

DI-Solver™ NH₃

Dissolved Ammonia Delivery System



The MKS DI-Solver™ NH₃ 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 NH₄OH concentration to deliver the desired level of dissolved ammonia.

Product Features

- Precise conductivity control in range from 5 to 121 μ 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 NH₃ 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).

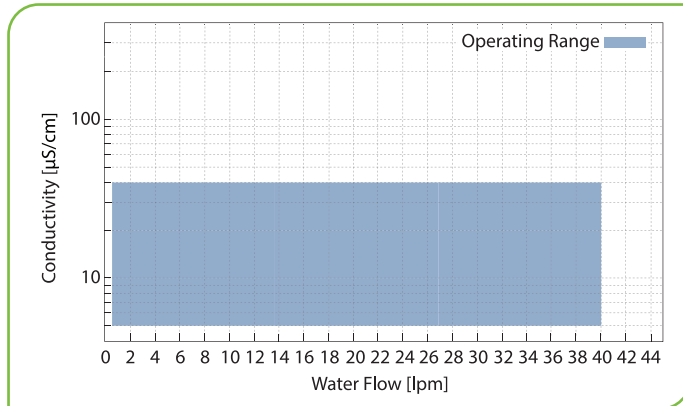


Figure 1 - Conductivity range of 5 to 40 $\mu\text{S}/\text{cm}$ at 0.5 to 40 lpm
Specified achievable ammonia conductivity in UPW for a system pressure of 2.5 bar_g, a cooling water temperature and UPW temperature of 20°C.

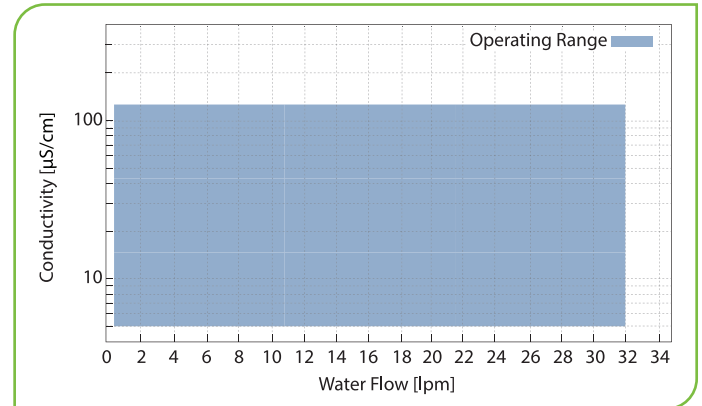
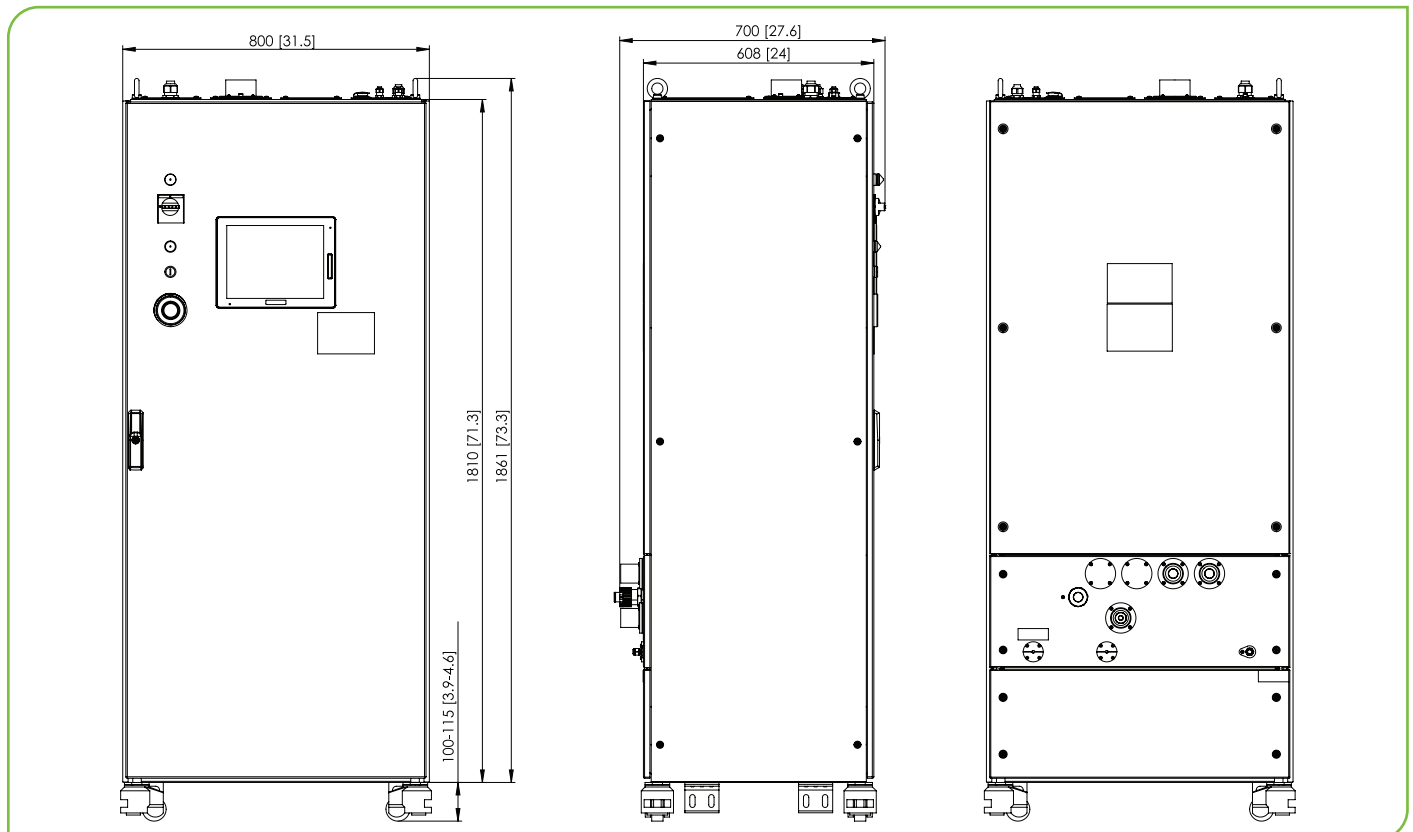


