sartorius
mechatronics

Cubis: The new benchmark

turning science into solutions

Once again, Sartorius sets the standards for all others to follow: Cubis, the first series of laboratory balances that feature a completely modular design. User-configurable and customizable to changing applications.

Every Cubis uncompromisingly implements your specific requirements profile.

Cubis meets our strict criteria for Advanced Pharma Compliance and is made to measure for quality management systems in the regulated areas of the pharmaceutical industry.

Precision balance consisting of an MSU display and control unit and an 8202S weighing module with 10-mg readability and an 8,200-g weighing capacity

The new Sartorius Cubis:
Future generations of premium balances will try to measure up to this standard

Analytical balance consisting of an MSA display and control unit, 324S weighing module with 0.1-mg readability and a 320-g weighing capacity, and a DU manual draft shield

Modularity

The Cubis modular system offers you a choice of display and control units, weighing modules and draft shields.

The basic characteristics of your custom-tailored Cubis are defined by the particular combination of these modules. Interface modules and a full range of accessories enable you to customize your balance even further.

The new Sartorius Cubis has been designed for users who always need the best, but who want to invest only in what is necessary.

Cubis: The most sophisticated weigh to focus on what is necessary

CUBIS MODULAR DESIGN

With Cubis, you will always stay at the cutting edge without having to invest in completely new equipment. This is what makes the Cubis modular design so special, with a number of unique advantages:

1. Optimal interchangeability or extension of modules
2. Shorter innovation cycles for individual modules
3. Faster development of additional modules

User Guidance

Apart from aspects strictly involving metrological specifications, preparing for and performing a weighing procedure and meeting the relevant regulatory standards are gaining ever-increasing importance.

The ratio between the steps of the actual measurement procedure and the accompanying steps are decisive criteria for the efficiency of work sequences, especially for complex and frequently recurrent applications. In designing Cubis, we focused on this major aspect.

The new Q-Guide enables tasks and individual work sequences to be quickly configured for error-free performance. The Cubis software and user interface eliminate the detours so you can get down to business.

Once you have defined a task, you are interactively guided straight to the settings needed for your application. Irrelevant information is hidden. Only the application mode you select is displayed, making navigation even easier. Just touch the USER key to gain access to User|Password Management. TASK enables you to select defined tasks directly.

All Cubis controls are easy to use, clearly designed and logically structured. Their user guidance features prevent time-consuming and cost-intensive operating errors.

Q-Guide user interface:
The reference for fast and targeted navigation

The MSA display and control unit shown here features a high-contrast TFT touch screen for clear and easy viewing, even of complex work sequences. Different sets of colors enable you to customize the screen to your individual needs. Clearly identified touch keys featuring positive click action let you effortlessly control the main basic functions of the balance. This ensures fast and error-free operation.

You can adjust the tilting angle of the display and control unit to ensure optimal viewing at all times.

User Guidance

In a choice of three display and control units, Cubis meets the requirements of different operating concepts. It covers the entire range of laboratory applications from simple weighing right on up to management of complex work sequences by means of defined tasks and the User|Password Management menu.

