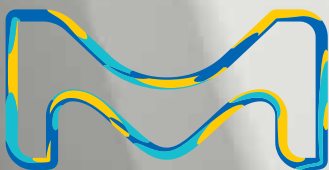


Milli-Q®
Lab Water

Milli-Q® HX 7000 Series High-Throughput Water Purification Systems

Connected, sustainable central pure water
solutions for up to 9000 L daily



The life science business of Merck operates as
MilliporeSigma in the U.S. and Canada.

MERCK

Milli-Q® HX 7000 series

A new range of high-throughput systems backed by decades of water purification expertise

Expertise to match today's changing laboratory environment

Laboratories around the world are evolving continually to keep pace with growing research requirements, new ways of sharing scientific information, the trend toward connectivity, and increasingly stringent environmental regulations. Adapting space and equipment to meet these new needs can be challenging for all involved.

As part of this process, your responsibilities may involve renovating or expanding existing labs — or planning, designing, and engineering entirely new facilities. In either case, you may need to specify water purification systems. That's where our expertise is key.

Merck has 50 years of experience in the water purification business. Our products are designed to improve the quality and reliability of results — from research laboratories to QA/QC laboratories in the pharmaceutical industry.

Based on our extensive knowledge of laboratory applications and equipment, pharmaceutical industry requirements, and water

purification technologies, we can help you select the appropriate water purification solution: a comprehensive total water purification package for a single laboratory, a suite of laboratories — or an entire laboratory building.

Our Milli-Q® HX 7000 water purification systems and SDS 500 (storage, protection and distribution systems) can be combined in compact and modular installations. One or more Milli-Q® HX 7000 systems can be provided in order to ensure the right water quality and quantity for each laboratory or department, and thus avoid very long distribution loops, which can encourage bacterial contamination.

Such installations are not only easier to maintain and sanitize, but also offer greater flexibility in the event that adjustments are required for future lab upgrades or configuration changes. There is also the added benefit of redundancy in case a system backup is ever required.

Point-of-use Milli-Q® IQ 7000 polishing systems can be added throughout the installation as needed, in order to meet ultrapure water quality needs for more sensitive applications.



A total water purification systems partnership

To meet a customer's specific requirements, we work closely with stakeholders throughout the different project stages. End-user scientists, architects, consultants, lab and facilities managers, as well as contractors and equipment suppliers all have their own criteria that must be evaluated before any decisions can be made.

We help establish key parameters for the installation, including water quality and quantity, industry standard requirements, and considerations for long-term laboratory use. We're your partner throughout the project.

A comprehensive solution to match your needs

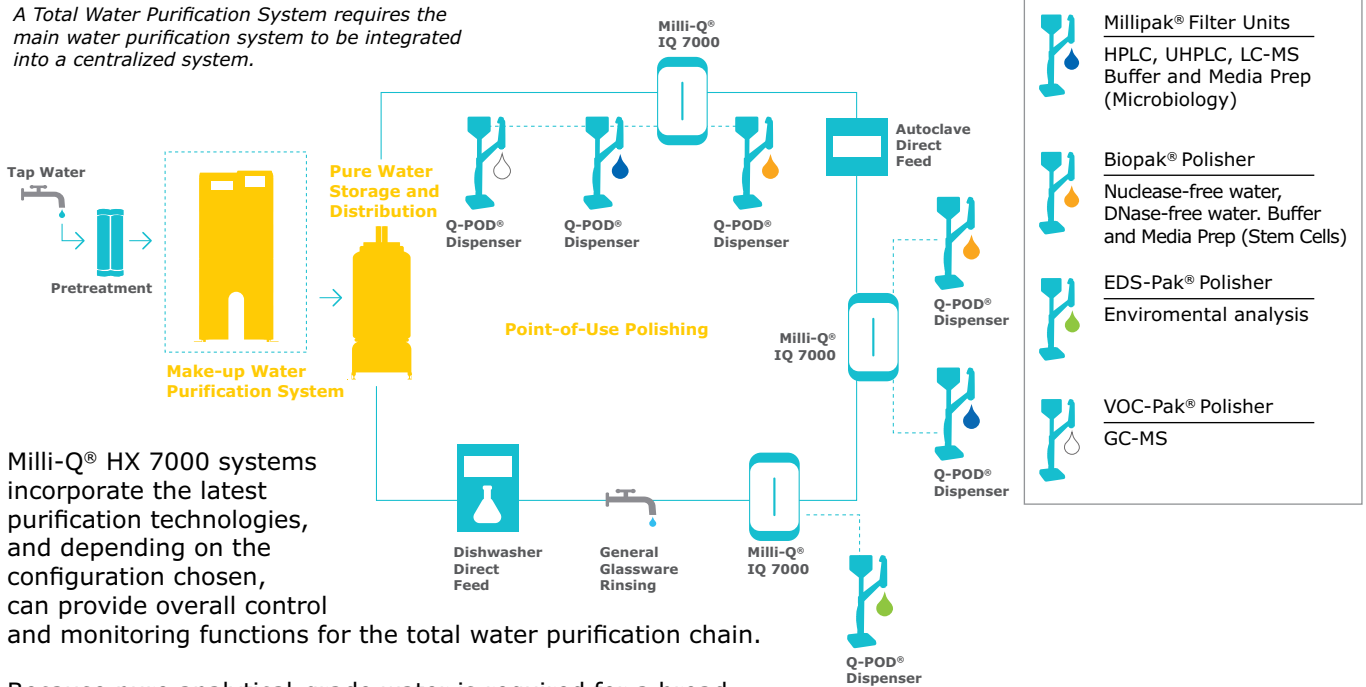
Purified water is required for a wide range of applications within a laboratory facility. The water quality needed can range from general laboratory grade to ultrapure water matching the sensitivity of critical research and analytical techniques. In addition, the water quantity can vary from a few liters for a single end-user to several hundred or thousand liters per day for a laboratory facility.

Merck's Milli-Q® HX 7040/7080/7120/7150 range is designed for customers who require a few hundred liters to up to several thousand liters per day of analytical-grade water. Placed at the heart of a total pure water solution, an Milli-Q® HX 7000 high-throughput system and accompanying SDS 500 can be connected to additional components and accessories in order to build a comprehensive water purification system to match a customer's specific needs.



Merck is your partner of choice for total water purification systems — from conception and design, right through to engineering expertise and technical support services.

A Total Water Purification System requires the main water purification system to be integrated into a centralized system.



Milli-Q® HX 7000 systems incorporate the latest purification technologies, and depending on the configuration chosen, can provide overall control and monitoring functions for the total water purification chain.

