



**sartorius**  
mechatronics

## Complete Catalog Laboratory Mechatronics



turning science **into solutions**





## A Profile of Sartorius

The Sartorius Group is a leading international laboratory and process technology provider covering the segments of biotechnology and mechatronics. In 2008, the technology group earned sales revenue of 611.6 million euros. Founded in 1870, the Goettingen-based company currently employs approximately 4,600 persons. The major areas of activity in its biotechnology segment focus on filtration, fluid management, fermentation, purification and laboratory applications. In the mechatronics segment, the company primarily manufactures equipment and systems featuring weighing, measurement and automation technology for laboratory and industrial applications.

Key Sartorius customers are from the pharmaceutical, chemical and food and beverage industries and from numerous research and educational institutes of the public sector. Sartorius has its own production facilities in Europe, Asia and America as well as sales subsidiaries and local commercial agencies in more than 110 countries.



D692211 001

pH/ATC electrode  
pH 0...14 / -5...80°C / 3M KCl

TEMPERATURE COMPENSATION  
pH 0...14 / -5...80°C / 3M KCl

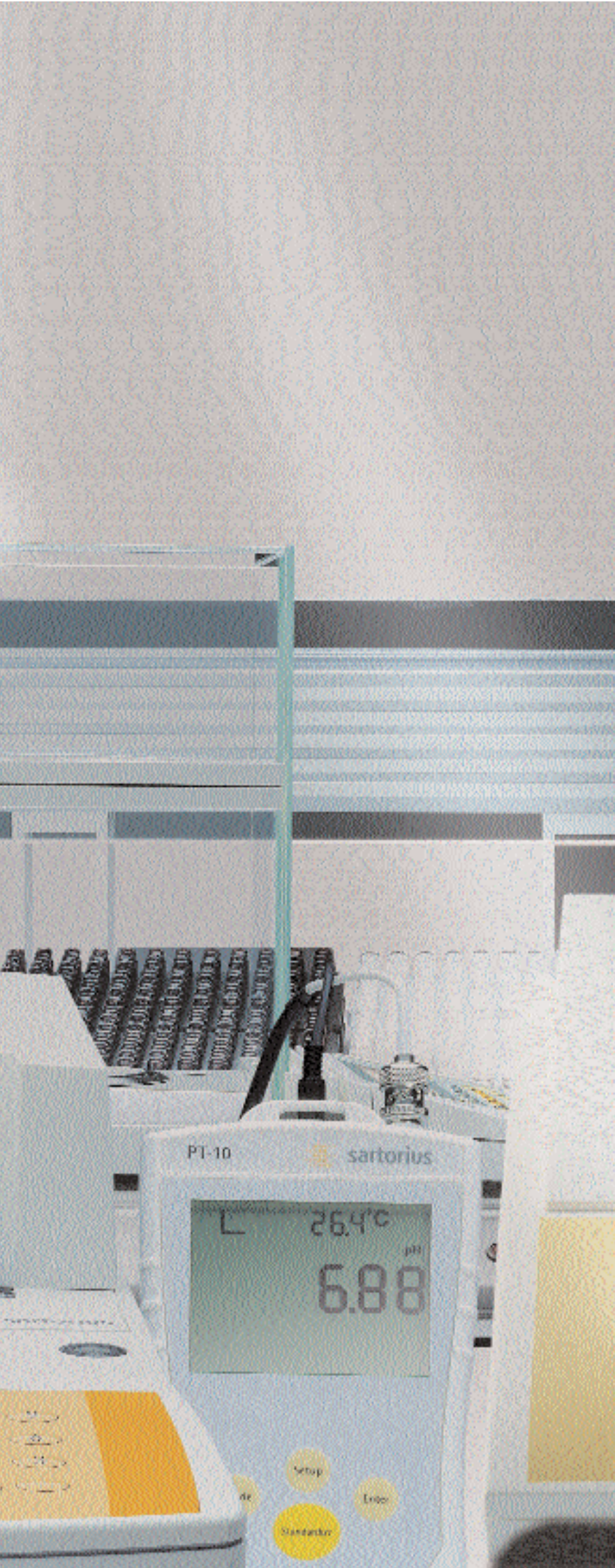


CAUTION HIGH  
TEMPERATURE

125.7xL

7 8 9  
4 5 6  
1 2 3  
0





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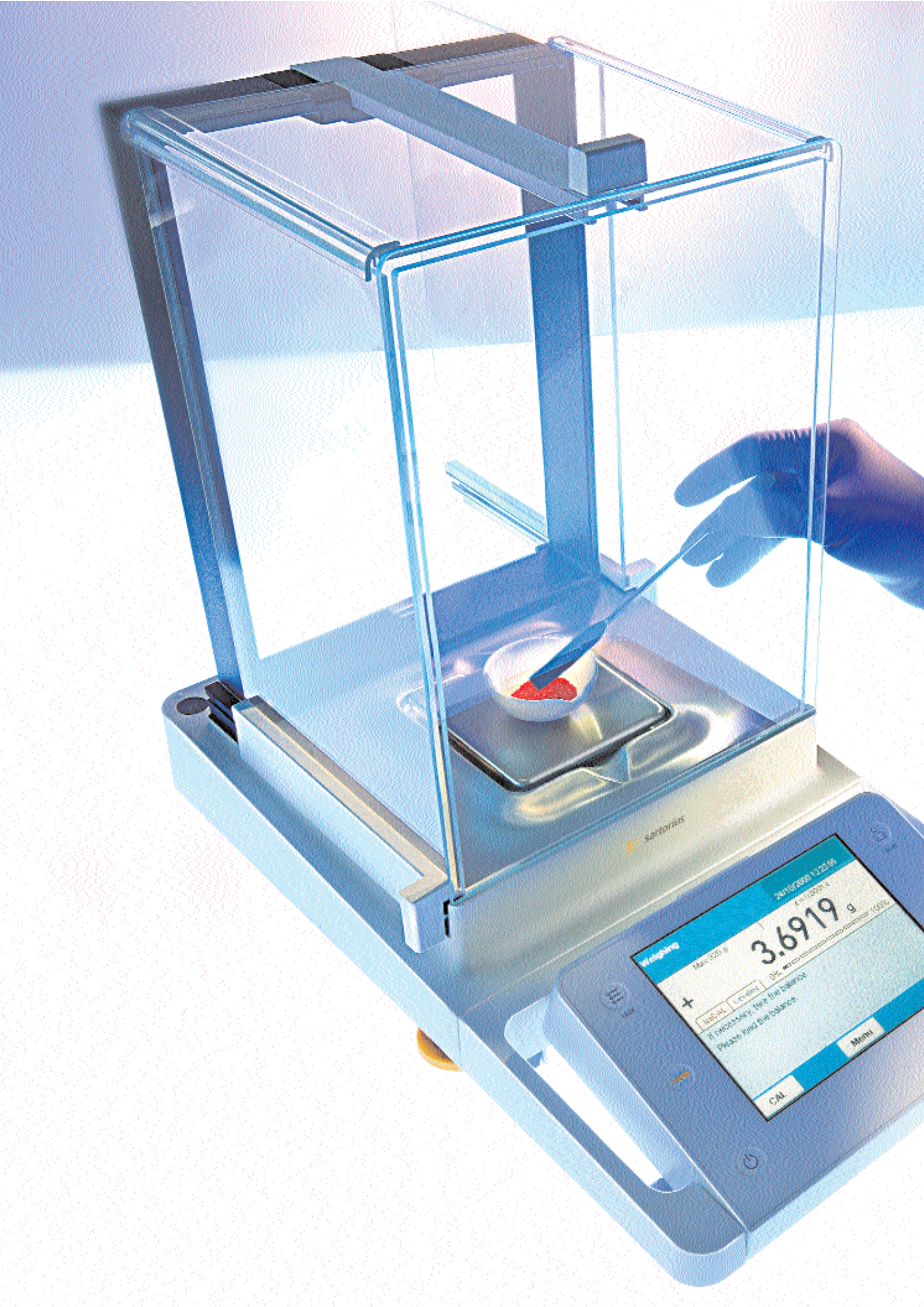
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Sartorius

weighing  
Max 220 g  
241612888 122516  
6 m 10000 g  
3.6919 g  
100%  
+  
-  
TARE  
CAL  
Menu  
If necessary, tare the balance  
Please find the balance



## Weighing Technology for Laboratories



## Cubis®. The New Benchmark



Cubis is the first completely modular laboratory balance series. It is freely configurable and adaptable to different fields of application. Every Cubis is an uncompromising implementation of an individual requirement profile. The Cubis meets our stringent criteria for advanced pharma compliance and is ideally suited to quality management systems in the regulated areas of the pharmaceutical industry.



The modular Cubis system consists of display units and service units, weighing modules and draft shields. Interface modules and a complete range of accessories permit further individual adaptations. Cubis – the most sophisticated way to concentrate on what's necessary.



### **The operating concept Q-Guide – reference for fast and trouble-free navigation**

Tasks and individual work processes can be set up in a quick and trouble-free way with the new operating concept Q-Guide. Thus the software and user interface of the Cubis always present the user with only that part of the complete set of options that this user requires to perform his application. If the user has defined a task, he is guided directly and interactively through the settings; irrelevant information is grayed out.



With a total of three service units, the Cubis meets the demand of different operating philosophies and covers the entire range of laboratory applications. From simple weighing to administration of complex work processes using defined tasks and user | password management.

### **MSE – weighing pure and simple**

Large, high-contrast LCD display, easily understood menu guide with short descriptions, and clearly arranged, precisely actuated keys.

### **MSU – Classic and universal**

High-resolution, generously dimensioned, monochrome graphical display and precisely actuated keys with a clear action point. For users who wish to combine classical operation via keys with the broadest possible range of services.

### **MSA – The ultimate solution**

Technology and information design of the elite class. Touchscreen with high-resolution color TFT for brilliant reproduction of text and graphics. Outstanding ease of use and display quality, especially for complex applications requiring frequent text entry.

### **Technological innovations position the Cubis far ahead of the current standards in the premium segment**

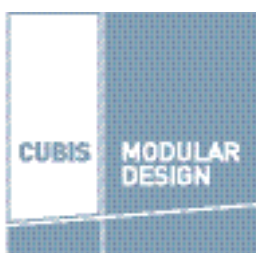
The quality, reliability and precision of Sartorius balances are legendary and require no detailed commentary. But the Cubis also offers: New benchmarks for measurement accuracy, response time and repeatability.

### **The first top-loading laboratory balance with accuracy to five decimal places**

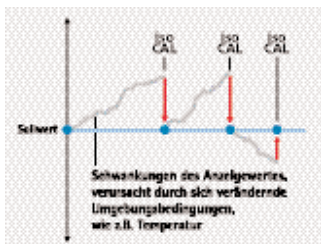
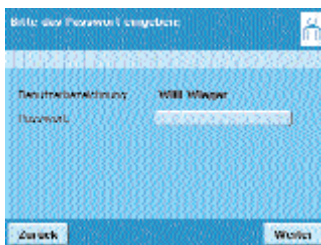
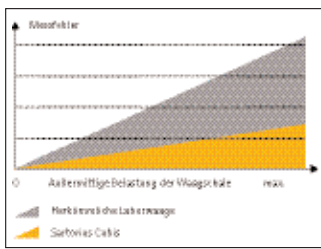
The Cubis is the first mass-produced, top-loading semimicrobalance with full resolution up to 220 g. This design results in an approx. 25% lower space requirement compared to conventional laboratory balances with the same resolution. The combination of a compact construction, 0.01 mg resolution and a weighing range up to 220 g is only possible with the Sartorius monolithic weighing system, which is a world first.

### **The first laboratory balance with Q-Pan off-center load compensation**

The Cubis is the first laboratory balance to compensate for off-center loading of the weighing pan. Q-Pan simultaneously offers the user two advantages: A significant reduction in the off-center load error and consequently the use of larger weighing pans.







### The first balance with automatic Q-Level leveling

Q-Level combines a newly developed sensor system with the latest display technology, thus making leveling of the scale easier, faster and more reliable.

Q-Level optionally permits automatic self-actuated leveling at the touch of a button or interactively guided leveling. The display provides all the necessary information: The position of the air bubble and the indication of which leveling foot should be turned in which direction (standard in the display and service units MSA and MSU; MSE with warning message only).

### Cubis. The first top-loading analytical balance with a motorized draft shield

Even in draft shields, the Cubis is the new benchmark in the premium class: Smooth-running draft shield doors often offer inadequate stability; however, higher stability often makes disassembly more difficult and leads to restricted visibility. Not so with the Cubis. Despite their high mechanical stability, the draft shields of the Cubis run very smoothly thanks to their new materials. They permit excellent visibility of the entire weighing chamber and the sample and offer secure shielding against external impact factors.

Sartorius is the first manufacturer to combine the maximum ease of use of a motorized draft shield with the minimum space requirement of Cubis analytical balances and semimicrobalances.

Fast and easy working with learning capability and control via ergonomic palm-operable keys mean that the motorized DA draft shield can be adjusted to any work process. In addition to the motorized drive, the DI draft shield possesses an integrated ionizer which, at the touch of a button, eliminates the impact of electrostatic charges on samples or sample vessels.

For cleaning purposes, all doors of the draft shield can be disassembled in just a few steps.

### Advanced pharma compliance.

#### For the use of the Cubis in regulated areas

Both inspection equipment monitoring as a component of QM systems and the United States Pharmacopeia set very stringent requirements for supervisors and laboratory devices. The advanced pharma compliance of the Cubis offers more than the best possible prerequisites for compliance with general regulations. Advanced pharma compliance permits the seamless integration of the Cubis into processes and thus provides valuable support in implementing individually designed safety concepts, e.g. with

- easy, fast and thorough cleaning.  
Only high-grade materials with smooth, structure-free surfaces are used.
- Protection against manipulation with user | password management.
- Audit trail function – logs major changes to the device. In this way, errors can be tracked quickly.
- Integrated Alibi memory for traceable transfer to a PC of weighing data subject to calibration requirements.
- Maximum connectivity with Q-Com.  
Three fixed (USB, RS232C, Ethernet (not on the MSE)) and three optional interfaces make almost all forms of bidirectional communication possible.
- GLP-compliant, configurable printout.
- All data, such as the user's master data or tasks, can be transferred easily and safely from one Cubis to another using an SD card (not on the MSE).
- Fully automatic calibration | adjustment with isoCAL.
- Warning and reminder functions with configurable action hierarchy for leveling, minimum initial weights, calibration | adjustment.





Please use the adjacent fields to enter the selection made with the icon.



### Cubis display and service units

Select the display and service unit and enter it in the field marked with the icon.

Types	MSA	MSU	MSE
Operation	Touchscreen, keys for central basic functions	Keys	Keys
Display	High-resolution color TFT, 5.7" graphical display	High-resolution black-and-white, 5.7" graphical display	Black-and-white LCD display,
Adaptation of the service unit	Tiltable display, removable service unit	Tiltable display, removable service unit	removable service unit
Standard data interfaces	<ul style="list-style-type: none"> <li>– USB (integrated into weighing module)</li> <li>– RS232C accessory interface, 25-pin (integrated into weighing module)</li> <li>– Ethernet (integrated into display and service unit)</li> </ul>	<ul style="list-style-type: none"> <li>– USB (integrated into weighing module)</li> <li>– RS232C accessory interface, 25-pin (integrated into weighing module)</li> <li>– Ethernet (integrated into display and service unit)</li> </ul>	<ul style="list-style-type: none"> <li>– USB (integrated into weighing module)</li> <li>– RS232C accessory interface, 25-pin (integrated into weighing module)</li> </ul>
SD card reader	Integrated as standard into display and service unit	Integrated as standard into display and service unit	
Operation of the motorized draft shield (only for DA or DI draft shields)	Actuation via side keys or contactlessly via IR switch (optional), learning capability	Actuation via side keys or contactlessly via IR switch (optional), learning capability	Actuation via keys or contactlessly via IR switch (optional), learning capability
Applications	Unit conversion, SQmin function for minimum initial weight according to USP, isoCAL automatic calibration   adjustment function, individual identifiers, density determination, statistics, calculations, averaging, formulation, weighing in percent, time-controlled functions, totalizing, DKD measurement uncertainty, second tare memory, counting, checkweighing	Unit conversion, SQmin function for minimum initial weight according to USP, isoCAL automatic calibration   adjustment function, individual identifiers, density determination, statistics, calculations, averaging, formulation, weighing in percent, time-controlled functions, totalizing, DKD measurement uncertainty, second tare memory, counting, checkweighing	Unit conversion, SQmin function for minimum initial weight according to USP, isoCAL automatic calibration   adjustment function, density determination (buoyancy method only), calculations, averaging, net   total formulation, weighing in percent, counting



### Cubis leveling

Select the type of leveling and enter the identifier "0" or "1" in the field marked by the icon.

0

The Cubis shows the level indicator on the display and provides support for rapid leveling (as standard on the display and service units MSA and MSU; only a warning message in MSE).

1

Fully automatic, motorized Q-Level leveling at the touch of a button (available for all analytical balances and semimicrobalances with 0.1 mg or 0.01 mg readability and all precision balances with 1 mg readability).



### Test certificates and permits

Select a test certificate | permit and enter the identifier in the field marked with the icon.

00

Standard certificate of conformity to specifications

TR

Like 00, but with a detailed test protocol

CE

Calibrated in the factory with European calibration permit



### Optional interface modules

Depending on the balance, it may be possible to select an additional interface module.

IR

RS232 interface, 25-pin

IB

Bluetooth® interface

IP

RS232 interface, 9-pin, inc. PS/2 interface





### Cubis weighing modules

Enter the module identifier from the left, starting with the field marked with the icon.

	Readability [mg]	Weighing capacity [g]	Weighing pan (BxD) [mm]	Typical stabilization time [s]	Typical response time [s]	Repeatability [mg]	Linearity [mg]	Off-center load [mg]* (test load [g])	Minimum initial weight [g]**
<b>225S</b>	0.01	220	85 × 85	2	6	0...60 g: 0.015 60...220 g: 0.025	0.1	0.15 (100)	0.02
<b>225P</b>	0.01   0.02   0.05	60   120   220	85 × 85	2	6	0...60 g: 0.015 60...220 g: 0.04	0.15	0.2 (100)	0.02
<b>125P</b>	0.01   0.1	60   120	85 × 85	2	6	0...60 g: 0.015 60...120 g: 0.06	0.15	0.15 (50)	0.02

#### Analytical balances

0.1 mg

<b>324S</b>	0.1	320	85 × 85	1	3	0.1	0.3	0.3 (200)	0.12
<b>224S</b>	0.1	220	85 × 85	1	3	0.07	0.2	0.2 (100)	0.12
<b>324P</b>	0.1   0.2   0.5	80   160   320	85 × 85	1	3	0.1   0.2   0.4	0.5	0.4 (200)	0.12
<b>124S</b>	0.1	120	85 × 85	1	3	0.1	0.2	0.2 (50)	0.12

#### Precision balances

<b>3203P</b>	1   10	1,010   3,200	140 × 140	1	1.5	1   6	5	2 (1,000)	1.5
<b>2203S</b>	1	2,200	140 × 140	1	1.5	1	3	2 (1,000)	1.5
<b>2203P</b>	1   10	1,010   2,200	140 × 140	1	1.5	1   6	5	3 (1,000)	1.5
<b>1203S</b>	1	1,200	140 × 140	1	1.5	0.7	2	2 (500)	1.5
<b>623S</b>	1	620	140 × 140	0.8	1	0.7	2	2 (200)	1.5
<b>623P</b>	1   2   5	150   300   620	140 × 140	0.8	1	1   2   4	5	4 (200)	1.5
<b>323S</b>	1	320	140 × 140	0.8	1	0.7	2	2 (200)	1.5
<b>10202S</b>	10	10,200	206 × 206	1	1.5	7	20	20 (5,000)	12
<b>8202S</b>	10	8,200	206 × 206	1	1.5	7	20	20 (5,000)	12
<b>6202S</b>	10	6,200	206 × 206	1	1.5	7	20	20 (2,000)	12
<b>6202P</b>	10   20   50	1,500   3,000   6,200	206 × 206	1	1.5	7   20   40	50	50 (2,000)	12
<b>4202S</b>	10	4,200	206 × 206	0.8	1	7	20	30 (2,000)	12
<b>2202S</b>	10	2,200	206 × 206	0.8	1	7	20	20 (1,000)	12
<b>1202S</b>	10	1,200	206 × 206	0.8	1	7	20	20 (500)	12
<b>12201S</b>	100	12,200	206 × 206	0.8	1	50	100	200 (5,000)	100
<b>8201S</b>	100	8,200	206 × 206	0.8	1	50	100	200 (5,000)	100
<b>5201S</b>	100	5,200	206 × 206	0.8	1	50	100	200 (2,000)	100

\* Position according to OIML R76 \*\* typical minimum initial weight according to USP (United States Pharmacopeia), USP31-NF26



### Cubis draft shields

Select a draft shield and enter the corresponding identifier in the field marked with the icon.

<b>DO</b>	No draft shield. Please always enter this identifier for weighing modules with the weighing pan size 206 × 206 mm.
<b>DE</b>	Manual glass draft shield for precision balances with a readability of 1 mg.
<b>DU</b>	Manual analytical balance draft shield with smooth-running, wide-opening doors, unimpeded access to the weighing chamber without interfering braces. For all models with 0.01 mg, 0.1 mg and 1 mg readability.
<b>DA</b>	Automatic, motorized draft shield with learning capability for ergonomic working and individual adaptation to different applications. For all models with 0.01 mg, 0.1 mg and 1 mg readability.
<b>DI</b>	Like the DA draft shield, but with the addition of an integrated ionizer to eliminate the impact of electrostatic charges in samples and vessels.