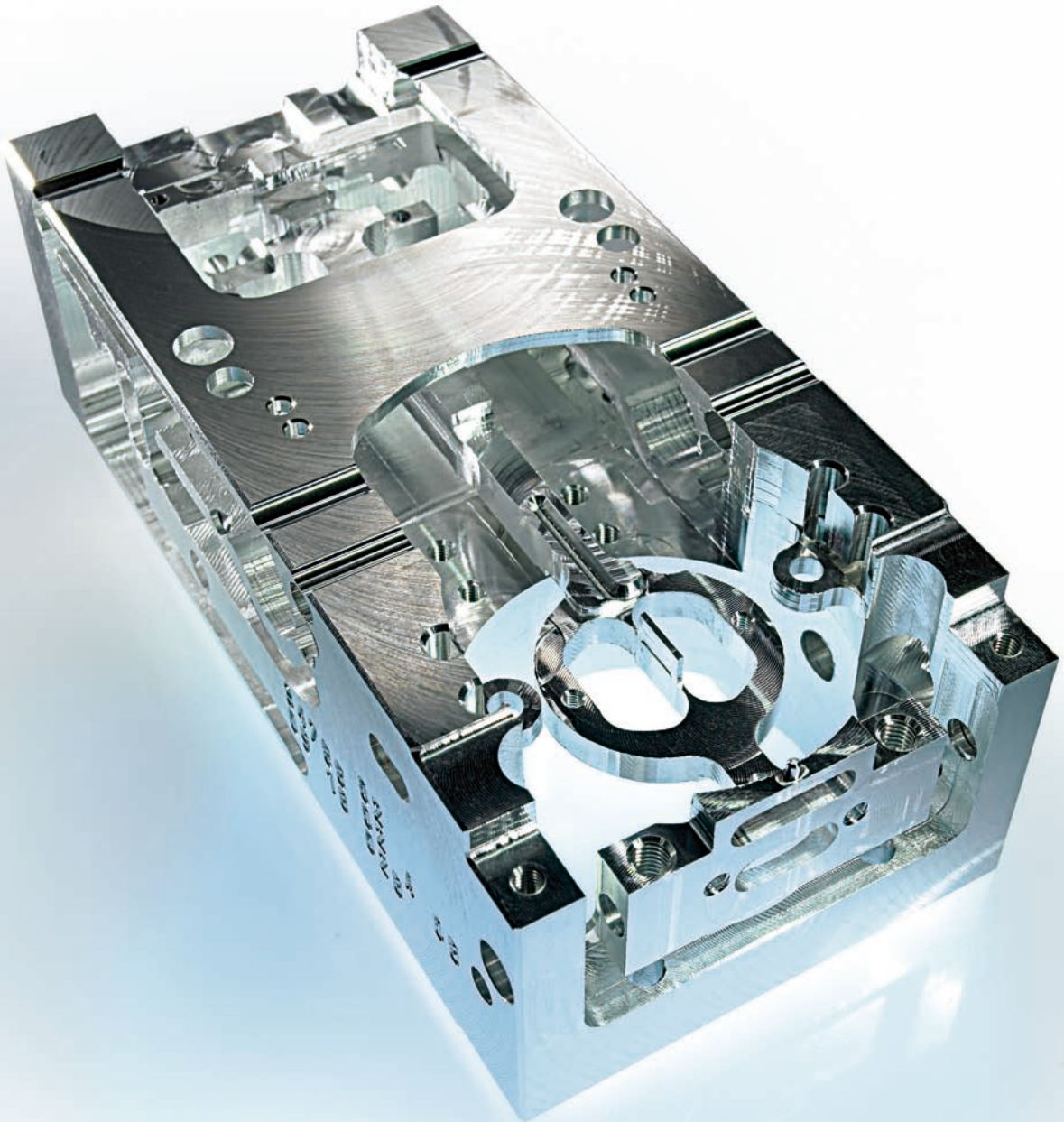
MSE – pure and simple weighing
Large, high-contrast liquid crystal display, easy-to-understand menu guidance with short text prompts; clearly structured keys for precise activation of functions.

MSU – classic and universal
High-resolution, generously sized, monochrome graphic display and keys that feature positive click action and precise activation of functions. For users who prefer to combine classic key-operated control with the widest range of performance features.

MSA – the non plus ultra
Top-of-the-line technology and information design. Touch screen featuring high-resolution color TFT for high-contrast display of texts and graphics. Outstanding operating convenience and display quality, especially for complex applications that require substantial text input.

