

Product series

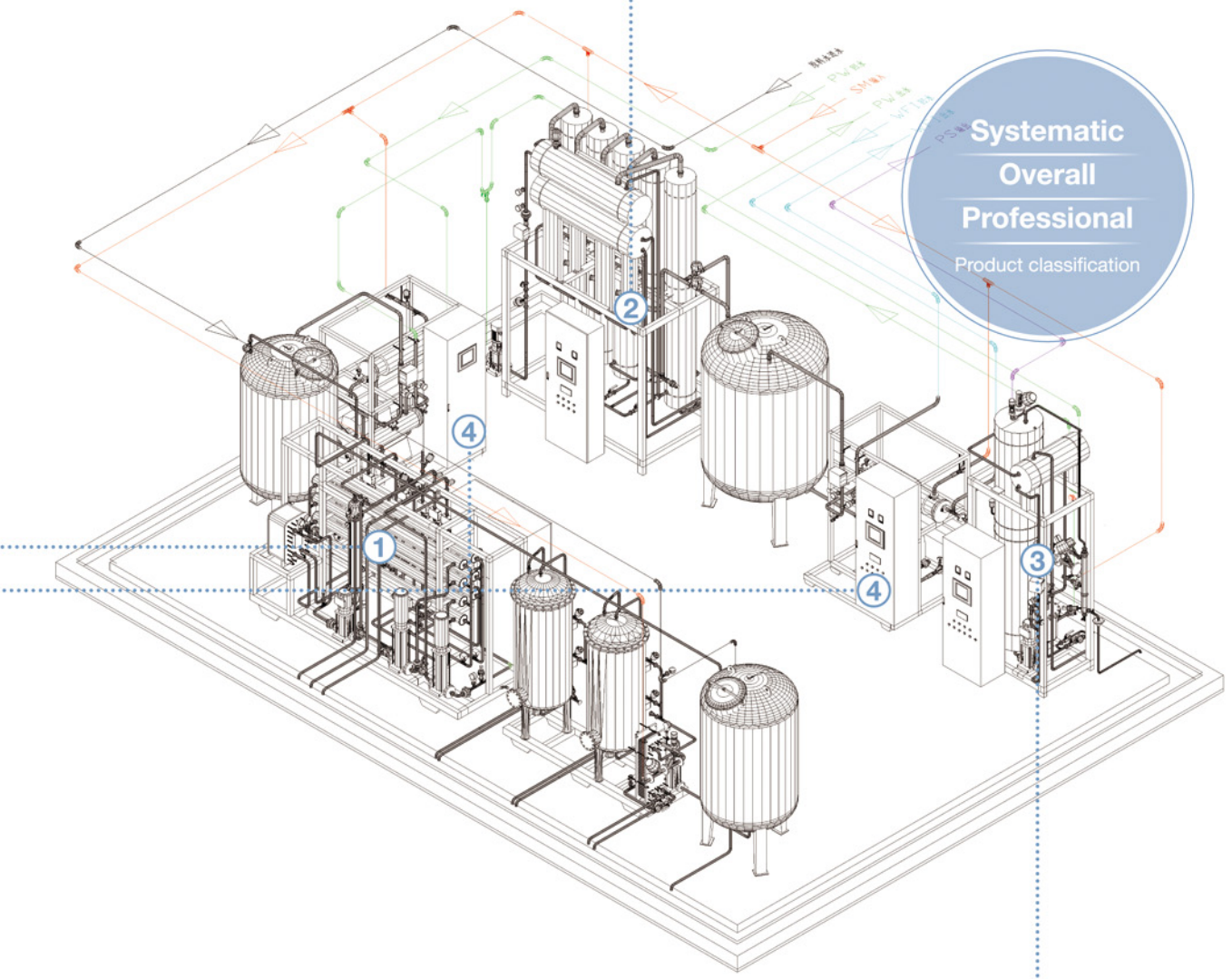
Purified water system

The purified water system adopts modular design enabling the system to have various characteristics, such as independence, modularization and simple operation, etc. These functions ensure the consecutiveness, stability and reliability of the equipment. In addition, we will make more than two design plans for the selection by the clients in accordance with the water quality report and URS, including pretreatment configuration, combination of desalination system, selection of distribution system and disinfection methods, etc. In the meantime, we also provide a complete set of verification system for clients, including design validation in the preliminary stage, FAT test within the factory, installation validation in later stage, operation validation and performance validation as well as perfect after-service system.

Multi-effect water distiller

Distillation is the technical process for chemical and microbiological purification of raw water through steam-liquid phase transition method and separation. During this technical process, the water is evaporated and the steam produced isolated from the water. What's more, the unevaporated water flows back to dissolved solid substance, non-volatile matter and high molecular weight impurities. During the process of distillation, low molecular impurities may be taken along in the steam produced by water evaporation in the form of water spray or water drop. Under this circumstance, we need a separating unit to remove the thin water spray and the carried impurities, including endotoxin. The purified steam after condensation will become water for injection. At least 99.99% endotoxin content may decrease through distillation method.

