LIQUOZON® VariO$_3$

Dissolved Ozone Delivery Systems

LIQUOZON® VariO$_3$ dissolved ozone gas delivery systems provide high purity ozone in ultrapure water. Dissolved ozone is used extensively to remove organic and metallic contamination in Semiconductor and Electronic Thin Film applications, increasing manufacturing productivity and yield. LIQUOZON VariO$_3$ provides high purity ozone in ultrapure water and is equipped with a green idle mode to reduce excess water usage.

The VariO$_3$ dissolved ozone system employs MKS' proprietary contact system to deliver >80% ozone mass transfer. Users can configure and control dissolved ozone concentrations and flow rates within tight specifications. The LIQUOZON dissolved ozone system has analog and digital bidirectional communication with remote control capability.

Product Features

- <5% concentration accuracy at constant flow rates typical
- Analog and digital bidirectional communication with remote control
- High purity ozone environment
- Easy installation and operation
- Versatile mechanical system interface

Key Benefits

- Ensures high purity surfaces by removing organic, metallic and particle contamination
- Unit to unit control provides repeatable process performance
- Cost effective water, power and chemical consumption management reduces operational spending
- Eliminates environmental waste impact with easy conversion back to oxygen

The LIQUOZON VariO_3 platform hosts a number of models inside the same cabinet, covering a wide range of performance. The low concentration VariO_3 delivers up to 90 ppm DI-O_3 at rates of 2 liters/min and up to 15 ppm DI-O_3 and flow rates of up to 60 liters/min (Figure 1).

The standard version (Figure 2) delivers a maximum of 31 ppm DI-O_3 at 60 liters/min while having a boosted mid-range performance. Both are ideally suited for single wafer cleans, oxide growth, and post CMP cleans as well as immersion applications.

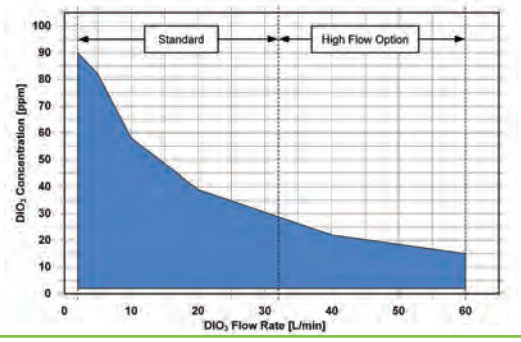


Figure 1 – Characteristic performance chart of a low concentration delivery system