Because pure analytical-grade water is required for a broad range of laboratory applications, Milli-Q® HX 7000 systems are a perfect fit for labs everywhere, including those in the pharmaceutical, clinical, chemical, metallurgical, cosmetics, food & beverage, electronics and biotech sectors.

Analytical-grade water meets the specifications for Type 2 water defined by a number of regulatory bodies, including:

- ISO® 3696: 1987 Grade 2 Water for Analytical laboratory use (NF EN ISO® 3696:1995, BS EN ISO® 3696:1995)
- GB/T6682-2008 Grade 2 Water for Analytical laboratory use
- ASTM® D1193 Type 2 (2006 Reapproved 2011) Reagent Grade Water
- Japanese Industrial Standard JIS K 0557, A3 - 2012

and for Purified Water defined by the:

- European Pharmacopoeia Purified Water 9.2 (2017)
- United States Pharmacopoeia Purified Water (USP 38)
- Chinese Pharmacopoeia (2015 appendix XVII A-227) Water for Pharmaceutical Purposes
- Japanese Pharmacopoeia (17-2016) Purified Water

It is suitable for the following applications:

- Microbiological media preparation
- Buffer preparation
- Hydroponics
- Manufacturing chemical and biochemical reagents
- Pharmaceutical laboratories

The table below gives minimum specifications for different water types*

Contaminant	Parameter and unit	Type 3	Type 2	Type 1
Ions	Resistvity (MΩ·cm)	> 0.05	> 1.0	>18.0
Organics	TOC (ppb)	< 200	< 50	< 10
Pyrogens	EU/ml	NA	NA	< 0.03
Particulates	Particulates >0.2 µm (units/ml)	NA	NA	< 1
Colloids	Silica (ppb)	< 1000	< 100	< 10
Bacteria	Bacteria (CFU/ml)	< 1000	< 100	< 1

*These values are provided only as guidelines, as some specific laboratory applications may require a quality superior to the quality indicated by the norms.

At the heart of your Total Pure Water solution

A total pure water solution consists of not just one system, but rather several integrated parts. At the heart of the solution, the Milli-Q® HX 7000 system serves as the nerve center for the entire water

purification chain, and provides total control of all functions, operating parameters and standard accessory components.

The Milli-Q® HX 7000 water purification system

The Milli-Q® HX 7000 system is the starting point for the installation. It functions as the makeup water system, using tap feed water purified by a combination of purification technologies to produce the required water quality in sufficient volume for use in all the laboratories.

An SDS 500 unit for storage, protection and distribution of pure water

- The SDS unit stores purified water from the Milli-Q® HX 7000 makeup system, helping to meet daily needs and cover peak periods of high demand from the labs. It is important to ensure that the Milli-Q® HX 7000 water production rate and the tanks are sized to meet the labs' daily and peak usage demands for purified water.
- The SDS unit also distributes and maintains top-quality pure water through the piping network at the correct flow rates and pressures. In-line UV lamps and integrated final 0.22 µm sterile filtration devices maintain/improve the quality of distributed water.

Point-of-use delivery and polishing

Throughout the piping distribution network, pure water can be used for a variety of purposes:

- Feed to instruments, clinical analyzers, dishwashers or autoclaves
- General glassware rinsing
- Buffer and media preparation
- Feed to high-throughput ultrapure water purification systems (Super-Q® systems) or point-of-use "polishing" systems, such as Milli-Q® IQ 7000 systems.



inside the Milli-Q® HX 7000



State-of-the-art complementary purification technologies

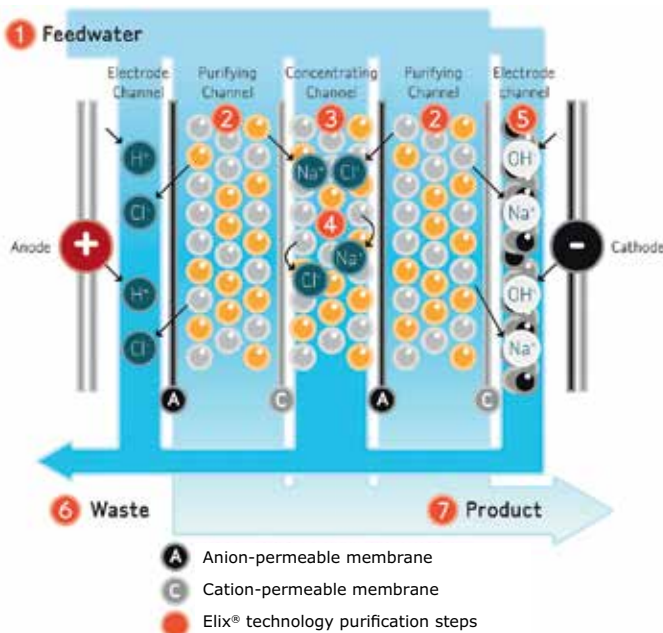
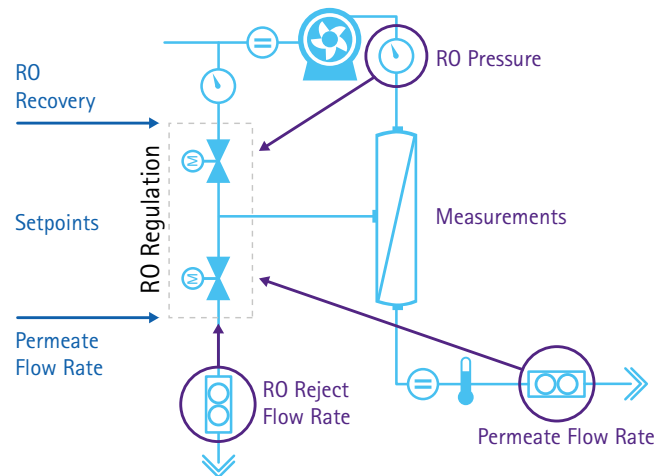
Progard® pretreatment packs combine several purification media to protect the Milli-Q® HX 7000 system by removing:

- Particles (0.5 µm filter)
- Free chlorine and colloids (activated carbon filter) from tap water

Other pretreatment such as backwashable carbon filters and ultrafiltration can be added depending on your feed water quality.

Advanced RO technology and Evolutive Reject Adjustment (ERA™)* technology decrease water consumption

- Advanced reverse osmosis removes 95-99% of ions and 99% of all dissolved organics (MW > 200 Dalton), microorganisms and particles.
- ERA™ technology uses an integrated calculator to optimize RO water recovery (between 45 and 75%) depending on feed water quality.
 - Production flow and water recovery rates remain constant regardless of feed water temperature.
 - No manual adjustment of valves is needed to maintain flow rate or protect RO cartridge lifetime.
 - Users save water, time and money.
 - Maintenance time is reduced, as well as the risk of human error.
 - System uptime is optimized and reliability increased.



