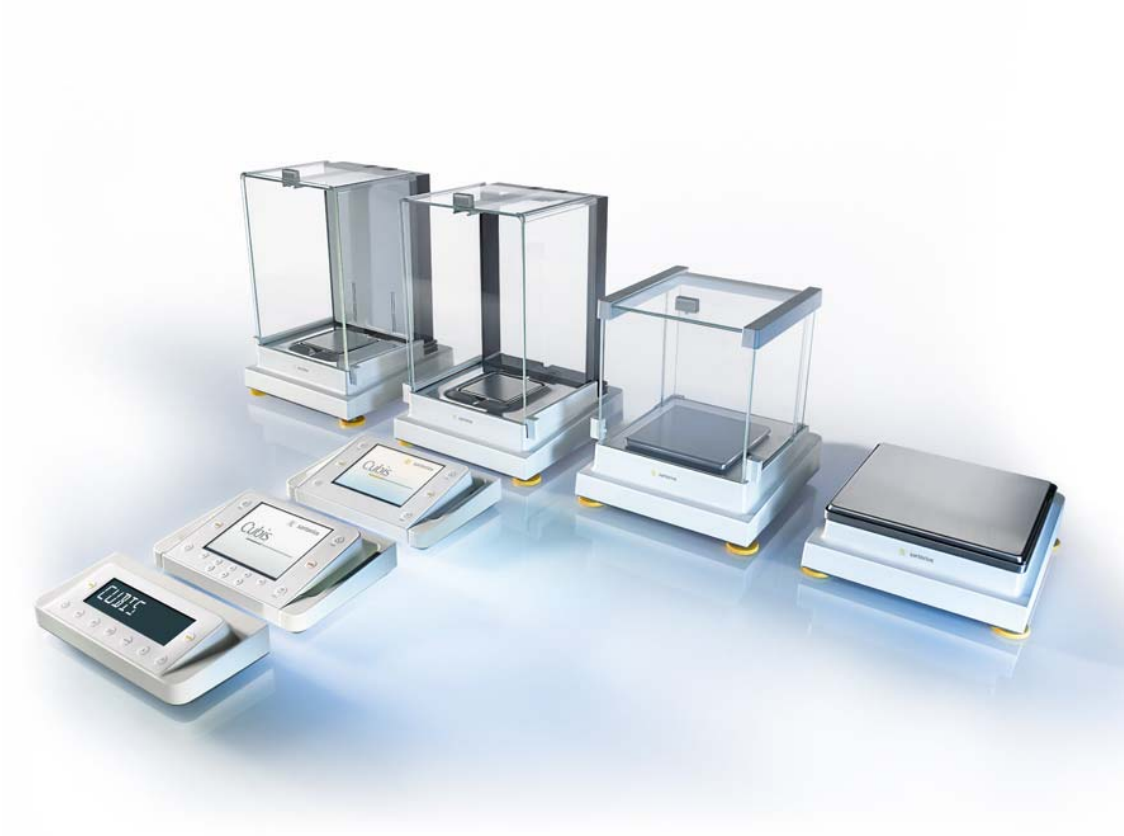
Sartorius Cubis Series



General technical specifications

Power requirements	100 – 240V~, -15%/+10%, 50-60Hz, 1,0A
Input voltage	15 Vdc, ± 5%
Power consumption	7W (max.)
Ambient temperature, operation	+5 °C ... +40 °C
Highest relative humidity	80% for temperatures up to 31 °C, decreasing linearly up to 50% relative humidity for 40 °C
Safety of electrical equipment	according to EN 61010-1:2001: Safety requirements for electrical equipment for measurement, control, and laboratory use – Part 1: General requirements
Electromagnetic compatibility	according to EN 61326-1:2006: Electrical equipment for measurement, control, and laboratory use - EMC requirements – Part 1: General requirements
Interference resistance	Suitable for use in industrial areas
Immunity to interference:	Class B: Suitable for use in residential areas and areas that are connected to a low voltage network that also supply residential buildings.