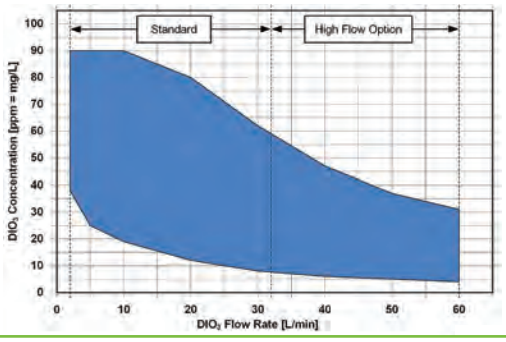
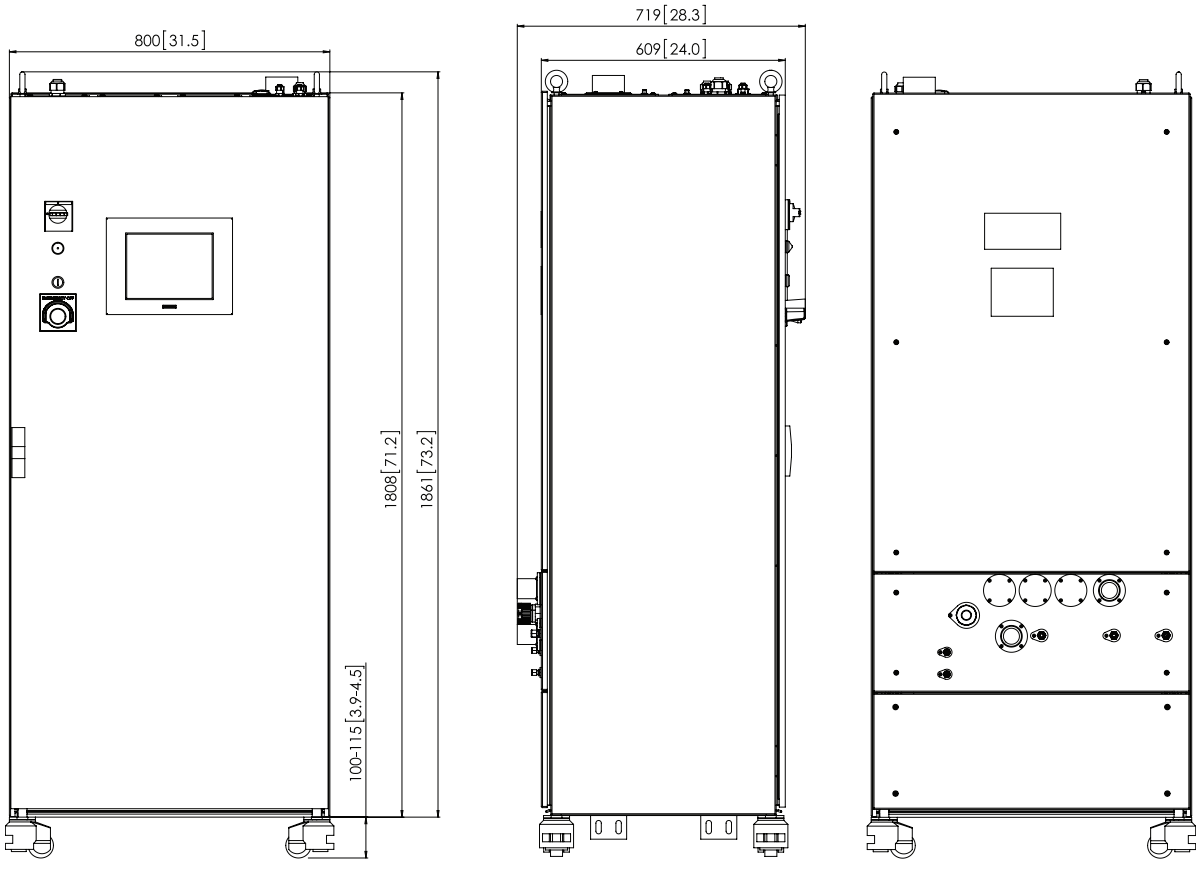


Figure 2 - Characteristic performance chart of a standard concentration and flow rate

Specified achievable dissolved ozone concentration 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). Back-plane design may vary according to chosen configuration.

Specifications

System Specifications	
Ozonated Water Pressure	Configurable 1.8-3.0 bar_g (3.7 bar_g with outlet pump)
Plumbing Materials	
Liquid Wetted Surfaces	• PFA, PTFE, quartz glass
Gas Wetted Surfaces	• 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)	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. 315-400 kg, depending on configuration
Compliance	CE, SEMI S2, SEMI F47, NRTL
Facility Requirements	
O_2	• ≥Grade 4 (purity ≥99.99%)
Inlet Pressure	• 4.5 - 7.6 bar_g (65 - 110 psig), at least higher 3 bar than system pressure
Flow Rate	• ≤15 slm, typ. 9 slm, according to SEMI E12 (0°C / 1.01325 bar)
Dopant Gas CO_2	• ≥Grade 4.5 (purity ≥99.995%)
Inlet Pressure	• 5.0 - 7.6 bar_g (73 - 110 psig)
Flow Rate	• Typ. 0.15 - 0.5 slm, depending on the configuration
Ultra-Pure Water (UPW)	
Half Life Time of O_3 in UPW	• >12 min @ 20°C, (which is standard in semiconductor fabs)
UPW IN Pressure (full flow)	• 1 - 5 bar_g (14.5 - 73 psig) 0.8 bar higher than system pressure
Temperature	• 15 – 25°C (59 – 77°F), rated 20°C (68°F)
Cooling Water	
Quality	• Demineralized, filtration ≤20 µm
Temperature	• 17 – 23°C (63 – 73°F), rated 20°C (68°F)
Pressure	• Max. 5.0 bar_g (73 psig) differential pressure ≥3 bar
Flow Rate	• Typ. 3.0 - 10.0 L/min (0.8 - 2.6 gpm), depending on the configuration
Power	3/PE~, 200 - 208 V ± 10 %, 50/60 Hz, 850 - 8000 W

Ordering Information

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

www.MKS.com

LIQUOZON VariO$_3$_08/23