

# DI-Solver™ NH<sub>3</sub>

## Dissolved Ammonia Delivery System



The MKS DI-Solver™ NH<sub>3</sub> is a compact, stand-alone system designed to provide dissolved ammonia water for use in rinsing processes in the semiconductor industry. The system is specifically designed to provide optimal cleaning capability at a given conductivity. The alkaline chemistry of dissolved ammonia provides ESD protection during rinsing, particle lift-off, and residual particle removal. It also prevents

corrosion of metal interfaces, which is a common problem in semiconductor manufacturing. The system uses closed-loop control to keep conductivity and pressure stable under changing flow conditions. It also monitors and adjusts the NH<sub>4</sub>OH concentration to deliver the desired level of dissolved ammonia.

### Product Features

- Precise conductivity control in range from 5 to 121  $\mu$ S/cm
- Flow rates up to 40 lpm
- <5% conductivity stability
- Proprietary gas dosage through mass flow control system
- Perfectly suited for high purity applications



### Key Benefits

- Best dynamic conductivity control and accuracy at point of use from proprietary control of gas
- Increases yields by inhibiting Electrostatic Discharge
- Improves interconnect reliability and yield by preventing metal surface and post CMP clean corrosion
- Cost effective water, power and chemical consumption reduces operating costs

MKS' DI-Solver NH<sub>3</sub> leverages the established and proven architecture of LIQUOZON® Ozonated Water Delivery System, integrating high purity standard materials and safety features in a rugged system to meet the demands of advanced technology manufacturing.

The below figures show the possible performance ranges of different configurations that provide a conductivity range of 5 to 40  $\mu\text{S}/\text{cm}$  at 0.5 to 40 lpm (Figure 1), or 5-121  $\mu\text{S}/\text{cm}$  at 0.5 to 32 lpm (Figure 2).

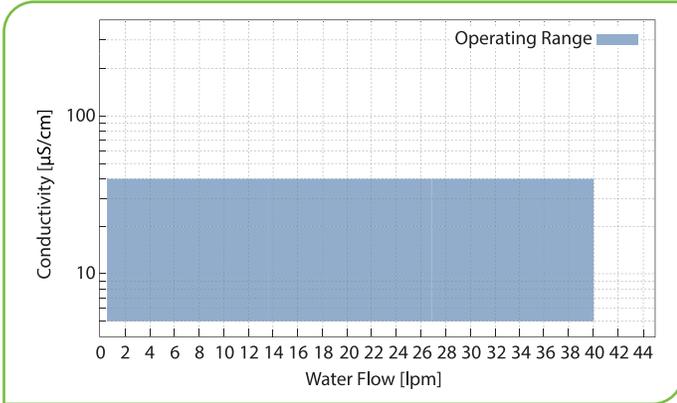


Figure 1 - Conductivity range of 5 to 40  $\mu\text{S}/\text{cm}$  at 0.5 to 40 lpm  
Specified achievable ammonia conductivity in UPW for a system pressure of 2.5 bar<sub>g</sub>, a cooling water temperature and UPW temperature of 20°C.

