

# Milli-Q® Advantage A10®

## Water Purification Systems

User-adapted ultrapure water



# User-adapted ultrapure water

Your ultrapure water needs	Our solutions: the Milli-Q® Advantage A10® system
A reliable and versatile source of high-quality ultrapure water	Using an existing source of pure water as feed, the Milli-Q® Advantage A10® system delivers high-quality ultrapure water (resistivity value: 18.2 MΩ·cm @ 25 °C; ≤ 5 ppb). Two separate components — the Milli-Q® water production unit and the Q-POD® (Quality-Point-of-Delivery) unit — provide an ultrapure water solution adapted to today's laboratory environments.
Ultrapure water quality adaptable to a variety of needs	Q-POD® dispensers provide final polishing for Milli-Q® Advantage A10® water at the point of use. A unique range of Application Pak final purifiers is available to remove specific contaminants right before ultrapure water delivery.
Easy, convenient ultrapure water delivery	The ergonomic Q-POD® dispensers provide easy delivery of ultrapure water. Use the autofill key to deliver a precise volume, or manually press the plunger to deliver ultrapure water from low to high flow.
Advanced water quality monitoring	The system's A10® Total Oxidizable Carbon (TOC) and high-precision resistivity meters enable control over both organic and ionic contaminants that can impact your results. Both meters match USP requirements.
Optimized lab space	The compact Milli-Q® water production unit can be installed on the bench, under the bench or on a wall — wherever it's best for you. To facilitate water delivery, up to three Q-POD® ultrapure water delivery units per system can be placed in different locations.
Smooth and easy communication	Important information about water quality and system operation is visible on the easy-to-read Q-POD® dispenser display and on the water production unit screen. A handy Quick Reference Guide inside the system door provides concise information on operation and maintenance.
Data tracking that meets your requirements	Activating Millitrack® Basic software provides data management, remote access to dashboard, and long-term archiving capabilities. For Title 21 CFR Part 11 compliance Millitrack® Compliance software provides additional features such as e-signature, audit trail, and account management for full system control.
Compliance with the highest Quality Assurance demands	Milli-Q® Advantage A10® systems are manufactured in an ISO®-registered, cGMP manufacturing facility and are delivered with a Certificate of Conformity and Certificate of Calibration for all built-in meters; consumables are delivered with a Certificate of Quality.
Fast, efficient technical support	Merck Millipore is a partner you can count on. Watercare Pact service plans offer a full range of support, including qualification expertise and validation support.
Carefree maintenance procedures	Maintenance procedures are easy and straightforward, with consumable replacement dates signaled 15 days ahead of time by the system. RFID technology protects against use of an incorrect consumable and also enables automatic traceability.
Systems that evolve with lab changes	A large range of accessories and options is available to enable your Milli-Q® system to evolve with changes within the laboratory.