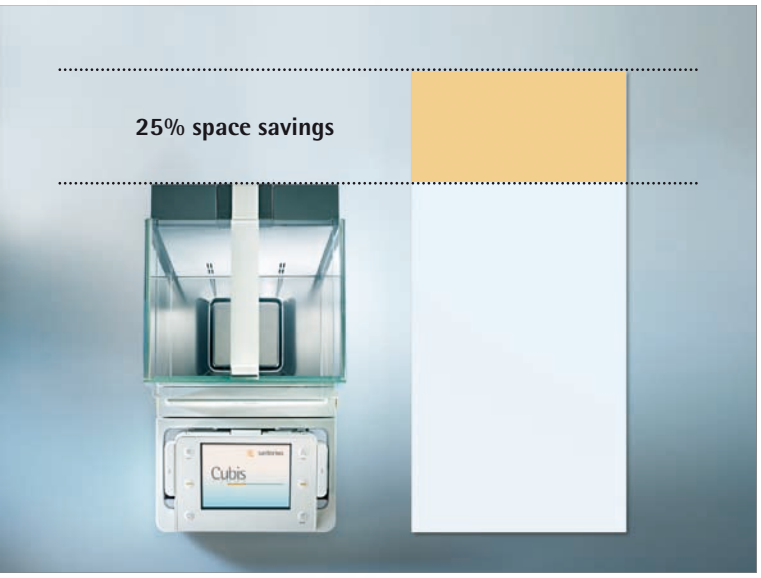
The quality, reliability and precision of a Sartorius balance are legendary.

And Cubis lives up to the legend: it sets new benchmarks in accuracy, response time and repeatability.

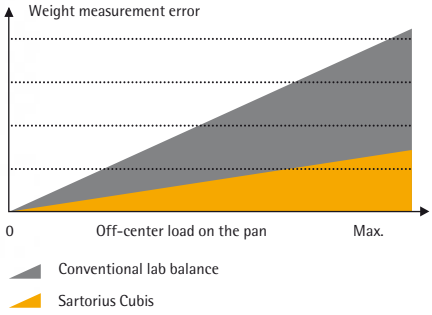


Unique monolithic weigh cell
Cubis incorporates the second generation of the world's only monolithic weigh cell manufactured exclusively by Sartorius. And these exceptionally rugged cells have become even more compact and precise.

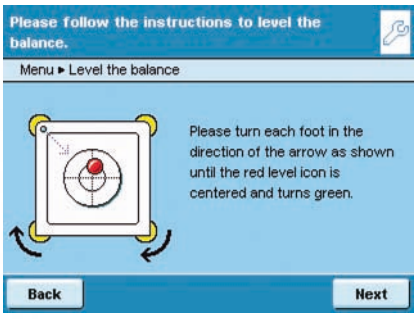
Technological innovations in Cubis go far beyond the usual standards of the premium segment



The first five-digit toploading lab balance
Cubis is the first standard toploading semi-microbalance featuring full resolution all the way up to 220 g. As a result, its footprint takes up to 25% less space compared with conventional lab balances of the same resolution. Unique worldwide, the Sartorius monolithic weigh cell is what makes this unbeatable combination possible in the first place: compact design, resolution of 0.01 mg and weighing capacity of up to 220 g.



The first lab balance with Q-Pan off-center load compensation
Cubis is the first lab balance that compensates for errors caused when a sample is off-centered on the pan. And the Q-Pan feature offers you two advantages: it significantly reduces off-center loading errors, and thus enables Cubis to be designed with an extra-large weighing pan.



The first balance with automatic levelling: Q-Level
Q-Level combines novel sensors with the most advanced display technology, making it easier and faster to level the balance accurately. A standard feature of Cubis MSA and MSU display and control units, interactive prompting guides you during manual levelling. While Q-Level is active, the display shows you all the information you need: the position of the air bubble as well as prompts so you know which levelling foot has to be turned in which direction (MSE only with an alert message).

Q-Level also provides the option of fully automatic, motorized levelling at the touch of a key (not available for MSE). Levelling could not be easier or more convenient than this.

As far as draft shields go, Cubis is also the new benchmark in the premium class.

All Cubis draft shields offer a number of hands-on, tangible benefits that eliminate the usual drawbacks. On conventional lab balances, easy-to-open draft shield doors are usually flimsy, and those with a sturdier construction obstruct the operator's view.

No so with Cubis: Despite their sturdy design, the doors are made of advanced materials so they glide open smoothly. And their transparency allows optimal viewing of the entire weighing chamber and the sample inside. Yet the draft shield protects the balance from interfering effects outside.