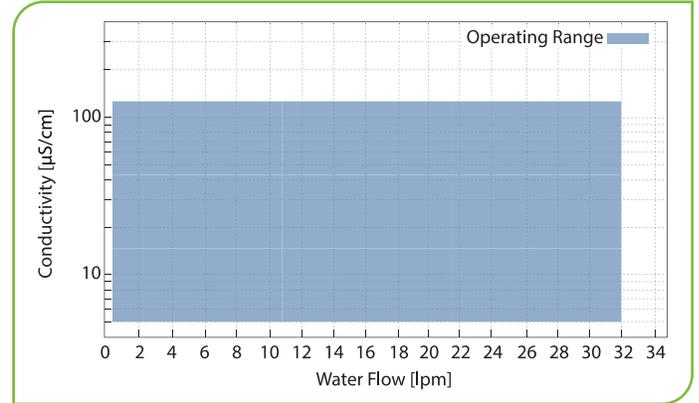
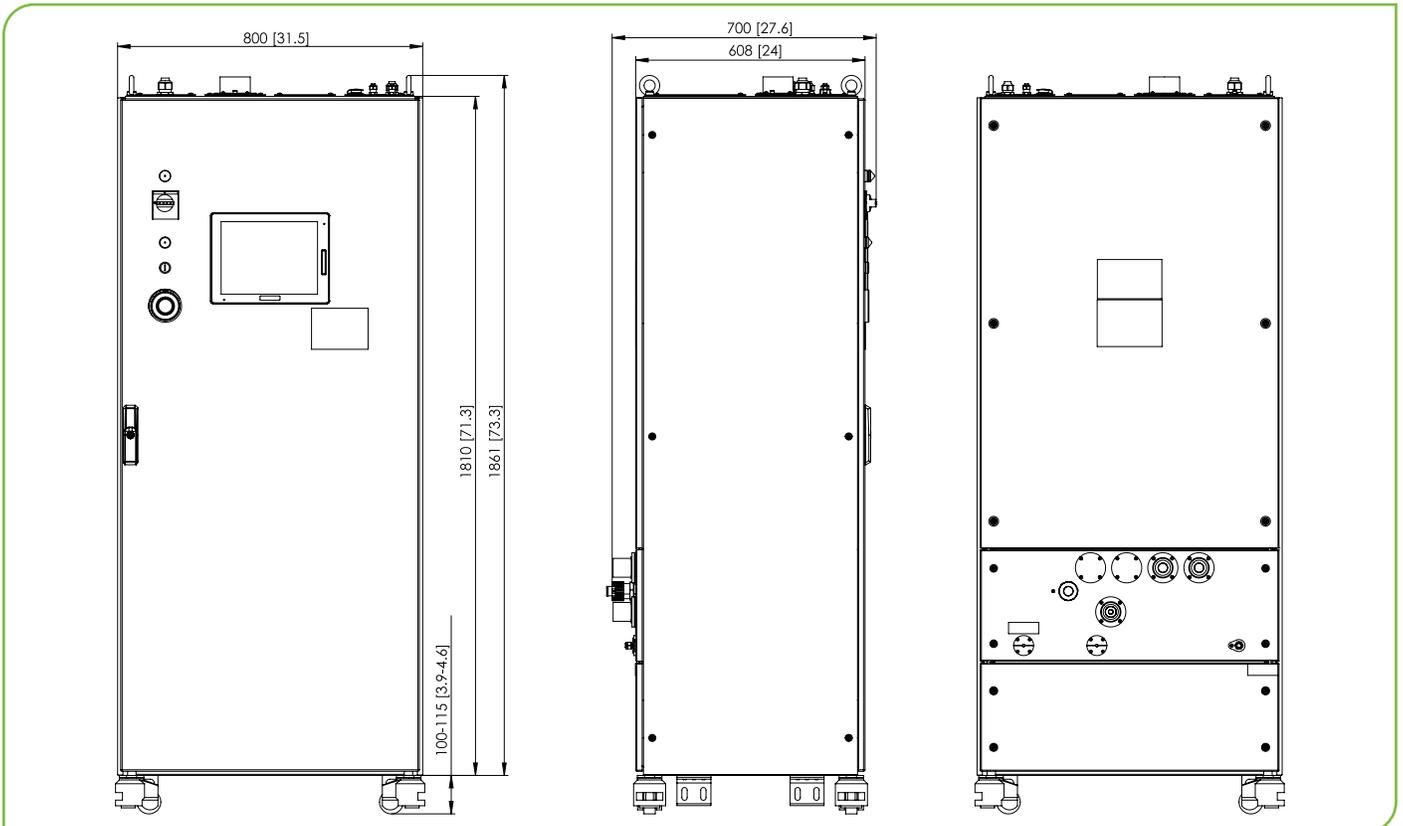


Figure 2 - Conductivity range of 5-121  $\mu\text{S}/\text{cm}$  at 0.5 to 32 lpm  
Specified achievable ammonia conductivity in UPW for a system pressure of 2.5 bar<sub>g</sub>, a cooling water temperature and UPW temperature of 20°C.