Systematic
Overall
Professional
Product classification



Storage distribution system

⑤ On-line cleaning system

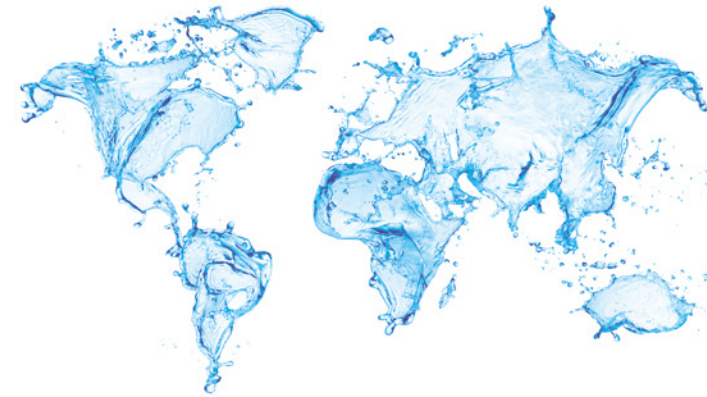
⑥ Biological products tank in batching system

Pure steam generator

The clean steam usually takes purified water as feeding water and the steam is produced through pure steam generator or the first effect evaporator of multi-effect water distiller. At the time of condensation, the clean steam shall meet the requirements of water for injection. Deionized water and purified water can be taken as feeding water of pure steam generator. After evaporation and separation (remove such pollutants as particles and bacterial endotoxin), it can be conveyed to the using point under certain pressure.



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TECHNOLOGY LEADER INDUSTRY MODEL

HIGHFINE



FDA standard water system
Mainstream supplier of global water system

1 Purified Water System

Hot Water Disinfection Purification Water System

Pure water equipment requirements

- The water quality meets all the provisions of China pharmacopoeia standard and FDA;
- Automatic equipment operation and conditional automatic processing program (such as back flush, regeneration, acid-washing and disinfection procedures);
- Monomer and pipe equipment meet GMP requirements (all such back end processing equipments as sterilizer, membrane filtration, terminal water tank and pipeline adopt the 316L material and the pre-treatment pipeline adopts SUS304 material).



2 Multi-effect Water Distiller

B Series Multi-effect Water Distiller

B series multi-effect water distiller adopts rising film and multi-diversion form to evaporate. The industrial steam enters the evaporator, passes through valves and interchange heat with the purified water rising film in the tube. The purified water after heat exchange becomes vapour. Then impure heat source will be removed from the vapour through diversion separation device in the machine to produce the secondary steam. The pure steam after steam-water separation will become distilled water after being condensated as heating source in II effect. Then the distilled water will enter into the condenser under differential pressure. After that, it will enter the storage tank through the pipes. The concentrated water without evaporation and separation shall enter the next effect for re-evaporation through concentrated water inlet.

Equipment features

- Adopt rising film for evaporation to solve the problem of uneven distribution of water.
- High thermal efficiency, 100% heat exchange.
- Save industrial steam consumption, 20% energy saving.
- Distribute feeding water for each effect accurately to reduce raw water loss.
- No need to exchange the multi-diversion separation device and life-span of the equipment can be extended.



3 Pure Steam Generator

Hot Water Disinfection Purification Water System

Production capacity

The standard equipment model table shows the equipment production capacity under the condition of 3bar pure steam pressure and 6bar industrial steam with the unit in kg/h. The actual production capacity of some equipment shall be acquired in accordance with the actual operation pressure. Use this actual operation pressure to multiply the conversion coefficient in the specified production capacity.

Model selection example

- Industrial steam pressure: 7bar
- Pure steam pressure needed: 2bar
- The highest demand of pure steam: 500kg/h
- Conversion coefficient: 1.7
- Specified output requirement: $500/1.7=294\text{kg/h}$
- Model selected: PSG 300 DTS



4 Storage Distribution System

Pure Water Storage Distribution System

Distribution system is specially designed according to customers' real situation on the basis of GMP, ISPE and FDA guidelines. The system adopts the frame structure and has such advantages as space-saving, plug-and-play and convenient installation. It will be conducted with pre-installation and operational qualification at the manufacturing plant. All the pipelines use the 316L stainless steel without dead leg and the sanitary chuck. The roughness of the surface contacting with the products shall be less than $0.6\mu\text{m}$. There is no buffering tank in the loop to avoid bacteria growth, which is in compliance with FDA requirements.



5 On-line Cleaning System

Stationary CIP Workstation

CIP cleaning device can be used as the indissoluble production equipment and can also be used in the cleaning system with manual operation and automatic operation. The device is widely used in the plants, such as food, drinks and pharmacy, etc. CIP device can not only clean the machine, but also control the cleaning methods of microorganism.

CIP cleaning device has the following advantages

- Can make the production plan reasonable and improve the production capacity.
- Compared with manual cleaning, CIP cleaning effect will not be affected due to different operators. The CIP device can also improve product quality.
- Can avoid the danger in the cleaning operation and save labor force.
- Can save the cost of cleaning agent, steam, water and production.
- Can increase the service life of machine components.
- CIP cleaning devices include three types, such as manual, semi-automatic and automatic operation, which can be selected by the users.



6 Biological Products Tank In Batching System

Automatic welding equipment that can manufacture stainless steel pressure vessel.

Three kinds of technologies for surface treatment of the stainless steel container:

- 400# + electrobrightening RaO. $4\mu\text{m}$
- 400# + 600# + 800# + 2 electrobrightening RaO. $28\mu\text{m}$
- Surface sandblasting and surface matte sanding Ra ≤ 0.6
- Electrolytic polishing technologies and devices

Workshop and equipment for mechanical mixing.

Possess the devices for physical and chemical analysis of materials, thickness inspection and inner surface roughness test. The equipment design and manufacturing are totally in compliance with FDA requirements; The pressure vessel meets the national relevant standards and the requirements for pressure vessel safety inspection. It also conforms to the relevant requirements for equipment installation.