## Premium Ultramicrobalances and Microbalances SE2, ME5 and ME36S. Highest Precision – Even for the Smallest Sample Quantities



Design 1



Design 2



Design 3



**The premium microbalances meet the most stringent requirements when it's necessary to achieve measurement results quickly and with exceptional accuracy**

The balances also offer maximum support when used as testing equipment in the context of a QM system. This is ensured by performance features such as the

- SQmin function: Display of the permitted minimum initial weight according to the United States Pharmacopeia (can be activated by Sartorius Service)
- Fully automatic calibration and adjustment function (isoCAL)
- ISO/GLP-compliant logging
- Input of alphanumeric sample identifiers

### 100% glass draft shield

The motorized draft shield on the SE2 and ME5 is made entirely of glass with no frame to obstruct your view. A special coating on the glass inside the chamber eliminates interfering factors – such as those caused by electrostatically charged objects.

### Cleaning as easy as 1–2–3

In just one easy step, you can completely remove the draft shield. The weighing chamber base plate features smooth, easy-to-clean surfaces. Such design features really pay for themselves whenever absolute cleanliness is the number one priority.

### Easy to operate

The generously sized opening of the draft shield moves to any desired position – you can choose to operate the draft shield by pressing a palm-operable key, a foot switch (optional) or an external computer.

### Specifications

Model		SE2***	ME5***	ME36S***	SE2-F Filter balance	ME5-F Filter balance
Weighing capacity	g	2.1	5.1	31	2.1	5.1
Readability	µg	0.1	1	1	0.1	1
Repeatability (±)	µg	0.25	1	2	0.25*	1**
Linearity (≤ ±)	µg	0.9	4	10	0.9*	4**
Response time (average)	s	10	10	14–18	10*	10**
Weighing pan Ø	mm	20	30	30	50 or 20 (75 and 90 optional)	50 or 30 (75 and 90 optional)
Design		1	1	3	2	2

\* with standard weighing pan Ø 20 mm

\*\* with standard weighing pan Ø 30 mm

\*\*\* Models SE2, ME5 and ME36S are available in calibrated versions

### Fast results

With stabilization times of only 10 seconds, the SE2 and ME5 will save you valuable time during each weighing operation.

### Brilliant readability

The backlit, high-contrast graphical display ensures excellent readability. Text-based user guidance allows the balance to be configured quickly and confidently "if you need to do more than just weighing".

### Flexible

Every ultramicrobalance and microbalance has 14 built-in application programs as standard features, such as air buoyancy correction, differential weighing program, and statistical evaluation.

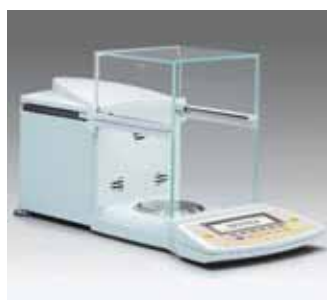
Featuring a readability of 1 µg, the ME36S offers an exceptionally wide weighing range up to a capacity of 31 g and outstanding metrological specifications, making it ideal for highly accurate microweighing and for weighing microquantities into heavy tare containers.

All balance-generated data can be logged via the standard RS232C data interface.

### Filter weighing

The models ME5-F and SE2-F were specially designed for weighing filters of up to 90 mm in diameter. The draft shield is made completely of metal, thereby minimizing the interfering effects of static electricity.

## Premium Semimicrobalances and Analytical Balances: Sartorius ME – When Results Matter



### Unrivalled speed

An outstanding feature of the Sartorius ME series is speed: stable readouts with five decimal places in just eight seconds.

Controlled by palm-operable keys or by custom programming, the draft shield closes quietly, precisely and quickly. It can be adapted to any weighing scenario, according to the requirements of your application.

### Unrivalled stability

Repeatability of the weights measured is an additional strength of the Sartorius ME. The results are just as stable as the monolithic weighing system of the ME.

The Sartorius ME is amazingly impervious to the surrounding environment of its installation location. Interfering static electricity on samples and tare containers can be neutralized at the touch of a button.

### Unrivalled reliability

Sartorius ME stands for reliability, year in, year out. That's why we are offering a three-year warranty, which we will extend on request up to a total of five years.

### The Facts

Unique monolithic weighing system

Three-part, motorized draft shield system

User-friendly palm-activated keys for draft shield operation; foot switch optional for applications where you need your hands free

Neutralization of static electricity

Prompts in clear English for operator guidance

Alphanumeric input capability for sample IDs

Software support for use in quality management systems

SQmin function displays the minimum initial weight in accordance with the United States Pharmacopeia (can be activated by Sartorius Service)

Display of measurement uncertainty according to the German Calibration Service (DKD)

ISO/GLP-compliant, user-configurable records|printouts

### Built-in applications

Built-in software supports all key laboratory weighing applications to ensure smooth, time-saving lab procedures and reliable results.

- Density determination
- Calculation of weights using a definable factor or equation
- Statistical evaluation
- Differential weighing
- Air buoyancy correction
- Air density determination

### Specifications

Model	ME235S	ME235P	ME235P-SD*	ME614S	ME414S	ME254S
Weighing capacity (g)	230	60 110 230	60 110 230	610	410	250
Readability (mg)	0.01	0.01 0.02 0.05	0.01 0.02 0.05	0.1	0.1	0.1
Repeatability (≤mg)	0.015 (0–60 g) 0.025 (60–230 g)	0.015 (0–60 g) 0.040 (60–110 g) 0.040 (110–230 g)	0.015 (0–60 g) 0.040 (60–110 g) 0.040 (110–230 g)	0.1	0.1	0.07
Linearity (≤ ± mg)	0.1	0.15	0.15	0.4	0.3	0.15
Response time (≤s)	8	8	8	3	2.5	2.5
Off-center load at ½ maximum load (≤mg) (according to OIML R76)	0.15	0.2	0.2	0.6	0.4	0.3
Weighing pan diameter (mm)	90	90	90	90	90	90
Clearance above weighing pan (mm)	253	253	195	253	253	253

All models are available in verified versions (excluding \*)

\* with short-design draft shield and pipette opening, Ø 60 mm, with cover



## Standard Micro-, Semimicro-, Analytical and Precision Balances

### The New Sartorius CP: Unrivalled in Its Performance Class

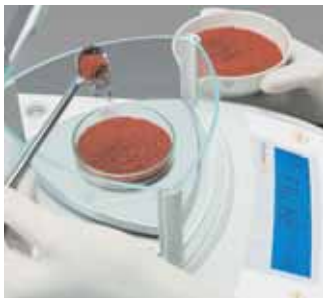


As the successor to the Sartorius Competence series, which proves its reliability on a daily basis in practical use, the Sartorius CP also sets standards for engineering, quality and features. If you want to avoid taking risks when you make the investment in a new balance, the new CP is the best choice you can make.

Whether your samples are in the micro-gram range or up to 34 kg, the Sartorius CP series with its 29 models offers the right instrument for practically every weighing task in the laboratory.

#### Engineering

All balances in the Sartorius CP series are equipped with a monolithic weighing system available only from Sartorius. This system is not only incredibly precise, but also exceptionally reliable and durable.



And the new Sartorius CP scores winning points with further technical advantages that ensure continuous operation of the balance with the greatest possible accuracy:

Take the built-in, motorized adjustment weight: Just touch the CAL key, and the balance will automatically perform internal calibration and adjustment – whenever required in your process.

And there's the isoCAL function. When the ambient temperature changes by a specific value or once a defined time interval has elapsed, isoCAL performs internal calibration and adjustment fully automatically. Therefore, the balance ensures that calibration is carried out at regular intervals, and delivers consistently high accuracy.



On top of this, the high-contrast, backlit display is exceptionally easy to read under any room lighting conditions (non-backlit micro- and semi-microbalances available).

#### Quality

Not just the housing, but also the entire construction of the new Sartorius CP with its powerful core, the monolithic weighing system, stand up to the abuse of tough daily use. The same goes for the control keys, the components on a balance that are most frequently used. Even after they have been pressed tens of thousands of times, they will continue to work precisely, just like they did from day one, with positive click action for reliable activation of their respective functions.

#### Features

The Sartorius CP has precisely the features you need for fast and professional processing of weighing tasks in everyday laboratory routines. This includes ISO/GLP-compliant documentation. Connected to a Sartorius YDP20-OCE data printer or a computer, the new Sartorius CP enables you to comply with documentation requirements for use in a quality management system.

The draft shield designs of the balance models featuring readabilities of 1 µg, 2 µg, 0.01 mg, 0.1 mg or 1 mg are also impressive. Both the construction and size are specially adapted to the particular readability, offering tangible assets in actual use:

- Excellent shielding from drafts
- Draft shield doors that glide open smoothly for optimal access to the weighing chamber
- Outstandingly easy-to-clean design.

A bidirectional RS232C data interface provides the ideal basis for communication, for example with a PC.

For advanced applications, such as weighing in percent, net-total formulation, dynamic weighing or animal weighing, mass unit conversion and counting, the CP offers easy-to-run programs as standard features.



Design 1



Design 2



Design 3



Design 4



Design 5

## Specifications

Model	Read-ability (mg)	Weighing capacity (g)	Repeatability ( $\leq \pm$ mg)	Linearity ( $\leq \pm$ mg)	Response time (average) ( $\leq$ s)	Weighing pan (mm)	Design
<b>Microbalances</b>							
CPA2P	0.001   0.002   0.005	0.5   1   2	0.001   0.002   0.003	0.002   0.004   0.005	10	$\varnothing$ 20	1
CPA26P	0.002   0.01	5   21	0.004	0.008	10	$\varnothing$ 50	3
CPA2P-F Filter balance	0.001   0.002   0.005	0.5   1   2	0.002   0.003   0.004	0.002   0.004   0.005	10	$\varnothing$ 20 $\varnothing$ 125 Filter weighing pan	2
<b>Semimicrobalance</b>							
CPA225D	0.01   0.01   0.1	40   100   220	0.02   0.05   0.1	0.03   0.1   0.2	6   3	$\varnothing$ 80*	4
<b>Analytical balances</b>							
CPA324S	0.1	320	0.2	0.3	3	$\varnothing$ 80*	5
CPA224S	0.1	220	0.1	0.2	2	$\varnothing$ 80*	5
CPA124S	0.1	120	0.1	0.2	2	$\varnothing$ 80*	5
CPA64	0.1	64	0.1	0.2	2	$\varnothing$ 80*	5

\* Triangular weighing pan shape.  $\varnothing$  = Diameter of the inner circle.





Design 6



Design 7



Design 8



Design 9



Design 10

## Specifications

Model	Read- ability (g)	Weighing capacity (g)	Repeata- bility ( $\leq \pm$ g)	Linearity ( $\leq \pm$ g)	Response time (average) ( $\leq$ s)	Weighing pan (mm)	Design
<b>Precision balances</b>							
CPA1003S**	0.001	1,000	0.001	0.002	2	$\varnothing$ 110*	6
CPA623S	0.001	620	0.001	0.002	1.5	$\varnothing$ 110*	7
CPA1003P**	0.001   0.01	500   1,000	0.001   0.01	0.002   0.02	2	$\varnothing$ 110*	6
CPA423S	0.001	420	0.001	0.002	1.5	$\varnothing$ 110*	7
CPA323S	0.001	320	0.001	0.002	1.5	$\varnothing$ 110*	7
CPA223S	0.001	220	0.001	0.002	1.5	$\varnothing$ 110*	7
CPA6202S	0.01	6,200	0.01	0.02	1.5	190×204	8
CPA5202S-DS**	0.01	5,200	0.01	0.02	1.5	$\varnothing$ 130	9
CPA4202S	0.01	4,200	0.01	0.02	1.5	190×204	8
CPA3202S	0.01	3,200	0.01	0.02	1.5	190×204	8
CPA2202S	0.01	2,200	0.01	0.02	1.5	190×204	8
CPA2202S-DS**	0.01	2,200	0.01	0.02	1.5	$\varnothing$ 130	9
CPA6202P	0.01   0.02   0.05	1,500   3,000   6,200	0.01   0.01   0.03	0.02   0.02   0.05	1.5	190×204	8
CPA34001S	0.1	34,000	0.1	0.2	2	400×300	10
CPA16001S	0.1	16,000	0.1	0.2	2	400×300	10
CPA12001S	0.1	12,000	0.1	0.2	2	400×300	10
CPA10001	0.1	10,000	0.1	0.2	1	190×204	8
CPA8201	0.1	8,200	0.1	0.2	1	190×204	8
CPA34001P	0.1   0.2   0.5	8,000   16,000   34,000	0.1   0.2   0.5	0.3   0.3   0.3	2	400×300	10
CPA5201	0.1	5,200	0.1	0.2	1	190×204	8
CPA34000	1	34,000	0.5	1	1.5	400×300	10

\* Triangular weighing pan shape.  $\varnothing$  = Diameter of the inner circle. \*\* = Equipped with the analytical balance draft shield as a standard feature. All models are available in calibrated versions (excluding CPA2P, CPA2P-F, CPA2202S-DS, CPA5202S-DS, CPA1003P). Accessories available on request.

## Standard Analytical and Precision Balances Extend The New Achievers for Your Lab



On paper, many lab balances look the same. But in the real world, there's more to a lab balance than just its technical specifications.

The new Sartorius Extend series was specially designed for effective and reliable weighing in daily lab routines. This is where more powerful technology and application-oriented operation and features make all the difference.

### Winning technology

More versatility in high-resolution applications: 1 mg to 620 g and 10 mg to 6200 g. High-end technology made standard.



The monolithic weighing system, only available from Sartorius worldwide, offers unique prerequisites for permanently high measurement accuracy and reliability.

The latest powerful microprocessor technology ensures shorter response times for faster results. In an Extend balance with 1 mg readability, the typical response time is just 1 to 1.2 seconds. Reliable weighing results are achieved all the time – even under less than ideal ambient conditions, thanks to the Extend's highly sophisticated digital compensation algorithms.

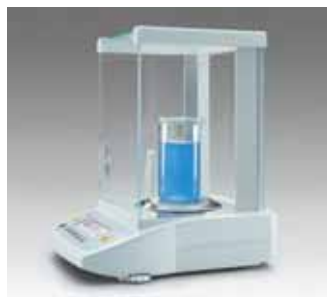


### Ease of use

When you need to get a heavy workload of repetitive applications done fast and reliably, day in and day out, the last thing you need is a lab balance so complicated that it causes operating errors and wastes your valuable time as a result. This is not the case with the Sartorius Extend. A simple, easy-to-understand control panel, key function assignments and the easy-to-read display are ideal for efficient weighing in your lab.



User-friendly operation: short, plain-English text prompts and cursor keys for navigation make it simple for you to configure the balance to meet your individual requirements.



The backlit display with its 15-mm digits means the results of measurement are plain to see, under any lighting conditions.

The level indicator is positioned conveniently right next to the display – so that checking whether the balance is level becomes "second nature" to the operator.

### The range of features

Add up all features of the new Sartorius Extend, and you'll find all the advantages that only a genuine Sartorius lab balance can offer: features that pay for themselves, time and again.

A built-in, motorized calibration weight is standard in all analytical balances. Applied at a touch of a button, it ensures the highest weighing accuracy. The precision balances, depending on requirements, are available in two versions – with internal calibration (-CW) or external calibration.

Whenever you need ISO/GLP-compliant documentation of raw data or calibration|adjustment data, the Sartorius Extend balance provides it at the touch of a key (in combination with the optional YDP20-OCE data printer).

The easy-to-clean draft shield chamber on the analytical balances provides optimal lighting conditions inside, thanks to its nearly frameless all-glass design.

The following additional built-in application programs come as standard:

Weighing in percent, net-total-formulation, calculation (multiplication|division), dynamic weighing|animal weighing, mass unit conversion, and counting

The bidirectional RS232C data interface is another standard feature. Alternatively, Sartorius can provide an adapter cable for connection to a USB port.





Design 1



Design 2



Design 3



Design 4

## Specifications

Model	Read-ability (mg)	Weighing capacity (g)	Repeatability (mg)	Linearity ( $\leq \pm$ mg)	Response time (average in s)	Weighing pan (mm)	Design
<b>Analytical balances</b>							
ED224S	0.1	220	0.1	0.2	2.5	Ø 90	1
ED124S	0.1	120	0.1	0.2	2.5	Ø 90	1

Model	Read-ability (g)	Weighing capacity (g)	Repeatability (g)	Linearity ( $\leq \pm$ mg)	Response time (average in s)	Weighing pan (mm)	Design
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## Precision balances

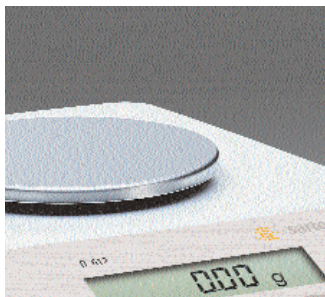
ED623S-CW	0.001	620	0.001	0.002	1	Ø 115	2
ED623S*	0.001	620	0.001	0.002	1	Ø 115	2
ED423S-CW	0.001	420	0.001	0.002	1	Ø 115	2
ED423S*	0.001	420	0.001	0.002	1	Ø 115	2
ED323S-CW	0.001	320	0.001	0.002	1	Ø 115	2
ED323S*	0.001	320	0.001	0.002	1	Ø 115	2
ED153-CW	0.001	150	0.001	0.002	1.3	Ø 115	2
ED153*	0.001	150	0.001	0.002	1.3	Ø 115	2
ED6202S-CW	0.01	6,200	0.01	0.02	1.1	180×180	4
ED6202S*	0.01	6,200	0.01	0.02	1.1	180×180	4
ED4202S-CW	0.01	4,200	0.01	0.02	1.1	180×180	4
ED4202S*	0.01	4,200	0.01	0.02	1.1	180×180	4
ED3202S-CW	0.01	3,200	0.01	0.02	1.1	180×180	4
ED3202S*	0.01	3,200	0.01	0.02	1.1	180×180	4
ED2202S-CW	0.01	2,200	0.01	0.02	1.1	180×180	4
ED2202S*	0.01	2,200	0.01	0.02	1.1	180×180	4
ED822-CW**	0.01	820	0.01	0.02	1	Ø 150	3
ED822*	0.01	820	0.01	0.02	1	Ø 150	3
ED8201-CW	0.1	8,200	0.1	0.1	1	180×180	4
ED8201*	0.1	8,200	0.1	0.1	1	180×180	4
ED5201-CW	0.1	5,200	0.1	0.1	1	180×180	4
ED5201*	0.1	5,200	0.1	0.1	1	180×180	4
ED2201-CW	0.1	2,200	0.1	0.1	1	180×180	4
ED2201*	0.1	2,200	0.1	0.1	1	180×180	4

All models, except those marked with \*, are devices available in calibrated versions.

\*\* Weighing pan size for calibrated versions: 180 × 180 mm.

## Budget-Class Analytical and Precision Balances Talent

### The Affordable Introduction to Sartorius Weighing Technology



Sartorius Talent series balances are the alternative for all your simple weighing operations: economically priced yet with an uncompromisingly high degree of quality, reliability and sophisticated weighing technology. Whether you need to operate a balance in the lab, at school or a university, or in the field using the battery function, a balance from the Sartorius Talent series will always be the number one choice.

#### 19 models – one design

The right weighing capacity for every application and every budget? No problem with the Talent series. It offers you 3 analytical balances with weighing capacities of 60 g, 120 g and 210 g, respectively, and a total of 16 precision balances – ranging from the top-of-the-line model with a 3,100-g weighing capacity and 0.01-g readability to the high-capacity model featuring a 12-kg capacity.

#### Ease of use

When it comes to strictly weighing, ease of use is the top priority. The balances in the new series prove to be particularly talented in this area: Just set it up, switch it on, and start weighing. It couldn't be any easier.

#### Dependable and accurate

Permanent reliability and weighing certainty are ensured by the innovative weighing system technology, and the robust construction of the balance housing.

#### Portability is standard

Many of the Talent series balances are also battery-operable, providing an alternative to line current operation. The built-in "power-saver" feature extends the service life of the battery. This function will automatically shut off the balance if a key has not been pressed after 2 minutes. An added benefit of this portable application: the balance is compact and lightweight.

#### Built-in application software

Talent series balances offer various application programs as standard features to make routine work easy: weighing in percent, net-total formulation, weigh averaging|dynamic weighing, counting and mass unit conversion.

#### RS232C data interface

Each model comes standard with a bidirectional RS232C data interface. This means no extra cost if you need to log the balance-generated results on an optional printer or connect a remote display for use in the educational sector.