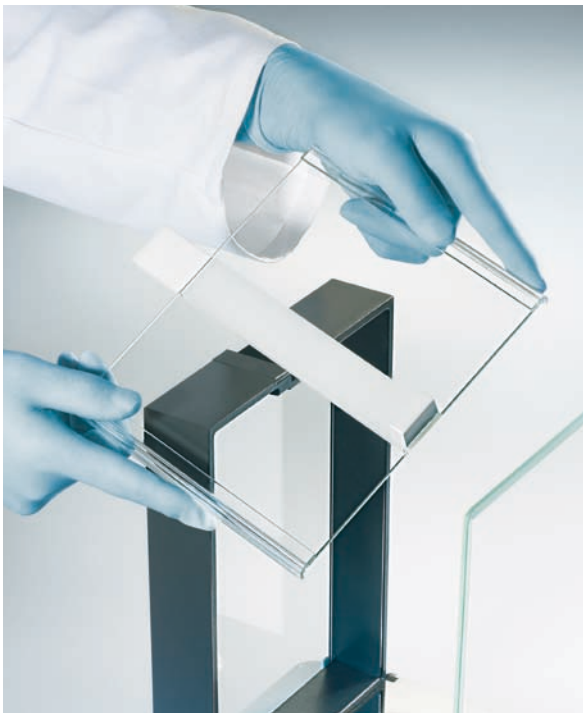
Static electricity on the draft shields of conventional lab balances can cause weighing errors. Cubis eliminates this potential source of error thanks to the electrically conductive coating on the glass panels of its draft shield.

Sartorius is the first manufacturer to combine the maximum operating convenience provided by a motorized draft shield with minimum space requirements in its Cubis analytical and semi-microbalances.

Cubis: The first toploading analytical balance with a motorized draft shield

The Cubis DA draft shield features a learning function and palm-activated, user-friendly keys for fast and convenient control. These enable it to be adapted to any work sequence. Besides being motor-driven, the DI draft shield has a built-in ionizer that eliminates interfering electrostatic charges on samples, or on sample containers, at the touch of a key.

Semi-microbalance consisting of an MSA display and control unit, 225S weighing module with 0.01-mg readability and a 220-g weighing capacity



For cleaning, all draft shield panels can be removed in a few easy steps – without compromising the stability of the entire construction.

Touch-free opening and closing of the motorized draft shield using the IR hand switch YHS01MS. This means added reliability, especially for applications in which toxic samples need to be handled.

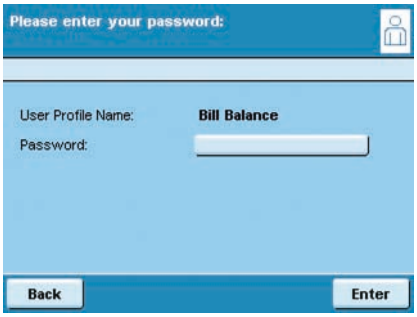
Advanced Pharma Compliance

The requirements for controlling and monitoring the accuracy of inspection, measuring and test equipment used in quality systems and those of the United States Pharmacopeia place exceptionally high demands on lab equipment and operators alike.

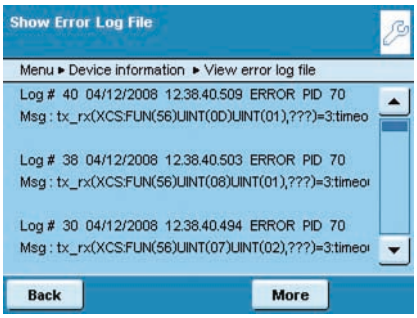
Each function and feature of a lab balance that support compliance with monitoring, control and documentation requirements translate to specific user benefits.

The Advanced Pharma Compliance feature of Cubis offers more than the best possible conditions for compliance with general standards, such as GLP-compliant logging of weighing data.