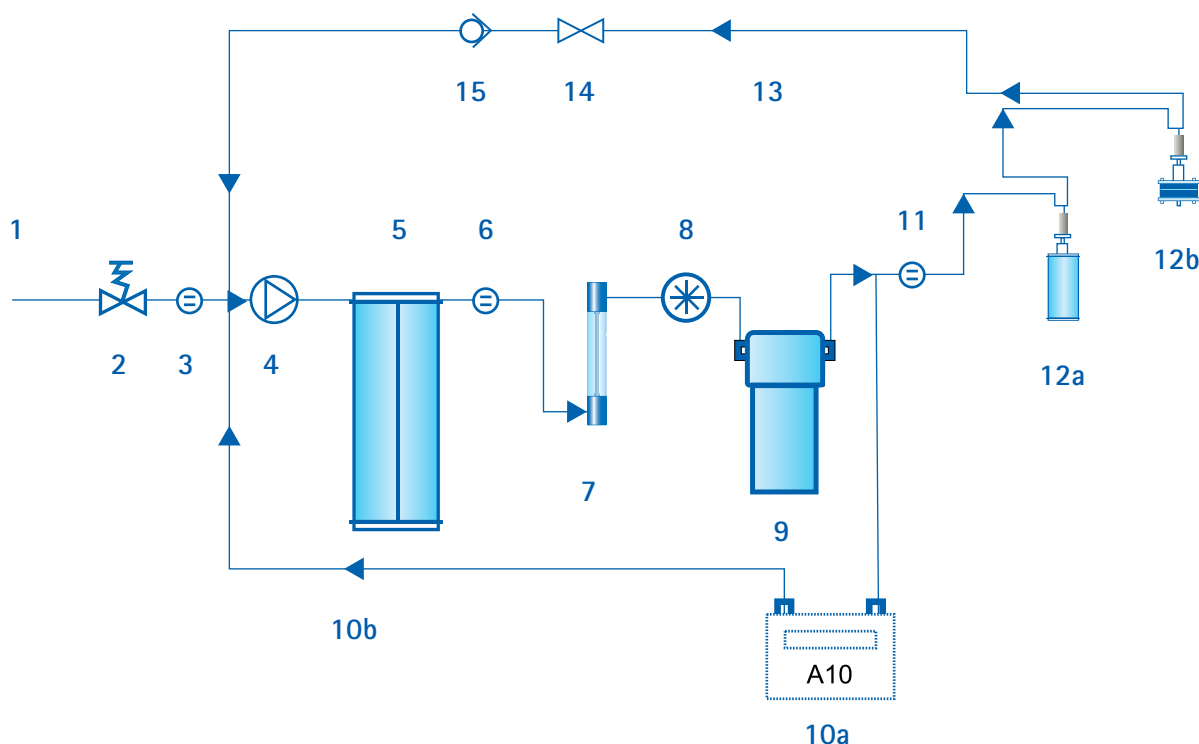
# Milli-Q Advantage A10<sup>®</sup> water purification pathway

## Optimized purification

The most reliable ultrapure water quality depends on building an optimized purification sequence.

Merck Millipore makes this possible by using a variety of purification media in the Milli-Q<sup>®</sup> Advantage A10<sup>®</sup> system, in order to offer you a flexible solution matching the diversity of your applications.

- Pure water, ideally from an Elix<sup>®</sup> purification system, enters the Q-Gard<sup>®</sup> pretreatment pack (5), which is chosen based on the feed water source.
- Pretreated water then passes into a dual wavelength UV lamp (7), which ensures organic molecule oxidation and bacteria destruction.
- Next, the Quantum<sup>®</sup> polishing cartridge (9) removes ionic and organic contaminants below trace levels to match the water quality required for your application.
- The ultrapure water produced by the system recirculates through a loop up to the Q-POD<sup>®</sup> unit, where the final purification step required for your particular application occurs.
- The measurement of both organic and ionic quality of produced water occurs at the outlet of the system, through the appropriate calibrated meters.
  - Accurate Total Oxidizable Carbon (TOC) monitor (10a)
  - High-sensitivity resistivity cell (11)



- |   |   |                                   |
|---|---|-----------------------------------|
| 1 - Pure water feed                       | 7 - 185/254 nm UV lamp                  | 12a - Q-POD <sup>®</sup> 1        |
| 2 - Inlet solenoid valve                  | 8 - Flow meter                          | 12b - Q-POD <sup>®</sup> 2        |
| 3 - Optional feed water conductivity cell | 9 - Quantum <sup>®</sup> cartridge      | 13 - Recirculation loop           |
| 4 - DC pump                               | 10a - Online TOC monitor                | 14 - Recirculation solenoid valve |
| 5 - Q-Gard <sup>®</sup> packs             | 10b - Online TOC monitor reject recycle | 15 - Recirculation check valve    |
| 6 - Intermediate conductivity cell        | 11 - Product resistivity cell           |                                   |

# A reliable and versatile source of high-quality ultrapure water

As a scientist today, you face many challenges. You're responsible for delivering high-quality technical results — but now at any even faster pace. You also have to comply with a growing number of quality and regulatory standards, while working in a laboratory where space may be limited. Resulting from on-going dialogues with scientists like you, Merck Millipore continues to develop water purification systems that improve your work environment.

