

# Milli-Q® Reference Water Purification System

The reference for ultrapure water systems



# Ultrapure water by Merck Millipore

Scientists today face many challenges. As always, they need to deliver high quality technical results. But now, they must do so at a faster pace, while meeting increasing standards and often operating in laboratories with limited space.

Merck Millipore designed the Milli-Q® Reference system to address these needs. From pure water, the system produces ultrapure water adapted to your specific applications and exceeding the requirements of the most demanding norms.

We've achieved all this with a new purification strategy. Water is purified in a first step to reach a resistivity of 18.2 MΩ.cm at 25 °C and a TOC value below 5 ppb. This water is sent through a small recirculation loop to the Application-Pak, where a final purification step, critical for specific experiments, removes contaminants just before water leaves the system.

The flow schematic on the next page shows how the water is purified and delivered by the system.



## Convenience in water delivery

The Milli-Q® Reference system delivers water the way scientists need it for convenience and time savings, improving laboratory efficiency.



Easily prepare solutions with the low flow function to precisely adjust the meniscus in volumetric flasks.



The 75 cm long tubing reaches the sink for easy glassware washing.

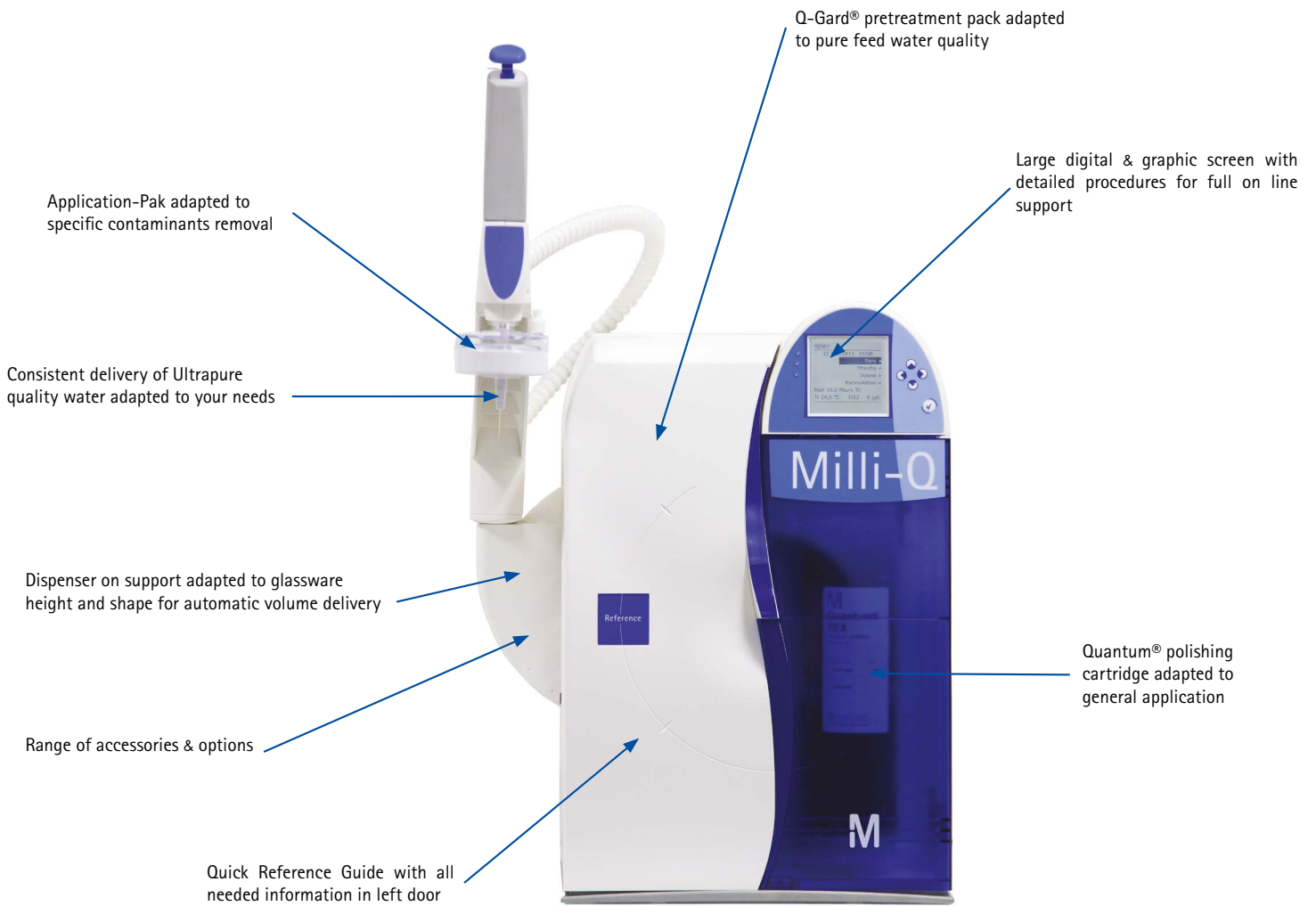


Save time with the volumetric function, automatically delivering the water volume that you need, designed to fit the height & shape of all laboratory glassware.

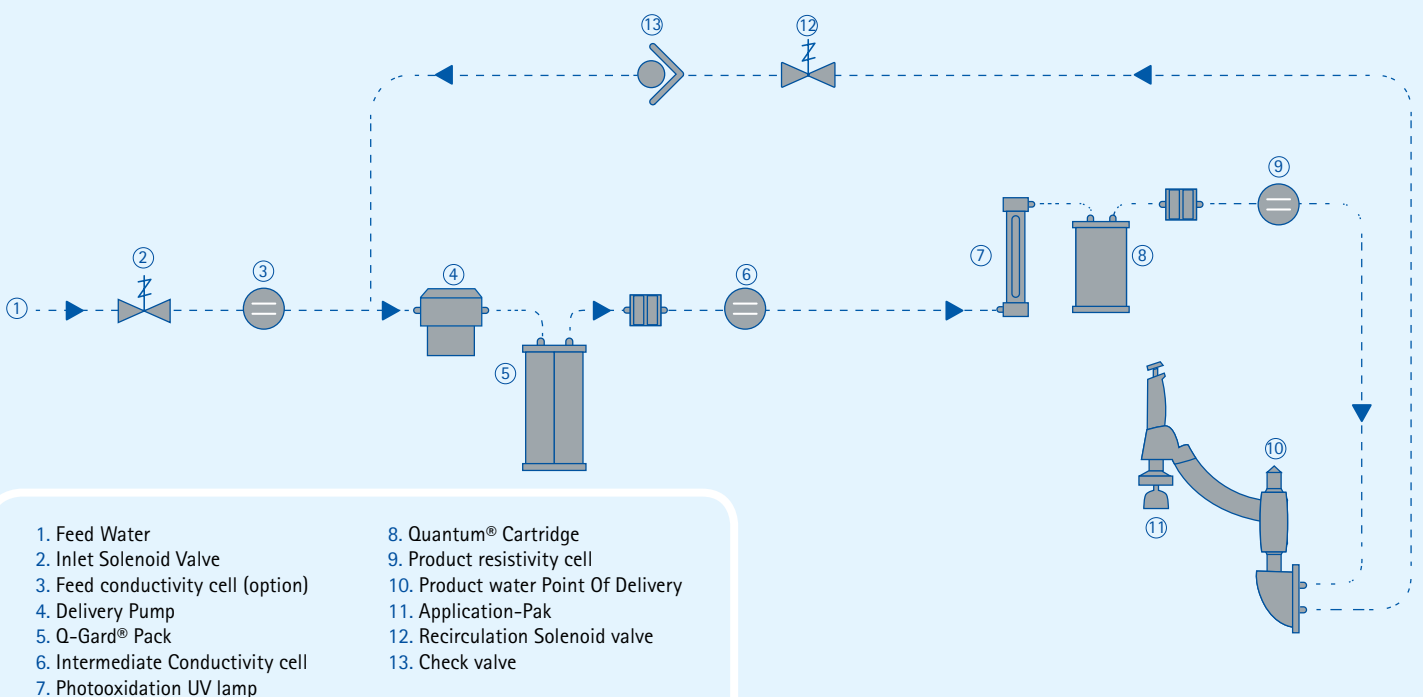


Deliver water hands-free using the footswitch option for more convenience.

