



# Cubis<sup>®</sup> MSA Dosing System

Simplifying Progress

**SARTORIUS**



# Preparation of Standards – with the Cubis® MSA Dosing System Easier Than Ever Before

The Cubis® MSA Dosing System simplifies workflows in the preparation of analytical standards. Once the desired concentration(s) of the components and the volume of the standard solution have been entered, the required amount of sample to be weighed is automatically calculated and the target weight is shown as a bar graph with the tolerances: If the desired target weight is not achieved, the Q-App Dosing software will recalculate the required volume of solvent based on the actual weight determined and transmit this value to the automatic dispenser. After the solvent has been added, the weight of your sample is again measured gravimetrically. At the end of this procedure, the application software calculates the exact concentration of your standard solution from the weights of your component(s) and the volume of solvent.

# Unsurpassed Precision for Valid Analytical Results

Reference samples, called standards, are required to determine the concentration of chemical compounds using highly sensitive quantitative analytical procedures. These standards have a defined concentration of one or several known compounds. It goes without saying that the concentration(s) of these standards must be as accurate as possible to prevent subsequent errors in determining unknown concentrations in samples.

Although preparation of standards of known concentration(s) is a common routine in analytical laboratories, two problems regularly confront lab technicians:

1. The required weight of the soluble compound(s) is calculated based on the volume and desired concentration of the solvent. The decisive problem is the weight of the solid compound(s). Normally, high-resolution laboratory balances with an accuracy of several decimal places are used to measure the exact weight. However, it is next to impossible to reach the target weight exactly during dosing of a compound.
2. If the compound weighed does not precisely equal the calculated weight, the volume of solvent has to be adjusted to reach the desired final concentration. Recalculation of the required volume of liquid takes time and is a possible source of error.

The Cubis® MSA dosing system with the YAPP16 Q-App software is precisely designed to eliminate these problems described. The system guides the user automatically throughout the entire process of preparing standards, and the application software automatically takes care of all calculations in the background. There is no need to reach the target weight exactly as the software automatically corrects the required solvent volume to the appropriate value. At the end of this procedure, the software uses the weight of the compound(s) measured and the gravimetrically checked, effective solvent weight to calculate the verified concentration(s) and the verified volume of the standard prepared.

Find out more:

<https://www.sartorius.com/en/applications/quality-control-testing/sample-preparation-qc/standards>

## Integrated System for Preparation of Standards of a Defined Concentration

- Perfectly integrated system: Highly accurate weighing by the Cubis® MSA balance and dispensing of solvents using automatic dispensers or electronic or manual pipettes
- Software application: Controls system components by the YAPP16 Dosing Q-App
- Automatic preparation of standards: Maximum efficiency and time savings without any compromises in accuracy or precision
- Valid results: Automatic calculation of the verified volume and concentration(s)
- Flexible: Create your individual library with solvents and compounds along with specifications on purity, lot, molecular weight, density and supplier
- Cost- and time-efficient: Automated processes eliminate unnecessary wastage of solvents or compounds
- Standardized process: 100% compliance with your SOPs
- Controlled workflows: 100% consistency in the preparation of standards, independently of the particular lab analyst
- Validation and documentation of system functions: Optimal support during validation



