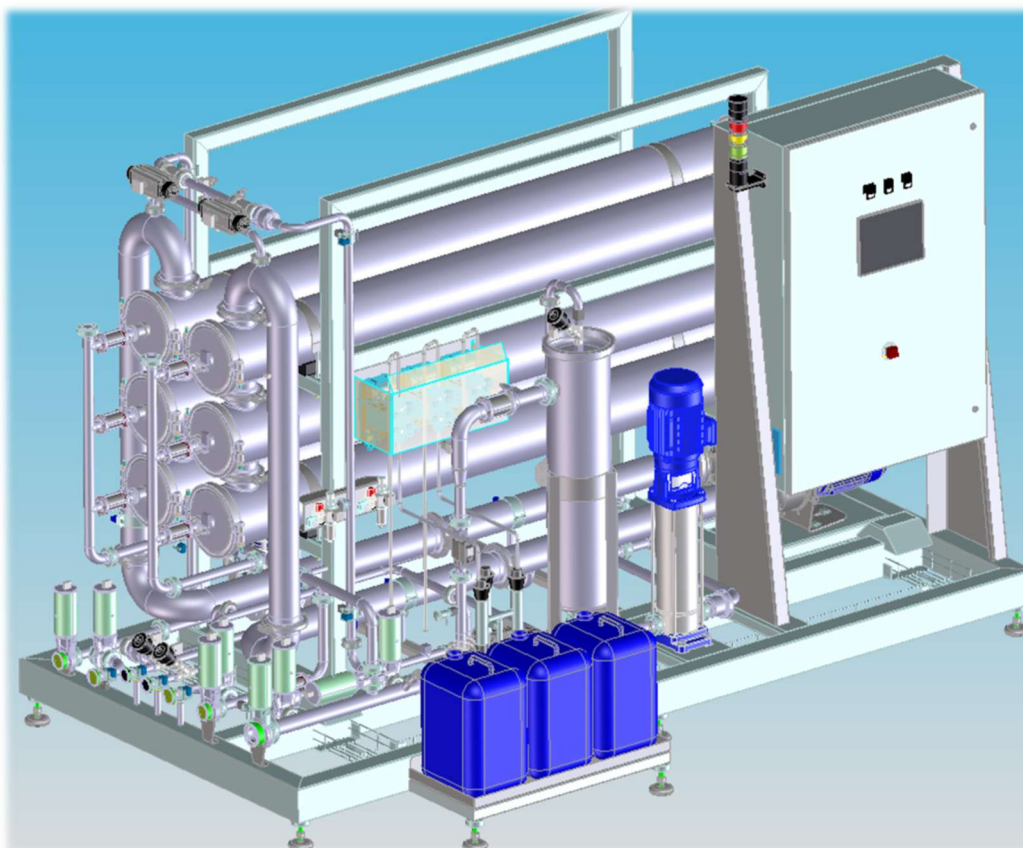


Automatic Ultrafiltration System Model NEXT-UF A



1. OPERATING PRINCIPLE:

Ultrafiltration is similar to nanofiltration and osmosis, but is defined as a cross-flow filtration process that separates ions.

Next Ultrafiltration separates solutes larger than 1,000 daltons (molecular weight); due to the larger pore size in the membrane, ultrafiltration requires a much lower operating pressure differential: 0.7 to 6.9 bar.

Ultrafiltration removes larger organics, colloids, bacteria and pyrogens, while still allowing most ions and small organics such as sucrose to permeate the porous structure.

Cross-flow membrane filtration technology is used to physically separate even extremely small soluble substances (ions, molecules) from an aqueous solution, whose size can be measured in nm (nanometers).

The degree of filtration depends on many factors:

- the pore size of the membrane and the material it is made of;
- the chemical characteristics of the fluid to be treated;
- operating parameters (temperature, pressure, pH, etc.);
- the fluid dynamic regime (by increasing or decreasing the circulation speed of the fluid flowing tangentially to the surface it is possible to modify the membrane performance in terms of rejection).