The Elix® electrodeionization module ensures constant quality pure water, productivity and profitability

- Remaining ions are removed in the Elix® electrodeionization module, where ion-exchange resins are continuously regenerated by an electric field. No hazardous chemical regeneration or costly resin replacement is needed.
- There are no DI cartridges to change, which reduces maintenance time and ensures low and predictable running costs.
- Regardless of feed water quality (conductivity, CO₂ levels), or RO cartridge performance, both running costs and product water quality remain the same — there are no unexpected costs for users.
- Elix® patented technology does not require softeners; labs save space and maintenance time.

Merck's Elix® module: unique technology is based on anion- and cation-permeable membranes, high-quality ion-exchange resin, and activated carbon beads. Water produced by the Elix® module enters the tank with resistivity greater than 5 MΩ·cm @ 25 °C (typically up to 15 MΩ·cm @ 25 °C).

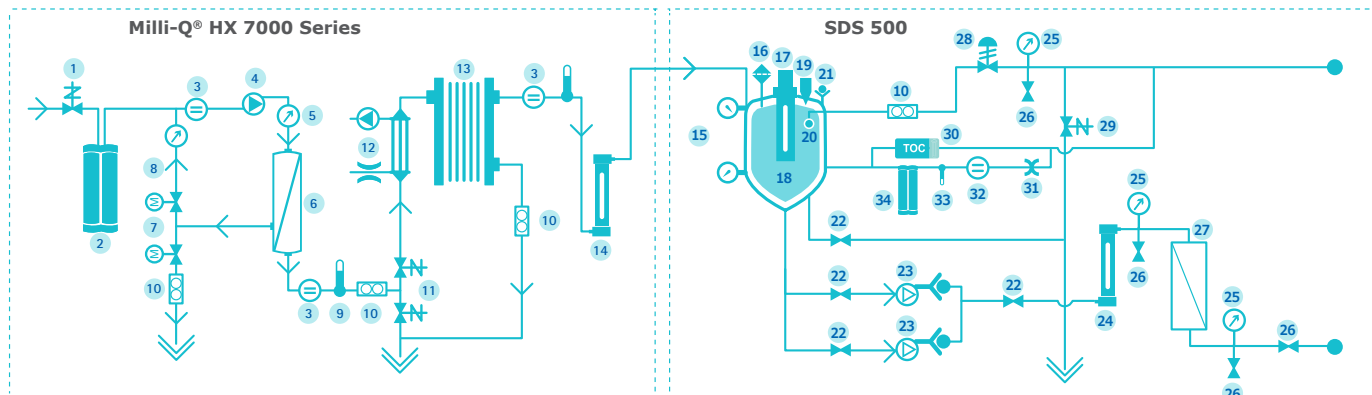
Ultraviolet (UV) lamp and final filtration for full bacterial control

- UV lamp sanitization occurs at three stages: during water production, storage in the SDS 500, and recirculation in the distribution loop. As a result, the water's bacterial count is reduced by a log reduction value of 4 (a bacterial count of 10,000 CFU/mL will be reduced to 1 CFU/mL irrespective of the system's nominal flow rate).
- A pharmaceutical grade Opticap® (0.22 μm) filter provides final filtration before water is delivered.
- Optimum-quality Elix® water can be used for bacteria-sensitive applications.

*Patent pending

Milli-Q® HX 7000 series

Water Purification Systems



- | | | |
|--|---|---|
| 1. Inlet valve | 13. Elix® module | 25. Pressure gauge |
| 2. Progard® pretreatment pack | 14. UV lamp (254 nm) | 26. Sampling valve |
| 3. Conductivity cell | 15. Tank level pressure sensors | 27. Opticap® filter (0.22 µm) |
| 4. RO pump | 16. Vent filter | 28. Back pressure regulator |
| 5. Pressure sensor | 17. Automatic Sanitation Module (ASM) (UV 254 nm; option instead of spray ball) | 29. Automatic loop rinsing valve |
| 6. RO cartridge | 18. Tank | 30. TOC monitor (option) |
| 7. Twin motorized valve - RO recirculation | 19. Overflow | 31. 4 LPM flow controller (option with Resistivity booster) |
| 8. RO circulation loop | 20. Spray ball | 32. Resistivity cell (option) |
| 9. Temperature sensor | 21. Check valve | 33. Temperature cell (option) |
| 10. Flow sensor | 22. Valve | 34. Resistivity booster (option) |
| 11. 3-way automatic rinsing valve | 23. Distribution pump(s) | |
| 12. Degassing unit (option) | 24. UV lamp (254 nm; option) | |



Full control of the installation and water quality parameters

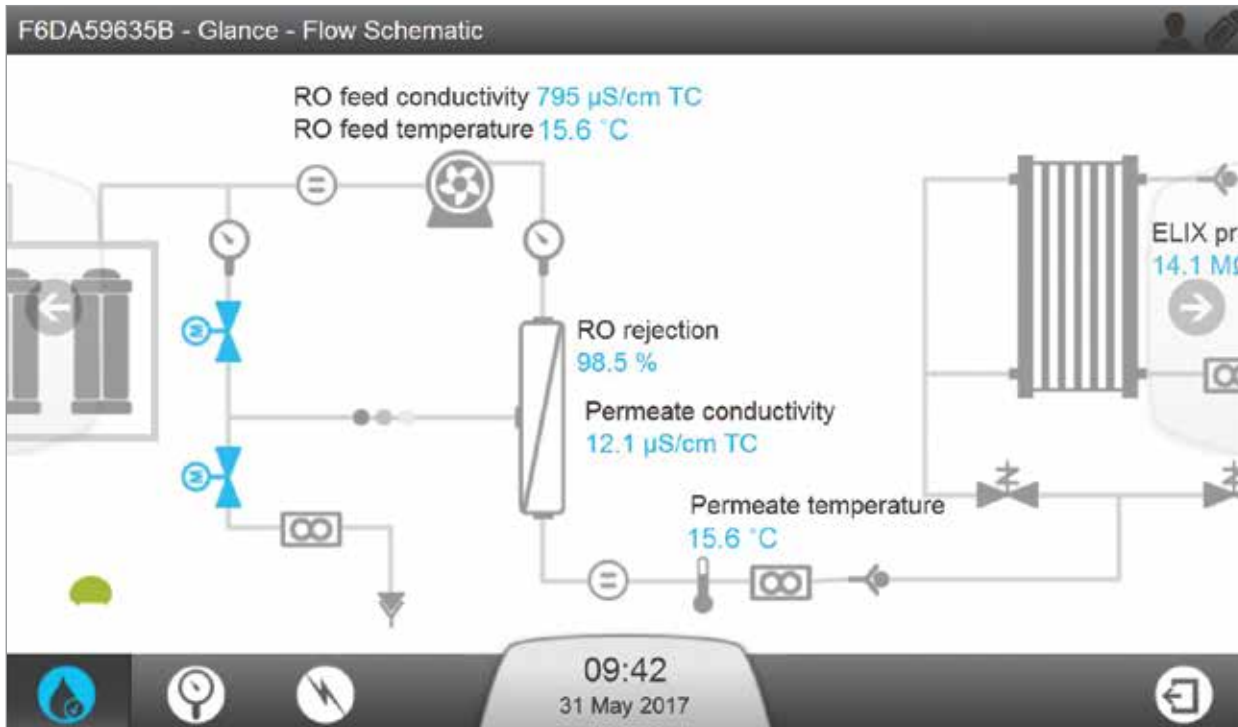
Milli-Q® HX 7000 systems drive and control all additional equipment needed in an installation, including:

