Milli-Q

# User Manual
## Milli-Q® IQ 7003/7005/7010/7015

# INTRODUCTION

Congratulations!
Thank you for buying a Milli-Q water purification system.

Milli-Q® IQ 7003/7005/7010/7015 produces ultrapure water from a tap water source. Installation of this product should be performed by a qualified service representative with access to qualified installation documentation.

This user manual is a guide for use during the normal operation and maintenance of a Milli-Q IQ 7003/7005/7010/7015 water purification system. It is highly recommended to fully read this manual and comprehend its contents before handling the water purification system.

## System identification

| System | Catalogue number | Voltage | Frequency |
|---|---|---|---|
| Milli-Q® IQ 7003 | ZIQ7003T0 | 100-240 V | 50-60 Hz |
| Milli-Q® IQ 7005 | ZIQ7005T0 | 100-240 V | 50-60 Hz |
| Milli-Q® IQ 7010 | ZIQ7010T0 | 100-240 V | 50-60 Hz |
| Milli-Q® IQ 7015 | ZIQ7015T0 | 100-240 V | 50-60 Hz |

Manufacturing site:
Millipore SAS, 67120 Molsheim, France

For more information on your Milli-Q system, please call your local representative or visit our website www.emdmillipore.com (North America) or www.merckmillipore.com (Rest of the World).

## Intended use

The Milli-Q IQ 7003/7005/7010/7015 is intended to produce pure (type 2) and ultrapure (type 1) water from a tap water source primarily for use in research and quality control in a variety of laboratories worldwide.

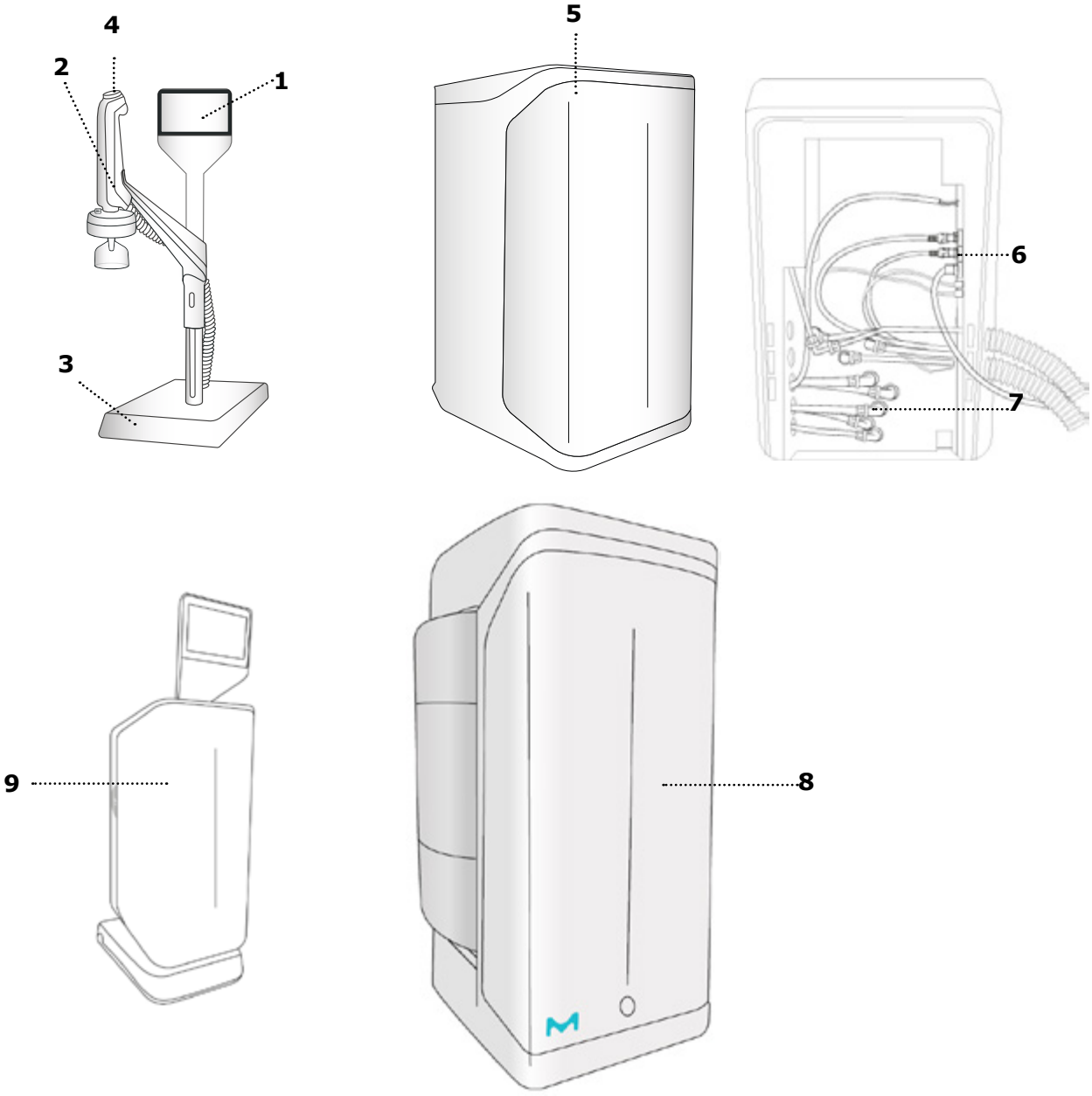
The product is designed to produce ultrapure water with specific characteristics (refer to the requirements and specifications section) when it leaves the water purification system, provided that it is fed with water quality within specifications and properly maintained as required by the supplier.