Design 1



Design 2



Design 3



Design 4

## Specifications

Model	Readability (mg)	Weighing capacity (g)	Repeatability ( $\leq \pm$ g)	Linearity ( $\leq \pm$ g)	Response time (average) (s)	Weighing pan (mm)	Design
Analytical balances							
TE214S	0.1	210	0.0001	0.0002	3	Ø 90	1
TE124S	0.1	120	0.0001	0.0002	3	Ø 90	1
TE64	0.1	60	0.0001	0.0002	3	Ø 90	1

Model	Readability (g)	Weighing capacity (g)	Repeatability ( $\leq \pm$ g)	Linearity ( $\leq \pm$ g)	Response time (average) (s)	Weighing pan (mm)	Design
Precision balances							
TE313S	0.001	310	0.001	0.002	2.5	Ø 100	2
TE313S-DS*	0.001	310	0.001	0.002	2.5	Ø 100	1
TE153S	0.001	150	0.0015	0.003	2.5	Ø 100	2
TE153S-DS*	0.001	150	0.0015	0.003	2.5	Ø 100	1
TE3102S	0.01	3,100	0.01	0.02	2.5	174×143	4
TE1502S	0.01	1,500	0.015	0.03	2.5	174×143	4
TE612	0.01	610	0.01	0.02	2	Ø 116	3
TE412	0.01	410	0.01	0.02	2	Ø 116	3
TE212	0.01	210	0.01	0.02	2	Ø 116	3
TE6101	0.1	6,100	0.1	0.2	2	174×143	4
TE4101	0.1	4,100	0.1	0.2	2	174×143	4
TE2101	0.1	2,100	0.1	0.2	1.5	174×143	4
TE601	0.1	610	0.1	0.2	1.5	174×143	4
TE12000	1	12,000	1	2	1.5	174×143	4
TE6100	1	6,100	1	2	1.5	174×143	4
TE4100	1	4,100	1	2	1.5	174×143	4

\* with analytical balance draft shield

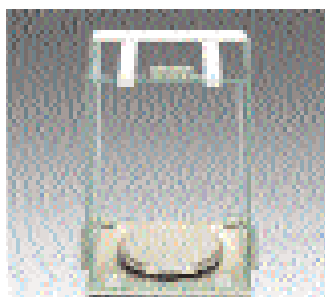
## Accessories

### Accessories for Cubis models

<b>Calibratable data printer</b> for connection to RS232, 25-pin Accessory interface	YDP10-OCE
<b>Calibratable data printer</b> with <i>Bluetooth</i> ® data transfer (only in connection with YD001MS-B or option IB)	YDP10BT-OCE
<b>Paper rolls</b> for printer YDP10-OCE; 5 x 40 m rolls	6906937
<b>Adhesive labels</b> on normal paper for YDP10BT-OCE (20 m continuous roll x 57 mm)	69Y03247
<b>Color ribbon</b> for YDP10-OCE and YDP10BT-OCE	6906918
<b>Additional display</b> , LCD, figure size 13 mm, backlit	YRD03Z
<b>RS232C connection cable</b> , to connect to PC with 9-pin COM interface, length 2 m	7357314
<b>Standard operating procedure</b> (SOP)	YSL07D
<b>Infrared sensor</b> for contactless function triggering (e.g. draft shield control)	YHS01MS
<b>Hand switch</b> for printing, taring or using a function key; Selection via menu, inc. T-connector	YHS02
<b>Foot switch</b> for printing, taring or using a function key; Selection via menu, inc. T-connector	YFS01
<b>Foot switch</b> for the functions open/close draft shield (only in combination with DA and DI draft shield), taring and printing	YPE01RC
<b>Density determination kit</b> for solids and liquids for weighing modules with a readability ≤ 1 mg	YDK01MS
<b>3-segment control display</b> , red – green – red, for plus minus weighings, inc. T-connector	YRD11Z
<b>Barcode reader</b> with connection cable, 120 mm reading range	YBR03PS2
<b>Pipette calibration kit</b> for models with 0.01 mg and 0.1 mg readability; hardware and software	on request
<b>Software</b> for pipette calibration	on request
<b>RS232C data interface</b> 25-pin for connection of Cubis accessories	YD001MS-R
<b>Data interface</b> ® for wireless connection of data printer YDP10BT	YD001MS-B
<b>RS232C data interface</b> , 9-pin including PS/2 for connecting a PC or a keyboard	YD001MS-P
<b>Antistatic weighing pan</b> , diameter 130 mm, for weighing modules with a readability of 0.1 mg or 0.01 mg	YWP01MS
<b>Antistatic weighing pan</b> , diameter 150 mm, for weighing modules with a readability of 1 mg	YWP02MS
<b>Support arm</b> for 10/100 mg precision weighing modules for raising the service units MSE, MSU, MSA	YDH01MS
<b>Weighing table</b> made from synthetic stone, with vibration dampening	YWT03
<b>Wall console</b>	YWT04
<b>Weighing table</b> from wood with synthetic stone for precise, reliable measurements	YWT09
<b>Service unit</b> with backlit LCD display and tactile keys	YAC01MSE
<b>Service unit</b> with backlit b/w graphic display and tactile navigation keys	YAC01MSU
<b>Service unit</b> with color TFT graphic display and touchscreen	YAC01MSA
<b>Display cable 3 m</b> for Cubis models, or separated setup of display and weighing unit	VF4016
<b>SartoCollect software</b> for data communication between balance and PC	YSC02
<b>Sartorius OPC server</b> for integration of 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-

The brand name and logo for *Bluetooth*® wireless technology are owned by Bluetooth SIG Inc. The use of this brand name and trademark by Sartorius AG is under license. Other brand names and trade names belong to their respective owners.





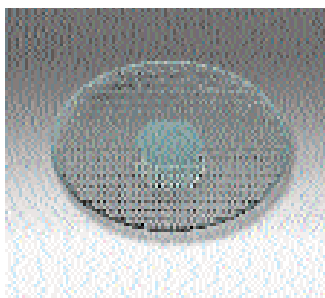
#### Accessories for all ME, SE, CPA, ED and TE models

<b>Data printer</b> , calibratable, with date, time, statistics	YDP20-OCE
<b>Paper rolls</b> for printer YDP20-OCE; 5 x 40 m rolls	6906937
<b>Color ribbon</b> for YDP20-OCE	6906918
<b>Adhesive labels</b> on normal paper for YDP20-OCE (20 m continuous roll)	69Y03247
<b>SartoCollect</b> , data transfer and integration on computer	4SC02
<b>Weighing table</b> for precise, reliable weighings	YWT09
<b>Weighing table</b> made from synthetic stone, with vibration dampening	YWT03
<b>Wall console</b>	YWT04
<b>Additional display</b> LCD, figure size 13 mm, reflective	YRD02Z
<b>Hand switch</b> , inc. T-connector	YHS02
<b>Foot switch</b> , inc. T-connector	YFS01
<b>Ionization blower</b> for electrostatically charged samples [220 V]	YIB01-ODR
<b>Ionization blower</b> for electrostatically charged samples [110 V]	YIB01-OUR
<b>Ionization probe Stat-Pen</b> for discharging electrostatically charged samples	YSTP01
<b>T-connector</b> for connection of 2 peripheral devices	YTC01
<b>RS232C USB connection cable</b> , for connection to a PC via USB interface; length 1.5 m	YCC01-USBM2
<b>RS232C connection cable</b> , for connection to a PC with 25-pin COM interface; length approx. 2 m	7357312
<b>RS232C connection cable</b> , for connection to a PC with 9-pin COM interface; length approx. 2 m	7357314
<b>Standard operating procedure (SOP)</b>	YSL01D
<b>LCD</b> , figure size 13 mm, reflective	YRD03Z
<b>3-segment control display</b> , red – green – red, for plus minus weighings, inc. T-connector	YRD11Z

#### Accessories for ME models and SE2

<b>Battery set</b> , external with optical charge control display for SE2, ME5 and all ME models	YRB05Z
<b>Antistatic weighing pan</b> for electrostatically charged samples for ME235S, ME235P, ME254S, ME414S, ME415S and ME614S for ME5	YWP01ME YWP01MC
<b>Density determination kit</b> for ME235S, ME235P, ME254S, ME414S, ME415S and ME614S	YDK01
<b>Storage plate</b> , for acclimatization of materials to be weighed, for all ME models (excluding ME5)	YGS01ME
<b>Weighing scoop</b> made from chrome nickel steel, 90 mm x 32 mm x 8 mm	641214
<b>Foot switch</b> , inc. T-connector for all ME models and SE2	YPE01RC
<b>Barcode reader</b> , for all ME models and SE2 (YCC01-0024M01 required)	YBR02FC
<b>Cable with T-connector</b> , for connection of the barcode reader	YCC01-0024M01
<b>Bluetooth® RS232C adapter</b> with external antenna (only point-to-point connections)*	YBT01
<b>Bluetooth® USB adapter</b> (point-to-multipoint capability)*	YBT02

\* The operation of these devices is only permitted in the following countries: Austria, Belgium, Denmark, Finland, France (indoor use only), Germany, Greece, Iceland, Ireland, Liechtenstein, Luxembourg, the Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, and the United Kingdom.



#### Accessories for CPA and ED models

<b>Battery set</b> , external, with optical charge control display up to 10 kg weighing capacity from 12 kg to 34 kg weighing capacity	YRB05Z
	YRB06Z
<b>Analytical balance attachment</b> for CPA623S, CPA423, CPA323S, CPA223S	YDS01CP
<b>Antistatic weighing pan</b> for CPA225D, CPA324S, CPA224 S, CPA124S, CPA64, ED224S, ED124	YWP01CP
<b>Density determination kit</b> for CPA225D, CPA324S, CPA224S, CPA124S for ED224S, ED124S	YDK01
	YDK01LP
<b>Draft shield cover</b> with hole (Ø 30 mm) for CPA623S, CPA423S, CPA323S, CPA223S	YDS02CP
<b>Hook for under-scale weighing</b> , screwable, for CPA12001S, CPA16001S, CPA34001S, CPA34001P, CPA34000	69EA0040
<b>Bluetooth®-RS232C adapter</b> with external antenna (only point-to-point connections)*	YBT01
<b>Bluetooth®-USB adapter</b> (point-to-multipoint capability)*	YBT02
<b>In-use dust cover</b> for display and control unit CPA34001S, CPA16001S, CPA12001S, CPA34001P, CPA34000 for CPA423S, CPA323S, CPA623S, CPA223S for CPA4202S, CPA3202S, CPA2202S, CPA8201, CPA6202S, CPA6202P, CPA5201, CPA10001 for display and control unit CPA225D, CPA324S, CPA224S, CPA124S, CPA64	6960CP01
	6960CP02
	6960CP03
	6960CP04

#### Accessories for TE models

<b>Battery set</b> , external (service life: 20 or 40 hours, depending on model)	YRB08Z
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\* The operation of these devices is only permitted in the following countries: Austria, Belgium, Denmark, Finland, France (indoor use only), Germany, Greece, Iceland, Ireland, Liechtenstein, Luxembourg, the Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, and the United Kingdom.







## Safety Weighing Cabinet SWC

### Safe Weighing of Toxic and Powdery Substances



For researchers and laboratory technicians, working with poisonous or highly reactive substances does pose a considerable risk. Especially when weighing, the smallest sample amounts have a high risk potential.

#### Health and safety are top priorities

In order to protect the health of laboratory personnel, proper safety measures must be taken when weighing dangerous powdered substances.

The Sartorius Safety Weighing Cabinet SWC offers many significant design advantages over a regular laboratory hood: It creates a contained area around the laboratory balance which prevents any air or finely powdered particulates from escaping into the operating personnel's work area. At the same time, the constant inlet air velocity and the special cabinet construction both keep the air current practically turbulence-free, and, as a result, ensure consistent and repeatable weighing results.

#### Single-source equipment

The balance and weighing cabinet are perfectly matched to each other. With its SWC Safety Weighing Cabinet, Sartorius has succeeded in uniting two otherwise contradictory requirements: maximum personnel protection and reliable weighing results.

The Safety Weighing Cabinets are available in four different sizes for special applications, such as using a second laboratory balance in the cabinet or for unusually high structures.

Each of the four basic models consists of: Safety Weighing Cabinet with a separate HEPA filter unit, data-logging alarm, lighting unit, waste disposal system (on one side), airflow smoke test kit and anti-static cleaning wipes.

Sartorius SWC Safety Weighing Cabinets comply with the requirements of EN14175.

Model with filter unit	Model without filter unit	Dimensions in mm (Width × Depth × Height)
SWC900	SWC900NF	890×750×510
SWC1200	SWC1200NF	1230×750×510
SWC900T	SWC900TNF	890×750×770
SWC1200T	SWC1200TNF	1230×750×770

#### Accessories

YWCF02	Carbon filter for solvent vapors
YWCF03	Box for carbon filter; for attachment to the filter box
YWCG01	Disposal chute for attachment to the side of the cabinet
YWCG02	Disposable chute bags (100 pcs)
YWCG03	Muffler for attachment to fan filter box
YWCG04	Airflow smoke test kit
YWCG07	Antistatic decontamination wipes
YWCG16	Printer table for attachment to the cabinet
YWT10	Laboratory bench; fits SWC900, SWC900T and SWC900NF
YWT11	Laboratory bench; fits SWC1200, SWC1200T and SWC1200NF

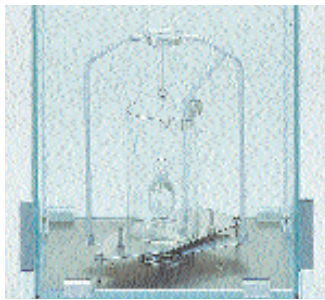
Other accessories for our Safety Weighing Cabinets are available on request.

All of the balances listed below have been tested for use in the Safety Weighing Cabinet and achieved their typical repeatability with correspondingly extended response times.

Balance series	ME SE	Sartorius CPA	Extend ED
Microbalances	ME5 ME36S	CPA2P	
Semimicrobalances	ME235S ME235P	CPA225D	
Analytical balances	ME614S ME414S ME254S	CPA324S CPA224S CPA124S CPA64	ED224S ED124S
Precision balances		CPA1003S CPA1003P CPA623S CPA423S CPA323S CPA223S CPA2202S-DS CPA5202S-DS	ED623S ED423S ED323S ED153 All models listed are also available in -CW versions



## Sartorius Density Determination The Optimal Equipment for All Methods



Whether you use the buoyancy method, the displacement principle or the pycnometer method for determining the density of solid, powdery or liquid samples – Sartorius offers you the technical equipment for performing these applications simply, quickly and precisely.

These include:

- Analytical and precision balances
- The YDK01 or YDK01LP density determination kits
- An integrated application program built into the balance for density determination (standard software in all ME and LA balances)



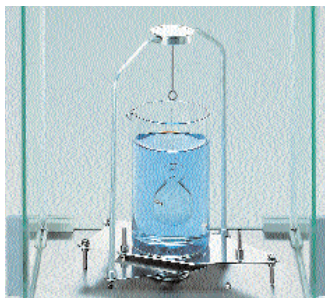
### Easy to use

Nothing is more annoying in laboratory applications than complicated operating sequences with delicate and sensitive instruments. This is why our density determination kits have been built to be especially rugged and uncomplicated.



### Perfected technology and practical accessories

Large and easily accessible sample holders are supplied so that you can perform measurements in air or in a buoyancy medium. The special design prevents air bubbles from adhering, which could otherwise distort your results.



If you weigh a substance with a density less than that of the buoyancy medium – forget the extra work. The specially shaped weighing pan lets you immerse your sample effortlessly below the surface of the liquid.

And determination of the density of liquids couldn't be easier than with our standardized glass plummet.

### The integrated application software controls the measurements and evaluates them for you

The application software integrated into the balances of the ME and Cubis series provides you with the ultimate in user convenience.

Just select your preferred method of measurement by menu, weigh your samples and the balance does the entire evaluation for you. In the process, it automatically takes into account all important factors that influence the measurement. For example, after you have entered the temperature, the balance directly calculates the density of the selected immersion medium.

### Results in black and white

A record of your results is printed out on the interfaced data printer – if you wish, as an ISO/GLP-compliant record.

The printout includes the following data:

- Temperature and density of the buoyancy medium
- Weight value of the sample during weighings in air and immersed in the medium
- The volume and the density of the sample

### Which density kit for which balance?

YDK01 density set for:

- ME models with 0.01 mg and 0.1 mg readability
- CPA324S, CPA224S, CPA124S, CPA225D

YDK01LP density set for:

- ED models with 0.1 mg readability

YDK01MS density set for:

- Cubis models with  $\leq 1$  mg readability

## Bluetooth® Wireless Technology\* Weigh and Communicate Wirelessly



Bluetooth® wireless technology, widely used for laptops and mobile telephones, offers real advantages for both measurement and data storage processes. With a range of up to 100 meters, wireless connection of measuring stations, PCs and peripheral devices is now completely feasible for laboratory use.

No more cables to trip over, no more cable ducts and dust collectors, no more inconvenient restrictions when positioning devices because infrared data interfaces have to be connected to one another within line of sight. Not only for mobile weighing, but also for clean-room and ultra-clean-room conditions or contaminated environments, Bluetooth® wireless technology represents a practical alternative that eliminates connection problems before they occur.

Another major advantage of Bluetooth® wireless technology is the ability to connect multiple weighing stations in individual networks.

The installation is extremely simple. This technology uses the 2.45 GHz ISM band (for industrial, scientific, and medical usage). No fees are charged for this frequency, which means no added recurring costs for the user.

Data security is a high priority in Bluetooth® wireless technology. The data transfer in both send and receive directions is protected by the use of frequency hopping, and other encryption techniques are also available. Thus, even sensitive areas are reliably secured.

With the YBT01 module for connection to the RS232C data interface on the balance, and the YBT02 module for connection to the computer's USB port, Sartorius presents a solution that meets the most sophisticated requirements, with the same high quality as our premium balances designed for use in the chemical and pharmaceutical industries.

The communication module has a stainless-steel housing that meets the highest cleanliness requirements optimally. All data transfer procedures and protocols are familiar to anyone who has used RS232C data interfaces.

So you can say goodbye to cable problems. All thanks to Bluetooth® wireless technology. The modules are suitable to use with any of our premium-series ME and Cubis balances.

The equipment may be used only in the following countries: Austria, Belgium, Denmark, Finland, France (indoor use only), Germany, Greece, Iceland, Ireland, Liechtenstein, Luxembourg, the Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, and the United Kingdom.

### YBT01

**Bluetooth® RS232C adapter with external antenna. Point-to-point connections only.**

Transmitting power	Complies with Class 1
Supported profiles	Serial port
Data transfer rate	1,200...115,200 bits/s (can be configured by Sartorius service)
Temperature range	0... +40 °C
IP protection class	IP65
Dimensions (L×B×H)	121 mm × 84 mm × 32 mm (without antenna, cable, wall bracket)

### YBT02 Bluetooth® USB adapter. Point-to-multipoint capability.

Transmitting power	Complies with Class 1
Specifications	Bluetooth® wireless technology V.1.1
PC software	Bluetooth® device driver
Operating system	Windows® 98, 2000, XP

\* The brand name and logo for Bluetooth® wireless technology are owned by Bluetooth SIG Inc., USA. The use of this trademark by Sartorius is under license.

## Eliminate Static Electricity Quickly and Reliably



Static electricity can block the entire workflow of everyday lab routines. When samples are weighed, particularly non-conductive sample materials such as plastic, glass or porcelain, an electrostatic field may build up between the sample and the stationary parts of the balance. As a rule, this effect is seen when the digits of a weight readout seem to "race out of control." This makes reliable weighing, particularly in the analytical field, very difficult. By ionization of samples using the Sartorius StatFan or StatPen ionizing blower, static electricity is neutralized within just a few seconds, making it unnecessary to increase the humidity of the air. Elimination of static electricity can be performed instantly wherever needed, without any time delay.

Sartorius ionizing blowers can be used anywhere undesirable electrostatic charges are generated; for example, in production areas and photographic labs. The flow rate of the ionizing stream can be continuously adjusted. For StatPen, the flow rate is altered by moving it closer or further away from a sample.

### Specifications

	Power connection	AC adapter	Neutralization	Airflow	Weight
Ionizing blower	230 V/50 Hz	18 V/50 Hz	Up to $\pm 20$ V	Up to 1,000 ccm/min	approx. 0.6 kg
StatFan YIB01-ODR					
Ionizing blower StatFan YIB01-OUR	110 V/50 Hz	18 V/50 Hz	Up to $\pm 20$ V	Up to 1,000 ccm/min	approx. 0.6 kg
StatPen YSTP01	100 V... 230 V 50... 60 Hz		Up to $\pm 30$ V		approx. 0.8 kg



# Sartorius Pipette Calibration Totally Accurate, Efficient and Independent



GPC65-CW



GPC26-CW/GPC225-CW



YDB01WZA

## Save time and money

Pipettes are gauges used as inspection, measuring and test equipment. GLP guidelines and ISO standards require pipettes to be tested at defined intervals to ensure their continued proper functioning. Quick testing must also be performed between these intervals. Having pipette calibration performed externally can be expensive and time-consuming. Backup pipettes must also be available to maintain routine operations. The equipment for performing the oft-required quick tests is not even available in many cases.

Now you can calibrate your pipettes yourself quickly and inexpensively with the GPC Pipette Calibration Balance or YCP03-1 Pipette Calibration Kit from Sartorius.

## Procedure

The liquid taken up in the pipette is weighed on a balance. The volume of the liquid is calculated from its weight and density and compared with the nominal volume for the pipette. The balance transmits the weight value to the PC where all the required calculations are performed – for example, by the Picaso software. At the end of each measurement, the calibration results are printed as a GLP-compliant report. The installation of an evaporation trap maintains the humidity at 60–90 %, thus preventing loss of liquid from the pipetting vessel.

## GPC Pipette Calibration Balances

### Fast and user-friendly

The balances in the GPC series are ideally suited for gravimetric testing of the volume of any pipette size. Because these balances do not require an additional draft shield, opening and closing of the draft shield doors is eliminated. This saves considerable time. The calibration workstation's modular design can be optimally adapted to your lab staff's ergonomic needs.

