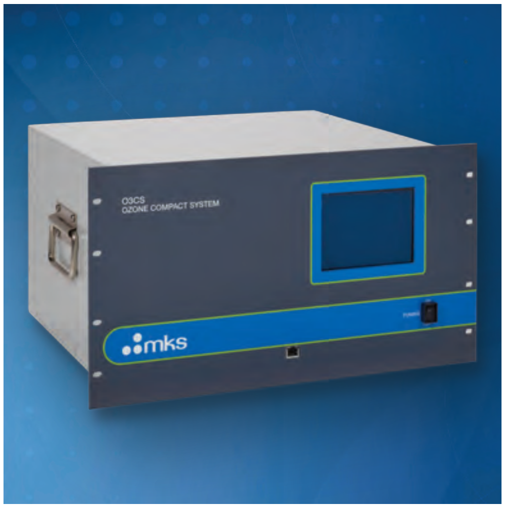
PLASMA & REACTIVE GAS SOLUTIONS

OZONE GENERATORS & SYSTEMS

ULTRA-PURE, RELIABLE OZONE GAS DELIVERY



OZONE GENERATORS & SYSTEMS

FIELD PROVEN GAS DELIVERY FOR ADVANCED APPLICATIONS

MKS offers a wide range of modular ozone delivery systems which produce ultra-pure ozone gas for use in semiconductor manufacturing processes. Ozone is a powerful oxidizing agent, which is used for depositing insulating layers and dielectric materials in integrated circuits. It is also utilized in Chemical Vapor Deposition (CVD) processes to achieve uniform gap filling over complex topographies. Ozone reacts with a wide range of precursor gases resulting in the formation of Al_2O_3, ZrO_2, HfO_2, and La_2O_3 metal oxides to enable thin film deposition processes like Atomic Layer Deposition (ALD) to create conformal films for high aspect ratio structures. MKS ozone generators produce high concentration ozone enabling the creation of higher film density and improving product yield, enhancing product performance and reliability.

- Industry standard generators and subsystems for ultra-clean ozone generation
- Integrated, modular subsystems for ozone monitoring, flow control and power distribution
- High flow, high concentration ozone generators with patented cell design
- Solutions in leading-edge applications such as CVD, ALD, and etch manufacturing

AX8575

Stand-alone High Flow, High Concentration Ozone Delivery System

- Ozone concentrations up to 350g/Nm^3 at higher flow rates to meet new process requirements
- Supports single or multiple process tools for efficiency and lower COO
- Modular design allows each channel to be process matched for maximum flexibility
- Fast, easy installation and quick start up with minimum connections required

AX8580

Fully Integrated Modular Ozone Delivery System

- Highest ozone concentrations >400g/Nm^3 and flow rates for improved quality
- Equipped with up to (4) AX8415 generators
- Individually controlled outputs support up to (4) channels or combined into a single channel chamber process tool
- Improved operating performance and extended lifetime

AX8585

Stand-alone High Concentration Ozone Delivery System

- Ozone concentrations up to 375g/Nm^3 at higher flow rates to meet newer process requirements
- Supports single or multiple process tools for maximum efficiency and lower COO
- Modular design allows each channel to be process matched for maximum flexibility
- Closed-loop operation for tighter process control
- Fast, easy installation and quick start up with minimum connections required

AX8555

Stand-alone Low Flow Ozone Delivery System

- Specifically designed for lower flow processes with high ozone concentration control
- Flexible interlock interface assembly configures easily to OEM tools
- Modular design allows each channel to be process matched to different concentration and flow
- Closed-loop operation for tighter process control
- Optional integrated ozone destructs with bypass valve

Ozone Gas Delivery Systems

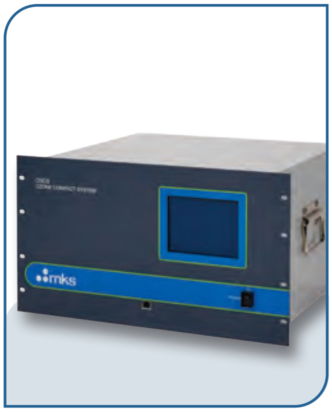
MKS ozone gas delivery systems provide field-proven, high concentration, ultra-clean ozone generation for advanced thin film applications such as Atomic Layer Deposition (ALD), Chemical Vapor Deposition (CVD), Tetraethyl Orthosilicate (TEOS)/Ozone CVD (HDSACVD), and oxide growth. Gas delivery models have integrated ozone concentration monitoring, flow control, and power distribution. Additional system options include safety monitoring, status indicators and ozone destruction capability.