Merck KGaA does not warrant the product for any specific application. It is up to the user to determine if the quality of the water produced by the product matches their expectations, fits with norms/legal requirements and to bear responsibility resulting from the usage of the water.

*The product is not intended to produce: water for injection, water for dialysis, sterile water for irrigation or injection, bacteriostatic water for injection, sterile purified water in containers, and sterile water for injection in container or ingestion. The product is not intended to be used in explosive environments according to ATEX Directive – equipment & protective systems intended for use in potentially explosive atmospheres. In addition the product is not intended as a Medical Device, including In-Vitro Devices.*

## System overview

Milli-Q IQ 7003/7005/7010/7015 consists of different units:




| | | | |
|---|---|---|---|
| **1** | POD (Point of Dispense) with screen interface | **6** | Electrical connections |
| **2** | POD dispenser | **7** | Hydraulic connections |
| **3** | POD base | **8** | Storage tank |
| **4** | Dispensing wheel | **9** | Milli-Q® IQ Element (optional) |
| **5** | Water purification unit | | |

## Description of the system

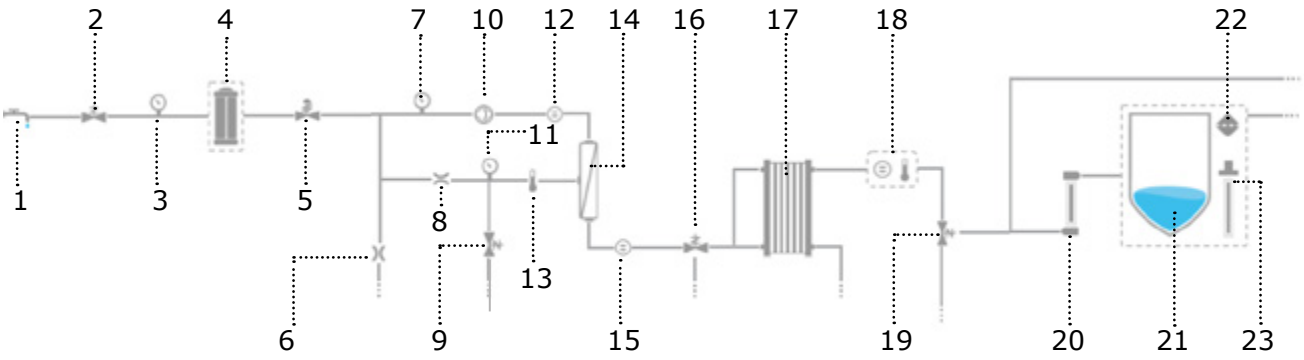
The Milli-Q® IQ 7003/7005/7010/7015 manages the production and the distribution of pure (Type 2) and ultrapure (Type 1) water from a tap water source. It is composed of three different sections:

- Water purification unit manages the production of pure and ultrapure water.
- Point of dispense (POD) integrates the screen interface and manages the dispensing of pure (E-POD®) and ultrapure (Q-POD®/Milli-Q® IQ Element) water. At least one Q-POD® is necessary and up to 4 PODs can be installed, 1 E-POD® + 3 Q-POD® or 4 Q-POD®.
- Storage tank stores and maintains the pure water quality.