### "On the go" pipette calibration

With the optional YDB01WZA carrying case, you can pack up your GPC pipette calibration balance along with the other accessories.

Ambient conditions permitting, you have everything you need to calibrate your pipettes directly at the place of use.

### Equipment supplied

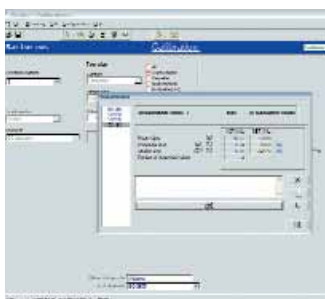
- Weighing cell with separate electronics box
- Display/service unit with 1 m cable (GPC65-CW: 0.3 m cable)
- Motorized calibration and adjustment function with built-in calibration weight
- Bidirectional RS232 data interface port
- Leveling feet and level indicator
- AC adapter
- Pipette calibration kit consisting of:
  - Evaporation trap
  - Pipetting vessels 6 ml and 21 ml (3 of each)
  - Special adapter and reduction fittings for pipetting vessels
- Cable for connecting the balance (RS232) to a PC (USB)

## Overview of GPC models

Model capacity	Readability	Weighing capacity	Pipetting weighing
GPC26-CW	0.001 mg	20 g	0.001 mg – 8 g
GPC65-CW	0.01 mg	60 g	0.01 mg – 35 g
GPC225-CW	0.01 mg	220 g	0.01 mg – 195 g

## Optional accessories

Optional accessories	Order number
PICASO pipette calibration software (PC running Windows operating system 98/2000/NT or XP required)	YCP03-2
Draft shield and 50 ml stainless-steel vessel (for GPC65-CW and GPC225-CW only)	YDS01WZA
Carrying case for mobile use	YDB01WZA



PICASO pipette calibration software



ME235P-SD



ME5 with VF988

## Pipette calibration kit YCP03-1

### Optimize your pipette calibration

With the YCP03-1 Pipette Calibration Kit, you can save time, money, and organizational effort. Of course, you need to choose the best balance for your needs to benefit from all these advantages.

### If you need a balance for other uses as well ...

... the Sartorius microbalances and semimicrobalances are the right solution for you. You can turn your balance into a pipette calibration workstation – and then back into an ordinary balance again – quickly and easily.

### Equipment supplied

- Picaso program CD
- Evaporation trap
- Weighing system adapter
- Vessel adapter for 21 ml vessels
- Reduction fitting for 6 ml pipetting vessel
- Pipetting vessels 6 ml and 21 ml (3 of each)
- Connection cable for balance – computer
- Centering disk for the evaporation trap
- Carrying case

### Overview of balance models

Model*	Readability (mg)	Weighing capacity (g)
ME36S (VF3677 required)	0.001	31 (16 g**)
ME5 (VF988 required)	0.001	5
CPA26P (VF3604 required)	0.002 0.01	5 21
ME235S	0.01	230
CPA225D (VF2396 required)	0.01 0.1	100 220
ME235P	0.01 0.02 0.05	60 110 230
ME235P-SD (with short-design draft shield)	0.01 0.02 0.05	60 110 230

### Accessories

	Order number
Pipette calibration kit incl. PICASO pipette calibration software (for all of the above-named balance models, except ME5)	YCP03-1
Short-design draft shield and adaptation of YCP03-1 for CPA225D	VF2396
Adaptation of YCP03-1 for ME36S	VF3677
Adaptation of YCP03-1 for CPA26P	VF3604

Special pipette calibration kit for ME5 consisting of:

Draft shield, evaporation trap, vessel adapter and pipetting vessel (2.5 ml) VF988

\* Models ME235S, ME235P, CPA225D, ME5 and ME36S are also available in versions calibrated for legal metrology.

\*\* Weighing capacity with pipette calibration kit installed: 16 g

## Picaso system requirements

Picaso requires a PC running Windows® 95|98|NT|2000|XP with an RS232C interface port for the interface cable, 64 MB RAM and at least 20 MB available hard disk space.

### Overview of Picaso software performance features

- Measurement data saved at a click of the mouse
- Program includes presaved specifications of more than 450 pipette types
- Measurements in accordance with British Standard, ASTM and EN ISO 8655
- Individual pipettes inventoried
- Data records are GLP-compliant and include mean, (in)accuracy, (im)precision, and standard deviation
- Statistics displayed in graphs
- Time-controlled functions for monitoring calibration cycles
- Online help for all functions

## OEM Products



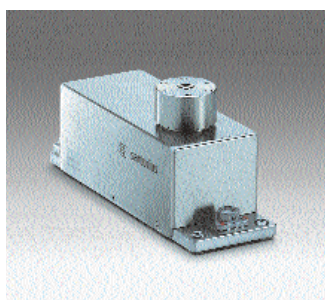
### Do you need a weighing sensor for your applications?

Sartorius offers excellent and precise sensors for mass determination. Whether you need to count small parts or batch precise amounts of liquids and solids, we have the right sensors for your solution.

In addition to monitoring and filling, our weighing cells are used in a variety of application areas, from tensiometers and thermogravimetric systems to check-weighers and special balances, to name but a few.

The table below shows the range of OEM products available, with details on weighing capacities and readabilities. The possibilities go beyond what you see here – in close cooperation with you, we can also develop customer-specific solutions adapted to individual requirements.

Contact us and we'll advise you on all the possibilities.



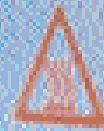


Weighing capacity (g)	Readability (mg)	Models				
		Individual components without CE mark	Encapsulated components with CE mark		Explosion-protected	Optional built-in calibration weight
			IP20	IP44	IP44	IP65
0.5 ... 2	0.001 ... 0.005		WZ2P-CW			
20	0.001		WZA26-CW			
60	0.01		WZA65-CW			
60	0.1	WZ64S				
60	0.1	WZ64-CW				
60	0.1			WZA64		...-CW
60	0.1			WZA64-X		
120	0.1	WZ124S				
120	0.1	WZ124-CW				
120	0.1			WZA124		...-CW
180	0.1			WZA224-ND		
210   80	0.01   0.1	WZ215-CW				
210	0.1	WZ214S				
220	0.01		WZA225-CW			
220	0.1	WZ224-CW				
220	0.1			WZA224		...-CW
600	0.1		WZ614-CW			
320	1	WZ323		WZA323		...-CW
520	1	WZ523		WZA523		...-CW
620	1			WZA623-X		
1,000	10					WZG1
1,200	1	WZ1203		WZA1203		...-CW
2,000	20					WZG2
6,200	10			WZA6202-X		
8,200	10	WZ8202		WZA8202		...-CW
10,000	100					WZG10
12,000	100	WZ12001		WZA12001	WZA12001-X	
20,000	200			WZA224-ND		WZG20

#### Examples of order number combinations

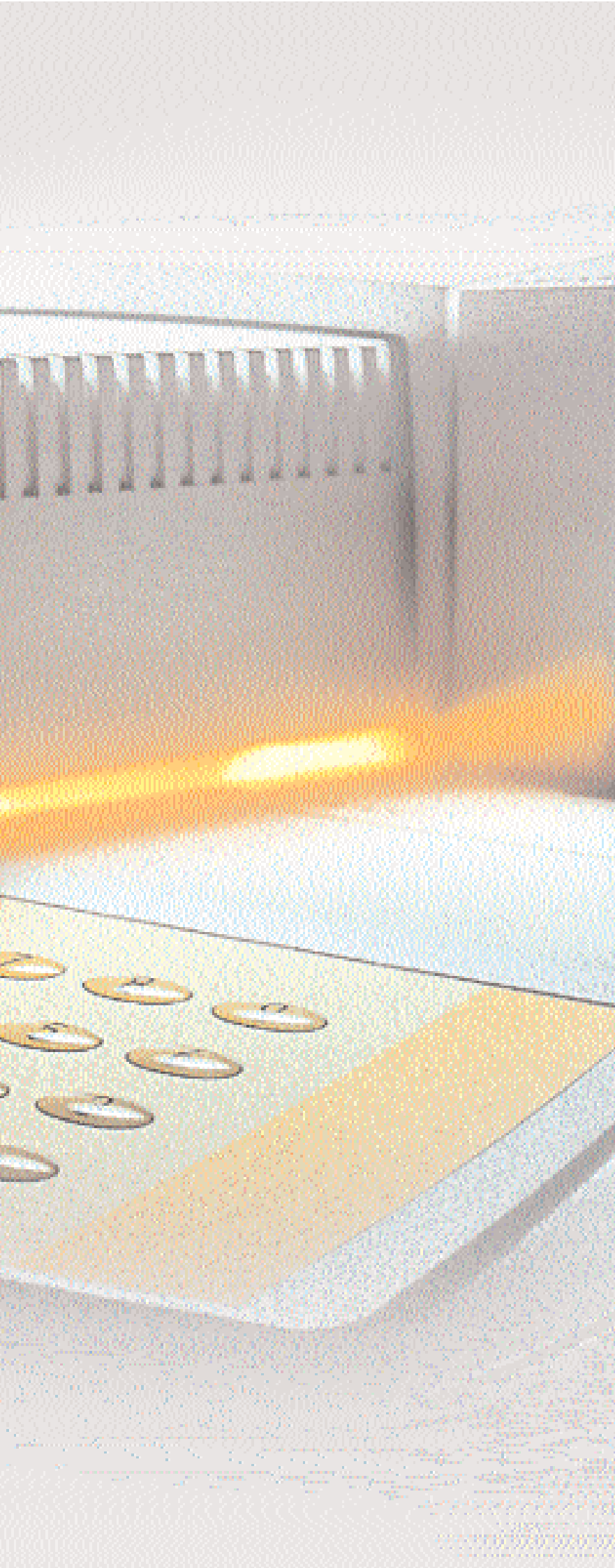
WZ523	Weighing cell with individual components without built-in calibration weight
WZ523-CW	Weighing cell with individual components with built-in calibration weight
WZA523	Weighing cell with encapsulated components without built-in calibration weight

For more information on our weighing systems, visit our website:  
<http://www.sartorius.com/index.php?id=1215>



CAUTION HIGH  
TEMPERATURE





## Moisture and Water Content Measurement



## The Right Equipment for Any Application

Foods, chemical/pharmaceutical products, building materials or animal feed – you name it, the moisture or water content has a decisive impact on price, processability and quality, ranging from raw materials to final products. Determining this moisture content is one of the most common analyses in product development and in the manufacturing process. Here, the most diverse requirements on speed, resolution of the values measured or on the operating design of the moisture analyzers must also be considered in all cases. As a leading provider of moisture analysis equipment, Sartorius is thoroughly familiar with the needs of its customers and thus offers a wide range of equipment that is continuously being enhanced.

### **Infrared drying – fast and precise**

A fast alternative to the classic oven drying method, infrared dryers from the Sartorius series of **Moisture Analyzers** are being increasingly used. These analyzers are compact and designed for routine operation in production and in applications involving incoming inspection. They feature the resolution of an analytical balance, and are ideal for research and development. Moreover, these moisture analyzers are supplied in versions with an EC type-approval certificate for use in legal metrology. Sartorius offers a custom solution for nearly every requirement. A wide selection of infrared heat sources, such as a halogen lamp, a CQR quartz glass heater and a ceramic heating element, enable these moisture analyzers to be optimally adapted to the intended application.

### **Microwave drying**

If the sample contains a large amount of water, microwave drying is the fastest and most effective sample heating method. It takes just 40–120 seconds to vaporize the water out of the sample. If under normal pressure conditions, the temperature of the escaping water vapor measures slightly over 100°C during the heating process. As such, this method is comparable to the 105°C setting in a classic oven dryer.

### **Differential weighing**

If the oven drying method is absolutely essential, the differential weighing program of the **LA Reference** series of balances efficiently manages large volumes of data and automatically calculates the differences between the tare weight, initial sample weight and backweight.

### **Coulometry – selective detection of water**

If you need to determine not the moisture, but the water content of a sample, the coulometric Karl Fisher titration method is the most commonly used technique. A further advancement in KF filtration is the combination method incorporated in the **Water Detection System WDS 400**. The WDS 400 allows accurate measurements to be performed down to a detection threshold of 1 µg of water. At the same time, it enables quantitative differentiation among surface water, capillary water, and water of crystallization. In addition, the WDS 400 completely eliminates the need for the test reagents required in KF titration.

### **Microwave Resonance Technology**

The microwave resonance method offers the advantage of particularly fast measurement, well below one second. At the same time, it is non-destructive, which means that this versatile method can be used in the laboratory and for online and offline applications.

The basis of this new Sartorius product line is the LMA300P, a modular system that consists of a control and evaluation unit and a resonator module in which the moisture of a sample is measured. Applications for the system cover measurement of the moisture in pourable, granulated and viscous products with a moisture content between 0.1–60%.

The new PMD300 series can analyze moisture levels online, meaning that the analysis is performed and the results passed to the processing unit continuously. Highly sensitive sensors integrated in the production line constantly analyze moisture content and send the information to the processing unit, which is directly connected to the controller, ensuring that the entire process is constantly controlled and documented – and 100% automatic.

### **NIR Technology**

Optical or spectroscopic methods exploit the interaction between light and the sample. If light is directed onto a sample, part of that light is reflected, changing it characteristically. The resulting change in the light is then used to calculate the moisture content. NIR spectroscopy is a nondestructive technology, meaning that the samples can be used for further analyses. In addition, NIR spectroscopy is fast, reliable and precise.

The LMA500 NIR calibrator is the first in our new NIR spectroscopy series. It not only analyzes moisture content, it can also do on-site calibration, allowing adaptation of methods to the materials being tested at a given time. The NIR calibrator is designed for pourable and granulated substances with a moisture content between 0.1% and 50%, depending on the sample.

## Sartorius MA35

### Easy ... Very Easy!



The MA35 is the new basic model in the moisture analyzer series from Sartorius. Its performance functions and operating concept are geared toward daily routine processes such as repetitive QC monitoring of samples as performed during in-process control and incoming goods inspection. To make the MA35 even more user-friendly, we have done away with seldom-used programming options without compromising flexibility or measurement accuracy.

#### **No need for programming**

End-point determination is fully automatic. It is no longer necessary to program a shut-off parameter. The MA35 continuously monitors the drying process and stops the measurement as soon as the sample has reached a constant weight – i.e., when no more weight loss can be detected despite heating. A built-in weighing system provides the measurement accuracy required for this with 1-mg resolution that is optimized for use in high temperature ranges. For sample heating, the MA35 is equipped with two powerful metal tubular-shaped heating elements, providing 360 watts of power. These heating elements, also called dark radiators, are both rugged and durable. Compared to heating lamps made from glass, e.g. infrared lamps or halogen heaters, these are especially resistant to dirt and vibration. In addition, the MA35's metal heating elements can be used in accordance with the strict guidelines of the FDA and HACCP in cases where glass is prohibited in certain production processes.

#### **Easy-to-understand and error-free moisture analysis**

The operating design focuses on accuracy and ease of use. The concise display shows the user all important information at a single glance. Easy-to-understand icons guide you in three steps from taring the sample pan to starting the measurement. The MA35 has done away with the regular Program Selection menu, opting instead for a limited number of drying routines that can be saved in the non-volatile memory. All important operating parameters can be accessed and changed in seconds, giving you more flexibility.

The optional printer, YDP20-OCE, enables you to print analysis results on a short report to save on paper usage. If you need comprehensive documentation, you can also print out the sample analysis results as well as the weighing system and temperature calibration as a detailed GLP report.

## Sartorius MA150. The Compact Class With Maximum Performance and Minimum Space Requirements



### For routine operation

A rugged design with low space requirements and easy operation are the major features of the MA150. Fully automatic drying of a sample until a constant weight is reached eliminates the need for programming an endpoint shutoff parameter. Twenty drying routines can be saved to give you the flexibility you need when the moisture content of additional, "out-of-the-ordinary" samples of material has to be measured.

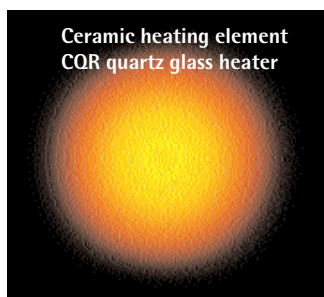
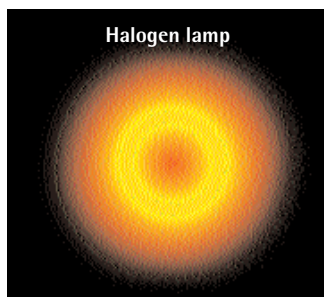


### Customizable and fast

Sartorius offers you a choice of two different moisture analyzers that cover diverse requirements on moisture measurements. Whichever heat source you opt for, both analyzers deliver results within just minutes. For temperature-sensitive samples, a ceramic heating element ensures especially gentle heating over the entire surface. The other choice, a CQR quartz-glass heater, optimizes the analysis time even further, which is already ultrafast for the analyzer featuring the ceramic heater.

### Application-specific solutions

Practical accessories round off the entire line-up of Sartorius moisture analyzers. These include, for instance, an in-use dust cover that is included with the standard equipment supplied and a special version of the moisture analyzer without openly accessible glass components in compliance with the stringent FDA and HACCP requirements that ban the use of glass in production.





## Sartorius MA100. Analytical Precision, Combined with Flexibility and Dynamics



### As accurate as an analytical balance

The **MA100** is the first infrared dryer in the world that features a built-in weighing system with 0.1-mg resolution and an EC type-approval certificate. A motorized heating unit moves over the sample to open or close the sample chamber. This reduces interfering effects when a sample is placed on the pan or a measurement is started. The pacesetting design enables the MA100 to achieve a measuring accuracy well beyond that provided by conventional infrared dryers.



### Automatic adaptation to reference values

The acronym "SPRM" stands for "Swift Parameter Adjustment to a given Reference Method." This function enables the operating parameters of **MA100** to be adapted to the results of an available reference method and to be saved as a drying routine. Optimization of operating parameters doesn't get any faster than this.



### Flexible and modular

The Sartorius MA100 analyzers give you a choice of three different infrared heat sources: a halogen lamp for standard applications, a ceramic heating element for gentle heating of temperature-sensitive samples and a CQR quartz glass heater. The CQR combines the fast drying capability of a halogen lamp with the gentle heating capability of a ceramic heater for drying samples evenly over their entire surface. A printer that can be optionally integrated into the housing eliminates the tangle of cables so typical of an external printer, and helps tidy up your work area.

### A clean solution

Did you accidentally spill a sample? Are there spatters of grease inside the sample chamber? No problem with the MA 100. The Plug & Dry® feature enables you to easily slide out the cover with the heater for thorough cleaning, without the risk of cleaning agent entering the inside of the housing.

## Specifications

### MA35 | MA100 | MA150

	MA35	MA100	MA150
Max. weighing capacity (g)	35	100	150
Accuracy of the weighing system (mg)	1	0.1	1
Weighing system with EC type-approval certificate		•	
Repeatability, average (%)			
– for initial sample weight approx. >1 g	± 0.2	± 0.1	± 0.2
– for initial sample weight approx. >5 g	± 0.05	± 0.02	± 0.05
Readability (%)	0.01	0.001	0.01
Display mode for results			
– % moisture	•	•	•
– % dry weight	•	•	•
– % RATIO	•	•	•
– g residue	•	•	•
– g/kg residue		•	•
– g/l residue			•
– mg weight loss		•	•
– Calculated value (measured value × factor)		•	
Temperature range and settings			
– 40°C–160°C, adjustable in 1-degree increments	•		
– 30°C–230°C, adjustable in 1-degree increments		•	
– 40°C–220°C, adjustable in 1-degree increments			•
Heating mode			
– Standard drying	•	•	•
– Quick drying		•	
– Gentle drying		•	•
– Phase drying		3 × 0.1–999 min.	1 × 0.1–999 min.
Analysis mode			
– Fully automatic	•	•	•
– Semi-automatic		1–50 mg/5–300 sec. 0.1–5.0%/5–300 sec.	1–50 mg/5–300 sec. 0.1–5.0%/5–300 sec.
– Timer settings	1 × 0.1–99 min.	3 × 0.1–999 min.	1 × 0.1–99 min.
– Timer mode × fully/semi-automatic		2 × 0.1–999 min. + automatic	
SPRM® mode for parameter recognition		•	
Heating unit			
– Ceramic IR heating element (infrared)		•	•
– Halogen lamp (infrared)		•	
– CQR heater (coiled quartz radiator)		•	•
– Metal tubular-shaped heating element (infrared dark radiator)			
Later exchange of the heating unit by Plug & Dry®*		•	
Access to the sample chamber			
– via hinged, flip-up cover	•		•
– via motorized cover		•	

	MA35	MA100	MA150
Optional version compliant with FDA HACCP regulations**	•		•
DLG Signam approved			•
Built-in calibration weight		•	
Operator guidance features			
– Context-sensitive menu with alphanumeric interactive prompts and symbols (icons)	•	•	•
– Text input for sample identification using soft-key prompts		•	
– Numeric keypad for sample identification and parameter input		•	
– Parameter input using soft-key prompts	•	•	•
reproTEST for determining the repeatability of the weighing system		•	
Number of program memories	1	30	20
Memory for data storage			
– Statistics of the last 9,999 measurements		•	
– End point up to the next moisture analysis run	•	•	•
Parameter settings password-protected against unauthorized access		•	•
Manual input of tare weights		•	
Data printer			
– Integratable (optionally retrofittable)		•	
– External (optional)	•	•	•
Printout			
– GLP-compliant, user-configurable		•	•
– GLP-compliant, inalterable standard configuration template	•		
– Short record	•		
Data interface port			
– RS-232C unidirectional	•		•
– RS-232C bidirectional		•	
Bar code scanner can be connected		•	
In-use dust cover for keypad		•	•
Power consumption (VA)	max. 400	max. 700	max. 700
Housing dimensions (mm) W×D×H	224×366×191	350×453×156	213×320×180.5
Weight. approx. (kg)	5.8	8.0	5.5

\* Does not apply to the CQR heater

\*\* Not available with halogen lamp or CQR quartz glass heater



## Accessories

### MA35 | MA100 | MA150



Accessories	MA35	MA100	MA150
Disposable sample pans, 80 units, Aluminum, round, Ø 90 mm	6965542	6965542	6965542
Glass fiber filters, Ø 90 mm for analysis of liquid, pasty and fatty samples			
– Hard quality, for viscous samples, 80 units	6906940	6906940	6906940
– Soft quality with high suction force, 200 units	6906941	6906941	6906941
Panel replacement set	YDS05MA	YDS03MA	YDS04MA
Aluminum panels for replacing glass panels to meet FDA HACCP regulations (conversion kit)			
SartoCollect, Software for communication between moisture analyzer and PC (including 25 Pin   9 Pin, 2 m) cable	•	•	•
Carrying case		YDB03MA	YDB05MA
Data printer			
– Integratable		YDP01MA	
– External	YDP20-OCE	YDP20-OCE	YDP20-OCE
Ink ribbon cartridge for data printer	6906918	6906918	6906918
Paper rolls for data printer, – 5 rolls, 50 m each	6906937	6906937	6906937
External calibration weight			YCW5128-00
– 100 g (E2) DKD Certificate			
– 30 g ± 0.3 mg DKD Certificate	YSS43-00		
– 50 g (E2) DKD Certificate		YCW4528-00	
Temperature adjustment set with manufacturer's certificate	YTM01MA	YTM03MA	YTM03MA
500 disposable pipettes	YAT01MA	YAT01MA	YAT01MA

Are you interested in receiving more information about our moisture analyzers?