## Dimensional Drawing



Note: Unless otherwise specified, dimensions are nominal values in millimeters (inches referenced).

## Specifications

System Specifications	
Ammonia Water (DI-NH <sub>3</sub> )	Configurable 1.0-3.0 bar <sub>g</sub> (3.7 bar <sub>g</sub> with outlet pump)
Plumbing Materials	
Liquid Wetted Surfaces	<ul style="list-style-type: none"> <li>• PFA, PTFE, quartz glass</li> </ul>
Gas Wetted Surfaces	<ul style="list-style-type: none"> <li>• 316L stainless steel, PFA, PTFE</li> </ul>
Communication	Binary in/out, RS232/RS485, analog 4 – 20 mA in/out, USB
Cabinet, Dimensions (H x W x D)	<ul style="list-style-type: none"> <li>• Coated steel, approx. 1810 mm x 800 mm x 610 mm (71.2" x 31.5" x 24.1")</li> <li>• Overall height: approx. 2000 mm (79")</li> </ul>
Weight	Approx. 290-300 kg, depending on configuration
Compliance	CE, SEMI S2, SEMI F47, NRTL
Facility Requirements	
N <sub>2</sub>	
Inlet Pressure Surfaces	<ul style="list-style-type: none"> <li>• ≥Grade 4 (purity ≥99.99%), dew point &lt;-40°C</li> </ul>
Standard Flow Rate	<ul style="list-style-type: none"> <li>• 4.5 - 7.6 bar<sub>g</sub> (65 - 110 psig), at least higher 3 bar than system pressure</li> <li>• ≤10 slm, according to SEMI E12 (0°C / 1.01325 bar)</li> </ul>
Ammonia (NH <sub>3</sub> )	
Inlet Pressure	<ul style="list-style-type: none"> <li>• ≥Grade 4.5 (purity ≥99.995%)</li> </ul>
Standard Flow Rate	<ul style="list-style-type: none"> <li>• 3.0 – 5.0 bar<sub>g</sub> (44 - 73 psig)</li> <li>• ≤2.0 slm, according to SEMI E12 (0°C / 1.01325 bar)</li> </ul>
Ultra-Pure Water (UPW)	
UPW IN Pressure	<ul style="list-style-type: none"> <li>• &lt;0.1 ppb metals, &lt;10 particles/ml of 0.1µm size, free of organics</li> </ul>
Temperature	<ul style="list-style-type: none"> <li>• 1.3 - 4 bar<sub>g</sub> (14.5 - 73 psig), at least 1.3 bar higher than system pressure</li> <li>• 20 – 25°C (59 – 77°F), rated 20°C (68°F)</li> </ul>
Clean Dry Air (CDA)	
Pressure	<ul style="list-style-type: none"> <li>• Filtration, free of oils and particles</li> </ul>
Flow Rate	<ul style="list-style-type: none"> <li>• 6.0 – 8, 3 bar<sub>g</sub> (87 – 120 psig)</li> <li>• ≤15 slm, typically 10.0 slm according to SEMI E12 (0°C / 1.01325 bar)</li> </ul>
Exhaust	
Cabinet Underpressure	<ul style="list-style-type: none"> <li>• &gt;8mm (0.32") water column</li> </ul>
Standard Flow Rate	<ul style="list-style-type: none"> <li>• &gt;70m<sup>3</sup>/h, according to SEMI S6 (21.1°C / 1.01325 bar)</li> </ul>
Power	3/PE~, 200 - 208 V ±10 %, 50/60 Hz, collective 1050 W

## Ordering Information

Please contact your local MKS sales office for price and availability information.