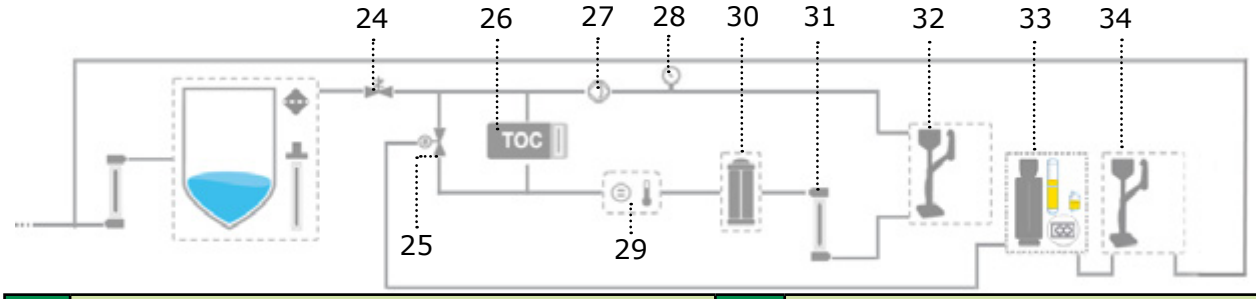
## System flow-schematics

The system is fed with tap water and the distribution loop is fed by a storage tank.

*Production flow-schematic*




*Distribution flowschematic*




| | | | |
|---|---|---|---|
| **1** | Tap Feed Water | **18** | Pure water Resistivity Cell |
| **2** | Inlet Solenoid Valve | **19** | Pure water 3 Ways Valve |
| **3** | System Feed Pressure Sensor | **20** | ech$_2$o® bactericidal lamp |
| **4** | IPAK GARD® | **21** | Storage Tank |
| **5** | Pressure Regulator | **22** | Vent Filter |
| **6** | Reverse Osmosis (RO) Reject Capillary | **23** | ech$_2$o® ASM lamp |
| **7** | RO Pump Feed Pressure Sensor | **24** | Distribution Inlet Solenoid Valve |
| **8** | Flow Controller | **25** | Motorized Valve |
| **9** | RO Flush Solenoid Valve | **26** | TOC Monitor |
| **10** | RO Pump (bypass 180psi) | **27** | Distribution Pump |
| **11** | RO Pressure Sensor | **28** | Pressure Sensor |
| **12** | Feed Conductivity Cell | **29** | Ultrapure Resistivity Cell |
| **13** | Thermistor | **30** | IPAK QUANTA® |
| **14** | RO membrane (1 or 2 depends on syst type) | **31** | ech$_2$o® oxidation lamp |
| **15** | Permeate Conductivity Cell | **32** | E-POD® |
| **16** | Permeate 3 Ways Valve | **33** | Milli-Q® IQ Element (optional) |
| **17** | Elix® EDI Module | **34** | Q-POD® |

This system uses potable tap water as feed and produces pure (Type 2) and ultrapure water (Type 1) delivered by independent POD dispensers.

The system is divided into three sections. These are the production, the storage and the distribution.

Production: Tap water is first purified by the IPAK Gard® pretreatment pack which contains the pleated filter and carbon block. Particles, colloids and free chlorine are efficiently removed before the reverse osmosis purification. The intelligent reverse osmosis (RO) purification that follows controls water consumption, ensures a constant product flow rate and optimal water quality. Majority of contaminants are removed at this stage such as the ions, particles, bacteria and large organics. The purified RO water then enters the patented Elix® electrodeionization module, where ion-exchange resins are continuously regenerated by a small electrical field. The pure water then passes through the mercury-free ech$_2$o bactericidal lamp where bacteria is further eliminated resulting in pure water that is stored in the storage tank.

Distribution: Pure water is stored in high-quality polyethylene tank, which is equipped with the vent filter and the mercury-free ech$_2$o ASM lamp. The vent filter maintains the consistent purity of stored water and provides effective protection against airborne contaminants. The ech$_2$o ASM lamp further protects the integrity of the stored water with regular exposure to bactericidal UV light. Purified water then flows to the mercury-free ech$_2$o oxidation lamp. Organic molecules are partially oxidized, resulting in ions. These are then captured in the next stage when the purified water enters the IPAK Quanta polishing cartridge, composed of ion-exchange resins and synthetic activated carbon.

Throughout the purification steps, quality parameters are monitored with resistivity sensors and the A10® TOC (total oxidizable carbon) monitor. The A10 TOC Monitor uses a small UV lamp during its TOC analysis mode. This is called the ech$_2$o A10 TOC Lamp.

The E-POD and Q-POD are the main interfaces with the user. They are configured with 2 or 5 meter connectors to the main production unit depending on the laboratory setting. The arm holding the dispenser on the mast can be moved up and down to adapt to laboratory glassware. Its dispensing 'wheel' delivers water from precise drop-by-drop up to fast 2 L/min flowrate. The POD's large 5" touchscreen offers a wide range of applications for users. It also has an USB port to easily export data. At the outlet of the dispenser, the final purification is performed by the application-specific POD-Pak.

When not in active use, the water within the units will recirculate for three minutes every hour. This is to maintain water quality, a clean environment and to avoid contamination. The system should not be turned off as this will stop the periodic recirculation taking place.