Cubis display and control units



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		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)
SD card reader	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 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, density determination (buoyancy method only), calculation, averaging (weigh averaging), net | total formulation, weighing in percent, counting

Cubis weighing modules

Semi micro balances 0.01mg

Model		225S	225P	125P
Readability	mg	0.01	0.01/0.02/0.05	0.01/0.1
Capacity	g	220	60/120/220	60/120
Tare range (subtractive)	g	– 220	– 220	– 120
Repeatability (std. deviation)	<±mg	0...60g: 0.015 60...220g: 0.025	0...60g: 0.015 60...220g: 0.04	0...60g: 0.015 60...120g: 0.06
Linearity	<±mg	0.1	0.15	0.15
Corner load (Test load [g])	mg	0.15 (100)	0.2 (100)	0.15 (50)
Minimum sample weight*	mg	20	20	20
Sensitivity drift within +10...+30°C	±ppm/K	1	1	1
Average stabilization time	s	< 2	< 2	< 2
Average response time	s	< 6	< 6	< 6
External calibration weight (of at least accuracy class...)	g	200 (E2)	200 (E2)	100 (E2)
Display update rate (depends on the filter level selected)		0.2 – 0.4		
Weighing pan dimensions (W x D)	mm	85 x 85		
Weighing chamber height (DU draft shield)	mm	261		
Protection		Protected against dust and water		

Analytical balances 0.1 mg

Model		324S	224S	324P	124S
Readability	mg	0.1	0.1	0.1/0.2/0.5	0.1
Capacity	g	320	220	80/160/320	120
Tare range (subtractive)	g	– 320	– 220	– 320	– 120
Repeatability (std. deviation)	<±mg	0.1	0.07	0.1/0.2/0.4	0.1
Linearity	<±mg	0.3	0.2	0.5	0.2
Corner load (Test load [g])	mg	0.3 (200)	0.2 (100)	0.4 (200)	0.2 (50)
Minimum sample weight*	mg	120	120	120	120
Sensitivity drift within +10...+30°C	±ppm/K	1	1	1	1
Average stabilization time	s	< 1	< 1	< 1	< 1
Average response time	s	< 3	< 3	< 3	< 3
External calibration weight (of at least accuracy class...)	g	200 +100 (E2)	200 (E2)	200 +100 (E2)	100 (E2)
Display update rate (depends on the filter level selected)		0.1 – 0.4			
Weighing pan dimensions (W x D)	mm	85 x 85			
Weighing chamber height (DU draft shield)	mm	261			
Protection		Protected against dust and water			

* = Typical minimum sample weight acc. to USP (Unites States Pharmacopeia), USP31-NF26

Precision balances

Model		3203P	2203S	2203P	1203S
Readability	mg	1/10	1	1/10	1
Capacity	g	1010/3200	2200	1010/2200	1200
Tare range (subtractive)	g	– 3200	– 2200	– 2200	– 1200
Repeatability (std. deviation)	<±mg	1/6	1	1/6	0,7
Linearity	<±mg	5	3	5	2
Corner load (Test load [g])	mg	2 (1.000)	2 (1.000)	3 (1.000)	2 (500)
Minimum sample weight*	g	1.5	1.5	1.5	1.5
Sensitivity drift within +10...+30°C	±ppm/K	1	1	1	1.5
Average stabilization time	s	< 1	< 1	< 1	< 1
Average response time	s	< 1.5	< 1.5	< 1.5	< 1.5
External calibration weight (of at least accuracy class...)	g	2000 (E2)	2000 (E2)	1000 (E2)	1000 (E2)
Display update rate (depends on the filter level selected)		0.1 – 0.4			
Weighing pan dimensions (W x D)	mm	140 x 140			
Weighing chamber height (DE draft shield)	mm	172			
Protection		Protected against dust and water			

Model		623S	623P	323S
Readability	mg	1	1/2/5	1
Capacity	g	620	150/300/620	320
Tare range (subtractive)	g	– 620	– 620	– 320
Repeatability (std. deviation)	<±mg	0.7	1/2/4	0.7
Linearity	<±mg	2	5	2
Corner load (Test load [g])	mg	2 (200)	4 (200)	2 (200)
Minimum sample weight*	g	1.5	1.5	1.5
Sensitivity drift within +10...+30°C	±ppm/K	2	2	2
Average stabilization time	s	< 0.8	< 0.8	< 0.8
Average response time	s	< 1	< 1	< 1
External calibration weight (of at least accuracy class...)	g	500 (E2)	500 (F1)	200 (E2)
Display update rate (depends on the filter level selected)		0.1 – 0.4		
Weighing pan dimensions (W x D)	mm	140 x 140		
Weighing chamber height (DE draft shield)	mm	172		
Protection		Protected against dust and water		

