

DI-250 Machine



The DI-250 Industrial Pure Water System is an integrated unit designed for the production of deionized water. It supplies 250 liters of DI water per hour for use in the rinsing cycles of offline PCBA cleaning machines or stencil cleaning machines. Its primary function is to remove residual solutions and ions from cleaned PCBAs or stencils, thereby ensuring that their cleanliness meets required standards. Functionally, the system is divided into three main sections: a pre-treatment system, an RO (Reverse Osmosis) system, and an MB (Mixed-Bed) system.

Parameter

No	Name	Specification	Remark
1	Supply Volume	1.5T/Hour	
2	DI Water Pressure	0.15~0.3Mpa	
3	Water Production Rate	250L/H	
4	DI Water Storage Tank	160L	
5	DI Water Quality	10 megohms	
6	DI Water Booster Pump	Nanfeng Pump Industry 0.37 kW	
7	Multi-media Filter	25L Quartz Sand + Activated Carbon	
8	Cation Softener	25L Cation Resin	
9	Filtration Precision	20-Inch 1 - 5 μ m PP Cotton Filter	2pcs
10	High-pressure pump	Nanfeng Pump Industry 1.1 kW	
11	RO Membrane	40*40	1pcs
12	Power	AC380V, 50/60HZ, 1.6KW	
13	Machine size	L1100xW1100xH1600 (mm)	
14	Weight	about 400kg	
15	Material	The water tank is made of SUS304 stainless steel, while the outer casing is constructed from 201 sheet metal.	

DI-250 Product Description

I. Overview of the Pure Water System

Based on the user's process requirements, water volume demands, and other technical specifications—and predicated on the quality of the municipal tap water supply—this RO (Reverse Osmosis) + MB (Mixed-Bed) Ultrapure Water Production System has been designed and provided. (Note: For certain cities, a municipal tap water quality analysis report may be required.)

Functionally, this ultrapure water system is divided into three major components: the Pre-treatment System, the RO Reverse Osmosis System, and the MB Mixed-Bed System.

Pre-treatment System: Composed of a multi-media filter (consisting of quartz sand and coconut-shell activated carbon), a cation softener, and a PP cotton-core fine filter.

Its function is to remove particulate impurities, organic matter, residual chlorine, and other contaminants from the raw water; to reduce the water's SDI (Silt Density Index) value; to prevent calcium and magnesium ions in the water from scaling on the reverse osmosis membranes; and to safeguard the long-term, stable operation of the downstream RO membrane system. In accordance with the water quality requirements for the RO system feed, the standard output capacity of the pre-treatment system is designed to be 1 m³/h.

RO Reverse Osmosis System: Primarily composed of a high-pressure pump, reverse osmosis membranes, and membrane pressure vessel assemblies. It serves the function of preliminary desalination. The salt removal rate for the raw water exceeds 98%. To account for the natural aging of the reverse osmosis membranes over time, the system is configured with ample capacity reserves; the standard water output of the RO system is 500 L/h, while the final MB Mixed-Bed System produces 0.5 tons/hour of ultrapure water (at ambient temperature).

Water Quality: The RO Reverse Osmosis System achieves a desalination rate of over 98%. The final effluent from the system reaches a resistivity of 10 MΩ·cm (at 25°C), making it suitable for use as process water in cleaning applications.

Raw Water Source: Local municipal tap water.

II. Pure Water System Unit Composition and Operation

1. Pre-treatment System

Includes the multi-media filter (composed of quartz sand and coconut-shell activated carbon) and the PP cotton-core fine filter.

1.1. Multi-media Filter

1.1.1. Suspended substances in water consist of minute particles. Visible to the naked eye, these particles are primarily composed of silt, clay, protozoa, algae, bacteria, and high-molecular-weight organic matter, which frequently remain suspended within the water. As tap water passes through the quartz sand layer, large suspended particles are effectively removed.

The activated carbon layer removes organic substances—specifically, the fishy or moldy odors resulting from the growth and decay of aquatic organisms, plants, or microorganisms, as well as the earthy tastes or astringency caused by the decomposition of organic matter. It also eliminates residual chlorine left over from disinfection. This process ensures the proper functioning of downstream systems. The reduction of residual chlorine in the water plays a crucial role in protecting the water-softening resins and membrane components, thereby extending the service life of both the reverse osmosis membranes and the mixed-bed deionizers. The filter medium used consists of granular, fruit-shell-based activated carbon.

1.1.2 Multi-media Filter Flushing Procedure: (Flushing Cycle: 1–2 times per week; frequency depends on local water quality)

Flushing Method: Set the manual control valve on the multi-media filter to the "Forward Flush" position and flush for 15 minutes. Then, switch the valve to the "Rinse" position and rinse for an additional 10 minutes. Once the flushing process is complete, return the multi-way valve to the "Run" (Service) position.