# Cubis® MSA Dosing System Components

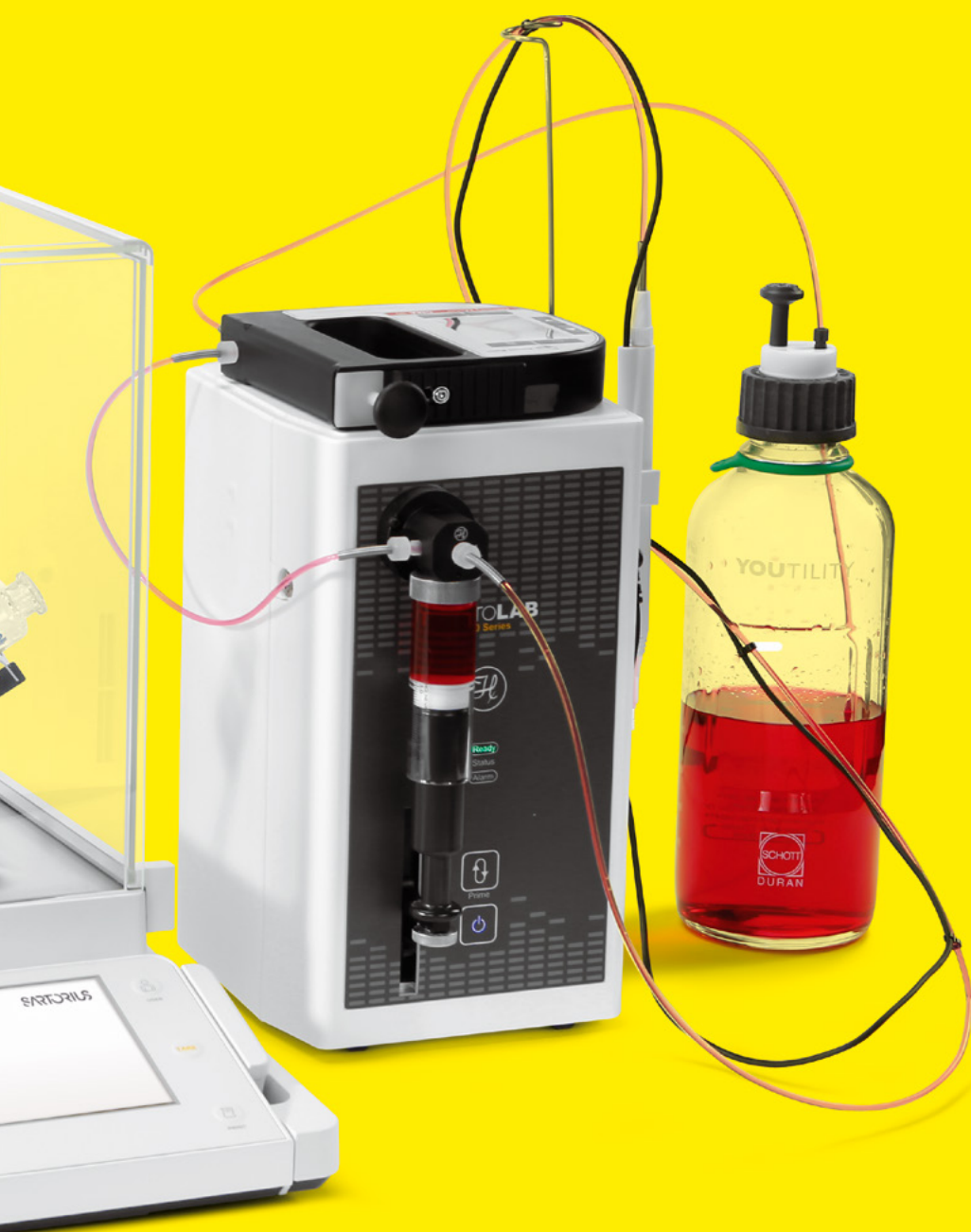
The Cubis® MSA dosing system is custom-configurable from a choice of components. These key components include a Cubis® MSA balance and the YAPP16 Dosing Q-App software. Configuration options are as follows:

- Cubis® MSA: Modular, configurable high-resolution balances for accurate determination of the mass of liquid, paste-like, powdered or solid materials
- YAPP16: Dosing application software for Cubis® MSA balances for preparing standards of a defined concentration
- Dispenser: The solvent can be dosed manually using a pipette or an automatic dispenser; currently, the Hamilton Microlab dispenser or the Hirschmann opus titration unit can be integrated into the Cubis® MSA dosing system
- Picus® pipettes: Their fully electronic mode ensures unsurpassed accuracy and repeatability of pipetting results; the ergonomic and especially lightweight design protects users from chronic repetitive strain injury (RSI)



- Density meter: The YAPP16 Dosing Q-App corrects for the temperature-dependent density of solvents in its automatic calculations; the Anton Paar DMA35 density meter can be used for measuring the density of solvents
- Printer: The YDP30 thermal transfer printer can be connected to document the results on your choice of standard or self-adhesive fade-resistant paper
- Sample holder: Various sample holders are available to accommodate the containers you use

Cubis® MSA balances already installed can be easily retro-fitted with these components to readily convert them into dosing systems.