Model		10202S	8202S	6202S	6202P	4202S
Readability	mg	10	10	10	10/20/50	10
Capacity	g	10200	8200	6200	1500/3000/ 6200	4200
Tare range (subtractive)	g	– 10.200	– 8200	– 6200	– 6200	– 4200
Repeatability (std. deviation)	<±mg	7	7	7	7/20/40	7
Linearity	<±mg	20	20	20	50	20
Corner load (Test load [g])	mg	20 (5.000)	20 (5000)	20 (2000)	50 (2000)	30 (2000)
Minimum sample weight*	g	12	12	12	12	12
Sensitivity drift within +10...+30°C	±ppm/K	2	2	2	2	2
Average stabilization time	s	< 1	< 1	< 1	< 1	< 0.8
Average response time	s	< 1.5	< 1.5	< 1.5	< 1.5	< 1
External calibration weight (of at least accuracy class...)	kg	10 (E2)	5 (E2)	5 (E2)	5 (F1)	2 (E2)
Display update rate (depends on the filter level selected)		0.1 – 0.4				
Weighing pan dimensions (W x D)	mm	206 x 206				
Protection		Protected against dust and water				

Model		2202S	1202S	12201S	8201S	5201S
Readability	mg	10	10	100	100	100
Capacity	g	2200	1200	12200	8200	5200
Tare range (subtractive)	g	– 2.200	– 1200	– 12200	– 8200	– 5200
Repeatability (std. deviation)	<±mg	7	7	50	50	50
Linearity	<±mg	20	20	100	100	100
Corner load (Test load [g])	mg	20 (1000)	20 (500)	200 (5000)	200 (5000)	200 (2000)
Minimum sample weight*	g	12	12	100	100	100
Sensitivity drift within +10...+30°C	±ppm/K	2	2	4	4	4
Average stabilization time	s	< 0.8	< 0.8	< 0.8	< 0.8	< 0.8
Average response time	s	< 1	< 1	< 1	< 1	< 1
External calibration weight (of at least accuracy class...))	kg	2 (F1)	1 (F1)	10 (F1)	5 (F2)	5 (F2)
Display update rate (depends on the filter level selected)		0.1 – 0.4				
Weighing pan dimensions (W x D)	mm	206 x 206				
Protection		Protected against dust and water				

* = Typical minimum sample weight acc. to USP (Unites States Pharmacopeia), USP31-NF26

Verified models with EC type approval: Semi micro balances 0.01mg

Model		225S-0CE	225P-0CE	125P-0CE
Accuracy class*	mg	Ⓘ	Ⓘ	Ⓘ
Scale interval d*	mg	0.01	0.01/0.02/0.05	0.01/0.1
Maximum capacity, Max*	g	220	60/120/220	60/120
Verification scale interval, e*	mg	1	1	1
Minimum capacity, Min*	mg	1	1	1
Tare range (subtractive)		< 100% of maximum weighing capacity		
Range of use according to CD *	g	0.001 – 220	0.001 – 220	0.001 – 120
Minimum sample weight**	mg	20	20	20
Average stabilization time	s	< 2	< 2	< 2
Average response time	s	< 6	< 6	< 6
External calibration weight (of at least accuracy class...))	g	200 (E2)	200 (E2)	100 (E2)
Allowable ambient operating temperature:		With »isoCAL« function: +5...+40 °C | Without »isoCAL« function: +15...+25 °C		
Adaptation to ambient conditions and user requirements		By selection of 1 of 4 optimized filter levels		
Display update rate (depends on the filter level selected)		0.2 – 0.4		
Weighing pan dimensions (W x D)	mm	85 x 85		
Weighing chamber height (DU draft shield)	mm	261		
Protection		Protected against dust and water		