- Single and duplex distribution pumps and their alarms
- Bactericidal UV lamp in the distribution loop*
- Automatic Sanitization Module (ASM)* on the SDS 500 unit
- Storage tank levels and alarms
- Vent and final filter consumable management
- TOC and resistivity monitoring in the distribution loop, depending on the configuration chosen
- Water detector to stop water production and distribution in case of a leak*
- Embedded web server technology compatible with LIMS and BMS via TCP/IP protocol; alarm outputs to LIMS/BMS for monitoring purposes

Following each purification step, the Milli-Q® HX 7000 system checks relevant parameters:

- Feed pressure, feed water quality
- RO pressure, RO water quality, RO membrane efficiency (% ion rejection)
- Elix® water: resistivity and temperature
- Water quality in the loop return (resistivity and/or TOC*) can also be checked by the system

* Available as an option



Compact SDS 500 storage unit protects water purity for efficient distribution

The SDS 500, with its state-of-the-art design, is the perfect companion for the Milli-Q® HX 7000 series of systems:

- Distribution flow up to 60 L/minute; single or duplex pump options
- Polyethylene tank with IR polypropylene piping
- Hermetically sealed lid with no overflow to drain prevents bacterial contamination
- Optional Automatic Sanitization Module (ASM) with integrated 254 nm UV lamp prevents bacterial and biofilm growth on tank inner surfaces
- Optional spray ball cleans the tank cover with high pressure
- Constant velocity in the loop limits biofilm buildup
- Cylindrical shape and conical bottom for full drainage
- Vent filter protects against airborne contaminants
- Differential pressure sensor for accurate level measurement
- Sanitary connection; sanitary sampling port located anywhere in the loop

superior communications interface, full connectivity and traceability

You can rely on the Milli-Q® HX 7000 system's superior connectivity to meet your current and future requirements.

All the details needed for daily operation of the Milli-Q® HX 7000 system are available at a glance. The system's large colored touchscreen allows users to navigate easily among several views that show data, including:

- Water production status
- Storage level
- Dispensing status
- Consumables exhaustion status
- Alarm and alert status

Information is displayed in a user-friendly, easy-to-read dashboard format.

System status zone

Large display shows water qualities and distribution process

Clear, visible status of all consumables



Notification zone for alerts and alarms

If a consumable change is required, the system will display a yellow, blinking alert 15 days in advance. Just touch the yellow alert to open a new screen...



... where a wizard will explain the maintenance procedure in easy, step-by-step instructions.





Traceability keeps your data always at hand

Water is a reagent whose quality must be documented for laboratories seeking accreditation (or reaccreditation) to the ISO® 15189: 2012 standard. Traceability of all system events, as well as electronic data archiving, facilitate compliance with worldwide regulatory guidelines and make the accreditation process easier.

Milli-Q® HX 7000 systems enable up to two years of data storage, which can be transferred via the network or USB key whenever needed. In addition, automatic electronic records are less time-consuming and less expensive to manage than their paper equivalents.

An ergonomic and patented pack locking system allows Progard® purification packs to be changed in seconds.

