

Milli-Q® Integral Water Purification Systems

Integrated pure and ultrapure water at your fingertips

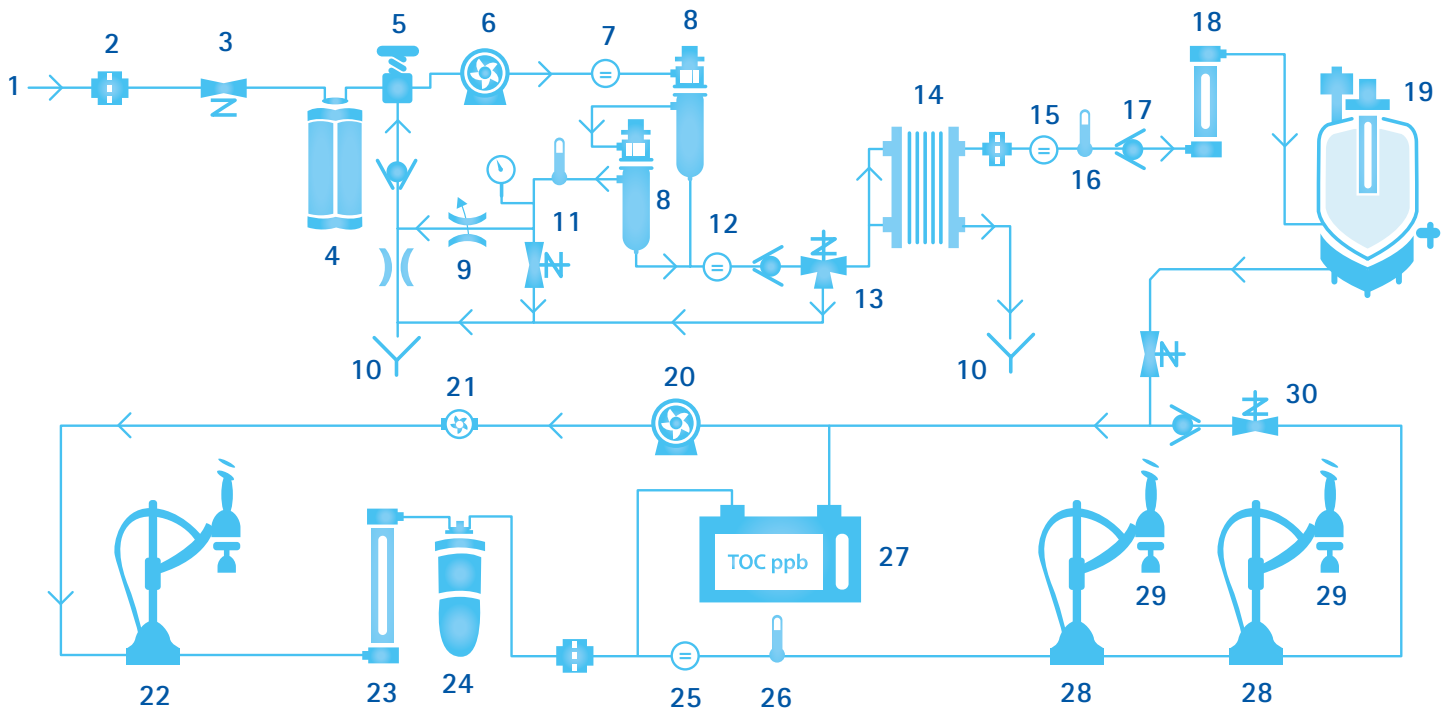


Integrated pure and ultrapure water at your fingertips

Your pure and ultrapure water needs	Our solution: the Milli-Q® Integral system
Pure and ultrapure water directly from tap water – in a single unit	A comprehensive and optimized sequence of water purification and monitoring technologies allows the system to produce both pure (Type 2) and ultrapure water from tap – in a single unit. Patented Elix® electrodeionization technology and ergonomic POD water dispensers provide consistent water quality and optimized delivery.
Ultrapure water quality adaptable to a variety of needs.	A range of Application-Pak final polishers exists to remove specific types of contaminants just before water is delivered from POD dispensers.
Easy, convenient pure and ultrapure water delivery	Ergonomic Q-POD® and E-POD® dispensers provide easy delivery of ultrapure and pure water. Choose manual or automatic volume delivery; high or low water flow to suit your needs and save time.
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	Designed for the best use of lab space, the Milli-Q® Integral water purification unit and POD dispensers can be installed on the bench, under the bench, or on a wall.
Intuitive operation	Intuitive system controls allow access to three levels of system information (regular use, maintenance, system management). A handy <i>Quick Reference Guide</i> inside the system door provides concise information on operation and maintenance.
Smooth and easy communication	Easy-to-read screens on the water production unit and POD dispensers provide all the system information needed for operation.
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® Integral 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.
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.
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.
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 your laboratory.

Milli-Q® Integral water purification pathway

The Milli-Q® Integral system uses regular tap water as feed, and produces pure and ultrapure water delivered by independent POD dispensers.



- | | | |
|--|---------------------------------------|---|
| 1. Tap water feed | 11. RO reject solenoid valve | 21. Flow meter |
| 2. Strainer | 12. Permeate conductivity cell | 22. E-POD® dispenser and final polisher |
| 3. Inlet solenoid valve | 13. 3-way solenoid valve | 23. Photooxidation UV Lamp |
| 4. Progard® pretreatment pack | 14. Elix® electrodeionization module | 24. Quantum® cartridge |
| 5. Pressure regulator | 15. Elix® resistivity cell | 25. Milli-Q® product water resistivity cell |
| 6. Booster pump | 16. Thermistor | 26. Thermistor |
| 7. Feed water conductivity cell | 17. Check valve | 27. Milli-Q® water TOC monitor |
| 8. RO cartridge with sanitization port | 18. Bactericidal UV Lamp | 28. Q-POD® dispenser |
| 9. RO reject recycling | 19. PE Reservoir, ASM and Vent filter | 29. Final polisher Application-Pak |
| 10. Drain | 20. Delivery pump | 30. Recirculation solenoid & check valve |



For scientists who work with a variety of applications requiring both pure (Type 2) and ultrapure (Type 1) water, the **Milli-Q® Integral water purification system** provides the perfect solution. The system's comprehensive and optimized sequence of water purification and monitoring technologies allows both pure and ultrapure water to be produced directly from potable tap water – in a single unit. Milli-Q® Integral system users gain in convenience and also save on capital expense and lab space.

