

U6000AT+

Ultrasonic Nebulizer/Membrane Desolvator



Lower Detection Limits, Reduced Solvent Loading

The Teledyne CETAC Technologies U6000AT+ offers detection limits up to 5x lower for ICP-AES and ICP-MS. Samples are introduced onto a highly efficient piezoelectric transducer, providing greater analyte transport efficiency to the ICP. The U6000AT+ adds a membrane desolvation module to the base U5000AT+ Ultrasonic Nebulizer (USN) for improved reduction of solvent-based interferences, particularly for volatile organics. The ultrasonic nebulizer is placed directly on top of the membrane module, conserving valuable laboratory bench space.



U6000AT+ Ultrasonic Nebulizer/Membrane Desolvator

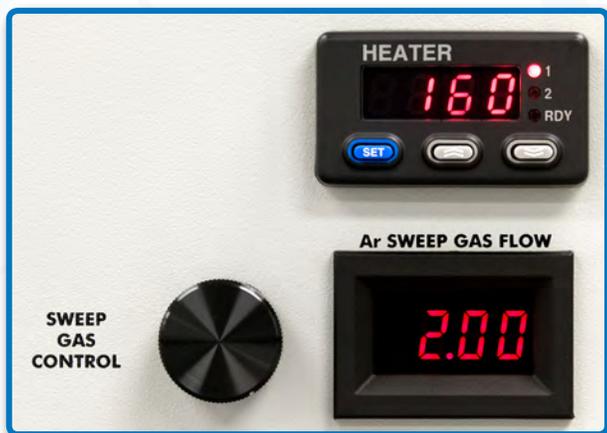
Benefits

The U6000AT+ combines the efficiency of the U5000AT+ USN with a membrane desolvation unit for reduced sample solvent loading to the ICP.

For U6000AT+ is used primarily with ICP-AES for improved analysis of volatile organic solvents. The U6000AT+ can alleviate serious problems such as loss of plasma, plasma instability, high carbon emission background, and carbon buildup on the ICP torch.

For ICP-MS, the U6000AT+ can be used for both volatile organics and aqueous samples (reduction of oxides and hydrides).

Analyte signal enhancement with the U6000AT+ is typically 2 to 5 times greater, for both ICP-AES or ICP-MS, than a standard pneumatic nebulizer.



Sweep Gas Control

Features

The U6000AT+ has a compact footprint for convenient placement on a benchtop or laboratory cart.

The membrane desolvator module can be easily disconnected from the USN when membrane desolvation is not necessary, allowing standalone operation of the USN. If membrane desolvation is needed, the USN simply stacks on top of the membrane module—no additional bench area required.

Easy Setup and Operation

Each U6000AT+ is provided with an interface kit for easy connection to the host ICP-AES or ICP-MS.

The press of one button ("operate") on the USN generates sample aerosol.

The dedicated temperature controller can be quickly reset for organic or aqueous applications.