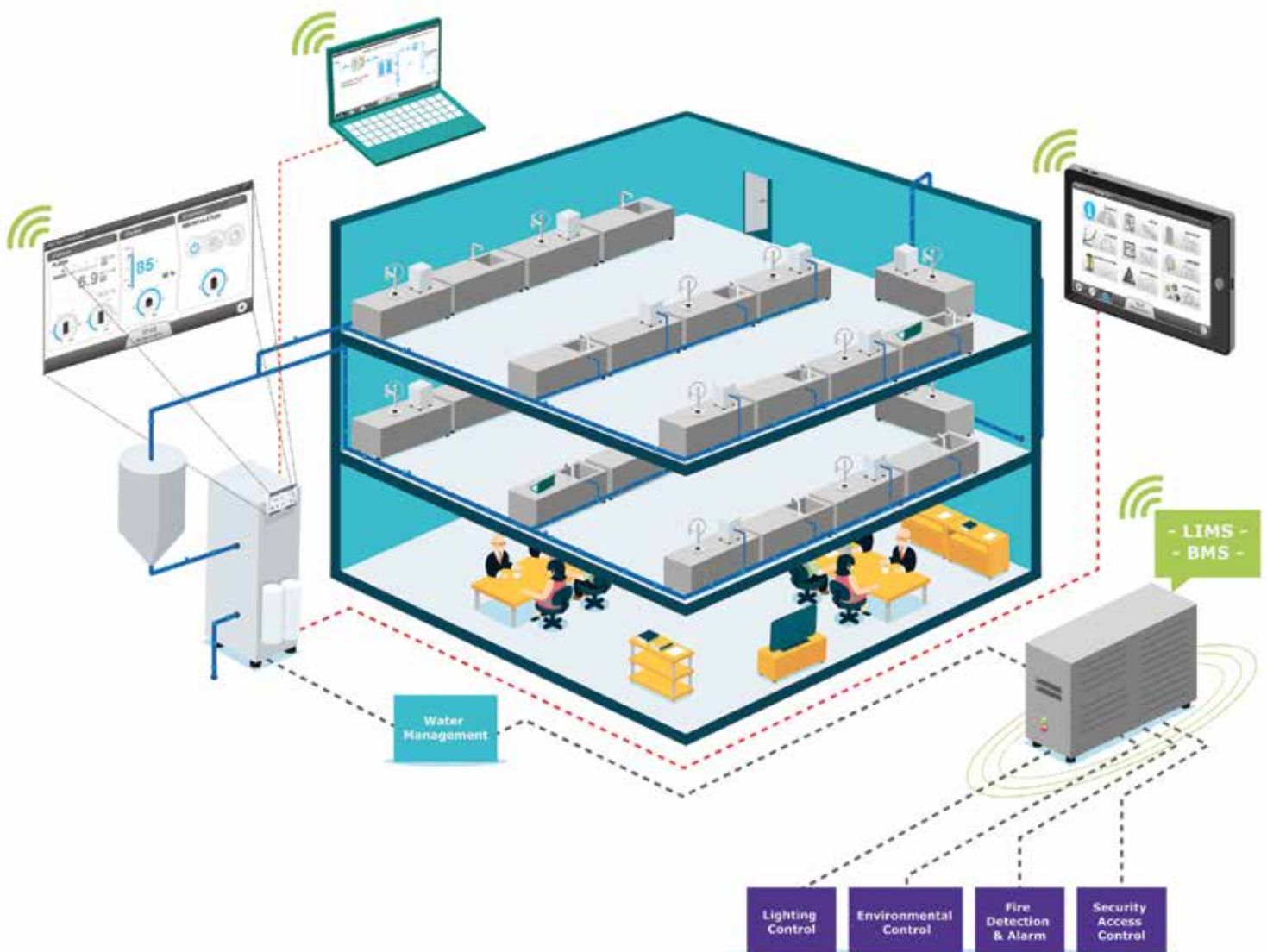


Connectivity provides flexible monitoring

Through the flexible system interface, users can view real-time web pages in order to monitor Milli-Q® HX 7000 system operations.

The system's full connectivity also offers authorized users remote monitoring 24/7 via a computer, tablet or smartphone. Up to three users can remotely access the system at the same time.

Risk management is provided through the Milli-Q® HX 7000 system's numerous adjustable set points, designed to trigger an alert or alarm in case of deviation. This proactive approach maximizes uptime for water purification and prevents breakdowns to ensure greater lab productivity.



The Milli-Q® HX 7000 water purification system can be controlled remotely by a PC or tablet device, and can be connected to a Laboratory Information Management System (LIMS) or Building Management System (BMS).

A sustainable solution, today and tomorrow

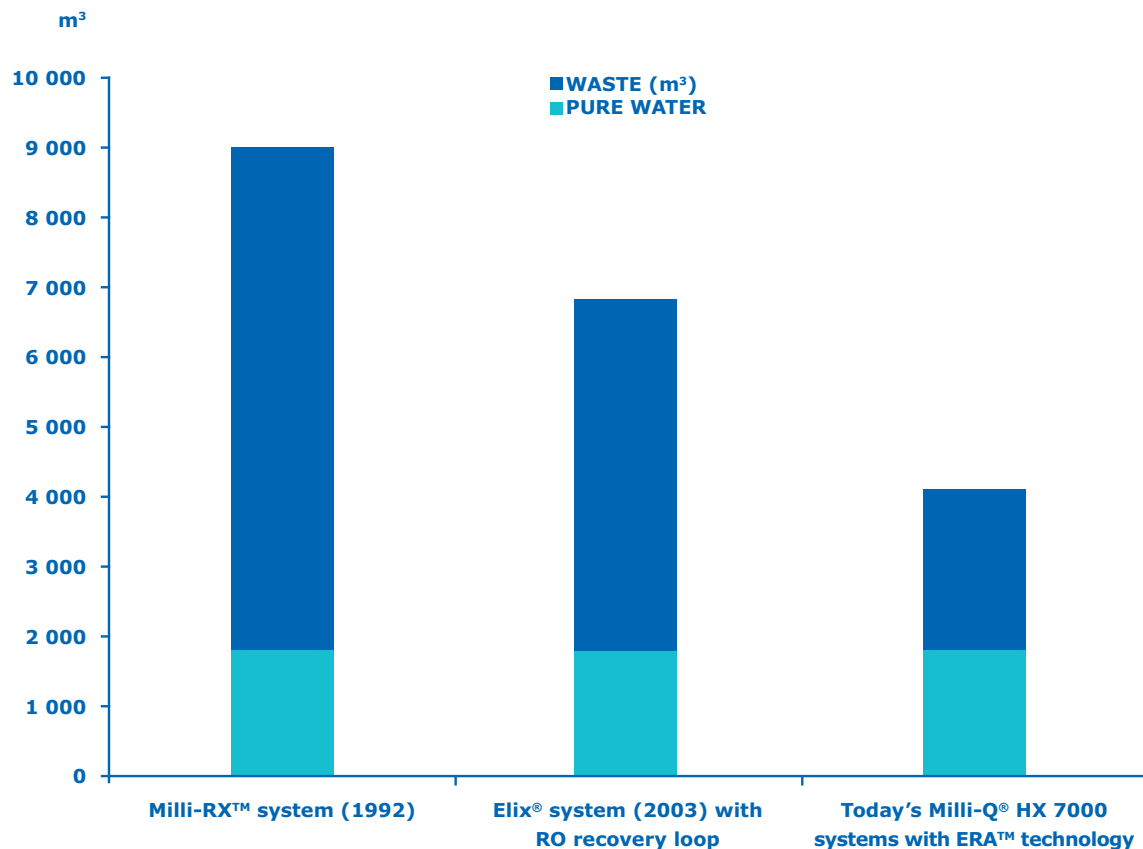
Merck is committed to environmental sustainability. Ongoing developments in Lab Water product stewardship underscore our determination not only to increase our own product sustainability, but also to help our customers move toward sustainable solutions themselves.

Our efforts include using optimized purification technologies that help decrease energy and water consumption, reducing packaging and documentation, and providing consumable recycling where possible.

The Milli-Q® HX 7000 series of systems incorporate patented Elix® technology, which provides constant-quality water without the need for resin cylinders, softeners, or conditioning systems. In addition, new

integrated ERA™ technology automatically optimizes water recovery based on feed water quality to decrease tap water usage — up to 50% compared to other high-throughput RO systems — reducing costs and helping protect valuable resources. The RO recovery loop also optimizes water consumption (between 45 to 75%) by recycling part of the water that has been rejected to the drain, thus further reducing water waste and also extending RO cartridge and Progard® pack lifetimes.

In a busy laboratory environment with a variety of equipment — often installed in a relatively small space — Milli-Q® HX 7000 systems also help reduce noise pollution with an operating noise level of less than 50 decibels (at a distance of one meter).