Pure and ultrapure water from tap – in a single unit

The Milli-Q® Integral system is a compact solution that combines the production of Type 2 (pure) water and Type 1 (ultrapure) water in a single unit – eliminating the need for a pretreatment stage upstream of the ultrapure water system.

Dual POD (Point-of-Delivery) concept

The Milli-Q® Integral system's POD dispensers are designed to save space and increase convenience for users. Users can customize their lab installations by placing Q-POD® ultrapure water dispensers and E-POD® pure water dispensers exactly where they're needed. For additional convenience, the ergonomic POD units have been specially designed to accommodate the shape and height of the most commonly used laboratory glassware.

As many as three independent POD dispensers per system can be conveniently located at different places in the laboratory. The versatile POD dispensers can be adapted to a variety of laboratory applications with our range of point-of-use Application-Paks, which remove specific contaminants just before water is dispensed.



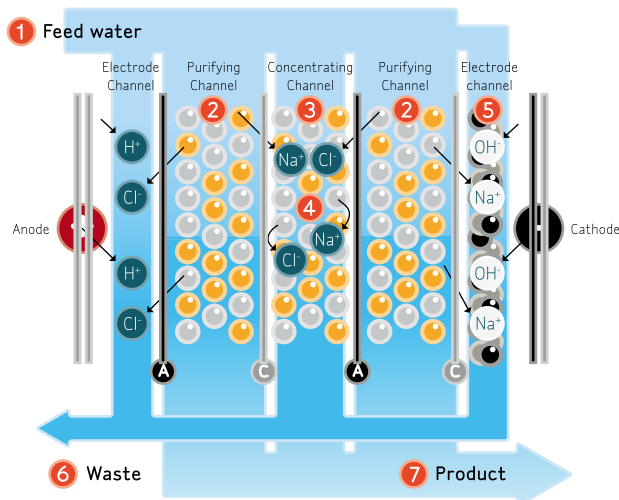
Lower running costs and water waste with exclusive Elix® technology

The Milli-Q® Integral system combines proven and superior Elix® electrodeionization (EDI) technology with the best-in-class Milli-Q® solution. Milli-Q® Integral system users benefit from pure and ultrapure water of consistently high quality – as well as lower running costs and water waste, thanks to Merck Millipore's patented Elix® technology.

Elix® EDI technology provides consistent production of superior quality pure water with no need for added softeners, chemical regeneration or the replacement of DI cartridges.

The Elix® module is built using electrodes and mixed bed ion-exchange resins separated by anion- or cation-permeable membranes. The ion-exchange resins are permanently self-regenerated in the Elix® EDI module via a weak electrical current, ensuring constant high water quality at a low operating cost. This low energy process rejects little water, allowing users to save on tap water and electricity consumption. No special maintenance or chemical regeneration that would deteriorate the resin beads is needed. This unique process has become the new standard for the production of Type 2 water, and is replacing both distillation and conventional deionization units in the laboratory.

Integrated Elix® technology provides Milli-Q® Integral users with consistently high water quality at optimal operating cost. Following prior purification by RO technology, water produced by the Elix® module has a resistivity level greater than 5 MΩ·cm @ 25 °C – a value that exceeds the resistivity of double distilled water. The pure water produced may be used for basic laboratory needs, such as buffer and reagent preparation, microbiology media preparation, histology, dissolution testing (with UV detection) and glassware rinsing.



- A** Anion-Permanent Membrane
- C** Cation-Permanent Membrane
- Elix® technology purification steps

Elix® electrodeionization (EDI) module

Ultrapure water quality adaptable to a variety of needs

Additional purification steps provide ultrapure water with 18.2 MΩ.cm @ 25 °C resistivity that can be “fine-tuned” even further to remove specific types of contaminants. With the appropriate **Application-Pak** point-of-use polisher in place, the Milli-Q® Integral system will provide water suitable for HPLC, LC-MS, MALDI-ToF-MS, IC, ICP, AA and most of the analytical techniques commonly used in the laboratory.

Application-Paks can be easily connected to POD dispensers, letting you match your water quality to your specific research and applications. For example; a Biopak® ultrafiltration cartridge fitted at the point of use will produce water suitable for genomics applications (quality at least equivalent to DEPC-treated water) and cell culture.



Application-Pak range



Biopak® Polisher

Bacteria-free,
Pyrogen-free and
nuclease-free water



VOC-Pak® Polisher

Water for volatile
organic compounds
analysis



EDS-Pak® Polisher

Water for endocrine
disrupters experiments



LC-Pak® Polisher

Water for ultratrace
organic analysis



Millipak® Filter

Bacteria-free and
particulate-free water

Easy, convenient pure and ultrapure water delivery

Easy operation allows researchers to save valuable time. Pure and ultrapure water delivery with E-POD® and Q-POD® dispensers is simple and intuitive, matching your requirements without compromising quality.

The Milli-Q® Integral system makes it easy for you to adapt your water purification system to your different laboratory applications. You can be sure to have the daily volume of water you require at the flow rate you need – up to 360 L pure or ultrapure water per day, at up to two liters per minute when needed.

Q-POD® and E-POD® units can be used with a variety of laboratory glassware. Water dispensing methods are simple and intuitive, with easy operation that allows scientists to select either manual or automatic delivery to save valuable time.

POD units are placed on a recirculation loop, and can be located up to 290 cm from the main unit or from the previous POD on the loop. In each unit, water recirculates through an 80 cm loop up to the water dispenser outlet.