# Cubis® MSA Balance: Highly Accurate Gravimetric Measurements



- Modularity: The balance can be configured according to your specific requirements
- Accuracy: Exact measurements with an accuracy of down to 6 decimal places
- Q-Level: Automatic, motorized leveling function
- Intelligent isoCAL calibration system: 100% certainty that your balance is always correctly calibrated and adjusted
- Verification function: Complete traceability of measured values ensured by calibration using OIML weights
- Draft shield: Convenient operation due to touch-free, automated draft shield
- Q-Grip sample holder, YHS01MS: Safe and easy handling of volumetric flasks and other vessels
- Sample holder, YSH02: Included in the standard equipment for micro balances of the Cubis® weighing module models 36S, 36P, 66S, 66P and 116P

## Cubis® display and control unit: One interface for full system operation

- Cubis® high-resolution color touch-screen display: Easy and convenient operation of the entire system
- Cubis® operating unit: Connection between the Cubis® MSA balance and the automatic dispenser
- YAPP16 Dosing Q-App software: Can be installed on the operating unit using an SD card; MSA balances already available can be upgraded with this application software
- Space-saving installation: No separate computer necessary

## Balance models for various flask sizes

| Model | Weighing capacity (g) | Readability (mg) | Flask weight (g)* | Recommended flask volume (mL) |
|-------|-----------------------|------------------|-------------------|-------------------------------|
| 116P  | 12   111              | 0.002   0.01     | 6   32            | 2   50                        |
| 66P   | 61                    | 0.001   0.01     | 23                | 25                            |
| 66S   | 12   61               | 0.001            | 6   23            | 2   25                        |
| 36P   | 6   31                | 0.001   0.01     | 5   17            | 1   10                        |
| 36S   | 31                    | 0.001            | 17                | 10                            |

\* Dimensions and weights of long-necked flasks can vary, depending on the flask manufacturer

Please use the selection tool on the following website to individually configure your Cubis® MSA balance:

<https://www.sartorius.com/en/products/weighing/laboratory-balances/premium-level-balances/cubis/cubis-high-capacity-micro-balance>