Verified models with EC type approval: Analytical balances 0.1mg

Model		324S-0CE	224S-0CE	324P-0CE	124S-0CE
Accuracy class*		Ⓘ	Ⓘ	Ⓘ	Ⓘ
Scale interval d*	mg	0.1	0.1	0.1/0.2/0.5	0.1
Maximum capacity, Max*	g	320	220	80/160/320	120
Verification scale interval, e*	mg	1	1	1	1
Minimum capacity, Min*	mg	10	10	10	10
Tare range (subtractive)	g	< 100% of maximum weighing capacity			
Range of use according to CD *	g	0.01 – 320	0.01 – 220	0.01 – 320	0.01 – 120
Minimum sample weight**	mg	120	120	120	120
Average stabilization time	s	< 1	< 1	< 1	< 1
Average response time	s	< 3	< 3	< 3	< 3
External calibration weight (of at least accuracy class...))	g	200 +100 (E2)	200 (E2)	200 +100 (E2)	100 (E2)
Allowable ambient operating temperature:		With »isoCAL« function: +5...+40 °C | Without »isoCAL« function: +15...+25 °C			
Display update rate (depends on the filter level selected)		0.1 – 0.4			
Weighing pan dimensions (W x D)	mm	85 x 85			
Weighing chamber height (DU draft shield)	mm	261			
Protection		Protected against dust and water			

Verified models with EC type approval: Precision balances

Modelle		3203P-0CE	2203S-0CE	2203P-0CE	1203S-0CE
Accuracy class*		Ⓘ	Ⓘ	Ⓘ	Ⓘ
Scale interval d*	mg	1/10	1	1/10	1
Maximum capacity, Max*	g	1010/3200	2200	1010/2200	1200
Verification scale interval, e*	mg	10	10	10	10
Minimum capacity, Min*	mg	100	100	100	100
Tare range (subtractive)	g	< 100% of maximum weighing capacity			
Range of use according to CD *	g	0.1 – 3200	0.1 – 2200	0.1 – 2200	0.1 – 1200
Minimum sample weight**	g	1.5	1.5	1.5	1.5
Average stabilization time	s	< 1	< 1	< 1	< 1
Average response time	s	< 1.5	< 1.5	< 1.5	< 1.5
External calibration weight (of at least accuracy class...))	g	2000 (E2)	2000 (E2)	1000 (E2)	1000 (E2)
Allowable ambient operating temperature:		With »isoCAL« function: +5...+40 °C | Without »isoCAL« function: +15...+25 °C			
Display update rate (depends on the filter level selected)		0.1 – 0.4			
Weighing pan dimensions (W x D)	mm	140 x 140			
Weighing chamber height (DE draft shield)	mm	172			
Protection		Protected against dust and water			

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

** = Typical minimum sample weight acc. to USP (Unites States Pharmacopeia), USP31-NF26

Verified models with EC type approval: Precision balances

Model		MSA623S-0CE	623P-0CE	323S-0CE
Accuracy class*	mg	II	II	II
Scale interval d*	mg	1	1/2/5	1
Maximum capacity, Max*	g	620	150/300/620	320
Verification scale interval, e*	mg	10	10	10
Minimum capacity, Min*	mg	20	20	20
Tare range (subtractive)		< 100% of maximum weighing capacity		
Range of use according to CD *	g	0,02 – 620	0,02 – 620	0,02 – 320
Minimum sample weight**	g	1,5	1,5	1,5
Average stabilization time	s	< 0,8	< 0,8	< 0,8
Average response time	s	< 1	< 1	< 1
Allowable ambient operating temperature:		With »isoCAL« function: +5...+40 °C | Without »isoCAL« function: +10...+30 °C		
Display update rate (depends on the filter level selected)		0.1 – 0.4		
Weighing pan dimensions (W x D)	mm	140 x 140		
Weighing chamber height (DE draft shield)	mm	172		
Protection		Protected against dust and water		

Model		10202S-0CE	8202S-0CE	6202S-0CE	6202P-0CE	4202S-0CE
Accuracy class*		I	II	II	II	II
Scale interval d*	g	0,01	0,01	0,01	0,01/0,02/0,05	0,01
Maximum capacity, Max*	g	10.200	8.200	6.200	1.500/3.000/ 6.200	4.200
Verification scale interval, e*	g	0,1	0,1	0,1	0,1	0,1
Minimum capacity, Min*	g	0,5	0,5	0,5	0,5	0,5
Tare range (subtractive)		< 100% of maximum weighing capacity				
Range of use according to CD *	g	0,5 – 10.200	0,5 – 8.200	0,5 – 6.200	0,5 – 6.200	0,5 – 4.200
Minimum sample weight**	g	12	12	12	12	12
Average stabilization time	s	< 1	< 1	< 1	< 1	< 0,8
Average response time	s	< 1,5	< 1,5	< 1,5	< 1,5	< 1
Allowable ambient operating temperature:						
With »isoCAL« function		+5...+40°C	+5...+40°C	+5...+40°C	+5...+40°C	+5...+40°C
Without »isoCAL« function		+15...+25°C	+10...+30°C	+10...+30°C	+10...+30°C	+10...+30°C
Display update rate (depends on the filter level selected)		0.1 – 0.4				
Weighing pan dimensions (W x D)	mm	206 + 206				
Protection		Protected against dust and water				