Each Q-POD® and E-POD® unit has a color backlit screen enabling the user to check system operation and water quality at a glance. Day after day, your water quality remains constant, matching the most stringent specifications, and helping you achieve optimum reproducibility in your work.



Manual water dispense

Water can be obtained by pressing the plunger of the POD unit, from low flow for fine adjustment of the level in calibrated flasks, to high flow for fast filling. Additionally, the dispenser can be removed from its support to facilitate water delivery for applications such as glassware or plate washing.

Automatic volumetric water dispense

Volumetric water dispensing is set on the base of the POD unit. The user can adjust the volume to be delivered with the (+) and (-) keys, and then press the volumetric dispensing button to start delivery of the selected volume, with excellent accuracy ($< 1\%$) and reproducibility ($cv < 1\%$).

The mast and the arm supporting the Q-POD® and E-POD® dispensers are designed to accommodate all commonly used glassware – from a 250 mL Erlenmeyer flask to a 5 L calibrated flask – and even a 20 L carboy!

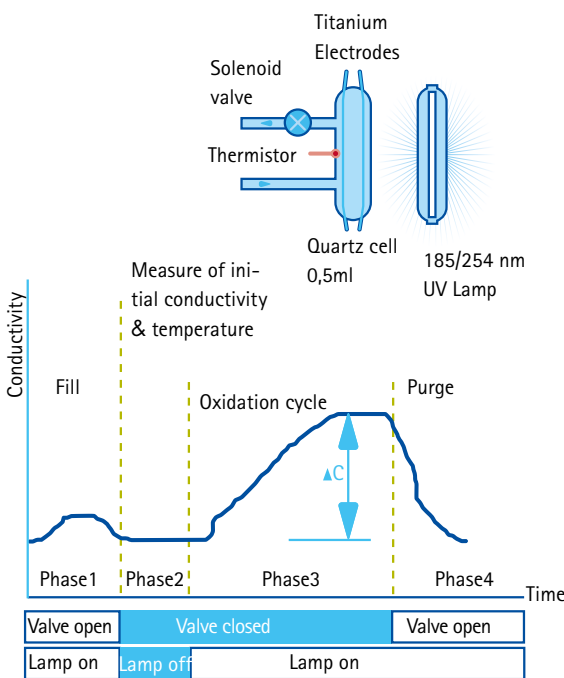
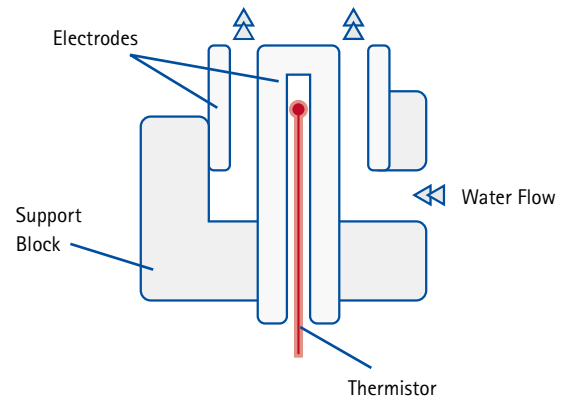
For hands-free water delivery, an optional footswitch can be connected to the base of the POD dispensers or directly to the Milli-Q® Integral system. Press once to start and once to stop.

Advanced water quality monitoring

Resistivity monitoring for high-precision measurement of ionic concentration

The proper measurement of resistivity is key to making sure that ionic contamination of high purity water remains at sub-ppb level. Milli-Q® Integral system high-precision resistivity meters have specific features to ensure that the value displayed on the system screen is meaningful.

- Patented cell design with coaxial electrodes to warrant cell constant stability.
- Flow-through design to make sure that the measurement is representative of the actual ionic concentration in the water.
- Low cell constant (0.01 cm⁻¹) for optimum measurement accuracy of low ionic contamination as required by ASTM® D 1125-95 (2009).
- Temperature measurement with a 0.1 °C resolution for proper report of temperature-compensated resistivity, as recommended in ASTM® D 1125-95 (2009).
- Automatic warning messages if the resistivity measurement is compromised by a defect.
- Design allowing performance of a resistivity suitability test as required by USP § 645 and EP (European Pharmacopoeia)



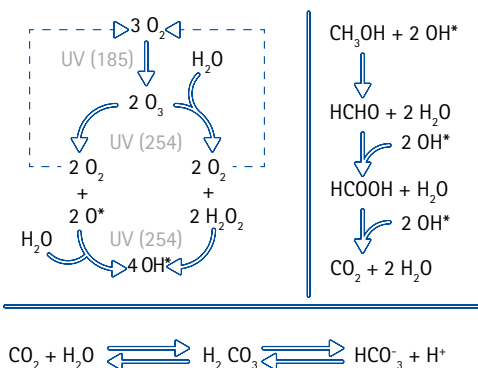
TOC monitoring for prevention of organic breakthrough

The measurement of TOC levels allows the user to verify that the system's organic contaminants removal process is operating within specifications.

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 °C) is monitored regularly 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.

The A10® TOC monitor patented technology offers several benefits:

- Oxidation and conductivity measurements occur in the same cell. As a result, the A10® monitor checks that all organics have been oxidized (end point reaction) in order to deliver an accurate and reproducible TOC value.
- An accurate measurement of TOC between 1 and 999 ppb is provided, based on extended calibration (certificate included).
- The design allows performance of the TOC suitability test as required by USP § 643 and EP (European Pharmacopoeia).



Optimized lab space

Today's laboratories are used for multiple activities, with bench space for researchers' critical experiments often at a premium. To make the best use of the lab space you have available, Merck Millipore designed the Milli-Q® Integral water purification system as two separate components:

- The compact Milli-Q® Integral system water purification unit can be conveniently located under the bench – or high on a wall.
- The system's E-POD® and Q-POD® water delivery units also take up very little bench space, or if you prefer, they can also be installed on a wall.



Intuitive operation

Researchers must be able to access required information immediately—whenever they need it.

