Elix® Reference Water Purification Systems

The best in pure water

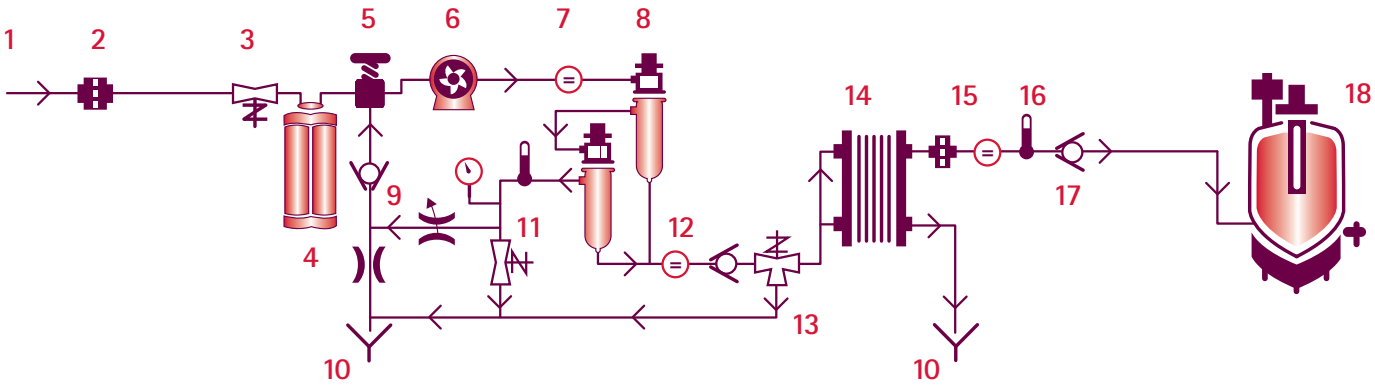
Merck Millipore is a division of MERCK

The best in pure water

Your pure water needs	Our solution: the Elix® Reference systems
Type 2 pure water with consistent and reliable water quality	Complementary water purification techniques, including **state-of-the-art Elix® electrodeionization technology**, ensure delivery of constant- and reliable-quality Type 2 pure water.
High-quality pure water meeting the specifications for your applications	With resistivity > 5 MΩ·cm at 25 °C (typically 10-15 MΩ·cm) and TOC < 30 ppb, Elix® Reference system product water is of **better quality than double distilled water.**
Low and predictable running costs	With no resin packs to change, the self-regenerating Elix® electrodeionization module **lowers running costs.** Overall reduced water and electricity use also allow significant savings.
Advanced water quality monitoring	Key water quality parameters are measured by the system's **high-precision monitoring equipment.**
Data tracking that meets your requirements	When activated, **Millitrack®** software provides data management, remote access to dashboard, and long-term archiving capabilities.
Compliance with the highest Quality Assurance demands	**Elix® Reference systems** are manufactured in an **ISO®-registered, cGMP manufacturing facility** and are delivered with a Certificate of Conformity and a Certificate of Calibration for all built-in meters; consumables are delivered with a Certificate of Quality.
Intuitive operation	**Intuitive system controls** allow access to three levels of system information (regular use, maintenance, system management). A handy ***Quick Reference Guide*** inside the system door provides concise information on operation and maintenance.
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 Elix® Reference system to evolve with changes within the laboratory.

Elix® Reference water purification pathway

The Elix® Reference system uses regular tap water as feed, and produces Type 2 pure water that is delivered by independent E-POD® dispensers.



1. Tap water feed
2. Strainer
3. Inlet solenoid valve
4. Progard® pretreatment pack
5. Pressure regulator
6. Booster pump
7. Feed water conductivity cell
8. RO cartridge with sanitization port
9. RO reject recycling
10. Drain
11. RO reject solenoid valve
12. Permeate conductivity cell
13. 3-way valve
14. Elix® electrodeionization module
15. Elix® resistivity cell
16. Thermistor
17. Check valve
18. PE Reservoir, ASM, and Vent filter

Merck Millipore has concentrated our expertise in the Elix® Reference system to bring you the best in pure water technology. This innovative system provides pure water to meet the most rigorous standards of regulatory bodies around the world.

Combining Merck Millipore's patented Elix® electrodeionization technology with the most advanced purification technologies, the Elix® Reference system uses potable tap water as feed to produce consistently high-quality pure water for all your lab's pure water needs.

Consistently pure and reliable Type 2 water quality

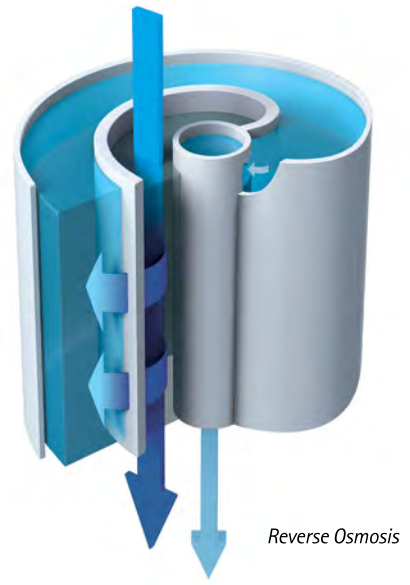
By incorporating proven, patented Elix® electrodeionization (EDI) technology with other advanced complementary water purification techniques (Progard® pretreatment and advanced reverse osmosis), Elix® Reference systems make the best use of existing purification technologies – providing the ideal solution for every lab using pure water – from a few liters to several hundred liters per day.