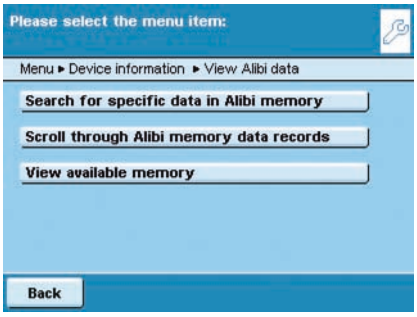
Advanced Pharma Compliance enables seamless integration of Cubis into processes and thus provides valuable support in implementing customized equipment safety and reliability concepts.



User|Password Management for tamper-proof security



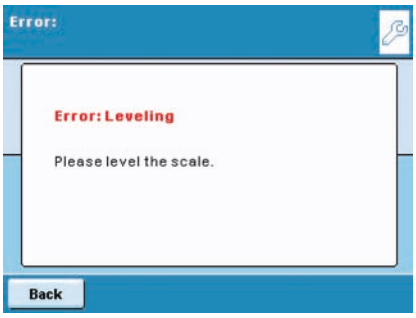
The Audit Trail function logs important changes to the equipment. In this way, any errors can be quickly traced.



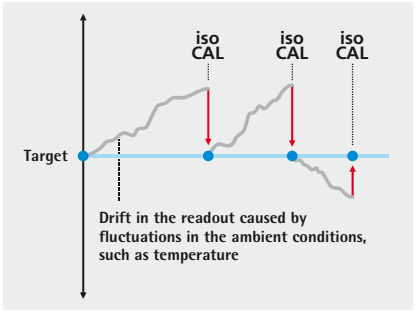
Integrated Alibi memory for traceable transfer of legal-for-trade weighing data to a PC

Cubis can be cleaned easily, quickly and thoroughly.
Only high-grade materials with smooth, non-textured surfaces are used on the balance.

Advanced Pharma Compliance makes Cubis ideal for use in regulated areas



Alert messages and reminder functions with user-definable action hierarchy for leveling, minimum sample weight, calibration and adjustment.

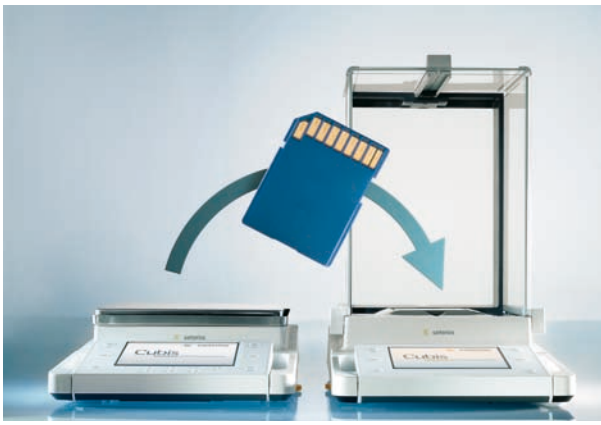


Fully automatic calibration and adjustment, isoCAL

All parts of the housing are designed with large radii, considerably eliminating crevices and corners in which debris or traces of cleaning agents can build up.

GLP-compliant, user-configurable printouts

Maximum connectivity with Q-Com. Three standard-equipped interface ports (USB, RS-232C, Ethernet*) and three optional ports enable nearly any type of bidirectional communication; up to four interface ports can be simultaneously used.

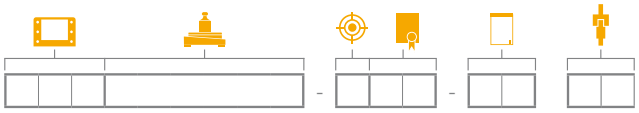


Ready to operate within just a few seconds
All data, such as user base data or tasks, can also be easily and securely transferred by SD card from one Cubis* to another.

When several Cubis balances are used concurrently, but are not networked, this feature saves considerable time in configuring their settings.

* does not apply to MSE

Technical Specifications



Please enter the order codes for your choices in the adjacent fields below each icon.

Cubis display and control units

Select the display and control unit and enter the model name in the field identified by the respective icon.