Over the last 25 years, Merck has dramatically reduced water purification system water consumption, enabling laboratories to save up to several thousand dollars per year on tap water expenses. The graph shows water

consumption and the split between purification system water and reject water for three Merck water purification systems over a seven-year period (production of 1000 L/day of pure water, 312 days per year).

Get unequalled quality of Milli-Q® services and support

Whether your project is a small laboratory renovation — or the design of a new laboratory building — it's critical to have full confidence in the expertise of your water purification supplier.

We're proud of our unequalled service offering, which allows us to pass along outstanding benefits to our Milli-Q® HX 7000 system users. Before installation, a certified Field Service Engineer will analyze the laboratory's feed water quality. Then during the installation procedure, the measured feed water parameters are programmed into Milli-Q® HX 7000 system memory, making it possible to optimize water recovery and maximize system performance.

Throughout the system's lifetime, we offer Milli-Q® service plans* that can be tailored to meet specific customer needs. Options range from a single annual preventive maintenance visit with replacement of aging parts, to full system coverage, including qualification, calibration, and verification services.

Count on us to support your project with state-of-the-art technologies and manufacturing excellence, wherever you are.

Final User / Laboratory

Architect, Engineer, Design & Facility Needs



- Configuration options based on the user's environment and specific needs (central or individual water purification solution with additional point-of-use systems)
- Selection of the optimal systems
- Support for loop design based on our 50 years of experience
- Design Qualification of the complete solution
- System installation
- Support for the loop sub-contractor

* Subject to subscription



Specific to pharmacopeia and accredited labs

Our stringent Quality system, product development process and manufacturing procedures ensure that our products are robust and reliable. Milli-Q® HX 7000 systems are manufactured in an ISO® 9001- and ISO® 14001-registered site. Additionally, to ensure efficiency and safe operation, systems are

IEC-certified (CE, cULus, FCC, EAC). Furthermore, to reduce environmental impact, all Milli-Q® HX 7000 systems follow European Restriction of Hazardous Substances (RoHS) and Waste Electrical and Electronic Equipment (WEEE) directives.

Needs



Full Solution Qualification



- Installation Q
- Operational Q
- Maintenance Procedure
- Calibration
- Verification

Training

- Users
- Maintenance Department
- Quality controller & assurance expert



Lifetime Services

- Milli-Q® Service Plans*
- Technical support hotline
- Maintenance Protocol
- Traceability



Technical Appendix

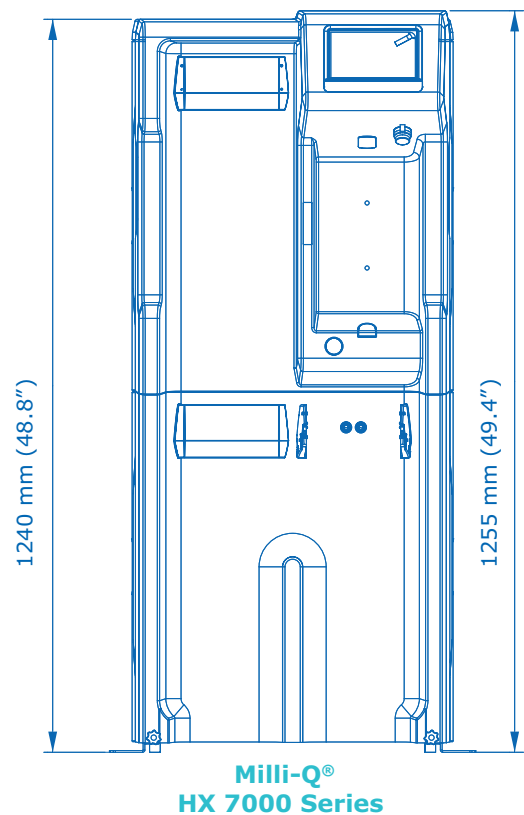
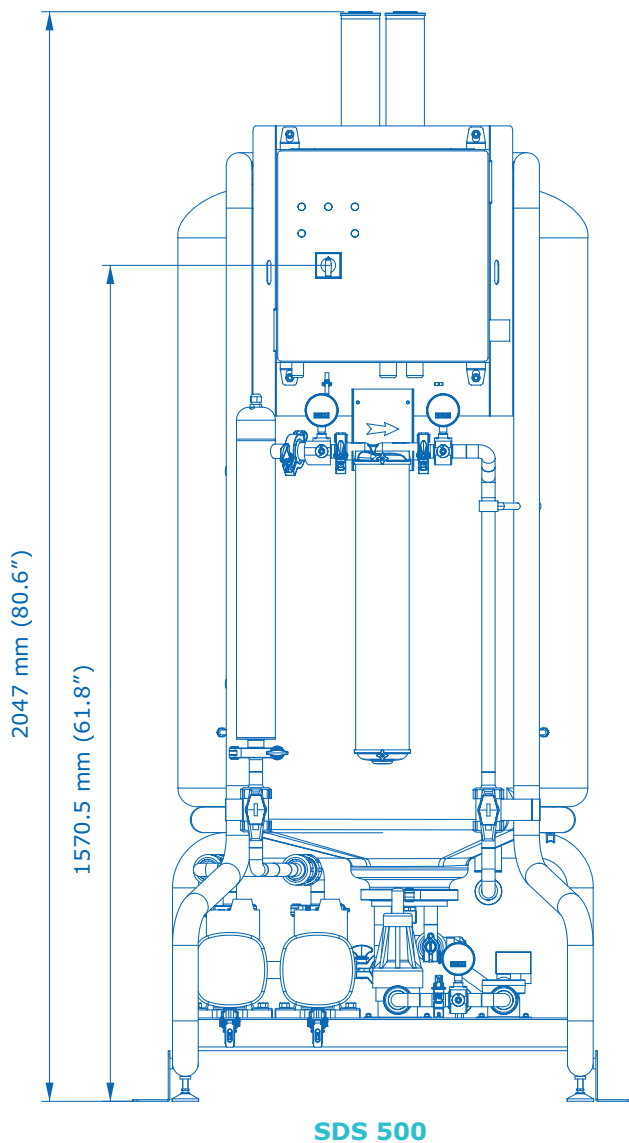


Milli-Q® HX 7000 series system paired with the SDS 500

Milli-Q® HX 7000 series

Type 2 Water Purification Systems

System Dimensions



Milli-Q® HX 7000 series

Type 2 Water Purification Systems

Feed Water Requirements

Parameter	Value or Range
Pressure	2 – 6 bar
Flow rate	> 10 L/min at 2 bar
Feed water type	Potable water
Temperature	5 – 35 °C
Conductivity	10 – 2000 µS/cm at 25 °C
pH	4 – 10
Hardness (as CaCO ₃)	< 300 ppm
Silica concentration	< 30 ppm
Carbon dioxide concentration (CO ₂)	< 30 ppm
Langelier Saturation Index (LSI)	< 0.3
Fouling Index (FI _s) or Silt Density Index (SDI)	≤ 7(*)
Total Organic Carbon (TOC)	< 1 ppm
Free chlorine for Milli-Q® HX 7040 LC, 7080 LC, 7120, 7150 systems	< 1.5 ppm
Free chlorine for Milli-Q® HX 7040 HC, 7080 HC systems	< 1.5 ppm – 3 ppm

* < 12 when the optional UF pretreatment is installed.