The Milli-Q® Advantage A10® system has been designed especially for you. Using an existing source of pure water as feed, the Milli-Q® Advantage A10® system delivers high-quality ultrapure water (resistivity value: 18.2 MΩ·cm @ 25 °C; ≤ 5 ppb), providing an ultrapure water solution adapted to today's laboratory environments.

The Milli-Q® Advantage A10® system simplifies your daily life in the lab by utilizing **two distinct components**:

- The **Milli-Q® production unit** is a compact system that can be placed either on the bench, under the bench, or on a wall — wherever it best suits you.
- The **Q-POD® (Quality-Point-of-Delivery) unit** provides final polishing at the point of use, delivering ultrapure water adapted to your specific needs.



## Ultrapure water quality adaptable to a variety of needs

The revolutionary Q-POD® technology empowers you with convenient and flexible dispensing options. Up to three Q-POD® units can be used with each Milli-Q® Advantage A10® system at different locations within the same laboratory.

Depending on your application, specific contaminants can affect your results. The Milli-Q® Advantage A10® system offers a unique range of final purifiers for complete peace of mind. You just choose the appropriate media that remove the specific contaminants that may affect your results depending on the application.

For example, the Millipak® filter with the Millipore Express® membrane (0.22 µm) produces particulate and bacteria-free ultrapure water for analytical applications such as spectrophotometry, spectroscopy, and chromatography. The BioPak® ultrafilter, while removing particulates and bacteria, produces pyrogen- and nuclease-free ultrapure water for biochemical applications.



### Application Pak range



**BioPak® Polisher**

Pyrogen-free and nuclease-free water



**VOC-Pak™ Polisher**

Water for volatile organic compounds analysis



**EDS-Pak® Polisher**

Water for endocrine disruptors experiments



**LC-Pak™ Polisher**

Water for ultratrace organic analysis



**Millipak® Polisher**

Bacteria-free and particulate-free water

# Easy, convenient ultrapure water delivery

Daily performance is facilitated by having ultrapure water and information conveniently delivered at the point of use. Helping you to work both intuitively and precisely, the Q-POD® dispenser is always within your reach. Select a very precise volume through the autofill key, or manually press the plunger.

You gain enhanced flexibility in your work through convenient and adaptable dispensing with the Q-POD® unit:

- **Adjust** the Q-POD® unit arm (rotation and height) to match the size and shape of all the commonly-used laboratory glassware and plasticware.
- **Verify / improve** the water quality before delivery by pressing the water recirculation button on the base of the Q-POD® unit.
- **Select** the desired volume to deliver automatically by simply using the + and – keys and then pressing the central key. The last delivered volume is recorded on the Q-POD® screen to facilitate re-use.
- **Press** the Q-POD® dispenser trigger to vary the speed of water delivery:
  - Low-flow
  - Medium-flow
  - High-flow (up to 2 L/min)
- **Remove** the Q-POD® dispenser from the arm to easily wash glassware with ultrapure water above a sink.