At [www.sartorius.com](http://www.sartorius.com) you will find our applications database packed with information on which analyzer is best for which application and which Sartorius operating parameters are recommended. Moreover, numerous scientific articles are available for download as PDF files.



## Sartorius LMA200PM

### Speed Meets Analytical Precision



If the sample contains a high moisture content, microwave drying is the fastest and most effective thermogravimetric method (loss-on-drying principle) for moisture analysis. Developed for measuring moisture content ranging from approx. 8% to 100%, the LMA200PM performs moisture analysis in a fraction of the time it takes for other thermogravimetric methods. It delivers results between approx. 40–120 seconds on average. With a cylindrical design, a focused emission of microwave energy is channeled vertically through dual apertures at the bottom of the chamber. This concentrates the microwave energy specifically to the sample. During the test, a carousel spins the sample, permitting an even distribution of microwave energy. This prevents hot and cold spots from occurring, a familiar problem with conventional microwave analyzers.

#### Built-in analytical balance

The moist and dry weight of the sample required for calculating the loss of moisture is measured by a built-in analytical weighing system featuring 0.1 mg resolution. Thanks to its monolithic design (the cell is robotically etched from a single block), this system is particularly suitable for use in a moisture analyzer, because it considerably reduces zero point drift during heat exposure when compared with classic weighing systems.

#### Intelligent endpoint determination

A moisture sensor integrated in the exhaust system of the sample chamber monitors the progress of drying. When the measurement begins, the moisture of the air inside the sample chamber continuously increases as water evaporates from the sample. Once the sample has dried and no longer releases water, the air moisture content drops back to its original level – a clear indication of the end point. At the same time, the built-in weighing system monitors the weight progression and confirms when the sample reaches a constant weight. This dual monitoring system ensures optimal moisture analysis results.

#### High speed

Two factors play a major role for ultra-fast measurements. First, the sample must absorb microwave energy within the shortest time possible and transform it into heat energy. For this purpose, the LMA200PM has a cylindrically shaped sample chamber that focuses the microwave radiation on the sample optimally. Second, the resulting water vapor must be transported away from the sample as fast as possible to obtain rapid analysis results. To accomplish this, a sample is applied to a glass fiber pad that allows water vapor to evaporate not only from the top of the pad and upward through the sample, but also from the bottom of the pad. An exhaust system draws water vapor out of the sample chamber, thus preventing the effects of condensation.



## Specifications | Accessories

### LMA200PM

Model	LMA200PM
Weighing capacity (g)	70
Measuring accuracy of the weighing system (g)	0.0001
Reproducibility on average Initial sample weight starting at approx. 1 g (%)	± 0.05
Sample carriers	90 mm Ø (3½") glass fiber pads
Display modes	% moisture, ppm moisture, % volatile components, % dry weight (solids), ppm dry weight, g dry weight, mg loss on drying, % RATIO
Measuring range	Approx. 8–100% moisture
Sample heating	– Microwave generator with 1000 W input power
Power control for heating	– 2–100%, adjustable in 1% increments
Endpoint determination	– Fully automatic, by means of weight and moisture sensors – User-defined as loss of weight/time: 1–50 mg/ 1–99 sec. 0.1–9.9 %/ 1–99 sec. – Timer mode: 0.1–99.9 min.
Analysis time (in seconds)	Approx. 40–120 (depends on sample and moisture)
Programs	320, saved to non-volatile memory
Data printer	Thermal printer, built-in
Moisture analysis report	– User-configured GLP record – The report can be printed on non-fading paper by the built-in thermal printer.
Operator guidance	– Menu-driven, alphanumeric dialogue text (English, French, German, Italian and Spanish selectable) – 5 pre-programmed function keys
Data interfaces	– 1 × RS-232 port for PC – 1 × Ethernet port
Housing dimensions W x D x H (mm)   (in)	510 × 535 × 304   20 × 21 × 12
Weight, approx. (kg)   (lbs)	22   48.5
Power consumption (VA)	1200 max.

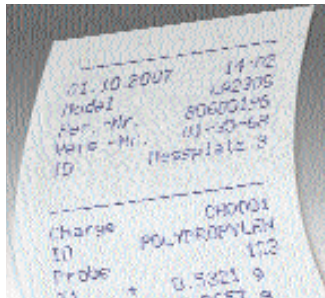
Accessories	Order no.
200 glass fiber pads	6906941
500 disposable pipettes	YAT01MA
5 rolls of printer paper, each with 20 m	69M30100

## Sartorius LA Reference Efficient Management of Backweighing Data



Management of extensive weighing data, such as those generated, for instance, in the classic oven drying method, is a powerful feature of the differential weighing function in the **Sartorius LA Reference** series of balances. For up to 999 samples, these balances save the tare weight, initial sample weight and the backweight, and use these data to calculate the final result.

It does not matter in which sequence the measured data are logged – **LA Reference** adapts to the individual needs of the user. A printout of all weights on the optionally available YDP20-OCE data printer is generated according to the sequence of the sample numbers.



## Specifications|Accessories

### LA Reference\*

Model	Readability	Weighing capacity
LA120S	0.1 mg	120 g
LA230S	0.1 mg	230 g
LA230P	0.1 0.2  0.5 mg 60 120	230 g
LA310S	0.1 mg	310 g
LA130S-balance for weighing filters	0.1 mg	150 g
LA1200S	0.001 g	1200 g
LA620S	0.001 g	620 g
LA220S	0.001 g	200 g
LA2000P	0.001 0.01g	1010 2000 g
LA620P	0.001 0.002 0.005 g	120 240 620 g
LA5200D	0.001 0.01g	1010 5000 g
LA3200D	0.001 0.01 g	1000 3200 g
LA6200S	0.01 g	6200 g
LA8200S	0.01 g	8200 g
LA4200S	0.01 g	4200 g
LA2200S	0.01 g	2200 g
LA820	0.01 g	820 g
LA420	0.01 g	420 g
LA2200P	0.01 0.02 0.05 g	400 800 2200 g
LA5200P	0.01 0.02 0.05 0.1 g	1200 2400 3800 5200 g
LA8200P	0.01 0.02 0.05 g	2000 4000 8200 g

#### Performance features of the differential weighing program

- Memory capacity for 999 samples in up to 100 lots
- Alphanumeric input of lot and sample names
- Taring, sample weighing and backweighing with up to 30 backweighs per sample
- Automatic and manual weight storage
- Evaluation of results with residue and loss (weight unit and %), calculation factor, RATIO values
- List function with display pages for lots, samples, measured values and results
- Statistical evaluation with statistics display page
- Printout as individual, backweighing or statistics record
- User-specific, configurable printout
- Interface port for bar code scanner

\* Models will be phased out in October 2009



**Moreover, all LA Reference balances offer the following features:**

- Backlit graphic display with full text support and variable digit sizes
- Fully automatic calibration|adjustment function, isoCAL
- Memory for ISO|GLP-compliant calibration|adjustment records
- 4 user-programmable lines, e.g., for entering the company's address
- Standard equipped with application programs for counting, weighing in percent, checkweighing, animal weighing, formulation, totalizing, calculation of weight values, density determination and statistics, time-controlled functions, such as automatic data printout at intervals according to a preset time

**Accessories**

**Order No.**

Data printer with date, time, statistics functions

YDP20-OCE

Ink ribbon cartridge for data printer

6906918

Paper rolls for data printer, 5 rolls, 50 m each

6906937

## Sartorius WDS 400. Selective Detection of Surface Water, Capillary Water and Water of Crystallization



### Water, not moisture

Thermogravimetric methods, such as the oven drying method, use the weight loss of a sample to determine the total content of all volatile components and not, however, the pure water content. As a rule, the latter task is performed using electrochemical techniques that are based on the principle of coulometry (coulomb = electric charge). The most commonly known methods are coulometric Karl Fisher titration for solid and liquid samples and the phosphorus pentoxide method for trace analysis of gases. However, both methods require complicated equipment; moreover, KF titration necessitates the use of additional chemicals in order to perform an analysis. The WDS 400 Water Detection System from Sartorius combines these three standard methods into a high-resolution and easy procedure for selective detection of water in solids and pastes.

### Get all three in one

The WDS 400 adopts the principle of convection heating from the oven drying method in order to drive out the entire moisture from a sample. A ceramic disc coated with extremely hygroscopic phosphorus pentoxide P<sub>2</sub>O<sub>5</sub> completely absorbs the water from the resulting gas mixture and bonds water molecules to phosphoric acid H<sub>3</sub>PO<sub>4</sub> on the disc surface in a chemical reaction.

By coulometry, i.e., by an electric current generated at the ceramic disc, phosphoric acid is broken down into phosphorus pentoxide P<sub>2</sub>O<sub>5</sub>, hydrogen H and oxygen O. Based on Faraday's law, it is known how much current is necessary in order to split off all hydrogen atoms from a chemical compound. Thus, the WDS 400 uses the amount of electric current to calculate the quantity of water driven out of a sample.

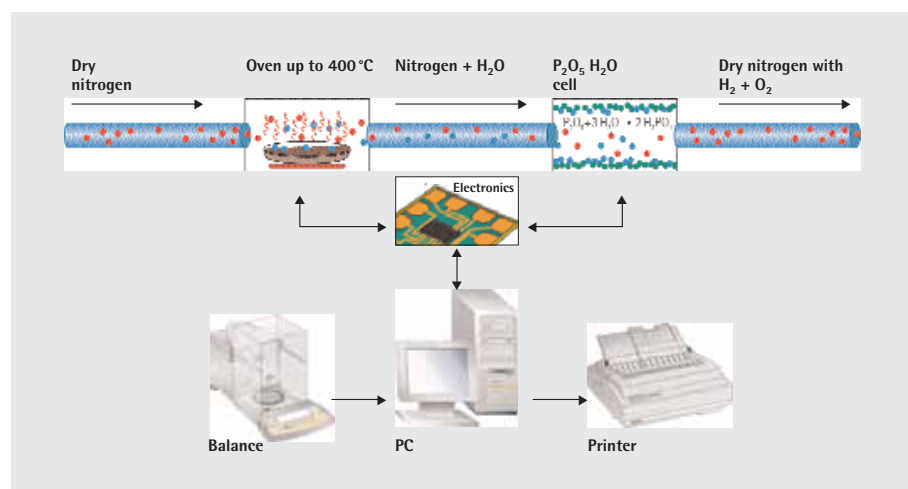
### Highly accurate and selective

This combination method works so accurately that it is even possible to detect one single microgram of water. Beyond that, the WDS 400 enables water fractions to be differentiated according to surface water, capillary water and water of crystallization (the latter is chemically bound water).

### Easy operation

All the user has to do is just weigh-in a sample. The WDS 400 does not require any complicated handling of detection reagents, many of which are toxic.

For measurement of the water content, the user can choose the type of carrier gas, either nitrogen (Class 5.0) or room air. For using room air, the WDS 400 has a built-in pump and a drying unit.



## Specifications|Accessories

### Water Detection System WDS 400



#### Specifications

Moisture analysis method measurement	Thermal analysis followed by coulometric
Sample heating in the built-in stainless steel oven (convection heating)	From room temperature up to 400°C; adjustable in increments of 1°C
Detection limit	1 µg of water
Reproducibility	±2% of the absolute water value measured (depends on sample)
Measuring range	1 ppm to approx. 40% water (depends on sample)
Sample weight, average	15–2,000 mg
Display	ppm/% and µg water, mA current
Analysis time	Average: 10–20 min adjustable in increments of 1 min–10 h
Operator guidance Software	English, for PCs with Windows® 2000   NT   XP
Data storage	On the hard drive of the interfaced PC
Number of measuring programs	Limited only by the PC's hard drive memory
Power supply	115 230 V ±10 %
Frequency	50 ... 60 Hz
Carrier gas	– Dry room air (using integrated air pump with molecular sieve) – Nitrogen, N <sub>2</sub> (Class 5.0)
Gas prepressure	1 bar (15 psi)
Gas consumption	100–200 ml/min
Power consumption	Standby 100 W At full power 600 W
Dimensions (W×D×H)	500×500 ×180 mm
Weight	20 kg

#### Accessories

Regeneration kit for electrochemical cell	69MA0224
Calibration standard	69MA0225
PTFE particle-removing filters starting from serial no. 19070049	69MA0226
PTFE particle-removing filters up to serial no. 19170000	69MA0292
Nickel scoops for weighing samples	69MA0228
Electrochemical cell, uncoated	69MA0232
Molecular sieve for drying unit	69MA0293
Flexible gas tubing, stainless steel, for external gas supply, approx. 2 m	69MA0229





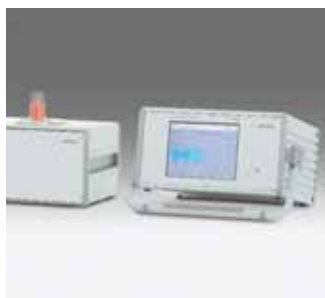
### Recommended balance models

Semi-microbalances	ME235S	ME235P	CPA225D
Weighing range structure	SuperRange	PolyRange	DualRange
Weighing capacity (g)	230	60   110   230	80   100   220
Readability (mg)	0.01	0.01   0.02   0.05	0.01   0.1

Microbalances	SE2	ME5	ME36S	CPA2P	CPA26P
Weighing range structure	SuperRange	SuperRange	SuperRange	PolyRange	PolyRange
Weighing capacity (g)	2.1	5.1	31	0.5   1   2	5   21
Readability (µg)	0.1	1	1	1   2   5	2   10

## Sartorius LMA300P

### Moisture Analysis in a Fraction of a Second



The **LMA300P** works with microwave resonance technology. In this indirect measurement method, a harmonic electromagnetic resonator field is built up by a microwave generator in a sensor (applicator). When the applicator is filled with a sample, the water in the sample interferes with the oscillation behavior (resonance) of the microwave, or interacts with the resonance field, changing the height and width of the resonance frequency peak.

#### Calibration

This change in resonance field is detected by a sensor, and the analyzer CPU calculates the moisture content of the sample based on the calibration previously carried out. The basic analyzer calibration required can be done by the classic oven drying method or, of course, using an infrared moisture analyzer from the Sartorius MA series.

#### Fast measurement

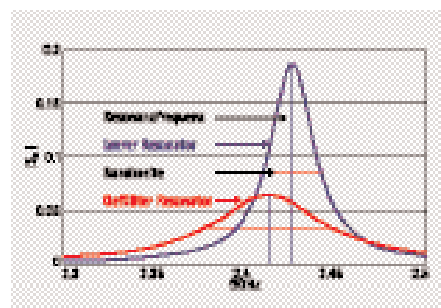
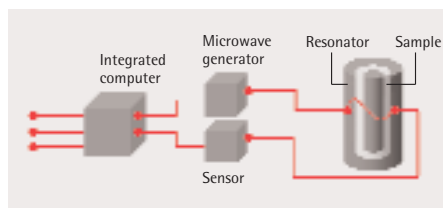
The microwave resonance method offers the advantage of particularly fast measurement in under one second. At the same time, it is non-destructive, which means that samples can be further used for subsequent tests. Changes in the color and surface structure of the sample, as is frequently the case, for instance, in natural raw materials, does not have any effect on calibration or thus on the measured result, unlike near infrared spectroscopy. The microwave resonance method is not limited to measurement of the surface moisture; rather, it also determines the core moisture thanks to its operating principle.

#### Application areas

The **LMA300P** can be used for nearly all pourable and granulated products as well as viscous liquids, such as whitewash and other similar materials. The measuring range is between approx. 0.1–60% moisture. The prerequisite for operating the analyzer is to calibrate measurements on the basis of a measurement procedure providing absolute accuracy. The major application area for the **LMA300P** is incoming and in-process quality control.

#### Design

The LMA300P is a modular-designed system consisting of a control and evaluation unit, **LMA300PA**, and a resonator module. This type of modular design allows a different resonator type to be used (available on request), and enables the analyzer to be easily adapted to customer-specific applications.



## Specifications | Accessories

### LMA300P

#### Specifications\*

Measuring range (%)	Approx. 0.1–60
Readability (%)	0.01
Measuring accuracy (%) (depends on calibration and type of sample)	± 0.05
Measuring time (s)	< 1
Display	% moisture, % dry weight (solids)
Measurement method	Microwave resonance technology
Allowable sample temperature (°C)	Approx. 0–70
Operator guidance	Touch screen with demand-driven menu based on alphanumeric prompts (dialogue text and symbols)
Memory for number of measurement programs	40
Data printer, optional	External
GLP-compliant report	Yes, with optionally available printer, YDP20-OCE
Interface port	2 × RS-232 C for printer and PC USB port + 128 MB USB flash drive
Line voltage	110–230 V AC
Frequency	50 ... 60 Hz
Power consumption	60 VA max.
Housing dimensions (in mm) W × D × H Control unit, LMA300PA	500 × 430 × 200
Weight approx. (kg) Control unit, LMA300PA	11.5

\*\* In addition to the LMA300PR sensor module, other sensors are also available on request. Depending on the desired application, however, the technical specifications will have to be agreed on with a Sartorius applications technician.

Optional Accessories	Order no.
Data printer	YDP20-OCE
Ink ribbon cassette for YDP03-OCE	6906918
Printer paper, 5 rolls, each with 50 m, for YDP03-OCE	690693
Applicator, 60 mm	69MA0294
Applicator, 140 mm	69MA0295
Reference standard	LMA301SY

Sensor Specifications	LMA300PR	LMA301PR	LMA302PR	LMA303PR	LMA304PR
Dimensions (mm)	370 × 245 × 275	370 × 245 × 275	370 × 395 × 375	260 × 270 × 280	370 × 385 × 375
Weight	10 kg	10 kg	11 kg	5 kg	15 kg
Sample volume	(60/150) ml	(90/125) ml	400 ml	27 ml	2000 ml
Resonator diameter	40 mm	50 mm	46 mm	26 mm	96 mm

## Sartorius PMD300P and PMD301P

### Online Moisture Analysis in a Fraction of a Second



The moisture analysis systems from the Sartorius PMD300 series have been designed for online, in-process analysis. Through the use of microwave resonance technology, moisture content can be measured in less than one second. The system averages the individual measurements over a user-defined period. Then they are sent over the appropriate interface to a PC, switch cabinet or a PLC controller. Both core and surface moisture content are measured. The analysis is non-destructive and is not influenced by the color, density or surface characteristics of the sample material.

#### Sensors

A wide variety of sensors is available for the PMD300 series. This way, the analysis method can be customized to the sample and process as each situation requires. Depending on sensor type, the measuring range is between a moisture content of 0.1% and 60%.

Ultrasensitive planar sensors, featuring a special ceramic surface, are especially suited for use in assembly lines or in hoppers. Due to their compact form and high protection rating, all sensors can be used in the food industry. The diameter of the sensors' measuring field is between 50 mm and 130 mm.

Bypass sensors are especially suited for pourable or granulated products that are transported through pipes. Intake and discharge valves controlled by the PMD301P extract a defined sample amount, measure it and then return it to the main current. Optional functions also allow density to be measured together with moisture.

A special fork sensor is available for non-contact analysis. The sample is sent between two sensor surfaces without it touching the surface of the sensors. Ex-protected versions are available for all sensor types.

#### Applications

**Monitoring and retraceability:**

These versatile analysis systems can be used in a variety of locations. For example, they can be used in the incoming goods department to analyze raw materials continuously and document the results. Instead of doing spot checks, the entire batch is monitored without interruption. (Meets IFS V5 requirements.)