Model		2202S-0CE	1202S-0CE	12201S-0CE	8201S-0CE	5201S-0CE
Accuracy class*		II	II	II	II	II
Scale interval d*	mg	10	10	100	100	100
Maximum capacity, Max*	g	2.200	1.200	12.200	8.200	5.200
Verification scale interval, e*	g	0,1	0,1	1	1	1
Minimum capacity, Min*	g	0,5	0,5	5	5	5
Tare range (subtractive)		< 100% of maximum weighing capacity				
Range of use according to CD *	g	0,5 – 10.200	0,5 – 8.200	0,5 – 6.200	0,5 – 6.200	0,5 – 4.200
Minimum sample weight**	g	12	12	100	100	100
Average stabilization time	s	< 0,8	< 0,8	< 0,8	< 0,8	< 0,8
Average response time	s	< 1	< 1	< 1	< 1	< 1
External calibration weight (of at least accuracy class...))	kg	2 (F1)	1 (F1)	10 (F1)	5 (F2)	5 (F2)
Allowable ambient operating temperature:		With »isoCAL« function: +5...+40 °C | Without »isoCAL« function: +10...+30 °C				
Display update rate (depends on the filter level selected)		0.1 – 0.4				
Weighing pan dimensions (W x D)	mm	206 + 206				
Protection		Protected against dust and water				

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

** = Typical minimum sample weight acc. to USP (Unites States Pharmacopeia), USP31-NF26

Cubis leveling function

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.

Test certificates and approvals

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

Cubis draft shields

DO	No draft shield. Please enter this ID code for weighing modules with pan sizes of 206 x 06 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
DI	As for the DA draft shield, but additionally with integrated ionizer to eliminate interfering electrostatic charges on samples and sample containers

Optional interface modules

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

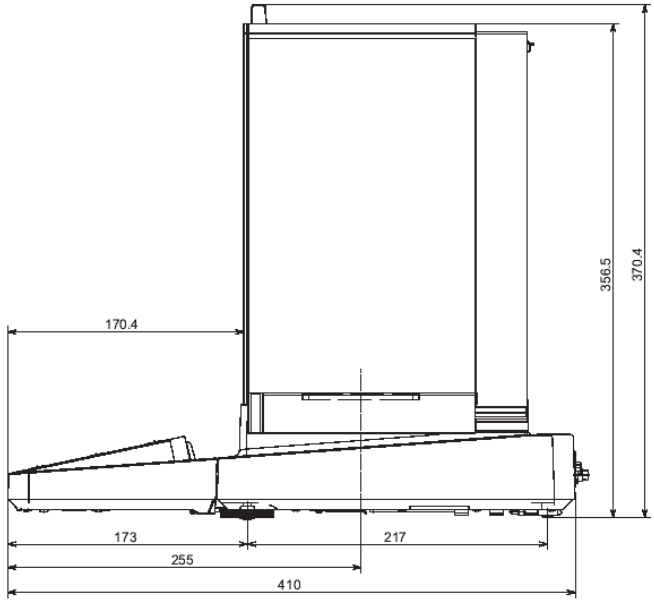
Accessories

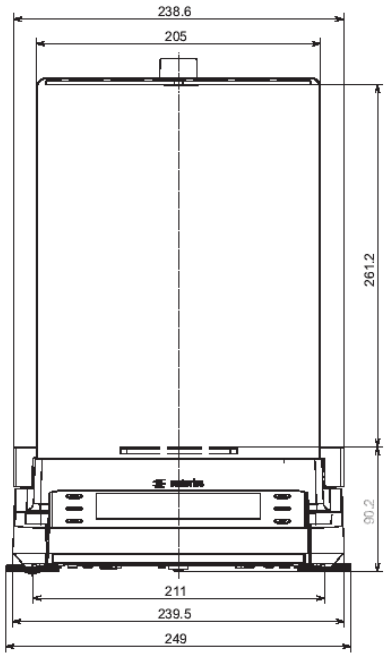
Data printer, suitable for use in legal metrology, connects to a 25-pin RS-232 port on accessory equipment	YDP10-0CE
Data printer, with data transfer capability using *Bluetooth*® wireless technology (only if connected to YDO01MS-B or Option IB)	YDP10BT-0CE
Paper rolls for YDP10-0CE printer; 5 rolls, 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