Milli-Q® Integral systems offer three levels of information, so that users have easy and convenient access to all the data they require:

- **Regular use:** all information required is directly visible on the POD screen.
- **Maintenance:** information is available from the main screen with step-by-step directions (text and drawings) indicating the actions to be performed.
- **System management:** critical parameters, such as set points, are protected by an ID login and a password in the "Manager" menu.

In addition, a *Quick Reference Guide* (located inside the door of the Milli-Q® Integral system) provides all the information required to understand the operation and maintenance of the system.

Smooth and easy communication

Milli-Q® Integral system users benefit from easy, efficient access to the information they need:

- The large backlit screen on the water production unit shows simplified and detailed information (choose from 8 languages).
- Alerts and alarms (which can be enhanced by a buzzer) are visible on the system's main screen, with complete information on actions required accessible instantly.
- Sensors regularly monitor system operation to ensure it operates with specifications. For instance, if ionic contamination of feed water exceeds specifications, causing high conductivity, the built-in Feed Water Conductivity Meter will trigger an alarm to alert you.
- Clear graphics help you perform specific tasks such as maintenance. From the same screen, reports on the system's water quality and history can also be printed out.
- Critical information, such as set points or units, is accessible only to the designated responsible user, and is protected by a login and a password.
- Ultrapure water dispense may be stopped automatically after a fixed time set by the user, in order to avoid water loss or lab flooding.
- The system's Ethernet connection allows data to be transferred to a personal computer or a LIMS.



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® Integral system.

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

Now Milli-Q® Integral 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
 - Manage, 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® Integral system is certified for safety and electromagnetic compatibility.



Carefree maintenance procedures

The Milli-Q® Integral 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 Progard® 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 this option, you'll receive a warning 30 days in advance prompting you to schedule a maintenance service visit.

Fast, efficient technical support

Comprehensive Service Program

Watercare Pact service plans offer a range of support, from a single annual checkup to a full system cover. Merck Millipore's certified Field Service Support Engineers provide expert, professional support for the installation and maintenance of your Milli-Q® Integral water purification systems, and our technical hotline support experts are available to investigate, diagnose and solve customer issues. Available services include:

- Installation
- Technical and scientific assistance
- Troubleshooting visits
- Customized user training
- Verification and/or calibration of monitoring devices
- US & EU Pharmacopeia Resistivity & TOC suitability test support
- Validation support
- Maintenance plans

Qualification expertise

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

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



See what fellow scientists are saying...

Today, Milli-Q® Integral systems are the choice of scientists around the world in environments as diverse as academic, pharmaceutical, clinical, and government labs, in both validated and non-validated environments. Milli-Q® Integral systems not only fulfill the needs of isolated laboratories, but also have been successfully used in many new or refurbished large research buildings as a more reliable and lower cost alternative to central water systems with delivery loops. Please read on to see why – and visit our website:

www.merckmillipore.com/labwater

"It was the only choice I was interested in for the Center. With the Integral system, we can get two forms of water from one source – that allows us to accommodate all users."

Nathaniel Hentz, Biomanufacturing Training and Education Center (BTEC), North Carolina State University, Raleigh, North Carolina, U.S.A.

"With Integral, we never run out of water. Our lab requires a large volume of pure and ultrapure water and we can't afford to run out. Our Integral system can generate 120 liters per day and has a 60 liter reservoir. We can replenish five liters every hour so we never run out of water."

Kris Gellynck, Ph.D., Senior Scientist, Orthox Ltd., Oxford U.K.

"We always have water at our fingertips. We've got a 60 liter tank right in the lab and a POD dispenser that makes access very convenient. We don't have to plan ahead for water needs and then walk down the hall to get it... and hope that the filters are okay once you get there."

Dr. Michael Holinstat, Thomas Jefferson University, Philadelphia, PA, USA

"I integrated one of the POD dispensers directly into a system that mixes water from the Integral with a 10x buffer solution. The core lab used to purchase prepared 1x buffer, which is quite expensive and delivery was often unreliable. I did a simple cost analysis and it was quite clear – making the 1x buffer myself using the Integral system decreased my cost of doing business. The system will pay for itself in a year."

Suzanne Schloemann, Coordinator, Flow Cytometry Lab, Washington University, St. Louis, Missouri, U.S.A.

"In the past, I was using water from an in-house central water system and bottled LC-MS water for our chromatography work. However, for the highly sensitive instruments that we now have (UHPLC-MS system and PDA detectors), this water quality simply wasn't good enough – at one point TOC was measured at over 200 ppb! To solve the problem, we installed a Milli-Q® Integral system. We've been working with the system for over a year now, and I'm happy to say that we have consistently high ultrapure water quality. It's exactly what we need to ensure the highest quality eluent that is essential for our analyses."

Dr Martin Fuhr, Grünenthal GmbH, Aachen, Germany

"For a pharmaceutical company like Tillotts, it goes without saying that our water quality has to meet very specific high standards, which is one of the reasons we use the Milli-Q® Integral system. The system's POD water dispensers are another real "plus" for us – they have a clear, clean design, and they're very easy to use. With the Millipak® Application-Pak Pak we get bacteria-free and particulate-free ultrapure water in the volumes we need."

Mr. Daniel Bootz, Tillotts Pharma AG, Ziefen, Switzerland

"The POD system allows us to focus on our research rather than watching containers fill with water. All we have to do is set the POD to dispense a specified amount of water and it does it automatically – no one has to stand there and turn off the system once the container is full."

Kris Gellynck, Ph.D., Senior Scientist, Orthox Ltd., Oxford U.K.



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® Integral 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 and assets management.

Millitrack® Basic software

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

PrePak holder & associated PrePak consumable

If the Silt Density Index (= particulate contamination) or the chlorine level in tap water exceeds specifications, the PrePak holder and its consumable containing a prefilter and a natural activated carbon column can be placed upstream of the Milli-Q® Integral system.

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.

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.

Reservoirs /Storage & Distribution Systems (SDS)

Select from the full range of Merck Millipore reservoirs (30-350 L) designed for optimum pure water storage.