Model	MSA	MSU	MSE
Operation	Touch screen, keys for main basic functions	Keys	Keys
Display	High-resolution color TFT, 5.7" graphic display	High-resolution black and white 5.7" graphic display	Liquid-crystal display, black and white
Adjustment of the display and control unit	Display tiltable; control unit detachable	Display tiltable; control unit detachable	Control unit detachable
Standard interface ports	– USB (built into weighing module) – RS-232C port for connecting accessories, 25-pin (built into weighing module) – Ethernet (built into display and control unit)	– USB (built into weighing module) – RS-232C port for connecting accessories, 25-pin (built into weighing module) – Ethernet (built into display and control unit)	– USB (built into weighing module) – RS-232C port for connecting accessories, 25-pin (built into weighing module)
SD card reader	Built into display and control unit as a standard feature	Built into display and control unit as a standard feature	–
Operation of the motorized draft shield (only applies to DA or DI draft shield)	Activated by side keys or touch-free using IR switch (optional); learning function	Activated by side keys or touch-free using IR switch (optional); learning function	Activated by key or touch-free using IR switch (optional); learning function
Applications	Mass unit conversion by toggling, SQmin function for minimum sample weight according to the USP, isoCAL automatic calibration|adjustment function, customized identification, density determination, statistics, calculation, averaging (weigh averaging), formulation, weighing in percent, time-controlled functions, totalizing, DKD measurement uncertainty, second tare memory, counting, over|under checkweighing	Mass unit conversion by toggling, SQmin function for minimum sample weight according to the USP, isoCAL automatic calibration|adjustment function, customized identification, density determination, statistics, calculation, averaging (weigh averaging), formulation, weighing in percent, time-controlled functions, totalizing, DKD measurement uncertainty, second tare memory, counting, over|under checkweighing	Mass unit conversion by toggling, SQmin function for minimum sample weight according to the USP, isoCAL automatic calibration|adjustment function, density determination (buoyancy method only), calculation, averaging (weigh averaging), net|total formulation, weighing in percent, counting

Cubis leveling function

Select the type of leveling function and enter the order code "Ø" or "1" in the field identified above by this icon.

Ø	Cubis displays the level indicator on the screen and provides guidance for fast and accurate leveling (standard feature on MSA and MSU display and control units; only an alert message on the MSE).
1	Fully automatic, motorized leveling function, Q-Level, at the touch of a key (available for all analytical and semi-microbalances with 0.1-mg or 0.01-mg readability and all precision balances with 1-mg readability (will be available as of May 2009).

Test certificates and approvals

Select a test or approval certificate and enter the order code in the field identified above by this icon.

ØØ	Standard certificate for proof of compliance with specifications
TR	As for ØØ, but with detailed test report
CE	Verified at the factory for use in legal metrology with European verification approval certificate

Optional interface modules

Depending on the balance model you are using, you may select an additional interface module.

IR	RS-232 interface port, 25-pin
IB	*Bluetooth*® wireless technology inteface
IP	RS-232 interface port, 9-pin, incl. PS/2 port

Cubis weighing modules

Please enter the model name, starting from the left, in the field identified by this icon on the top left of this double page.