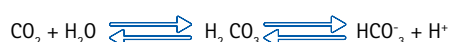
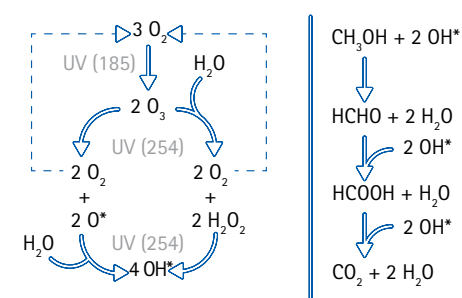
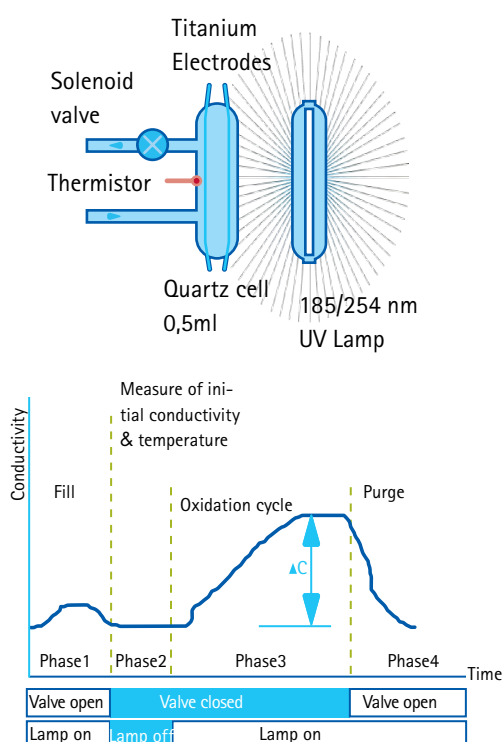
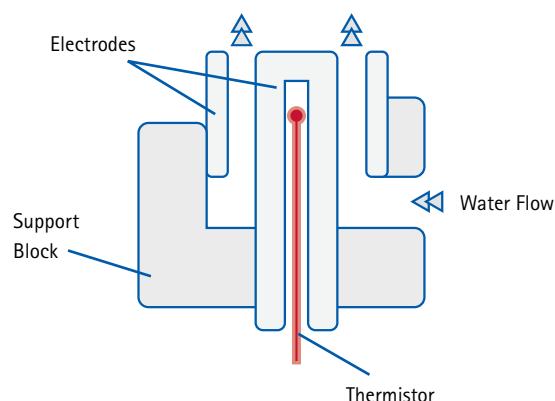
# Advanced water quality monitoring

In the Milli-Q® Advantage A10® system, resistivity and TOC meters allow control over both ionic and organic contaminants that can impact your results.

## Sensitive ionic detection

The Milli-Q® Advantage A10® systems' high precision resistivity meters have specific features to ensure that the value displayed on the screen is meaningful:

- Patented cell design with coaxial electrodes to warrant cell constant stability
- Flow-through design to make sure that the measure is representative of the actual ionic concentration in water
- Low cell constant ( $0.01 \text{ cm}^{-1}$ ) to ensure optimum measurement accuracy of low ionic contamination as required by ASTM® D 1125-95 (2009)
- Temperature measurement with a  $0.1^\circ \text{C}$  resolution for a proper report of temperature-compensated resistivity, as recommended in ASTM® D 1125-95 (2009)
- Automatic warning messages if the resistivity measure is compromised by a defect
- Design allows TOC suitability test to be performed as required by USP § 645 and EP.



## Prevention of organic breakthrough

The proper measurement of TOC levels is key for confirming that the system's organic removal process is operating within specifications.

The integrated TOC meter accurately monitors from 1 to 999 ppb. The design takes into account USP § 643 and EP suitability requirements. TOC measurements are performed automatically on a continuous basis during production and intermittently during periods of non-use. This lets you check the organic content of the water regularly, while avoiding the risk of your work being compromised by an undetected organic breakthrough.

- The TOC monitor uses a 0.5 ml quartz cell to capture ultrapure water.
- When the A10® UV lamp is on, photocatalytic oxidation of organic compounds occurs.
- The end product of organic oxidation is carbon dioxide, which dissolves in water and causes conductivity to increase. This change in conductivity (temperature-compensated to  $25^\circ \text{C}$ ) is monitored continually by the titanium electrodes in the TOC monitor.
- A set of algorithms confirms complete oxidation and calculates the carbon level associated with this conductivity change.



## Optimized lab space

The compact Milli-Q® water production unit can be installed on the bench, under the bench or on a wall – wherever it's best for you. To facilitate water delivery, up to three Q-POD® ultrapure water delivery units per system can be placed in different locations within the same laboratory, for ultrapure water when and where you need it.