Washer Distribution Kit

Cost-effective solution ensuring pressurized pure water feed to common laboratory appliances with flow rates between 15 - 16.2 L/min (at 1 bar or 15 psi, depending on voltage)

Automatic Sanitization Module (ASM)

The ASM device uses a 254 nm germicidal UC lamp to efficiently prevent the development of biofilm inside the reservoir.

Lab Close connection kit

The unique Lab Close kit maintains the system in operating condition with minimum water and electricity usage when the facility needs to be closed for extended periods such as vacations.

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® Integral purification unit and POD dispensers

Save space by installing the Milli-Q® Integral 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® or E-POD® dispenser from harsh chemicals, such as strong acids and bases, aggressive solvents, or etchants.



Milli-Q® Integral system water specifications

The Milli-Q® Integral system is designed to be fed by potable tap water as described in US-EPA, EP, and WHO norms.

Ultrapure (Type 1) water quality

Milli-Q® water (sourced from a Q-POD® unit)

Parameter	Value	Unit
Resistivity ¹	18.2	MΩ.cm @ 25 °C
TOC ²	< 5	ppb (µg/L)
Bacteria ^{3,4}	< 0.01	CFU / mL
Particulates > 0.2 µm ³	< 1	Particulates / mL
Pyrogens (Endotoxins) ⁴	< 0.001	EU / mL
RNases ⁴	< 1	pg/mL
DNases ⁴	< 5	pg/mL

¹ Resistivity can also be displayed non-temperature compensated as required by USP

² In the appropriate test conditions

³ With Millipak® filter

⁴ With Biopak® filter as Application-Pak

The Milli-Q® Integral system is designed to produce ultrapure water in agreement with the quantitative specifications of Type I water as described in ISO® 3696, ASTM® D1193, and of EP and USP Purified Water, as well as the CLSI® – CLRW. A compliance report, with test details, is available upon request.

Pure (Type 2) water quality

Elix® water (at Elix® module outlet)

Parameter	Value	Unit
Resistivity	> 5	MΩ.cm @ 25 °C
TOC	< 30	ppb (µg/L)

Note: If pure water is sourced from an E-POD®, the following water quality specifications are achieved:

Parameter	Value	Unit
Bacteria ^{1,2}	< 0.1	CFU / mL
Particulates > 0.2 µm ¹	< 1	Particulates / mL
Pyrogens (Endotoxins) ²	< 0.001	EU / mL
RNases ²	< 0.01	ng / mL
DNases ²	< 4	pg/ µL

¹ With Millipak® filter

² With Biopak® filter as Application-Pak

Resistivity, TOC, and bacteria levels match the requirements of Type 2 water as described in ISO® 3696, ASTM® D1193 (Type II resistivity, TOC, HBC Table I specification), and purified water as described in USP, EP. A compliance report, with test details, is available upon request.

Water delivery

Pure water production

System	Pure water production (Max L/day)	Pure water delivery at E-POD® unit (L/min)
Milli-Q® Integral 3	70	Up to 2.0
Milli-Q® Integral 5	120	Up to 2.0
Milli-Q® Integral 10	240	Up to 2.0
Milli-Q® Integral 15	360	Up to 2.0

Ultrapure water production

System	Ultrapure water production (Max L/day)	Ultrapure water delivery at Q-POD® unit (L/min)
Milli-Q® Integral 3	70	0.05 – 2.0
Milli-Q® Integral 5	120	0.05 – 2.0
Milli-Q® Integral 10	240	0.05 – 2.0
Milli-Q® Integral 15	360	0.05 – 2.0

Milli-Q® Integral system installation

Parameter	Value & Unit
Production unit dimensions (H x W x D)	50 x 33.2 x 48.4 cm (19.7 x 13.07 x 19 in)
POD delivery unit dimensions (H x D)	57.9 x 23 cm (22.8 x 9 in)
Production unit operating weight	24-28 kg (52.9-61.7 lb)
POD delivery unit operating weight	4.7 kg (10.36 lb)
Distance from production unit to POD	290 cm (9.5 ft)
Dispenser tubing length	80 cm (2.6 ft)
Electric power cable length	290 cm (9.5 ft)
Electric power supply voltage	100-230 V +/- 10% 50-60 Hz

Feed water connector: ½" Gaz - Main unit data connection: Ethernet (RJ45) - POD data connection: Parallel port (25-pin D-Sub)



Storage Tanks and Accessories

Storage with a Difference



Guarantee the purity of your stored water

Pure water requires a storage system to prevent the degradation of your water quality. Merck Millipore's 30-, 60-, and 100-liter polyethylene (PE) storage tanks are designed to maintain consistent purity of stored water and provide effective protection against airborne contaminants.*

Prevent contamination

Water stagnancy can cause bacterial proliferation. Our optimal Automatic Sanitization Module (ASM) provides the ideal solution for the prevention of bacterial growth and biofilm formation on the inner surface of the storage tank. In addition, our advanced vent filter protects pure water from airborne contamination.

Distribute your stored water where it is needed

To provide pure water for use with all of their applications, laboratories need to be able to distribute stored water from their water purification system storage tanks.

- For distribution of **non-pressurized pure water**, a valve is conveniently located on the front of the Merck Millipore storage tanks.
- For convenient **distribution of pressurized pure water** from the storage tank, an E-POD® point-of-delivery dispenser can be connected to an Elix® Advantage or Milli-Q® Integral water purification system.
- For **automatic feed** of pure water, distribution valves on the base of the storage tank allow connection to other laboratory equipment such as glassware washing machines. Distribution pumps are also available if needed.

** A complete line of storage tanks is available, ranging in capacity from a few liters to several hundred liters. Your nearest Merck Millipore office will be able to guide you in the choice of the tank best suited to your needs.*

Optimized pure water storage

The main concern when storing pure water is degradation of water purity over time. Only a strict choice of storage tank materials, associated with a careful design and appropriate protection against airborne contaminants, can ensure consistent water quality during storage.

Innovative storage tank design

Merck Millipore 30-, 60-, and 100-liter polyethylene storage tanks incorporate the latest technical developments and advanced features for stored water of consistent purity.

