LIQUOZON® DI-O_3

Dissolved Ozone Delivery System

MKS' LIQUOZON® DI-O_3 is a dissolved ozone gas delivery system providing high purity ozone in ultrapure water for Semiconductor and Electronic Thin Film applications like contaminant removal and surface conditioning via wet clean or rinsing methods. The high redox potential of ozone causes rapid conversion back to oxygen making it an environmentally friendly alternative to other chemical processes.

The DI-O_3 system has user controllable and configurable dissolved ozone concentration and flow rates, meeting specific requirements for a wide range of applications. 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

- **Leading Technology**
  - — MKS proprietary contacting system allows > 80% ozone mass transfer
  - — < 4% concentration accuracy at constant flow rates typical
  - — Green idle modes reduce excess water usage
- **Process**
  - — Wide operation window with tight process control
  - — Analog and digital bidirectional communication with remote control
  - — High purity ozone environment
- **Reliability & Maintenance**
  - — High unit to unit reliability and repeatability
  - — Market proven components with long life-spans
  - — Easy installation and operation

Key Benefits

- Ensures high purity surfaces by removing organic, metallic and particle contamination
- High yield oxide growth created by superior concentration control
- Unit to unit control for 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

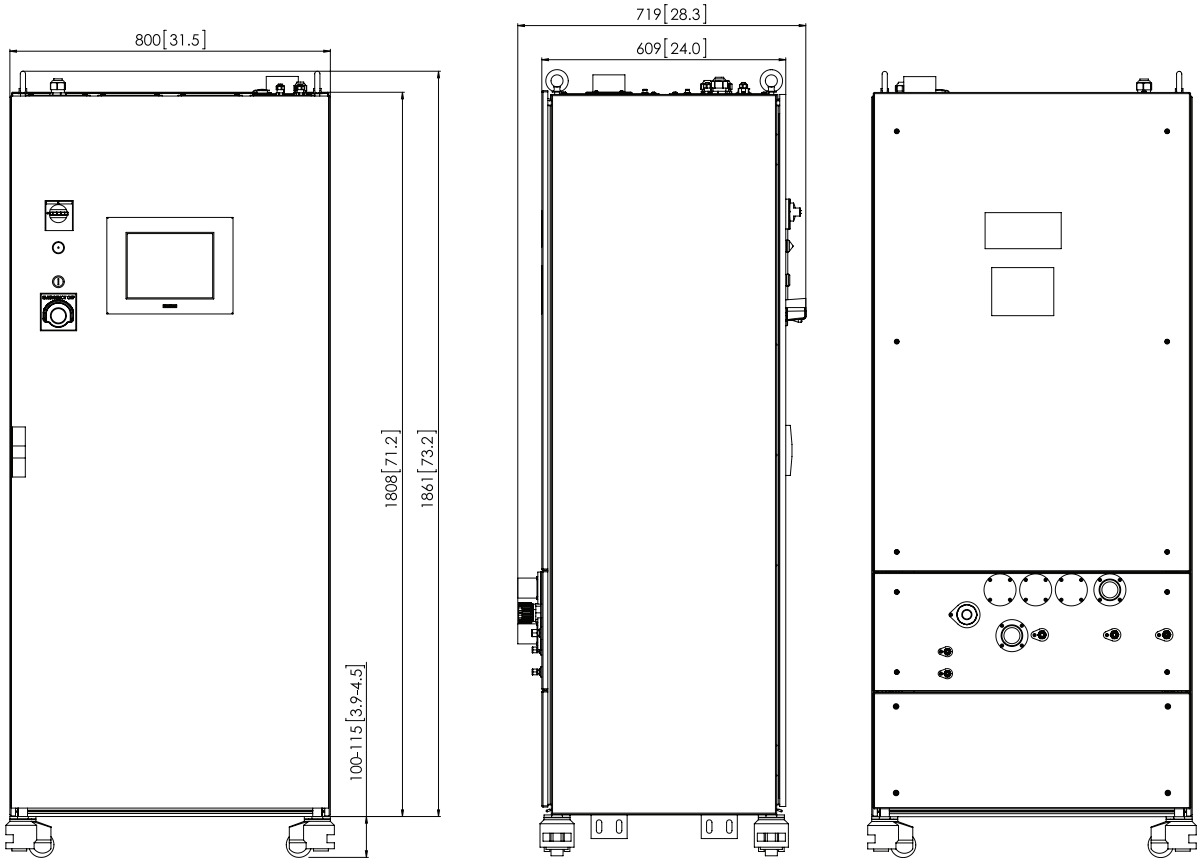
Facility Requirements

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 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

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).

Ordering Information

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

www.MKSINST.com
+1-978-645-5500 | +1-800-227-8766

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