**Optimizing energy consumption:**

A significant factor contributing to the success of many processes is exact and immediate moisture analysis. This is why online moisture measurement is often used in baking and drying processes. The ideal conditions for drying and baking processes can be met by continuously monitoring moisture content without loss of time. The temperature in the oven, air supply or conveyor belt speed are adjusted to the current moisture content of the product. This lets you save valuable energy.

#### Time management

Frequently, a predefined moisture content must be reached before proceeding to the next step in the process (batch processing). This is possible using Sartorius' online moisture analysis systems because they measure moisture content continuously and send them to the controller without delay. When the target moisture content has been reached, the process will go on to the next step instantaneously and automatically. Online moisture analysis makes your process efficient and transparent.



## Specifications | Accessories

### PMD300PA-000U

#### Evaluation unit

Dimensions	410 × 460 × 210 mm
Weight	19 kg
Material	Stainless steel
Protection rating	IP 54

#### Mains connection (line voltage)

(110–230) V AC / (50–60) Hz / 70 VA

#### Interface ports

Data	One RS-422 port (for PC, PLC, online computer); two RS-232 ports; optional Profibus and Ethernet ports
Analog output	2 × (0/4–20) mA (active, potential-free)
Analog input	1 × (0/4–20) mA
Control inputs	4 × optocoupler inputs, 24 V, e.g. for start, stop and product selection
Control outputs	5 potential-free (24 V, 0.25 A DC)

#### Ambient conditions

##### Temperatures

Sample temperature	0°C to +70°C autom. temperature compensation
Ambient temperature	0°C to +40°C

#### Accessories

Reference standard for planar sensors	PMD302SY
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#### Planar sensor specifications

##### PMD310SR

Protection rating	IP 65
Height of microwave field over the sensor	up to 50 mm
Sensor material	ceramic
Measuring field diameter	110 mm
Sensor diameter	188 mm
Sensor height	53 mm
Weight	3 kg

##### PMD311SR

Protection rating	IP 65
Height of microwave field over the sensor	up to 70 mm
Sensor material	ceramic
Measuring field diameter	120 mm
Sensor diameter	188 mm
Sensor height	53 mm
Weight	3 kg

##### PMD312SR

Protection rating	IP 65
Height of microwave field over the sensor	up to 80 mm
Sensor material	ceramic
Measuring field diameter	130 mm
Sensor diameter	188 mm
Sensor height	53 mm
Weight	3 kg

##### PMD313SR

Protection rating	IP 65
Height of microwave field over the sensor	up to 30 mm
Sensor material	ceramic
Measuring field diameter	50 mm
Sensor diameter	80 mm
Sensor height	112 mm
Weight	1.6 kg

## Sartorius LMA500. Analyzing Moisture Content With Optics — Quick, Reliable, Non-Destructive



The LMA500 uses spectroscopy. It exploits the interaction between light and the sample. If the sample is exposed to near infrared light (NIR), a part of this light is reflected and modified characteristically on interaction with the sample. This change in the NIR light, which is dependent on the water content of the sample, reveals its moisture content.

### Calibration

The LMA500 calibrates itself by analyzing data it has collected using sophisticated multivariate statistics (regression analyses, approximation procedures) practically without the need for user input or expert knowledge. If desired, you can quickly adjust the calibration by connecting an MA35 rapid moisture analyzer. This allows you to adjust to changes in sample characteristics, giving you another method for updating your system to new batches. Or you can create calibrations for products that have just been added to your product portfolio. Calibration settings for many classes of substances are available from Sartorius.

### Verification made easy

Multivariate evaluation offers index values for evaluating measurements. This information identifies anomalies or samples that have been categorized incorrectly so corrective action can be taken immediately.

### Applications

The LMA500 is designed for analyzing the moisture content of pourable and granulated products, and viscous products as well such as slurry. It measures moisture content within a range of approximately 0.1% – 50%. Calibration with a direct measurement is required if you wish to use the NIR calibrator. The NIR calibrator is optimized for use with the MA35 moisture analyzer. Naturally, other reference methods can be used. The major applications of the NIR calibrator include laboratory analysis and at-line process control. Analysis does not modify the sample, so the sample can still be used after measurement.

### Design

The NIR calibrator and its measuring, operating and evaluating components are contained in a water resistant IP54 housing. A fiber optic cable connects the probe so that measurements can not only be taken in the integrated analysis area but also at other locations, in the MA35 or directly in the production process. Thanks to the device's compact design, it can be quickly transported to other testing locations.

### Software

The LMA500's software is easy to use and intuitive. All data are protected. Only users who have authenticated can access the system. User permissions can be individually modified to suit your needs. No expert knowledge is necessary to create, extend or adjust calibration settings.

## Specifications

### LMA500PO

#### Spectrometer system

Spectral range	1,100 to 1,700 nm (effective: 1,100 to 1,680 nm)
A/D converter	16 bits
Spectral resolution [ $\Delta\lambda$ FWHM]	< 16 nm
Wavelength precision	< 5 nm
Signal to noise ratio	> 3500:1
Photometric linearity	Gradient: $1 \pm 0.05$ ; Axis intercept: $0 \pm 0.05$

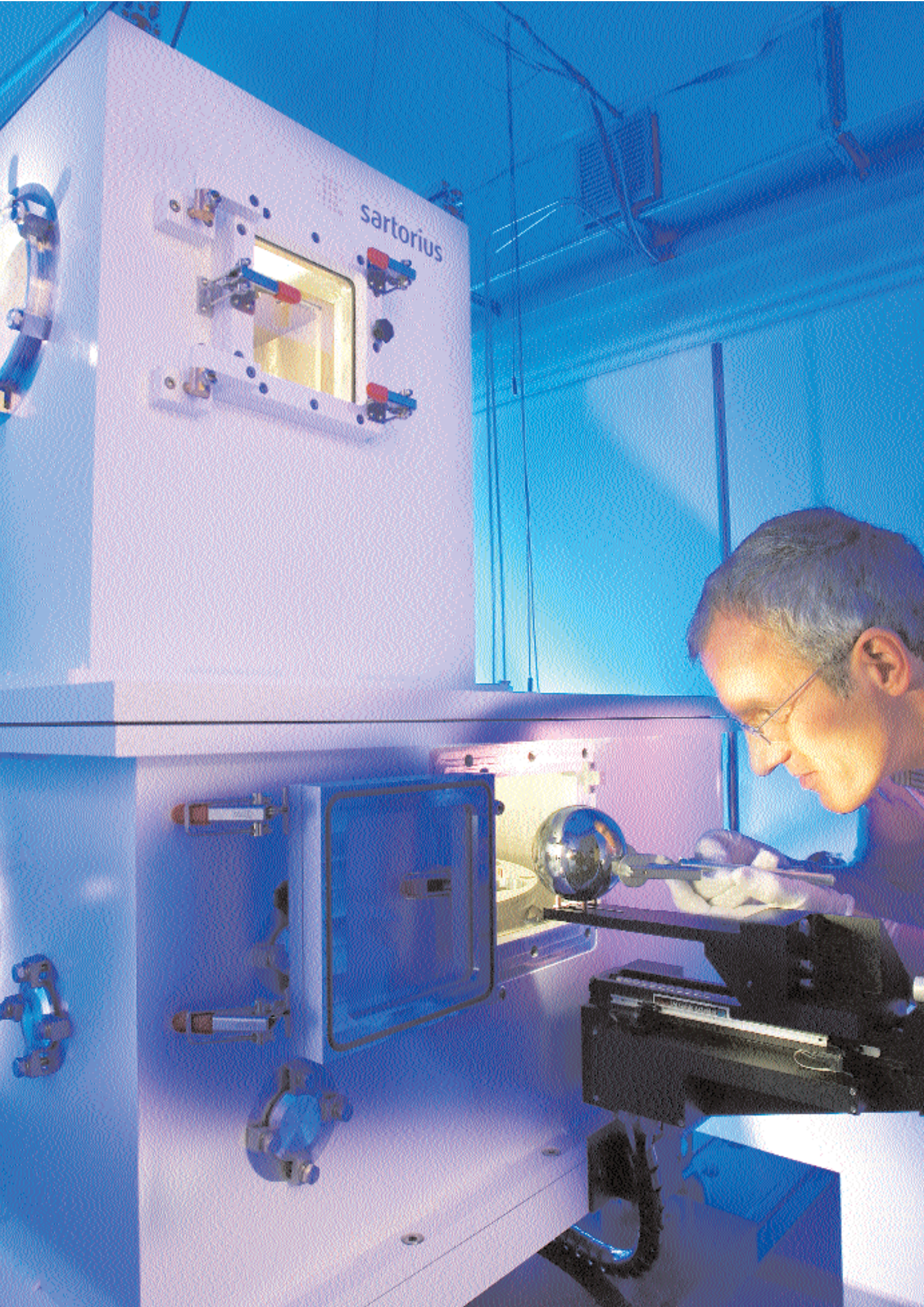
#### Functions

Measurement range, typical	0 to 50% moisture (pourable and granulated samples)
Reproducibility, typical (%)	0.2% absolute moisture, dependent on sample and reference method
Precision of comparison, typical (%)	0.5% absolute moisture, dependent on reference method
Measurement time, typical	2 seconds
Memory capacity	1 GB for data and calibration
Sample pan dimensions	Ø 90 mm

#### Device (Hardware)

Dimensions	(W × D × H) 550 × 387 × 180 mm
Net weight, ca.	11.5 kg
Voltage	100 V to 240 V, -15% ... +10%
Frequency	48–60 Hz
Fuses	2 (ground/phase), 6.3 AT, 5 x 20 mm
Power consumption	45 VA maximum
Temperature range	+10°C ... +30°C
IP protection rating	IP54 (also during use); Front cover, display: IP65
Built-in interface	2+ RS232C (To connect MA35 and YDP20-OCE) Format: 7 bit ASCII, 1 start bit, 1 stop bit Parity: odd Speed: 1200 baud Handshake: hardware
Digital interfaces	1 Ethernet (RJ45): 10/100 Base-T, 1 x USB 1.1, PS/2 Keyboard
Display	Touchscreen 8.4" TFT (SVGA)









## Mass Metrology

## Automatic Mass Comparators and Robots



CCL1007



Load alternator CCL1007



CCR10-1000



Weight grabber CCR10-1000

### The fascination of precision

International trade requires the worldwide standardization of certain measurements. Mass plays an important role, because the majority of commerce throughout the world is defined by the mass of substances. To make sure the same masses are used around the world, each country has a national metrology institute (NMI) that governs units of measurement. These institutes are the measure of all things.

### Mass determination to the most exacting standards

On behalf of and in collaboration with the NMIs, Sartorius develops innovative mass comparators to the highest standards.

Sartorius has mastered the core disciplines of weighing like no other company, and sets new standards in mass metrology. In cooperation with the Bureau International des Poids et Mesures and the Institute for Process Measurement and Sensor Technology of the Technical University of Ilmenau, Sartorius has developed a mass comparator – the CCL1007 – that is capable of determining differences in mass to an accuracy of 0.1 µg for weights of 1 kg – even under high-vacuum conditions.

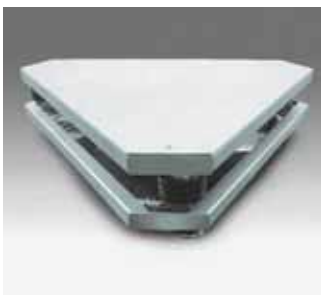
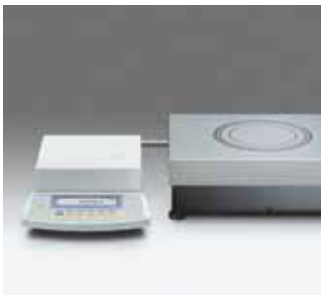
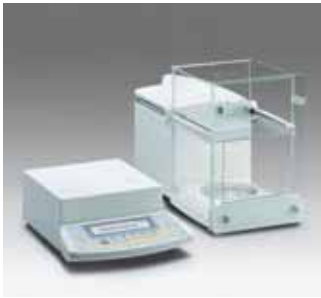
Our metrology experts will be happy to advise you, offering the best solution available to meet your needs.

### Automatic mass comparators and robots

Model	Maximum load	Readability	Typical Repeatability*	R = Robot A = Automatic
CCL1007	1,031 g	0.1 µg	0.1 µg	A 8 positions
CCR10	10.5 g	0.1 µg	0.2 µg	R 39–104 positions
CCR1000	1,002 g	1 µg	2 µg	R 21–60 positions
CCR10-1000	10.5 g 1,002 g	0.1 µg 1 µg	0.2 µg 2 µg	R 39–104 positions R 21–60 positions
CCE1000S-L	1.002 kg	0.001 mg	0.001 mg	A 4 positions
CCE10000U-L	10.05 kg	0.01 mg	0.01 mg	A 4 positions
CCE10000S-L	10.05 kg	0.1 mg	0.1 mg	A 4 positions
CCE20000S-L	20.05 kg	0.1 mg	0.1 mg	A 4 positions
CCE50001S-L	51 kg	1 mg	1 mg	A 2 positions

\* Repeatability is the standard deviation "s"; it is calculated from 6 ABBA cycles, after eliminating drift.

## Manual Mass Comparators



### Specifications

Model	Maximum load (g)	Readability (mg)	Typical repeatability (s in mg)*
<b>Analytical range</b>			
CCE6	6.1	0.0001	0.00015
CCE36	31	0.001	0.001
CCE66	61	0.001	0.001
CCE111	111	0.001	0.001
CCE605	610	0.01	0.015
CCE1005	1,110	0.01	0.01

### Universal range

CCE1004	1,200	0.1	0.05
CCE2004	2,500	0.1	0.1
CCE5004	5,100	0.2	0.3
CCE5003	5,100	1	0.5
CCE10000S	10,050	0.1	0.1
CCE10K3	11,000	1	1
CCE20000	20,050	1	1
CCE40K3	41,000	2	3
CCE60K3	64,000	2	4
CCE60K2	64,000	10	7

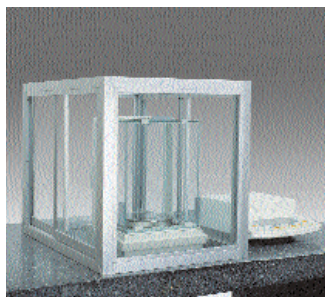
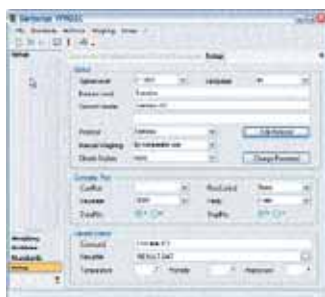
### Research and testing range

CCI60K2	64,000	50	100
CCI100K2	151,000	50	200
CCI300K	303,000	1,000	500
CCS600K	605,000	1,000	2,000
CCT1000K	1,200,000	1,000	2,000
CCS1000K	1,510,000	5,000	5,000
CCT2000K	2,010,000	1,000	5,000
CCS3000K	3,010,000	1,000	10,000

\* Repeatability is the standard deviation "s"; it is calculated from 6 ABA cycles, after eliminating drift.



## Accessories for Mass Determination



### Density determination

	Model	Maximum load	Readability	Typical repeatability
Volume comparator with 2 load alternators	VD1005	1,125 g	0.01 mg	0.02 mg
Volume comparator with load alternator	VL1005	1,125 g	0.01 mg	0.02 mg
Pycnometer for weights up to 50 kg	YP50K	50 kg		
Density reference: 1 kg silicon sphere	YDR1000SIC			
Density reference: 500 g silicon sphere	YDR500SIC			
Density reference: 200 g silicon sphere	YDR200SIC			

### Analysis of magnetic properties

Susceptometer for weights up to 50 kg	YSZ01C	50 kg	10 µg	10 µg
Susceptometer for weights up to 50 kg	YSZ02C	50 kg	1 µg	5 µg
Calibration kit for susceptometer	YSZ01RMC			
Susceptibility reference (1 kg)	YSZ01RMC			
Permeability indicator	YAW61			

### Software for mass determination

ScalesNet with Data Logger converter	YSN01C			
ScalesNet V4, 3. and other software licenses	YSN01LC			
ScalesNet V4, license for mass derivation	YSN01MC			
Data Logger converter (RS232 → LAN)	YSN01DC			
Evaluation program for mass metrology	YPR02C			

### Air density determination

Climate station for an E1 laboratory	YCM02C			
Climate station for an E2 laboratory	YCM03C			
Precision climate station for an E1 laboratory	YCM05C			

### Draft shields

for CCE10000S-L, CCE10000U-L, CCE20000S-L	YDS01C			
for CCE1000S-L	YDS44C			
for CCE40K3, CCE60K3, CCE60K2	YDS03C			
for CCE40K3, CCE60K3, CCE60K2	YDS05C			
for CCE6, SE2, ME5	YDS20C			
for CCE111	YDS22C			
for CCE1004, CCE2004, CCE5004, CCE5003	YDS24C			
for ME235S, CCE36, CCE66, CCE1005	YDS26C			
for CCI60K2	YDS62C			
for CCI100K2, CCI300K	YDS64C			
for CCS600K, CCS1000K	YDS80C			
for CC3000K	YDS82C			
for CCT1000K	YDS85C			
for CCT2000K	YDS87C			



## Weights and Weight Sets (YCW, YCS)



### The complete line – ranging from weights to certified testing services

Regular inspection and testing of weighing instruments are a must to ensure reliable weighing results. Sartorius offers highly accurate metrological weights and weight sets with nominal mass values from 1 mg to 1,000 kg, special and test weights, as well as the accessories required for correct handling and storage of weights.

Sartorius weights and weight sets are calibrated by the DKD\* and comply with the International Recommendation OIMLR111: 2004. They are therefore suitable for legal and general metrological applications in research and industry.

Sartorius weights meet the requirements for traceability to the national kilogram prototype in conformance with ISO 9001:2000. These weights help support your quality management and quality assurance systems, and fulfill GLP and GMP requirements.

### Your DKD partner for mass units

Sartorius is a DKD calibration laboratory for both weights and electronic laboratory balances and industrial scales. Sartorius calibration laboratories have been inspected and accredited for compliance with the regulations of the German calibration service, DKD, concerning mass units and meet the DIN EN ISO IEC 17025 international standard for test laboratories.

### Recalibration for any brand names, manufacturers and designs

Depending on how frequently weights are used, they must be recalibrated on a regular basis so that they meet the requirements for reliable measuring, inspection and test equipment. Sartorius offers recalibration service along with DKD calibration certificates for all weights ranging from 1 mg to 50 kg, regardless of their design or brand name, and up to 500 kg for F2 and M1 weights.

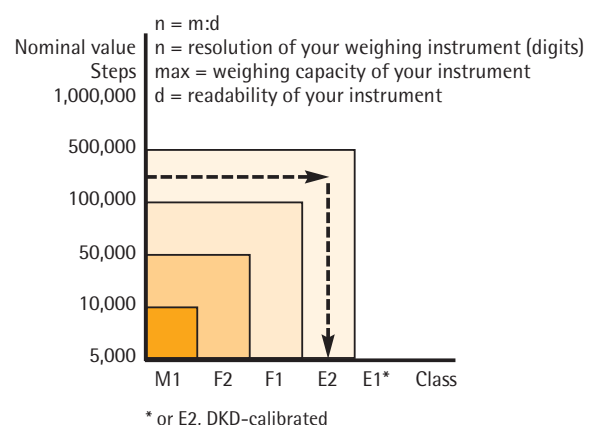
### Here's how to find the right test weight

Just determine the number of digits specified for your weighing instrument's resolution, then check the graph below for the particular accuracy class that your test weight must have.

The weight value of your test weight should be more than 80% of the maximum capacity of your weighing instrument.

Use the following chart to determine whether you need an individual weight or a weight set by comparing the nominal mass values.

Example: Suppose your weighing instrument has a capacity of 2,200 g and a readability of 0.01 g. This yields 220,000 digits, which correspond to a class E2 test weight. Since 80% of 2,200 g is 1,760 g, you need to round it to a weight value of 2,000 g.



## Metrological Weight Sets in Wooden Cases with Forceps\*



Weight sets

### Composition of the weight sets

- Weight without marking
- Weight with marking

Range	Contents	mg	g	kg
<b>1 mg – 5 g</b> Total contents: 11.11 g 16 pcs	1	●	●	
	2	● ○	● ○	
	5	●	●	
	10	●		
	20	● ○		
	50	●		
	100	●		
	200	● ○		
<b>1 mg – 100 g</b> Total contents: 211.11 g 21 pcs	1	●	●	
	2	● ○	● ○	
	5	●	●	
	10	●	●	
	20	● ○	● ○	
	50	●	●	
	100	●	●	
	200	● ○		
<b>1 mg – 200 g</b> Total contents: 611.11 g 23 pcs	1	●	●	
	2	● ○	● ○	
	5	●	●	
	10	●	●	
	20	● ○	● ○	
	50	●	●	
	100	●	●	
	200	● ○	● ○	
<b>1 mg – 1 kg</b> Total contents: 2,111.11 g 25 pcs	1	●	●	●
	2	● ○	● ○	
	5	●	●	
	10	●	●	
	20	● ○	● ○	
	50	●	●	
	100	●	●	
	200	● ○	● ○	
<b>1 mg – 5 kg</b> Total contents: 11,111.11 g 28 pcs	1	●	●	●
	2	● ○	● ○	● ○
	5	●	●	●
	10	●	●	
	20	● ○	● ○	
	50	●	●	
	100	●	●	
	200	● ○	● ○	
<b>1 g – 1 kg</b> Total contents: 2,110 g 13 pcs	1		●	●
	2		● ○	
	5		●	
	10		●	
	20		● ○	
	50		●	
	100		●	
	200		● ○	
<b>1 g – 5 kg</b> Total contents: 11,110 g 16 pcs	1		●	●
	2		● ○	● ○
	5		●	●
	10		●	
	20		● ○	
	50		●	
	100		●	
	200		● ○	
<b>1 g – 10 kg</b> Total contents: 21,110 g 17 pcs	1		●	●
	2		● ○	● ○
	5		●	●
	10		●	●
	20		● ○	
	50		●	
	100		●	
	200		● ○	

\* 1 kg and up: glove included

## Weight Sets (YCS)



### Features of Sartorius weight sets

The weights contained in Sartorius weight sets have the same features and properties as the individual weights in the corresponding maximum permissible errors. Sartorius weight sets are supplied in a wooden case, along with gloves, forceps and brushes.