## Smooth and easy communication

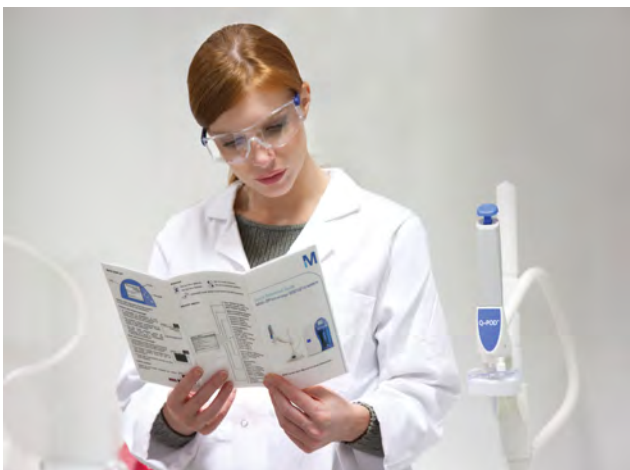
The Milli-Q® Advantage A10® system provides important information about water quality and system operation on the easy-to-read Q-POD® dispenser display and on the water production unit screen.

- The Q-POD® unit's multicolor graphic display allows easy interaction with the system and provides information about water quantity and quality.
- The primary graphic screen on the Milli-Q® production unit details the system's operation and performance for managing routine maintenance and troubleshooting procedures.
- In addition, a [Quick Reference Guide](#) (located inside the door of the Milli-Q® Advantage A10® system) provides all the information required to understand the operation and maintenance of the system.



Relevant data about your own workflow is accessible conveniently:

- **See** essential information on the Q-POD® unit screen at any time. All critical information, including water quality, system status and warnings, is summarized on the multicolor graphic display. The water quality status also can be printed directly from the Q-POD® unit.
- **Control** system use and maintenance on the water production unit screen. The main graphic screen on the production unit displays details of the system's operation and performance. Graphics assist the user in performing specific tasks, including maintenance procedures.
- **Protect access** to critical information. An ID code and password ensure that only the designated user can access fields containing critical information, such as water quality set points.



# Data tracking that meets your requirements

## Millitrack® Basic software

Millitrack® Basic software, when activated, provides enhanced data management control, remote access capabilities to the system dashboard, and long-term electronic archiving for your Milli-Q® Advantage system.

## Millitrack® Compliance innovative e-solution meets FDA 21 CFR Part 11 requirements

Now Milli-Q® Advantage system users in pharmaceutical, biotech and contract labs that follow GxP regulations can benefit from Millitrack® Compliance. This fully-embedded e-solution provides access to key water system information through a user-friendly graphical interface.

Millitrack® Compliance is designed to enable compliance with record saving, electronic signature and auditing criteria guidelines such as those of Title 21 CFR Part 11 or similar requirements set by other global regulatory organizations, including the European Medicines Agency (EMA) and the Pharmaceuticals and Medical Devices Agency, Japan.

Activating Millitrack® Compliance software provides users with four important key benefits:

- **Full System Control**

- Dynamic, real-time Dashboard displays essential information at a glance
- System components and essential data visible in a mouse click

- **Audit Trail**

- Time-stamped audit trail for full traceability of daily water purification system events
- Up to one year of record storage; protected archiving process

- **Electronic Signature**

- Water quality records are saved and signed electronically
- Signature and record are permanently linked to prevent falsification

- **Account Management**

- A system Administrator oversees system use, protecting critical information
- Manager, Operator, and Service roles are determined by access needs

Millitrack® Compliance software has a user-friendly graphical interface that provides key water system information to lab personnel – either through a point-to-point computer, direct network connection using TCP/IP Ethernet protocol, or via a web browser.





## Compliance with the highest Quality Assurance demands

**Certificate of Conformity** – The product has been assembled and tested according to Merck Millipore's stringent Quality Assurance procedures.

**Certificates of Calibration** – Included for the built-in resistivity meters and TOC monitor as well as other built-in sensors.