Milli-Q® HX 7000 Series Performance

Parameter	Value or Range
Resistivity	> 5 MΩ.cm @ 25 °C (10-15 MΩ.cm @ 25 °C typically)
Conductivity	< 0.2 µS/cm @ 25 °C
Total Organic Carbon (TOC)	Typically < 30 ppb
Microorganisms	< 10 CFU/mL
Dissolved silica	< 3 ppb (rejection >99.9%)

Electrical Specifications

System Type	Voltage / Frequency	Power Consumption (VA)
Milli-Q® HX 7040/7080	220-240 VAC, 50/60 Hz	750
	120 VAC, 60 Hz	775
	100 VAC, 50/60 Hz	
Milli-Q® HX 7120/7150	220-240 VAC, 50/60 Hz	870
	120 VAC, 60 Hz	900
	100 VAC, 50/60 Hz	

General Specifications

Noise level	< 50 dB at 1 meter
Communication protocol	TCP/IP/CGI, embedded web server and HTML 5 embedded website*
Communication ports	Ethernet, USB 2.0
Languages	English, French, Spanish, Portuguese, Italian, German, Russian, Chinese, Japanese

* No additional software needed for remote control.

Dimensions and Weights

	Milli-Q® HX 7040	Milli-Q® HX 7080	Milli-Q® HX 7120	Milli-Q® HX 7150
Dimensions (H x W x D) footprint	1 240 x 543 x 542 mm (48.8 x 21.4 x 21.3 in)			
Shipping weight	97 kg (213 lb)	105 kg (231 lb)	113 kg (249 lb)	124 kg (273 lb)
Dry weight	78 kg (172 lb)	86 kg (190 lb)	94 kg (208 lb)	105 kg (232 lb)

SDS 500

Storage, Protection & Distribution System

SDS 500 Specifications

Tank volume	500 L (132 Gallons)
Usable water volume	400 L (105 Gallons), <i>an additional volume of 100 L is reserved for low and high level security</i>
Weight (filled with water)	660 kg (1455 lb)
Weight (empty)	Up to 140 kg (308 lb)
Dimensions H x W x D	2047 x 790 x 1082 mm (80.6 x 31.1 x 42.6 in)
Floor space required	0.85 m ² (9.15 ft ²)
Noise level	E.g. 45.5 dB @ 1m (BPR = 1.5b / flow rate 20 L/min) E.g. 54.7 dB @ 1m (BPR = 4b / flow rate 40 L/min)

Pump Performances (Variable speed pumps)

Voltage / Frequency	Pump Performances
220-240 V, 50/60 Hz	Nominal: 16-40 LPM @ 1-4 bar
110-127 V, 50/60 Hz	4-9 GPM @ 14-58 psi
200 V, 50/60 Hz	Nominal: 16-40 LPM @ 1-3.5 bar*
100 V, 50/60 Hz	4-9 GPM @ 14-50 psi*

* At 90V, performance is reduced to 16-40 LPM @ 1-3 bar (4-9 GPM @ 14-43 psi).

Electrical Specifications

Voltage / Frequency	Maximum Power Consumption	Maximum Intensity
220-240 V, 50/60 Hz	2100 VA	< 9A
100-127 V, 50/60 Hz	2000 VA (120 V)	< 16A
	2000 VA (100 V)	< 20A

Materials

Tank	Medium density polyethylene (MDPE)
Frame	Epoxy painted passivated steel
Valves and fittings	Polypropylene, polyamides, EPDM
Piping	Beta Polypropylene Homopolymer (Beta PP-H)
Pump wetted parts	316 SST and tungsten carbide / carbon and EPDM seals
BPR wetted parts	Polypropylene, EPDM, PTFE
Pressure gauge	Inox 316 L
Other mechanical parts	Polyethylene terephthalate (PETP)

Plumbing Connections

Pure water inlet to tank	3/4" Sanitary TC
Tank drain	1 1/2" Sanitary TC
Tank loop inlet/return	1 1/2" Sanitary TC

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

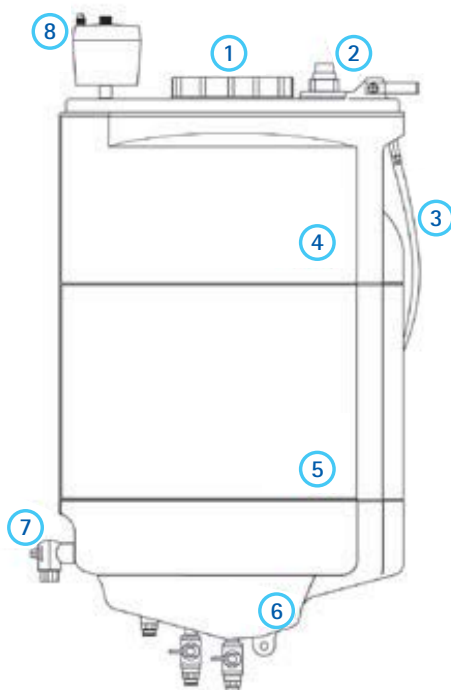
Fail-safe protection

- 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:

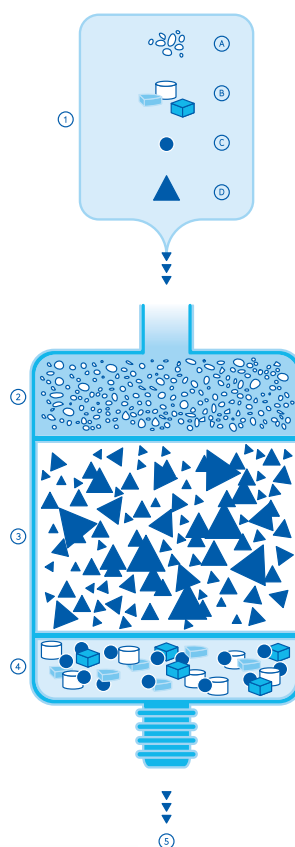
- Advanced Vent Filter
- Automatic Sanitization Module
- Air Gap Device
- E-POD® pure water remote dispenser
- Washer Distribution Kit
- Water Sensor
- Lab Close Kit