Service weight sets come in a plastic case for mobile maintenance of balances and scales.

Class E1 and E2 weight sets come with wire weights up to 500 mg.

Class F1, F2 and M1 weight sets come with leaf weights up to 500 mg.

Nominal mass	E1	E2	F1
From 1 mg to 5 g	YCS011-351-0X	YCS011-352-0X	
From 1 mg to 100 g	YCS011-511-0X	YCS011-512-0X	YCS01-513-0X
From 1 mg to 200 g	YCS011-521-0X	YCS011-522-0X	YCS01-523-0X
From 1 mg to 1 kg	YCS011-611-0X	YCS011-612-0X	YCS01-613-0X
From 1 mg to 5 kg	YCS011-651-0X	YCS011-652-0X	YCS01-653-0X
From 1 g to 1 kg	YCS31-611-0X	YCS31-612-0X	YCS31-613-0X
From 1 g to 5 kg	YCS31-651-0X	YCS31-652-0X	YCS31-653-0X
From 1 g to 10 kg	YCS31-711-0X	YCS31-712-0X	YCS31-713-0X

Nominal mass	F2	M1
From 1 mg to 100 g	YCS01-514-0X	YCS01-515-0X
From 1 mg to 200 g	YCS01-524-0X	YCS01-525-0X
From 1 mg to 1 kg	YCS01-614-0X	YCS01-615-0X
From 1 mg to 5 kg	YCS01-654-0X	YCS01-655-0X
From 1 g to 1 kg	YCS31-614-0X	YCS31-615-0X
From 1 g to 5 kg	YCS31-654-0X	YCS31-655-0X
From 1 g to 10 kg	YCS31-714-0X	YCS31-715-0X

Service weight set	E2	F1
From 100 g to 5 kg	YSS5128-6528-0X	
From 1 g to 5 kg		YSS3138-6538-0X

### Options:

X = 0: weights with DKD certificate in Sartorius's name (E2, F1, F2 – 50 kg)

X = 2: weights with DKD certificate in customer's name

YCW02: DKD calibration certificate with customer data

# mg Weights (YCW)



Knob weights



Leaf weights



Wire weights

## Features of Sartorius weights

Class F1 leaf weights (F2, M1 in weight sets);  
individual weights available on request  
1-5 mg aluminum; density 2.7 g/cm<sup>3</sup>  
10-500 mg nickel silver; density 8.6 g/cm<sup>3</sup>

Class E1 and E2 wire weights  
1-500 mg special steel,  
non-magnetizable  
E1; density 8.0 g/cm<sup>3</sup>  
E2; density 7.95 g/cm<sup>3</sup>

Nominal mass	Wire weights Class E1	Wire weights Class E2	Leaf weights Class F1
1 mg	YCW0111-0X	YCW0121-0X	YCW013-0X
2 mg	YCW0211-0X	YCW0221-0X	YCW023-0X
5 mg	YCW0511-0X	YCW0521-0X	YCW053-0X
10 mg	YCW1111-0X	YCW1121-0X	YCW113-0X
20 mg	YCW1211-0X	YCW1221-0X	YCW123-0X
50 mg	YCW1511-0X	YCW1521-0X	YCW153-0X
100 mg	YCW2111-0X	YCW2121-0X	YCW213-0X
200 mg	YCW2211-0X	YCW2221-0X	YCW223-0X
500 mg	YCW2511-0X	YCW2521-0X	YCW253-0X

## Options:

X = 0: weights with DKD certificate in Sartorius's name (E2, F1, F2 – 50 kg)

X = 2: weights with DKD certificate in customer's name

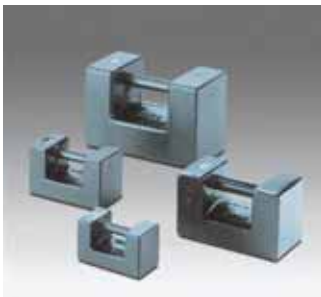
YCW02: DKD calibration certificate with customer data



## Weights (YCW)



Knob weights



Block weights



Cylindrical weights

Class E1, E2, F1 and F2 knob weights  
1 g to 50 kg, special steel,  
non-magnetizable  
E1; density 8.0 g/cm<sup>3</sup>  
E2, F1, F2; density 7.95 g/cm<sup>3</sup>

M1: 1–10 kg, brass/galvanized,  
shiny polished  
Packaging of the weights:  
up to 20 g in a plastic box  
from 50 g in a wooden case  
from 1 kg: glove included

### Knob weights (100 kg and up: cylindrical weights)

Nominal mass	E1 (1)	E2 (1)	F1 (1)	F2 (1)	M1 (2)	M2 (3)
1 g	YCW311-0X	YCW312-0X	YCW313-0X	YCW314-0X		YCW316-0X
2 g	YCW321-0X	YCW322-0X	YCW323-0X	YCW324-0X		YCW326-0X
5 g	YCW351-0X	YCW352-0X	YCW353-0X	YCW354-0X		YCW356-0X
10 g	YCW411-0X	YCW412-0X	YCW413-0X	YCW414-0X		YCW416-0X
20 g	YCW421-0X	YCW422-0X	YCW423-0X	YCW424-0X		YCW426-0X
50 g	YCW451-0X	YCW452-0X	YCW453-0X	YCW454-0X		YCW456-0X
100 g	YCW511-0X	YCW512-0X	YCW513-0X	YCW514-0X		YCW516-0X
200 g	YCW521-0X	YCW522-0X	YCW523-0X	YCW524-0X		YCW526-0X
500 g	YCW551-0X	YCW552-0X	YCW553-0X	YCW554-0X		YCW556-0X
1 kg	YCW611-0X	YCW612-0X	YCW613-0X	YCW614-0X	YCW615-0X	YCW616-0X
2 kg	YCW621-0X	YCW622-0X	YCW623-0X	YCW624-0X	YCW625-0X	YCW626-0X
5 kg	YCW651-0X	YCW652-0X	YCW653-0X	YCW654-0X	YCW655-0X	YCW656-0X
10 kg	YCW711-0X	YCW712-0X	YCW713-0X	YCW714-0X	YCW715-0X	YCW716-0X
20 kg	YCW721-0X	YCW722-0X	YCW723-0X	YCW724-0X		
50 kg	YCW751-0X	YCW752-0X	YCW753-0X	YCW754-0X		
100 kg			YCW813-0X	YCW814-0X*	YCW8157-0X	
200 kg			YCW823-0X	YCW824-0X*	YCW8257-0X	
500 kg			YCW853-0X	YCW854-0X*	YCW9157-0X	
1,000 kg			YCW913-0X	YCW914-00*		

\* Cylindrical weight with lug



Block weight, stainless steel



Block weight

Nominal mass	Block weights (1) M1	Block weights (4) M1	Block weights (4) M2
5 kg	YCW6554-0X	YCW6559-0X	
10 kg	YCW7154-0X	YCW7159-0X	
20 kg	YCW7254-0X	YCW7259-0X	
50 kg	YCW7554-0X	YCW7559-0X	
100 kg		YCW8159-0X	YCW6569-0X
200 kg**		YCW8259-0X	YCW7169-0X
500 kg**		YCW8559-0X	YCW7269-0X
1,000 kg**		YCW9159-0X	YCW7569-0X

\* Cylindrical weight with lug for crane

\*\* Cylindrical weight with lug for crane, stackable

### Material:

(1) stainless steel, (2) galvanized brass, (3) brass, precision lathed surface,  
(4) Material: gray casting, painted black

### Options:

X = 0: weights with DKD certificate in Sartorius's name (E2, F1, F2 – 50 kg)

X = 2: weights with DKD certificate in the customer's name

YCW02: DKD calibration certificate with customer data

# Test Weights (YCW...8)



Test Weights

## Features of Sartorius test weights

Stainless steel, non-magnetizable,  
density 7.9 g/cm<sup>3</sup>, shiny polished;  
packaging:  
in a plastic screw-top can with  
DKD certificate in Sartorius's name

Nominal mass	E2	F1	F2
1 g	YCW3128-00	YCW3138-00	
2 g	YCW3228-00	YCW3238-00	
5 g	YCW3528-00	YCW3538-00	
10 g	YCW4128-00	YCW4138-00	
20 g	YCW4228-00	YCW4238-00	
50 g	YCW4528-00	YCW4538-00	
100 g	YCW5128-00	YCW5138-00	YCW5148-00
200 g	YCW5228-00	YCW5238-00	YCW5248-00
500 g	YCW5528-00	YCW5538-00	YCW5548-00
1 kg	YCW6128-00	YCW6138-00	YCW6148-00
2 kg	YCW6228-00	YCW6238-00	YCW6248-00
5 kg	YCW6528-00	YCW6538-00	YCW6548-00
10 kg		YCW7138-00	YCW7148-00

## Option:

YCW02: DKD calibration certificate with customer data

## Accessories for Weights (YAW)



Forceps



Weight forks



Handles for lifting weights



Permeability indicator



Susceptometer



Clean room weight case

### Accessories for Sartorius weights

Sartorius offers glass bell jars with a support plate, plastic cases, brushes, gloves, forceps with silicone-coated tips, weight forks, handles for lifting weights and a permeability indicator (for checking magnetic properties of weights of accuracy classes E1, E2, F1 and F2).

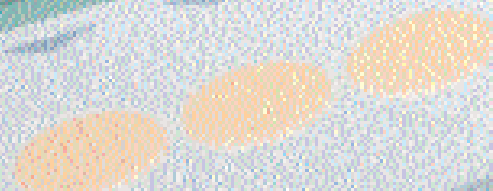
In addition, Sartorius supplies susceptometers for easy and convenient determination of the susceptibility and magnetization of weights in accordance with OIML R111: 2004.

Accessories		Order No.
Glass bell jar with support plate	for 1 mg – 5 g	YAW00
	for 1 mg – 50 g (100 g or 200 g)	YAW01
	for 100 g – 1 kg (2 kg)	YAW02
	for 2 kg – 5 kg	YAW03
	for 10 kg	YAW04
	for 20 kg	YAW05
Brush	for 50 kg	YAW06
	small, 100 mm	YAW11
	medium, 115 mm	YAW12
	large, 150 mm	YAW13
Pair of gloves	extra large, 250 mm	YAW14
	Cotton	YAW21
	Leather	YAW22
Forceps with silicone-coated tips	115 mm for 1 mg – 5 g	YAW31
	160 mm for 1 g – 200 g	YAW32
	230 mm for 1 g – 1 kg	YAW33
Weight forks	for 500 g	YAW41
	for 1 kg	YAW42
	for 2 kg	YAW43
Handles for lifting weights	for 5 kg	YAW50
	for 10 kg	YAW51
	for 20 kg	YAW52
	for 50 kg	YAW53
Permeability indicator	For checking magnetic properties of weights of accuracy classes (OIML R111: 2004) E1, E2, F1 and F2; supplied in a wooden case	YAW61
Susceptometer	Resolution 10 µg	YSZ01C
	Resolution 1 µg	YSZ02C
Standard susceptibility reference	For checking magnetic properties of weights of accuracy classes E1, E2, F1 and F2, field of application according to OIML R111: 2004 from 2 g to 50 kg.	
	1 kg	YSZ01RMC
Calibration kit for susceptometer		YSZ01RMC
Plastic screw-top can for individual weights* with closed-pore insert; also suitable for clean rooms	for 50 g weights	YAW50GL
	for 100 g weights	YAW100GL
	for 200 g weights	YAW200GL
	for 500 g weights	YAW500GL
	for 1 kg weights	YAW1000GL
	for 2 kg weights	YAW2000GL
	for 5 kg weights	YAW5000GL
	for 10 kg weights	YAW10000GL

\* for knob weights only; for information on cans for cylinder weights, please contact Sartorius

Docu-ph<sub>100</sub>

12.03.08 12:15  
20.5 °C ATC 100  
-82.6 mV  
1.58



Menu Cal Print/Menu







## Electroanalysis for Laboratories

## Sartorius DocuClip® & Docu-pH<sub>Meter</sub>

### The New Standard for Reliability in Electrochemical Analysis



Reliability starts with easy and comprehensive operation. With the newly developed Docu-pH<sub>Meter</sub> instruments, Sartorius is setting new standards in the determination and management of measured values. Equipped with a graphic display and easy-to-use softkeys, all Docu-pH<sub>Meter</sub> models are practical meters that make even complex laboratory tasks simple.

You can choose between "intelligent" electrodes connected to DocuClip® or standard electrodes with a BNC connector.

#### Comprehensive features – simple results

- Graphical display and softkeys
- Easy-to-understand menu-driven prompts in plain language
- Defined function keys for the most common applications; no double-assigned keys

- Fast mode for rapid results
- Automatic recognition of the DocuClip®
- Automatic recognition of a variety of temperature probes
- Serial interface for data transfer to computer or printer (Docu-pH<sub>Meter</sub>⁺)
- Data storage capacity for 500 data records (Docu-pH<sub>Meter</sub>⁺)

Give your electrodes an identity. DocuClip® is a unique device that makes an electrode uniquely identifiable, in just seconds. Equipped with built-in memory for calibration data, DocuClip® works together with the Sartorius Docu-pH<sub>Meter</sub> to store essential electrode specifications over its entire service life.

Electrode data is logged 100% automatically in each measurement, and can be sent to a printer or exported to a computer for further processing.

#### Specifications

Temperature measurement	Docu-pH <sub>Meter</sub>	Docu-pH <sub>Meter</sub> ⁺
Temperature measuring range in °C	–5 ... 105	–5 ... 105
Readability in °C	0.1	0.1
Accuracy in °C	± 0.2	± 0.2
Temperature compensation	Automatic or manual from –5°C ... 105°C	
Buffer recognition	Automatic: technical buffers, DIN/NIST buffers	
Calibration points, max. number	3	3
Date   time battery-supplied	–	×
Sample IDs	–	×
Calibration reminder	–	×
Complete GLP-compliant record   printout	–	×
Memory for measurement data	–	×
Communication with DocuClip®	×	×
Input for pH combination electrodes BNC		BNC
Input for temperature probes		
NTC 10 kΩ, NTC 30 kΩ, Pt1000	2.5 mm male jack plug	2.5 mm male jack plug
RS232C interface	–	×
Dimensions in mm	89 × 229 × 145	
Weight in kg	1	1

## Specifications

pH measurement	Docu-pH <sub>Meter</sub>	Docu-pH <sup>+</sup> <sub>Meter</sub>
Measuring range	-2,000 ... 20,000	-2,000 ... 20,000
Readability	0.001   0.01   0.1 configurable	0.001   0.01   0.1 configurable
Accuracy	± 0.005	± 0.005

## mV measurement

Measuring range in mV	-2,000.0 ... 2,000.0	-2,000.0 ... 2,000.0
Readability in mV	0.1   1 configurable	0.1   1 configurable
Accuracy in mV	± 0.2 <   1,000   ± 1 >   1,000	± 0.2 <   1,000   ± 1 >   1,000

## Choice of Standard Features

Docu-pH <sub>Meter</sub>	Order number	
Measuring instrument incl. electrode retainer arm, technical buffers, AC adapter, operating instructions	Docu-pH	Docu-pH+
<b>... with electrodes and DocuClip® for unique, 100% traceable data recording</b>		
pH electrodes with plastic body, refillable, fiber junction, NTC 10 kΩ	Docu-pH   P10doc	Docu-pH+   P10doc
glass housing, refillable, platinum junction, NTC 10 kΩ		Docu-pH+   P11doc
plastic body, gel electrolyte, fiber junction, NTC 10 kΩ	Docu-pH   P12doc	Docu-pH+   P12doc
Plastic body, gel electrolyte, fiber junction	Docu-pH   P20doc	Docu-pH+   P20doc
Glass housing, refillable, platinum junction		Docu-pH+   P21doc
<b>... with conventional electrodes</b>		
pH electrodes with plastic body, refillable, fiber junction, NTC 10 kΩ	Docu-pH   P10	Docu-pH+   P10
glass housing, refillable, platinum junction, NTC 10 kΩ		Docu-pH+   P11
plastic body, gel electrolyte, fiber junction, NTC 10 kΩ	Docu-pH   P12	Docu-pH+   P12
Plastic body, gel electrolyte, fiber junction	Docu-pH   P20	Docu-pH+   P20
Glass housing, refillable, platinum junction		Docu-pH+   P21
<b>DocuClip®</b>		
... for unique, 100% traceable documentation of calibration for any pH electrodes Initialization by the user with Docu-pH <sub>Meter</sub> (Docu-pH <sup>+</sup> <sub>Meter</sub> ) required	DocuClip®	

## Professional Meter: Multitalented Instruments for the Most Sophisticated Measurement Tasks



pH| mV meters, ion meters, conductivity meters. Four models – with all options to meet the highest requirements.

- Large, backlit multifunctional 5.7" VGA graphical display
- Measuring accuracy to  $\pm 0.1$  mV
- Automatic temperature compensation
- Menu-driven prompts in plain language
- Automatic recognition of 26 standard buffers (inc. NIST and DIN)
- Automatic checking of your combination electrode's functionality
- Automatic calibration prompt
- Stability indicator
- Help function always available through softkeys

### Clear functions – clear advantages

Simultaneous display of a measured value and the temperature, also for parallel measurements of the pH and conductivity, for example

Research-grade – i.e. the highest – accuracy covering a broad range of concentrations

Excellent reliability and repeatability of the measured results

GLP | GMP | ISO-compliant documentation of the calibrations and results

Interface port for connecting a printer or a PC



### PP-15 | pH meter for pH and ORP measurements.

Higher resolution to guarantee even greater accuracy in electrochemical analysis.



### PP-20 | pH meter and conductivity meter.

In addition to pH measurement, the high-end PP-20 Professional Meter offers research-grade conductivity measurements.



### PP-25 | pH-meter and ion-selective meter.

In addition to convenient pH measurement, the PP-25 features the added capability of research-grade ion-selective analysis for a wide range of concentrations.



### PP-50 | pH meter, ion-selective meter and conductivity meter combined in a single unit.

The fully professional PP-50 combines all features of the models presented in this catalog. This convenient Professional Meter is designed for use in a broad range of applications in the electrochemical analysis field.



## Specifications

pH measurement	PP-15	PP-20	PP-25	PP-50
Measuring range	-2,000 ... 20,000	-2,000 ... 20,000	-2,000 ... 20,000	-2,000 ... 20,000
Calibration points, max. number	5	5	5	5
mV measurement				
Measuring range in mV	± 2,000	± 2,000	± 2,000	± 2,000
Temperature measurement				
Temperature measuring range in °C	-5 ... +105	-5 ... +105	-5 ... +105	-5 ... +105
Ion-selective analysis				
Measuring range	–	–	$1.00 \cdot 10^{-9} \dots 9.99 \cdot 10^9$	
Direct potentiometric measurement and incremental modes	–	–	×	×
Calibration points, max. number	–	–	7	7
Conductivity measurement*				
Measuring range in $\mu\text{S}/\text{cm}$	–	0.5 ... 20,000	–	0.5 ... 20,000
Specific electrical resistance Measuring range in $\Omega \cdot \text{cm}$	–	50 ... $2.0 \cdot 10^6$	–	50 ... $2.0 \cdot 10^6$
Salinity Measuring range in ppt	–	0.01 ... 42.0	–	0.01 ... 42.0
NaCl content Measuring range in ppt	–	0.01 ... 70.0	–	0.01 ... 70.0
TDS Measuring range in mg/l	–	0.005 ... 300,000	–	0.005 ... 300,000
Calibration points, max. number	–	5	–	5
Manual temperature input	×	×	×	×
Inputs for pH combination electrodes and ISE	BNC	BNC	2 BNC	2 BNC
Input for conductivity measuring cells	–	DIN	–	DIN
Date and time, non-volatile memory	×	×	×	×
Memory for measurement data	620	620	620	620
Dimensions in mm	265 × 200 × 100			

\* Specifications based on a cell constant of 2.54 cm

## pH|mV Meter – Reliability in All Applications



### Basic Meter –

#### A strong basis featuring Sartorius quality

Four keys do it all!

The user-friendly prompts and messages guide you fast and reliably through laboratory routines.

#### PB-11

- Easy 1-key calibration of 1, 2 or 3 calibration points
- Automatic buffer recognition
- Automatic electrode test during calibration
- Automatic temperature compensation
- Clear readout with easy-to-understand symbols and LCD display

Three kits are available with different ranges of equipment:

Meter with electrode retainer arm, technical buffers, AC adapter and operating instructions, as well as:

- Refillable pH electrode, PY-P10, with plastic body and built-in temperature sensor PB-11-P10
- Refillable pH electrode, PY-P11, with glass body and built-in temperature sensor PB-11-P11
- Low-maintenance pH electrode, PY-P20, with gel electrolyte PB-11-P20

### Portable Meter –

#### Compact design – solid performance

It's easy to operate anywhere in the field where you need accurate measurements on the spot.