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1.2. Cation Softener

To prevent calcium and magnesium ions in the water from forming scale deposits on the reverse osmosis (RO) membranes—thereby avoiding damage to the membrane modules and preventing widespread scaling—a softener is installed.

Installing a softener upstream of the RO unit extends the system's cleaning cycles, prolongs the service life of the membranes, and ultimately reduces operating costs.

1.3. PP Fine Filter

The security filter serves as the final filtration stage before the water enters the main RO unit. It is essential for ensuring that the Silt Density Index (SDI) of the feed water remains stable at a value of 4 or less prior to entering the RO unit. This is critical because the pure water recovery rate of a typical RO system is generally limited to 50%–60%.

The designed water production capacity is 0.25 tons per hour (T/H).

Operating Principle:

(a) The PP cotton filter utilizes a filter cartridge made of PP cotton with a pore size of 5 μm . Water flows from the exterior of the PP cotton inward; it passes through the micropores and permeates out through the central tube located within the inner wall of the PP cotton cartridge. This process effectively filters out microscopic particulate impurities that are larger than the specified pore size.

(b) After a period of use, impurities and particulate matter accumulate increasingly on the outer surface of the PP cotton cartridge until it eventually loses its filtration effectiveness. At this point, it is imperative to replace the filter cartridge; failure to do so will result in contamination of the downstream RO equipment. The standard replacement interval is typically 1 to 2 months (though this may vary depending on local water quality conditions and actual water usage).

1.4 Important Notes:

(a) As the precision filter cartridge is used, the impurities trapped within its micropores will accumulate until the cartridge eventually becomes ineffective. At this point, it is imperative that you replace it immediately. Generally, replacement is required once a month; however, the actual replacement frequency depends on the quality of the raw water and the duration of equipment operation. Initially, it is advisable to inspect the filter cartridge weekly to determine if it is fully contaminated and requires replacement. After repeating this process a few times to establish an appropriate replacement cycle, you should adhere to that schedule going forward.

(b) Periodically monitor the SDI value of the water output from the security filter on a daily basis. If the SDI value exceeds 4, please inspect the precision filter to check whether the cartridge's sealing ring is damaged or loose. If the filter cartridge is found to be contaminated, please replace it promptly.

2 RO Reverse Osmosis System

2.1 Introduction

The RO (Reverse Osmosis) unit serves as the "heart" of the entire pure water system; therefore, users are advised to exercise particular care during its maintenance. The operational parameters of this unit are designed based on the following factors:

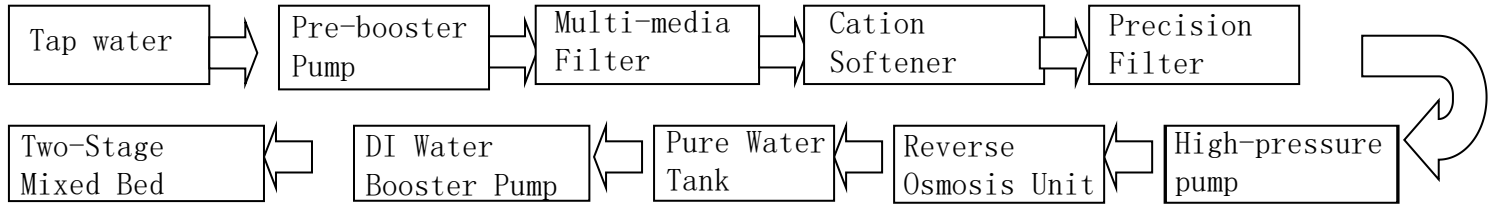
1) The inlet water temperature must be maintained within the specified design range (typically around 25°C).

2) The quality indicators of the inlet water must be equivalent to those of standard municipal tap water.

3) The inlet water must undergo pre-treatment to reduce its SDI value and remove residual chlorine.

This RO system incorporates automatic control technology and is equipped with essential safety features—such as protection against water shortages, high water levels, and low pressure—to safeguard the equipment and extend its service life. Consequently, users are strongly advised to operate the system and maintain operational records in strict accordance with the design specifications. Our company reserves the right to disclaim any liability for losses or damages resulting from operational errors by personnel or inadequate supervision.

III. Pure Water System Process Flow Diagram



IV. Instructions for Replacing Consumables and Wear Parts:

No	Name	Model	Quantity	Recommended Replacement Interval
1	Quartz Sand	0.5	25Kg	8-12 months; water yield: about 50 T.
2	Coconut Shell Activated Carbon	6-12目	12.5Kg	8-12 months; water yield: about 60 T.
3	Softening Resin	cation	25L	8-12 months; water yield: about 100 T.
4	Precision Filter	1-5um	2pcs	7-15day
5	Reverse Osmosis Membrane	40*40	1pcs	Water volume: about 90 T
6	Mixed-Bed Resin	Polishing Resin	20x2L	The water quality does not meet requirements; the water output is about 60 T