Ozone Gas Generators

Ozone gas generators and subsystems are the industry standard for compact, high concentration, ultra-clean ozone gas generation. Applications include Atomic Layer Deposition (ALD), Atomic Layer Etch (ALE), Chemical Vapor Deposition (CVD).

Compact Ozone Gas Delivery Systems

Our compact ozone gas delivery systems provide full ozone delivery capability in a small, compact footprint making them easy to integrate in space constrained manufacturing environments. The integrated solutions contains all necessary subcomponents needed for precise ozone delivery for advanced thin film processes like Atomic Layer Deposition (ALD). All compact systems are configurable to meet a wide range of ozone flow and concentration to support a wide range of processes.



O3CS

Compact Ozone Delivery System

- Turn-key compact ozone system with integrated control system
- Ozone concentrations up to 20 wt% (300 g/m^3) and flow rates from 0.5-20 slm
- Configurable to adapt ozone output to specific process conditions
- Fully integrated control system with closed-loop control of flow, pressure and concentration

AX8415

Ultra High Concentration, High Flow Ozone Generator

- Ozone concentrations up to 425 g/Nm^3 or 27.1 wt% at 5°C @ 2.5 slm
- O_2 flow rate from 2.5-50 slm enables process flexibility
- Patented cell design enables production of high concentration ozone
- Operational with or without the addition of nitrogen
- Closed-loop operation for tighter process control

AX8410 PRIME

High Concentration, Ultra High Flow Ozone Generator

- Ozone concentrations up to 375 g/Nm^3 or 24.2 wt% at 5°C
- O_2 flow rate from 5-80 slm enables process flexibility
- Patented cell design enables production of high concentration ozone
- Closed-loop operation for tighter process control
- Multi-parameter touch screen interface for smart front panel operation and control

AX8407

High Flow Ozone Generator

- Ozone concentrations up to 335 g/Nm^3 or 21.7 wt% at 5°C
- O_2 flow rate from 5-40 slm enables process flexibility
- Patented cell design enables production of high concentration ozone
- Closed-loop operation for tighter process control

WHY MKS?

CRITICAL TECHNOLOGIES

World-class technology and development capabilities for leading-edge processes

PROVEN PARTNER

Recognized leader delivering innovative, reliable solutions for our customers' most complex problems

OPERATIONAL EXCELLENCE

Consistent execution across all aspects of our business

COMPREHENSIVE PORTFOLIO

Extensive offering of products and services for the markets we serve

MKS Plasma & Reactive Gas Solutions
90 Industrial Way
Wilmington, MA 01887
+1 978.284.4000

Wattstrasse 11-13
D-13355 Berlin, Germany
+49.30.464.0030

MKS Corporate Headquarters
2 Tech Drive, Suite 201
Andover, MA 01810
+1 978-645-5500
+1 800-227-8766 (in USA)

MKS INSTRUMENTS, INC. enables technologies that transform our world. We deliver foundational technology solutions to leading edge semiconductor manufacturing, electronics and packaging, and specialty industrial applications.

We apply our broad science and engineering capabilities to create instruments, subsystems, systems, process control solutions and specialty chemicals technology that improve process performance, optimize productivity and enable unique innovations for many of the world's leading technology and industrial companies.

Our solutions are critical to addressing the challenges of miniaturization and complexity in advanced device manufacturing by enabling increased power, speed, feature enhancement, and optimized connectivity. Our solutions are also critical to addressing ever-increasing performance requirements across a wide array of specialty industrial applications.

Additional information can be found at **www.MKS.com**.