All-in-one pretreatment pack

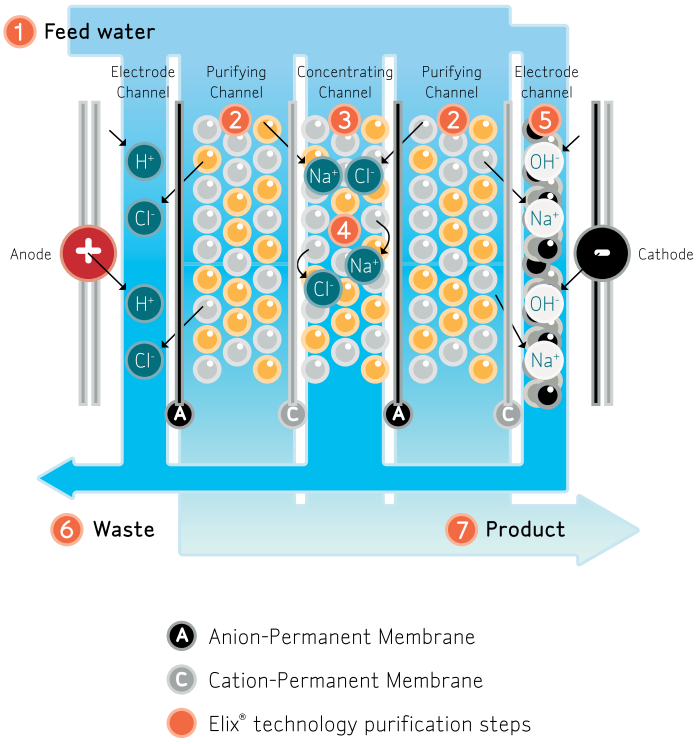
The Progard® pack efficiently removes the particles, free chlorine and colloids present in potable tap water and provides the best protection for the system's Reverse Osmosis (RO) membrane, guarding it against clogging and helping to extend equipment lifetime. Pack changes are triggered in part by actual water consumption, letting you obtain optimal use from your pretreatment.

Intelligent Reverse Osmosis (RO)

Intelligent RO removes 95-99% of all dissolved organics (MW > 200 Dalton), microorganisms and particles. High water recovery, achieved with part of the RO reject water being recycled back to the RO membrane feed water stream, can be adjusted up to 50% to optimize water consumption. Elix® Reference systems also benefit from a constant RO product flow rate, allowing the system to maintain a steady product flow rate – in contrast to standard RO-based systems that typically undergo temperature variations.



Reverse Osmosis



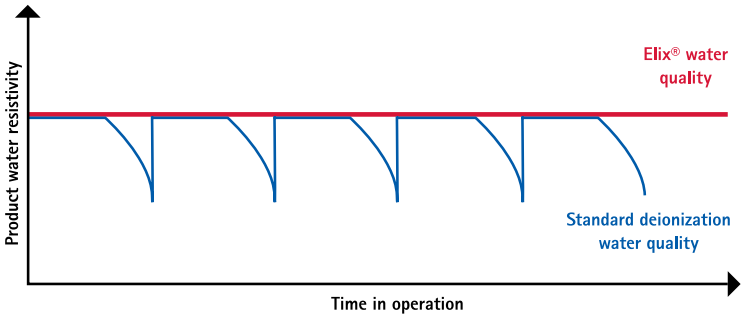
Best-in-class Elix® EDI technology

The Elix® module uses electrodeionization to remove the remaining ions. The patented Elix® EDI treatment provides the following benefits for Elix® Reference system users:

- Consistent high-quality water: Resins do not degrade, as they are not exposed to harsh regeneration chemicals or removed from the system.
- No extra softeners are needed, thanks to Elix® technology and its use of carbon beads
- Minimal electricity consumption: The Elix® module uses the equivalent of the energy required by an electric light bulb.
- Uninterrupted water production: Continuously regenerated ion-exchange resins eliminate hazardous chemical regeneration or costly resin replacement.

High-quality pure water to match your applications

Consistency and reliability in pure water quality is crucial in laboratory applications. The Elix® Reference system helps you meet the most challenging requirements. The system is designed to produce pure water that meets or exceeds requirements as described by ISO® 3696 (Grade 2 water); ASTM® D1193 (Type II resistivity and TOC Table I specifications); and by the United States, European, and Japanese Pharmacopeias for Purified Water.



The graph shows the superiority of Elix® technology over systems using ion-exchange resin packs. Resistivity drops dramatically when these packs are exhausted.