**Declaration of Conformity** – European Union EC Directive for safety and electromagnetic compatibility

**Certificate of Quality** – Consumables are delivered with a Certificate of Quality ensuring that they will deliver the water quality and quantity expected.

**Application Pak validation** – Application Paks are validated for efficient removal of the specific contaminants that they target. **Validation Guides** with test results are available upon demand.

**ISO® 9001 v. 2000- and ISO® 14001-registered manufacturing site** – Certificates are available upon request.

**CE, cUL, FCC** – To ensure efficiency and safety of operation, the Milli-Q® Advantage system is certified for safety and electromagnetic compatibility.



## Carefree maintenance procedures



The Milli-Q® Advantage A10® system provides users with information on consumables replacement at 15 days' notice, ensuring that you have enough time to obtain the required products.

Thanks to innovative RFID technology, the catalogue and serial numbers of Q-Gard® and Quantum® cartridges are automatically registered in the system's memory upon insertion, which enables optimal traceability and also prevents insertion of an incorrect consumable.

Additionally, the system can also manage its own service agenda. If you request it, you'll receive a warning 30 days in advance prompting you to schedule a maintenance service visit.

## Fast, efficient technical support

Merck Millipore application specialists provide information about system use and application insights, as well as how to select the best services related to your particular situation.

### Comprehensive service program

Choose the services you need from Merck Millipore's comprehensive Watercare Pact service program, which covers your requirements every step of the way:

- Installation
- Technical and scientific assistance
- Preventive maintenance visits
- Troubleshooting visits
- Customized user training
- Verification and/or calibration of monitoring devices
- Pharmacopeia suitability tests
- Validation support
- Maintenance plans



### Qualification expertise

Merck Millipore's Qualification Program facilitates laboratory validation procedures.

Validation support is provided by trained Merck Millipore Field Service Support Engineers using calibrated equipment and Qualification Workbooks.

With experience in water system qualification services since 1998, Merck Millipore can assist you in complying with regulatory standards applicable to your industry.

## Systems that evolve with lab changes

Laboratory needs can change quickly, making it necessary for you to adapt your water purification system to fit within a new configuration or to provide high purity water for additional applications.

To meet your specific needs, Milli-Q® Advantage A10® systems can be customized with a wide range of accessories and options:

#### Millitrack® Compliance software

Unique Lab Water e-solution designed for labs following GxP regulations that need to comply with Title 21 CFR Part 11 (or similar) guidelines. Benefits include: full system control, audit trail, electronic signature, and account management.

#### Millitrack® Basic software

Enhanced data management control, remote access capabilities, and long-term electronic archiving.

#### Q-POD® Element unit

The Q-POD® Element unit is designed to provide ultrapure water for use in trace elemental analysis, down to ppt and sub-ppt levels.

#### Additional POD units / Application Pak point-of-use polishers

Add more POD units and / or Application Pak polishers to provide additional points of dispense or to customize pure/ultrapure water to match a new application in your lab.

#### Water sensor

Placed on the floor, this sensor stops water feed to the system if there is water on the floor.

#### Wall-mounting brackets for Milli-Q® Advantage A10® purification unit and POD dispensers

Save space by installing the Milli-Q® Advantage A10® system on the wall. POD units can also be installed on the wall for further space saving.

#### Footswitch

Connect the footswitch to the base of a POD dispenser for hands-free water delivery: press once to start and once to stop.

#### Silicone POD cover

This cover protects your Q-POD® dispenser from harsh chemicals, such as strong acids and bases, aggressive solvents, or etchants.

# Milli-Q® Advantage system water specifications

A report on conformity of Milli-Q® Advantage water quality to Type 1 water quality as described by ASTM®, ISO® 3696 and CLSI® norms and to Purified Water as described in USP and EP is available upon request.