Figure 2 - Conductivity range of 5-121 $\mu\text{S}/\text{cm}$ at 0.5 to 32 lpm
Specified achievable ammonia conductivity in UPW for a system pressure of 2.5 bar_g, a cooling water temperature and UPW temperature of 20°C.

Dimensional Drawing



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

Specifications

| System Specifications | | |
|-------------------------------------|-------------------------|---|
| Ammonia Water (DI-NH ₃) | | Configurable 1.0-3.0 bar _g (3.7 bar _g with outlet pump) |
| Plumbing Materials | | |
| | Liquid Wetted Surfaces | <ul style="list-style-type: none"> • PFA, PTFE, quartz glass |
| | Gas Wetted Surfaces | <ul style="list-style-type: none"> • 316L stainless steel, PFA, PTFE |
| 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"> • Coated steel, approx. 1810 mm x 800 mm x 610 mm (71.2" x 31.5" x 24.1") • Overall height: approx. 2000 mm (79") |
| Weight | | Approx. 290-300 kg, depending on configuration |
| Compliance | | CE, SEMI S2, SEMI F47, NRTL |
| Facility Requirements | | |
| N ₂ | | |
| | Inlet Pressure Surfaces | <ul style="list-style-type: none"> • ≥Grade 4 (purity ≥99.99%), dew point <-40°C |
| | Standard Flow Rate | <ul style="list-style-type: none"> • 4.5 - 7.6 bar_g (65 - 110 psig), at least higher 3 bar than system pressure • ≤10 slm, according to SEMI E12 (0°C / 1.01325 bar) |
| Ammonia (NH ₃) | | |
| | Inlet Pressure | <ul style="list-style-type: none"> • ≥Grade 4.5 (purity ≥99.995%) |
| | Standard Flow Rate | <ul style="list-style-type: none"> • 3.0 – 5.0 bar_g (44 - 73 psig) • ≤2.0 slm, according to SEMI E12 (0°C / 1.01325 bar) |
| Ultra-Pure Water (UPW) | | |
| | UPW IN Pressure | <ul style="list-style-type: none"> • <0.1 ppb metals, <10 particles/ml of 0.1µm size, free of organics |
| | Temperature | <ul style="list-style-type: none"> • 1.3 - 4 bar_g (14.5 - 73 psig), at least 1.3 bar higher than system pressure • 20 – 25°C (59 – 77°F), rated 20°C (68°F) |
| Clean Dry Air (CDA) | | |
| | Pressure | <ul style="list-style-type: none"> • Filtration, free of oils and particles |
| | Flow Rate | <ul style="list-style-type: none"> • 6.0 – 8, 3 bar_g (87 – 120 psig) • ≤15 slm, typically 10.0 slm according to SEMI E12 (0°C / 1.01325 bar) |
| Exhaust | | |
| | Cabinet Underpressure | <ul style="list-style-type: none"> • >8mm (0.32") water column |
| | Standard Flow Rate | <ul style="list-style-type: none"> • >70m³/h, according to SEMI S6 (21.1°C / 1.01325 bar) |
| 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.