	Readability [mg]	Weighing capacity [g]	Weighing pan (W × D) [mm]	Average stabilization time [s]	Average response time [s]	Repeatability [mg]	Linearity [mg]	Off-center loading error [mg]* (Test load [g])	Minimum sample weight [g]**
Semi-microbalances (will be available as of May 2009; models verified for legal metrology, as of June 2009) 0.01 mg									
225S	0.01	220	85 × 85	2	6	0...60 g: 0.015 60...220 g: 0.025	0.1	0.15 (100)	0.02
225P	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
125P	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									
324S	0.1	320	85 × 85	1	3	0.1	0.3	0.3 (200)	0.12
224S	0.1	220	85 × 85	1	3	0.07	0.2	0.2 (100)	0.12
324P	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
124S	0.1	120	85 × 85	1	3	0.1	0.2	0.2 (50)	0.12
Precision balances									
3203P	1|10	1,010|3,200	140 × 140	1	1.5	1|6	5	2 (1,000)	1.5
2203S	1	2,200	140 × 140	1	1.5	1	3	2 (1,000)	1.5
2203P	1|10	1,010|2,200	140 × 140	1	1.5	1|6	5	3 (1,000)	1.5
1203S	1	1,200	140 × 140	1	1.5	0.7	2	2 (500)	1.5
623S	1	620	140 × 140	0.8	1	0.7	2	2 (200)	1.5
623P	1|2|5	150|300|620	140 × 140	0.8	1	1|2|4	5	4 (200)	1.5
323S	1	320	140 × 140	0.8	1	0.7	2	2 (200)	1.5
10202S	10	10,200	206 × 206	1	1.5	7	20	20 (5,000)	12
8202S	10	8,200	206 × 206	1	1.5	7	20	20 (5,000)	12
6202S	10	6,200	206 × 206	1	1.5	7	20	20 (2,000)	12
6202P	10|20|50	1,500|3,000|6,200	206 × 206	1	1.5	7|20|40	50	50 (2,000)	12
4202S	10	4,200	206 × 206	0.8	1	7	20	30 (2,000)	12
2202S	10	2,200	206 × 206	0.8	1	7	20	20 (1,000)	12
1202S	10	1,200	206 × 206	0.8	1	7	20	20 (500)	12
12201S	100	12,200	206 × 206	0.8	1	50	100	200 (5,000)	100
8201S	100	8,200	206 × 206	0.8	1	50	100	200 (5,000)	100
5201S	100	5,200	206 × 206	0.8	1	50	100	200 (2,000)	100

* Position acc. to OIML R76 ** Typical minimum sample weight according to the USP (United States Pharmacopeia), USP31–NF26

Cubis draft shields

Select a draft shield and enter the corresponding order code in the field identified by this icon on the top left of this double page.

DO	No draft shield. Please enter this ID code for weighing modules with pan sizes of 206 × 206 mm.
DE	Manual glass draft shield for precision balances with a readability of 1 mg.
DU	Manual analytical draft shield chamber, with smooth-action doors that open wide and provide unimpeded access to the weighing chamber without any interfering frame braces. For all models with a readability of 0.01 mg, 0.1 mg or 1 mg.
DA	Automatic, motorized draft shield with learning function for user-friendly operation and easy customization to the changing requirements of various applications. For all models with a readability of 0.01 mg, 0.1 mg or 1 mg (will be available as of May 2009).
DI	As for the DA draft shield, but additionally with integrated ionizer to eliminate interfering electrostatic charges on samples and sample containers (will be available as of May 2009).

