AX8555

Stand-Alone Low Flow Ozone Delivery System

The AX8555 Ozone Delivery Subsystem supports multiple chambers or tools to provide ultra clean ozone gas. The AX8555 is a fully integrated, lower flow ozone gas delivery system specifically designed for advanced semiconductor process applications such as Atomic Layer Deposition (ALD). ALD is a self-limiting "pulsed" process that sequentially introduces reactants into the process chamber in the gas phase to build successive monolayers of film on the wafer. By appropriately selecting the precursor materials, parameters such as growth rate, reaction temperature, impurity levels, and crystallinity of the deposited films can be influenced. Films grown using ozone as an oxidizer in ALD are very high quality, stoichiometric, uniform, dense and free from any significant contamination.

Product Features

- Specifically designed for lower flow for advanced applications such as ALD
- Closed-loop concentration for tighter process control
- Modular design where each channel can be process matched to different concentration and flow
- Optional integrated ozone destructs with bypass valve
- Flexible tool interface
  - Interlock interface assembly configures easily to OEM tools

Key Benefits

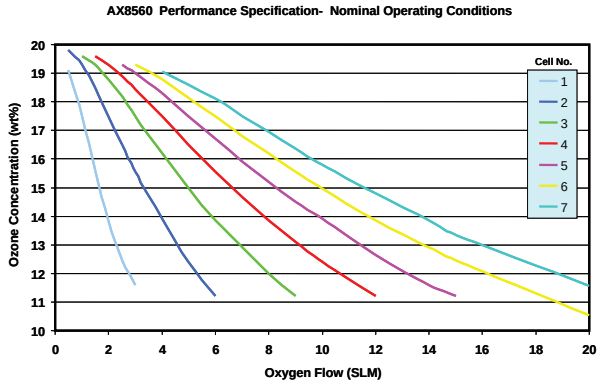
- Supports single or multiple process tools for maximum efficiency and lower cost of operation
- Environmentally friendly solution easily converts back to benign O_2
- Generated at point-of-use removing transportation and storage needs

For gate oxides and high-k dielectric materials, one of the precursors needs to be an oxidizer. Ozone has many advantages over other oxidizers as a precursor for ALD and as a strong oxidizing agent. Ozone has a high redox potential, can be generated at the point-of-use, and it decays naturally into oxygen ($2O_3 \Rightarrow 3O_2$). Therefore, it is considered a "green" chemical. If required, ozone can also be destroyed at the output of the process chamber using a catalytic or thermal destruct unit. This significantly lowers chemical disposal cost, as the output is oxygen and contains no ozone. Ozone is very stable at room temperature, making it a good choice for most applications. In addition to ALD, typical ozone applications include chemical vapor deposition (CVD), photoresist strip, wafer cleaning, contaminant removal, surface conditioning, and oxide growth.

The AX8555 system is configurable with up to four (4) independent channels to support multiple ALD tools or chambers concurrently. Each channel can be matched to the specific concentration and flow required for your specific process. The ozone source for each channel is the production-proven AX8560 ozone delivery subsystem. It incorporates MKS patented, field-proven, high concentration, ultra clean ozone generation technology, as well as integrated ozone concentration monitor and flow control. The AX8555 includes all subassemblies required for stand-alone operation, including power distribution, an ambient ozone safety monitor, status indicator panel, and optional integrated ozone destructs for each channel.

Note: For ozone performance of each output channel, please refer to the AX8560 performance graph to the right.