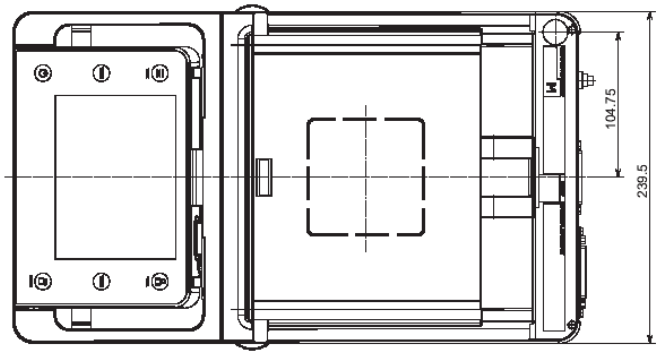
Dimensional drawings

Semi micro and analytical balances with manual draft shield DU

All Dimensions in mm

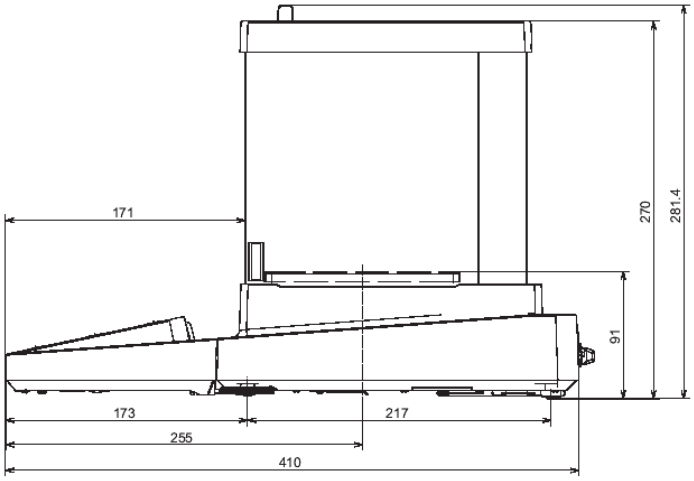


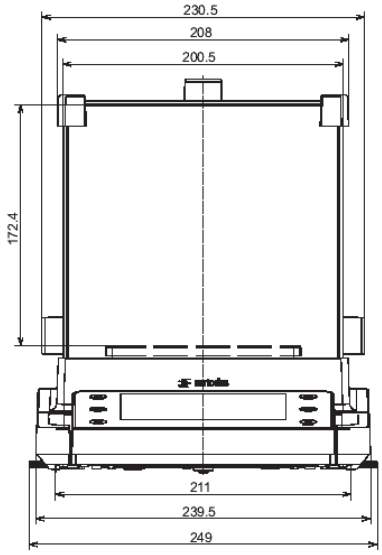


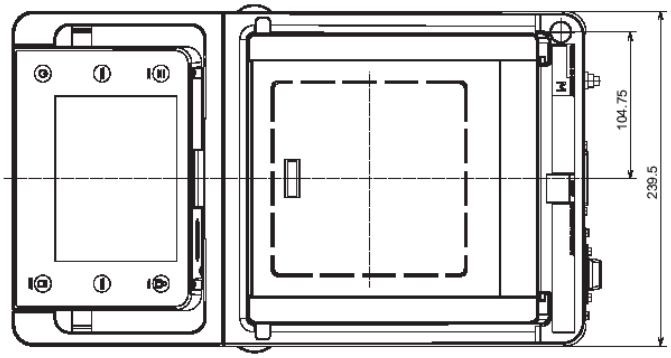


Precision balances with mg-draft shield DE

All Dimensions in mm







Precision balances without draft shield

All Dimensions in mm