Pure water, such as the water produced by Elix® Reference systems, is used throughout the lab for:

- Feed to laboratory equipment (e.g., Milli-Q® Type 1 ultrapure water systems, weatherometers, autoclaves, glassware washers, and dissolution testing units)
- Preparation of microbiological media, buffer and pH solutions
- Histology
- Chemical reactions run in water
- Manual glassware rinsing

With resistivity values that are greater than 5 MΩ·cm at 25 °C, and with less than 30 ppb TOC, the quality of Elix® Reference water exceeds that of double distilled water. In general, water that has been purified using Elix® technology is suitable for use with analyses at the parts per million (ppm) or high parts per billion (ppb) levels.

Low and predictable running costs

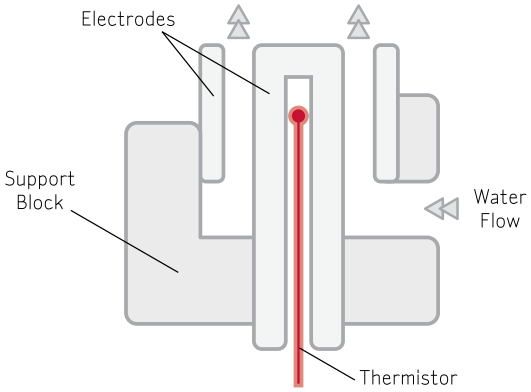
Elix® systems are the only systems available today that use electrodeionization technology in a way that is dependable, efficient, and robust. Budget-conscious users will appreciate Elix® Reference systems for their low and predictable running costs:

- Integrated Elix® electrodeionization technology requires no costly resin replacement or regeneration.
- Only a single Progard® pretreatment pack is needed to remove particles, free chlorine and colloids from tap water.
- No polishing pack needed for pure water production; no extra softeners or anti-scaling cartridge needed upstream of the Elix® module.
- Electricity consumption is 200 times less than that of conventional distillation equipment.
- The system's efficient RO-reject water recirculation loop significantly reduces tap water use and helps extend the lifetime of the Progard® pack.
- No strong chemicals must be purchased for resin regeneration or cleaning purposes.
- There are no transportation and storage costs (as with bulky and cumbersome resin cartridges or bottled water).

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 purity water remains at sub-ppb level. Elix® Reference 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).

Data tracking that meets your requirements

When activated, Millitrack® software provides enhanced data management control, remote access capabilities to the system dashboard, and long-term electronic archiving for your Elix® Reference system.

Compliance with the highest Quality Assurance demands

To assist you in following industry requirements, Elix® Reference systems are delivered with specific Certificates of Quality and Calibration for temperature and resistivity meters. Merck Millipore's manufacturing site is ISO® 9001 v2000 and ISO® 14001 certified.

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 meter.

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.

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 Elix® Reference system is certified for safety and electromagnetic compatibility.

Traceability and remote access To facilitate your daily work in a GLP and GMP (Good Manufacturing Practices) environment, all quality and events-related data is available. The user can access this data via PC for on-screen consultation.

Intuitive operation

Researchers must be able to access required information immediately – whenever they need it. Elix® Reference systems offer three levels of information, so that users have easy and convenient access to all the data they require:

- 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 Elix® Reference system) provides all the information required to understand the operation and maintenance of the system.

Carefree maintenance procedures

Low-maintenance Elix® Reference systems free you to concentrate on your laboratory work. Elix® technology eliminates the need for extra polishing packs or conditioning cartridges, so there is just one Progard® purification pack to change — and the system's ergonomic pack locking system makes this easier than ever to do.

Automatic self-maintenance functions (i.e., flush mode, rinsing mode, sanitization cycle) keep the system's reverse osmosis membrane in top operating condition, and ensure optimal water quality. System sanitization is recommended approximately four times a year, and takes just a few minutes to perform.

The Elix® Reference system provides information on replacement of consumables at 15 days' notice, ensuring that you have enough time to obtain the required products. Thanks to the system's innovative RFID technology, catalogue and serial numbers for Progard® consumables are automatically registered in memory upon insertion, which ensures optimal traceability and also prevents insertion of an incorrect consumable.

Additionally, the system is able to manage its own service agenda. If you request this option, you will 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 Elix® Reference 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.

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, Elix® Reference systems can be customized with a wide range of accessories and options:

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

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 UV 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 Elix® Reference purification unit
Save space by installing the Elix® Reference system on the wall.

Elix® Reference System Water Specifications

The Elix® Reference system is designed to meet or exceed requirements as described by ISO® 3696 (Grade 2 water); ASTM® D1193 (Type II resistivity and TOC Table I specifications); and by the United States, European and Japanese Pharmacopeias for Purified Water.

Water Quality

Parameter	Value
Resistivity	> 5 MΩ.cm @ 25 °C
TOC	< 30 ppb

Water Delivery

Elix® Reference system	3	5	10	15
Pure water production (Max l/h)	3	5	10	15

Installation Specifications

Parameter	Value
Production unit dimensions (H x W x D)	500 x 346 x 484 mm (19.7 x 13.6 x 19.1 in)
Production unit operating weight	21.5 – 26.4 kg (47 - 58 lb)
Electric power cable length	250 cm (8.2 ft)
Electric power supply voltage	100-230 V +/- 10%
Electric power supply frequency	50-60 Hz

www.millipore.com/labwater

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