## Feed Water Specifications

Parameter	Value & Unit
Feed water quality	Elix®, RiOs™, distilled or DI water with conductivity < 100 µS/cm and TOC < 50 ppb
Feed water connection	1/2 in Gaz M
Feed water pressure*	0 – 0.3 bar
Feed water temperature	5 – 35 °C

\* For pressure above 0.3 bar, a pressure regulator needs to be installed upstream of the system; for pressures between 0 and -0.2 bar, the system will operate, but product flow rate may be lower.

## Product Water Quality

Parameter	Value & Unit
Manual dispense flow rate	Adjustable between 50 and 2000 mL/min
Automatic dispense volume	100 mL 250 mL to 5 L by 250 mL increments 5 L to 60 L by 1 L increments
Volumetric dispense accuracy	1% for volumes between 250 mL and 60 L
Volumetric dispense dispersion	CV < 1% for volumes between 250 mL and 60 L
Resistivity*	18.2 MΩ.cm at 25 °C
TOC**	≤ 5 ppb (µg/L)
Bacteria ***	< 0.1 cfu/mL
Pyrogens (endo-toxins)****	< 0.001 Eu/mL (pyrogen-free)
RNases****	< 0.01 ng/mL (RNase-free)
DNases****	< 4 pg/mL (DNase-free)

\* Resistivity can be displayed temperature-compensated at 25 °C or non-temperature-compensated as required by USP

\*\* TOC spec – Test conditions: Milli-Q® Advantage system equipped with Q-Gard® T1 pack and Quantum® TEX cartridge, feedwater produced by Elix® system with resistivity > 1 MΩ.cm at 25 °C, TOC < 30 ppb. Product water quality may vary due to local feed water conditions.

\*\*\* Results with Millipak® Express 40 or BioPak® final polisher in place

\*\*\*\* Results with BioPak® final polisher in place

## Safety

The Milli-Q® Advantage system is tested by an independent and accredited company for compliance with the CE directives related to safety and electromagnetic compatibility. The report can be consulted on demand.

The Milli-Q® Advantage system is built using components and practices recommended by UL and has been cUL marked. The registration can be verified on the UL web site (<http://www.ul.com>).

## Milli-Q® Advantage System Dimensions

Parameter	Value & Unit
System footprint	1195 cm² (185 in²)
System height	497 mm (19.56 in)
System width	332 mm (13.07 in)
System depth	360 mm (14.17 in)
System weight (packaged)	19 kg (41.88 lb)
System weight (empty)	14.5 kg (31.96 lb)
System weight (with water)	19.5 kg (42.99 lb)
Dispenser delivery loop length	750 mm (29.52 in)
Electrical power supply cable length	290 cm (114.1 in)
Electrical power supply voltage	100 – 230 V ± 10 %
Electrical power supply frequency	50 – 60 Hz ± 10 %
Feed water connection	1/2 in. Gaz F
Data connection	Ethernet (RJ45)

## Q-POD® Accessory Dimensions

Parameter	Value & Unit
Q-POD® height	579 mm (23.50 in)
Q-POD® diameter	230 mm (9.05 in)
Dispenser delivery loop length	800 mm (31.49 in)
Q-POD® weight (packaged)	7.2 kg (15.87 lb)
Q-POD® weight (empty)	5 kg (11.02 lb)
Q-POD® weight (with water)	5,5 kg (12.12 lb)
Loop & cable to system length	290 cm (114.1 in)
Data connection	Parallel Port (25-pin D-Sub) for print-out

## Certification

The Milli-Q® Advantage system is delivered with a Certificate of Conformity ensuring that it has been built and tested fully assembled following Merck Millipore Standard Operating Procedures and a Certificate of Calibration for the temperature and resistivity meters built in the system. The Milli-Q® Advantage consumables are automatically delivered with a Certificate of Quality. Merck Millipore's manufacturing site is ISO® 9001 v.2000 and ISO® 140001 certified.

## Ordering information

To order a Milli-Q® Advantage A10® system and associated consumables, please contact your local Merck Millipore subsidiary, or visit our dedicated website:  
[www.millipore.com/labwater](http://www.millipore.com/labwater)



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