All tanks have a small footprint and are designed for wall-mounting if required. Underbench installation is also possible for some models.

Unique features

- Polyethylene selected for its minimum release of extractables
- Opaque walls block sunlight to prevent algae development
- Smooth inner surface prevents biofilm formation
- Cylindrical shape minimizes surface area in contact with water
- Conical bottom allows complete draining for cleaning and rinsing
- Pure water smoothly fed in at the bottom of the tank prevents absorption of carbon dioxide
- Front valve enables manual dispense of pure water
- Distribution valves permit connection to other laboratory equipment
- Hermetically sealed lid blocks air from entering the tank
- Large top opening allows manual cleaning during sanitization procedure
- Compact space-saving design

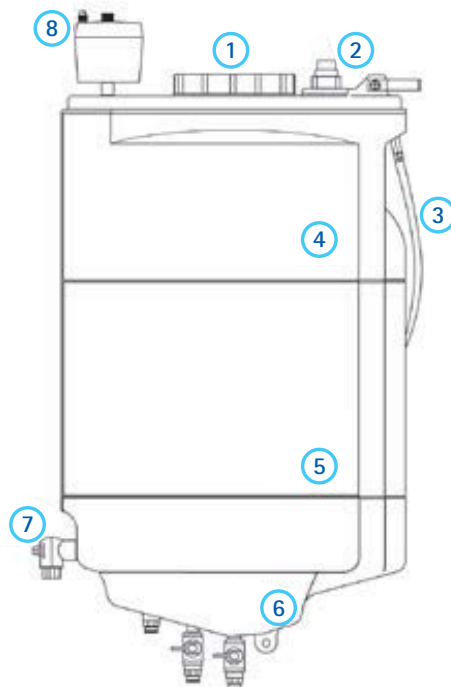
Fail-safe protection

- Sensor rod float switch system for automatic storage tank refill and indication of water level (% full)
- Overflow connected to the drain, in the unlikely event of a water system malfunction
- Direct display of stored water level on water purification system units
- Water sensor

Storage tanks designed for efficiency

Designed for efficiency

1. Hermetically sealed lid
2. Sensor rod float switch
3. Sanitary overflow
4. Blow-molded storage tank
5. Cylindrical shape
6. Conical bottom with distribution valves
7. Front dispensing valve
8. Advanced vent filter



For details of the tests performed during the storage tank development process, please request the publication "R&D Notebook 1: Optimizing the storage of purified water for laboratory applications" (Ref. No.: RDO01EN00) from your local Merck Millipore representative.

Storage Tank Accessories

In order to help ensure optimum purity and distribution of your stored water, Merck Millipore offers a range of accessories and connections for your storage tank, including the following items:

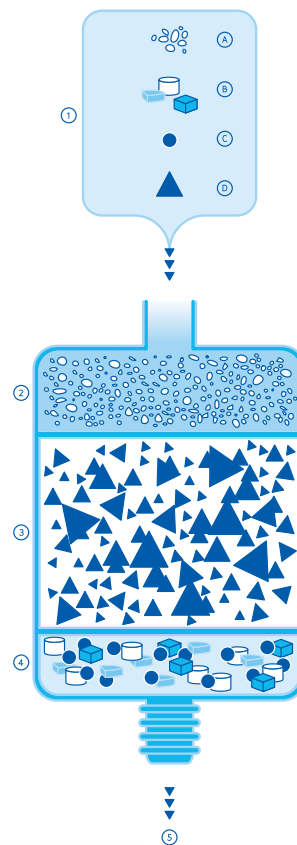
- Advanced Vent Filter
- Automatic Sanitization Module
- Air Gap Device
- E-POD® pure water remote dispenser
- Washer Distribution Kit
- Water Sensor
- Lab Close Kit

Advanced vent filter: important protection against airborne contaminants

Air is contaminated by carbon dioxide, particles, microorganisms, and volatile organic compounds that come mainly from the laboratory atmosphere. To protect pure water from all these contaminants, Merck Millipore has developed an advanced storage tank vent filter that includes:

- Activated carbon to adsorb volatile organics (including lab solvents such as acetone, chloroform, and methanol)
- A soda-lime bed to remove CO₂
- A Durapore® hydrophobic membrane for particle and bacteria retention

This advanced vent filter is recommended for the protection of high-resistivity water, such as Elix® product water, during storage. To protect RiOs™ reverse osmosis-quality water, a Durapore® 0.45 µm hydrophobic membrane vent filter is also available.



Advanced storage tank vent filter

1. Airborne Contaminants
 - A. Volatile Organics
 - B. Particles
 - C. Bacteria
 - D. CO₂
2. Volatile Organics absorption
3. CO₂ removal
4. Particle and Bacterial retention
5. Storage tank inlet
Purified air enters the storage tank