# Milli-Q® Reference System at a glance



## Inside the Milli-Q® Reference System



## EASY ACCESS TO INFORMATION

Access to water system data is structured simply, so you can save time instead of searching endless numbers for the one you want.

The **Main Screen** on the production unit delivers detailed information in (local language) on system operation and performance. Clear graphics help you perform specific tasks such as maintenance. From the same screen, you can even print reports on the system's water quality and history.

Fields related to critical information such as the definition of water quality set points are accessible only to the designated responsible user and are protected by an identification code and a password.

Alerts & alarms are clearly visible on the system's main screen and can be enhanced by a buzzer.



A **Quick Reference Guide** located in the door of the Milli-Q® Reference water system provides additional support for retrieving information. The system comes with a complete and detailed user manual in 8 languages on CD-ROM. A printed manual contains essential information (in local language).

# Easy and reduced maintenance

Maintaining the Milli-Q® Reference system won't take time away from your research. Maintenance frequency is minimal, and the procedures are simplified to the utmost.



Q-Gard®  
Pretreatment  
Pack



Quantum®  
Polishing Cartridge



Application-Pak

- You can replace the Q-Gard® pretreatment pack or the Quantum® polishing cartridge in less than 5 minutes. These consumables have an RFID tag, automatically registering the catalog and lot number of the new unit in the system's memory, so that you can quickly and easily maintain traceability.
- Replacing the Application-Pak takes less than 2 minutes.
- The UV lamp built inside the system is designed to last at least 2 years.
- The system will alert you to replace consumables or schedule service visits at least 15 days before maintenance is actually required, so you'll never be without the water you need.

## Service

Merck Millipore provides a comprehensive range of service programs performed by certified Merck Millipore field service support engineers to thoroughly maintain and validate your Milli-Q® system, complying with your industry's regulatory standards.

The service program portfolio covers all maintenance requirements such as installation, customized user training, scientific and technical support, troubleshooting, preventive maintenance visits, and all validation requirements using ad hoc calibrated equipment, procedures, workbooks and suitability tests within a GXP's environment.

## TOTAL WATER SOLUTIONS

To get the best results from your Milli-Q® Reference system, Merck Millipore recommends feeding it with pure water produced by RiOs™ (Type 3) or Elix® (Type 2) water systems.



# Milli-Q® Reference system water specifications

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

## Feed Water Specifications

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

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

## Product Water Quality

Parameter	Value & Unit
Manual dispense flow rate	Adjustable between 50 and 2000 mL/min
Automatic dispense volume	100 mL 250 mL to 5 L by 250 mL increments 5 L to 60 L by 1 L increments
Volumetric dispense accuracy	3 % for volumes between 250 mL and 60 L
Volumetric dispense dispersion	CV < 3% for volumes between 250 mL and 60 L
Resistivity <sup>1</sup>	18.2 MΩ.cm at 25 °C
TOC <sup>2</sup>	≤ 5 ppb (µg/L)
Bacteria <sup>3</sup>	< 0.01 CFU/mL
Pyrogens (endotoxins) <sup>4</sup>	< 0.001 EU/mL (pyrogen-free)
RNases <sup>4</sup>	< 1 pg/mL (RNase-free)
DNases <sup>4</sup>	< 5 pg/mL (DNase-free)

<sup>1</sup> Resistivity can be displayed temperature-compensated at 25 °C or non-temperature-compensated as required by USP

<sup>2</sup> TOC spec – Test conditions: Milli-Q® Reference system equipped with Q-Gard® T1 pack and Quantum® TEX cartridge, feedwater produced by Elix® system with resistivity > 1 MΩ.cm at 25 °C, TOC < 30 ppb. Product water quality may vary due to local feed water conditions.

