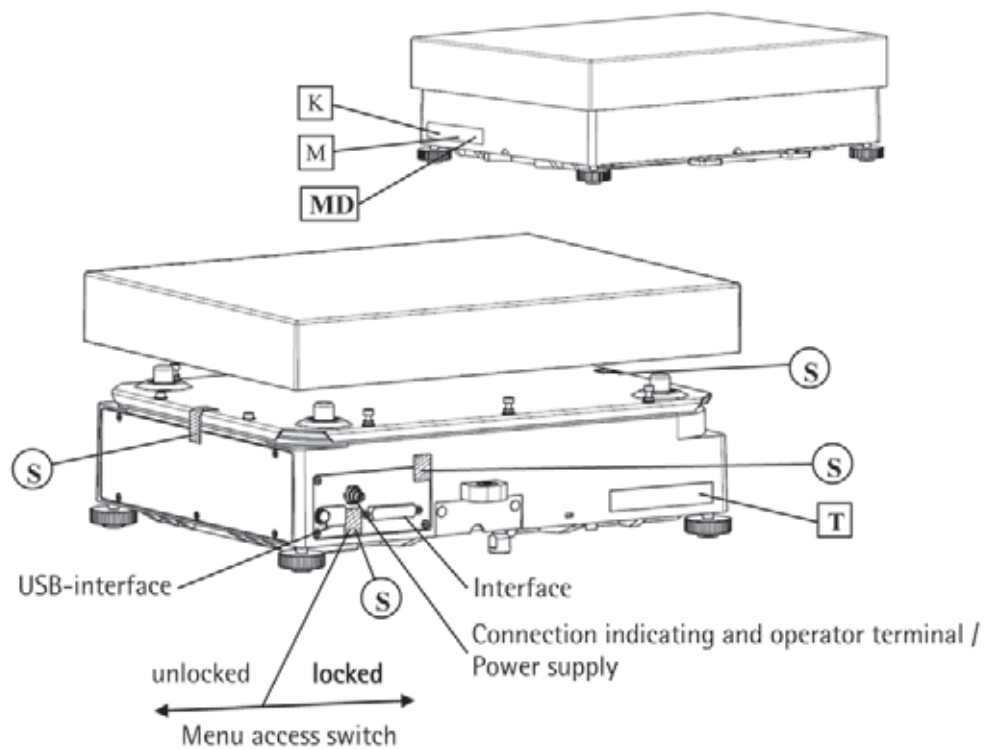
Weighing modules SG EE, SH EE



PPCU110913e

Type weighing instrument: MSX
EC type-approval certificate: D09-09-015

Weighing modules SI EF, SJ EF



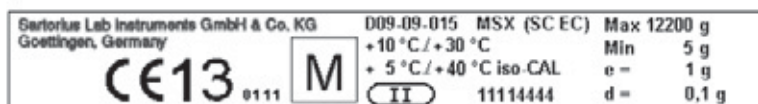
- K** Descriptive plate with CE-sign
- M** Mark for EC verification (green metrology sticker)
- S** Protective mark (self-adhesive mark or seal)
- MD** Metrological data Max, Min, e and if existent d
- T** Plate with model designation (weighing module)

Type MSX

Indicating and operator terminals: YAC01MSE, YAC01MSA, YAC01MSU

Weighing modules: SA EA, SB EA, SB EB, SC EA, SC EB, SC EC, SD EE, SG EE, SH EE, SI EF, SJ EF

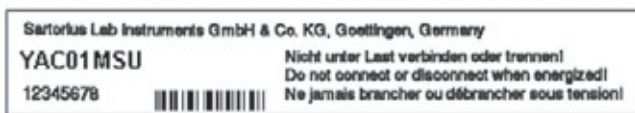
Example of descriptive plate on a weighing instrument already verified K



Example of plate with model designation (weighing module) T



Example of plate with model designation (terminal) T



Sartorius Lab Instruments GmbH & Co. KG
Weender Landstrasse 94–108
37075 Goettingen, Germany

Phone +49.551.308.0
Fax +49.551.308.3289
www.sartorius.com

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