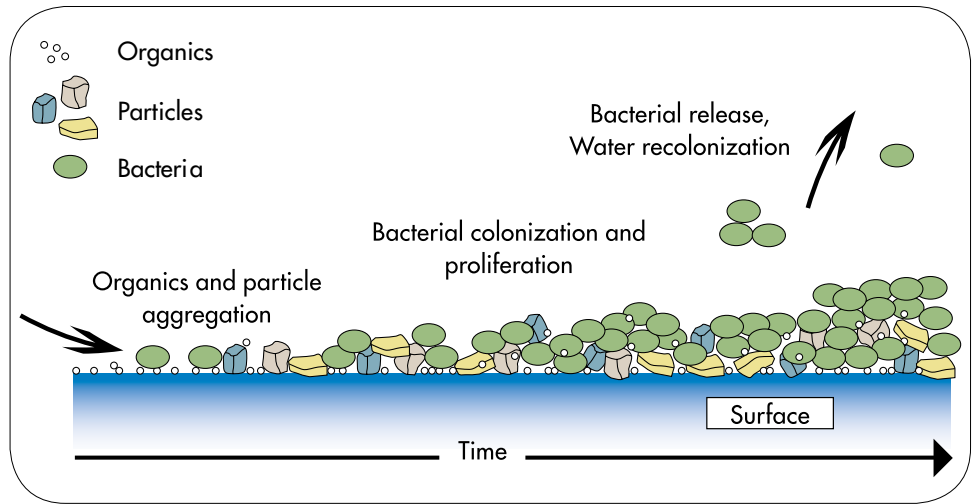


Complete Merck Millipore water purification chain with the ASM and water sensor

Automatic Sanitization Module (ASM):
say "No!" to bacterial proliferation

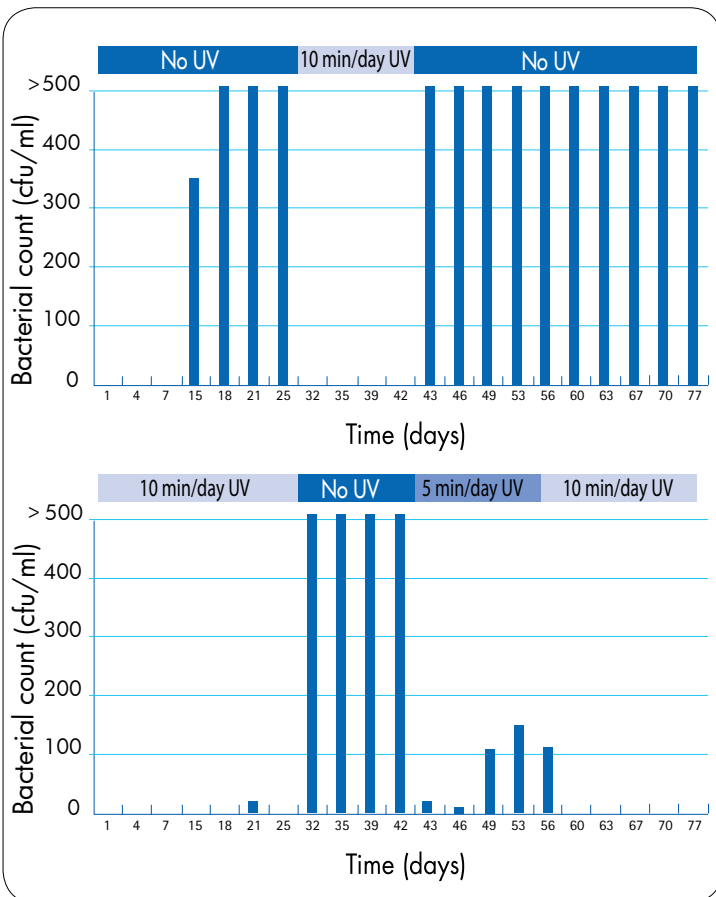
Maintaining high purity water with low bacteria levels during storage is critical. If left to proliferate, trace levels of microorganisms present in pure water compromise water purity. This bacterial contamination is responsible for the formation of a biofilm – an accumulation of organic material made up of active and dead organisms, on the inner walls of the storage tank.

Even though chemical sanitization and mechanical scrubbing may be periodically performed, this biofilm is difficult to remove and is a frequent source of recontamination in stored water.



Biofilm formation over time

Merck Millipore's ASM is designed to prevent the growth and proliferation of bacteria and the resulting biofilm on the inner surface of Merck Millipore PE storage tanks. The ASM makes use of the germicidal properties of an ultraviolet (UV) light at 254 nm, which is fitted inside the tank.



Germicidal effectiveness of the UV lamp

The ASM provides full flexibility for guaranteed results

- 254 nm UV lamp; selected for its germicidal effectiveness
- Pre-programmed intervals of 10-min / day automatic UV illumination for optimized efficiency
- Additional programmable and manual UV exposure possible to meet critical application requirements
- Up to 45 min /day of UV exposure for total flexibility
- Program daily time settings, UV cycles, and UV lamp operation displayed on the Millitrack® e-Solution dashboard
- UV lamp exchange alarm for easy maintenance
- Compact design allowing installation on top of the storage tank

10 minutes of daily UV exposure is sufficient

During development of the ASM, the UV lamp exposure cycles were optimized by examining the resulting bacterial reduction after exposure.

Two 60-liter storage tanks were fed by an intentionally contaminated reverse osmosis water purification system. The tanks were then emptied and refilled each day and alternately equipped with an ASM into which variable illumination times were programmed.

As shown in the graphs, 10 minutes per day of UV exposure were enough to make the tanks return to their original low bacterial levels.

Air gap device for protection against bacteriological contamination

Water purification systems and storage tanks sometimes require a connection to the drain.

Drains are typically dirty environments contaminated by microorganisms, and in particular, bacteria. Therefore, when the outlet of the water system reject tubing is pushed into the drain, there is a risk that bacteria could contaminate the inside of the reject tubing, and then progressively move to the water system.

One way to prevent this from occurring is to install an air gap device on the reject tubing. This allows the reject water flow to move through the tubing without touching the inside of the contaminated drain environment. Installing an air gap device is an easy and safe way to prevent the development of bacteria above the air gap level.



Air Gap Device

E-POD® pure water remote dispenser: pure water where you need it

The E-POD® Elix® water point-of-delivery unit can be connected to an Elix® Advantage pure water system or Milli-Q® Integral pure and ultrapure water system to dispense pure water wherever it is needed in the lab.