<sup>3</sup> Results with Millipak® filter

<sup>4</sup> Results with Biopak® final polisher in place

These values (validated with Elix® feed water) are typical and may vary depending on the nature and concentration of contaminants in the feed water.

## Safety

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

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

## Milli-Q® Reference System Dimensions

Parameter	Value & Unit
System footprint	1195 cm <sup>2</sup> (185 in <sup>2</sup> )
System height	497 mm (19.56 in) 713 mm (28.07 in)
System width	332 mm (13.07 in) 413 mm (16.25 in)
System depth	360 mm (14.17 in) 458 mm (18.03 in)
System weight (packaged)	19 kg (41.88 lb)
System weight (empty)	14.5 kg (31.96 lb)
System weight (with water)	19.5 kg (42.99 lb)
Dispenser delivery loop length	750 mm (29.52 in)
Electrical power supply cable length	290 cm (114.1 in)
Electrical power supply voltage	100 – 230 V ± 10 %
Electrical power supply frequency	50 – 60 Hz ± 10 %
Feed water connection	1/2 in. Gaz F
Data connection	Ethernet (RJ45)

## Q-POD® Accessory Dimensions

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

## Certification

The Milli-Q® Reference system is delivered with a Certificate of Conformity ensuring that it has been built and tested fully assembled following Merck Millipore Standard Operating Procedures and a Certificate of Calibration for the temperature and resistivity meters built in the system. The Milli-Q® Reference consumables are automatically delivered with a Certificate of Quality. Merck Millipore's manufacturing site is ISO® 9001 v.2000 and ISO® 14001 certified.

## Accessories

Customize your Milli-Q® Reference system to meet your specific needs.

### Space Savers

Save your bench space for your crucial experiments by removing the arm and dispenser from the Milli-Q® Reference system and mounting it on the Q-POD® support. Place the water purification cabinet under your bench, or high on a wall, freeing your bench for your research. More space savers include:

- Milli-Q® Reference Wall Mounting Bracket
- Q-POD® Wall Mounting Bracket
  - Increase access to water from your bench
  - Save even more space

### Q-POD® Dispenser: Water delivery at your fingertips

The ultrapure water produced in the cabinet is sent in a small recirculation loop to the outlet of the Q-POD® dispenser. Water is delivered from the Q-POD® outlet

The Q-POD® dispenser is loaded with convenient features:

- Variable water flow (slow flow to 2 L/min) controlled by plunger
- Hand-held gun dispensing option to facilitate washing applications
- Volumetric dispense control with + and - buttons to select dispensed volume
- Multicolor graphic display shows at a glance that the water quality is within specification and the system is operating without alarms.
- Printer connection to instantly record water quality history



### System Protectors

Sensors can help keep your Milli-Q® Reference system running with minimal vigilance on your part.

- **Water Sensor** – Placed on the floor, this sensor stops water feed to the system if there is water on the floor. No more water spills, even if users forget to stop water delivery while filling containers.
- **Feed Water Conductivity Meter** – If ionic contamination of feed water exceeds specifications, causing high conductivity, an alarm will alert you.
- **Level Sensor** – If your Milli-Q® Reference system is fed from a Merck Millipore tank, this electronic connector transfers tank level information to the Milli-Q® system. The sensor stops water feed from an empty tank and lets you check water levels in the tank before sourcing water, preventing air from entering the system.
- **Silicone Q-POD® Cover** – The Q-POD® dispenser is designed to operate in a wet environment. However, this silicone cover protects your Q-POD® from harsh chemicals, solutions or solvents.

### Footswitch

Connect the footswitch to the base of the Q-POD® dispenser or directly to the Milli-Q® system for hands-free water delivery: press once to start and once to stop.



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