#### Portable Meter PT-10

- Battery operation using a 9-volt battery (optional AC adapter available)
- Waterproof according to IP65
- Easy 1-key calibration of 1, 2 or 3 calibration points
- Automatic buffer recognition
- Automatic electrode test during calibration
- Automatic temperature compensation
- Clear readout with easy-to-understand symbols and LCD display
- Weight only 270 g
- Two kits are available with different ranges of equipment:

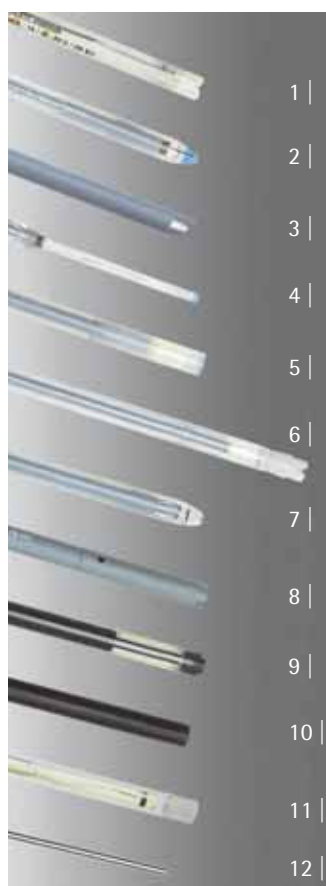
Meter in a carrying case with 9-volt DC battery, technical buffers (90 ml with pH 7 and 90 ml with pH 4), 2 x 60 ml plastic sample containers, as well as:

- Low-maintenance combination electrode, PY-P12, gel-filled, fiber junction, built-in temperature sensor PT-10P
- Low-maintenance electrode PY-P20, gel-filled, fiber junction PT-10-P20

### Specifications

	Basic Meter PB-11	Portable Meter PT-10
<b>pH measurement</b>		
Measuring range	-1.99 ... 19.99	0.00 ... 14.00
Calibration points, max. number	3	3
<b>mV measurement</b>		
Measuring range in mV	-1,800 ... +1,800	-1,800 ... +1,800
<b>Temperature measurement</b>		
Measuring range in °C	-5 ... +105	-5 ... +105
Input for pH combination electrodes	BNC	BNC
Protection class	–	IP65
Power supply	AC adapter	9V battery or AC adapter
Dimensions in mm	230 x 120 x 80	165 x 95 x 33
Weight	1,390 g	270 g inc. battery

## Sensors for the Highest Measuring Quality



### pH | ATC combination electrodes – glass membrane electrodes

All pH combination electrodes have an Ag | AgCl reference. The electrodes are supplied with a fixed cable and BNC connector; electrodes with a built-in temperature sensor additionally have a 2.5 mm male jack. All models are optionally available with DocuClip.

Figure	Order number	Construction	Built-in temperature sensor	Application range pH value	Application
1	PY-P10	Plastic body; electrolyte: KCl 3 mol/l, free of silver ions, fiber junction	yes	0 ... 14	Simple standard applications
2	PY-P11	Glass body; electrolyte: KCl 3 mol/l, free of silver ions, platinum junction, toughened, low-resistance glass	yes	0 ... 14	All standard applications are TRIS-compatible
3	PY-P12	Plastic body, gel-filled, fiber junction	yes	0 ... 14	Simple standard applications
3	PY-P20	Plastic body, gel-filled, fiber junction	no	0 ... 14	Simple standard applications
2	PY-P21	Glass body; electrolyte: KCl 3 mol/l, free of silver ions, platinum junction, toughened, low-resistance glass	no	0 ... 14	All standard applications are TRIS-compatible
4	PY-P22	Microelectrode (length 110 mm, diameter 5 mm), electrolyte: KCl 3 mol/l, free of silver ions, platinum junction, low-resistance glass	no	0 ... 14	Low sample quantity
5	PY-P23	Flat-membrane electrode, glass body, gel-filled, annular gap junction, low-resistance glass	no	2 ... 13	Surface measurements, low sample quantity
6	PY-P24	High-performance electrode, plastic body; electrolyte: KCl 3 mol/l, free of silver ions, adjustable sleeve junction for control of the flow rate of the KCl solution, low-resistance glass membrane	no	0 ... 14	Samples with a low ionic concentration, emulsions, suspensions for extreme pH values

### ORP combination (redox) electrodes

This type of electrode has an Ag | AgCl reference. It is supplied with a permanently attached cable and a BNC connector.

Figure	Order number	Construction	Built-in temperature sensor	Application range pH value
7	PY-R01	Glass body, porous ceramic junction; probe: Platinum disc (4 mm diameter), electrolyte: KCl 3 mol/l, free of silver ions	no	0 ... 14

**Conductivity cells and multisensor cell (pH, conductivity, temperature)**

The conductivity cells are supplied with a permanently attached cable and an 8-pin DIN connector.

Figure	Order number	Recommended measuring range	Construction	Application range pH value
8	PY-R01	0.5 $\mu\text{S}/\text{cm}$ ... 2,000 $\mu\text{S}/\text{cm}$	4-band conductivity cell (platinum)	yes
8	PY-C02	0.01 $\text{mS}/\text{cm}$ ... 5 $\text{mS}/\text{cm}$	4-band conductivity cell (platinum)	yes
8	PY-C03	1 $\text{mS}/\text{cm}$ ... 200 $\text{mS}/\text{cm}$	4-band conductivity cell (platinum)	yes
	PY-C12	1 $\mu\text{S}/\text{cm}$ ... 300,000 $\mu\text{S}/\text{cm}$	4-band conductivity cell (graphite)	yes
3	PY-PC1	0.01 $\text{mS}/\text{cm}$ ... 5 $\text{mS}/\text{cm}$ pH value 0 ... 14	Combination electrode, 12 mm diameter; 120 mm length; 2-band cell (platinum); pH electrode with gel-filled electrode; temperature sensor	yes

**Ion-selective pH combination electrodes**

All ion-selective electrodes are combination electrodes. They are supplied with a permanently attached cable and a BNC connector.

Figure	Order number	Ion	Measuring range in ppm	pH application range
9	PY-I01	Fluoride ( $\text{F}^-$ )	0.05 ... 500	5 ... 5.5
10	PY-I02	Ammonia ( $\text{NH}_3$ )	0.02 ... 17,000	$\geq 11$
11	PY-I03	Sodium ( $\text{Na}^+$ )	0.02 ... to saturated solution	9 ... 12
9	PY-I04	Chloride ( $\text{Cl}^-$ )	2 ... 35,500	2 ... 12
9	PY-I05	Nitrate ( $\text{NO}_3^-$ )	0.4 ... 62,000	2.5 ... 11
9	PY-I06	Potassium ( $\text{K}^+$ )	0.04 ... 39,000	2 ... 12
9	PY-I07	Calcium ( $\text{Ca}^{2+}$ )	0.2 ... 40,000	2.5 ... 11
9	PY-I08	Silver/sulfide ( $\text{Ag}^+/\text{S}^{2-}$ )	0.003 ... 12,000 $\text{S}^{2-}$   0.01 ... 108,000 $\text{Ag}^+$	$>12 \text{ S}^{2-}$   2 ... 8 $\text{Ag}^+$

**Temperature compensating probe**

NTC 10 k $\Omega$  Stainless-steel sensor with permanently attached cable and a 2.5 mm male jack.

Figure	Order number	Recommended for...	Construction
12	PY-T01	Temperature measurement and automatic temperature compensation – 120 mm length without built-in temperature sensor	Stainless-steel body, 4.7 mm diameter,



## Accessories



	Order number
<b>Data Printer for Professional Meter and Docu-pH<sub>Meter</sub> Docu-pH<sup>+</sup><sub>Meter</sub></b>	YDP20-PH
Paper rolls, 5 x 40 m rolls	6906937
Ink ribbon	6906918
<b>pH buffers</b>	
50 capsules per pack; dissolve contents of each capsule in 100 ml of distilled water	
pH = 4.01 ± 0.02 at 25°C	PY-Y01
pH = 7.00 ± 0.02 at 25°C	PY-Y02
pH = 9.00 ± 0.02 at 25°C	PY-Y03
pH = 10.00 ± 0.02 at 25°C	PY-Y04
Color-coded buffer solution in practical pump-bottle, eliminates the need for a beaker during calibration, traceable to NIST standards	
pH = 4.00 ± 0.01 at 25°C, 500 ml	PY-Y21
pH = 4.00 ± 0.01 at 25°C, 6×90 ml	PY-Y21-6
pH = 7.00 ± 0.01 at 25°C, 500 ml	PY-Y22
pH = 7.00 ± 0.01 at 25°C, 6×90 ml	PY-Y22-6
pH = 10.00 ± 0.01 at 25°C, 500 ml	PY-Y23
<b>Storage solution</b> , for pH combination electrodes, 500 ml	PY-Y05
<b>Cleaning solution</b> , pepsin   hydrochloric acid, 500 ml	PY-Y06
<b>Electrolyte solution</b> , KCl (3 mol/l), free of silver ions, 500 ml	PY-Y07
<b>Conductivity standards, traceable to NIST standards</b>	
0.084 mS/cm ± 1.0 % at 25°C (KCl 0.0001 mol/l), 500 ml	PY-Y10
0.147 mS/cm ± 1.0 % at 25°C (KCl 0.001 mol/l), 500 ml	PY-Y11
1.413 mS/cm ± 1.0 % at 25°C (KCl 0.01 mol/l), 500 ml	PY-Y12
12.88 mS/cm ± 1.0 % at 25°C (KCl 0.1 mol/l), 500 ml	PY-Y13
<b>Equipment Qualification – IQ   OQ   PQ</b>	
Qualification (IQ   OQ) pH meter	8407pH
For each additional parameter	8407Para









## Process Weighing & Control



## Process Weighing & Control: Reliable Weighing Equipment Based on Experience



Within our Process Weighing & Control business area, we offer an especially wide range of products and services for many industrial branches and applications.

### Our solutions for your process

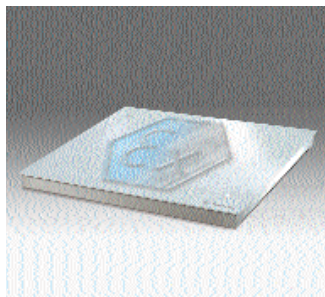
Our strength lies in the process industries, from the food industry through the chemical industry to pharma|cosmetics|life sciences. For regulated industries, we offer qualified performance, from products through application safety to service. Even for fields of application that have areas with explosion risks, our systems offer the highest level of safety (inc. international certifications).



In materials flow from goods acceptance and warehousing through production and quality assurance to outgoing goods: our systems record, control and check the materials flow and accompany the data flow. Sartorius systems ensure the optimal use of materials and the best yields.



In item-oriented manufacturing industries, we are present with counting scales and checkweighers.



The typical requirements and conditions in each industrial sector are met thanks to the appropriate design of our equipment (process accuracy, materials selection, surface characteristics, device protection class, use in explosion risk areas, portable|fixed) and the accompanying qualification (IQ/OQ qualification documentation). Our solutions therefore support the requirements of current standards and regulations, such as ISO, DKD, USP, IFS, BRC, HACCP, GMP, EHEDG, GAMP, and ATEX.



### Our solutions for your process

We see ourselves as specialists and highly capable partners for optimizing weight-based and lot-based processes. At Sartorius, we offer more than just products. We provide technical consulting services and problem-solving expertise that focus on your processes and add value.

Process optimization is one of the key driving forces of innovation at Sartorius, as well as a driving force for your investment decision.

The high quality of our products and our prompt, worldwide service guarantee the optimal and efficient structuring of overall operating costs – another cornerstone of your investment decision.

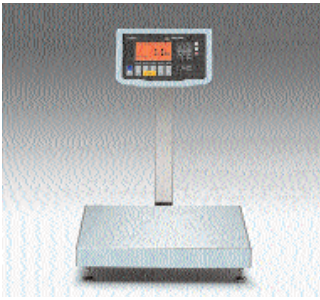
### Technical consulting is our calling

Although production processes may resemble each other, no one installation is ever the same as the other. This is why we offer our customers individual consulting to develop solutions that are precisely customized to their specific application.

We operate across the globe – contact us today!



## Weigh, Detect, Control – Reliable Technology for Your Process



### Weigh

- Complete scales combine ease of use with high performance – comprehensive accessories and options permit perfect adaptation to the installation location and application
- Platforms in different materials and accuracies as the basis of a wide variety of industrial weighing tasks
- Weighing indicators and terminals permit individual process solutions, while a wide variety of interfaces and option cards permit connection to other systems
- Beltweighers for mass flow rate determination of granulated products and discharge regulation in various different designs for all installation locations.
- Paint mixing scales, from simple scales to complex, networked systems, with outstanding product features such as the recalculation function.

### Detect

- Metal detectors for all types of packaged and unpackaged products and product flows
- X-ray inspection systems to detect metal, bone, glass, stones, ceramics and plastics. They are also used to recognize shape, volume and dimensions, fill level monitoring, completeness checking, weight checking, and the detection of cavities and rips in products.
- Online moisture measurement procedures permit the split-second determination of the moisture content in a running production process, with the use of microwave resonance and NIR technology
- Sartorius FLI SealTester – Inline leak testing of gas-flushed food bags directly in the process and in a non-destructive way.

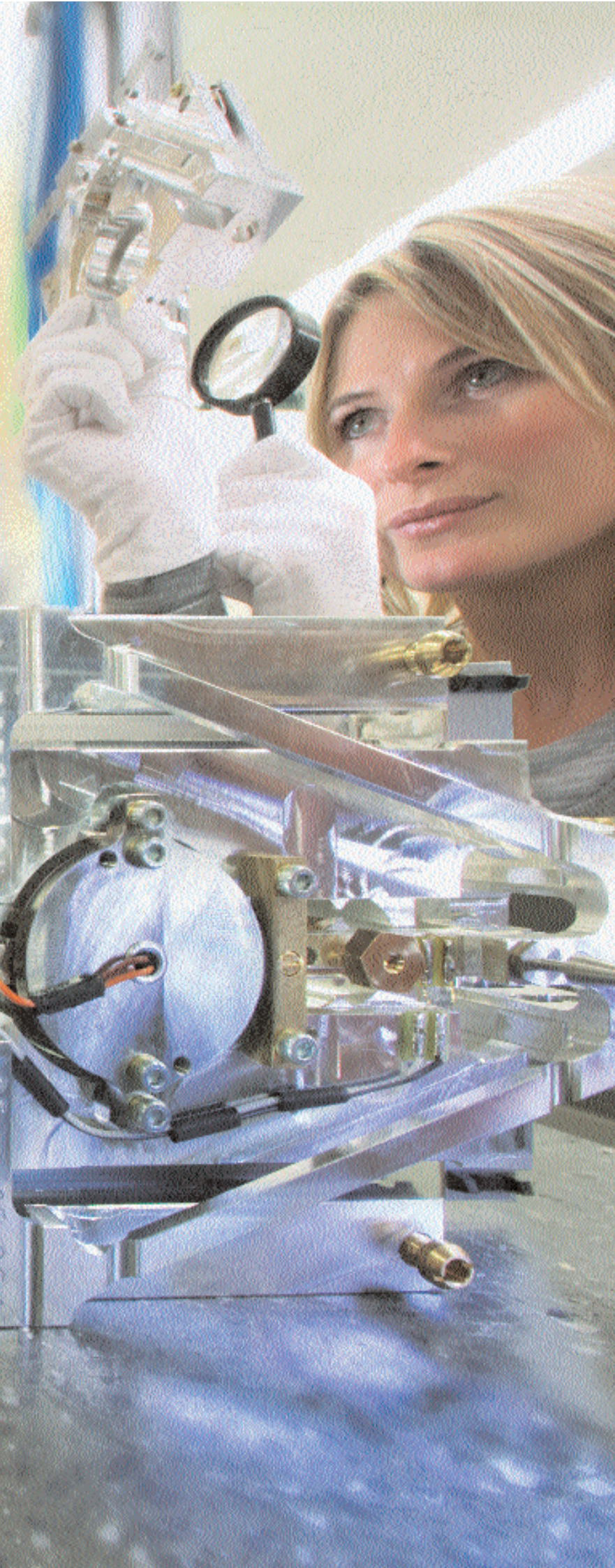
### Control

- Systems for precise dosing of individual components, with intelligent tracking of switch-off points for fast and precise filling.
- Recipe management systems for direct and simple management of recipe and material data: from single-user manual recipe systems through to fully automatic process control.
- Process controller with built-in PLC and built-in material and recipe database; ideal for dosing and recipe processes.
- Dynamic checkweighers for seamless weight control of loose or packaged products.
- Finished packaging control systems as a compact solution through to networked solutions for in-process quality assurance
- Weighing cells, installation kits and electronics – components optimally matched to each other cover the entire spectrum of hopper weighing applications.
- Process transmitters for tank, container and hopper scales combine particularly high accuracy and resolution with extremely high reliability









Service

## Services Provided



The services provided by Sartorius range from installation and maintenance through qualification to engineering. Quality and reliability are the foundation of our service philosophy. As a worldwide service organization, our aim is to provide the best possible technical weighing services that match your requirements perfectly.

### **Installation and commissioning**

Installation and commissioning by our service professionals makes your equipment 100% operational in the shortest possible time. Your new equipment is therefore at your disposal immediately. In particular, the reliability of the measuring results and the service life of your equipment significantly depend on its initial installation and configuration according to the specifications.

This is what you can expect from us:

- Flawless setup of your equipment
- Connection of peripheral devices such as printers
- Adjustment of the equipment settings to your installation location
- Setup of interfaces
- Setup of applications
- Training of equipment users relevant to your workplace

### **Equipment qualification (IQ/OQ) – professional support for the pharmaceutical industry**

Validating your processes requires qualifying the devices you are using. Qualifying measuring systems in many fields of the pharmaceutical industry is therefore mandatory. Sartorius will support you with a skilled team of trained specialists. Our solutions support current guidelines such as e.g. GLP, GMP or FDA. The documentation can easily be integrated into existing QM systems.

The following services are included in the qualification:

- Clear documentation of the equipment qualification in the equipment's logbook
- Review and documentation of the correctness of the equipment installation
- Documentation of the equipment configuration
- Metrological equipment checking on site
- Issuing a DKD calibration certificate indicating the uncertainty of measurement
- Determining the minimum sample quality according to the USP guidelines incl. printout of protocol
- Workplace-related instruction of the equipment users including training certificate

### **Maintenance service and maintenance contracts**

Regular equipment maintenance keeps your equipment permanently in peak condition. In this way, you ensure the reliability of your measuring results, while effectively preventing unplanned equipment failures and downtime. Whether under fixed-interval or short-term service contracts, our maintenance service gives you the sense of security you need. And this even holds true for equipment from other manufacturers.

Our service offering includes:

- Workplace-related functionality checking of your equipment
- Measurement technology-related and metrological equipment checking
- Equipment inspection with checking of mechanical and electrical components
- Testing of equipment settings
- Function-related cleaning
- Equipment adjustment if necessary





### Calibration certificates

It is mandatory in the context of inspection equipment monitoring according to DIN EN ISO/IEC 17025 that calibration certificates be issued regularly for all of your measuring devices. Sartorius has been accredited by the physical technical federal agency PTB to issue DKD calibration certificates for non-automatic electronic scales and check weights. The DKD calibration certificate is an internationally recognized certificate that will provide you and your auditors with an absolute security when assessing your measuring results. A calibration certificate can be issued as part of a new installation or when performing maintenance or corrective maintenance work on a device.

Your advantages:

- Recognized certificate according to European DKD guideline EURAMET|cg-18|v.01
- Consistent traceability to national standards and the original kilogram
- Exact data regarding measurement uncertainty
- Determination of the minimum initial weight
- Security for your inspection equipment monitoring
- International validity

### Minimum initial weight certificate according to the USP guidelines

Chapter 41 of the United States Pharmacopeia (USP) specifies the use of balances and weights. This chapter requires that, when weighing substances, a measurement uncertainty of 0.1% relating to the initial weight must not be exceeded.

Our experienced service technicians determine the minimum initial weight according to USP using a special software tool and draw up a minimum initial weight certificate according to USP. A mark is placed on the balance to indicate the smallest permitted initial weight according to USP.

### Corrective maintenance service

We offer corrective maintenance through our local service and in our repair center. Using exclusively original spare parts, subsequent adjustments in accordance with the manufacturer's specifications, highly trained technicians and short cycle times guarantee highest repair quality and only short downtimes of your equipment.

This is what you can expect from us:

- Short repair cycle times
- Corrective maintenance using exclusively original spare parts
- Detailed repair report in case of shop repair
- Function-related cleaning
- Equipment adjustment
- Urgent repair service (subject to agreement)
- New purchase offer in the event of inefficient repairs

### Online test equipment management

The outsourcing of your test equipment management is a matter of trust! With an Internet-based platform for test equipment management, Sartorius offers you an integral software solution so you can minimize your test equipment monitoring expenditure. 24 hours a day, 7 days a week, and from any PC with Internet access, you have direct access to all relevant test equipment data and can easily download all calibration certificates.

Your advantages:

- 24-hour/365-day access to all test equipment data and calibration certificates
- Easy-to-use and clear menu structure
- Your location is irrelevant
- The product lifecycle of the equipment is seamlessly documented
- No software installation required

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