LIQUOZON® VariO$_3$

Dissolved Ozone Delivery System

The LIQUOZON® VariO$_3$ dissolved ozone gas delivery system removes organic, metallic and particle contamination in Semiconductor and Electronic Thin Film applications like contaminant removal and surface conditioning via wet clean or rinsing methods. The VariO$_3$ provides high purity ozone in ultrapure water and is equipped with a green idle mode to reduce excess water usage. Designed with MKS' proprietary contact system, the VariO$_3$ is highly efficient, delivering >80% ozone mass transfer. The system supports a wide operational window with tight process control.

Users can configure and control dissolved ozone concentrations and flow rates. The VariO$_3$ has analog and digital bidirectional communication with remote control capability. The modular and versatile mechanical system interface makes it easy to integrate and service in today's equipment facilities and meets the latest safety and monitoring requirements.

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

Key Benefits

- Ensures high purity surfaces by removing organic, metallic and particle contamination
- Unit to unit control for 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

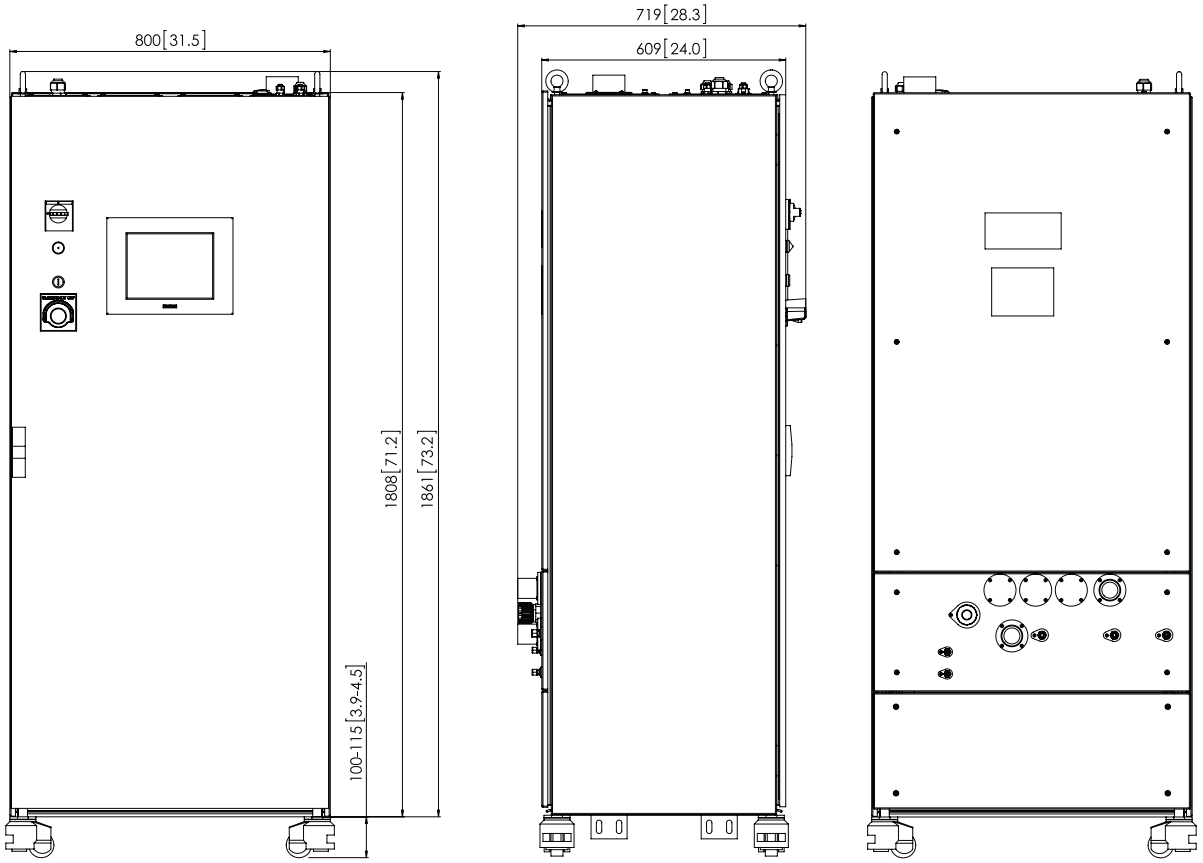
Specifications

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 barg (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 barg (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

Parameter	DI-O_3 Flow [L/min]	DI-O_3 Concentration [ppm = mg/L]	
		Min.	Max.
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. At higher UPW temperatures, lower system pressure or higher cooling water temperature, the maximum performance will decrease.	2	38	90
	10	19	90
	20	12	80
	30	8	62
	40	6	47
	50	5	37
	60	4	31

Table 1 - Performance and operating range

Dimensional Drawing



Note: Unless otherwise specified, dimensions are nominal values in millimeters (inches referenced). Back-plane design may vary according to chosen configuration.

Ordering Information

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

www.MKSINST.com

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