Operate Button and Temperature Controllers

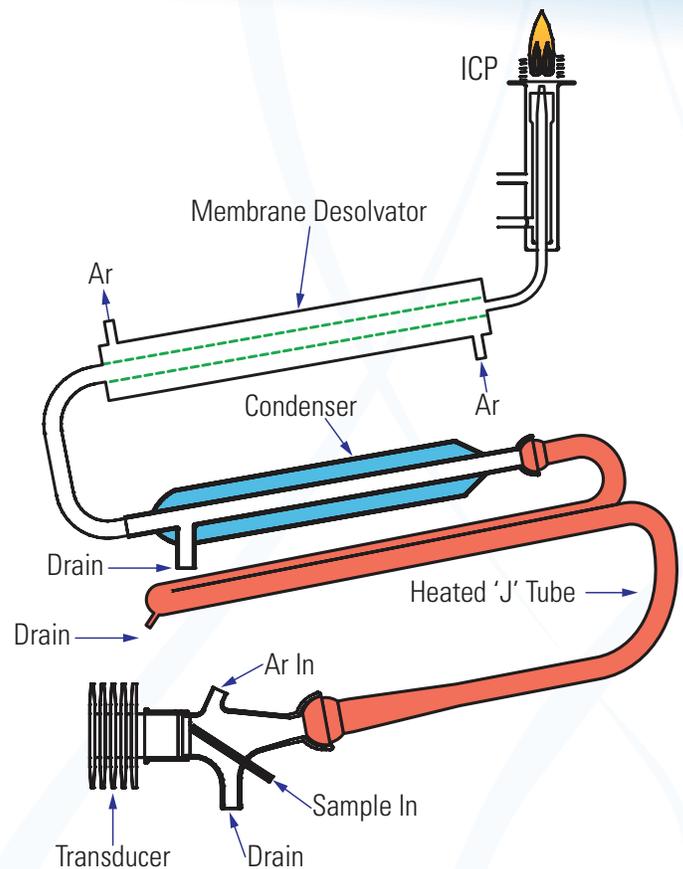


Principle Of Operation

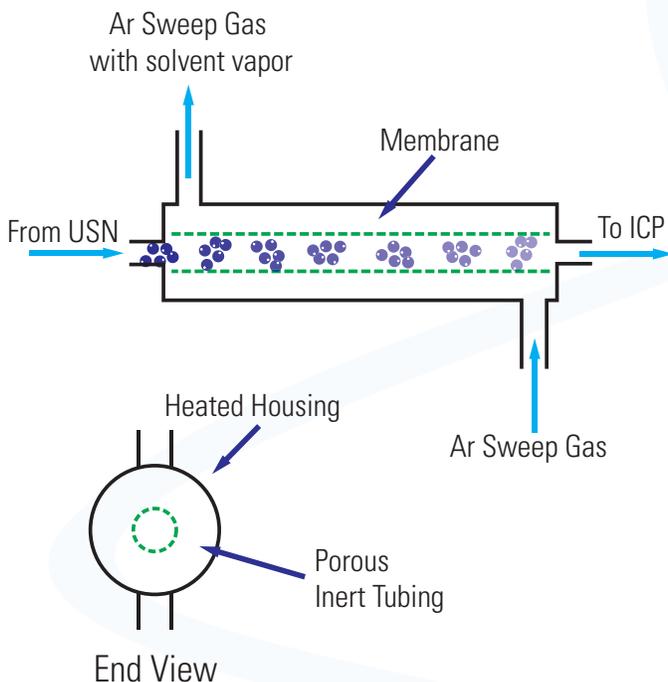
A peristaltic pump introduces liquid sample across an oscillating piezoelectric transducer. The oscillations disperse the sample into a fine aerosol, which is swept out of a spray chamber by a flow of argon gas from the host ICP-AES or ICP-MS instrument.

The aerosol passes through a heated tube and an electrothermally cooled condenser. An integrated drain pump removes the condensed sample solvent and any excess sample liquid from the spray chamber.

After passing through the condenser, the dried aerosol particles are swept by the nebulizer gas to the membrane desolvator module.



U6000AT+ Schematic



Membrane Schematic

The membrane desolvator consists of a porous fluoropolymer tube that is placed inside a heated oven. The sample aerosol from the USN passes into the membrane, and the high temperature of the oven (160° C) maintains the sample solvent as a vapor. A second counter-current flow of argon gas (the sweep gas) flows outside the porous membrane wall and removes any volatile solvent vapor to vent. Nonvolatile sample components do not pass through the membrane wall and continue to the ICP-AES or ICP-MS.

The membrane desolvator has a number of important features: the membrane is chemically inert and it can remove water vapor and both polar and non-polar volatile organic solvents. In addition, the membrane desolvator incorporates a dedicated gas control unit for the Ar sweep gas, which can be easily teed from the main ICP Ar supply.

U6000AT+ Specifications

Sample Uptake Rate: 0.5 to 2.5 mL/min

Nebulizer Gas Flow: 0.5 to 1.5 L/min

Sweep Gas Flow: 0 to 5.0 L/min

Heater Temperature: 120°C to 160°C

Cooler Temperature: -20°C to +10°C

Membrane Oven Temp: 80 °C to 160 °C

Voltage:

Ultrasonic Nebulizer: 100-120 VAC, 50/60 Hz, 4.5A
220-240 VAC, 50/60 Hz, 2.5A

Membrane Desolvator: 100-240 VAC, 50/60 Hz, 4A/2A

Dimensions:

Height: 38.7 cm (15¼")

Width: 35.6 cm (14")

Depth: 34.9 cm (13¾")

Weight: 13.6 kg (29.9 lbs)

Warranty: 12 month limited

BGX-100 Blend Gas Accessory

Add a low flow of oxygen (10 to 50 mL/min) between the U6000AT+ Ultrasonic Nebulizer / Membrane Desolvator and the ICP-AES or ICP-MS. Useful for the analysis of organic solvents.



BGX-100 Specifications

Voltage: 24 VDC Power Supply

Power Supply: 100-240V, 50/60 Hz, 2.2A

O₂ Flow Range: 0 to 50 mL/min

Dimensions:

Height: 11.2 cm (4½")

Width: 16.0 cm (6½")

Depth: 18.9 cm (7½")

Weight: 1 kg (2.2 lbs)

Warranty: 12 month limited

Schematic of BGX-100 Setup with U6000AT+