Ultrafiltration membranes are true porous membranes, capable of retaining medium molecular weight organic substances (in the range of 1,000-500,000 D from narrow ultrafiltration thresholds to microfiltration thresholds).

Standard models can be equipped with a variable number of modules depending on the flow rate of purified product extracted (permeate), from 10 to 105 hl/h.

1. BENEFITS

- High protection of the organoleptic characteristics of the must and wine.
- Low operating costs.
- Advanced level of automation.
- No use of filtration aids.
- High filtration yield.
- Low use of water and detergents for washing.

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2. APPLICATIONS:

Applications Mod. Plants. **NEXTUF A**

The main applications for this type of system using spiral membranes for ultrafiltration are in the wine, food, dairy and beverage industries, for:

1. Concentration of anthocyanins.
2. Concentration/Reduction of color points of musts and wines with partial or total discoloration.
3. Reduction of heavy metals.
4. Protein concentration.
5. Concentration of sugars (extracts).

3. MANUFACTURING SPECS

Components of the Mod system. **NEXTUF A**:

1. The proposed **NEXTUF A** systems are made of AISI 304L/316L steel.
2. The valves and pipes are in DIN11851/CLAMP configuration.
3. The **NEXTUF A** systems are managed by PLC and have Complete Automation in all Cycles (Production, Washing, Emptying, Rinsing, Permeability Test and Conservation).
4. For optimal management and protection of the **NEXTUF A** systems, the instrumentation has been inserted to control the presence of the liquid (sensors), the pressure (transmitters) to check the inlet and outlet pressures of the filter/s bag/s, membrane inlet and outlet, temperature (PT100 probe), flow rate (magnetic flow meters Food and Concentrate lines), regulation (modulating valve Concentrate line).
5. The **NEXTUF A** systems have been designed to work in the recovery factor range $KR\ 45 \div 75\ \%$, depending on the characteristics of the product being fed. $KR = (\text{permeate flow rate/feed flow rate}) * 100$.
6. The **NEXTUF A** mod. systems are designed to work during the production cycle at a maximum pressure of 12 bar.
7. The product entering the **NEXTUF A** mod. systems is loaded by means of a horizontal axis centrifugal pump in AISI316.
8. At the outlet of the feed pump, for the safety of the Ultrafiltration membranes, the product is filtered by one or more bag filters with a filtration degree of 75 μ micron (depending on the model of the **NEXTUF A** Systems).
9. The pressurization of the product exiting the bag filtration system occurs for all **NEXTUF A** Systems through a multi-stage centrifugal pump with a vertical axis in AISI316 managed by PLC via VFD, with an appropriate flow rate depending on the proposed **NEXTUF A** System.
10. The **NEXTUF A** mod. Systems include for each Recirculation Circuit a centrifugal pump with a horizontal axis in AISI316, capable of guaranteeing the flow of feeding of the membranes and the ideal speed in order to avoid clogging of the same.
11. Sampling valves are inserted in the feed, total permeate and total concentrate pipes.

12. For each vessel containing Ultrafiltration membranes, a glass sight glass is inserted to monitor the visual quality of the permeate of each container.
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22. The **NEXTUF A** mod. Systems include for each Recirculation Circuit a centrifugal pump with a horizontal axis in AISI316, capable of guaranteeing the membrane feed flow and the ideal speed in order to avoid clogging of the same.
23. Sampling valves are inserted in the feed, total permeate and total concentrate pipes.

4. TECHNICAL CARDS:

The following table shows the main characteristics of the systems:

Model	Number of vessels	Installed power [kw]	Nominal range flowrate of permeate (filtered) stream [hl/h]
NEXT UF 8A / 5A	8	7,35	10 - 25
NEXT UF 12A	12	10,15	15 - 35
NEXT UF 16A	16	13,7	20 - 50
NEXT UF 24A	24	17,1	30 - 70
NEXT UF 36A	36	21,3	45 - 105