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

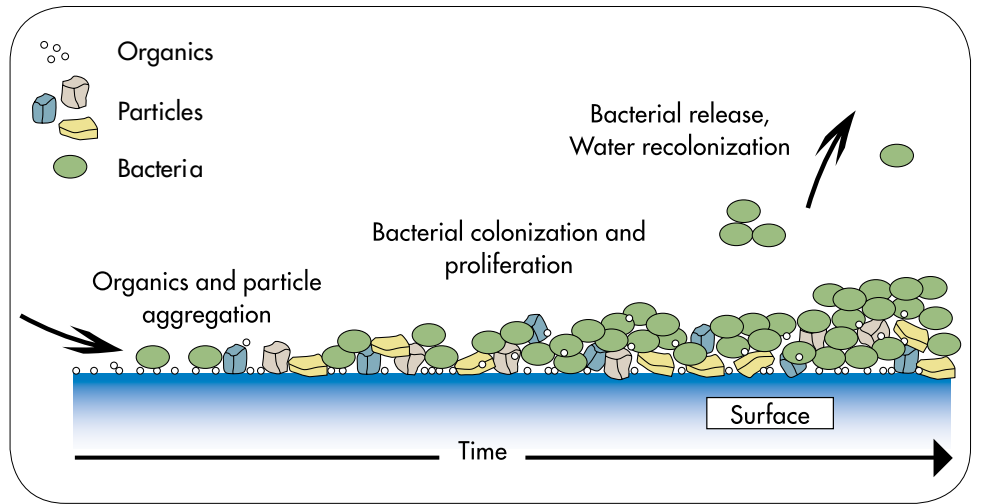


Complete Merck Millipore water purification chain with the ASM and water sensor

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

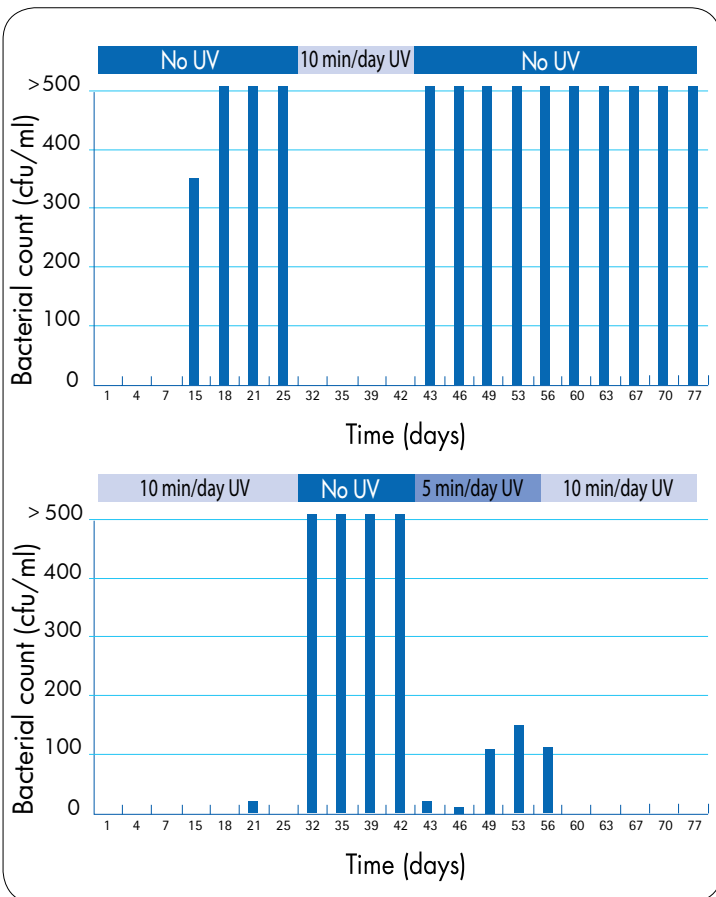
Maintaining high purity water with low bacteria levels during storage is critical. If left to proliferate, trace levels of microorganisms present in pure water compromise water purity. This bacterial contamination is responsible for the formation of a biofilm – an accumulation of organic material made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



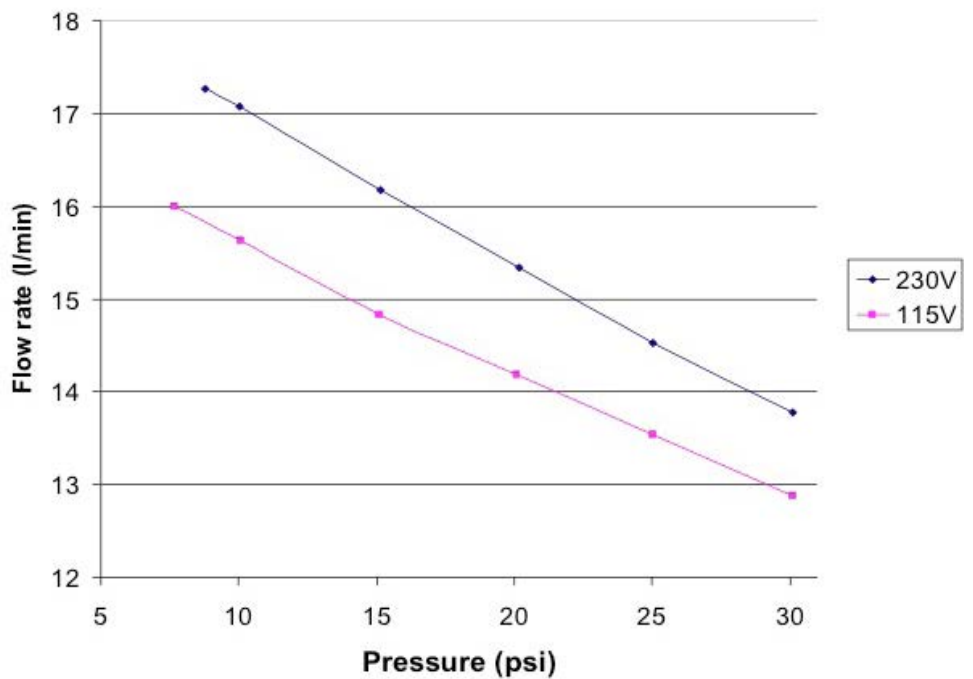
Distribution pumps to meet increased demands

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.
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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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.

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Please contact us if this literature doesn't answer all your questions.