# YAPP16<sup>1</sup> Dosing Q-App for Preparing Standards

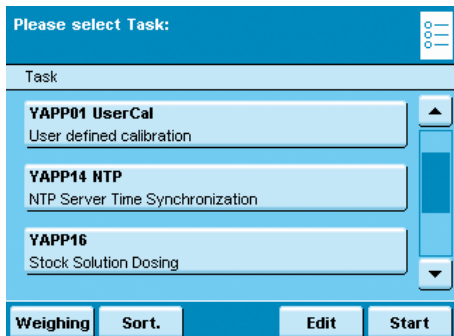


## Guaranteed consistency and complete traceability

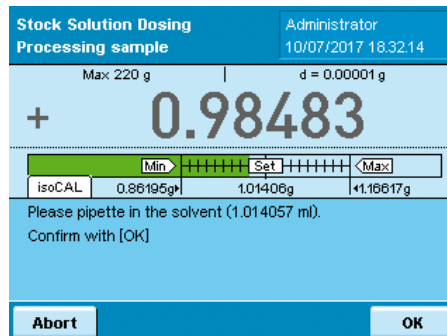
- Highly specialized software: Application specially designed for automated preparation of standards using the Cubis® MSA dosing system
- Standard Q-Guide: Safe and reliable user guidance throughout the entire process
- Reliable: Considers factors such as molecular weight and purity of the compound, as well as the density of the solvent: 100% valid results
- Automated: Automatic adjustment of the solvent volume to the actual weight of a compound
- Data integrity ensured: Administrator level for defining basic settings, such as allowable tolerances, password release for dealing with out-of-tolerance values, editing of libraries for solvents, components and samples and of the user level for preparation of standards
- Visual monitoring by the user: Color of the tolerance bar graph provides immediate feedback to the user as to whether weights are within or outside the permissible tolerances
- Audit trail: Systematic monitoring and documentation of process steps: 100% traceability in compliance with GLP and accredited procedures
- Versatile: Preparation of individual standards and mixed standards
- Volumetric displacement: Corrects for the volume of solvent displaced by the solid compounds that have been weighed
- Flexible: Different concentration units can be selected:  $\mu\text{g/mL}$ ,  $\text{mmol/L}$ ,  $\mu\text{g/L}$ ,  $\text{mg/L}$ ,  $\text{mg/mL}$
- Direct data transfer: Reliable documentation, error-free printing, no manual transcription errors
- Configurable printouts: Choice between GLP-compliant and standard printouts, as well as label printouts
- Automation: Interface for Thermo Scientific™ Chromeleon™ 7.2 chromatography data system (CDS) software. The Cubis® YAPP16 Dosing Q-App has an interface port for Chromeleon 7.2 CDS software, which enables data management of chromatographic systems, simplified run creation and data analysis, and is essentially a database. Direct transfer of the verified concentration of calibration standards to Chromeleon 7.2 CDS software represents a new milestone in the automation of quantitative analytical procedures



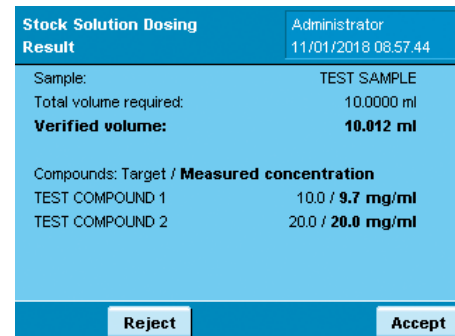
<sup>1</sup> An SD card (YDU-20) is required for installing the YAPP16 Dosing Q-App software



Easy activation of the Q-App.



YAPP16 checks and verifies the weight of compounds during preparation of standards.



The results of a standard prepared by running the YAPP16 Q-App are displayed.

# Accessories



## **Hamilton MICROLAB 630<sup>2</sup> single syringe dispenser: Automated, consistent and reliable handling of liquids**

- All-in-one dispensing and dilution:  
Simple and efficient preparation of solutions
- Automated handling of solvents: Absolutely consistent and 100% reliable
- High-performance syringe drive with 48,000 increments per stroke:  
Highly accurate aspiration and dispensing of liquids
- Accuracy: Works with even the smallest volumes, as well as with volatile, viscous and high-density liquids
- Solvent volume based on the weight of a sample: Ensures reliability and accuracy, saving expensive analytes and reducing costly solvent waste
- Chemically inert: Fluid path made of borosilicate glass, PTFE and CTFE; resistant to aggressive solvents
- SCAT solvent safety kit: Guarantees safe use of solvents without exposing users to hazards
- Fast exchange system for solvents: Easy exchange of solvents by quick-connect coupling
- Complete system: 25 mL syringe, tubing and 4 bottles with caps included in the equipment supplied

<sup>2</sup>To connect a Hamilton dispenser to a Cubis® MSA balance, you will need an additional serial cable (69Y03295) and a serial interface (YDO01MS-R).



## **Hirschmann opus titration<sup>3</sup> unit: Motorized dosing directly from a solvent flask**

- Volume as needed: Three different models with distinct volumes and electronic control of solvent dispensing
- Can be automated: RS-232 interface port for connection to a Cubis® MSA balance
- Flexible: Two different accessory sets, depending on how frequently the solvent is changed
- Exact: Titration pulse triggered by motor enables clean droplet breakup starting at 10 µL for the most accurate dosing
- Saves expensive reagents: Media recirculating system for simple and rapid venting without reagent loss
- Chemically inert: Discharge valves and valve seats consist of high-purity aluminum oxide ceramic, and valve springs are made of Hastelloy
- Rugged: Use of high-grade materials (ECTFE, DURAN® glass, FEP); media-conveying components suitable for steam sterilization (121°C)

<sup>3</sup>You will need the following to connect a Hirschmann opus titration unit to a Cubis® MSA balance: an additional serial cable (69Y03295), a serial interface (YDO01MS-R) and one of the accessory sets (YDU-15 or YDU-16). For Hirschmann opus accessory set I, the solvent reservoir is external (for fast change-out of the bottle). For Hirschmann opus accessory set II, the dispenser is attached to the reservoir.