Advantages of the E-POD® remote dispenser include:

- Improved bacterial water quality (less than 0.1 cfu/mL, with final filter)
- Versatility enabling use for multiple applications or users when a Millipak® or Biopak® polisher is fitted to the dispenser outlet

- Volumetric dispensing to save time
- Ergonomic design and ease of use
- Flexibility, with installation of up to three E-POD® units per system
- Information at a glance thanks to the color backlit screen on the dispenser base
- Space-saving small footprint



E-POD® pure water remote dispenser



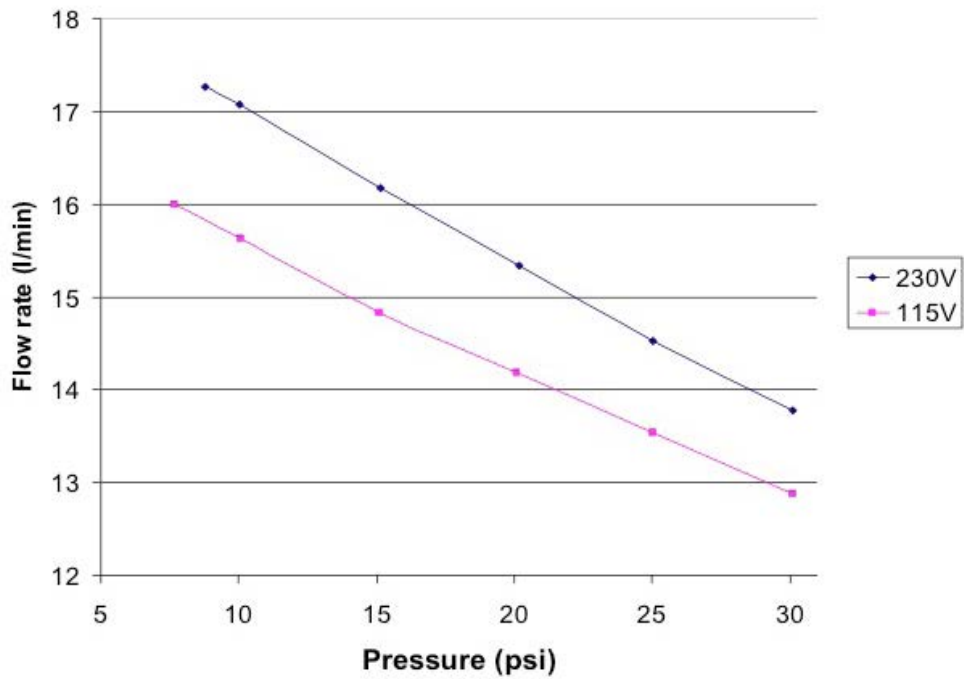
Distribution pumps to meet increased demands

Washer Distribution Kit

A key use of pure water is as feed to laboratory appliances such as glassware washers, autoclaves, sterilizers and weathering devices.

The Merck Millipore Washer Distribution Kit provides cost-effective and convenient distribution of pure water to common laboratory appliances, with flow rates between 12.5 – 13.5 L/min (at 2 bar or 30 psi, depending on voltage).

Installation of the small-footprint kit is fast, easy, and universal, with bench, underbench, or wall-mounted options. Users profit from a silent, automatic supply of pure water when required.



The graph shows characteristics of Merck Millipore distribution pumps. Pumps provide a long service lifetime and quiet operation.



Washer Distribution Kit

Water sensor for control over feed water supply

If there is water on the floor, the water sensor enables shutdown of the feed water supply in order to prevent a lab flood.

Lab Close Kit keeps your system in top condition when you're away

When your facility is closed for an extended time – such as vacation periods – the Lab Close Kit will avoid water purification system standstill during these long periods. The Lab Close Kit intelligently optimizes the consumption of water and electricity by your system, preventing the negative effects of nonuse, such as bacteria buildup. Your water purification system remains in top condition, ready for immediate use upon your return.

Specifications & Ordering Information

Specifications for Polyethylene Storage Tanks

There are several different storage tank sizes available in this range:

30-liter Storage Tank*

Diameter	380 mm (14.82 in.)
Height	600 mm (23.4 in.)
Maximum Usable Capacity	25 L
Weight (full)	30 kg (66.14 lb)

60-liter Storage Tank

Diameter	380 mm (14.82 in.)
Height	840 mm (32.76 in.)
Maximum Usable Capacity	54 L
Weight (full)	59 kg (130.07 lb)

100-liter Storage Tank*

Diameter	380 mm (14.82 in.)
Height	1255 mm (48.95 in.)
Maximum Usable Capacity	91 L
Weight (full)	98.5 kg (217.15 lb)

* For 30-liter and 100-liter storage tanks, underbench models are also available.

Ordering Information

Description	Catalogue No.
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Polyethylene Storage Tanks

30-liter PE tank	TANKPE030
30-liter PE underbench tank	TANKBI030
60-liter PE tank	TANKPE060
100-liter PE tank	TANKPE100
100-liter PE underbench tank	ZBITANK01

Description	Catalogue No.
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Accessories

Advanced Vent Filter

Advanced vent filter (for Elix® water purification systems)	TANKMPK01
Standard vent filter (for RiOs™ water purification systems)	TANKMPK02

Automatic Sanitization Module

Milli-Q® Integral; Milli-Q® Direct, Elix® Advantage, and Elix® Reference water purification systems	TANKASMIN
ASM for RiOs™ / Elix® / AFS® Essential water purification systems	TANKASMES

Air Gap Device

Air Gap Device	AIRGAP001
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E-POD® Pure Water Remote Dispenser

E-POD® pure water dispenser	ZRXSP0D01
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Washer Distribution Kit

Washer Distribution Kit (Left) 230 V	ZWDK5L100
Washer Distribution Kit (Left) 115 V	ZWDK6L100
Washer Distribution Kit (Right) 230 V	ZWDK5R100
Washer Distribution Kit (Right) 115 V	ZWDK6R100

Water Sensor

Connection from the system	ZFWATDET4
Connection from the tap water source	ZFWATDET1 (120 V) or ZFWATDET2 (230 V)
Water sensor with cable	TANKLK002

Lab Close Kit

Milli-Q® Integral; Elix® Advantage; Elix® Reference; and Milli-Q® Direct water purification systems	LABCLOSE1
RiOs™ / Elix® / AFS® Essential water purification systems	Included, setting to be activated



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Use the above details to contact us if this literature doesn't answer all your questions.

Pricing on any accessories shown can be found by keying the part number into the search box on our website.

The specifications listed in this brochure are subject to change by the manufacturer and therefore cannot be guaranteed to be correct. If there are aspects of the specification that must be guaranteed, please provide these to our sales team so that details can be confirmed.