AX8560 Compact Integrated Ozone Delivery Subsystem

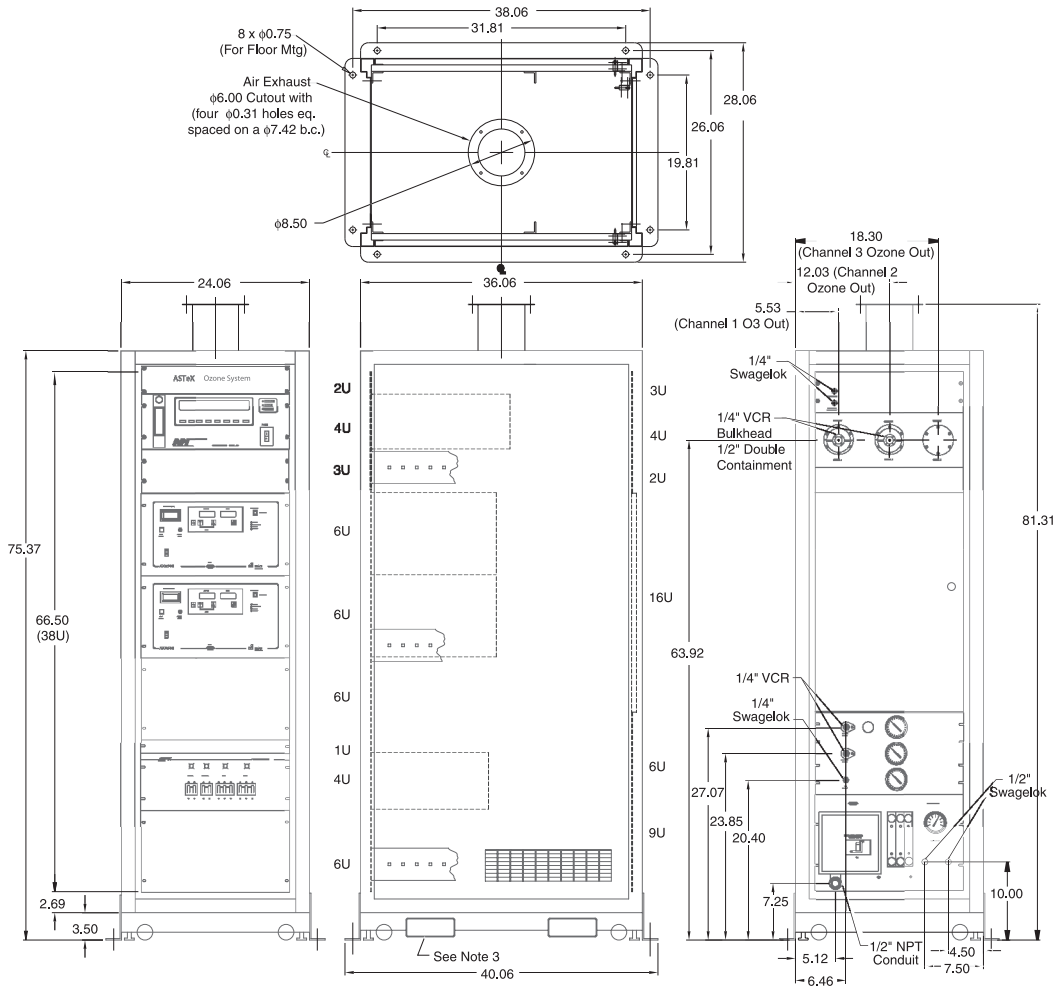


AX8560 Performance Graph

Specifications

Feed Gases	
Type	• Oxygen • Nitrogen (20 - 100 ppm of total flow) • Carbon Dioxide (1000 - 2000 ppm of total flow)
Purity	99.9995% minimum
Supply Pressure	• 60 psig (4.2 kg/cm²) nominal, 75 psig (5.3 kg/cm²) maximum • N_2/CO_2 pressure 10 psi higher than O_2 pressure
Connections	Feed gases - ¼ inch face seal (VCR®)
Pressure Indication	Inlet pressure gauge for each gas
Electrical Power	
Voltage	208 volts AC (±10%), three phase
Current	15 amps RMS, 30 amps service, 31 amps RMS, 50 amps service (depending on configuration) minimum of 10,000 A.I.C
Frequency	50/60 Hz
Cooling Water	
Maximum Supply Pressure	85 psig (6.0 kg/cm²)
Flow Rate	1.0 gpm (2.3 - 3.8 slm) minimum to 1.6 gpm max. per channel (depending on configuration)
Temperature	63 - 73°F (17 - 23°C)
Quality	Demineralized, filtered to 20µm
Connections	½" compression (Swagelok®)
Flow Control/Indication	Variable-area flow meter with valve
Pressure Indication	Inlet pressure gauge
Exhaust	
Type	SEMI Category 4 (accidental or emergency release of hazardous gas or vapor)
Flow Rate	150 cfm (70.8 l/s)
Static Pressure	0.10 in. (2.54 mm) H_2O minimum, measured at the bottom of the duct flange adapter on cabinet
Connection	6" diameter duct opening
Control Air (if required)	
Type	CDA or dry nitrogen, 40µm filtered
Pressure	70 - 100 psig
Fitting	¼" compression (Swagelok®)
Environmental	
Ambient Air Temperature	41 - 104°F (5 - 40°C)
Relative Humidity	30% - 90% (non-condensing)
Altitude	Up to 3280 ft. (1000 m) above mean sea level
Mechanical	
Dimensions (W x H x D)	24 in. x 75 in. x 36 in. (610 mm x 1575 mm x 914 mm)
Weight	• 600 lbs.(272 kg) for system with one generator • 880 lbs.(400 kg) for system with four generators
Compliance	CE, SEMI S2-0302, SEMI F47

Dimensional Drawing



Note: Unless otherwise specified, dimensions are nominal values in inches.

Ordering Information

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

www.MKS.com

AX8555_02/24