#### **Picus® pipettes: Electronic pipettes for professionals**

- Flexible: Available for various volumes (10 µL to 10,000 µL max. volume)
- User-friendly: Unique, lightweight and compact design
- Convenient: One-touch operating button and feather-light electronic tip ejection minimize muscle strain
- Precise: Electronic piston control and brake ensure accurate pipetting results, independently of the user
- Exact: Repeated blow-out function helps dispense every last droplet, facilitating dosing of viscous liquids
- Practicality: Selection of pipetting modes enables a wide variety of liquid handling tasks to be quickly and easily performed

Please use the selection tool on the following website to choose your Picus® pipette:

<https://www.sartorius.com/en/products/pipetting-and-dispensing/electronic-pipettes/picus>



#### **Anton Paar DMA™ 35 portable density meter:**

##### **Total ease of operation and robust design**

- User-friendly features: Compact design and low weight permit measurements using just one hand
- Ruggedness: Tested chemical resistance of the sample-contacted parts against commonly used liquids
- Readability: Measuring cell with inspection window and backlight
- Portability for complete independence: Cable-less; battery operation





## YDP30 printer: Perfect printouts for documentation and complete traceability

- Thermal transfer printer: GLP-compliant printout on self-adhesive, fade-resistant paper
- Configurable printouts: Choose between GLP-compliant and standard printouts or label printouts with unique reference IDs
- Direct digital data transfer: Error-free printing of reports and labels

## Ordering Information

| Order number | Product   |
|--------------|---|
| YDU-10       | Hamilton ML630 complete dispenser package   |
| YDU-11       | Hamilton ML630 complete dispenser package, incl. density meter, YDU-9                                   |
| YDU-12       | Hirschmann opus titration unit, 10 mL, 100 – 240 V  |
| YDU-13       | Hirschmann opus titration unit, 20 mL, 100 – 240 V  |
| YDU-14       | Hirschmann opus titration unit, 50 mL, 100 – 240 V  |
| YDU-15       | Hirschmann opus accessory set I   |
| YDU-16       | Hirschmann opus accessory set II  |
| 84ICL31      | Installation of an electronic titration unit or dispenser   |
| 84QAL31      | Installation qualification (IQ) of an electronic titration unit or dispenser                            |
| 84ICL0x*     | Installation of a laboratory balance  |
| 84QAL0x*     | Installation and operational qualification of a laboratory balance                                      |
| 84QBL31      | Functional test of the YAPP16 Dosing Q-App, incl. documentation   |
| YDU-9        | Anton Paar DMA™ 35 density meter  |
| YDP30        | Laboratory thermal transfer printer   |
| 69Y03286     | Self-adhesive paper and ink ribbon set for YDP30  |
| 69Y03285     | Standard paper and ink ribbon set for YDP30   |
| YDU-20       | SanDisk 8 GB SD card  |
| YDO01MS-R    | RS-232 interface, 25-pin  |
| 69Y03295     | Sartorius RS-232 cable  |
| YFH01MS      | Flask holder for Cubis® analytical and semi-micro balances; accommodates a wide variety of vessel sizes |
| YAPP16       | Cubis® Dosing Q-App software  |

\* Order numbers for installation and operational qualification (IQ|QQ) depend on the particular balance model, such as Cubis® MSA micro.

If you are interested in connecting the Cubis® dosing system to the Chromeleon™ 7.2 CDS software, please contact your local Thermo Fisher Scientific partner.

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