Cubis accessories

Data printer, suitable for use in legal metrology, connects to a 25-pin RS-232 port on accessory equipment	YDP10-0CE
Data printer, with data transfer capability using *Bluetooth*® wireless technology (only if connected to YDO01MS-B or Option IB)	YDP10BT-0CE
Paper rolls for YDP10-0CE printer; 5 rolls, 50 m each	6906937
Adhesive labels on standard paper for YDP10BT-0CE (continuous roll, each with 20 m × 57 mm)	69Y03247
Ink ribbon cartridge for YDP10-0CE and YDP10BT-0CE	6906918
Remote display, LCD; height of digits 13 mm; backlit	YRD03Z
RS-232C interface cable, for connecting the balance to a PC with a 9-pin COM port; length 1.5 m	7357314
Standard Operating Instructions (SOP)	YSL07E
Infrared sensor for touch-free activation of functions (e.g., draft shield control)	YHS01MS
Hand switch for activating the print, tare or function key; key function selectable by menu code; incl. T-connector	YHS02
Foot switch for activating the print, tare or function key; key function selectable by menu code; incl. T-connector	YFS01
Foot switch for OPEN|CLOSE draft shield functions (only in combination with DA and DI draft shields) and taring and printing functions	YPE01RC
Density determination kit for liquids and solids; for weighing modules with a readability of ≤ 1 mg	YDK01MS
3-segment checkweighing display, red – green – red, for over|under (plus|minus) checkweighing, incl. T-connector	YRD11Z
Bar code scanner with connecting cable; 120 mm scanning width	YBR03PS2
Pipette calibration set for models with a readability of 0.01 mg or 0.1 mg; hardware and software	Available on request
Software for pipette calibration	Available on request
RS-232C data interface, 25-pin, for connection of Cubis accessory equipment	YDO01MS-R
Bluetooth® interface module for wireless connection of the YDP10BT data printer	YDO01MS-B
RS-232C data interface, 9-pin, including PS/2 port for connecting a PC or a keyboard	YDO01MS-P
Anti-static weighing pan; diameter of 130 mm, for weighing modules with a readability of 0.1 mg or 0.01 mg	YWP01MS
Anti-static weighing pan; diameter of 150 mm, for weighing modules with a readability of 1 mg	YWP02MS
Display holder for 10|100-mg precision weighing modules; for raising (post-mounting) MSE, MSU and MSA display and control units	YDH01MS
Balance table made of cast stone, with vibration dampeners	YWT03
Wall console	YWT04
Balance table made of wood, with cast stone slab inset for precise and reliable weighing	YWT09
Display and control unit, with backlit LCD and tactile keys	YAC01MSE
Display and control unit, with backlit black & white graphic display and tactile navigation keys	YAC01MSU
Display and control unit, with color TFT graphic display and touch screen	YAC01MSA
Display cable, 3 m, for Cubis models; for remote setup of the display unit and the weighing module	VF4016
SartoCollect software for data communication between a Cubis balance and a PC	YSC02
Sartorius OPC server for networking all Sartorius Cubis balances; requires 32-bit Microsoft® Windows 2000 or XP with current Service Pack versions (free, downloadable version for a 30-day test available on the Sartorius website)	
– Initial license	6289OPC
– Each additional license specified on a single order	6289OPC-L

Glossary

Adjustment	Setting a weighing instrument to eliminate the difference between the displayed value and the true mass of a sample.
Calibration	Determining the relation between the displayed value and the true mass of a sample. Calibration does not entail any intervention that changes the parameters of the balance.
isoCAL	Today's advanced balances are equipped with a fully automatic calibration|adjustment function. It is activated once a factory preset or a user-definable interval has elapsed. In addition, when a defined temperature difference is exceeded, the calibration|adjustment procedure is triggered automatically. This makes it possible to ensure the accuracy of a balance over the long term without any operator intervention.
Level indicator	Device used to find the horizontal plane for correct leveling of a balance.
Linearity	Deviation from the theoretical linear slope of the characteristic curve of two interdependent variables. If the zero point and the span of a balance have been correctly adjusted, the linearity can be determined by the positive or negative deviation of the weight readout from the actual load on the balance.
Minimum sample weight according to the USP (United States Pharmacopeia)	Section 41 of the USP specifies the use of balances and weights. It states that the minimum sample amount measured on a balance may not be less than 1,000 times the uncertainty of measurement (or the uncertainty of measurement must not be greater than 0.1% of the minimum sample weight). Tare loads, such as sample containers, may not be included in the calculation of the minimum sample weight. Determination of the minimum sample weight must be performed and documented at the place of installation. Under good installation conditions, the minimum sample weight for a semi-microbalance is generally between 15 mg and 25 mg.
Off-center loading error	Change in the value displayed when a given load is placed in different positions on the weighing pan.
Readability	The smallest difference in mass that can be displayed by a balance.
Repeatability	The ability of a balance to display consistent results under the same specified test conditions when the same load is placed on the balance in the same manner repeatedly (generally six times). The standard deviation, for instance, may be used as a quantitative expression of repeatability. The measurement of the repeatability must include both the balance specifications and the ambient conditions (vibration, fluctuating air current, temperature and humidity, etc.). Operator handling of the balance also affects the standard deviation.
Response time	This time is comprised of the stabilization time and the time it takes to open and close the draft shield and to place a sample on the balance.
Stabilization time	The time span between complete placement of an object (approx. 0.5 Max) on the load receptor – a weighing pan in this case – and the point at which the display readout or output signal remains stable within an interval of +/- 3 times the standard deviation around the final static value.

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